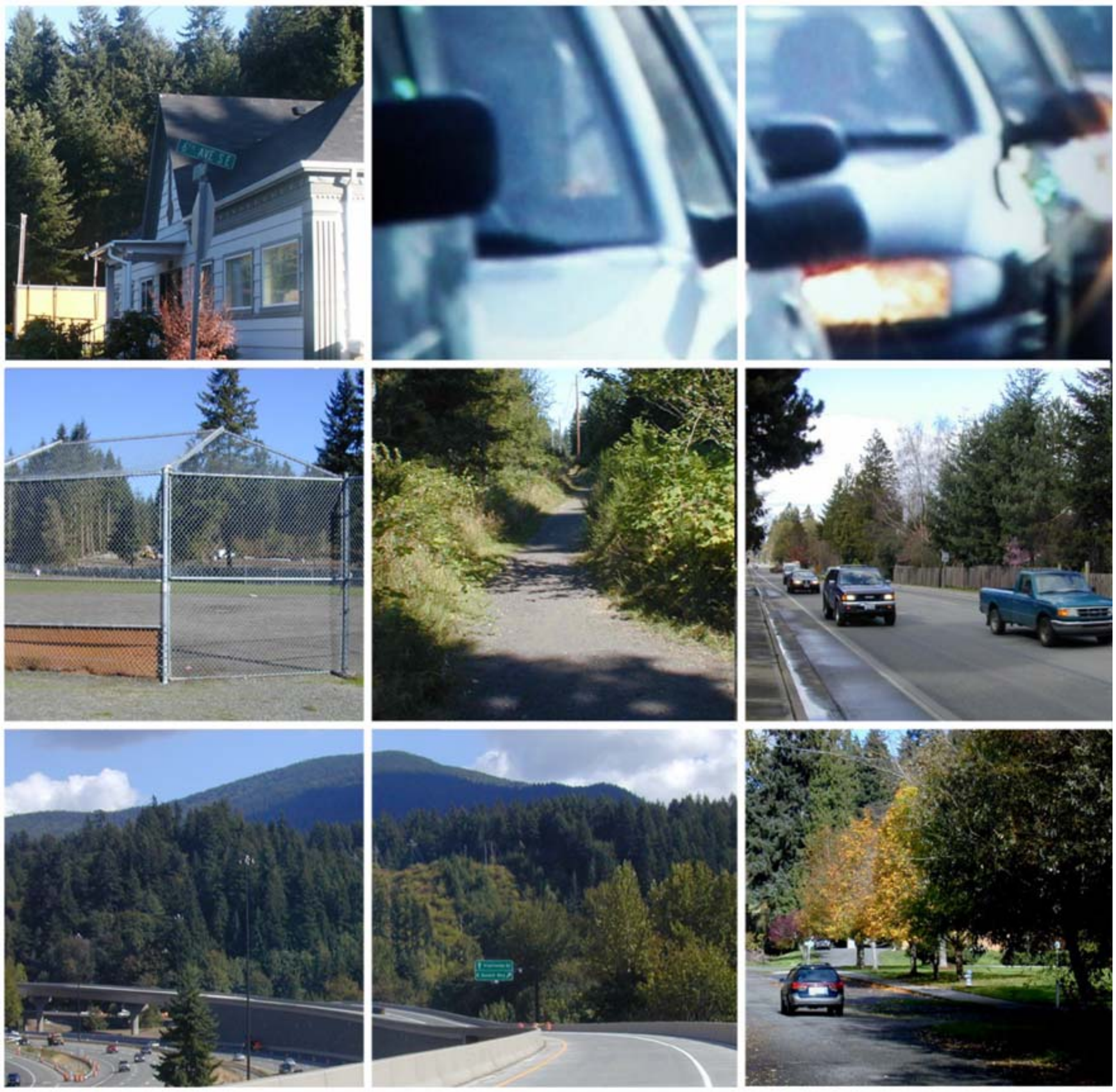
SOUTHEAST ISSAQUAH BYPASS

Final Environmental Impact Statement and Section 4(f) Evaluation

December 2007

Volume 1
Chapters 1 –5



U.S. Department of Transportation
Federal Highway Administration

Washington State
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CITY OF ISSAQUAH

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Southeast Issaquah Bypass

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and Section 4(f) Evaluation

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FHWA-WA-EIS-00-1F

Southeast Issaquah Bypass
Issaquah, Washington

Final Environmental Impact Statement and Section 4(f) Evaluation

Submitted pursuant to 42 U.S.C. 4321, 49 U.S.C. 1651 Sec. 4(f), 16 U.S.C. 470 Sec. 106, and RCW 43.21C. This action complies with Executive Order 11988, Flood Plain Management; Executive Order 11990, Protection of Wetlands; and Executive Order 12898, Environmental Justice.

Submitted by: U.S. Department of Transportation, Federal Highway Administration (FHWA)
Washington State Department of Transportation (WSDOT)
City of Issaquah

12-20-07 Date of Approval	Daniel M. Mathis for Federal Highway Administration
12/20/07 Date of Approval	[signature] for Washington State Department of Transportation
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Abstract

The proposed action is construction of a bypass arterial roadway in the eastern portion of the City of Issaquah. A new north/south arterial is proposed connecting Front Street South in the south with Interstate 90 at the Sunset interchange in the north. The project would include traffic control systems, pedestrian and bicycle trail connections, and stormwater management facilities.

Copies of this final environmental impact statement are available at the City of Issaquah Department of Public Works, 1775 12th Avenue NW, Issaquah, Washington, 98027, for a cost of $66.00, which does not exceed the cost of reproduction.

Persons with disabilities may request that this information be prepared and supplied in alternate forms by calling collect (360) 664-9009, or persons with hearing impairment may call 1-800-486-8392 (TTY relay service) or (360) 705-6980 for Olympia residents.

Washington State Department of Transportation Title VI Notice to Public

The Washington State Department of Transportation hereby gives public notice that it is the policy of the department to assure full compliance with Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, and related statutes and regulations in all programs and activities. Title VI requires that no person in the United States of America shall, on the grounds of race, color, sex, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Washington State Department of Transportation receives federal financial assistance.

The Use of Metric Measurements

Measurements in this document are written in metric units followed by equivalent English units in parentheses.

State Environmental Policy Act (SEPA) Fact Sheet

Nature and Location of Proposal

The Southeast Issaquah Bypass project would create a new north/south arterial roadway between Interstate 90 (I-90) and Front Street South in Issaquah. The new roadway would relieve existing traffic congestion on Front Street South through downtown Issaquah and provide improved mobility throughout the eastern portions of the city. The proposed project would increase the capacity of the local road network, provide an important new link in the regional roadway system, and promote multimodal transportation options by including pedestrian, bicycle, and recreational trail connections.

Proponent

City of Issaquah

Date of Implementation

Construction of the proposed project would begin following acquisition of project permits and right-of-way. Construction timing and duration would be subject to state and local budgeting and appropriation procedures.

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Permits and Approvals Required

A preliminary list of required federal, state, and local permits and approvals for the preferred alternative includes the following:

U.S. Army Corps of Engineers

- Clean Water Act Section 404 nationwide permit or individual permit

Washington Department of Fish and Wildlife

- Hydraulic project approval

Washington Department of Ecology

- Clean Water Act Section 401 water quality certification
- Shoreline substantial development permit
  (conditional use and variance approval)
- Coastal Zone Management Act consistency determination
- National Pollutant Discharge Elimination System (NPDES) general permit for stormwater discharges
- NPDES permit for construction activities disturbing one or more acres

Washington Department of Natural Resources

- Forest practices approval

Puget Sound Clean Air Agency

- Demolition notification (for any structure that might contain asbestos)

King County

- Clearing permit
- Sensitive areas review

City of Issaquah

- Shoreline substantial development permit
- Floodplain development permit
- Critical areas review
- Public agency and utility exception
- Clearing permit
- Demolition permit
- Haul road agreement
- Street use permit

Authors and Principal Contributors

This document has been prepared under the direction of the Federal Highway Administration (FHWA) and the Washington State Department of Transportation (WSDOT). Research and analysis were provided by the following contributors:

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HT Associates

- Transportation

Otak, Inc.

- Surveying

Federal Highway Administration
Washington State Department of Transportation

- Review and Guidance

Date of Issue of Final EIS: December 20, 2007

Date of Final Action: Record of Decision, Winter 2008

Subsequent Environmental Review

None anticipated

Location of EIS Background Data

City of Issaquah Department of Public Works
1775 12th Avenue NW
Issaquah, Washington 98027

Cost to the Public for Copy of EIS

Copies of this final EIS are available for a cost of $66.00 (plus postage), which does not exceed the cost of reproduction and distribution, at the following location:

- Issaquah Department of Public Works
  1775 12th Avenue NW
  Issaquah, Washington 98027

The final EIS is also available for review at the following libraries:

- Bellevue Regional Library
  1111 110th Avenue NE
  Bellevue, Washington
- Issaquah Library
  10 West Sunset Way
  Issaquah, Washington
- Sammamish Library
  825 228th Avenue NE
  Sammamish, Washington

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Abbreviations

ACM	asbestos-containing materials
AQMP	air quality maintenance plan
AST	aboveground storage tank
BLM	federal Bureau of Land Management
BMP	best management practice
CBD	central business district
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CFR	Code of Federal Regulations
cfs	cubic feet per second
CIP	capital improvements plan
cm	centimeters
CO	carbon monoxide
COD	chemical oxygen demand
C&SCS	Confirmed and Suspected Contaminated Sites database
dBA	A-weighted decibels
DNRP	King County Department of Natural Resources and Parks
DPS	distinct population segment
EB	eastbound
Ecology	Washington Department of Ecology
EFH	essential fish habitat
EIS	environmental impact statement
ERNS	Emergency Response Notification System
ESA	federal Endangered Species Act
ESCP	erosion and sedimentation control plan
ESU	evolutionarily significant unit
FACW	facultative wetland
FAZ	forecast analysis zone
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FTE	full-time employee
g	acceleration of gravity units
GLO	General Land Office
GMA	Washington State Growth Management Act
gpm	gallons per minute
ha	hectare
HAP	hazardous air pollutant
HCT	high-capacity transit
HOV	high-occupancy vehicle
HPA	hydraulic project approval
I-90	Interstate 90
IAC	Washington Interagency Committee for Outdoor Recreation
kg	kilograms
km	kilometers
LDS Church	Church of Jesus Christ of the Latter Day Saints
LEDPA	least environmentally damaging practicable alternative
Leq(h)	hourly equivalent sound level
LOS	level of service

LUST	leaking underground storage tank
LWD	large woody debris
µg/L	micrograms per liter
MCL	maximum contaminant level
MFTA	Grand Ridge Master Transportation Financing Agreement
mg/L	milligrams per liter
MOA	memorandum of agreement
mpg	miles per gallon
MPO	metropolitan planning organization
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSATs	mobile source air toxics
MSE	mechanically stabilized earth
MSL	mean sea level
MTCA	Washington Model Toxics Control Act
MTFA	Grand Ridge Master Transportation and Finance Agreement
MTP	metropolitan transportation plan
MTS	metropolitan transportation system
NAAQS	National Ambient Air Quality Standards
NB	northbound
NEPA	National Environmental Policy Act
NIMS	National Incident Management System
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries	NMFS
NO3+NO2	nitrate+nitrite nitrogen
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPL	Superfund National Priorities List
NRCA	natural resource conservation area
NRCS	USDA Natural Resource Conservation Service
NRHP	National Register of Historic Places
OAHP	state Office of Archaeology and Historic Preservation
OBL	obligate wetland
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PFMC	Pacific Fisheries Management Council
PM10	air particulate matter measuring less than 10 micrometers
ppm	parts per million
PSA	preliminary site assessment
PSCAA	Puget Sound Clean Air Agency
PSE	Puget Sound Energy
PSRC	Puget Sound Regional Council
RCP	WSDOT Roadside Classification Plan
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
ROD	record of decision
SAC	Signatory Agency Committee
SaSI	Salmonid Stock Inventory database
SB	southbound
SCMP	spill contingency management plan
SCS	Soil Conservation Service

SEPA	State Environmental Policy Act
SLS&E Railroad	Seattle Lake Shore & Eastern Railroad
SMSA	standard metropolitan statistical area
SPAR	Sammamish Plateau Access Road
SPCC plan	spill prevention, control, and countermeasures plan
spv	seconds per vehicle
SR	State Route
SWM	King County Surface Water Management
SWPPP	stormwater pollution prevention plan
TCE	trichloroethylene
TCLP	toxicity characteristic leaching procedure
TCP	Toxics Cleanup Program
TDM	transportation demand management
TESCP	temporary erosion and sedimentation control plan
TIP	transportation improvement plan
TMDL	total maximum daily load
TNM	the FHWA traffic noise model
TP	total phosphorus
TSD	treatment, storage, and disposal
TSM	transportation system management
TSS	total suspended solids
UGA	urban growth area
UGB	urban growth boundary
U.S. COE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
U.S. EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
vmt	vehicle miles traveled
VOC	volatile organic compound
vph	vehicles per hour
WAC	Washington Administrative Code
WB	westbound
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WPA	Works Progress Administration
WRIA	water resource inventory area
WSDOT	Washington State Department of Transportation

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Summary

Summary

This document is the final environmental impact statement (EIS) for the Southeast Issaquah Bypass project. The information and analyses presented in this document have resulted from changes in the proposed project, and meet the requirements of the National Environmental Policy Act (Code of Federal Regulations [CFR], Chapter 40, parts 1500-1508) and State Environmental Policy Act (Revised Code of Washington [RCW] 43.21C).

The proposed project to which this document applies is the Southeast Issaquah Bypass, a new principal arterial to be constructed in the eastern portion of Issaquah, Washington. A complete description of the proposed project is provided in Chapter 2 of this document. A draft EIS for this project was published by the Federal Highway Administration (FHWA), Washington State Department of Transportation (WSDOT), city of Issaquah, and King County in 2000. After receiving comments on the draft EIS, preparation of a final EIS began in 2000. As those efforts proceeded, the proposed project was reexamined based on information provided in the draft EIS and on input from agencies and citizens who provided comments on the project.

This reexamination concluded that one southern alignment in the draft EIS should no longer be pursued, and that the other southern alignment would require modifications to make it more acceptable to agencies and the public. During winter 2000/2001, changes in the design and location of the proposed project's southern alignments were explored to better avoid or reduce potential impacts on wetlands, streams, fish and wildlife habitat, adjacent residences, and land uses. This resulted in several changes in the project, which required preparation of a supplemental EIS. According to FHWA regulations, an EIS may be supplemented whenever the agency determines the following:

- Changes to the proposed action would result in significant environmental impacts that were not evaluated in the EIS, or
- New information or circumstances relevant to environmental concerns and bearings on the proposed action or its impacts would result in significant environmental impacts not evaluated in the EIS (23 CFR 771.130).

As it became apparent that supplemental environmental analysis would be needed, funding for additional work became a concern. In spring 2001, work on the proposed project was suspended while additional funding was pursued. By summer 2001, new funding had been identified and project work resumed. At that time, a new southern alignment was identified and the FHWA requested that the team extend the traffic modeling analysis to the year 2030. Consequently, a revised traffic model was developed and applied to the proposed project. The results of the 2030 traffic modeling, completed in spring 2002, demonstrated that a four-lane facility would be required in order to accommodate future traffic conditions.

Because of the need to modify the design to accommodate four lanes of traffic, funding once again became a concern. The Issaquah City Council requested a thorough review of the proposed project objectives, which led to another suspension of design work while the future of the project was debated. The council voted in May 2002 to complete the supplemental EIS for the proposed project, including study of a new southern alignment along with further study of the previous southern alignment. These two alignments, combined with the three northern alignments introduced in the draft EIS, comprise the six "build alternatives analyzed in the supplemental draft EIS. The supplemental draft EIS was issued in June 2004.

After publication of the supplemental draft EIS, the city reviewed comments received on that document and the proposed project alternatives. Modified Alternative 5 was developed as a result of agencies participating in the Interagency 404 Merger Agreement review in 2005. Comments from reviewing agencies resulted in the need to provide additional information on the design of Modified Alternative 5, which has been incorporated into this final EIS.

Purpose of the Proposed Action

The following paragraph is the formal purpose and need statement for the Southeast Issaquah Bypass project:

The need for the proposed project is the result of existing traffic volumes on city streets, and the necessity to increase mobility by reducing congestion and improving access to Interstate 90. The purpose of the proposed project is to resolve these problems by reducing traffic volumes that are causing the two existing interchanges, and the Front Street corridor, to be overburdened.

The purpose of the proposed action is to relieve existing traffic congestion on Front Street South through downtown Issaquah and provide improved mobility throughout the eastern portions of the city. To meet this objective the action should increase the local road network's capacity; improve the existing level of service consistent with the city's comprehensive plan; provide an important new link in the regional roadway system; and promote multimodal transportation options by including pedestrian, bicycle, and recreational trail connections.

The proposed action, the Southeast Issaquah Bypass project, would create a new north/south arterial roadway to be located between Interstate 90 (I-90) and Front Street South in Issaquah, Washington (see **Figure S-1**). This project would reduce existing and future levels of congestion on Front Street South because traffic currently passing through downtown Issaquah could use the Southeast Issaquah Bypass as an alternate route between I-90 and points south of the city. A portion of the trips that now use Southeast Newport Way for access to and from I-90 could be expected to shift to the Southeast Issaquah Bypass. Traffic on East Sunset Way would also be expected to decrease because the new bypass would provide an alternate route between areas north and south of I-90. The new arterial may also result in fewer future trips on other north/south arterials such as Front Street South and 2nd Avenue Southeast.

Need for the Proposed Action

The city of Issaquah is currently experiencing a high volume of pass-through traffic, and future projections indicate the need to increase mobility by reducing

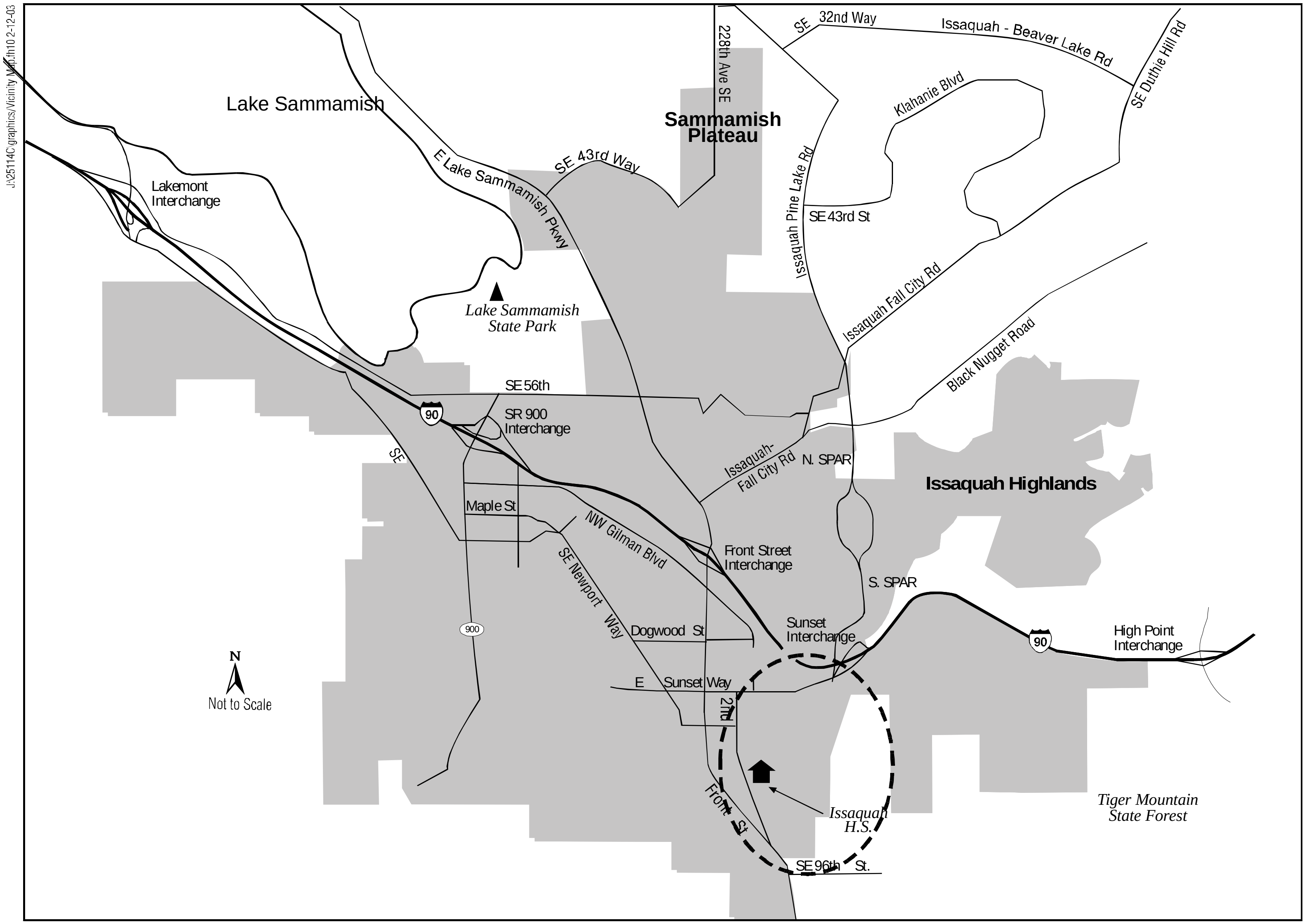

Figure S-1
Vicinity Map

traffic levels on local streets. For more than 10 years WSDOT, King County, and the city have been exploring ways to alleviate current and future congestion by providing additional access to I-90 in the Issaquah area and creating an alternate route for north/south traffic through the Front Street corridor.

The need for the proposed project results from existing traffic volumes that are impeding travel within the city, future growth that is expected to increase the traffic problem, and growth management regulations that require the city to provide infrastructure capable of serving future planned development. The project alternatives are described in Chapter 2.

Related Actions

The following transportation projects have been recently constructed near the proposed Southeast Issaquah Bypass project area:

- Sunset Interchange
- South Sammamish Plateau Access Road (South SPAR), now named Highlands Drive
- North Sammamish Plateau Access Road (North SPAR), now named Highlands Drive.

Alternatives Considered but Rejected

Since the inception of this project in the early 1990s, numerous designs have been considered to improve north-south access through Issaquah to I-90. These options have ranged from making improvements to existing roadways that currently connect to I-90 (such as State Route 900 [SR 900] and Front Street South) to construction of completely new roadways in other corridors.

The *Southeast Bypass Road Alternatives Alignment Study* (1997) investigated nine alternative corridors to connect areas south of the city with I-90. The nine corridors were first identified through discussions with city staff. The corridor alternatives were then refined based upon public comments received during the scoping period for the draft EIS. Each corridor alternative was evaluated based upon social and economic impacts, natural environment impacts, transportation improvements, and cost. Because the Front Street South to Sunset interchange corridor had the lowest environmental, social, and economic impact and provided substantial transportation improvements at a moderate cost, it was selected for further study. All other corridor alternatives were eliminated from further consideration.

Alternatives Evaluated in the Final EIS

After evaluating numerous alternatives to the proposed project, three alignments in the north and two alignments in the south were selected for further study. These five alignments were combined in different pairs to create the six build alternatives analyzed in the June 2004 supplemental draft EIS. Modified Alternative 5 was developed after the 2004 supplemental draft EIS was issued, as a result of agencies participating in the 404 Merger Agreement review. This alternative is very similar to the original Alternative 5, differing only in the road alignment along 6th Avenue Southeast to further minimize wetland impacts and proposed stormwater facilities that were refined to meet mitigation goals. The no-action alternative also continues to be evaluated, to provide the option of not constructing a new roadway.

If constructed, the proposed project would result in a new four-lane roadway, approximately 1.9 kilometers (1.1 miles) in length, between Front Street South and I-90. The proposed roadway would include two travel lanes in each direction, with bicycle lanes, curbs, gutters, and sidewalk and trail connections. Brief descriptions of the six build alternatives and the no-action alternative considered in this final EIS follow.

Alternative 1

Alternative 1 would extend southward from a new T-intersection at East Sunset Way, following a former railroad right-of-way along the North A alignment and 6th Avenue Southeast along the South A alignment to a reconfigured intersection with Front Street South (**Figure S-2**). New traffic signals would be installed at East Sunset Way, the main entrance to a proposed mixed-use development (Park Pointe), and a reconfigured intersection with Front Street South.

The proposed roadway would include two travel lanes in each direction, with center-turn and right-turn lanes in several locations. Each travel lane would be 3.6 meters (12 feet) wide, and 1.5-meter- (5-foot-) wide bicycle lanes would be provided in each direction adjacent to the curb and gutter. A 4.2-meter- (14-foot-) wide hard surface pedestrian/bicycle trail would be provided along the entire western edge of the roadway.

A new trailhead parking area located at the eastern end of Southeast Andrews Street would provide additional access to the Tiger Mountain trail system. A 1.5-meter- (5-foot-) wide sidewalk would be provided along the eastern roadway edge.

Alternative 1 would include a bridge over the north tributary to Issaquah Creek (also known as the Lewis Lane tributary) and its associated wetland. Retaining walls would be constructed along both sides of the alignment in the north, to minimize impacts on steep slope areas and adjacent properties. In addition, Alternative 1 would include the construction of six stormwater pond systems to manage runoff from new impervious-surface areas.

Alternative 2

This alternative would follow the same North A alignment route as Alternative 1. In the south it would continue to follow the South C alignment along the abandoned railroad right-of-way as it turns west beyond the high school football field (**Figure S-3**). A new four-way intersection at 2nd Avenue Southeast would be constructed, and the new roadway would end at Front Street South, just west of the 2nd Avenue Southeast intersection. Signalization for Alternative 2 would be the same as described for Alternative 1, except that signals would be installed at the new 2nd Avenue Southeast intersection.

The number and dimensions of travel lanes, bicycle lanes, the pedestrian/bicycle trail, and sidewalks would be the same as described for Alternative 1. The pedestrian/bicycle trail located along the western edge of the roadway would directly connect to the Rainier Trail. In addition to the new trailhead parking at the eastern end of Southeast Andrews Street, this alternative would include trailhead parking with a direct connection to the high school trail.

Similar to Alternative 1, retaining walls would be constructed along both sides of the roadway along the North A alignment to minimize impacts to steep slope areas and adjacent properties. Five stormwater pond systems would be constructed as part of Alternative 2.

Alternative 3

Under this alternative, the new road would follow the North B alignment southward from a new T-intersection at East Sunset Way, traversing the western edge of the Tiger Mountain natural resource conservation area (NRCA) along the base of Tiger Mountain. The road would then follow the South A alignment along 6th Avenue Southeast to a reconfigured intersection with Front Street South (**Figure S-4**). The roadway surface would be recessed below existing grades for approximately one-third of a mile adjacent to the high school, to reduce potential traffic noise. Signalization would be the same as described for Alternative 1.

The travel lanes, bicycle lanes, pedestrian/bicycle trail, sidewalks, stormwater ponds, trailhead parking area, retaining walls, and bridge over North Fork Issaquah Creek would be basically the same as described for Alternative 1.

Alternative 4

Alternative 4 would follow the same North B alignment as Alternative 3 in the north and the same South C alignment as Alternative 2 in the south, resulting in a new roadway extending 1.7 kilometers (1.1 miles) from a new T-intersection at East Sunset Way to a new four-way intersection at 2nd Avenue Southeast (**Figure S-5**). As with Alternative 3, the roadway surface would be recessed below existing grades for approximately one-third of a mile adjacent to the high school to reduce potential traffic noise. Signalization, the number and dimensions of travel lanes, bicycle lanes, the pedestrian/bicycle trail, sidewalks, stormwater ponds, trailhead parking areas, and retaining walls would be basically the same as described for Alternative 2.

Modified Alternative 5 (the Preferred Alternative)

This alternative which is made of North C and a slightly modified South A would extend southward from a new T-intersection at East Sunset Way, following a southerly route along the base of Tiger Mountain. In the south, the road would follow along 6th Avenue Southeast to a reconfigured intersection with Front Street South (**Figure S-6**).

Signalization would be the same as described for Alternatives 1 and 3. New traffic signals would be installed at East Sunset Way, the main entrance to a proposed residential development project (Park Pointe), and a reconfigured intersection with Front Street South. The proposed roadway would include two travel lanes in each direction, with center-turn and right-turn lanes in several locations. A hard surfaced pedestrian/bicycle trail would be provided along the entire western edge of the roadway.

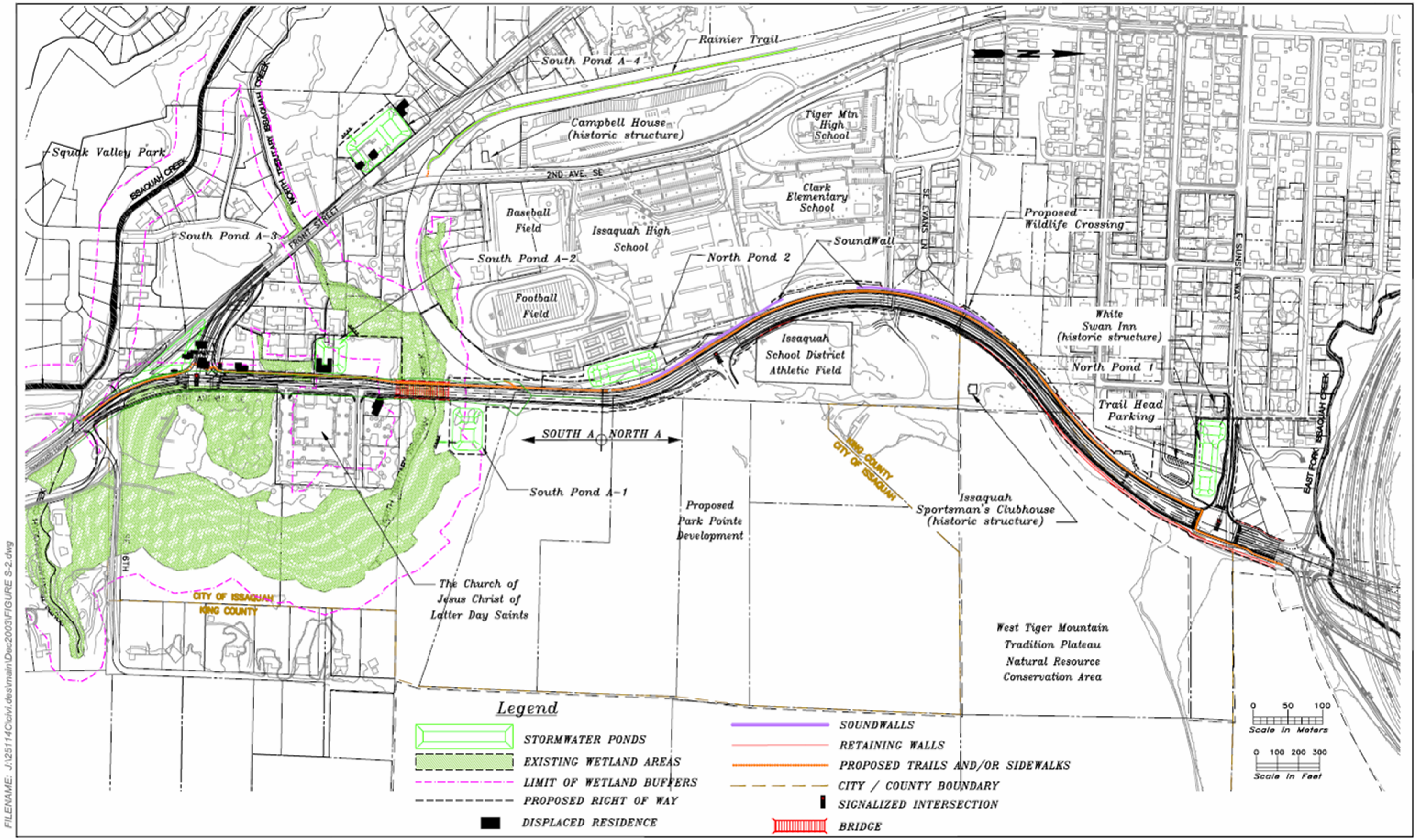

Figure S-2
Alternative 1 (North A and South A)

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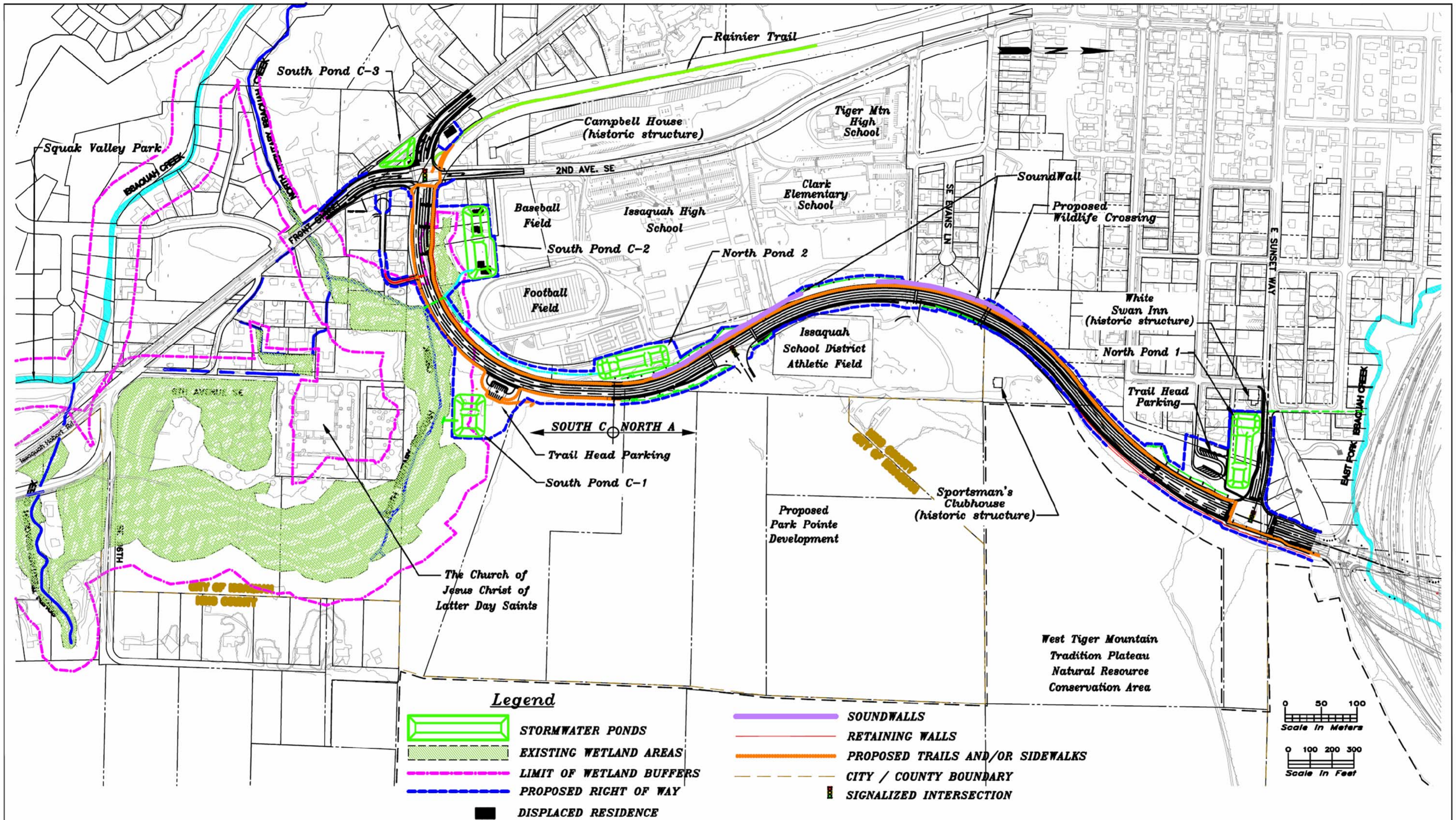

Figure S-3
Alternative 2 (North A and South C)

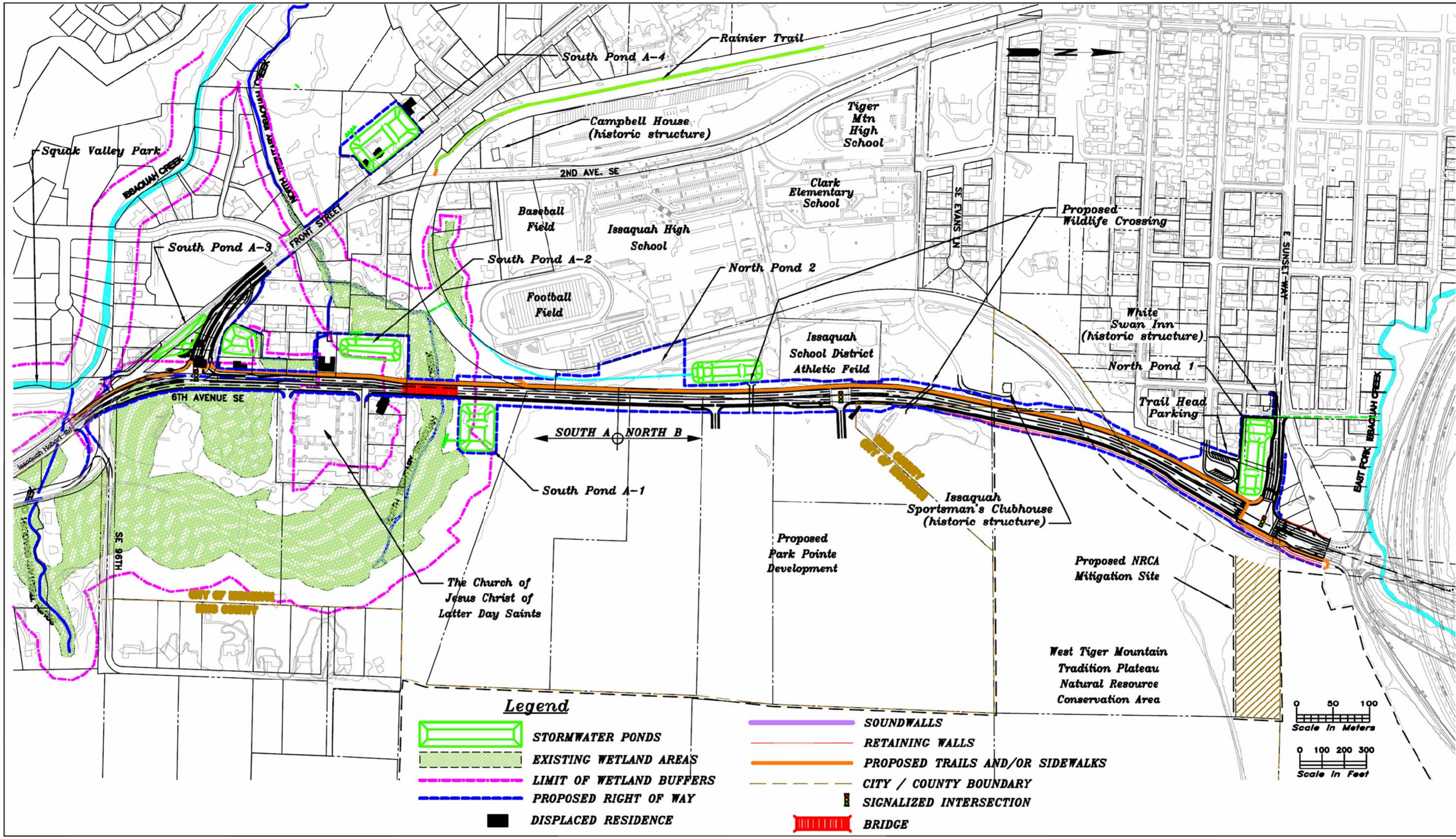

Figure S-4
Alternative 3 (North B and South A)

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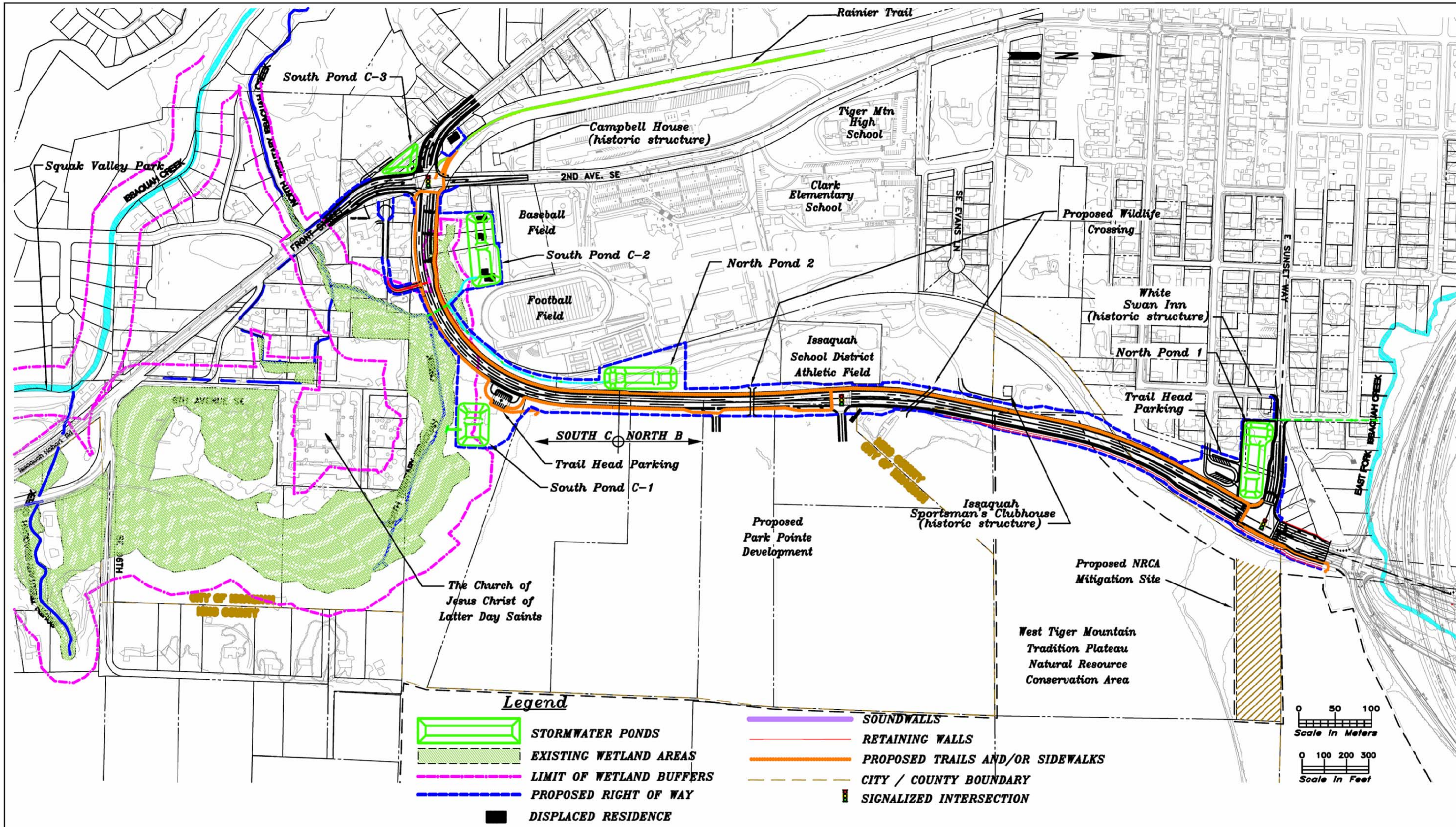

Figure S-5
Alternative 4 (North B and South C)

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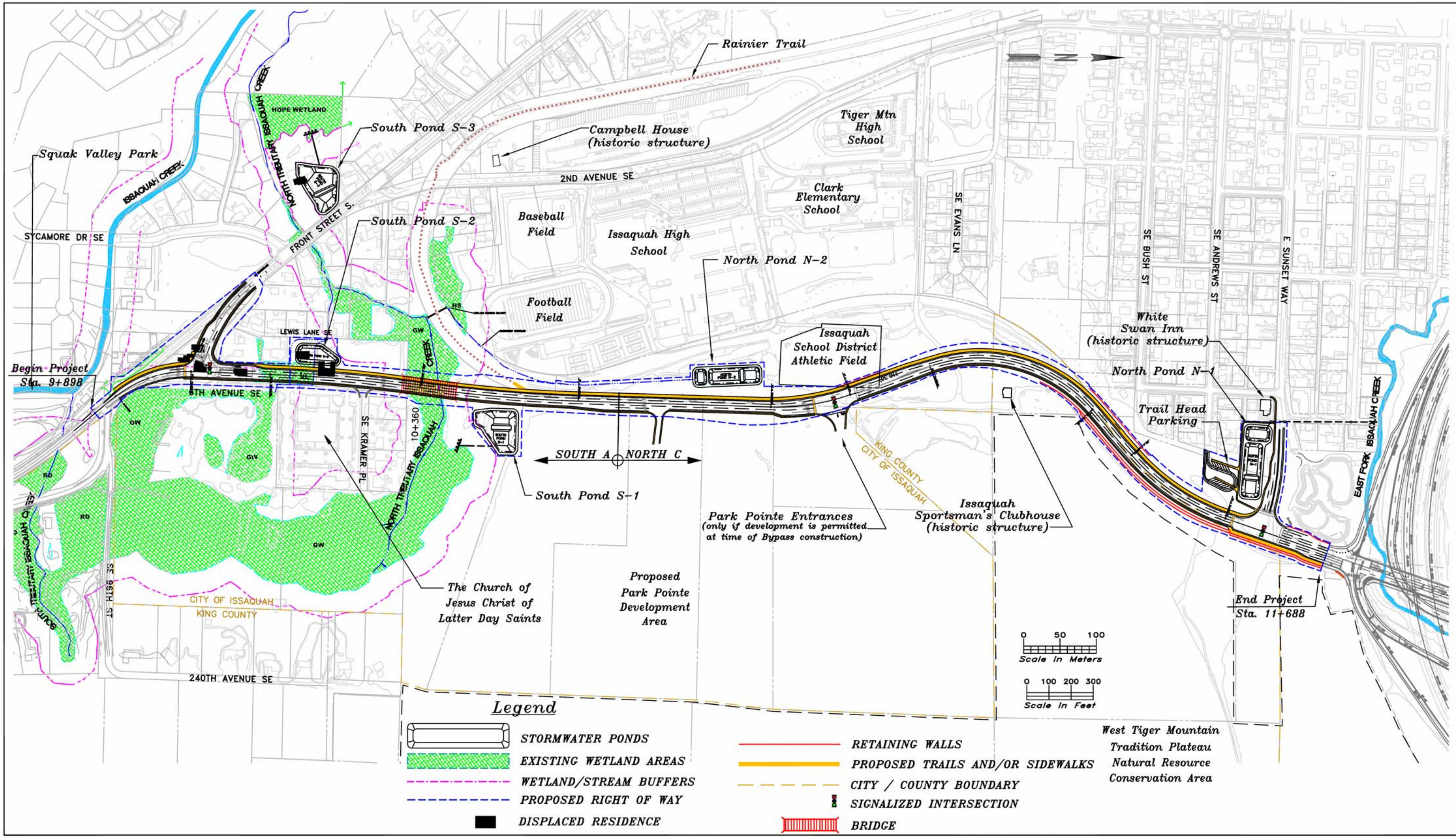

Figure S-6
Modified Alternative 5 (North C and South A)

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Modified Alternative 5 would include a bridge over the north tributary of Issaquah Creek (also known as the Lewis Lane tributary) and its associated wetland. Retaining walls would be constructed along both sides of the alignment along the north alignment, to minimize impacts to steep slope areas and adjacent properties. In addition, Modified Alternative 5 would include the construction of five stormwater pond systems to manage runoff from new impervious areas.

Alternative 6

Alternative 6 would extend approximately 1.6 kilometers (1.0 miles) from a new T-intersection at East Sunset Way to a new four-way intersection at 2nd Avenue Southeast (**Figure S-7**). The north half of this alignment is the same as Alternative 5, following the North C alignment southward along the former railroad right of way. The alignment would then pass between the Issaquah Sportsmen's Clubhouse and the Issaquah School District athletic field. Alternative 6 would then follow the South C alignment along the former railroad right-of-way around the southern end of Issaquah High School.

Signalization, the number and dimensions of travel lanes, bicycle lanes, the pedestrian/bicycle trail, sidewalks, stormwater ponds, trailhead parking areas, and retaining walls would be similar to features described for Alternatives 2 and 4. The pedestrian/bicycle trail located along the western edge of the roadway would directly connect to the Rainier Trail, creating a nearly continuous path from the Issaquah Community Center to the Tiger Mountain trail system. In addition to new trailhead parking at the eastern end of Southeast Andrews Street, this alternative would include trailhead parking with a direct connection to the high school trail. This parking would be provided to replace parking lost to construction of the new intersection at 2nd Avenue Southeast.

Alternative 7, the No-Action Alternative

Under the no-action alternative (shown in **Figure S-8**), the Southeast Issaquah Bypass would not be constructed, and no right-of-way would be acquired. The no-action alternative would include modifying the temporary configuration at Sunset interchange, which was built in anticipation of the Southeast Issaquah Bypass, with a permanent roadway connecting to Sunset Way. This will be conducted by WSDOT using existing funding. This alternative does consider the construction of a number of other roadway projects in the area, including the I-90/Sunset interchange project, South Sammamish Plateau Access Road (SPAR), and North SPAR, all of which have been completed. It also assumes continued construction of commercial and residential projects, both locally and regionally, resulting in additional traffic demands on city streets.

Under the no-action alternative, the city would have to return to the planning process to evaluate transportation improvement options to alleviate traffic congestion on city streets between I-90 and Issaquah/Hobart Road. Selection of new alternatives may require significant changes to the city's transportation policy if other capacity improvement projects, such as widening of Newport Way or Front Street South, are to be considered as viable alternatives to the Southeast Issaquah Bypass. Many of these improvements are likely to be very controversial because direct impacts caused by road widening along existing city arterials would affect many more properties and residents than for the Southeast

Issaquah Bypass. Alternatively, the city can adopt a lower level of service in its transportation system, thereby delaying the need for—and decisions on—future transportation improvements.

In any case, selection of the no-action alternative would result in deferral of transportation improvements between I-90 and Issaquah/Hobart Road for perhaps another 10 years. In the meantime, local traffic and through commute traffic would continue to travel along Front Street South, 2nd Avenue Southeast, and East Sunset Way. Over time, increased residential development in Issaquah and unincorporated King County to the south of the city, as allowed under current land use regulations and required by the state Growth Management Act, is expected to further increase traffic and congestion. At this time, public transit agencies have no plans to extend transit services south along Issaquah/Hobart Road to provide an alternative to motorists. The increased congestion would also continue to further increase the amount of traffic through adjacent residential neighborhoods in an attempt to avoid congestion on the primary arterials.

The Preferred Alternative

Modified Alternative 5 is the course of action that FHWA, WSDOT, and the city of Issaquah have determined to be the most desirable in terms of balancing functional efficiency and environmental and social costs.

Estimated Cost

Estimated costs for construction of the proposed project alternatives (including design and right-of-way) are shown in **Table S-1**. These estimates are based on preliminary design information and would likely change at the time of construction.

Table S-1
Estimated Construction Costs

Alternative	Estimated Construction Cost
Alternative 1	$44.3 million
Alternative 2	$36.4 million
Alternative 3	$41.5 million
Alternative 4	$33.7 million
Modified Alternative 5	$43.5 million
Alternative 6	$35.6 million
Note: Dollars were estimated in 2002 and inflated by 3% per year to arrive at dollars for 2009.	

Right-of-Way Acquisition

The estimated amounts of right-of-way acquisition required for the alternative project routes are shown in **Table S-2**.

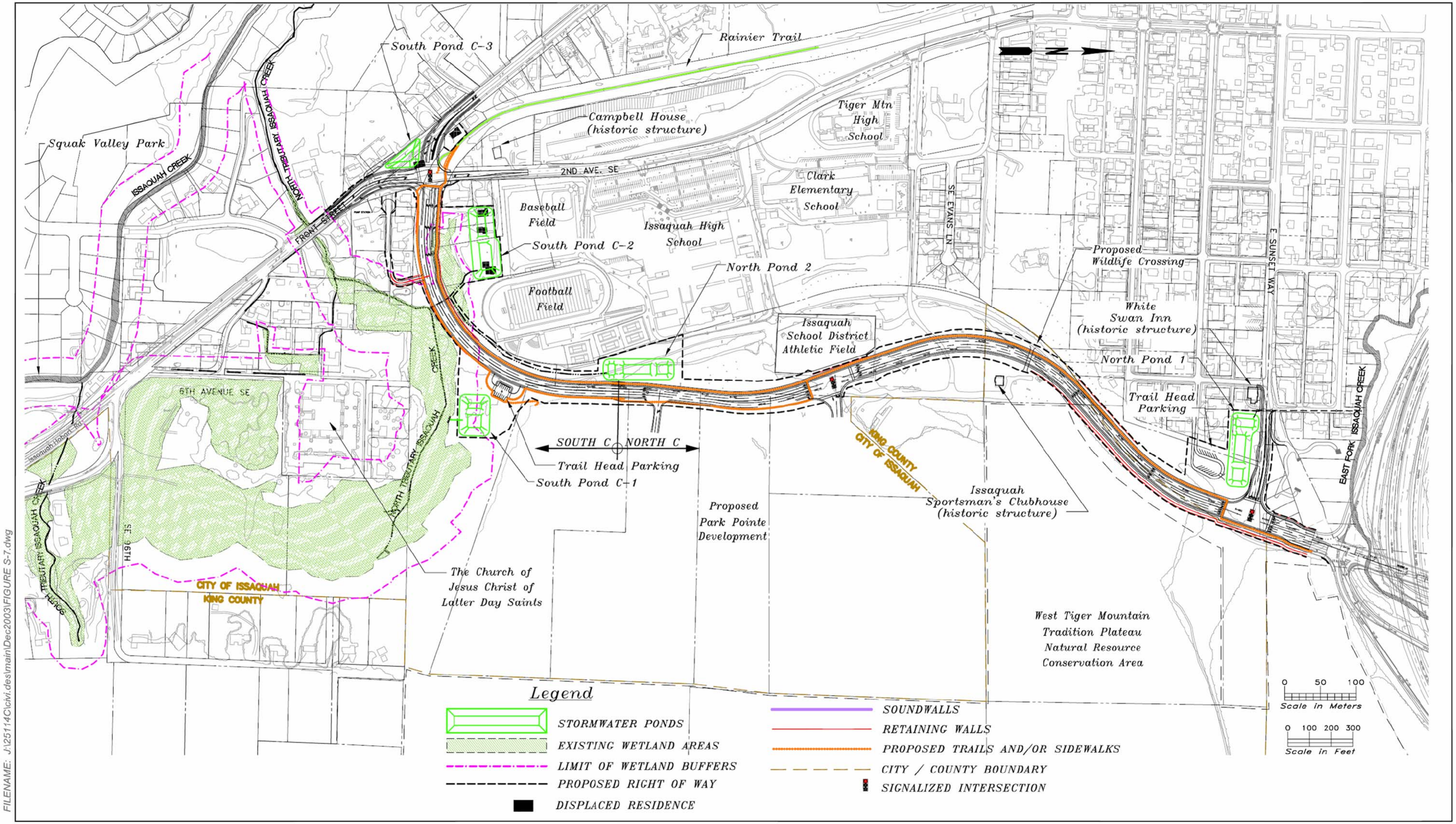

Figure S-7
Alternative 6 (North C and South C)

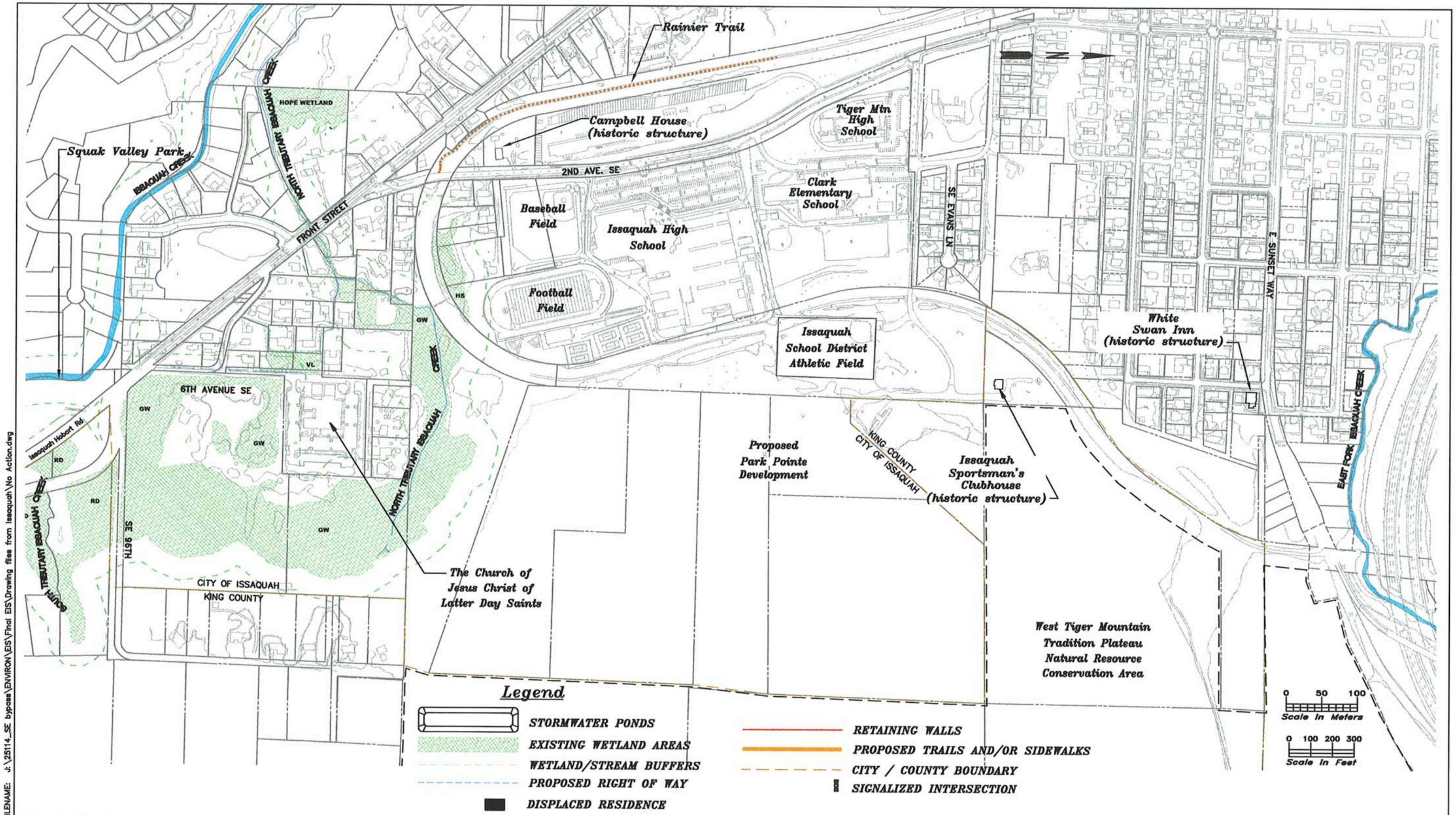

Figure S-8
Alternative 7 (No Action)

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Table S-2
Estimated Right-of-Way to Be Acquired

Alternative	Estimated Right of Way Amount
Alternative 1	87,962 square meters (21.7 acres)
Alternative 2	102,489 square meters (25.3 acres)
Alternative 3	98,871 square meters (24.4 acres)
Alternative 4	113,498 square meters (28.0 acres)
Modified Alternative 5	82,069 square meters (20.2 acres)
Alternative 6	105,541 square meters (26.1 acres)

Required Permits and Regulatory Approvals

A preliminary list of the federal, state, and local permits and approvals that may be required by the proposed project follows.

U.S. Army Corps of Engineers

- Clean Water Act Section 404, nationwide permit or individual permit.

Washington Department of Fish and Wildlife

- Hydraulic project approval.

Washington Department of Ecology

- Clean Water Act Section 401 water quality certification
- Shoreline substantial development permit
(conditional use and variance approval)
- Coastal Zone Management Act consistency determination
- National Pollutant Discharge Elimination System (NPDES) general permit for stormwater discharges
- NPDES permit for construction activities disturbing one or more acres.

Washington Department of Natural Resources

- Forest practices approval.

Puget Sound Clean Air Agency

- Demolition notification (for any structure that might contain asbestos).

King County

- Clearing permit
- Sensitive areas review.

City of Issaquah

- Shoreline substantial development permit
- Floodplain development permit
- Critical areas review
- Public agency and utility exception
- Clearing permit
- Demolition permit
- Haul road agreement
- Street use permit.

In addition, the final step in the National Environmental Policy Act (NEPA) environmental review process is a record of decision (ROD), to be issued by the FHWA. The final step in the State Environmental Policy Act (SEPA) environmental review process is a notice of action, to be published in the Washington Department of Ecology SEPA Register.

Major Environmental Impacts and Mitigation Measures

Table S-3 summarizes for comparison purposes the major environmental impacts and proposed mitigation measures associated with the build alternatives and the no-action alternative analyzed in this final EIS.

Table S-3
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Air Quality	
All Build Alternatives	
No exceedances of the 8-hour or 1-hour average National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO) were predicted under all build alternatives. Reduction of congestion on Front Street could result in a reduction of CO concentrations along Front Street for all build alternatives, compared to the no-action alternative. Temporary emissions would also occur during construction.	No mitigation is required. Best management practices (BMPs) would be followed to address temporary impacts associated with construction activities. BMPs could include lowering speed limits in construction areas to reduce dust, spraying exposed soil with water, covering trucks that transport materials, providing wheel washers to remove particulate matter from truck tires, and requiring appropriate emission control devices on construction equipment.
No-Action Alternative	
Predicted worst-case CO concentrations would be similar to existing conditions in 2010 and 2030. No exceedances of the 1-hour average NAAQS for CO are predicted. Predicted maximum 8-hour CO concentrations from vehicle emissions range from 4.8 to 5.0 parts per million (ppm) for the year 2010 and from 3.8 to 3.9 ppm for the year 2030.	Mitigation measures for impacts resulting from the proposed project would not be required because the project would not be constructed.
Noise	
Alternative 1	
Peak-hour noise levels would increase by up to 17 decibels (dBA) above existing conditions by 2030. Eleven residences, an athletic field, a high school and a church would experience noise impacts that approach or exceed noise abatement criteria.	Noise barriers would be constructed near the Southeast Evans Lane neighborhood and Issaquah High School at a cost of approximately $375,000. Even with mitigation, four residences, an athletic field, and a church would experience noise impacts.
Alternative 2	
Peak-hour noise levels would increase by up to 16 dBA above existing conditions by 2030. Fourteen residences, an athletic field, and a high school would experience noise impacts that would approach or exceed noise abatement criteria.	Noise barriers would be constructed near the Southeast Evans Lane neighborhood and Issaquah High School at a cost of approximately $375,000. Even with mitigation, nine residences and an athletic field would experience noise impacts.
Alternative 3	
Peak-hour noise levels would increase by up to 17 dBA above existing conditions by 2030. Four residences and a church would experience noise impacts that would approach or exceed noise abatement criteria.	Two noise walls were evaluated. One was found to be not feasible because it would eliminate vehicle access to local streets, and the other did not meet WSDOT reasonableness criteria. Neither has been included as mitigation.

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Noise (continued)	
Alternative 4	
Peak-hour noise levels would increase by up to 13 dBA above existing conditions by 2030. Seven residences would experience noise impacts that would approach or exceed noise abatement criteria.	One noise wall was evaluated. It did not meet WSDOT reasonableness criteria and was found to be unreasonable or not feasible based on FHWA noise abatement criteria. Therefore, no mitigation is proposed.
Modified Alternative 5 (Preferred Alternative)	
Noise level changes in the project area would range from a 3-dBA decrease to a 17-dBA increase above existing conditions. Four residences, an athletic field, and a church would experience noise impacts approaching or exceeding noise abatement criteria. Secondary and cumulative effects are included in noise modeling results; substantial adverse impacts are not expected.	Two noise walls were evaluated. One wall could not meet WSDOT feasibility criteria and achieve a minimum 7-dBA reduction in noise. The other wall did not meet WSDOT reasonableness criteria. Both walls were found to be unreasonable or not feasible based on FHWA noise abatement criteria. Therefore, no specific mitigation is proposed. The city would work with the school district to identify appropriate mitigation measures.
Alternative 6	
Peak-hour noise would increase by up to 15 dBA above existing conditions by 2030. Seven residences and an athletic field would experience noise impacts approaching or exceeding noise abatement criteria.	Two noise walls were evaluated. Both were found to be unreasonable or not feasible based on FHWA noise abatement criteria, and neither met WSDOT reasonableness criteria. Therefore no mitigation is proposed.
No-Action Alternative	
Noise level changes in the project area would range from no change to an increase of 5 dBA above existing conditions, caused by traffic volume increases. Noise levels at 12 residences on East Sunset Way would reach 68 dBA and would exceed maximum permissible noise levels. Levels at three residences west of the existing Front Street South and 2nd Avenue Southeast intersection would reach 66 dBA, approaching the maximum permissible noise levels. A total of 15 residences would experience noise impacts.	Mitigation measures for impacts resulting from the proposed project would not be required because the project would not be constructed.
Energy	
Alternatives 1 and 3	
Energy consumption by vehicle traffic would increase 17% by 2030. Construction activities would entail temporary energy consumption.	No substantial impacts are expected to result from any of the build alternatives; therefore mitigation would not be needed.

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Energy (continued)	
Alternatives 2, 4, and 6 Energy consumption by vehicle traffic would decrease 10% by 2030. Construction activities would entail temporary energy consumption.	
Modified Alternative 5 (Preferred Alternative) Energy consumption by vehicle traffic would increase 17% by 2030. Construction activities would entail temporary energy consumption. Secondary and cumulative effects are included in the energy analysis; substantial adverse impacts are not expected.	
No-Action Alternative Overall traffic congestion in the study area would decrease because of improved traffic operations with the I-90/Sunset interchange, resulting in a decrease in energy use from existing conditions.	Mitigation would not be required.
Geology and Soils	
All Build Alternatives Impervious surface runoff or point discharges could increase erosion and landslide potential. Seismic risk is considered low. Large cuts and fills at the north end of the project corridor and fills at the south end of the corridor could result in soil erosion and sedimentation during construction activities. No secondary impacts are expected. However, the project would contribute to cumulative impacts on earth resources in the project area.	Structures in steep slope areas would be supported with foundations on firm and unyielding soils or bedrock. During construction, erosion and sedimentation control measures would be implemented consistent with local, state and federal requirements.
No-Action Alternative No adverse impacts related to earth resources are expected.	Mitigation would not be required.

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Hydrologic Systems	
All Build Alternatives Under any of the build alternatives, the project could contribute to construction site sediments entering Issaquah Creek, increased surface water runoff entering Issaquah Creek and Lake Sammamish, and reduced groundwater recharge in the lower Issaquah valley aquifer. Impacts that are specific to each of the build alternatives are described below.	For any of the build alternatives, direct impacts on existing drainage system features would be mitigated through in-kind facilities to maintain flow conveyance capacity and mitigate flooding impacts. Buffer areas would be provided to mitigate project disturbances. Stormwater management facilities for any of the build alternatives would be designed consistent with the criteria set forth in the 1998 King County *Surface Water Design Manual* (or most current edition adopted by the city of Issaquah), Ecology's *Stormwater Management Manual for Western Washington* (2005 edition), and the 2006 WSDOT *Highway Runoff Manual*. For any of the build alternatives, peak runoff flows and durations would be controlled to match forested runoff conditions from the project site during storm events up to the 50-year recurrence interval event. Infiltration of stormwater would be used to the maximum extent practicable for any of the build alternatives. A detailed evaluation of the infiltration capacity of the proposed stormwater pond sites would be conducted during project design. For any of the build alternatives, low-impact-development stormwater management practices would be incorporated to the maximum extent practicable (e.g., porous or permeable pavement, compost soil amendment applied in landscaped areas to promote infiltration, and drainage ditches and swales in lieu of storm drain pipes). An erosion and sedimentation control plan would be implemented throughout construction of any of the build alternatives to minimize discharge of sediment-laden water to project area drainage systems and streams.
Alternative 1 Surface water discharge volumes would increase by approximately 10,477 cubic meters (8.9 acre feet) per year, and annual infiltration volumes would increase by approximately 17,953 cubic meters (14.6 acre feet).	
Alternative 2 Surface discharge volumes would increase by approximately 14,446 cubic meters (11.7 acre feet) per year, and infiltration volumes would increase by approximately 13,968 cubic meters (11.3 acre feet) per year.	
Alternative 3 Surface discharge volumes would increase by approximately 12,064 cubic meters (9.8 acre feet) per year, and infiltration volumes would increase by approximately 16,402 cubic meters (13.3 acre feet) per year.	
Alternative 4 Surface discharge volumes would increase by approximately 16,034 cubic meters (13.0 acre feet) per year, and infiltration volumes would increase by approximately 12,418 cubic meters (13.3 acre feet) per year.	
Modified Alternative 5 (Preferred Alternative) Under the base scenario (infiltration at only one facility), total surface runoff volumes would increase by approximately 48,000 cubic meters (38.9 acre feet) per year, and infiltration volumes would decrease by approximately 21,700 cubic meters (17.6 acre feet) per year. Under the alternate scenario (infiltration at three facilities), total surface runoff volumes would increase by approximately 6,100 cubic meters (4.9 acre feet) per year, and infiltration volumes would increase by approximately 17,900 cubic meters (14.5 acre feet) per year.	

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Hydrologic Systems (continued)	
Alternative 6 Surface discharge volumes would increase by approximately 15,630 cubic meters (12.5 acre feet) per year, and infiltration volumes would increase by approximately 12,916 cubic meters (10.5 acre feet) per year.	
No-Action Alternative No adverse impacts on drainage systems and Issaquah Creek tributaries in the project area would occur. No changes in groundwater recharge are expected.	No mitigation measures would be required.
Floodplains	
Alternatives 1, 3, and Modified Alternative 5 (Preferred Alternative) New impervious surface area could increase the rate and volume of stormwater runoff in the subbasin, exacerbating flooding along the main stem of Issaquah Creek. Encroachment impacts would occur where fill, roadway surfaces, and bridge approaches and structures are located within the 100-year floodplain (primarily along 6th Avenue South). Each alternative would displace approximately 3,947 cubic meters (3.2 acre-feet) of floodplain storage volume.	Filling of any floodplain would be mitigated by creating compensatory storage by excavation of an equal volume in the adjacent area. With mitigation, no impacts on 100-year flood levels would occur. The increased rate of stormwater runoff would be mitigated by design and construction of detention ponds for the proposed project. Stormwater discharge would be the same as under predevelopment conditions.
Alternatives 2, 4, and 6 New impervious surface area could increase the rate and volume of stormwater runoff in the subbasin, exacerbating flooding along the main stem of Issaquah Creek. No displacement of flood storage volume would occur.	The increased rate of stormwater runoff would be mitigated by design and construction of detention ponds for the proposed project. Stormwater discharge would be the same as predevelopment conditions.
No-Action Alternative This alternative would not cause any impacts on the floodplains.	Mitigation measures would not be required.

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

<table>
<tr><th>Impacts</th><th>Mitigation</th></tr>
<tr><td colspan="2">Water Quality</td></tr>
<tr><td>All Build Alternatives
Greater stormwater runoff volumes from pollution-generating impervious surfaces would result from the project, in turn resulting in increased pollutant loads to surface water and groundwater.
Average annual loadings of pollutants discharged to groundwater via infiltration facilities would increase relative to existing conditions.
There would be a potential for water quality impacts resulting from any accidental hazardous materials spills that might occur. However, the potential for this type of accident would be no greater on the proposed roadway than on comparable arterial roadways in the Puget Sound area.
Construction could result in increased suspended sediment in East Fork Issaquah Creek, the north tributary of Issaquah Creek, and the main stem of Issaquah Creek downstream.
It is estimated that phosphorus loading in construction site runoff would be minor.
In combination with other development in the project vicinity, the following types of water quality impacts would result from the proposed project:
o Sediments and pollutants in construction site runoff entering the north tributary of Issaquah Creek, East Fork Issaquah Creek, and the main stem of Issaquah Creek downstream
o Accidental spills of toxic materials entering these creeks or the lower Issaquah Valley aquifer due to vehicular accidents.
These cumulative impacts on downstream water quality would be greatest if other proposed major construction projects occur at the same time as construction of the Southeast Issaquah Bypass.</td><td>With proposed infiltration of stormwater, the project would achieve no net increase in average annual loadings and concentrations of pollutants of concern to fish and aquatic habitat in area streams. Extending the city sanitary sewer system to several homes in the south (as proposed) would likely more than offset the projected increase in oxygen demand and nutrient loadings.
Stormwater management facilities would be designed consistent with the criteria set forth in the 2005 King County Surface Water Design Manual (or most current edition adopted by the city of Issaquah), the Washington Department of Ecology's Stormwater Management Manual for Western Washington (2005 edition), and the WSDOT Highway Runoff Manual. Infiltration of runoff would be maximized in project design. The use of pesticides and fertilizers in landscape maintenance would be minimized, consistent with the city's integrated pest management policy. Oil/water separators would be provided to facilitate spill containment and cleanup.
The project would incorporate several features to minimize the impacts of accidental spills:
o Within the stormwater facilities, presettling ponds or vaults could be lined to isolate contaminants and prevent infiltration to groundwater.
o Mechanical devices such as valves or gates in the stormwater presettling ponds could be actuated remotely via telemetry, enabling 100 percent containment for short periods of time, allowing for cleanup before impacts on groundwater or surface water occur.
o Hydrocarbon sensors and alarms with telemetry could be installed at stormwater facilities to detect spills remotely. Telemetry of alarms to Public Works Operations and Police Dispatch could alert spill response personnel immediately.
o A citywide spill contingency response plan has been prepared to identify necessary policies and procedures for state and local emergency responders to effectively respond to a spill incident, to ensure public safety while minimizing risks to the environment.
With proposed mitigation, erosion impacts during construction would result in only minor contributions to cumulative sedimentation in the project area. A stormwater pollution prevention plan would be implemented throughout construction to minimize discharge to streams of sediments and pollutants in construction site runoff. Site runoff would be monitored during construction to identify deficiencies and corrective measures to improve runoff quality.</td></tr>
</table>

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Water Quality (continued)	
No-Action Alternative	
No alterations in existing runoff and recharge patterns would occur. Ongoing pollutant loadings would contribute to degradation of water quality in Issaquah Creek and the lower reaches of tributary streams to a slightly greater extent than occurs at present. Ongoing pollutant loadings in the Issaquah Creek north tributary would continue as a result of older septic systems in the adjacent neighborhood. The risk of accidental spills on city streets would remain.	No mitigation measures for water quality protection would be implemented, because no new sources of runoff contamination would be created.
Wetlands	
Alternatives 1 and 3	
Approximately 0.26 hectares (0.65 acres) of wetlands would be filled. Approximately 1.22 hectares (3.05 acres) of wetland buffer area also would be affected. The only other proposed development project in close proximity to the project area, the Park Pointe project, will have drainage entering the same wetland systems, creating the potential for cumulative impacts in local water levels and wetland vegetation communities that have adapted to existing conditions.	Compensatory wetland mitigation would be developed at one of two possible mitigation sites in the north tributary drainage basin, creating 0.52 hectares (1.3 acres) of forested and scrub-shrub wetland habitat. Both site options are considered onsite mitigation because they are close to the project and its wetland impacts. Compensatory buffer mitigation would also be provided. Construction activity impacts would be mitigated as follows: o Disturbed areas would be restored by returning the ground to its original grade and replanting with native wetland vegetation. o Low ground pressure equipment and equipment mats would be used to minimize impacts. o A temporary erosion and sedimentation control plan (TESCP) would be implemented during construction. o Prior to construction the limits of clearing would be marked and temporary erosion control devices (silt fencing, straw bales, etc.) would be placed to prevent runoff of sediment into the wetlands. o Clearing, grading, and other construction activities during the rainy season (October 1–April 30) would follow strict wet-weather permit requirements for turbidity in construction site runoff. o Stormwater facilities would be constructed and operational before the addition of any new impervious surfaces. o All stockpiles of soil would be covered with impervious materials during the rainy season.

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Wetlands (continued)	
Alternatives 1 and 3 (continued)	o Exposed soils that are not intended to be converted to roadways or stormwater ponds would be hydroseeded or revegetated with native species indigenous to the area as soon as possible. o All refueling operations would be conducted away from the wetlands, and a spill prevention, control, and countermeasures (SPCC) plan would be prepared by the contractor prior to any construction activities. No cumulative impacts are expected to result from constructing the project concurrently with the Park Pointe project, because Park Pointe will cause no wetland impacts, and stormwater would be infiltrated to maintain existing hydrologic systems.
Alternatives 2, 4, and 6 Approximately 0.06 hectares (0.16 acres) of wetlands would be filled, and approximately 0.56 hectares (1.39 acres) of wetland buffer area would be affected. Temporary impacts on wetlands and buffers, and cumulative impacts, are as described for Alternatives 1 and 3 above.	Compensatory wetland mitigation would be provided within the north tributary drainage basin, creating 0.13 hectares (0.33 acres) of forested and scrub-shrub wetland habitat. Compensatory buffer mitigation would also be provided. Mitigation for temporary impacts on wetlands and buffers, and cumulative impacts, are as described for Alternatives 1 and 3 above.
Modified Alternative 5 (Preferred Alternative) Approximately 0.24 hectares (0.59 acres) of wetland would be filled. This is a disturbed, scrub-shrub wetland adjacent to homes and 6th Avenue Southeast. Approximately 0.13 hectares (0.32 acres) of wetland would be permanently shaded by the proposed roadway bridge over the north tributary of Issaquah Creek and adjacent Class 1 (Category II) wetland area. Approximately 0.15 hectares (0.36 acres) of wetland buffer would also be permanently affected by this bridge crossing. During construction, approximately 0.08 hectares (0.20 acres) of temporary wetland and wetland buffer disturbance would occur.	Two options for compensatory mitigation of permanent wetland fill impacts have been identified. Under both options, at least 0.24 hectares (0.59 acres) of permanent impact on Class I (Category II) wetland would be mitigated at a 3-to-1 ratio, by reestablishing a minimum of 0.72 hectares (1.77 acres) of wetlands. The permanent shading impacts on wetlands would be mitigated at a 3-to-1 ratio by providing a minimum of 0.39 hectares (0.96 acres) of riparian restoration adjacent to the Issaquah Creek north tributary. Permanent wetland buffer impacts of 0.15 hectares (0.36 acres) would be mitigated at a 1-to-1 ratio by providing a minimum of 0.15 hectares (0.36 acres) of buffer adjacent to wetland reestablishment on the wetland mitigation site(s). The functions of this buffer replacement area would be equal to or greater than those of

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Wetlands (continued)	
Modified Alternative 5 (Preferred Alternative) (continued) The only other proposed development project in close proximity to the proposed project, the Park Pointe project, will have drainage entering the same wetland systems, creating the potential for cumulative impacts in local water levels and wetland vegetation communities that have adapted to existing conditions.	the impacted buffer. A 110-foot buffer is proposed on the mitigation sites between wetland reestablishment or enhancement areas and the adjacent roads or parking lots. Mitigation for temporary impacts on wetlands and buffers, and cumulative impacts, are as described for Alternatives 1 and 3 above.
No-Action Alternative Wetland conditions would not be altered under this alternative.	Mitigation measures would not be required.
Vegetation and Wildlife	
Alternative 1 Approximately 10.62 hectares (26.2 acres) of low-quality, previously disturbed wildlife habitat would be impacted. This includes some wetland vegetation and habitat that supports songbirds, small mammals, reptiles, and amphibians. The introduction of increased noise and activity may deter some wildlife from the immediate area, particularly during the daytime. Because no road currently exists in the project location, road-killed wildlife would likely increase in the north portion of the alignment, particularly during evening hours. Less wildlife mortality would occur in the south portion of the roadway, because wildlife could cross beneath the proposed bridge crossing of the stream and wetlands. Animals that nest and forage in surface soils and plant communities disturbed by construction could suffer direct mortality or be displaced into adjacent habitats. Construction activities on the edge of a stream channel or in a wetland area that is to be permanently filled may have detrimental effects on amphibians such as frogs, toads, and salamanders.	For any of the build alternatives, vegetation clearing would be minimized. Landscaping with native plants and creating new snags would replace lost habitat. The proposed bridge over the north tributary stream channel and adjacent wetlands would be elevated to allow wildlife to move through the wetland underneath the roadway. Riparian areas would be protected and restored if disturbed during construction of any of the build alternatives. Best management practices (BMPs) and a temporary erosion and sedimentation control plan would be followed during construction to prevent impacts on streams and wetlands. Offsite habitat restoration, preservation, and contribution to the city's tree replacement fund are possible additional mitigation measures for any of the build alternatives. For any of the build alternatives, wildlife signage, as determined appropriate by regulatory agencies involved in the project, would be provided along the new road corridor to warn drivers of the potential for encountering wildlife. The city would help fund and participate in a study of regional wildlife connectivity to better understand migration patterns of large mammals in the project area.
Alternative 2 Impacts would be similar to Alternative 1, except that approximately 10.15 hectares (25.08 acres) of relatively low quality and previously disturbed wildlife habitat would be impacted.	

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

<table>
<tr><th>Impacts</th><th>Mitigation</th></tr>
<tr><td colspan="2">Vegetation and Wildlife (continued)</td></tr>
<tr><td>Alternative 3

Impacts would be similar to Alternative 1, except that approximately 10.16 hectares (25.12 acres) of relatively low-quality and previously disturbed wildlife habitat would be impacted.</td><td rowspan="4"></td></tr>
<tr><td>Alternative 4

Impacts would be similar to Alternative 1, except that approximately 9.70 hectares (23.98 acres) of relatively low-quality and previously disturbed wildlife habitat would be impacted.</td></tr>
<tr><td>Modified Alternative 5 (Preferred Alternative)

Impacts would be similar to Alternative 1, except that approximately 10.58 hectares (26.14 acres) of relatively low quality and previously disturbed wildlife habitat would be impacted. The affected habitats include:
o Upland forest – 3.60 hectares (8.90 acres)
o Upland shrub – 6.74 hectares (16.65 acres)
o Scrub-shrub wetland – 0.24 hectares (0.59 acres).</td></tr>
<tr><td>Alternative 6

Impacts would be similar to Alternative 1, except that approximately 10.13 hectares (25.04 acres) of relatively low quality and previously disturbed wildlife habitat would be impacted.</td></tr>
<tr><td>No-Action Alternative

No impacts on vegetation and wildlife habitat in the Southeast Issaquah Bypass area would occur.</td><td>Mitigation measures would not be required.</td></tr>
</table>

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Fisheries	
Alternatives 2, 4, and 6	
Minor habitat loss at the location of proposed stormwater pond outfalls on the bank of the north tributary and on the bank of East Fork Issaquah Creek would occur. Peak flows in receiving waters could increase due to stormwater runoff from new impervious surfaces. Pollutant loadings due to stormwater runoff from pollution-generating impervious surfaces could impact receiving waters. Reduced infiltration from new impervious area may reduce summer base flows in local streams that support fish. Accidental spills of gasoline or other hazardous materials on the new roadway could cause adverse toxicity impacts on fish in area streams. Removal of riparian vegetation would reduce shading and increase stream temperatures and sedimentation.	Stormwater controls as described above under Hydrologic Systems would mitigate increases in peak flows in receiving waters. Net stormwater runoff from the project area would not exceed predevelopment conditions. Water quality treatment systems combined with infiltration of stormwater, described under Water Quality, would prevent increases in pollutant loads and concentrations. Mitigation of disturbed areas would include riparian revegetation, large woody debris placement, off-channel habitat creation and enhancement, spawning gravel placement, and barrier removal. Riparian plantings and wetland mitigation would be provided to compensate for the riparian and wetland areas removed. In-water work would occur only when salmon species are least likely to be affected (generally July 1–September 15). Native riparian vegetation would be planted along stream banks where vegetation is removed for stormwater outfall construction. Temporary erosion and sediment controls, as recommended in the King County *Surface Water Design Manual* (2005) and Ecology's Stormwater *Management Manual for Western Washington (2005),* would be implemented to reduce the potential for erosion impacts. A spill response plan would also be prepared.
Alternatives 1, 3, and Modified 5 (Preferred Alternative)	
Impacts would be similar to Alternatives 2, 4, and 6. In addition, the proposed bridge over the north tributary stream channel and adjacent wetland area would result in minimal loss of fish habitat. Indirect impacts would result from buffer clearing in the location of the proposed bridge.	Mitigation would be similar to Alternatives 2, 4, and 6. In addition, bridge impacts would be mitigated by restoring 400 to 500 feet of the Issaquah Creek north tributary west of Front Street South. Stream habitat restoration would include installation of large woody debris, spawning gravel placement, and other instream improvements to supplement invasive vegetation removal and riparian vegetation planting for the wetland mitigation.
No-Action Alternative	
There would be no impact on fisheries resources.	Mitigation measures would not be required.

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Threatened and Endangered Species	
All Build Alternatives The project could have impacts on habitat associated with Puget Sound Chinook salmon, Coastal Puget Sound bull trout, and Puget Sound steelhead. These impacts are expected to be minor and localized, due to increased stormwater runoff that impacts aquatic species and their habitat as well as physical impacts on habitat.	Stormwater runoff would be treated to achieve no net loading of pollutants to streams in the project area. Stormwater would be infiltrated to the maximum extent possible, to mimic natural hydrologic characteristics for the benefit of threatened and endangered fish species that may inhabit project area streams. In-water work would occur only during WDFW-approved time periods (generally July 1–September 15) when salmonid species are least likely to be affected. Native riparian vegetation would be planted in areas where vegetation is removed, to increase shading and provide cover for fish, habitat for insects, and a future source of large woody debris. Mitigation of fisheries impacts would be provided as described above for fisheries.
No-Action Alternative Threatened and endangered species would not be affected.	Mitigation measures would not be required.
Land Use	
Alternative 1 The project would contribute to other planned development and increases in urban land uses in the area. Secondary impacts are expected to be limited by existing zoning regulations. Potential secondary and cumulative impacts are not expected to exceed development projections embodied in planning and zoning regulations. The proposed Park Pointe project is not dependent on the Southeast Issaquah Bypass. The new roadway is consistent with Issaquah Comprehensive Plan goals and policies. Undeveloped land would be converted to new roadway right-of-way. Approximately 54,109 square meters (13.3 acres) of residential land, 2,860 square meters (0.7 acres) of forest-zoned land, and 30,993 square meters (7.6 acres) of land zoned for community facilities would be required.	For any of the build alternatives, the roadway would be designed to help minimize impacts on adjacent land areas and reduce the amount of land converted to roadway uses. New access would be provided to residences and other properties where appropriate, under any of the build alternatives. Right-of-way acquisitions for any of the build alternatives would be compensated at fair market value under the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Under any of the build alternatives, maintaining the existing zoning regulations for land adjacent to the proposed Southeast Issaquah Bypass and nearby areas would help to maintain existing development patterns in the vicinity of the new roadway.

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Land Use (continued)	
Alternative 2 Impacts would be similar to Alternative 1. Approximately 54,388 square meters (13.4 acres) of residential land and 45,241 square meters (11.1 acres) of community facilities land would be converted to roadway right-of-way.	
Alternative 3 Impacts would be similar to Alternative 1. Approximately 60,026 square meters (14.8 acres) of residential land, 19,195 square meters (4.7 acres) of forest land, and 19,650 square meters (4.8 acres) of community facilities land would be converted to right-of-way.	
Alternative 4 Impacts would be similar to Alternative 1. Approximately 60,305 square meters (14.9 acres) of residential land and 33,998 square meters (8.4 acres) of community facilities land would be converted to roadway right-of-way. The amount of forest land converted would be the same as Alternative 3.	
Modified Alternative 5 (Preferred Alternative) Impacts would be similar to Alternative 1. Approximately 98,735 square meters (24.4 acres) of land would be converted to roadway right-of-way, including approximately 68,915 square meters (17.1 acres) of residential land, approximately 4,280 square meters (1 acre) of land zoned F (forest), and approximately 25,540 square meters (6.3 acres) of land zoned for community facilities (CF).	

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Land Use (continued)	
Alternative 6 Approximately 61,353 square meters (15.1 acres) of residential land and 39,908 square meters (9.8 acres) of community facilities land would be converted to roadway right-of-way. The amount of forest land conversion would be the same as Alternative 5.	
No-Action Alternative Land use changes are expected to continue to occur in the project area, including changes associated with the proposed Park Pointe residential development. Changes to land uses within the project area would occur in accordance with existing Issaquah and King County comprehensive plans and existing zoning regulations.	Mitigation measures are not proposed. Mitigation of future development is expected to be provided by individual projects. The city of Issaquah may consider roadway and other improvements to address traffic congestion that may affect future land use decisions.
Social Elements	
Alternatives 1 and 2 *Population and Community Cohesion:* The proposed project would provide a new arterial for north-south travel, thereby enhancing local mobility. Neighborhood impacts would include encroachment on Issaquah High and Clark Elementary schools in the central project area, and access and residential disruptions in the southern project area. *Environmental Justice:* No disproportionate impacts on environmental justice population groups are expected. *Public Services and Utilities:* Long-term improvements in emergency vehicle response times and school bus travel times are expected. Utility line relocations would be needed in some areas along the project route. The proposed roadway centerline would be approximately 116 meters (380 feet) from Clark Elementary and 27 meters (90 feet) from Issaquah High School.	*Population and Community Cohesion*: Mitigation would not be required. *Environmental Justice:* Mitigation would not be required. *Public Services and Utilities:* Service and utility providers would be notified in advance regarding disruptions during construction. Emergency vehicle detours would be provided during construction. Sound walls would be provided for schools. *Recreation:* New trail connections would be provided and coordinated with existing trails in the project area. Two new trailhead parking areas would be constructed. *Transportation Services:* Mitigation would not be required.

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Social Elements (continued)	
Alternatives 1 and 2 (continued) *Recreation:* Formal and informal recreational trails would be disrupted by the proposed project. Under Alternative 1, approximately 1,040 linear meters (3,412 linear feet) of existing informal trails would be replaced; under Alternative 2 approximately 495 linear meters (1,624 linear feet) would be replaced. Minor impacts would affect the Tiger Mountain natural resource conservation area (NRCA). *Transportation Services:* Transit service would experience travel delays within the project area during construction. After construction, mobility on local streets would be improved, which would also help transit mobility. *Pedestrian and Bicycle Facilities:* Few facilities exist in the area, and no major impacts on these facilities would result.	*Pedestrian and Bicycle Facilities*: Sidewalks and new trail connections would be provided.
Alternatives 3 and 4 Impacts would be the same as for Alternative 1, except as follows: *Schools:* The proposed roadway centerline would be approximately 236 meters (775 feet) from Clark Elementary, 91 meters (900 feet) from Issaquah High under Alternative 3, and approximately 80 meters (263 feet) from the high school football field under Alternative 4. *Trails* Under Alternative 3, approximately 320 linear meters (1,050 linear feet) of trail :replacement would occur. Under Alternative 4, approximately 495 linear meters (1,624 linear feet) of trails would be replaced.	Mitigation would be the same as for Alternatives 1 and 2.
Modified Alternative 5 (Preferred Alternative) *Population and Community Cohesion:* The project would provide a new arterial for north/south travel, thereby enhancing local mobility. Neighborhood impacts would include encroachment on Issaquah High School and Clark Elementary School in the central project area, and access and residential disruptions in the southern project area.	*Population and Community Cohesion*: The project's impacts on mobility are expected to be beneficial, so mitigation measures would not be needed. Potential impacts resulting from the roadway encroaching on the fringe of neighborhoods would be reduced through landscaping and visual screening. Although the proposed project would alter the residential areas it would pass

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Social Elements (continued)	
Modified Alternative 5 (Preferred Alternative) (continued) Other community impacts would be related primarily to noise and visual changes to the setting. Environmental justice populations could experience noise and visual impacts. Ultimately, the bypass would change community character by contributing toward a more urban setting at the eastern edge of the city. Direct impacts on population growth are not expected to result. *Environmental Justice:* No disproportionate impacts on special population groups are expected. *Public Services and Utilities:* Long-term improvements in emergency vehicle response times and school bus travel times are expected. The project would include extension of new sewer lines in the south project area. An 8-inch sewer line would be installed beginning at Southeast Lewis Lane near Front Street South, extending to 6th Avenue Southeast from Southeast Lewis Lane to Southeast Kramer Place, then along Southeast Kramer Place to its eastern end. Side sewers would also be constructed. The roadway centerline would be approximately 213 meters (700 feet) from Clark Elementary and 91 meters (300 feet) from Issaquah High School. *Recreation:* The NRCA and Squak Valley Park would not be directly affected. A new four-lane roadway west of the NRCA and near several other recreational facilities would increase noise levels and vehicle emissions, and decrease visual quality for users. The North C portion of the alignment would require acquisition of approximately 2,490 square meters (0.62 acres) of property from the westernmost Sportsmen's Clubhouse parcel. *Transportation Services:* Transit service would experience travel delays within the project area during construction. After construction, mobility on local streets would be improved, which would improve transit mobility. *Pedestrian and Bicycle Facilities:* Few facilities exist in the area, and no major impacts on these facilities would occur.	through, when completed it would facilitate travel between the northern and southern parts of the city and would not have adverse impacts on community cohesion, so specific mitigation measures related to this element would not be needed. *Environmental Justice:* Mitigation would not be required. *Public Services and Utilities:* Service and utility providers would be notified in advance regarding disruptions during construction. Emergency vehicle detours would be provided during construction. *Recreation:* New trail connections would be provided and coordinated with existing trails in the project area. One new trailhead parking area would be constructed. Direct access to the clubhouse shooting range from Southeast Evans Street would be replaced with access from a new road constructed as part of the Park Pointe development. That new road would connect to the Southeast Issaquah Bypass at a new signalized intersection. If Park Pointe is not constructed, a new connection to the clubhouse would be provided from the Southeast Bypass roadway. *Transportation Services:* Mitigation would not be required. *Pedestrian and Bicycle Facilities*: Fencing or other barriers may be provided at places along the proposed roadway to reduce or eliminate opportunities for illegal crossings (jaywalking) and safety hazards associated with such activity. The roadway would include a signalized pedestrian crossing at the Park Pointe intersection to provide access from the schools to the trails leading to Tradition Lake. *Schools*: The athletic field would be extended to the west, and the north softball diamond relocated, to allow continued use of these facilities. The city has agreed to work with the school district during final project design to achieve a reasonable reduction in potential sound levels that may affect school facilities.

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Social Elements (continued)	
Modified Alternative 5 (Preferred Alternative) (continued) *Schools:* The proposed roadway centerline would be approximately 213 meters (700 feet) from Clark Elementary and 91 meters (300 feet) from Issaquah High School. The proposed alignment would directly affect the Issaquah School District athletic field. The bypass roadway would encroach approximately 24 meters (78 feet) into the field, reducing the usable portion of the field by approximately 715 square meters (0.22 acres), requiring reconfiguration of the south baseball diamond (i.e., the girls softball field). Combined with other transportation improvements, the project would support planned development, which may contribute to population increases in the area. These improvements would result in increased mobility in the project area. Cumulatively, planned development would add to demand for public services and facilities. The project would contribute to planned bicycle and pedestrian facilities in the city by providing sidewalk and trail connections. The project would contribute to mobility improvements that may have a beneficial effect on economic conditions in the eastern portion of the city. The project would contribute incrementally to residential and business displacements in the city. *Trails:* Approximately 440 linear meters (1,443 feet) of trails would be replaced.	*Trails:* New trailhead parking would be included in the northern portion of the project area just south of East Sunset Way The new trailhead parking area would provide much needed parking and convenient access to trails within the NRCA and the Mountains to Sound Greenway. A new 4.2-meter- (14-foot-) wide pedestrian/bicycle trail would be constructed along the west side of the Southeast Bypass roadway. A standard sidewalk would be constructed on the east side of the proposed roadway. The trail and the sidewalk would both provide connections to existing Tiger Mountain trails. A new parking area in the northern project area would be provided near the trailhead, which would improve access to trails in this location.
Alternative 6 Impacts would be the same as those for Alternatives 1 and 2, except: *Schools:* The proposed roadway centerline would be approximately 213 meters (700 feet) from Clark Elementary and 91 meters (300 feet) from Issaquah High School. *Recreation:* Alternative 6 would directly impact the Issaquah School District athletic field. The bypass roadway would encroach approximately 40 meters (131 feet) into the field, reducing the usable portion of the field by approximately 1,505 square meters (0.37 acres), requiring reconfiguration	Mitigation would be the same as for Alternatives 1 and 2. In addition, the athletic field would be reconfigured and extended to the west, preserving existing uses.

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Social Elements (continued)	
Alternative 6 (continued) of the south baseball diamond (i.e., the girls softball field) and eliminating the north baseball diamond because of insufficient land area to accommodate a second field. *Trails* Approximately 935 meters (3,067 feet) of trails would be replaced.	
No-Action Alternative Existing travel routes and mobility in the Issaquah area would remain the same. The proposed Southeast Issaquah Bypass is not directly connected to individual phases of development at Issaquah Highlands (formerly Grand Ridge), but it represents one of the four transportation components to be constructed for the Issaquah Highlands project, as identified in the Grand Ridge Master Transportation Financing Agreement (MFTA). If the Southeast Issaquah Bypass is not constructed, full development of Issaquah Highlands could still occur. In this case, travel from new development on the Sammamish Plateau to areas south of Issaquah would involve trips through the central portion of the city rather than around its eastern edge. This travel pattern would result in additional traffic on Front Street South and more congestion in the city, especially during peak travel hours. For some individuals the resulting congestion and lack of mobility would be perceived as a diminishment to the quality of life in the project area. The need for additional pass-through traffic within the central portion of the city would likely be a greater detriment to neighborhood and business cohesion than the proposed project. Because Issaquah is expected to grow, it is likely that congestion would continue to be an issue. Without the project, it is likely that congestion would worsen along Front Street South and the Front Street/I-90 interchange. This could impede cross-town travel and travel north and south. Within the community, mobility impediments and congestion could reduce the connectivity between neighborhoods and businesses. No disproportionate impacts on minority or special needs populations would occur.	No mitigation would be required.

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Social Elements (continued)	
No-Action Alternative (continued) Response times for emergency services would likely increase in relation to expected traffic increases and congestion within the Issaquah area. Operational impacts on utility providers would not occur. Trails and recreational facilities would remain the same. Visitors to local recreational facilities may experience delays in traveling to and from public recreation areas in the future. Existing transit routes would continue. If future service is extended farther south, transit would need to use Front Street South or 2nd Avenue Southeast. As traffic continues to increase on city streets, transit vehicles would likely experience travel delays, especially at peak hour times. Existing pedestrian and bicycle travel would continue along the combined formal and informal trail route. Bicyclists and pedestrians may experience delays and potential conflicts with vehicles as traffic increases.	
Economics	
Alternatives 1, 2, 3, 4, and 6 Under any build alternative, a reduction in property tax revenues would occur due to right-of-way acquisition. New revenue would be generated by jobs during construction. The anticipated loss of property tax revenue would range from approximately \$8,000 to \$11,000 per year—less than 0.01 percent of the city's total budgeted revenue. Sales tax and business and occupation tax revenues could increase as a result of the project, due to reduced congestion and improved access to businesses (especially retail and restaurant businesses) in the historic downtown area.	For any of the build alternatives, mitigation could include the following measures: o Installation of directional signs to the Front Street commercial district along the new Southeast Issaquah Bypass o Preparation of educational material to help people rediscover the downtown core businesses and retail shops o Advertisements for the Front Street commercial district following construction of the new Southeast Issaquah Bypass.
Modified Alternative 5 (Preferred Alternative) A reduction in property tax revenues would occur due to right-of-way acquisition. New revenue would be generated by jobs during construction. The anticipated loss of property tax revenue would be approximately \$8,600 per year—less than 0.01 percent of the city's total budgeted revenue for 2006.	

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Economics (continued)	
Modified Alternative 5 (Preferred Alternative) (continued) Sales tax and business and occupation tax revenues could increase as a result of the project, due to reduced congestion and improved access to businesses (especially retail and restaurant businesses) in the historic downtown area.	
No-Action Alternative The regional economy would not be affected, and local jobs would not be directly affected. Continued congestion may affect economic activity along Front Street South. The number of jobs that might be affected cannot be estimated, although this number is expected to be small compared to the total number of jobs in Issaquah.	No mitigation would be required.
Displacements and Relocations	
Alternative 1 Eight single-family residences would be displaced. No business displacements would occur.	Under any of the build alternatives, displaced property owners would be compensated at fair market value under the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. These regulations require relocation resources to be made available to all affected residential and business owners without discrimination. All property owners displaced by any of the build alternatives would be compensated at fair market value, and relocation assistance would be provided in locating suitable replacement housing. Where access to properties is affected, new access would be provided or properties would be acquired as described previously.
Alternative 2 Six single-family residences would be displaced.	
Alternative 3 Nine single-family residences would be displaced.	
Alternative 4 Seven single-family residences would be displaced.	
Modified Alternative 5 (Preferred Alternative) Eight single-family residences would be displaced.	
Alternative 6 Six single-family residences would be displaced.	

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Displacements and Relocations (continued)	
No-Action Alternative Residential displacements and right-of-way acquisition identified for the project would not occur.	Mitigation measures would not be required.
Historic and Archaeological Resources	
Alternatives 1 and 2 The centerline of the new roadway would be approximately 62 meters (203 feet) west of the Sportsmen's Clubhouse building. No property would be acquired from the clubhouse property. Access between the clubhouse and rifle range would be maintained.	Mitigation would be essentially the same for all build alternatives, as described below. No mitigation is proposed for the White Swan Inn. To minimize visual effects on the Sportsmen's Clubhouse, berms would be constructed between the clubhouse and the Southeast Issaquah Bypass. Landscaping would be employed to maintain the park-like setting, and light standards would be placed so as not to flood the clubhouse and grounds with light. Measures for mitigating changes in the setting, feeling, and association of the Issaquah Sportsmen's Clubhouse could include: o Replacing the existing parking area displaced by the Southeast Issaquah Bypass o Creating an oral history of the Issaquah Sportsmen's Clubhouse by interviewing members and their families, users, neighbors, and city and county personnel, and augmenting interviews with photographs of the clubhouse and range o Supporting an inventory of historical and archaeological resources in Issaquah o Creating walking tours of historic buildings, markers for historic buildings and sites, and brochures to be made available to schools, libraries, the museum, Chamber of Commerce, and local businesses
Alternatives 3 and 4 The northern portions of these alignments are east of the clubhouse, and the roadway is recessed about 2.5 to 4 meters (8 to 13 feet) below grade. Although recessing the road would provide some visual and noise relief, the roadway cut would be only 10 meters (33 feet) from the clubhouse, eliminating existing parking and altering the park-like setting. The alignments would change the association of the clubhouse and range, isolating the clubhouse from the range, and possibly marginalizing the usefulness of the building, which could lead to its abandonment. This degree of impact would create an adverse effect on the clubhouse building according to FHWA criteria.	
Modified Alternative 5 (Preferred Alternative) The White Swan Inn and the Sportsmen's Clubhouse would not be adversely affected. The criteria of adverse effect (36 CFR 800.5) state that an adverse effect occurs when an action alters the characteristics of a property that qualify it for the National Register of Historic Places in a manner that would diminish the property's integrity of location, setting, design, materials, workmanship, feeling, or association.	

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Historic and Archaeological Resources (continued)	
Alternative 6 The northern sections of the alignment are west of the clubhouse, requiring approximately 2,490 square meters (.61 acres) of land from the clubhouse site. The centerline of the new road would be approximately 36 meters (118 feet) west of the clubhouse building. The association of the clubhouse and rifle and gun range would be maintained, although access to the facilities would change. The effect would be the same as Alternatives 1 and 2. The park-like setting would be maintained with berms, native tree and shrub plantings, and focused lighting. The alignment would remove access to the clubhouse from Southeast Evans Street but would replace it with access from the Southeast Issaquah Bypass, near the rifle and gun range.	o Developing Issaquah history documents on topics such as Native American residents in the area, mining, logging and milling, settlement, railroads, and roads, ethnic groups, and development of municipal government o Creating road and trail signs or exhibits that discuss the sites and buildings along or near the Southeast Issaquah Bypass. Specifically for Alternatives 3 and 4, ensuring pedestrian access from the clubhouse to the sidewalk along the Southeast Issaquah Bypass would minimize reduced access. Proposed mitigation measures would be developed in coordination with the city of Issaquah and local historical organizations such as the Issaquah Historical Society who are familiar with past and current historic preservation projects.
No-Action Alternative No cultural resources would be affected.	No mitigation measures would be required.
Hazardous Materials	
Alternatives 1 and 2 No major impacts are expected. Hazardous materials may be encountered or released during construction. The risk of impact is low. Secondary impacts on hazardous materials are not expected. Cumulatively, the project would contribute to an expected minor increase in the risk of hazardous material spills that may result from traffic accidents in the project area.	Direct impacts would not occur, and mitigation would not be required. An emergency response plan for spills should be prepared for use during roadway construction and operation.
Alternatives 3 and 4 No major impacts are expected. Hazardous materials may be encountered or released during construction. Encroachment onto the former trap shooting site increases the risk to moderate. Hazardous material may be encountered because this alignment passes directly through the former trap shooting site increases the risk to moderate. Hazardous material may be encountered	Mitigation measures would be essentially the same for Alternatives 3, 4, Modified 5, and 6, as described below. An emergency response plan for spills should be prepared for use during roadway construction and operation.

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Hazardous Materials (continued)	
Alternatives 3 and 4 (continued) because this alignment passes directly through the former trap shooting range located west of the current Issaquah Sportsmen's Clubhouse shooting range. Elevated levels of lead and polycyclic aromatic hydrocarbons (PAHs) in soil and groundwater are suspected from broken clay pigeons at this site. Secondary impacts on hazardous materials are not expected. Cumulatively, the project would contribute to an expected minor increase in the risk of hazardous material spills that may result from traffic accidents in the project area.	Mitigation of direct impacts from hazardous materials would be required. A preliminary site assessment of the former trap shooting range is recommended. Contaminated soil encountered during construction activities would require stockpiling and testing to confirm regulatory classification and cleanup strategy.
Modified Alternative 5 (Preferred Alternative) and Alternative 6 No major impacts are expected to occur. Hazardous materials may be encountered or released during construction. Construction through former trap shooting site creates high risk. Secondary impacts on hazardous materials are not expected. Cumulatively, the project would contribute to an expected minor increase in the risk of hazardous material spills that may result from traffic accidents in the project area.	
No-Action Alternative No impacts related to hazardous materials are expected.	No mitigation would be required.
Visual Quality	
Alternative 1 Existing views would be altered by a new concrete and asphalt roadway in the project area. Vegetation would be removed and light and glare would increase. Retaining walls would be constructed in the northern portion of the project area and may be visible to surrounding properties. Two new noise walls would be constructed near the schools, altering views there, including views from the north athletic field. Partial views of the roadway would also be visible from the Sportsman's Clubhouse property. A new bridge would be constructed north of Southeast Kramer Place in the southern project area.	Mitigation measures would be the same for all of the build alternatives, as follows: o Landscaping using native plant materials could be provided to screen views of the roadway and reduce light and glare impacts. o Downward-directed lighting should be used to reduce spillover from roadway lights. o Walls and structures should be painted or otherwise treated to reduce visibility.

Table S-3 (continued)
Environmental Impacts and Mitigation Measures for All Alternatives

Impacts	Mitigation
Visual Quality (continued)	
Alternative 2 Retaining walls in the northern portion of the project area would be visible from surrounding properties, including the north athletic field. Portions of the roadway would be visible from the Sportsman's Clubhouse property. A new intersection would be created at 2nd and Front Street, altering views from nearby residential properties. New retaining walls in the south may also be visible from surrounding properties.	
Alternative 3 This roadway alignment would be farthest to the east, making it less visible to residential areas. Retaining walls in the northern portion of the project area may be visible from some nearby locations. Potential tree removal and roadway construction would alter views of the western edge of the Tiger Mountain NRCA.	
Alternative 4 Impacts in the northern project area would be similar to those of Alternative 3. In the southern area, impacts would be similar to those of Alternative 2.	
Modified Alternative 5 (Preferred Alternative) The project would contribute to changes in visual quality associated with development in the city. Retaining walls in the northern portion of the project area would be visible from surrounding properties, including the north athletic field. The eastern portion of the city has experienced an increase in urban uses, resulting in alterations in visual character. The project would be an incremental contribution to this ongoing urbanization in the area.	
Alternative 6 View impacts in the north would be similar to those of Alternative 5, and view impacts in the south would be similar to those of Alternative 2.	
No-Action Alternative Views in the project area would remain unchanged.	No mitigation measures would be required.

Chapter 1

Purpose of and Need for the Action

Chapter 1 Purpose of and Need for the Action

During preparation of the June 2000 draft environmental impact statement (EIS), representatives from a number of state and federal agencies worked with the city of Issaquah to develop a purpose and need statement for the Southeast Issaquah Bypass project. The purpose and need statement is one of the first and most important steps in the environmental documentation process for a transportation project subject to the procedural requirements of the National Environmental Policy Act (NEPA). The purpose and need statement should clearly and concisely describe the problems the proposed project is intended to correct and summarize the problems that would likely continue or worsen if the project is not implemented. The following paragraph is the formal purpose and need statement for the Southeast Issaquah Bypass project:

> ***The need for the proposed project is the result of existing traffic volumes on city streets, and the necessity to increase mobility by reducing congestion and improving access to Interstate 90. The purpose of the proposed project is to resolve these problems by reducing traffic volumes that are causing the two existing interchanges, and the Front Street corridor, to be overburdened.***

In addition to the formal purpose and need statement, the Federal Highway Administration (FHWA) requires a thorough discussion of a proposed project's purpose and need in the introductory chapter of the EIS. The purpose and need chapter should clearly demonstrate the need for the proposed project and justify the resulting impacts. It should address a variety of transportation issues (including existing and projected travel demand) and explain how travel demand translates into traffic, capacity, and safety needs, and needs for alternative transportation modes (i.e., transit, bicycles, and pedestrians). The following sections describe in more detail the purpose and need for the Southeast Issaquah Bypass project.

Purpose of the Proposed Action

The purpose of the proposed action is to relieve existing traffic congestion on Front Street South through downtown Issaquah, Washington, and provide improved mobility throughout the eastern portions of the city. To meet this objective, the action should increase the capacity of the local road network; improve the existing level of service consistent with the Issaquah Comprehensive Plan; provide an important new link in the regional roadway system; and promote multimodal transportation options by including pedestrian, bicycle, and recreational trail connections.

The proposed action, the Southeast Issaquah Bypass project, would create a new north/south arterial roadway between Interstate 90 (I-90) and Front Street South in Issaquah (see Figure S-1 in the Summary chapter). This project would reduce existing and future levels of congestion on Front Street South because traffic currently passing through downtown Issaquah could use the Southeast

Issaquah Bypass as an alternate route between I-90 and points south of the city. A portion of the trips that now use Southeast Newport Way for access to and from I-90 could be expected to shift to the Southeast Issaquah Bypass. Traffic on East Sunset Way would also be expected to decrease because the new bypass would provide an alternate route between areas north and south of I-90. The new arterial may also result in fewer future trips on other north/south arterials such as Front Street South and 2nd Avenue Southeast.

Need for the Proposed Action

History of the Project

For over ten years, the Washington State Department of Transportation (WSDOT), King County, and the city of Issaquah have been exploring ways to provide additional access to I-90 in the Issaquah area and create an alternate route for north-south traffic through the congested Front Street South corridor. The first such study was the *I-90 Issaquah Area Access Study* (Parsons Brinckerhoff, 1989). That study identified the Southeast Issaquah Bypass, the Sammamish Plateau Access Road (SPAR), and the I-90 Sunset interchange modifications as important improvements that could reduce congestion and improve mobility in the Issaquah subarea. The city of Issaquah and King County have included the Southeast Issaquah Bypass corridor in their comprehensive plans since 1995. Additional studies have investigated several alternative north-south corridors extending as far east as State Route 18 (SR 18). The proposed Southeast Issaquah Bypass project is the culmination of these earlier studies and represents the optimal corridor within which to alleviate current and future congestion.

A number of roadway alignments within this corridor were studied in the *Southeast Issaquah Bypass Road Alternatives Alignment Study* (Parsons Brinckerhoff, 1997). Two alignments in the north and five alignments in the south were evaluated in that study. The alignments were evaluated based on preliminary construction and right-of-way costs, environmental impacts, and transportation benefits.

In spring of 1997, the Issaquah City Council identified the two northern alignments and two of the five southern alignments for further analysis in the draft EIS. Later, a third northern alignment was added and included in the draft EIS issued in June 2000.

After review of agency and public comments on the draft EIS, the South B alignment was eliminated from further study because of its substantial wetland impacts. A new south alignment was then developed that minimized wetland impacts (South C). The combined effect of a new southern alignment, a change in the design year from 2015 to 2030, and the resulting need for a four-lane roadway from I-90 to Front Street South required the preparation of a supplemental draft EIS.

The proposed project has been reviewed under the Interagency 404 Merger Agreement. In this issue resolution process, several state and federal agencies have been involved during the initial review stages and in preparation of environmental analysis for the project. In cooperation with WSDOT and FHWA, other state and federal agencies reviewing the project include the U.S. Army Corps of Engineers (U.S. COE), National Marine Fisheries Service (NMFS), or NOAA Fisheries, U.S. Fish and Wildlife Service (USFWS), U.S. Environmental Protection Agency (U.S. EPA), Washington Department of Ecology (Ecology), and Washington Department of Fish and Wildlife (WDFW).

Under the merger agreement, signatory agencies reviewing the proposed project provided concurrence for the project purpose and need (Concurrence Point 1) and alternatives to be considered (Concurrence Point 2), following a series of meetings prior to preparation of the draft EIS in 2000. Upon resumption of project efforts on the supplemental draft EIS in 2002, the signatory agencies were asked to revisit Concurrence Point 2 in consideration of the proposed project changes. Signatory agency review resulted in receiving concurrence from the agencies, including advisory comment letters from U.S. EPA, USFWS, Ecology, and WDFW. Copies of those letters and the city's responses are provided in Chapter 5 of this final EIS.

After it was determined that Modified Alternative 5 should be the preferred alternative, signatory agencies were presented with information supporting this decision, and their formal concurrence with selection of the preferred alternative was requested. Their comments on this recommendation were received, and issue resolution meetings were held with signatory agencies to determine mitigation measures that would reduce potential impacts on natural elements in the proposed project area. Concurrence from all signatory agencies was received on Modified Alternative 5 as the preferred alternative in February 2006.

Consistency with the Growth Management Act

The proposed project would comply with regulations under the Washington State Growth Management Act (GMA) [RCW 36.70A], which requires that improvements including roads, sidewalks, bicycle lanes and other infrastructure be in place at the time of development, or that financial commitments be made to complete those improvements within 6 years. The proposed project would support planned development identified within the Issaquah Comprehensive Plan, consistent with Growth Management Act regulations.

The transportation element of the Issaquah Comprehensive Plan describes the city's transportation improvement plan (TIP) for 1995–2015 and lists projects intended to address roadway deficiencies in the city. The Southeast Issaquah Bypass is the first project listed in the Major Roadway Improvements, Capacity Projects category in the transportation improvement plan. The Southeast Issaquah Bypass is also identified under Policy T-91 of the transportation element, which describes the city's support for the construction of "major capital facilities to support the land use vision" in the comprehensive plan.

Chapter 18.15 of the Issaquah Municipal Code implements the city's transportation concurrency management under the Growth Management Act. City regulations define an acceptable level of service for city arterials based on established volume to planned capacity measures. Presently several arterials do not meet these standards, therefore additional roadway capacity is required before new development can be constructed. The proposed project would be consistent with the intent of these regulations that roadway capacity will be provided to support planned development within the Issaquah Comprehensive Plan.

Without new infrastructure improvements, the level of service would be expected to continue to deteriorate in the city. The resulting traffic congestion would, under Growth Management Act requirements, prevent new construction until new facilities could be provided or until the city adopted changes to level-of-service measures to lower acceptable standards for roadway congestion and travel time delays. The Issaquah Comprehensive Plan states that if capacity improvements or other measures cannot be implemented to address level-of-service deficiencies, a redesignation of the level-of-service standard may be employed "as a last resort."

Local and Regional Mobility

The Issaquah subarea transportation needs are identified and well-documented in both local and regional comprehensive plans. These documents include lists of projects necessary for satisfying transportation concurrency needs for planned growth and for meeting existing needs. In this way, the projects are related and cumulative in terms of their contribution to concurrency management and capacity. However, they are independently capable of providing capacity to the subarea road network.

The existing transportation system in the Issaquah subarea is either failing or at the brink of failure. The existing roadway network is very limited in providing north/south corridors, and even more limited with regard to corridors that also access I-90. Because this area has generally developed with residential land uses, there is a heavy westbound commute in the morning to job opportunities in Seattle, Bellevue, and other west King County destinations and heavy eastbound commute trips in the afternoon.

Because of this commute pattern and the limited number of north/south corridors with access to I-90, the city is currently experiencing a large volume of pass-through traffic in the morning and afternoon peak hours. Pass-through traffic is defined as trips originating and ending outside the city of Issaquah. Most of the pass-through traffic occurs in the north-south direction as vehicles try to access I-90 in the peak hours. It has been found that many vehicles have origination and destination points (AM and PM peak hours, respectively) south of the Issaquah city limits. Due to the limited options available, Front Street South has become significantly congested during peak hours.

Future traffic forecasts suggest that without other north-south corridor options, Front Street South would continue to become congested and peak-hour conditions would most likely spread for a longer duration. Delay and vehicle queuing may be especially severe near the Front Street South and I-90 intersections. In the morning, extensive queues and delays are predicted southbound from the Sammamish Plateau area, and northbound from south of the Issaquah city limits. In the afternoon, these predicted queues and delays reverse direction.

Given the severe congestion anticipated along Front Street South, drivers would look for alternative routes such as 2nd Avenue Southeast, which would result in an increase in neighborhood cut-through traffic. The Southeast Issaquah Bypass is needed to improve mobility between the northern and southern portions of Issaquah and to provide additional access to I-90.

Over time, it is assumed that overall traffic volumes will grow and that congestion will build throughout the region. The Southeast Issaquah Bypass is expected to reduce some congestion along Front Street South in the future (compared to the no-action alternative). It is also expected to reduce future neighborhood cut-through traffic along 2nd Avenue Southeast. The Southeast Issaquah Bypass is expected to provide some relief to the Front Street South/I-90 interchange. Although the proposed Southeast Issaquah Bypass facility is expected to relieve some congestion along Front Street South, the Front Street South arterial will continue to be heavily used in the future. However, traffic operations and delay times are anticipated to improve with the inclusion of the Southeast Bypass Road when compared to the no-action alternative. This would be primarily due to increased capacity paralleling Front Street South and the direct connection to I-90 for commuters coming from south of Issaquah. These results are explained in further detail in the transportation technical report in Appendix F of the supplemental draft EIS (June 2004).

A study was conducted to examine the traffic impact of opening the modified I-90 Sunset interchange on the existing local roadway network, assuming that the Southeast Issaquah Bypass was not constructed. This study, known as the *Southeast Issaquah Bypass Neighborhood Traffic Mitigation Study* (2002), concluded that although small-scale mitigation measures could be implemented throughout the neighborhood to make cut-through traffic less desirable, the most effective mitigation measure for reducing neighborhood cut-through traffic would be the inclusion of another north/south corridor. The results of the *Southeast Issaquah Bypass Neighborhood Traffic Mitigation Study* are consistent with the traffic operation analysis presented in the transportation technical report in Appendix F of the supplemental draft EIS (June 2004).

The various local and regional transportation plans show that the benefit and need for the Southeast Issaquah Bypass project would be even greater if other planned arterial street projects and interchange modifications to the north are carried forward. Two other projects (the South SPAR/I-90 Sunset interchange and the North SPAR project) are completed and have been included in the future-year traffic modeling undertaken for this project. When completed, the Southeast Issaquah Bypass would be one portion of a new north/south major arterial that, with the North SPAR and South SPAR projects, would extend from the Issaquah/Fall City Road on the Sammamish Plateau to the Issaquah/Hobart Road south of Issaquah. The presence of all three projects would complete a north/south system corridor, linking the Sammamish Plateau with the Issaquah Highlands development, I-90, and the region south of Issaquah. This new north/south arterial is needed to provide improved mobility between the northern and southern portions of Issaquah and to support existing and future development. The new project corridor would also relieve congestion within the currently congested Front Street South corridor and reduce future neighborhood cut-through traffic. The proposed Southeast Issaquah Bypass project would be one of three critical links in this larger transportation system.

Without the Southeast Issaquah Bypass, major congestion along Front Street South and a substantial increase in neighborhood cut-through traffic would be observed in the future. The Southeast Issaquah Bypass provides another much-needed north-south corridor that accesses I-90. Future traffic modeling suggests that the Southeast Issaquah Bypass would indeed act as a bypass to Front Street South, therefore alleviating some congestion and reducing traffic volumes along 2nd Avenue Southeast.

By the year 2030, a substantial increase in neighborhood cut-through traffic (primarily along 2nd Avenue Southeast) is also expected because of the high levels of congestion predicted on Front Street South. The Southeast Issaquah Bypass is expected to substantially reduce future traffic volumes along 2nd Avenue Southeast.

Chapter 2

Project Alternatives

Chapter 2 Project Alternatives

This chapter provides a chronological account of the numerous alternatives that have been considered for the Southeast Issaquah Bypass, and the basis for selection of Modified Alternative 5 as the preferred alternative. It begins with a brief explanation of the rationale used to define the project's physical limits, and then discusses the range of alternatives that have been considered for the project, including those that have been rejected from further study. For the final EIS, a discussion of the Interagency 404 Merger Agreement review is included. It also summarizes the expected traffic conditions (both with and without the project) and provides estimated construction costs and a preliminary construction schedule.

This final EIS examines five alignments within the project corridor: three alignments north of Issaquah High School and two alignments south of Issaquah High School. These five alignments combined to create six different build alternatives.

As discussed below, the Interagency 404 Merger Agreement review resulted in the development of a Modified Alternative 5. This alternative is almost identical to the original Alternative 5, except for a small shift in the South A alignment to avoid direct impacts on Wetland GW.

Project Termini and Why They Are Logical

When preparing an EIS for a new roadway project, the FHWA is required to follow specific procedures "in order to ensure the meaningful evaluation of alternatives and to avoid commitments to transportation improvements before they are fully evaluated." Specifically, Title 23 of the Code of Federal Regulations (CFR) 771.111(f) requires that an action evaluated in an EIS shall:

- "Connect logical termini and be of sufficient length to address environmental matters on a broad scope;
- Have independent utility or independent significance, i.e., be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made; and
- Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements."

The Southeast Issaquah Bypass project is consistent with the FHWA criteria described above in the following ways:

- The proposed project would create a new principal arterial extending from the Interstate 90 (I-90) Sunset interchange to a new intersection with Front Street South.
- The length of the proposed project (approximately 1 mile) would be adequate to allow meaningful analysis of environmental issues.
- The terminus points of the new roadway (a principal arterial and an interstate highway) would be logical and consistent with FHWA criteria.

- The proposed project would have independent utility and be a beneficial transportation investment, even if no additional transportation improvements were made in the area.
- The proposed project would not restrict or preclude any other known or reasonably foreseen transportation improvements in the project area.

Alternatives Considered but Rejected

Since the inception of this project in the early 1990s, numerous designs have been considered to improve north-south access through Issaquah to I-90. These options have ranged from making improvements to existing roadways that currently connect to I-90 (such as State Route 900 [SR 900] and Front Street South) to construction of completely new roadways in other corridors. This section summarizes the range of alternatives that have been considered to date, and explains why some of those alternatives have been eliminated from further study.

Interchange Alternatives

In 1989, the city of Issaquah co-sponsored a study to investigate a range of transportation improvements that would serve short- and long-term transportation needs in the I-90 Issaquah subarea (*I-90 Issaquah Area Access Study*, Parsons Brinckerhoff, 1989). The study focused on five I-90 interchanges in the Issaquah area (Lakemont Boulevard, SR 900, Front Street South, East Sunset Way, and High Point), including the connecting arterial network. The potential improvements ranged from construction of a park-and-ride lot with signalization and ramp improvements to construction of a new north/south arterial in either the 7th Avenue Northwest corridor or the corridor currently being considered for the Southeast Issaquah Bypass. This study was the first to suggest constructing a new roadway in the Front Street South to I-90 corridor.

Initial Corridor Alternatives

In 1996 the city co-sponsored a study that investigated nine alternative corridors to connect areas south of the city with I-90 (*Southeast Issaquah Bypass Road Alternatives Alignment Study,* Parsons Brinckerhoff, 1997). See **Figure 2-1**. The nine corridors were first identified through discussions with city staff and then refined based on public comments received during the scoping period for the draft EIS. Each corridor alternative was evaluated based on social and economic impacts, natural environment impacts, transportation improvements, and cost. Because the Front Street South to Sunset interchange corridor had the lowest environmental impact, the lowest social and economic impact, and provided substantial transportation improvements at a moderate cost, it was selected for further study. The other eight corridor alternatives are described below, but were eliminated from further consideration (**Table 2-1**).

Front Street to High Point Interchange Corridor

This alternative would consist of a new arterial roadway connecting Front Street South (Issaquah/Hobart Road) with the High Point interchange. Because of environmental impacts and geometrical constraints, this alternative is fatally

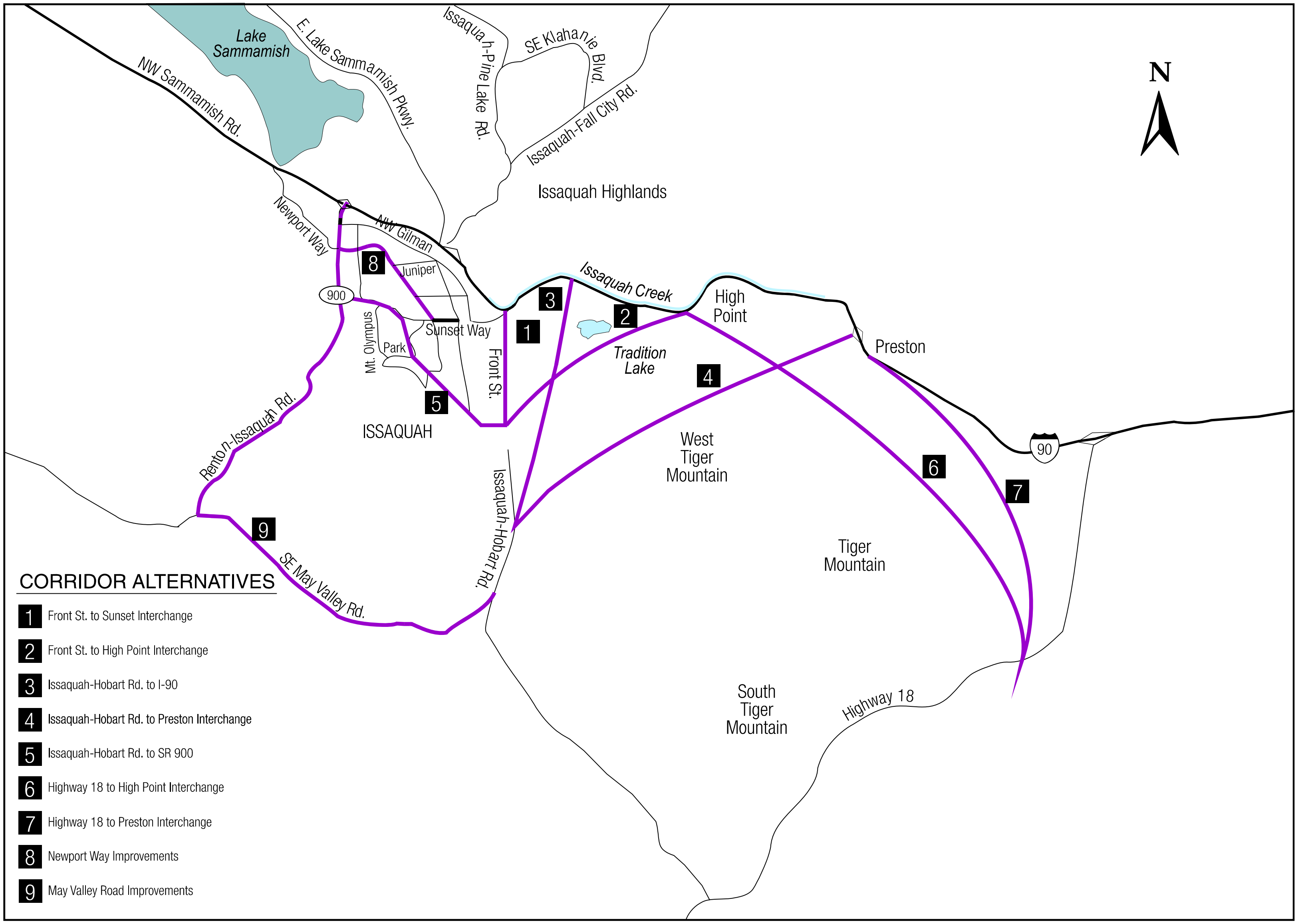

Figure 2-1
Corridor Alternatives

Table 2-1
Evaluation of Corridor Alternatives

	Alternative Description	Social and Economic Impacts				Natural Environment Impacts				Transportation Improvements			Cost	Overall
		Compatibility with Project Goals	Compatibility with Plans & Policies	Residential & Community Displacements	Parks, Recreation, & Open Space Impacts	Fisheries, Wildlife, & Vegetation Impacts	Wetland Impacts	Stream Impacts	Soil & Steep Slope Impacts	Geometric Feasibility	Decrease in Traffic Congestion	Transit Operations	Cost	Pass/Fail
1	Front Street South to Sunset interchange	P	P	P	P	P	P	P	P	P	P	P	P	**P**
2	Front Street South to High Point interchange	F	F	P	F	F	F	F	F	P	P	P	F	**F**
3	Issaquah/Hobart Road to I-90	F	F	P	F	F	F	F	F	P	P	P	F	**F**
4	Issaquah/Hobart Road to Preston interchange	F	F	P	F	F	F	F	F	F	F	P	F	**F**
5	Issaquah/Hobart Road to SR 900	F	F	F	F	F	F	F	F	F	F	P	F	**F**
6	Highway 18 to High Point interchange	F	F	P	F	F	F	F	F	F	F	P	F	**F**
7	Highway 18 to Preston interchange	F	F	P	F	F	F	F	F	F	F	P	F	**F**
8	Newport Way improvement	F	F	P	P	P	P	P	P	P	F	P	P	**F**
9	Maple Valley Road improvement	F	F	P	P	P	P	P	P	P	F	P	P	**F**

P = Alternative has potential to meet criteria; F = Alternative has no potential to meet criteria.

flawed. The alternative would require grades of 10 percent or greater to ascend West Tiger Mountain to the Tradition Lake Plateau and would likely encounter numerous streams and wetlands. On the plateau, there would be substantial impacts on the existing recreational area of Tradition Lake including nearby horse and hiking trails. This alternative would be over twice as long as the Front Street South to Sunset interchange alternative and would entail considerably greater engineering difficulty.

Issaquah/Hobart Road to I-90 Corridor

This alternative would consist of a new arterial connecting Issaquah/Hobart Road with I-90 between the Sunset and High Point interchanges, following the existing power line right-of-way.

This alternative included many of the shortcomings of the Front Street South to High Point interchange alternatives, including grades of 10 percent or greater to ascend West Tiger Mountain to the Tradition Lake Plateau, and would likely also encounter numerous streams and wetlands. On the plateau, there would be substantial impacts on the existing recreational area of Tradition Lake including nearby horse and hiking trails. This alternative would require the construction of an entirely new interchange at I-90 that, along with the high cost of engineering the alignment, would entail a total project cost that would far exceed the benefits it might provide.

Issaquah/Hobart Road to Preston Interchange Corridor

This alternative would consist of a new arterial connecting Issaquah/Hobart Road with I-90 at the Preston interchange. This would involve either circumventing Tiger Mountain or tunneling through it.

This alternative would require a massive engineering project with over 4.8 kilometers (3 miles) of tunnel and 8 kilometers (5 miles) of roadway along regulated steep slopes. Traffic congestion reduction in Issaquah would be minimal because with the large distance of out-of-direction travel required, travel time savings would not be provided over existing routes. Impacts on the environment would be severe due to the steep slopes, numerous streams, and wetland areas that exist all around Tiger Mountain.

Issaquah/Hobart Road to SR 900 Corridor

This alternative would consist of a new arterial connecting Issaquah/Hobart Road with SR 900 west of Newport Way. The I-90/SR 900 interchange would also be improved. Substantial environmental and community impacts were predicted for this corridor because of the close proximity to Issaquah Creek, the state fish hatchery, and an entire community on the north side of Squak Mountain.

Highway 18 to High Point Interchange Corridor

This alternative would consist of a new arterial connecting SR 18 (Highway 18) with I-90 at the High Point interchange. This roadway would either circumvent or tunnel through Tiger Mountain.

The limitations of the Issaquah/Hobart Road to Preston interchange alternative would also apply to this alternative, including over 4.8 kilometers (3 miles) of tunnel and 8 kilometers (5 miles) of roadway along regulated steep slopes, minimal traffic congestion reduction in Issaquah, and severe impacts on the environment because of the steep slopes, numerous streams, and wetland areas that exist around Tiger Mountain.

Highway 18 to Preston Interchange Corridor

This alternative would consist of a new arterial connecting Highway 18 with I-90 at the Preston interchange. This roadway would either circumvent or tunnel through Tiger Mountain.

The limitations of the Issaquah/Hobart Road to Preston interchange and Highway 18 to High Point interchange alternatives would also apply to this alternative, including over 4.8 kilometers (3 miles) of tunnel and 8 kilometers (5 miles) of roadway along regulated steep slopes, minimal traffic congestion reduction in Issaquah, and severe impacts on the environment because of the steep slopes, numerous streams, and wetland areas that exist around Tiger Mountain.

Newport Way Improvement Alternative

This alternative would improve Newport Way from Front Street to SR 900 in order to provide added traffic capacity. The I-90/SR 900 interchange, which is assumed to be improved, has been completed by WSDOT. It was concluded that this alternative would not substantially reduce congestion within the study area. Improvements to this corridor would also add more traffic to an already congested SR 900/I-90 interchange.

In the 1990s the city initiated design work for widening Newport Way to four lanes between Maple Street and Sunset Way. This project generated considerable opposition from residents along this road, and after consideration of impacts on properties and right-of-way acquisition needs, the project was modified to three lanes (i.e., two existing lanes plus a new center turn lane), mainly to improve safety. This project is included in the City of Issaquah transportation improvement program for construction in 2012 or beyond.

May Valley Road Improvement Alternative

This alternative would improve May Valley Road from Issaquah/Hobart Road to SR 900 to provide added traffic capacity. SR 900 and the I-90/SR 900 interchanges would also be improved. Both May Valley Road and SR 900 would need to be improved for a total length of over 8 miles. The project would have a high cost of improvements and not substantially reduce congestion within the study area. Even with improvements, traffic would have to access the already congested SR 900/I-90 interchange.

Following Concurrence Point 1 but prior to completing Concurrence Point 2 of the Interagency 404 Merger Agreement, state and federal agencies requested further study of the May Valley Road and Newport Way corridor in an effort to find an alternative that would minimize (if not avoid) wetland impacts. The May Valley Road and Newport Way corridors were evaluated considering the following criteria: relationship to the purpose and need statement, ability to reduce congestion, impacts on the natural and social environment, and operational or technical issues. The evaluation resulted in the rejection of these two corridor alternatives.

Initial Alignment Alternatives

The same study that narrowed the number of corridor alternatives from nine to one also evaluated seven different alignment alternatives within the Front Street South to Sunset interchange corridor *(Southeast Issaquah Bypass Road Alternatives Alignment Study,* Parsons Brinckerhoff, 1997). The alignments were divided into two northern segments and five southern segments that could be combined in different pairs to create ten different roadway configurations (**Figure 2-2**). The two northern alignments were assumed to be four-lane roadways and the five southern alignments were assumed to be two-lane roadways. Each alignment was evaluated using 21 different criteria (i.e., measures of effectiveness), to help identify differences between the alignments with respect to social and economic impacts, natural environment impacts, transportation improvements, and cost (**Table 2-2**).

Based on the results of the evaluation, the city identified two northern alignments (North A and North B) and two southern alignments (South A and South B) for further study in the draft EIS. A third northern alignment (North S) was added by the project team in an effort to minimize impacts on the Issaquah Sportsmen's Clubhouse and shooting range (**Figure 2-3**). (Note: the North S alignment is the same as the North C alignment included in this final EIS.) The three northern and two southern alignments could be combined in different pairs to create six different build alternatives. All six build alternatives were carried forward for analysis in the draft EIS issued in June 2000.

Interagency 404 Merger Agreement Alternatives

In October 1998, because of anticipated impacts on several high-quality wetlands in the proposed project area, the project came under the review provisions of the *Signatory Agency Committee Agreement to Integrate Aquatic Resources Permit Requirements into the National Environmental Policy Act and the State Environmental Policy Act Processes in the State of Washington* (Revised April 22, 2002). This agreement (commonly referred to as the 404 Merger Agreement) lays out formal procedures to be followed by five federal agencies: FHWA, NMFS, U.S. COE, U.S. EPA, and USFWS. These procedures are also to be followed by three state agencies: Ecology, WDFW, and WSDOT during environmental review for transportation projects that affect important aquatic resources.

Under the 404 Merger Agreement, a project cannot move forward without formal concurrence from NFMS, U.S. COE, U.S. EPA, USFWS, Ecology, and WDFW at the following three project milestones:

- Concurrence Point 1—Endorsement or rejection of the project purpose and need statement and the criteria used for evaluating and selecting alternatives
- Concurrence Point 2—Agreement with the alternatives selected for further study in the draft EIS
- Concurrence Point 3—Endorsement of the preferred alternative and any required mitigation plan.

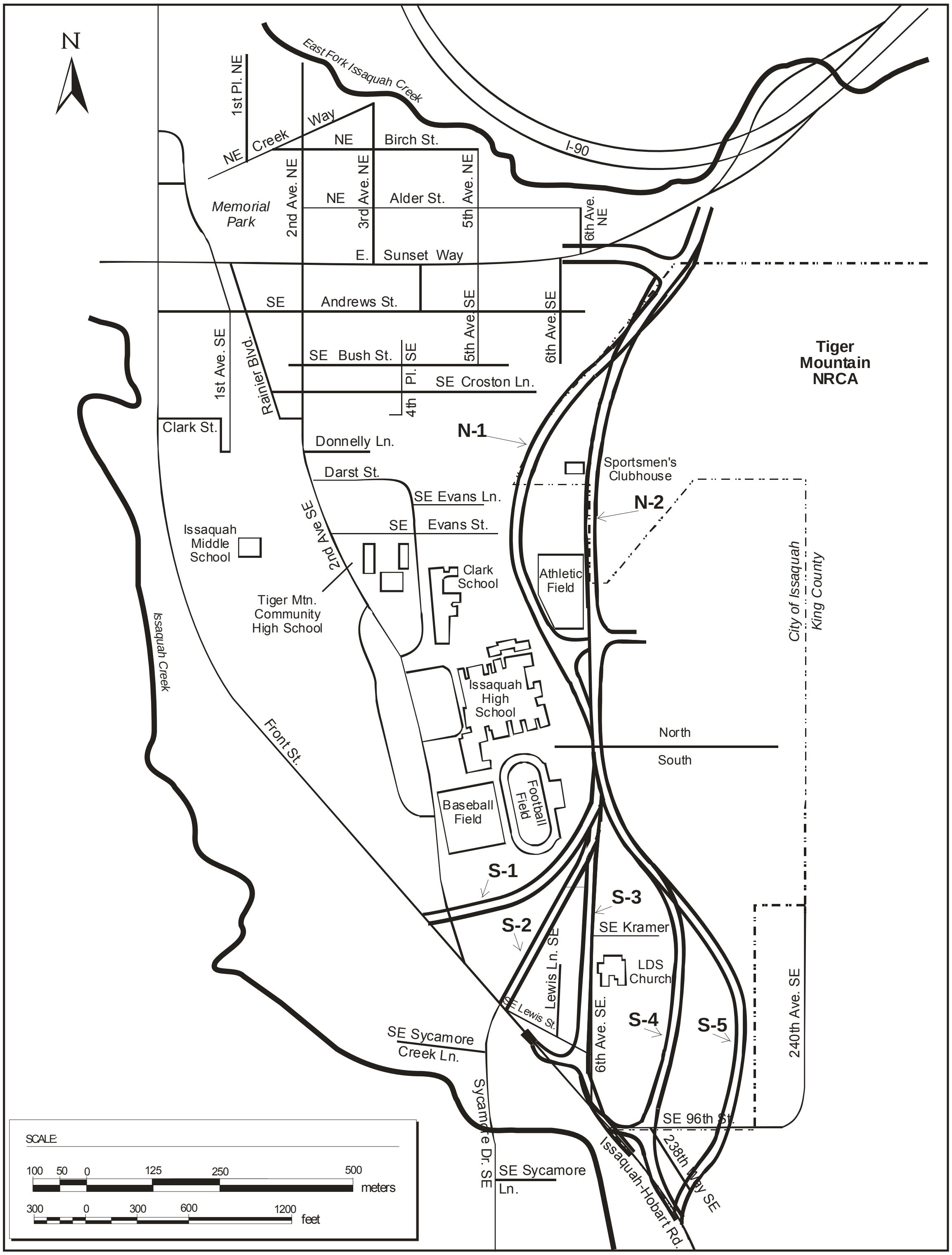

Figure 2-2
Initial Alignment Alternatives

Table 2-2
Evaluation of Initial Alignment Alternatives

MEASURE OF EFFECTIVENESS RANKING

1 2 3 4 5 →

Least Effective/ Most Impact — Most Effective/ Least Impact

	Alternative Description*	Social/Economic Impacts				Natural Environment Impacts				Transportation Improvements			Cost
		Compatibility with Project Goals	Compatibility with Plans & Policies	Residential & Community Displacements	Parks, Recreation, & Open Space Impacts	Fisheries, Wildlife, & Vegetation Impacts	Wetland Impacts	Stream Impacts	Soil & Steep Slope Impacts	Geometric Feasibility	Decrease in Traffic Congestion	Transit Operations	Cost
N2	Alignment follows city/county line	5	5	5	2	4	3	2	4	3	3	4	3
N1	Alignment follows old railroad grade (now Puget Power)	5	5	3	4	2	3	1	3	2	3	4	3
S-5	Easterly alignment, hugs hillside	5	5	5	2	4	3	1	4	1	1	2	2
S-3	Follows existing 6th Avenue SE alignment	5	5	5	2	3	2	3	4	1	3	1	1
S-2	Connects with Sycamore Drive SE at Front Street South	5	5	5	3	4	3	3	4	1	3	1	1
S-1	Follows former railroad right-of-way	5	5	2	3	4	3	2	4	1	3	3	3
S-4	Winds through wetlands just east of LDS Church	5	5	2	3	1	3	2	4	2	2	1	2

*See Figure 2-2 for alignment locations.

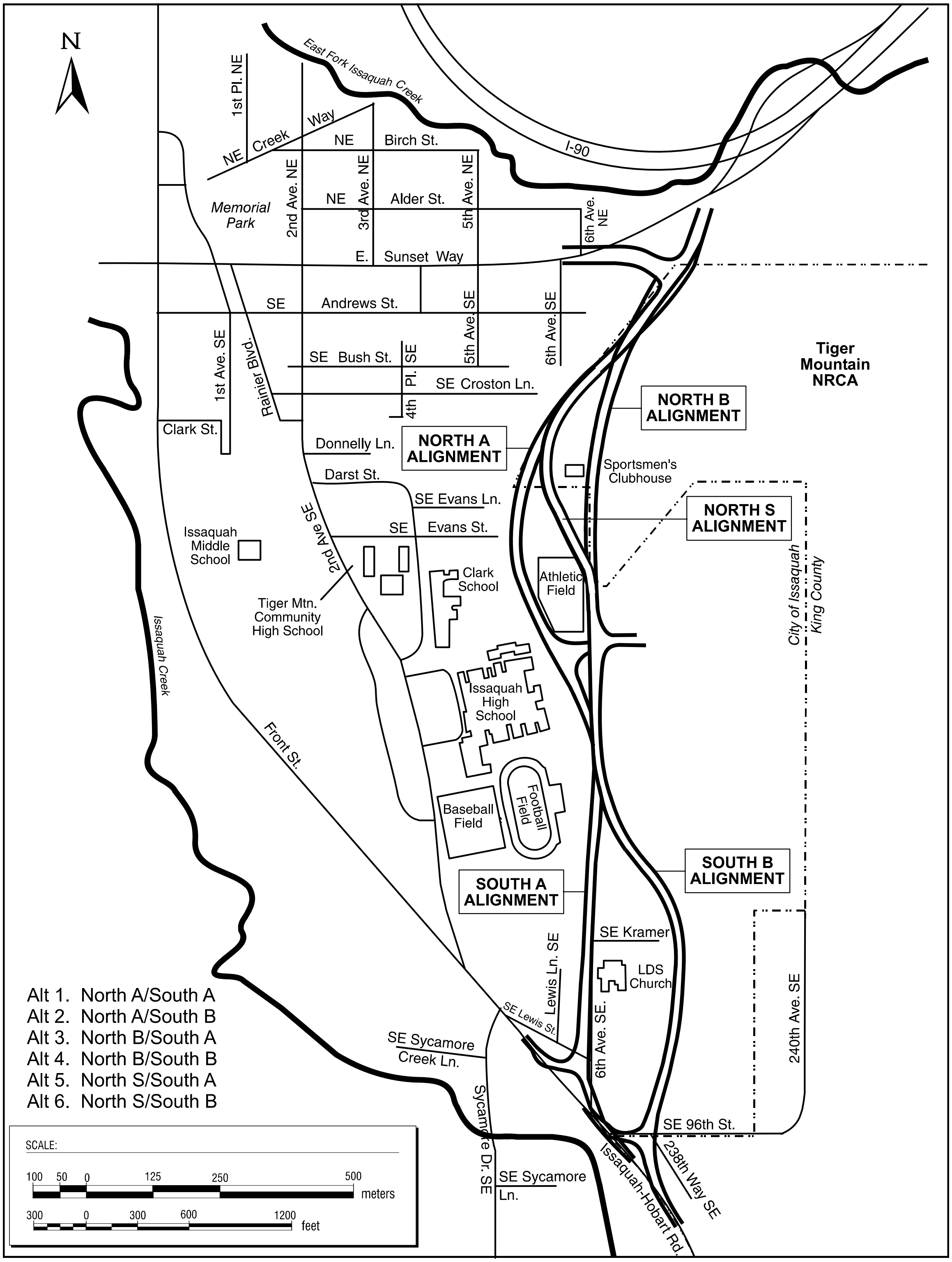

Figure 2-3
Draft EIS (June 2000) Alignment Alternatives

Following Concurrence Point 1 but prior to completing Concurrence Point 2, state and federal agencies requested further study of the May Valley Road and Newport Way corridor in an effort to find an alternative that would minimize (if not avoid) wetland impacts. At about the same time, the 404 Merger Agreement agencies also asked the city to investigate two transportation system management and transportation demand management (TSM/TDM) alternatives—congestion pricing (charging tolls) and expanded transit service—as a means to postpone (if not eliminate) the need for the Southeast Issaquah Bypass.

The May Valley Road and Newport Way corridors and the two TSM/TDM alternatives were evaluated considering the following criteria: relationship to the purpose and need statement, ability to reduce congestion, impacts on the natural and social environment, and operational or technical issues. The evaluation resulted in the rejection of the two corridor alternatives and concluded that congestion pricing or expanded transit service would not substantially reduce the pass-through trips and resulting congestion on Front Street South (**Table 2-3**).

Table 2-3
Evaluation of 404 Merger Agreement Alternatives

	May Valley Road Alternative	Newport Way Alternative	Tolling	Transit
Ability to Reduce Congestion	Poor: Overall volumes greater than Southeast Issaquah Bypass	Fair: 5% increase in trip demand at key intersections by 2015	Poor: Requires transit and access changes	Poor: Significant increase in riders needed
Impacts on Natural Environment	Numerous stream and tributary crossings; over 0.8 hectares (2 acres) of wetland fill; roadside habitat loss; steep slopes	Class 1 stream crossing; less than 0.40 hectares (1 acre) of wetland fill	Few: Tolling booths and transit facilities may disturb some areas	Few: Potential impacts from park-and-ride facilities
Impacts on Social Environment	Over 100 adjacent parcels; numerous property acquisitions; some businesses affected by right-of-way needs	Over 80 adjacent parcels; numerous property acquisitions including business and residential disruptions	Potential social justice concerns	Transit routes may require local improvements
Operational and Technical Issues	Worsens congestion at SR 900 interchange	Worsens congestion at SR 900 interchange; no improvements south of E. Sunset Way	Access control problems on adjacent streets	Area not easily served by transit
Approximate Length	8.0 miles (12.87 km)	2.25 miles (3.62 km)	–	–

Other Alternatives

Comments received during the course of the EIS process include suggestions on other potential alternatives to the Southeast Issaquah Bypass. These potential alternatives, and the reasons why they were not evaluated in detail, are provided below. The section titled Traffic Analysis of Alternatives Selected for Further Study evaluates some of these alternatives for effectiveness in reducing traffic congestion.

Transportation System Management and Transportation Demand Management

Transportation system management (TSM) and transportation demand management (TDM) were suggested as methods to reduce congestion. Transportation system management includes methods that can improve the efficiency of existing roadways, such as signal timing to improve traffic flow, variable message signs that can alert motorists of traffic incidents that can be avoided by using alternate routes, and congestion pricing. Transportation demand management includes methods that reduce the demand for travel and reduce the number of vehicles on roadways, such as telecommuting, flexible schedules, and vanpools.

Transportation system management techniques would not result in a significant benefit for managing traffic congestion in the project area, to be considered as an alternative to the Southeast Issaquah Bypass. Traffic system management (or *intelligent transportation system*, as Issaquah's traffic signal timing program is termed) is now being implemented in Issaquah, and additional improvements to those systems would not provide any additional measurable improvements to reducing congestion or reducing the demand for capacity along streets in the Southeast Issaquah Bypass project area.

The transportation demand management measures also would not provide sufficient reduction in demand, since these measures are not required of businesses, nor of the public in general, and therefore cannot be relied upon now or in the future. Even if instituted on a scale larger than has been achieved anywhere locally or regionally, the potential benefit of transportation demand management is too small to be considered a viable alternative to resolving the current capacity problems in the project area.

See also the discussion of TSM/TDM alternatives above under Interagency 404 Merger Agreement Alternatives.

Improvements to 2nd Avenue Southeast

Improving 2nd Avenue Southeast to provide additional capacity is not an acceptable alternative to the proposed project for several reasons, including safety impacts on the three schools fronting this street, impacts on adjacent neighborhoods, and the extensive improvements—including right-of-way acquisition—that would be needed to upgrade this street and also Sunset Way. The Southeast Issaquah Bypass project would avoid all these impacts and would provide a more efficient route for pass-by trips that do not require local access to downtown Issaquah.

Sunset Way is classified as a minor arterial, and 2nd Avenue Southeast is a collector arterial that has a lower classification and is designed for lower traffic volumes than the proposed Southeast Issaquah Bypass. These two existing roads are designed for lower traffic volumes than the proposed project and are not intended to provide primary relief for traffic congestion on the Front Street corridor. The three schools and the Issaquah School District bus barn on 2nd

Avenue Southeast already generate considerable traffic, affecting traffic on other roads including Front Street South and Sunset Way. A substantial increase in traffic along these roads would further affect school operations and could create significant additional safety impacts on students walking to and from school.

The city is very concerned about impacts on the Old Towne neighborhood resulting from cut-through traffic using Sunset Way and 2nd Avenue Southeast as routes to local freeway interchanges. A substantial increase in cut-through traffic was experienced after the Sunset interchange opened, and additional traffic along 2nd Avenue Southeast and Sunset Way would likely make it worse.

Using 2nd Avenue Southeast as the bypass would also separate and isolate the neighborhood east of 2nd Avenue Southeast, and Sunset Way would function at level-of-service F in the year 2030, which would contribute to degradation of the neighborhood. Using 2nd Avenue Southeast as an arterial bypass would require very significant improvements and additional right-of-way on that street and on Sunset Way to accommodate the projected traffic volumes. This would affect many existing homes, potentially requiring acquisition of property and relocation of residents. Those roadway improvements could also create a severe impact on neighborhood communities and the three schools fronting on 2nd Avenue Southeast.

Improving the intersections along 2nd Avenue Southeast, at Sunset Way and Front Street South, has also been suggested as an alternative to the Southeast Issaquah Bypass. Currently, these intersections experience severe congestion during peak hours when students and buses arrive and depart from the three schools along 2nd Avenue Southeast, and also during peak hours when vehicles attempt to get to and from the Sunset interchange at I-90. While some improvements to the intersections are possible, significant reduction in congestion can be accomplished only by constructing additional capacity on 2nd Avenue Southeast and Sunset Way, as described above.

Improvements to Front Street

Widening Front Street between I-90 and Issaquah/Hobart Road could potentially provide additional capacity for traffic through the corridor. However, this is not considered an acceptable alternative to the Southeast Issaquah Bypass, because it would substantially increase traffic in the downtown core area (Olde Town). Currently, Front Street is a two-lane roadway, with the exception of the very northern section near I-90. Past policies in the Issaquah Comprehensive Plan stated that Front Street should remain as a two-lane road, in order to preserve the land use and character of Olde Town. Past road improvements on Front Street have preserved that character by incorporating traffic calming features to narrow the roadway at intersections and crosswalks.

Widening Front Street would also take away parking that is in short supply in Olde Town. In addition, significant right-of-way acquisition might also be needed to create a four- or five-lane arterial. This would result in a very costly project that would adversely affect the economic vitality and future redevelopment potential of this important part of historic downtown Issaquah.

Widening of Highway 18

Widening SR 18 (Highway 18) between Issaquah/Hobart Road and I-90 from two lanes to four lanes is another alternative that has been mentioned frequently as a possible alternative to the Southeast Issaquah Bypass. An evaluation of this alternative is discussed later in the section titled Traffic Analysis of Alternatives Selected for Further Study.

While widening SR 18 could result in a small degree of benefit, it was concluded that a substantially greater reduction in traffic volumes on Front Street South could be obtained with construction of the Southeast Issaquah Bypass. Modeling indicated that widening SR 18 would reduce traffic volumes between 7 and 10 percent on Front Street South, whereas the Southeast Issaquah Bypass would reduce traffic volumes from 18 percent to as much as 51 percent.

Since widening SR 18 from Issaquah/Hobart Road to I-90 was not shown to be effective in reducing Front Street South congestion, it was eliminated from further consideration. (Note: WSDOT recently completed improvements to the I-90/SR 18 interchange. WSDOT is currently in the environmental review and design phases for widening SR 18 between Issaquah/Hobart Road and I-90, but construction funding for that project has not been allocated.)

Additional Transit Service and High-Occupancy Vehicle Facilities

The traffic modeling analysis discussed later under Traffic Analysis of Alternatives Selected for Further Study also evaluated whether a transit-based approach could limit the proposed roadway to two lanes, thereby serving as a reasonable alternative to the construction of a four-lane roadway. This analysis concluded that transit use is unlikely to alleviate enough traffic volume to allow the Southeast Issaquah Bypass to be a two-lane versus a four-lane facility. It follows that transit use is even less likely to totally replace the function of the Southeast Issaquah Bypass.

A survey conducted in 1999 found that most vehicles using Issaquah/Hobart Road were heading for east King County and the Sammamish Plateau, not to large traffic-generating destinations in Seattle. None of the top ten destinations indicated in the survey were single-point destinations such as Seattle, which would be more transit-friendly in terms of the ability to attract riders. Even under ideal circumstances, transit generally captures an estimated 3 percent or less of work trips leaving suburban locations. Thus, additional transit service is not seen as a viable alternative to the proposed project.

Additional Crossing under Interstate 90

The city of Issaquah is currently in the design and permitting phase for a new roadway crossing under I-90. The I-90 undercrossing will start at Gilman Boulevard at the post office signal and extend north along the former railroad right-of-way and along 221st Place Southeast to Southeast 56th Street. The purpose of this project is to aid in traveling between the north and south sides of I-90 by providing a third route across I-90, thus avoiding the existing congested SR 900 and Front Street interchanges.

Although the I-90 undercrossing is predicted to significantly improve traffic flow between Gilman Boulevard and streets north of I-90, this new road will have little or no effect on improving congestion south of I-90, because these two areas are distinctly separate with different traffic patterns and causes for congestion. Therefore, the I-90 undercrossing is not considered an alternative to the Southeast Issaquah Bypass.

Traffic Signal Upgrades and Roundabouts

Improving the traffic signals or replacing signals with roundabouts along local streets, including Front Street South, Sunset Way, Newport Way, and 2nd Avenue Southeast, has been suggested as an alternative to constructing new capacity on roads. This suggestion is based on the perception that signalized intersections are the main cause for traffic backups and congestion. However, traffic models incorporate signal operation when analyzing traffic movement. These models conclude that roadway capacity, not traffic signal operation, is the limiting factor in determining total vehicle capacity along the Front Street South corridor.

Roundabouts at each end of 2nd Avenue Southeast have been considered but would require considerable expense for new right-of-way, potential displacement of homes, and relocation of a sewer lift station. As an alternative transportation solution, roundabouts are not always feasible. Adequate street capacity in the legs leading to the roundabout must be available, and the design must incorporate specific geometric criteria to result in the desired driver behavior. Roundabouts may offer a possible means for improving flow through these intersections, but other improvements would likely be needed to make them significantly more effective than current intersections. As discussed above, limitations on existing road capacity exclude roundabouts as a viable alternative to the Southeast Issaquah Bypass.

Traffic signal operations in Issaquah will reach maximum efficiency shortly. The city is now upgrading signal operations through the Intelligent Transportation System project. This project involves connecting traffic signals with fiber-optic cables to allow communication between the traffic signals and a central signal timing system. This facility is located at Traffic Management Center within the Public Works Department. The system monitors the flow of traffic and allows adjustments to enhance traffic flow. It also has the ability to adjust for delays such as accidents, construction, and special traffic problems, with the aid of traffic cameras installed at major intersections.

While improvements in traffic flow will result from this system, benefits to the Front Street South corridor will be limited, because congestion there is primarily due to limited road capacity, not signal operations. Furthermore, expanding traffic signal coordination south along Issaquah/Hobart Road to signals at May Valley Road and Cedar Grove Road would not result in any benefit, because those signals are too far away to be effectively coordinated with traffic signals in the city.

Traffic Restrictions and Moratoriums on Development

To reduce traffic on Issaquah/Hobart Road, restrictions on its use could be instituted in various ways, such as posting LOCAL TRAFFIC ONLY signs with enforcement of that restriction; diverting traffic away from the road by using signs or tolls, or requiring permits; or enacting development moratoriums to prevent additional traffic growth. These methods fall under the general category of transportation system management, discussed above. It was concluded that congestion pricing (tolling) would not result in a significant benefit for managing traffic congestion in the project area.

Restricting traffic on Issaquah/Hobart Road would be contrary to public policy, which generally allows for free movement on public roads. Restrictions are typically enacted on local neighborhood streets, to reduce cut-through traffic for safety purposes, or in response to a structural issue, such as a load limit on a bridge. However, restricting traffic on a major arterial for the specific goal of reducing congestion through a particular jurisdiction would be extremely difficult or impossible to achieve. Not only would this require a technical analysis showing that rerouting traffic would not result in impacts on other roadways, legally binding agreements also would be needed to allow the city to control roadways within county jurisdiction. Neither of these tasks is considered possible.

Similarly, development moratoriums are not viewed as an effective means for managing road congestion, especially if the congestion is caused by traffic originating from other areas. The city has no control over development in areas outside its boundaries, where motorists on Issaquah/Hobart Road are traveling to or from. Development is restricted by law to that allowed by zoning, but additional restrictions are unlikely if the stated purpose is to relieve traffic in Issaquah. The city could institute a growth moratorium inside city limits, but this would have no effect on current traffic congestion and very little effect on future traffic volumes, given that the amount of potential future development in the city is small compared to that in the surrounding cities and county. Although growth moratoriums have been used by other jurisdictions in response to growth pressures, they are typically of limited duration to allow time for road improvements and other infrastructure to catch up with population growth.

Improved Downtown Parking

Improved parking in the Olde Town business area would not solve the problem that traffic congestion is creating for local businesses, in that shoppers are less likely to visit an area if congestion makes it difficult for them to get there. While a parking garage would help local businesses to some degree, congestion on Front Street South would not be improved and thus would remain an effective deterrent to people visiting Olde Town. Transportation improvements would still be needed to reduce congestion.

Redirection of Transportation Improvement Funds

Comments received from the public suggested that funds needed to construct the Southeast Issaquah Bypass are better spent on other improvements, including those summarized above. Various reasons were stated to support this view: the cost of the Southeast Issaquah Bypass is too high given the benefits; citizens of Issaquah cannot afford to pay for the project; other more cost-effective improvements are available; not enough studies have been conducted to justify the expense of the Southeast Issaquah Bypass; and so on. Although these comments say that the high cost of the project does not support selection of the preferred alternative, project cost is typically not a factor in selection of the preferred alternative.

When projects are proposed and evaluated in an EIS, it is assumed that funding is available to support the project (the purpose of the EIS is disclosure of environmental impacts and other legal requirements, not justification of project costs). However, cost is a very important consideration after the EIS is completed and project funding must be secured. As of the date of publication of this final EIS, funding for the Southeast Issaquah Bypass has not been allocated. As is common with most transportation projects, the majority of the construction cost of the Southeast Issaquah Bypass would be funded by grants from state and federal sources. The share contributed by the city would be in the range of 14 to 20 percent of the total project cost, depending on which grants are applied for. Local matching funds for construction can be authorized only by the city council, based on the council's careful consideration of how this project can be funded without affecting other needed transportation improvements identified in the transportation improvement plan (TIP). A public process is followed during development and approval of the annual transportation improvement plan, as well as for approval of project construction budgets that follow, to provide an opportunity for citizens to voice their opinions. The outcome of this process cannot be predicted at this time.

It should be recognized that transportation improvement projects are expensive, and they will be even more expensive in the future as construction costs escalate and traffic congestion gets worse. The cost of the Southeast Issaquah Bypass is not significant compared to other transportation projects constructed in the city by other agencies. For example, the I-90/Sunset interchange will cost over $130 million, the new Issaquah transit center will cost $29.5 million, and the SR 900 improvements are expected to cost $42.3 million (Phases 1 and 2).

If funding for the Southeast Issaquah Bypass is not allocated, other less costly transportation improvements would need to be identified and evaluated in future studies. However, as discussed above, based on available information, no alternatives to the Southeast Issaquah Bypass have been identified that would be as effective in reducing traffic congestion along the project corridor.

Alternatives Selected for Further Study in the Supplemental Draft EIS

The June 2000 draft EIS found that, due to major impacts on a large wetland in the southern portion of the project area, the South B alignment in Alternatives 2, 4, and 6 was unacceptable based on comments received from U.S. EPA, USFWS, and WDFW. These alternatives were subsequently rejected from further consideration.

Subsequently, during the winter of 2000/2001, the city began to consider making changes in the design and location of the proposed project's southern alignments to avoid or reduce potential impacts on sensitive wetlands, streams, and fish and wildlife habitat. A new alignment was identified (South C) that substantially reduced impacts on these important natural resources.

FHWA regulations require preparation of a supplemental EIS "whenever changes in the proposed action would result in significant environmental impacts" not previously evaluated, or when "new information or circumstances relevant to environmental concerns" has not been evaluated (CFR 771.130). Because of the combined effect the South C alignment addition, extension of the future traffic analysis year from 2015 to 2030, and the determination that a four-lane facility roadway would be required to accommodate future traffic, there was a need to prepare a supplemental draft EIS. Six new build alternatives (**Figure 2-4**) and the no-action alternative were selected for further study in the supplemental draft EIS.

Each alternative is described in detail in this section. As previously discussed, Alternative 5 in the supplemental draft EIS is replaced by Modified Alternative 5 in this final EIS. Updates to the project design that resulted from the Interagency 404 Merger Agreement review of the preferred alternative (Modified Alternative 5) are provided in the summary below and in the detailed evaluations of impacts and mitigation in Chapter 3. Many of the changes that resulted in Modified Alternative 5 are also applicable to the other Alternatives 1, 2, 3, 4, and 6. In particular, stormwater management for all of these alternatives would have to meet the stringent standards for stormwater treatment that were arrived at through the Interagency 404 Merger Agreement review of Modified Alternative 5. However, unless otherwise noted, Alternatives 1, 2, 3, 4, and 6 were not updated with those modifications because the discussions of impacts and mitigation would all be almost identical.

Alternative 1 (North A and South A)

This alternative is similar to Alternative 1 presented in the June 2000 draft EIS, except that the new roadway would be four lanes wide along its entire 1.9 km (1.2 miles) length. The new road would extend southward from a new T-intersection at East Sunset Way, following a former railroad right-of-way (North A) for approximately 1 km (0.6 miles). The road would then follow the alignment of 6th Avenue Southeast (South A) to a reconfigured intersection with Front Street South. New traffic signals would be installed at East Sunset Way, the main entrance to a proposed mixed-use development (Park Pointe), and a reconfigured intersection with Front Street South.

The proposed roadway would include two travel lanes in each direction, with center-turn and right-turn lanes in several locations. Each travel lane would be 3.6 meters (12 feet) wide, and 1.5-meter- (5-foot-) wide bicycle lanes would be provided in each direction adjacent to the curb and gutter. A 4.2-meter- (14-foot-) wide hard surfaced pedestrian/bicycle trail would also be provided along the entire western edge of the roadway, providing connections to the proposed Squak Valley Park, Rainier Trail, and the Tiger Mountain trail system. Figures showing typical roadway cross-sections are provided in the construction phasing discussion at the end of this chapter.

A new trailhead parking area located at the eastern end of Southeast Andrews Street would provide additional access to the Tiger Mountain trail system. A 1.5-meter- (5-foot-) wide sidewalk would be provided along the eastern roadway edge.

Alternative 1 would include a 75-meter (246-foot) bridge over the north tributary of Issaquah Creek and its associated wetland. Retaining walls would be required immediately south of the Sunset interchange, to accommodate cuts and fills of up to approximately 12 meters (40 feet) and 9 meters (30 feet), respectively. The maximum height of individual retaining walls would be approximately 9 meters

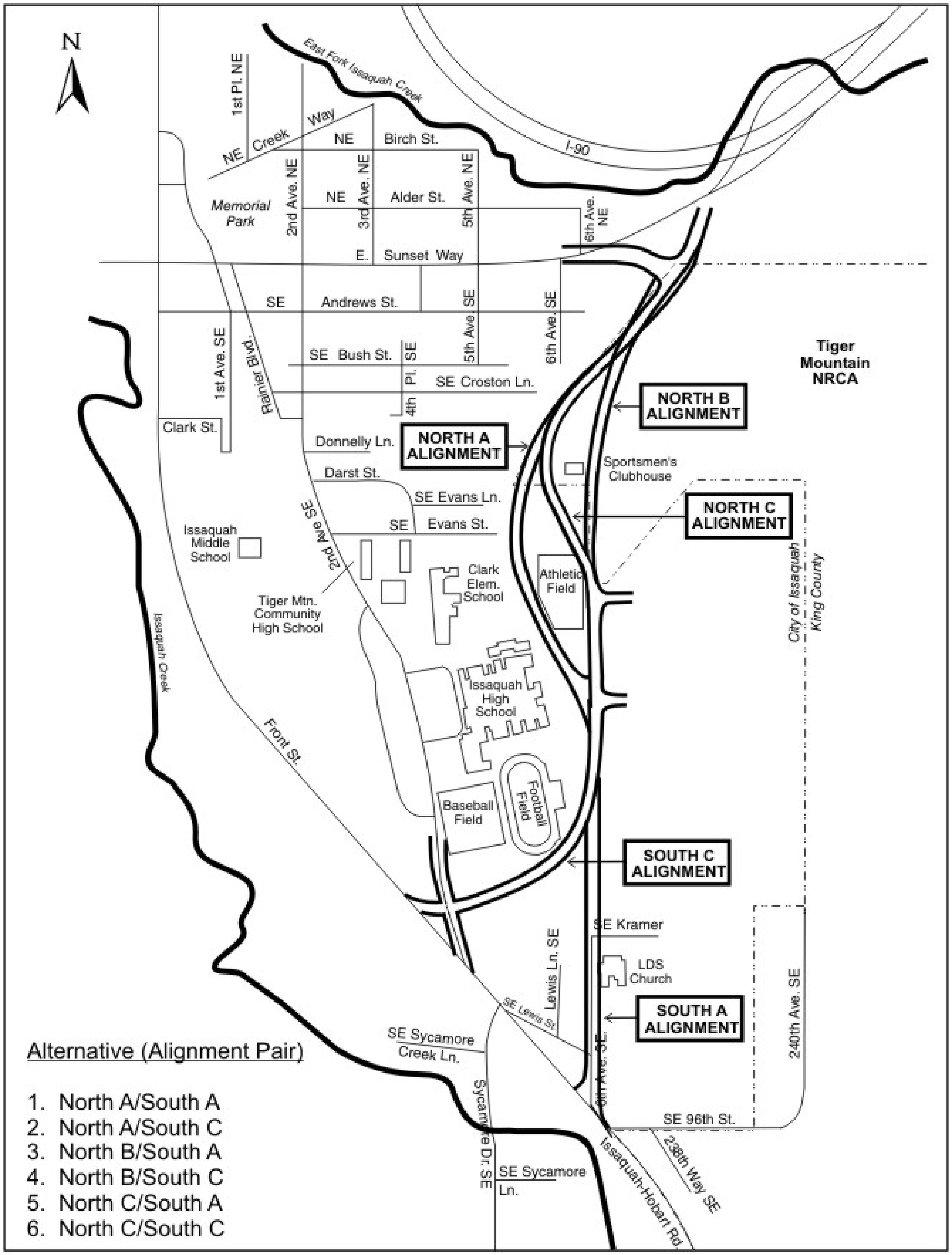

Figure 2-4
Supplemental Draft EIS Alternatives

(30 feet), because the walls would be stepped to reduce visual impacts. These retaining walls would minimize clearing of the forested slope and avoid impacts on the residential neighborhoods.

This alternative would also require two noise walls in the central project area. The first noise wall would be approximately 3 meters (10 feet) high and extend for approximately 387 meters (1,270 feet) near Issaquah High School along the western side of the roadway. The second noise wall would be approximately 2 meters (6.6 feet) high and extend for approximately 200 meters (656 feet) near the eastern end of Southeast Evans Street along the western side of the Southeast Issaquah Bypass roadway.

Six stormwater pond systems would be constructed as part of this alternative: North Pond 1 located immediately south of East Sunset Way; North Pond 2 just west of the high school tennis courts; South Pond A-1 adjacent to the north tributary of Issaquah Creek; South Pond A-2 on the west side of 6th Avenue Southeast near Southeast Kramer Place; South Pond A-3 adjacent to the reconfigured intersection at Front Street South; and South Pond A-4 just west of the existing Front Street South/2nd Avenue Southeast intersection. South Pond A-4 would likely be moved to the location shown in Modified Alternative 5 (South Pond S-3), resulting in fewer dislocations.

Alternative 2 (North A and South C)

This alternative would extend approximately 1.7 km (1.1 miles) from a new T-intersection at East Sunset Way to a new four-way intersection at 2nd Avenue Southeast. The roadway would follow both the North A alignment and a new southern alignment (South C). The South C alignment follows the former railroad right-of-way around the southern end of the high school property. South C was specifically designed to minimize impacts on wetlands and streams in the southern portion of the project area. Signalization for Alternative 2 would be the same as described for Alternative 1, except that signals would be installed at the new four-way intersection at 2nd Avenue Southeast.

The number and dimensions of travel lanes, bicycle lanes, the pedestrian/bicycle trail, and sidewalks would be the same as described for Alternative 1. The pedestrian/bicycle trail located along the western edge of the roadway would directly connect to the Rainier Trail, creating a nearly continuous path from the Issaquah Community Center to the Tiger Mountain trail system. In addition to new trailhead parking at the eastern end of Southeast Andrews Street, this alternative would include trailhead parking with a direct connection to the high school trail. This parking would be provided to replace parking lost to construction of the new intersection at 2nd Avenue Southeast.

As with Alternative 1, retaining walls would be required immediately south of the Sunset interchange to accommodate cuts and fills of up to approximately 40 and 30 feet, respectively, to minimize impacts on steep slope areas and adjacent properties. Additional walls would be constructed along both sides of the South C alignment to minimize impacts on the north tributary of Issaquah Creek, adjacent wetlands, and nearby residential properties. This alternative would include both of the noise walls described for Alternative 1.

Five stormwater pond systems would be constructed as part of Alternative 2: North Ponds 1 and 2 would be the same as described for Alternative 1; South Ponds C-1 and C-2 would be located on either side of the South C alignment; and South Pond C-3 in the southwest quadrant of the new four-way intersection at 2nd Avenue Southeast. South Pond C-3 would likely be moved a location west of South Front Street, as shown in Modified Alternative 5 (for South Pond S-3), to provide additional stormwater treatment from existing streets.

Alternative 3 (North B and South A)

This alternative is similar to Alternative 3 presented in the June 2000 draft EIS, except that the roadway would be four lanes wide along its entire 1.9-km (1.2-mile) length. The new road would follow the North B alignment southward from a new T-intersection at East Sunset Way, traversing the western edge of the West Tiger Mountain/Tradition Plateau natural resource conservation area (Tiger Mountain NRCA) along the base of Tiger Mountain. The road would then follow the South A alignment along 6th Avenue Southeast to a reconfigured intersection with Front Street South. The roadway surface would be recessed up to 1.5 meters (5 feet) below existing grades for approximately 600 meters (one-third of a mile) adjacent to the high school to reduce potential traffic noise. Signalization would be the same as described for Alternative 1. The number and dimensions of the travel lanes, bicycle lanes, pedestrian/bicycle trail, sidewalks, stormwater ponds, trailhead parking area, retaining walls, and bridge over North Fork Issaquah Creek would be basically the same as described for Alternative 1.

Alternative 4 (North B and South C)

Alternative 4 would follow the same alignment as Alternative 3 in the north (North B) and the same alignment as Alternative 2 in the south (South C), resulting in a new roadway extending 1.7 km (1.1 miles) from a new T-intersection at East Sunset Way to a new four-way intersection at 2nd Avenue Southeast. As with Alternative 3, the roadway surface would be recessed up to 1.5 meters (5 feet) below existing grades for approximately 600 meters (one-third of a mile) adjacent to the high school to reduce potential traffic noise. Signalization, the number and dimensions of travel lanes, bicycle lanes, the pedestrian/bicycle trail, sidewalks, stormwater ponds, trailhead parking areas, and retaining walls would be basically the same as described for Alternative 2.

Modified Alternative 5, the Preferred Alternative (North C and South A)

North C Alignment

The North C alignment proceeds southward from the Sunset interchange connection and passes west of the Issaquah Sportsmen's Club building to avoid this structure. The first part of the route includes cut-and-fill slopes along the hillside south of the Sunset interchange. This is followed by a cut section near the Issaquah Sportsmen's Club, continuing in a shallow cut to just past the high school softball field. The North C alignment requires taking a small portion of the northernmost softball diamond. This would be mitigated to ensure the continuing functionality of the two diamonds on this field. After passing the softball fields, the roadway reaches grade and stays essentially at grade for the rest of the project.

Retaining walls would be required along the North C alignment immediately south of the Sunset interchange, to accommodate cuts and fills of up to approximately 40 feet and 30 feet, respectively. The maximum height of individual retaining walls would be approximately 30 feet, because the walls would be stepped to reduce visual impacts. Conceptual illustrations of these walls are shown in **Figures 2-5 and 2-6**. These retaining walls would minimize clearing of the forested slope and avoid impacts on the residential neighborhoods. If fill were used instead of retaining walls, the toe of the fill slope in certain areas would extend to the valley floor. Existing trees on the lower portion of the slope would not be disturbed by construction of the wall, and much of the wall would be shielded from view by these trees.

South A Alignment

The South A Alignment begins at grade just opposite the high school football field, and stays essentially at grade as it crosses the north tributary on a 240-foot bridge that spans the north tributary and southern area wetlands, connecting to the existing 6th Avenue Southeast. At this point, the alignment shifts westward sufficiently (30 to 40 feet) to avoid impacts on wetlands, leaving the west and south boundaries of the large southern wetland untouched. The South A alignment would require filling a smaller wetland area (a 0.59-acre wetland west of 6th Avenue Southeast) and shading 0.32 acres of the large southern area wetland. Avoidance of this wetland is not possible and full mitigation would be provided for these impacts, as described in the conceptual mitigation plan that accompanies this final EIS. The bridge would have enough clearance (5–6 feet) to provide a natural corridor for local wildlife.

The South A alignment would cross the flood fringe of Issaquah Creek. Recent Federal Emergency Management Agency (FEMA) floodplain maps indicate a 100-year flood depth of less than 1 foot for the existing 6th Avenue Southeast. The Southeast Issaquah Bypass in this area would be raised slightly above flood stage at this point, reaching the existing grade of Front Street South. Compensation for the loss of flood storage would be provided by excavating the properties to be acquired along 6th Avenue Southeast. Some of these properties are filled as much as 3 feet above the existing grade and currently restrict flood storage in this area. If needed, additional flood compensatory storage can be obtained on the property that would be acquired on South Front Street for South Pond A-4.

In response to new and additional information relating to project impacts and mitigation, as identified during the Interagency 404 Merger Agreement review, several changes have been made to the project since the June 2004 issuance of the supplemental draft EIS, resulting in the Modified Alternative 5. These changes are summarized as follows:

- Change in preferred alignment: Alternative 5 is termed “Modified” from the supplemental draft EIS description, because the proposed South A alignment was shifted slightly to the west to avoid wetland impacts on Wetland GW. The project limits have also been refined indicating that the total length of the proposed roadway would be approximately 1.1 miles (not 1.2 miles, as noted in previous documents).

- Stormwater infiltration: The supplemental draft EIS assumed infiltration would occur in several of the proposed stormwater ponds. In the revised stormwater analysis (see Concurrence Point 3 packet, Attachment C [Issaquah 2005b]), two potential scenarios were evaluated: 1) only one north pond would infiltrate stormwater, given favorable soils at that location, and no infiltration would occur at other stormwater ponds, given unknown soil conditions at those locations; and 2) there would be stormwater infiltration at two northern ponds and one southern pond.

- The estimate of project impervious surface areas: The revised stormwater analysis identifies the expected range of impacts that would occur under the two scenarios above. Given the base assumption of infiltration at one northern pond, the project could result in a 17.6 acre-per-foot decrease in recharge volume. This would be equivalent to a very small percentage (0.1 percent [or 1/1000]) of the annual flow in the lower Issaquah valley aquifer. Based on very conservative assumptions, this scenario would result in the potential for up to a 0.16 percent decrease in base flows in lower Issaquah Creek. Under the second scenario, additional infiltration at the pond proposed near East Sunset Way and at one southern pond could occur. If this scenario is found feasible during design, it would be predicted to result in no reduction in recharge and no impacts on surface waters.

  Treatment of runoff from existing roads: To further reduce water quality impacts and to achieve no net increase in pollutant loadings to surface waters, the project now proposes to treat stormwater runoff from offsite areas. The stormwater pond proposed near Front Street South (South Pond S-3) would treat stormwater runoff from Front Street South and 2nd Avenue Southeast, which currently have no detention and treatment facilities. Stormwater runoff from a total of 16.15 acres of new and existing roadway would be treated, compared to a net increase of 10.72 acres of new impervious surface that would be constructed (i.e., 12.86 acres for the Southeast Bypass minus 2.14 acres of existing roadway that would be removed).

- Updated wetland impact evaluation and mitigation plan: This evaluation of project wetlands resulted in an updated wetland report. Further evaluation was prompted by updated wetland delineations and discussions with agency staff on wetlands rating and mitigation ratios, pursuant to Department of Ecology guidance. Up to 0.59 acres of wetland fill, 0.32 acres of wetland shading impacts, and 0.36 acres of wetland buffer impacts would occur. Mitigation for wetland fill and shading impacts would be provided through wetland replacement and riparian restoration at a 3-to-1 ratio (3 acres of mitigation would be provided per 1 acre of impact area). Mitigation for wetland buffer impacts would be provided through reestablishment of buffer area at a 1-to-1 ratio (1 acre of mitigation area would be provided per 1 acre of impact area). The conceptual mitigation plan was also revised and includes two potential mitigation approaches.

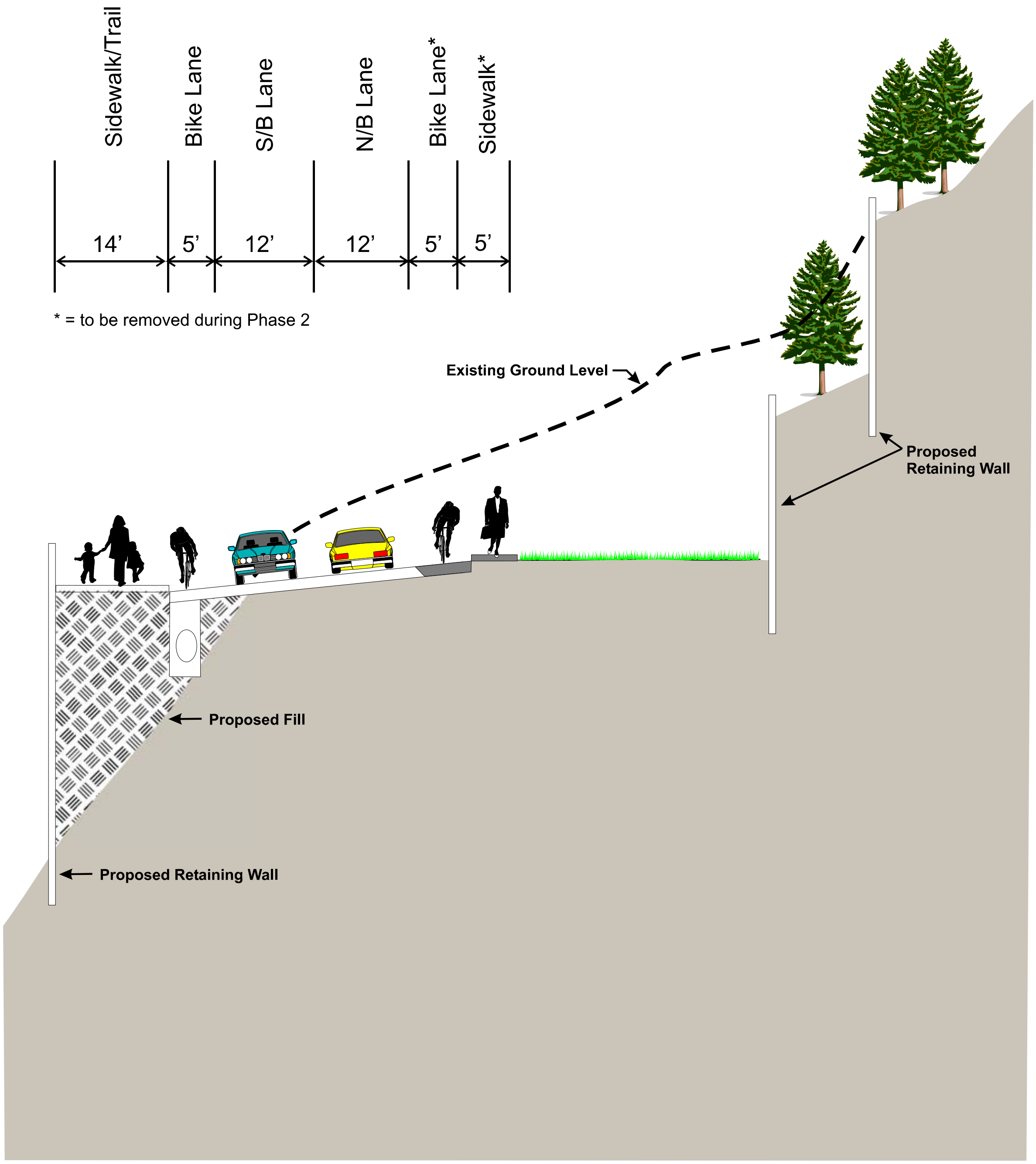

Figure 2-5
Typical Phase 1 Roadway Cross-Section: North Project Area

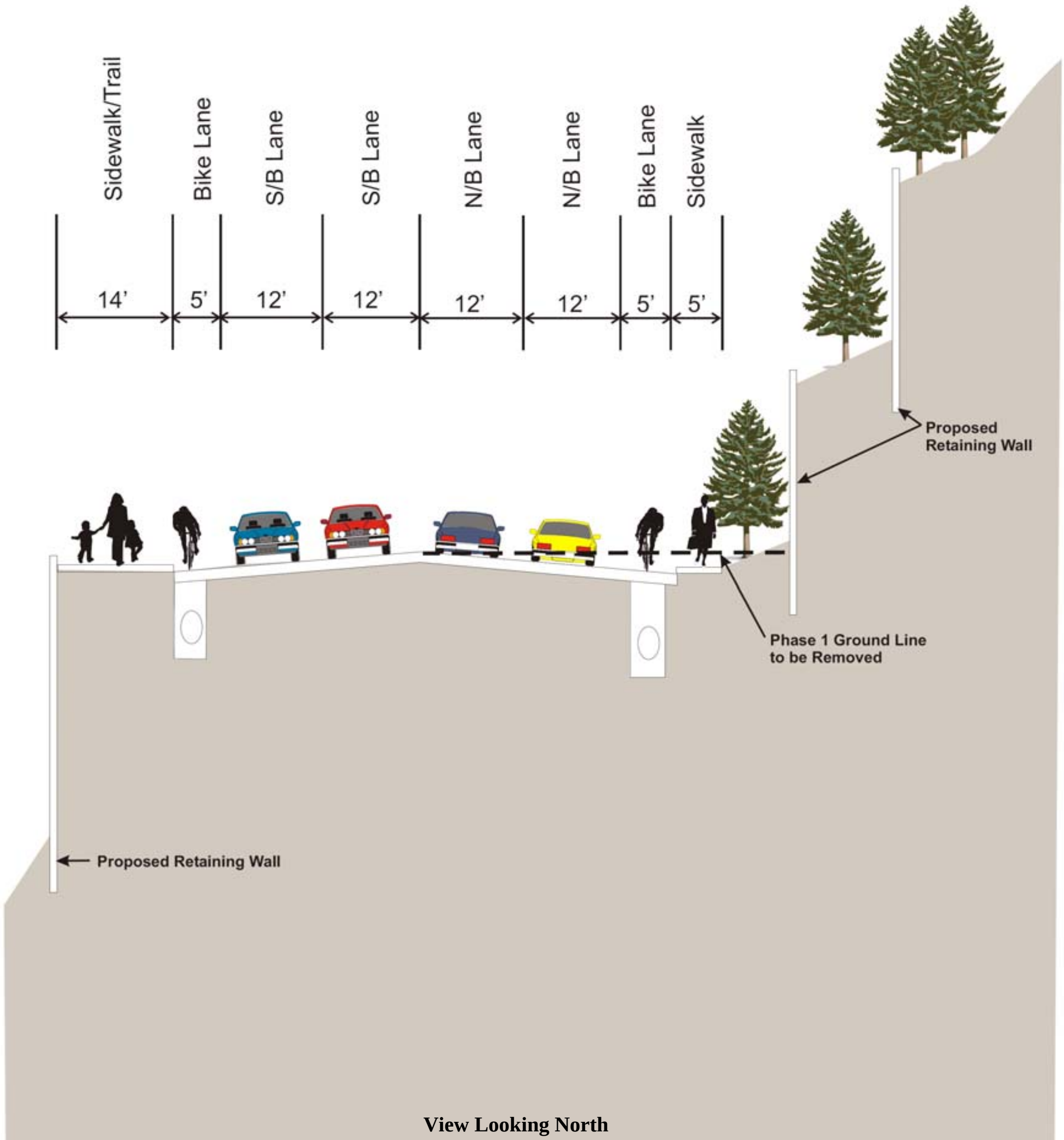

Figure 2-6
Typical Phase 2 Roadway Cross-Section: North Project Area

- Wildlife crossings: The wildlife crossing near the Issaquah Sportsmen's Club was eliminated because existing fencing on private property in the area would make this crossing ineffective. Recognizing the need for more understanding of the migration patterns of large mammals between Tiger and Squak Mountains, the city agreed during the 404 Merger Agreement issue resolution process to participate monetarily and help initiate a study and planning effort that addresses regional wildlife connectivity. The city also agreed to facilitate a discussion with WSDOT during the project design stage, through an inter-agency request to evaluate maintenance needs at existing wildlife crossings on I-90 in coordination with WDFW and USFWS.

The impacts associated with Modified Alternative 5 are presented in more detail in Chapter 3 of this final EIS. For additional information, the complete text of the Concurrence Point 3 packet is available from the city of Issaquah and via the city's website at *www.ci.issaquah.wa.us*.

Alternative 6 (North C and South C)

Alternative 6 would extend approximately 1.6 km (1 mile) from a new T-intersection at East Sunset Way to a new four-way intersection at 2nd Avenue Southeast. The north half of this alternative is the same as Alternative 5, following the North C alignment southward along the former railroad right-of-way. The alignment would then pass between the Issaquah Sportsmen's Clubhouse and the Issaquah School District athletic field. Alternative 6 would then follow the South C alignment along the former railroad right-of-way around the southern end of Issaquah High School.

Signalization, the number and dimensions of travel lanes, bicycle lanes, the pedestrian/bicycle trail, sidewalks, trailhead parking areas, and retaining walls would be similar to what is described for Alternatives 2 and 4. Stormwater pond systems would be basically the same as that described under Alternative 2.

The pedestrian/bicycle trail located along the western edge of the roadway would directly connect to the Rainier Trail, creating a nearly continuous path from the Issaquah Community Center to the Tiger Mountain trail system. In addition to new trailhead parking at the eastern end of Southeast Andrews Street, this alternative would include trailhead parking with a direct connection to the high school trail. This parking would be provided to replace parking lost to construction of the new intersection at 2nd Avenue Southeast.

Alternative 7 (No Action)

Under the no-action alternative, the Southeast Issaquah Bypass would not be constructed, no right-of-way would be acquired, and no direct construction impacts would occur.

The no-action alternative assumes construction of a number of commercial and residential projects in the area, including the proposed Park Pointe development east of Issaquah High School. In 2004 the city council changed the land use designation for Park Pointe from *urban village* to *low-density residential*. This change removed the potential for commercial, office and retail development on the property so now only residential units will be allowed. Development of this allowed density is not contingent on construction of the Southeast Issaquah Bypass. This assumption is consistent with current zoning that would allow development on the property even without construction of the Southeast Issaquah Bypass. Access to the proposed development under the no-action alternative is assumed to be from Southeast Evans Street. No other new streets were assumed to be constructed in the project area under this alternative.

Traffic Analysis of Alternatives Selected for Further Study

The traffic analysis that was prepared for the draft EIS was updated for the supplemental draft EIS. The build scenario, which considers all six alternatives, analyzed the same corridors with the addition of the Southeast Issaquah Bypass. Both scenarios were analyzed for year 2010 (year of opening) and year 2030 (design year) conditions. The no-action scenario analyzed the major corridors within the city without the addition of the Southeast Issaquah Bypass.

The I-90 undercrossing project, a recent new project being considered by the city to add another route to cross I-90 between Gilman Boulevard and Southeast 56th Street, was not included in the traffic analysis. This project, which was originally proposed in 2003 after the original Southeast Issaquah Bypass traffic analysis was prepared, would not have an effect on traffic patterns in the vicinity of the Southeast Issaquah Bypass project. Traffic using the I-90 undercrossing will be local traffic accessing the north and south sides of I-90 without traveling through the I-90 interchange at Front Street.

The build scenario assumes that the Southeast Issaquah Bypass would be a four-lane principal arterial under both year 2010 and year 2030 scenarios. The posted speed limit would be 35 miles per hour for each of the alternative alignments for the build scenario.

Both the no-action and build scenarios evaluated peak-hour traffic operations (AM and PM peak hours) for main intersections. For the year 2030 scenario, main intersections within the Front Street South, East Lake Sammamish Parkway, Issaquah/Fall City Road, North and South Sammamish Plateau Access Roads (North and South SPARs), SR 900, and East Sunset Way corridors were evaluated. For the year 2010 scenario, intersections at Front Street South, 2nd Avenue Southeast, and the Southeast Bypass were evaluated. The measure of effectiveness used for evaluating traffic operations was the level of service (LOS) designation, which is based on the estimated intersection delay (measured in seconds per vehicle [spv]).

The designation ranges from LOS A to LOS F; where LOS A describes free-flow traffic operations and minimal vehicle delay (in seconds per vehicle) and LOS F indicates failing conditions. **Table 2-4** illustrates the level of service designation and corresponding range of delay as defined by the *Highway Capacity Manual* (2000).

For details on the traffic analysis and methods used, see the transportation technical report in Appendix F of the supplemental draft EIS (June 2004). A technical memorandum summarizing the updated traffic analysis is included as Appendix D (Volume 2) in this final EIS.

Table 2-4
Level-of-Service Designations

LOS	Intersection Delay (seconds per vehicle)
A	≤ 10
B	> 10 to 20
C	> 20 to 35
D	> 35 to 55
E	> 55 to 80
F	> 80

The city of Issaquah currently is experiencing a large volume of pass-through traffic in the AM and PM peak hours. Pass-through traffic is defined as trips originating and ending outside the city. Most pass-through traffic occurs in the north-south direction as drivers travel to and from I-90 during peak hours. Because there are only a few north/south corridors available through the city, Front Street South becomes very congested during the peak hours.

The following sections summarize the existing traffic conditions in the project area and the modeling results of the no-action and build scenarios for 2010 and 2030. Additional information is presented on the limited potential for expanded transit service, increased high-occupancy vehicle (HOV) operations, or improvements to SR 18 to offset the need for the Southeast Issaquah Bypass project.

Summary of Future Traffic Volumes and Levels of Service

Table 2-5 compares projected volumes between the no-action and build scenarios for future years 2010 and 2030. The 2010 scenario suggests that the Southeast Issaquah Bypass would result in substantial reduction in traffic volumes on both Front Street South and 2nd Avenue Southeast. During the PM peak hour in the peak direction of travel (southbound) along Front Street South, a reduction of 200 to 650 vehicles may be anticipated with the inclusion of the Southeast Issaquah Bypass. Along 2nd Avenue Southeast (just south of Southeast Evans Street), a reduction in traffic volumes of approximately 640 vehicles may be anticipated with the inclusion of the Southeast Issaquah Bypass. These results indicate that the Southeast Issaquah Bypass would effectively operate as a bypass to Front Street South and potentially reduce neighborhood cut-through traffic.

As Table 2-5 illustrates, in the PM peak hour the traffic volume heading southbound just south of I-90 along the Southeast Issaquah Bypass is expected to be approximately 1,975 vehicles per hour. Southbound traffic volumes just north of Issaquah/Hobart Road are expected to be approximately 1,320 vehicles per hour.

As with the 2010 scenario, the 2030 scenario suggests that the Southeast Issaquah Bypass would result in substantial reduction in traffic volumes on both Front Street South and 2nd Avenue Southeast (see Table 2-5). A volume reduction in the southbound direction in the range of from 400 to over 1,000 vehicles is anticipated for the Front Street South corridor by 2030. For the 2nd Avenue Southeast corridor (just south of Southeast Evans Street), the southbound peak direction may anticipate a reduction of over 850 vehicles. These results indicate that the Southeast Issaquah Bypass would continue to function as a bypass to Front Street South in 2030 and potentially reduce neighborhood cut-through traffic.

Table 2-5
2010 and 2030 PM Peak Hour Traffic Volumes for the No-Action and Build Scenarios

Location	No-Action Scenario				Build Scenario			
	Southbound		Northbound		Southbound		Northbound	
	2010	2030	2010	2030	2010	2030	2010	2030
Southeast Bypass south of I-90	–			–	1,975	2,520	950	1,000
Southeast Bypass north of Issaquah/Hobart Road	–			–	1,320	1,830	485	595
Front Street South south of SE Newport Way	1,205	1,695	455	535	550	680	265	325
Front Street North north of E. Sunset Way	845	925	515	570	495	515	440	530
Front Street North north of Gilman Boulevard	1,335	1,510	1,740	2,170	985	1,060	1,745	2,085
2nd Avenue SE south of SE Evans	675	895	235	270	30	25	30	35

The 2nd Avenue Southeast corridor primarily serves several residential communities and public schools. Traffic modeling indicates that without the Southeast Bypass, Front Street is over capacity, making the other north-south corridor (2nd Avenue Southeast) more desirable and resulting in significant cut-through traffic. With the Southeast Bypass, the new bypass becomes much more desirable than 2nd Avenue Southeast because it has more capacity and a higher speed limit, and provides a direct route to Issaquah Highlands, I-90, and Issaquah/Hobart Road.

Table 2-6 summarizes the level of service and intersection delay for the major corridors in the project area. Included in the table are the no-action and build scenarios along with existing conditions (2000), opening year 2010, and design year 2030. For details on the traffic analysis, methods used, and 2030 volumes, see the transportation technical report in Appendix F of the supplemental draft EIS (June 2004). For more information on 2010 volumes, see Appendix D in Volume 2 of this final EIS.

In the no-action scenario for 2010 and 2030, most major corridors within Issaquah would be experiencing heavy congestion and poor levels of service during the peak hours (see Table 2-6). The expected level of congestion would suggest that the peak hour would likely spread for a longer period of time. Given the level of congestion projected for Front Street South without the Southeast Issaquah Bypass, other corridors such as 2nd Avenue Southeast (which primarily serves residential neighborhoods and Issaquah High School) would become attractive alternate routes to and from I-90.

Table 2-6
Summary of Intersection Levels of Service and Delay for Various Scenarios

Forecast Year	SPAR	Southeast Issaquah Bypass		Front/ WB Ramps	Front/EB Ramps	Front/Gilman	Front/Dogwood	Front/Sunset	Front/Clark	Sunset/ WB Ramps	Sunset/ EB Ramps	SE Bypass/ Sunset	SE Bypass/Park Pointe Access	SE Bypass/Front (South A)	Iss-Hobart May Valley Rd.	Sunset/2nd SE	Bush/2nd SE	Front/2nd SE
Year 2000: Existing	No Build	No Build	AM	F >80	F >80	C 26	B 16	C 31	C 20	NA	NA	NA	NA	NA	NA	A 7	A 7	F >80
			PM	F >80	F >80	E 72	B 13	E 76	C 30	NA	NA	NA	NA	NA	NA	A 9	A 6	B 18
Year 2010: No Action	Build	No Build	AM	E 56	E 67	E 71	C 28	D 43	F >80	A 8	B 17	NA	NA	NA	F >80	A 9	B 11	F >80
			PM	B 16	F >80	F >80	A 8	C 24	C 33	A 6	B 15	NA	NA	NA	F >80	B 12	F >80	D 48
Year 2010: Build	Build	Build	AM	C 33	B 15	E 75	A 10	F >80	D 41	B 15	B 16	A 8	B 16	A 6	F >80	B 14	A 3	D 38
			PM	F >80	F >80	F >80	B 12	B 17	B 17	B 12	B 18	D 43	F >80	C 22	F >80	B 14	A 3	A 5
Year 2030: No Action	Build	No Build	AM	C 22	C 22	F >80	E 71	F >80	F >80	B 12	A 6	NA	NA	NA	F >80	C 29	B 14	F >80
			PM	D 47	F >80	F >80	D 41	C 31	F >80	D 53	F >80	NA	NA	NA	F >80	F >80	E 78	F >80
Year 2030: Build	Build	Build	AM	D 46	C 27	E 69	D 49	E 60	E 73	B 14	B 12	B 12	C 22	B 19	F >80	A 6	A 4	C[2] 25
			PM	D 52	F >80	F >80	A 9	B 12	B 12	F >80	F >80	C 26	D 48	F >80	F >80	A 5	A 3	C[2] 29

Notes: For signal controlled intersections, level of service is provided with letter grade (A through F) and corresponding average seconds of delay per vehicle during the peak hour.
[1] Unsignalized intersection.
[2] Applicable to South A alignment only.
WB = westbound; EB = eastbound.

In the build scenario, many of the intersections along Front Street South and 2nd Avenue Southeast would improve a great deal as compared to the no-action scenario. However, a few intersections may experience similar or slightly worse traffic operations in the build scenario. This is primarily due to additional available capacity and travel patterns shifting slightly. However, the overall volumes traversing both the Front Street South and 2nd Avenue Southeast corridors would decrease with the incorporation of the Southeast Issaquah Bypass, which would provide another north/south corridor alternative.

Front Street

Existing traffic conditions along Front Street generally vary from very congested at intersections in the north near I-90 to moderately congested at intersections in the south (**Table 2-7**). During both the AM and PM peak hours, the intersections of Front Street North and the ramps to and from I-90 experience failing traffic conditions. The delays at these intersections exceed 80 seconds delay per vehicle, which translates to LOS F. In the AM peak hour, the Front Street South/2nd Avenue Southeast intersection also experiences failing conditions. AM and PM peak-hour operations at Front Street South intersections with Gilman Boulevard, Northwest Dogwood Street, East Sunset Way, and Southeast Clark Street range from LOS C to LOS E.

Table 2-7
Front Street South Intersections -
Year 2010 and 2030 AM Peak Hour Levels of Service and Delay

	No-Action Scenario		Build Scenario	
	Year 2010	**Year 2030**	**Year 2010**	**Year 2030**
Front Street N./ WB I-90 ramps	LOS E 56 sec/veh	LOS C 22 sec/veh	LOS C 33 sec/veh	LOS D 46 sec/veh
Front Street N./ EB I-90 ramps	LOS E 67 sec/veh	LOS C 22 sec/veh	LOS B 15 sec/veh	LOS C 27 sec/veh
Front Street N/ Gilman Boulevard	LOS E 71 sec/veh	LOS F >80 sec/veh	LOS E 75 sec/veh	LOS E 69 sec/veh
Front Street N/ NW Dogwood Street	LOS C 28 sec/veh	LOS E 71 sec/veh	LOS A 10 sec/veh	LOS E 49 sec/veh
Front Street N./ E. Sunset Way	LOS D 43 sec/veh	LOS F >80 sec/veh	LOS F >80 sec/veh	LOS E 60 sec/veh

WB = westbound; EB = eastbound.
sec/veh = seconds per vehicle

By comparing anticipated traffic operations from existing conditions to the no-action scenarios for 2010 and 2030, the intersections at Front Street South and the I-90 ramps show an improvement over existing failing conditions. This is primarily due to anticipated planned roadway improvements (see Appendix F of the June 2004 supplemental draft EIS), and secondarily due to the assumption that the Front Street South corridor will be a coordinated signal system in years 2010 and 2030.

For a comparison of anticipated traffic operations for the AM and PM peak hours between 2010 and 2030, see Table 2-7 and **Table 2-8**.

Table 2-8
Front Street South Intersections -
Year 2010 and 2030 PM Peak Hour Levels of Service and Delay

	No-Action Scenario		**Build Scenario**	
	Year 2010	**Year 2030**	**Year 2010**	**Year 2030**
Front Street N./ WB I-90 ramps	LOS B 16 sec/veh	LOS D 47 sec/veh	LOS F >80 sec/veh	LOS D 52 sec/veh
Front Street N./ EB I-90 ramps	LOS F >80 sec/veh	LOS F >80 sec/veh	LOS F >80 sec/veh	LOS F >80 sec/veh
Front Street N./ Gilman Boulevard	LOS F >80 sec/veh	LOS F >80 sec/veh	LOS F >80 sec/veh	LOS F >80 sec/veh
Front Street N./ NW Dogwood Street	LOS A 8 sec/veh	LOS D 41 sec/veh	LOS B 12 sec/veh	LOS A 9 sec/veh
Front Street N./ E. Sunset Way	LOS C 24 sec/veh	LOS C 31 sec/veh	LOS B 17 sec/veh	LOS B 12 sec/veh

WB = westbound; EB = eastbound.
sec/veh = seconds per vehicle.

During the AM peak hour, notable reductions in delay in year 2010 are predicted at the intersections of Front Street North with the eastbound and westbound I-90 ramps when the Southeast Issaquah Bypass is incorporated. Operations at the intersections of Front Street North with Gilman Boulevard and East Sunset Way would decrease slightly, primarily due to a slight shift in travel patterns with the inclusion of a new north/south corridor. Although overall volumes on Front Street North would be reduced with the Southeast Issaquah Bypass, there would be an increase in volumes at the intersection of the westbound I-90 ramps and Front Street North. For vehicles destined north on East Lake Sammamish Parkway from points south of Issaquah, the traffic model suggests that a portion may use the Southeast Issaquah Bypass to avoid congestion on Front Street North and then exit at the Front Street North interchange to access East Lake Sammamish Parkway. This diversion pattern would result in an increase in volumes at the Front Street South intersection. Its impact on I-90 mainline operation is projected to be negligible.

By year 2030, delay reductions can be observed at the intersections of Front Street North with East Sunset Way. However, a slight deterioration in operations can be observed at the intersection of Front Street North with the I-90 ramps. As with the 2010 scenario, this decrease would be primarily due to some shift in travel patterns with the inclusion of the Southeast Issaquah Bypass.

During the PM peak hour, the benefits of the Southeast Issaquah Bypass would be more obvious than in the AM peak hour. Several intersections along Front Street (including the westbound I-90 ramps, Northwest Dogwood Street, East Sunset Way, and Southeast Clark Street) are anticipated to have improved operations over the no-action scenario. The Front Street North and eastbound

I-90 intersection may have an increase in intersection delay due to a shift in travel patterns occurring north of this intersection.

In the 2030 scenario, the PM peak hour showed similar results and benefits from inclusion of the Southeast Issaquah Bypass as noted for year 2010. However, in the build scenario the intersection of westbound I-90 and Front Street North is anticipated to increase in delay over the no-action scenario during the PM peak hour. In addition, the intersection of Front Street North with Northwest Dogwood Street is anticipated to slightly deteriorate in the build condition. This is primarily due to a shift in travel patterns occurring to the north, as noted in the AM peak hour analysis discussion.

2nd Avenue Southeast

For both the AM and PM peak hours, all the intersections studied along 2nd Avenue Southeast show improved traffic operations over the no-action scenario for years 2010 and 2030 (**Table 2-9** and **Table 2-10)**. The only exception would be for the intersection of Southeast 2nd Street and East Sunset Way, where a slight deterioration is observed in the AM peak hour for the year 2010. This slight deterioration is likely due to a shift in traffic patterns in the build condition.

Table 2-9
2nd Avenue Southeast Intersections -
Year 2010 and 2030 AM Peak Hour Levels of Service and Delay

	No-Action Scenario		Build Scenario	
	Year 2010	**Year 2030**	**Year 2010**	**Year 2030**
2nd Avenue SE/ East Sunset Way	LOS A 9 sec/veh	LOS C 29 sec/veh	LOS B 14 sec/veh	LOS A 3 sec/veh
2nd Avenue SE/ SE Bush Street	LOS B 11 sec/veh	LOS B 14 sec/veh	LOS A 3 sec/veh	LOS A 4 sec/veh
2nd Avenue SE/ Front Street South	LOS F >80 sec/veh	LOS F >80 sec/veh	LOS D 38 sec/veh	LOS D (South A) 38 sec/veh
sec/veh = seconds per vehicle.				

Table 2-10
2nd Avenue Southeast Intersections -
Year 2010 and 2030 PM Peak Hour Levels of Service and Delay

	No-Action Scenario		Build Scenario	
	Year 2010	**Year 2030**	**Year 2010**	**Year 2030**
2nd Avenue SE/ East Sunset Way	LOS B 12 sec/veh	LOS F >80 sec/veh	LOS A 4 sec/veh	LOS A 5 sec/veh
2nd Avenue SE/ SE Bush Street	LOS F >80 sec/veh	LOS E 78 sec/veh	LOS A 3 sec/veh	LOS A 6 sec/veh
2nd Avenue SE/ Front Street South	LOS D 48 sec/veh	LOS F >80 sec/veh	LOS A 5 sec/veh	LOS F (South A) - >80 sec/veh LOS F (South C) - >80 sec/veh
sec/veh = seconds per vehicle.				

In the no-action scenario, Front Street would remain congested for long periods of time and drivers can be expected to look for alternative routes to and from I-90. Traffic on 2nd Avenue Southeast and other neighborhood streets show an increase in traffic volumes in the future. In the build scenario, traffic operations would improve substantially along 2nd Avenue Southeast. Construction of the Southeast Issaquah Bypass would help reduce traffic volumes along 2nd Avenue Southeast because drivers would instead use the Bypass Road for access to and from I-90.

Southeast Issaquah Bypass (South A Alignment)

The levels of service presented in **Table 2-11** and **Table 2-12** represent the traffic operations anticipated by the end of the AM and PM peak hours for the South A alignment. Most of the intersections operate at acceptable traffic operation levels in the years 2010 and 2030. However, in year 2010, the Southeast Issaquah Bypass and Park Pointe access intersection is anticipated to operate at LOS F. In year 2030, the intersection of Southeast Issaquah Bypass and Front Street is anticipated to fail. During the PM peak hour in 2030, the Front Street South and Southeast Issaquah Bypass intersection is anticipated to operate at LOS F. The failing level of service is primarily due to the high demand of vehicles using Front Street South (Issaquah/Hobart Road), which is capacity-constrained to a two-lane facility.

Table 2-11
Southeast Issaquah Bypass Alignment -
Year 2010 and 2030 AM Peak Hour Levels of Service and Delay

	South A	
	Year 2010	**Year 2030**
Southeast Bypass and East Sunset Way	LOS A 8 sec/veh	LOS B 12 sec/veh
Southeast Bypass and Park Pointe access	LOS B 16 sec/veh	LOS C 22 sec/veh
Southeast Bypass and Front Street South	LOS A 6 sec/veh	LOS B 19 sec/veh
sec/veh = seconds per vehicle.		

Table 2-12
Southeast Issaquah Bypass Alignment -
Year 2010 and 2030 PM Peak Hour Levels of Service and Delay

	South A	
	Year 2010	**Year 2030**
Southeast Bypass and East Sunset Way	LOS D 43 sec/veh	LOS C 26 sec/veh
Southeast Bypass and Park Pointe Access	LOS F >80 sec/veh	LOS D 48 sec/veh
Southeast Bypass and Front Street South	LOS C 22 sec/veh	LOS F >80 sec/veh
sec/veh = seconds per vehicle.		

Rolling queues are defined as queued vehicles traveling at 5 to 10 miles per hour (mph). Rolling queues impact traffic operations, but the level of service designation and intersection delay reported by the traffic simulation model do not account for rolling queues that may occur on the corridor, which is the case for the Southeast Issaquah Bypass. Primarily in the year 2030 PM peak hour, the model simulation in all the alternatives indicated that by the end of the hour, a rolling queue could be anticipated throughout the southbound direction of the Southeast Issaquah Bypass, continuing along southbound Issaquah/Hobart Road to May Valley Road.

A rolling queue can also be anticipated for much of Front Street South, heading southbound in the PM peak hour toward Issaquah/Hobart Road. The rolling queue is due primarily to the limited capacity on Issaquah/Hobart Road of one lane each direction. Either with or without the Southeast Issaquah Bypass, a rolling queue would be observed. Because of the limited capacity available on Issaquah/Hobart Road (a two-lane facility) heading northbound in the AM peak hour, the traffic is somewhat metered by the capacity constraints, and therefore the queuing is less extensive in the northbound direction.

Issaquah/Hobart Road

The Issaquah/Hobart Road is currently a two-lane facility (one lane each direction) from Southeast 96th Street to May Valley Road. Most of the Issaquah/Hobart Road section described falls within King County jurisdiction, and there are currently no plans for expanding this roadway facility. King County will determine if there is a need for future improvements to this road in accordance with regional policy. Anecdotal evidence suggests that the intersection of May Valley Road with Issaquah/Hobart Road is currently failing during both the AM and PM peak hours. Traffic analysis shows that that intersection is failing in both 2005 and 2030 during both peak hours in the no-action and build scenarios.

According to the traffic model, by the year 2010 Issaquah/Hobart Road is anticipated to experience traffic volumes that approach the maximum capacity of a single lane, with or without the Southeast Issaquah Bypass. **Table 2-13** lists anticipated volumes along Issaquah/Hobart Road in the PM peak hour.

Table 2-13
Year 2010 PM Peak Hour Southbound Volumes
for Issaquah/Hobart Road

	No-Action Scenario	Build Scenario*
South of 2nd Avenue SE	1,700 vph	1,685 vph
North of May Valley Road	1,430 vph	1,495 vph

vph = vehicles per hour.
* Volumes are the same for both South A and South C build scenario alignments.

By year 2030 it appears that extensive queues will occur along Issaquah/Hobart Road, primarily due to the limited capacity and options available to access the area served by this facility. Extensive rolling queues may be observed throughout this corridor, and the peak congestion period is anticipated to spread for a longer period of time.

Table 2-14 presents traffic volume forecasts for Issaquah/Hobart Road for the design year 2030. For this year, Issaquah/Hobart Road is anticipated to have volumes that exceed the capacity of one lane, with or without the Southeast Issaquah Bypass Road. The limited capacity of this corridor explains the extensive queue and the failure of the intersection of Issaquah/Hobart Road with May Valley Road in all the alignments analyzed.

Table 2-14
Year 2030 PM Peak Hour Southbound Volumes for Issaquah/Hobart Road

	No-Action Scenario	Build Scenario*
South of 2nd Avenue SE	2,335 vph	2,200 vph
North of May Valley Road	2,060 vph	2,125 vph

vph = vehicles per hour.
* Volumes are the same for both South A and South C build scenario alignments.

King County has reviewed year 2030 traffic analysis and determined that the projected volumes and traffic analysis presented for Issaquah/Hobart Road are reasonable. The year 2030 results indicated that traffic demand along Issaquah/Hobart Road may require additional roadway capacity to accommodate the projected volumes. King County policy regarding a roadway facility that is designated as rural (such as Issaquah/Hobart Road) states that capacity improvements can be warranted only when existing conditions prove to be deficient. Issaquah/Hobart Road is currently at the brink of failure but is not listed as deficient. Because potential future improvements to this road are uncertain, it was agreed that the Southeast Issaquah Bypass project should assume the existing roadway configuration for its future-year analysis.

Transit and High-Occupancy-Vehicle Operations

This section describes the city's planned transit improvements and discusses the operational feasibility of reducing the number of general-purpose lanes on the Southeast Issaquah Bypass from four to two lanes.

Planned Improvements

Since issuance of the supplemental draft EIS, the Issaquah Highlands park-and-ride was completed and opened in February 2006. The new facility provides 1,000 parking stalls on a 4-acre site within the Issaquah Highlands on Highlands Drive. The project was a cooperative effort by King County Metro and Sound Transit. It is served by Sound Transit Routes 554, 555 and 556 between Issaquah, Bellevue and Seattle, Metro Transit Route 218 which provides service from the park-and-ride to downtown Seattle via high-occupancy-vehicle (HOV) lanes on I-90, and Metro Route 269 that serves Bellevue. The proposed Southeast Issaquah Bypass would provide access to Issaquah Highlands for vehicles traveling from points of origin south of I-90.

A new transit center is also being constructed in Issaquah at the existing Issaquah park-and-ride location, located at the intersection of SR 900 and Newport Way Northwest. Sound Transit is currently building this facility and construction of the new 800-stall facility will be completed in early 2008. This facility serves many routes between Issaquah, the Sammamish Plateau, Bellevue, and Seattle.

Viability of Maintaining a Two-Lane Footprint with Additional Transit Service

This section considers whether a transit-based approach can limit the proposed roadway to two lanes, thereby serving as a reasonable alternative to the proposed construction of a four-lane roadway.

Given the forecasted demand in future years 2010 and 2030, the historical use of transit for a suburban community, the historical political climate, and planned transit service and transit-oriented development, it is unlikely that transit would serve enough north/south trips to reduce the Southeast Issaquah Bypass to two general-purpose lanes plus HOV lanes.

The recently completed Issaquah Highlands park-and-ride located in the Issaquah Highlands development (north of the Southeast Issaquah Bypass), would generate additional transit trips to and from the Issaquah Highlands development. As mentioned previously, other than planned route service to the Issaquah Highlands park-and-ride facility; regional transit plans do not explicitly identify new transit routes or additional service to the Sammamish Plateau within the study area. Even with the additional transit service planned for the Issaquah Highlands development, it is highly unlikely that the service would capture enough trips south of I-90 to reasonably convert two of the four lanes into HOV lanes along the Southeast Issaquah Bypass in the year 2010.

Additional information regarding the year 2030 Issaquah traffic model follows:

- By year 2030 (the design year for the Southeast Issaquah Bypass project), it is unlikely that transit use would alleviate enough traffic volume to allow the Southeast Issaquah Bypass to be a two-lane versus a four-lane facility, which is currently recommended. According to current traffic analysis, a four-lane facility would be needed by 2030, with or without aggressive transit assumptions.

- According to the model, an approximate 25 to 30 percent reduction in the number of projected trips along the proposed Southeast Issaquah Bypass would be needed in order for the Southeast Issaquah Bypass to operate as a two-lane facility. It would be very optimistic to assume that this level of trip reduction could be achieved in a densely populated urban setting, and even more so in a suburban community.

- The Puget Sound Regional Council (PSRC) EMME/2 Travel Demand Model trends indicate that transit generally captures an estimated amount of 3 percent or less of work trips leaving suburban locations. The transit mode share, as projected by the 2030 PSRC model, was estimated at 3 percent or less for the Issaquah area.

The Southeast Issaquah Bypass draft EIS (June 2000) noted that the metropolitan transportation plan for year 2020 estimates that the current trend for transit mode split for work trips within the region is about 8 percent. With HOV and transit-oriented development (as well as roadway improvements), the mode-split increases for transit are projected to be approximately 12 percent for the region. However, the regional average includes mode-split percentages for larger downtown locations including Seattle, Tacoma, Everett, and Bellevue. Smaller cities and rural locations will experience a lower transit mode split than the projected regional mode split. Given the PSRC's estimated transit service and ridership projections for both 2020 and 2030, accomplishing a 25 to 30 percent trip reduction in the Southeast Issaquah Bypass corridor would not be likely.

In 1998, Issaquah and King County hosted workshops to identify potential high-capacity transit (HCT) opportunities at the south end of the city. The potential location of a park-and-ride lot at the south end of the Southeast Issaquah Bypass project was discussed during these workshops. However, transit providers indicated the site would be difficult to efficiently serve based on workshop results. One conclusion reached at this meeting was that Metro Transit and Sound Transit would not provide service to a potential park-and-ride lot at the south end of the proposed Southeast Issaquah Bypass, for the following reasons:

- A park-and-ride at the south city limits would incur high support facility costs (e.g., potential need for transit-only lanes, bus pull-outs, etc.).
- Limited travel-time advantages (or none at all) would be expected to result from a park-and-ride facility at this location.

The Issaquah/Hobart Road survey (conducted by the Gilmore Research Group in 1999, at the city of Issaquah's request) also found that most vehicles using Issaquah/Hobart Road were heading for east King County and the Sammamish Plateau, not to large traffic-generating destinations in Seattle. None of the top ten destinations indicated in the survey were single-point destinations such as Seattle, which would be more transit-friendly in terms of the ability to attract riders. Ninety-two percent of the surveyed drivers said they do not currently use park-and-ride facilities. Moreover, 66 percent of the same drivers indicated they had no interest in a new park-and-ride facility in the south portion of the city.

During development of the draft EIS (June 2000) two no-construction options were studied: congestion pricing (charging tolls), and expanded transit service. These alternatives were evaluated considering the following factors: relationship to the purpose and need statement, ability to reduce congestion, impacts on the natural and social environment, and operational and technical issues. The investigation, which is documented in detail in the draft EIS (June 2000), concluded that congestion management, expanded transit service, or the two in combination would not substantially reduce the pass-through trips on Front Street South that cause much of Issaquah's traffic congestion.

Although the Southeast Issaquah Bypass project would not include HOV lanes under the current design, buses may still take advantage of the proposed roadway to improve travel times. As the eastern portion of the city develops, it is possible that the Southeast Issaquah Bypass and the proposed Park Pointe project may provide an opportunity for Issaquah and King County to revisit the issue of improving transit service in this area. Additionally, if the city pursues a phased construction approach in the future, city staff may wish to revisit the issue of implementing HOV lanes.

State Route 18 Improvements

Several comment letters on the June 2000 draft EIS pointed out that widening SR 18 between Issaquah/Hobart Road and I-90 (from two lanes to four lanes) might be more effective in reducing Front Street South congestion than constructing the Southeast Issaquah Bypass. In response, a study was conducted using King County's travel model to determine the approximate percentage change in 2020 traffic volumes on Front Street South from either building the Southeast Issaquah Bypass or widening SR 18 from two lanes to four lanes from Issaquah/Hobart Road to I-90 (see Appendix F of the June 2004 supplemental draft EIS).

This study reached the following conclusions. First, a greater reduction in traffic volumes on Front Street South could be expected with construction of the Southeast Issaquah Bypass than from widening SR 18. The model predicted that along Front Street South from just south of Newport Way to I-90, the SR 18 widening would produce traffic reductions between 7 and 10 percent, and the Southeast Issaquah Bypass would reduce traffic volumes from 18 percent to as much as 51 percent. Widening SR 18 would produce a slightly greater reduction in demand at Issaquah/Hobart Road (south of the city), and the proposed Southeast Issaquah Bypass, by relieving congestion on Front Street South and providing new capacity, would slightly increase the usage of Issaquah/Hobart Road at the same point. The same effects were predicted on Issaquah/Hobart Road south of 6th Avenue Southeast. Because widening SR 18 from Issaquah/Hobart Road to I-90 was not shown to be an effective way to reduce Front Street South congestion, it was eliminated from further consideration and is not included as a reasonable alternative in this final EIS.

Traffic Analysis Conclusions

- Traffic demand projections indicate that the Southeast Issaquah Bypass should be a four-lane arterial (two lanes in each direction) at the year of opening.
- The Southeast Issaquah Bypass would effectively operate as a bypass to Front Street South, reducing Front Street South congestion and neighborhood cut-through traffic along 2nd Avenue Southeast. (Volume reductions were observed on both Front Street South and 2nd Avenue Southeast when the Southeast Issaquah Bypass was modeled.)
- All three north alignments (North A, B, and C) and the South A and C alignments are acceptable in terms of traffic operations.
- Issaquah/Hobart Road is expected to become capacity-constrained by 2030.
- Greater reductions in volumes along Front Street South are expected with the Southeast Issaquah Bypass, in comparison to widening SR 18 to four lanes between Issaquah/Hobart Road and I-90.
- East Lake Sammamish Parkway, Issaquah/Fall City Road, and SR 900 are expected to operate poorly by 2030 with or without the Southeast Issaquah Bypass.

Estimated Construction Cost

Estimated costs (in 2007 dollars) for construction of the proposed project alternatives (including design and acquisition of right-of-way) are shown in **Table 2-15**. These estimates are based on preliminary design information and would likely change at the time of construction to reflect the actual design, annual escalation of construction and right-of-way costs, and other factors.

Table 2-15
Estimated Construction Costs

Alternative 1	$44.3 million
Alternative 2	$36.4 million
Alternative 3	$41.5 million
Alternative 4	$33.7 million
Alternative 5	$43.5 million
Alternative 6	$35.6 million

Clean Water Act Section 404 Requirements

As currently proposed, Modified Alternative 5 is intended to meet the requirements of Section 404 of the Clean Water Act. The guidelines set forth by Section 404 of the Clean Water Act specify that a permit authorizing filling of U.S. waters can be issued only if the discharge is determined to be the *least environmentally damaging practicable alternative* (LEDPA).

The supplemental draft EIS compared the alternatives being considered at that time and concluded that Alternative 6 would best meet the LEDPA definition. Since that time, the revisions made to Modified Alternative 5 support this alternative as the LEDPA, as supported by the Corps of Engineers approval by its concurrence on Concurrence Point 3. Therefore, Modified Alternative 5 is being advanced as the preferred alternative.

Additional avoidance and minimization opportunities will be pursued during project design to further reduce wetland impacts. Such measures may include (but are not limited to) minor changes to design alignment, use of steeper fill slopes, use of retaining walls to eliminate fill slopes, and determining how to achieve the optimal reduction of impacts on Wetlands GW and VL. These measures are expected to allow Modified Alternative 5 to meet the intent of the LEDPA definition.

Initial Wetland Mitigation Plan

The proposed project design includes several avoidance and minimization measures to reduce impacts on project area wetlands. A conceptual mitigation plan developed for the preferred alternative is included in Appendix F (Volume 2) of this final EIS. Under this plan, mitigation would be provided for wetland fill and for impacts on wetland buffer that would be affected by the proposed project. Compensatory wetland mitigation meeting Department of Ecology and city of Issaquah requirements would be provided for predicted temporary and permanent wetland impacts.

Mitigation would include creation of forested scrub/shrub wetland habitat onsite and within the same drainage basin as the disturbed wetland. Several locations within the project area (surrounding existing wetlands) have been identified for buffer enhancement. In each of these areas invasive plants would be cleared, native trees over 6 inches in diameter at breast height would be retained, new topsoil would be spread across the site, and native trees and shrubs would be planted. Wetland impacts and mitigation measures are described further in Chapter 3 and in the conceptual mitigation plan.

Biological Assessment

A biological assessment has been prepared for the proposed project to comply with requirements in Section 7 of the Endangered Species Act, which seeks to ensure protection of threatened and endangered species in the project area. The biological assessment identifies five threatened species occurring in the project area: marbled murrelet, spotted owl, Puget Sound bull trout, Puget Sound Chinook salmon, and Puget Sound steelhead. The bald eagle was federally listed at the beginning of the development of this assessment but has since been de-listed.

Puget Sound steelhead of the Puget Sound *distinct population segment* (DPS) has been added to the endangered list since the development of this biological assessment. A supplement to the biological assessment to address steelhead has been prepared.

Chinook salmon and steelhead are found within Issaquah Creek, East Fork Issaquah Creek, Lake Sammamish, and potentially in the north tributary in the southern project area. Issaquah Creek contains a strong run of hatchery coho salmon that may also be found in the north and south tributaries.

The proposed project would include a variety of mitigation measures intended to prevent adverse impacts on streams and water quality. The proposed design includes several measures to minimize impacts on vegetation and habitat areas. Impacts on streams, vegetation, and wildlife are described further in Chapter 3, and a biological assessment has been completed and issued as a separate document upon issuance of the final EIS. Agency concurrence has been received.

The Preferred Alternative

Modified Alternative 5 is the course of action that FHWA, WSDOT, and the city of Issaquah have determined to be the most desirable in terms of balancing social and economic impacts, impacts on the natural environment, transportation system performance, and cost. Modified Alternative 5 includes the North C and South A alignments. Factors that formed the basis for selecting Modified Alternative 5 as the preferred alternative are briefly summarized below.

The project's purpose and need statement (Chapter 1) describes the problems the proposed project is intended to correct. The selected alternative must therefore meet the purpose and need for it to be considered a viable project. In evaluating the six build alternatives, the following is concluded:

> *Alternative 6, the preliminary preferred alternative identified in the supplemental draft EIS, as well as Alternatives 2 and 4 that also*

incorporate the South C alignment, are rejected because these alternatives would not function as a true bypass for the city of Issaquah. Under the South C alignment the level of service (LOS) at 2nd Avenue and Front Street in the morning would be at LOS B with Alternatives 1, 3, and 5, whereas Alternatives 2, 4, and 6 (using the South C alignment) would result in LOS D in the morning. All build alternatives would result in LOS F in the evening at this location by 2030, as would the no-action alternative. Because of this intersection's proximity to local schools, this would create an unacceptable intersection with Front Street South and 2nd Avenue Southeast. It would also open the possibility for additional traffic to continue north on 2nd Avenue Southeast. This additional traffic would mix with existing traffic on 2nd Avenue Southeast and could affect travel to the three schools on 2nd Avenue Southeast, the school district bus barn, and Olde Town. The South C alignment would not solve existing problems with access to the larger Sycamore neighborhood off of Front Street South (a short distance south of 2nd Avenue Southeast), which would be affected by the South C alignment.

Chapter 3 covers the assessment of impacts on the natural and human environment, and the mitigation measures required to alleviate the adverse impacts. The selected alternative must be developed and refined to minimize project impacts, and provide compensatory mitigation for unavoidable impacts in accordance with regulatory requirements as reviewed and agreed upon by regulatory agencies. In evaluating the six build alternatives, the following is concluded:

Throughout the course of the EIS process, project alternatives were continually refined with the goal of reducing wetland impacts. This resulted in the rejection of one of the original alignments (South B), identification of a new potential alignment that could avoid most wetland impacts (South C), and refinement of what would become the preferred alignment to minimize impacts even further (South A). Under Modified Alternative 5, up to 0.59 acres of wetland fill, 0.32 acres of wetland shading impacts, and 0.36 acres of wetland buffer impacts would occur. While Modified Alternative 5 has more impact on wetlands than the South C alignment in Alternatives 2, 4, and 6, the South C alignment was found to be operationally unacceptable. Effective mitigation for Modified Alternative 5 can be provided using stringent Department of Ecology and city of Issaquah requirements as detailed in the conceptual mitigation plan and confirmed by resource agencies. Impacts on other environmental resources would be similar under all build alternatives, and mitigation would be provided as reviewed and agreed upon by the resource agencies during the 404 Merger Agreement process and in the biological assessment.

In conclusion, rejection of Alternatives 1, 2, 3, 4, and 6, along with the concurrence from resource agencies that Modified Alternative 5 would effectively mitigate impacts on natural resources in the proposed project area, resulted in selection of Modified Alternative 5 as the preferred alternative.

Preliminary Construction Schedule

Table 2-16 shows one possible sequence of construction activities for the Southeast Issaquah Bypass project. The actual sequence of activities would be determined by individual contractors and approved by the city of Issaquah.

Phased Construction

If the city of Issaquah decides to build the Southeast Issaquah Bypass, it may choose to do so in two separate construction phases. The first phase might include right-of-way acquisition, clearing and grading, retaining wall construction, and stormwater management facilities to accommodate a future four-lane roadway configuration, but would include only one new travel lane in each direction (except at intersections where additional turning lanes would be required). During a second future construction phase, one additional travel lane in each direction would be added within the existing right-of-way to accommodate the expected increase in traffic. Figures 2-5 and 2-6 show typical roadway cross-sections for a project constructed in this manner.

Twenty-Year Design Horizon

Typically, WSDOT and FHWA award federal construction grants only to projects designed to accommodate traffic volumes projected over a 20-year period. For this reason, this final EIS analyzes build alternatives that include four-lane roadway configurations. The traffic analysis prepared for this project estimates that a four-lane facility will be needed within 5 years of its anticipated 2010 opening date. The decision to build a two-lane facility versus a four-lane facility will depend on the availability of local, state, and federal construction funds and the degree of local community support for the project.

Table 2-16
Construction Activity Schedule

	YEAR1				YEAR 2			
CONSTRUCTION ACTIVITY	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Stormwater Management Facilities								
Excavation								
Retaining Walls								
Surfacing, Paving								
Signing, Stiping, Signals								

NOTE:
Because the proposed project requires many activities, the actual construction sequence has not been worked out in complete detail. The contractor will propose a construction sequence after contract award to efficiently accomplish work. The potential construction schedule is a general guide to understanding the steps necessary to complete the proposed facility. It is not to be construed as the final sequencing plan.

Chapter 3

Environmental Consequences

Chapter 3 Environmental Consequences

This chapter identifies impacts and mitigation measures for the proposed project. It identifies the direct impacts, future operational impacts, secondary and cumulative impacts, and construction activity impacts associated with the build alternatives (Alternatives 1 to 6) and the no-action alternative (Alternative 7), as identified in the June 2004 supplemental draft EIS. As discussed in Chapter 2, after the supplemental draft EIS was prepared, Alternative 5 was revised and renamed Modified Alternative 5. Information from studies on this new alternative is added to this chapter as appropriate.

If the Modified Alternative 5 is not specifically identified in the discussions of each element of the environment below, it should be assumed that, because the modifications to Alternative 5 affect only certain project features (relating to wetland avoidance), the discussion of the original Alternative 5 applies to Modified Alternative 5.

In some instances the new studies on Modified Alternative 5 went into further detail than that discussed in the supplemental draft EIS. Those additional studies were conducted to refine the analysis of the preferred alternative (Modified Alternative 5), in response to comments on the supplemental draft EIS and from discussions with agencies involved in the Interagency 404 Merger Agreement process. Because no changes were made to the original six build alternatives, there was no need to include a reevaluation of the original six alternatives in the new studies. Also, there was no indication in the questions being asked of Modified Alternative 5 that additional analysis would be needed on the original six alternatives in order to support a proper and accurate comparison of the proposed build alternatives.

Each alternative is analyzed in terms of the following types of impacts:

Direct impacts are caused by the action and occur at the same time and place (40 CFR 1508.8).

Secondary impacts (indirect effects) are caused by an action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR 1508.8).

Cumulative impacts result from the incremental consequences of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Construction impacts are limited to construction process impacts that are temporary in nature and typically limited to the immediate project area (e.g., construction noise, dust, traffic controls, etc.).

Many of these impacts are discussed in earlier technical reports and memorandums prepared for the individual environmental elements identified in this chapter, and evaluated in the June 2000 draft EIS and the June 2004 supplemental draft EIS. A list of the technical studies prepared for this project is provided in Appendix B of this final EIS.

Elements of the Environment Not Addressed in the Final EIS

The following elements of the environment, commonly addressed during NEPA/SEPA environmental review, are not addressed within this final EIS because they were determined to have no measurable impacts or to be nonexistent within the project area:

- Farmland
- Wild and scenic rivers
- Coastal barriers
- Coastal zone impacts.

Air Quality

Studies and Coordination

Carbon monoxide (CO) concentrations were calculated for existing conditions (2000) and predicted conditions, for the year of opening (2010), and the project design year (2030) using the Mobile 6.2 and CAL3QHC Version 2 models. Ozone concentrations that could result from this project were not modeled, because ozone is a secondary pollutant generated through a series of complex reactions between pollutants emitted from motor vehicles and other sources. Total ozone precursor emissions for the study area were modeled to compare the alternatives. Particulate emissions are primarily construction-related, and are described in the Construction Activity Impacts section of this chapter. A qualitative analysis of mobile source air toxics (MSATs) has been provided, in accordance with FHWA interim guidance, on MSATs issued in February 2006.

The air quality modeling evaluates operations of all build alternatives, along with existing roadways in the project area. The four intersections modeled for air quality were selected based on traffic volume, level of service, and the impact of the proposed project on traffic flow (**Figure 3-1**). The specific modeling method used is described in the Southeast Issaquah Bypass air quality technical report, which is incorporated herein by reference (see the 2004 supplemental draft EIS, Appendix H).

Affected Environment

Air quality in the project area is regulated by the U.S. Environmental Protection Agency, the Washington Department of Ecology, and the Puget Sound Clean Air Agency (PSCAA). Under the Clean Air Act, U.S. EPA has established the National Ambient Air Quality Standards (NAAQS), which specify maximum concentrations for carbon monoxide, particulate matter less than 10 micrometers in size (PM_{10}), ozone, sulfur dioxide, lead, and nitrogen dioxide. Transportation sources generate carbon monoxide, particulate matter, nitrogen dioxide, and ozone precursors. The NAAQS 8-hour carbon monoxide standard of 9 parts per million (ppm) is the standard most likely to be exceeded as the result of transportation projects and is used as an indicator of overall air quality. Nonconformance with NAAQS may threaten funding of transportation projects in the area.

Air quality maintenance areas are regions that have recently attained compliance with the NAAQS. The Southeast Issaquah Bypass project area lies within ozone and carbon monoxide maintenance areas. Air quality emissions in the Puget Sound region are currently being managed under the provisions of air quality maintenance plans (AQMPs) for ozone and carbon monoxide. PSCAA and Ecology developed the current plans, and U.S. EPA approved the plans in 1996. Any regionally important transportation project in the Puget Sound air quality maintenance areas must conform to the air quality maintenance plans. Conformity is demonstrated by showing that the project would not cause or contribute to any new violation, would not increase the frequency or severity of any existing violation, and would not delay timely attainment of the NAAQS.

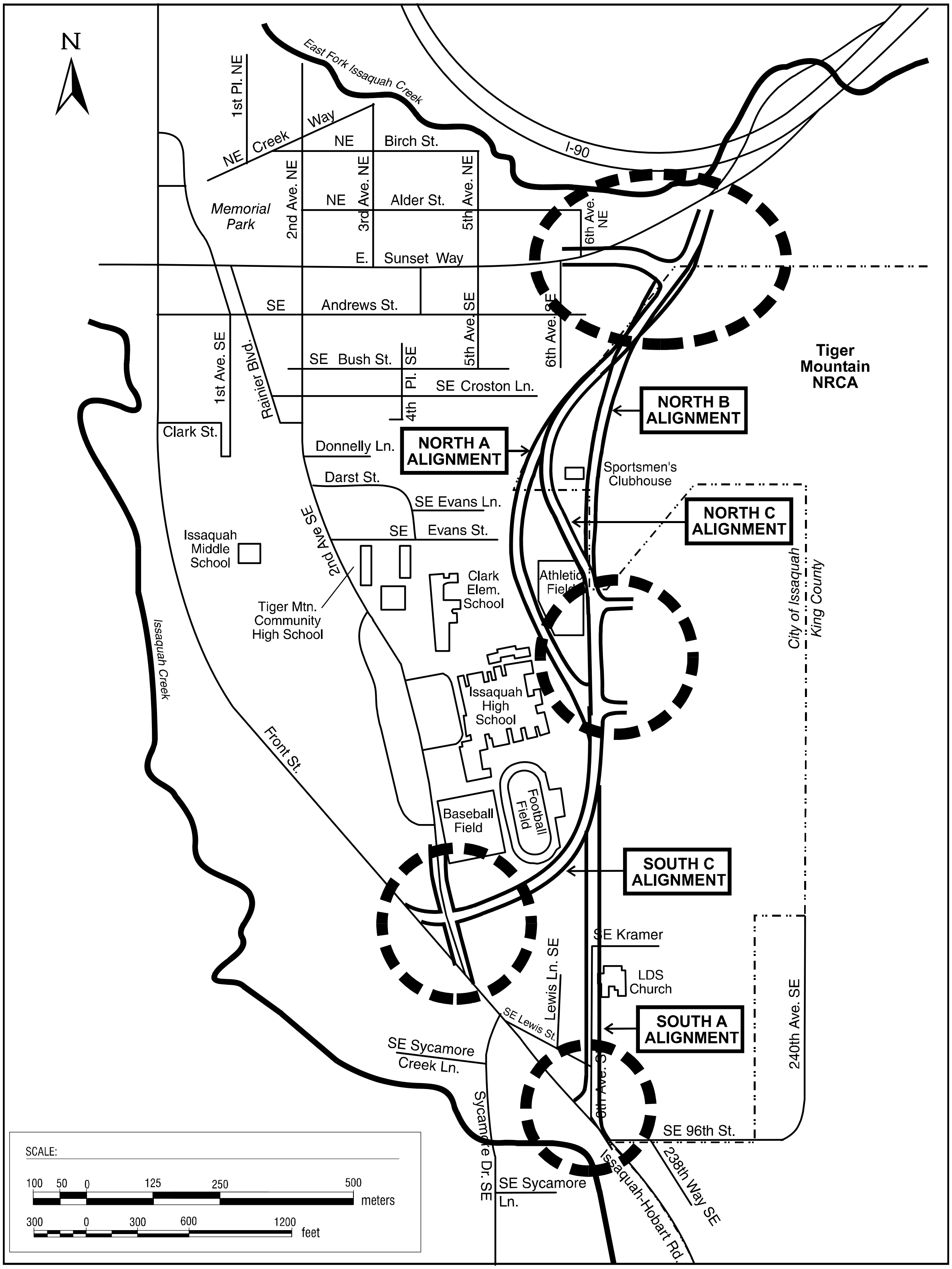

Figure 3-1
Intersections Modeled for Air Quality Impacts

The evaluation of existing air quality is based on ambient air quality data collected and published by Ecology and PSCAA. The closest air quality monitoring stations to the study area are located between 5 and 20 kilometers (km) (between 3 and 12 miles) away.

No exceedances of the NAAQS for carbon monoxide or ozone were observed at these locations from 1997 through 2002. The closest PM_{10} monitoring station to the project area is located approximately 20 km (15 miles) west. Both 24-maximum and annual levels at this monitoring station were well below the primary standards from 1997 to 1999. This monitor was not operating in 2000, 2001, or 2002.

Carbon Monoxide

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

Carbon monoxide concentrations for year 2000 existing conditions were modeled using the same methods and locations as the 2010 and 2030 predictions (**Tables 3-1 and 3-2**). Because of consistent methods and assumptions, modeled carbon monoxide concentrations for 2000 can be compared with those predicted for future alternatives to show the air quality trend expected in the project area.

Table 3-1
Maximum 1-Hour Average Carbon Monoxide Concentrations (ppm) for Southeast Issaquah Bypass Project Area

	Intersection			
Scenario	**Sunset Interchange**	**Front Street South and 2nd Avenue SE**	**Southeast Issaquah Bypass and Park Pointe Access Road**	**Southeast Issaquah Bypass and Issaquah/ Hobart Road**
2000 Existing Conditions	NA	6.4	NA	NA
2010 Alternatives 1, 3, 5	7.1	5.3	8.6	7.1
2010 Alternatives 2, 4, 6	7.1	7.6	8.6	NA
2010 No-Action (Alt. 7)	7.1	6.8	NA	NA
2030 Alternatives 1,3, 5	6.4	3.9	5.1	7.1
2030 Alternatives 2, 4, 6	6.4	5.9	5.1	NA
2030 No-Action (Alt 7)	5.4	5.6	NA	NA

Alternative 5 refers to Modified Alternative 5.
Concentration values are in parts per million (ppm).
The 1-hour average NAAQS for carbon monoxide is 35 ppm.
N/A = Not applicable; intersection or roadway would not exist under the alternative.

Table 3-2
Maximum 8-Hour Average Carbon Monoxide Concentrations (ppm) for Southeast Issaquah Bypass Project Area

Scenario	Intersection			
	Sunset Interchange	Front Street South and 2nd Avenue SE	Southeast Issaquah Bypass and Park Pointe Access Road	Southeast Issaquah Bypass and Issaquah/ Hobart Road
2000 Existing Conditions	NA	4.5	NA	NA
2010 Alternatives 1, 3, 5	5.0	3.7	6.0	5.0
2010 Alternatives 2, 4, 6	5.0	5.3	6.0	NA
2010 No-Action (Alt. 7)	5.0	4.8	NA	NA
2030 Alternatives 1,3, 5	4.5	2.7	3.6	5.0
2030 Alternatives 2, 4, 6	4.5	4.1	3.6	NA
2030 No-Action (Alt 7)	3.8	3.9	NA	NA

Alternative 5 refers to Modified Alternative 5.
Concentration values are in parts per million (ppm).
The 8-hour average NAAQS for carbon monoxide is 9 ppm.
N/A = Not applicable; intersection or roadway would not exist under the alternative.

Existing (year 2000) carbon monoxide concentrations were not modeled to exceed the 1-hour average NAAQS of 35 ppm (Table 3-1) at any location. The 8-hour average carbon monoxide concentrations for 2000 did not exceed the NAAQS of 9 ppm (Table 3-2). Modeled maximum 8-hour carbon monoxide concentrations for 2000 existing conditions range between 2.7 and 6.0 ppm.

Ozone

Ozone is a highly toxic form of oxygen and a major component of the complex chemical mixture that forms photochemical smog. Ozone is not emitted directly, but formed by a reaction between sunlight and nitrogen oxides. Ozone is primarily a product of regional vehicular traffic and point source and fugitive emissions of the 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.

Particulate Matter

Particulate matter includes small particles of dust, soot, and organic matter suspended in the atmosphere. Particles less than 10 micrometers in size are measured as PM_{10}. Sources of particulates include motor vehicles, industrial boilers, wood stoves, open burning, and dust from roads, quarries, and construction activities. High PM_{10} concentrations occur in fall and winter during periods of air stagnation and high use of wood for heat.

Impacts and Mitigation

Long-term effects on air quality in the project area would primarily result from vehicle emissions. At some locations, air quality would improve in comparison to existing conditions due to future decreases in emissions per vehicle. This would offset increases in emissions from growth in background traffic and slower vehicular speeds.

All Build Alternatives

Impacts

Predicted worst-case carbon monoxide concentrations under all build alternatives in 2010 and 2030 would be similar to existing conditions and no-action alternative concentrations at congested locations. No exceedances of the 1-hour or 8-hour average NAAQS for carbon monoxide were predicted under either of the alternatives (see Tables 3-1 and 3-2). Predicted maximum 8-hour carbon monoxide concentrations from vehicle emissions under Modified Alternative 5 ranged from 3.7 to 6.0 ppm for the year 2010 and from 2.7 to 5.0 ppm for the year 2030.

Under the build alternatives, emissions of particulate matter (PM) and hazardous air pollutants (HAPs), also called air toxics, would shift from Front Street South and 2nd Avenue Southeast to the proposed Southeast Issaquah Bypass. The project area is in attainment for PM_{10}, so current emissions in the area are not expected to cause exceedances of the NAAQS for PM_{10}. The U.S. EPA has not developed methods for the quantitative analysis of particulate matter and hazardous air pollutants from transportation projects. As discussed in the methodology chapter of the air quality technical report (Appendix H of the 2004 supplemental draft EIS), the emissions of particulate matter and all transportation-related hazardous air pollutants are much lower than the emissions of carbon monoxide evaluated in this study, and would vary in a similar fashion to the pollutants presented here. No significant adverse air quality impacts related to particulate matter or hazardous air pollutants emissions are expected to result from the Southeast Issaquah Bypass project.

Mitigation

No substantial adverse impacts would be created or worsened by any of the alternatives. Therefore, mitigation would not be required for the project.

Alternative 7—No Action

Impacts

Predicted worst-case carbon monoxide concentrations under the no-action alternative would be similar to existing conditions in 2010 and 2030. No exceedances of the 1-hour average NAAQS for carbon monoxide were predicted under either of the alternatives (see Table 3-1). Predicted maximum 8-hour carbon monoxide concentrations from vehicle emissions under the no-action alternative ranged from 4.8 to 5.0 ppm for the year 2010 and from 3.8 to 3.9 ppm for the year 2030 (see Table 3-2).

Mitigation

Mitigation measures for impacts resulting from the proposed project would not be required for the no-action alternative, because the project would not be constructed.

Conformity Finding

FHWA and WSDOT projects must comply with the project-level conformity criteria of the U.S. EPA conformity rule, and with Washington Administrative Code (WAC) Chapter 173-420. Regionally important projects must be included in a conforming metropolitan transportation plan (MTP) and transportation improvement plan (TIP) by the regional metropolitan planning organization (MPO).

The Southeast Issaquah Bypass project is included in the latest version of the Puget Sound Regional Council's metropolitan transportation plan and transportation improvement plan as project ISS-9. The project meets the criteria of 40 Code of Federal Regulations (CFR) Part 93 and WAC 173-420 for projects from a conforming plan and TIP. The project meets all of the hot-spot criteria of 40 CFR Part 93 and WAC 173-420-065. It also meets the conformity criteria of 40 CFR Part 93 and WAC 173-420.

The project's conformity with the individual criteria is discussed in the Southeast Issaquah Bypass air quality technical report (see Appendix H of the supplemental draft EIS).

Noise

Studies and Coordination

Information provided in this section was obtained from document review, site inspections and fieldwork conducted in the proposed project area. In determining the proposed project's potential noise impacts, the following noise regulations and impact criteria were adhered to: FHWA noise abatement criteria, Department of Ecology noise limits (WAC 173-60), and city of Issaquah construction noise limits (Issaquah Municipal Code, Chapter 16.35).

Characteristics of Noise

Sound is created when objects vibrate, resulting in a minute variation in surrounding atmospheric pressure called sound pressure. Loudness, compared to physical sound measurement, refers to how people subjectively judge a sound and varies from person to person. The range of magnitude from the faintest to the loudest sound the ear can hear is so large that sound pressure is expressed on a logarithmic scale in decibel units (dB). Magnitudes of typical noise levels are presented in **Table 3-3**.

Table 3-3
Sound Pressure Levels of Representative Environments and Noises

Source	dB	Description
Large rocket engine (nearby)	180	
Jet takeoff (nearby)	150	
Pneumatic riveter	130	
Jet takeoff at 60 meters (200 feet)	120	Pain threshold
Construction noise 3 meters (10 feet)	110	
Subway train	100	
Heavy truck at 15 meters (50 feet)	90	Constant exposure endangers hearing
Average factory	80	
Busy traffic	70	
Normal conversation at 1 meter (40 inches)	60	
Quiet office	50	Quiet
Library	40	
Soft whisper at 5 meters (16 feet)	30	Very quiet
Rustling leaves	20	
Normal breathing	10	Barely audible
Hearing threshold	0	

Source: Tipler, 1976.
dB = decibels.

Humans respond to frequency or pitch of sound. As measured by an electronic sound level meter, frequency weighting combines the sound frequencies into one sound level. The frequency weighting used for environmental noise is A-weighting (dBA), which simulates how an average person hears sounds.

Because of the logarithmic decibel scale, a doubling of the number of noise sources (i.e., traffic volume) increases noise levels by 3 dBA. A noise source emitting a noise level of 60 dBA combined with another noise source of 60 dBA yields a combined noise level of 63 dBA, not 120 dBA. A ten-fold increase in the number of noise sources adds 10 dBA.

Noise levels from traffic depend on volume, speed, and number of trucks. Vehicular noise is a combination of noises from the engine, exhaust, and tires. Other conditions affecting traffic noise include defective mufflers, steep grades, terrain, vegetation, distance from the roadway, and shielding by barriers and buildings.

Noise levels decrease with distance from the noise source. The propagation of noise can be greatly affected by terrain and the elevation of the receptor relative to the noise source. Level ground is the simplest scenario. Noise travels in a straight line-of-sight path between the source and receptor. If the noise source is depressed or the receptor is elevated, noise generally travels directly to the receptor. Noise levels may be reduced because the terrain crests between the source and receptor, resulting in a partial noise barrier near the receptor. If the noise source is elevated or the receptor is depressed, noise often is reduced at the receptor. The edge of the roadway can act as a partial noise barrier, blocking some sound transmission between the source and receptor.

Noise Level Descriptor

The equivalent sound level (L_{eq}) is a sound energy-averaged noise level. For example, two sounds, one of which contains twice as much energy but lasts only half as long, have the same L_{eq} noise levels. L_{eq} measured over a 1-hour period is the hourly L_{eq} [L_{eq}(h)], which is used for highway noise impact and abatement analyses.

Noise Regulations and Impact Criteria

For federally funded highway projects, traffic noise impacts occur when predicted L_{eq}(h) noise levels approach or exceed noise abatement criteria as established by the FHWA, or substantially exceed existing noise levels (U.S. Department of Transportation, 1982). Although "substantially exceed" is not defined, WSDOT considers an increase of 10 dBA or more to be an impact and an increase of 15 dBA or more to be a severe impact. The FHWA noise abatement criteria are noise guidelines that specify exterior L_{eq}(h) noise levels for various land activity categories. For receptors where serenity and quiet are of extraordinary significance, the noise criterion is 57 dBA. For residences, parks, schools, churches, and similar areas, the noise criterion is 67 dBA. For other developed lands, the noise criterion is 72 dBA.

The Washington Department of Ecology (Ecology) limits noise levels at property lines of neighboring properties (WAC 173-60). The maximum permissible noise levels depend on the land uses of both the source noise and receiving property. Ecology residential property line allowable noise ranges from 52 to 60 dBA, depending on the source of the noise. These allowable levels are reduced by 10 dBA between 10 p.m. and 7 a.m. on weekdays and 10 p.m. to 9 a.m. on Saturdays and Sundays. Sounds from motor vehicles on public roads are exempt from Ecology property line regulations. Ecology noise limits apply to construction equipment at rural and residential receiving properties between

10 p.m. and 7 a.m. on weekdays and 10 p.m. to 9 a.m. on Saturdays and Sundays. The city of Issaquah limits construction noise to between 7 a.m. and 6 p.m. on weekdays (Issaquah Municipal Code, Chap. 16.35). To meet city requirements, a permit would be required from the city to carry out construction at other times. Detailed information on noise regulation is included in the Southeast Issaquah Bypass noise technical report, which is incorporated herein by reference (see the 2004 supplemental draft EIS, Appendix G).

Traffic Noise Model

Ambient sound levels were measured at several locations near the project area to characterize weekday noise levels and calibrate the traffic noise model. Measured noise locations represented all sensitive use in the study area and were consistent with the FHWA *Manual for Highway Noise and Land Use*. Additional sound level measurements were taken at Issaquah High School to evaluate building acoustics and better describe the daily sound environment at the school.

Existing and future noise levels for each alternative were modeled at each of the monitoring locations to describe the alternative's effects on the audible environment. Typical receptor distances range from 7.6 to 61 meters (25 to 200 feet) from modeled roadways.

FHWA's traffic noise model (TNM) Version 2.0 (FHWA, 2002) was used to predict L_{eq}(h) traffic noise levels. This computer modeling program is the state-of-the-art industry standard for estimating traffic noise levels at discrete points by considering interactions between different noise sources and the effects of topographical features on the noise level. Noise emissions from free-flowing traffic depend on the number of vehicles, vehicular speed, and reference noise emission levels of an individual vehicle. Noise monitoring results were used to calibrate the existing conditions noise model. The modeled existing traffic noise levels at Issaquah High School and the athletic field do not include noise created by daily activities. Therefore, measured noise levels were used to describe the existing audible environment in these locations.

Affected Environment

Figure 3-2 shows modeled noise receptor locations. Noise-sensitive receptors in the project area include residential locations (Receptors A, B, C, D, I, J, K, L, M, N, O, P, and Q) and recreational locations (Receptors G and K). Schools (Receptors E, F, and H) and a church (Receptor L) are in the project area.

The area immediately south of I-90 and west of the Sunset interchange is mostly residential. Most of the structures are one-story single-family dwellings. The terrain is level; streets are paved; and local traffic is slight and noncommercial with the exception of East Sunset Way, which provides primary access to and from downtown Issaquah from the east. The area south of East Sunset Way and east of Front Street South interchange is primarily residential, with some commercial uses. The area south of I-90 and east of the Sunset interchange, extending the full north-south length of the project area is the West Tiger Mountain/Tradition Plateau natural resource conservation area (Tiger Mountain NRCA). It is undeveloped and set aside for low-impact recreational activity, primarily hiking and camping. Primary uses elsewhere in the project area are

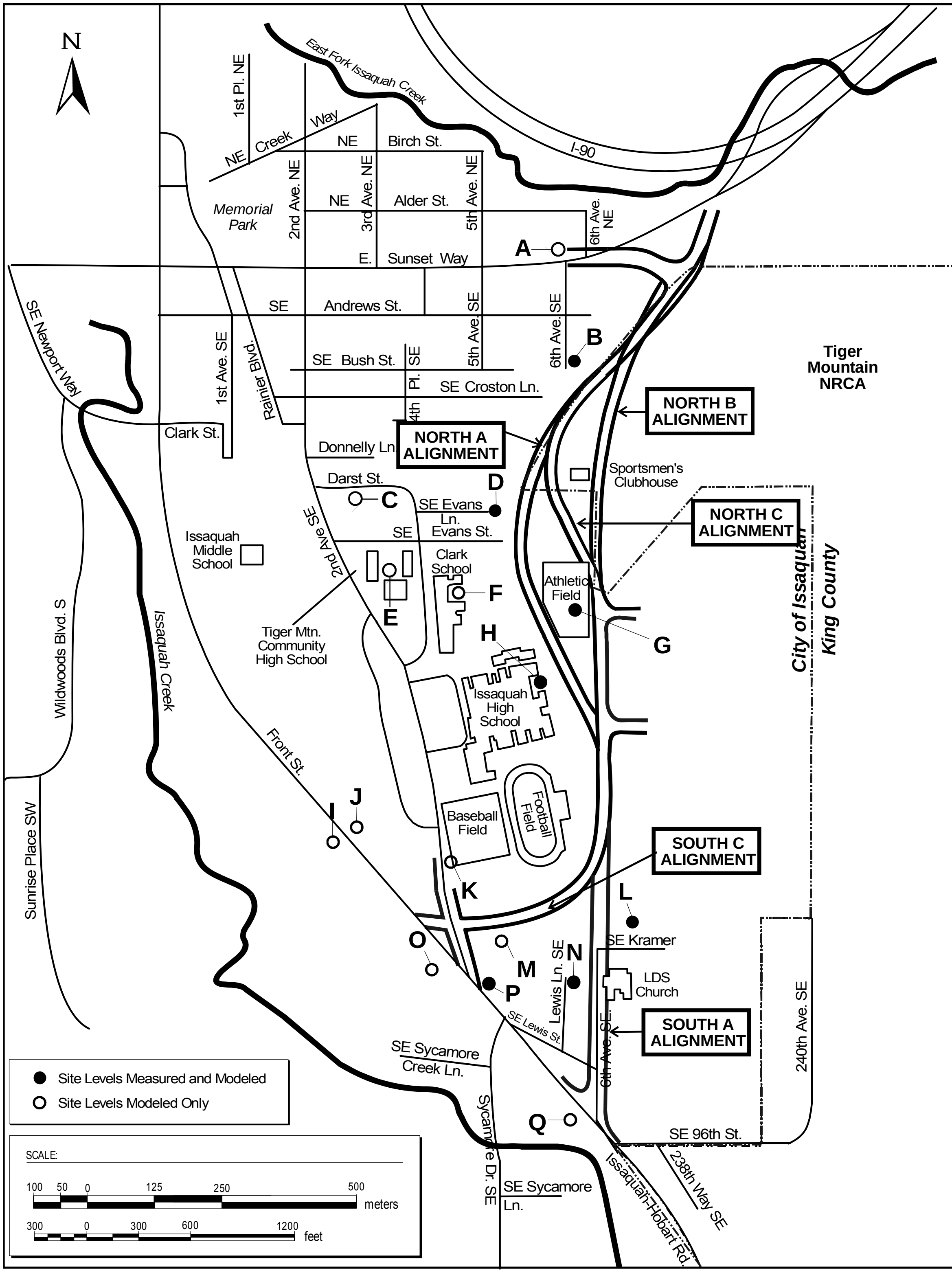

Figure 3-2
Noise Sites Measured and Modeled

residential, school, and church property, and the Issaquah Sportsmen's Clubhouse, a shooting range.

The receptor locations were selected to represent the range of affected properties. A detailed description of the receptors is available in the Southeast Issaquah Bypass noise technical report (see the 2004 supplemental draft EIS, Appendix G).

Table 3-4 presents existing sound measurements and modeled exterior traffic hourly equivalent sound levels (L_{eq}(h)). Existing noise levels are typical of small town and suburban areas (U.S. EPA, 1974). Traffic noise levels over the course of the day are highest when both traffic volumes and speeds are high. This generally occurs around the peak periods; however, congestion during the peak hour may lower traffic speeds resulting in lower noise levels. Free flow traffic conditions were modeled to predict worst-case noise levels. **Figure 3-3** shows the daily pattern of sound levels measured at Issaquah High School during a 24-hour period.

Table 3-4
Measured and Modeled Existing Noise Levels

	Location	Measured L_{eq} (dBA)	Date	Time	Modeled Peak-Hour L_{eq} (dBA)
A	East Sunset Way	NA			**63**
B	6th Avenue SE and Bush Street SE	50	October 8, 2002	11:00 AM	**53**
C	Darst Street	49	April 22, 1998	5:00 PM	**50**
D	550 SE Evans Lane	47	October 8, 2002	10:30 AM	**49**
E	Tiger Mountain High School	NA			**52**
F	Clark School	NA			**47**
G	Athletic field	**49**	October 8, 2002	10:00 AM	46
H	Issaquah High School	**50**	October 8, 2002	9:30 AM	47
I	Front Street South (northwest of 2nd Avenue SE)	NA			**60**
J	Front Street South (northeast of 2nd Avenue SE)	NA			**62**
K	2nd Avenue SE (north of Front Street South)	NA			**58**
L	SE Kramer Place	**50**	October 8, 2002	1:45 PM	46
M	South of South C alignment	NA			**55**
N	Lewis Lane SE	50	October 8, 2002	1:15 PM	**49**
O	Front Street South (southwest of 2nd Avenue SE)	NA			**63**
P	Front Street South and 2nd Avenue SE*	68	October 8, 2002	12:45 PM	**62**
Q	Issaquah/Hobart Road	NA			**59**

In areas dominated by traffic noise, the modeled peak-hour traffic noise L_{eq} (in **boldface** type) were used for existing sound levels. In areas dominated by other noise sources, the measured Leq (in **boldface** type) were used.
*Measurement site was at edge of roadway and used for calibration only. Modeled result is at nearest residence.

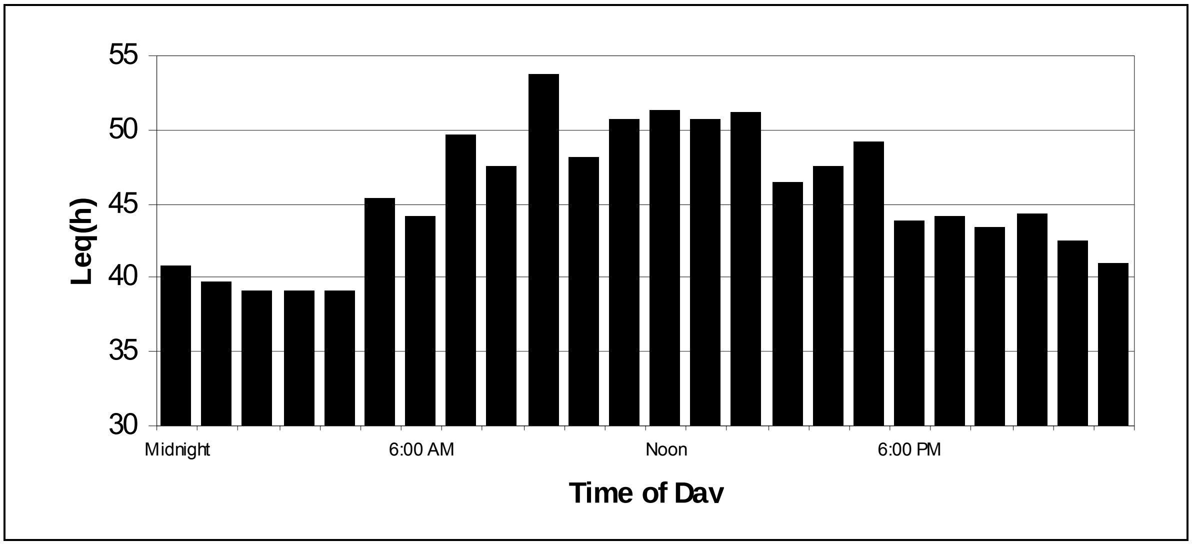

Figure 3-3
Issaquah High School Daily Noise Pattern

Impacts and Mitigation

Alternative 1

Impacts

Under Alternative 1, noise level changes in the project area would range from a 3 dBA decrease to an increase of 17 dBA above existing conditions (**Table 3-5**).

For seven residences in the Evans Road area (Receptor D), noise levels were predicted to increase from the existing 49 dBA to 65 dBA, a change of 16 dBA. For the Issaquah High School athletic field (Receptor G), noise levels could increase by 16 dBA. For Issaquah High School (Receptor H), noise levels could increase by 15 dBA. These would be noise increase impacts under WSDOT noise criteria because noise levels would increase by 10 dBa or more compared to existing conditions.

Two residences along Southeast Kramer Place and the Latter Day Saints (LDS) Church (Receptor L) could incur increases in noise levels of 14 dBA. For two residences on Lewis Lane Southeast (Receptor N), noise levels could increase by 17 dBA. These increases would be caused primarily by traffic noise from the Southeast Issaquah Bypass South A option. These would be noise increase impacts under WSDOT noise criteria because noise levels would increase by 10 dBa or more. Noise levels at Receptors I, J, K, O, and P were predicted to decrease between 1 and 3 dBA due to the projected diversion of traffic volumes from Front Street South and 2nd Avenue Southeast to the Southeast Issaquah Bypass.

A total of 11 residences, Issaquah High School and its associated athletic field, and the LDS Church would experience noise impacts without mitigation under Alternative 1 (**Table 3-6**).

Table 3-5
Modeled Noise Levels

Receptor	2000 Existing Conditions	2030 Alt. 1	2030 Alt. 2	2030 Alt. 3	2030 Alt. 4	2030 Mod Alt. 5	2030 Alt. 6	2030 Alt. 7 (No Action)
A	63	65	65	65	65	65	65	68
B	53	54	54	57	57	54	54	53
C	50	54	53	52	51	53	53	55
D	49	<u>65</u>	<u>65</u>	53	53	58	58	51
E	52	54	53	52	51	53	52	57
F	47	56	56	50	50	53	54	51
G	49*	<u>65</u>	<u>65</u>	56	56	<u>64</u>	<u>64</u>	49
H	50	<u>64</u>	<u>64</u>	55	53	57	57	51
I	60	57	60	58	60	58	60	61
J	62	61	62	61	62	61	62	63
K	58	55	59	55	59	55	59	61
L	50*	<u>64</u>	55	<u>64</u>	55	<u>64</u>	55	49
M	55	56	**<u>68</u>**	56	**<u>68</u>**	56	**<u>68</u>**	59
N	49	**<u>66</u>**	55	**<u>66</u>**	55	**<u>66</u>**	55	51
O	63	61	65	62	65	62	65	**66**
P	62	60	**66**	61	**66**	61	**66**	65
Q	59	60	63	60	63	60	63	62

<u>Underline</u> = Noise increase impact.
Boldface type = Approaches or exceeds FHWA noise abatement criteria.
*In areas dominated by traffic noise, the modeled peak-hour L_{eq} were used for existing sound levels. In areas dominated by other noise sources, the measured L_{eq} were used.

Table 3-6
Summary of Noise Impacts

Alternative	Impacts (without Mitigation)		Impacts (with Mitigation)	
	Residences	Other	Residences	Other
Alternative 1	11	3	4	2
Alternative 2	14	2	7	1
Alternative 3	4	1	4	1
Alternative 4	7	0	7	0
Modified Alternative 5	4	2	4	2
Alternative 6	7	1	7	1
Alt. 7 No Action	15	0	15	0

Other includes outdoor recreation areas, motels, hotels, schools, churches, libraries, and hospitals.

Traffic noise levels within Issaquah High School, assuming open classroom doors, would be approximately 48 dBA inside the first row of classrooms and would decrease at classrooms further from the bypass. This level is greater than the allowed classroom noise level for new construction and could affect student speech intelligibility if the classroom door is open.

Mitigation

Noise can be controlled at three locations: 1) at the source, such as with mufflers and quieter engines; 2) along the noise path, with barriers; and 3) at the receptor, with insulation. Noise abatement is necessary only where frequent human use occurs and where a lower noise level would have benefits (23 CFR 772.11). Insulation of buildings could be feasible, but this remedy does not apply to commercial and residential structures, which constitute most of the project area. This could be an effective way to mitigate interior noise levels for Issaquah High School, but assuming a 20-dBA reduction factor for the school's walls (with windows closed, which is typical for climate-controlled buildings), no interior noise above the FHWA noise abatement criterion of 52 dBA would be expected. Therefore, there would be no interior noise impacts to mitigate.

A variety of mitigation methods can be effective at reducing traffic noise impacts. For example, noise impacts from long-term operation of the proposed project can be reduced with traffic-control measures, constructing noise barriers, acquiring land as buffer zones, realigning the roadway, and insulating public buildings. Each of these options was considered as potential mitigation for impacts on sensitive receptors. None of these measures, with the exception of noise barriers, were found feasible. Noise barriers were evaluated in all areas where noise impacts were predicted (**Figure 3-4**).

Noise barrier analysis includes evaluation of feasibility and reasonableness to construct a barrier. Determination of engineering feasibility includes whether barriers could be built in a location to achieve a noise reduction of at least 7 dBA at the closest receptors. Determination of reasonability includes the number of sensitive receptors benefited by at least 3 dBA, the cost-effectiveness of the barriers, and concerns such as aesthetics, safety, and the desires of nearby residents. The reasonable wall area is based on the number of receptors that would be benefited by the wall and the magnitude of the impact. The allowable wall cost per noise sensitive receptor that would experience a level of 66 dBA, or an increase of 10 dBA, is $15,500 using WSDOT planning-level cost estimation of $22.10 per square foot. For each 1-dBA increase over 66 dBA the allowable cost increases by $1,500.

Noise barriers were found to be feasible and reasonable in only two areas for Alternative 1 (**Table 3-7**). A complete description of the barrier location and effectiveness evaluation, including the range of barrier lengths and heights evaluated, is provided in the noise technical report, in Appendix G of the supplemental draft EIS.

Noise barriers would be placed along the west side of the roadway alignment in the Evans Lane area (Wall 1, Receptor D) and in proximity of Issaquah High School (Wall 3, Receptor H). The proposed wall near Evans Lane would be approximately 2 meters (6.6 feet) high and 200 meters (656 feet) long. The proposed wall near Issaquah High School would be approximately 3 meters (10 feet) high and 387 meters (1,270 feet) long. The planning-level cost estimate for this wall is $95,000. These noise barriers would provide an 8-dBA reduction in those areas and would reduce exterior noise levels at seven residences and Issaquah High School to below impact criteria.

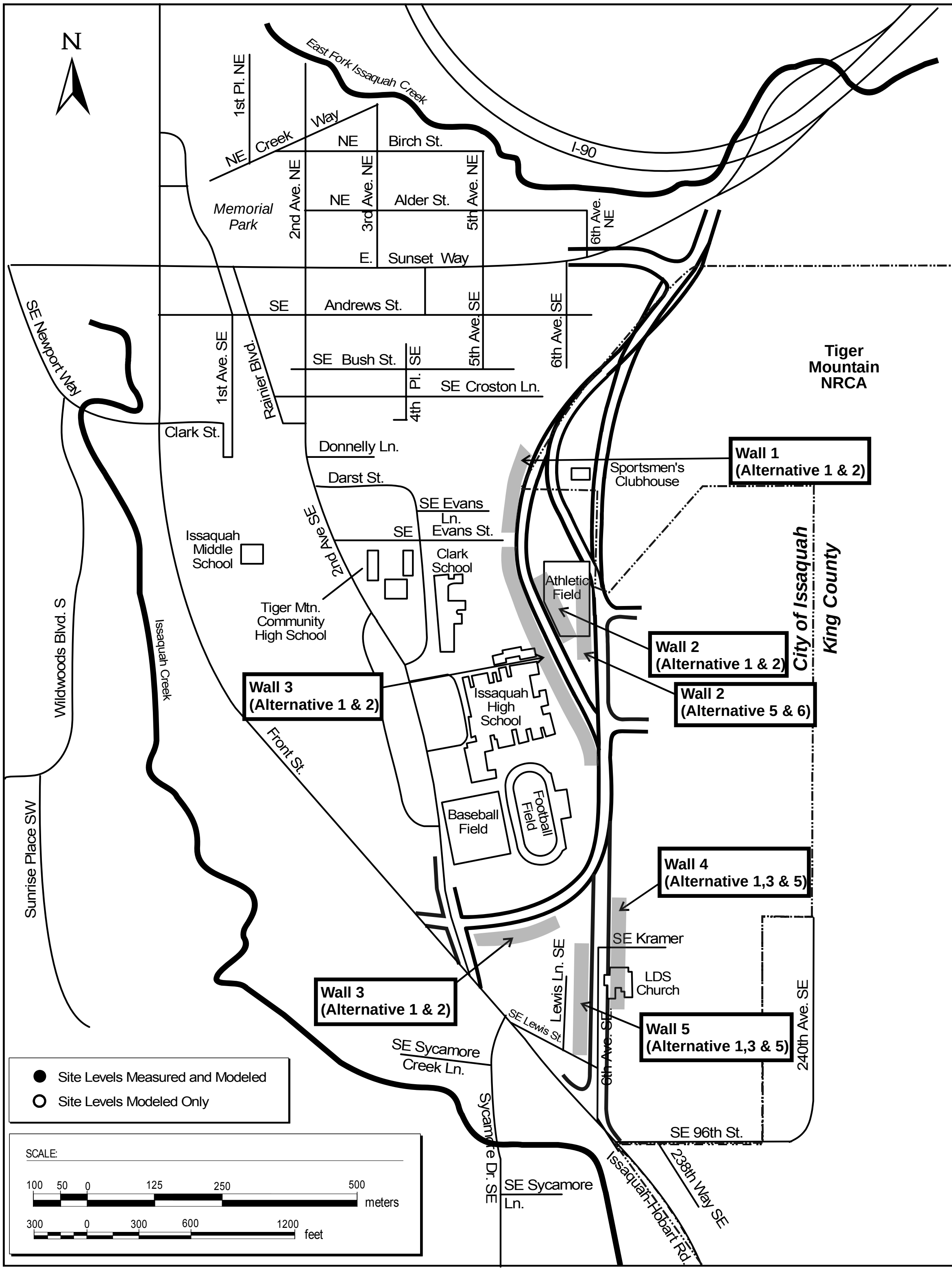

Figure 3-4
Locations of Evaluated Noise Walls

Table 3-7
Preliminary Evaluation of Noise Barriers

Wall Evaluated – Benefited Receptors; Alternatives	Result
Wall 1 – Receptor D; Alternatives 1 and 2	Feasible, reasonable
Wall 2 – Receptor G; Alternatives 1 and 2	Not feasible
Wall 2 – Receptor G; Alternatives 5 and 6	Feasible, not reasonable
Wall 3 – Receptor H; Alternatives 1 and 2	Feasible, reasonable
Wall 4 – Receptor L; Alternatives 1, 3, and 5	Not feasible
Wall 5 – Receptor N; Alternatives 1, 3, and 5	Feasible, not reasonable
Wall 6 – Receptors M & P; Alternatives 2, 4, and 5	Feasible, not reasonable
Note: Alternative 5 refers to Modified Alternative 5.	

A barrier (Wall 2) located along the western edge of the athletic field (Receptor G) was found not to be feasible because a noise reduction of 7 dBA could not be achieved. A barrier along the eastern edge of 6th Avenue Southeast (Wall 4) would not be feasible because of the requirement for access to Southeast Kramer Place and the LDS Church (Receptor L). Construction of a barrier along the western edge of 6th Avenue Southeast (Wall 5) would not be reasonable for residents along Lewis Lane Southeast (Receptor N) because the barrier would cost $50,800 per benefited residence to provide a 7-dBA reduction, which would not meet WSDOT reasonableness cost criteria of $15,500 per benefited receiver.

Even with mitigation, four residences, the Issaquah High School athletic field, and the LDS Church would experience noise impacts under Alternative 1.

Alternative 2

Impacts

Under Alternative 2, noise levels in the project area would range from no change to an increase of 16 dBA above existing conditions. Noise impacts that would result from traffic noise from the North A option of Alternative 2 would be similar to those described for Alternative 1. Traffic noise levels within Issaquah High School would also be similar to Alternative 1.

Because an exterior impact was found near the Issaquah High School classrooms, noise levels at the football stadium were modeled for this alternative. Traffic noise levels in 2030 were modeled to be 56 dBA at the bleachers and 57 dBA on the field. These traffic noise levels are less than the WSDOT noise impact criteria of 67 dBA and would be less than a 10 dBA increase above existing levels. Traffic noise levels in the vicinity of the football stadium would be lower for all other alternatives because traffic noise sources would be farther away.

For four residences south of the South C alignment (Receptor M), noise levels were predicted to increase from the existing 55 dBA to 68 dBA, a change of 13 dBA. For three residences, Receptor P would reach 66 dBA and would approach the maximum permissible noise levels. These increases would be caused primarily by traffic noise from the Southeast Issaquah Bypass South C option.

In summary, a total of 14 residences, Issaquah High School, and its associated upper athletic field would experience noise impacts under Alternative 2.

Mitigation

Mitigation measures under Alternative 2 are the same as for Alternative 1, except that an additional barrier (Wall 6) was evaluated for Alternative 2 south of the South C alignment (Receptor M) and near the intersection of Front Street South and 2nd Avenue Southeast (Receptor P). This barrier was not found to be reasonable, because it would cost $36,900 per benefited residence to provide a 7-dBA reduction, which would not meet WSDOT reasonableness cost criteria that ranges between $15,500 and $18,500 per benefited receiver for the affected receivers.

Alternative 3

Impacts

Under Alternative 3, noise level changes in the project area would range from a 2-dBA decrease to an increase of 17 dBA above existing conditions.

No noise impacts would occur as a result of the Southeast Issaquah Bypass North B option. Traffic noise levels in the portion of the project area between approximately Croston Lane and Issaquah High School (Receptors C through H) would be lower by between 1 and 5 dBA under Alternative 3 compared to Alternatives 1, 2, 5, and 6. The lower noise levels would be a result of the greater distance to and the lowered profile of the roadway compared to the other alternatives. A 1-dBA reduction is not perceptible, but a 5-dBA reduction is readily noticeable.

Noise impacts that would result from traffic noise from the South A option of Alternative 3 are similar to those of Alternative 1.

Traffic noise levels within Issaquah High School, assuming open classroom doors, would be approximately 39 dBA inside the first row of classrooms and would decrease at classrooms further from the bypass. This level is less than the allowed classroom noise level for new construction and would not result in a noise impact inside the classrooms.

As detailed above, a total of four residences and the LDS Church would experience noise impacts under Alternative 3.

Mitigation

Mitigation was evaluated and found to be not feasible and/or reasonable for Alternative 3 (see Table 3-7). A barrier (Wall 4) was not found to be feasible because of the requirement for access to Southeast Kramer Place and the LDS Church (Receptor L). Also, construction of a barrier (Wall 5) was not found to be reasonable for residents along Lewis Lane Southeast (Receptor N) because it would not meet WSDOT reasonableness criteria as described for Alternative 1.

Alternative 4

Impacts

Under Alternative 4, noise level changes in the project area would range from a 1-dBA decrease to an increase of 17 dBA above existing conditions.

No noise impacts would occur as a result of the Southeast Issaquah Bypass North B option. Traffic noise levels in the portion of the project area between approximately Croston Lane and Issaquah High School (Receptors C through H) would be lower by between 2 and 5 dBA under Alternative 4 compared to Alternatives 1, 2, 5, and 6. The lower noise levels would be a result of the greater distance to and the lowered profile of the roadway compared to the other alternatives. A 2-dBA reduction is generally not perceptible, but a 5-dBA reduction is readily noticeable.

Noise impacts that would be the result of traffic noise from the South C option of Alternative 4 are similar to those of Alternative 2. Traffic noise levels within Issaquah High School, assuming open classroom doors, would be approximately 37 dBA inside the first row of classrooms and would decrease at classrooms further from the bypass. This level is less than the allowed classroom noise level for new construction and would not result in a noise impact inside the classrooms.

As detailed above, a total of seven residences under Alternative 4 would experience noise impacts.

Mitigation

Mitigation was evaluated and found to be not feasible or reasonable for Alternative 4. A barrier (Wall 6) was evaluated south of the South C alignment (Receptor M) and near the intersection of Front Street South and 2nd Avenue Southeast (Receptor P). This barrier would not be reasonable as described for Alternative 2.

Modified Alternative 5

Impacts

Under Modified Alternative 5, noise level changes in the proposed project area would range from a 3-dBA decrease to an increase of 17 dBA above existing conditions. Predicted noise levels are shown in Table 3-5. For the athletic field (Receptor G), noise levels could increase by 15-dBA. This would be a noise impact under WSDOT noise criteria, because noise levels would increase by 10 dBA or more. The increase in noise would result from traffic noise from the North C option of the Southeast Issaquah Bypass.

Two residences along Southeast Kramer Place and the LDS Church (Receptor L) could experience noise level increases of 14 dBA. For two residences on Lewis Lane Southeast (Receptor N), noise levels could increase by 17 dBA. These increases would be primarily caused by traffic noise from the Southeast Issaquah Bypass South A option. These would be noise increase impacts under WSDOT noise criteria, because noise levels would increase by 10 dBA or more. Noise levels at Receptors I, J, K, O, and P were predicted to decrease by 1 to 3 dBA, due to the projected diversion of traffic volumes from

Front Street South and 2nd Avenue Southeast to the Southeast Issaquah Bypass.

Traffic noise levels within Issaquah High School, assuming open classroom doors, would be approximately 41 dBA inside the first row of classrooms and would decrease at classrooms further from the Southeast Issaquah Bypass. The total noise level inside the first row of classrooms inside Issaquah High School would be 51 dBA, which includes traffic noise and all other noise sources. This level is less than the allowed classroom noise level for new construction and would not result in a noise impact.

As discussed previously, a total of four residences, the school's associated athletic field, and one church under Modified Alternative 5 would experience noise impacts. To put these impacts into perspective, normal human conversation ranges from 44 to 65 dBA when people are about 3 to 6 feet apart. The smallest change in noise level that a human ear can perceive is about 3 dBA, and increases of 5 dBA or more are clearly noticeable. For most people, a 10-dBA increase in noise levels is perceived as a doubling of sound level. The increase in noise levels associated with Modified Alternative 5 would be 14 to 17 dBA. This noise increase would be perceived as more than a doubling of the existing sound level. The increase in noise at these locations would result in noise levels between 60 and 66 dBA, which are comparable to noise levels ranging from a typical office environment to a washing machine at a distance of 3 feet.

Mitigation

Mitigation was evaluated and found to be not feasible or reasonable for Modified Alternative 5. Construction of a barrier (Wall 2, see Figure 3-4) was not found to be reasonable for the Issaquah High School northern athletic field (Receptor G) because it would not meet WSDOT reasonableness criteria. The athletic field was found to have a household equivalence of nine residences, based on use data provided by the Issaquah School District. For this usage, the allowable barrier cost would be $140,000 because the predicted noise level is below 67 dBA. A wall of 8,850 square feet would be required to provide a 7-dBA reduction to the athletic field. The planning-level cost estimate for the wall size is $206,000. A barrier (Wall 4) was not found to be feasible because of the requirement for access to Southeast Kramer Place and the LDS Church (Receptor L). Also, construction of a barrier (Wall 5) would not be reasonable for residents along Lewis Lane Southeast (Receptor N), because the barrier would cost $50,800 per benefited residence to provide a 7-dBA reduction, which would not meet the WSDOT reasonableness cost criteria of $15,000 per benefited receiver. However, the city will continue to work closely with the school district to identify appropriate mitigation to offset the use of school district-owned recreational facilities.

Alternative 6

Impacts

Under Alternative 6, noise level changes in the project area would range from no change to an increase of 15 dBA above existing conditions.

Noise impacts that would result from traffic noise from the North C option of Alternative 6 are similar to those for the North C option of Modified Alternative 5.

Noise impacts that would result from traffic noise from the South C option of Alternative 6 are similar to those for the South C option of Alternative 2.

Traffic noise levels within Issaquah High School, assuming open classroom doors, would be approximately 41 dBA inside the first row of classrooms and would decrease at classrooms further from the bypass. This level is less than the allowed classroom noise level for new construction and would not result in a noise impact inside the classrooms.

As detailed above, a total of seven residences and the Issaquah High School athletic field would experience noise impacts under Alternative 6.

Mitigation

Mitigation was evaluated and found to be not feasible or reasonable for Alternative 6. Construction of a barrier (Wall 2) would not be reasonable for the athletic field (Receptor G) as described for Modified Alternative 5. A barrier (Wall 6) was also evaluated south of the South C alignment (Receptor M) and near the intersection of Front Street South and Second Avenue (Receptor P). This barrier also would not be reasonable as described for Alternative 2.

Alternative 7—No Action

Impacts

Under the no-action alternative, noise level changes in the proposed project area would range from no change to an increase of 5 dBA above existing conditions. This increase is attributed to traffic volume increases.

For twelve residences on East Sunset Way, Receptor A would reach 68 dBA and would exceed the maximum permissible noise levels. Three residences west of the current Front Street South and 2nd Avenue Southeast intersections would reach 66 dBA and would approach the maximum possible noise levels. Under the no-action alternative, a total of 15 residences would experience noise impacts.

Mitigation

Because the project would not be constructed, no mitigation is required.

Energy

Affected Environment

Energy is consumed during the construction and operation of transportation projects. Operational energy consumption includes fuel consumed by vehicles using the project, and a negligible amount of energy for signals and lighting. The transportation sector accounts for 50 to 55 percent of the petroleum consumed in the United States.

Energy consumption depends on traffic operations, as measured by vehicle miles traveled and changes in traffic speed for the various alternatives. The average fuel economy for new cars has been essentially flat over the last 15 years, varying only from 27.6 to 28.6 miles per gallon (mpg). Similarly, the average fuel economy for new light trucks, which include sport utility vehicles, has been largely unchanged for the past 20 years, ranging from 20.1 to 21.6 mpg (U.S. EPA, 2000). The increasing market share of light trucks, which have lower average fuel economy than cars, accounts for a decline of 1.9 mpg in fuel economy of the overall new light vehicle fleet since 1988.

Impacts and Mitigation

All Build Alternatives

Impacts

Table S-1 in the Summary chapter provides impact and mitigation information pertaining to the alternatives discussed in the June 2004 supplemental draft EIS.

The Southeast Issaquah Bypass would provide direct access between the area south of Issaquah and I-90 via the Sunset interchange. Although traffic would occur along the new roadway as a result of this project, it would decrease at several other congested locations, reducing the overall average level of congestion in the Issaquah area. Vehicle fuel consumption is largely determined by daily vehicle miles traveled and intersection operations. Energy consumption resulting from vehicles traveling in the southeast Issaquah area during the PM peak hour was computed using the SimTraffic traffic model (**Table 3-8**).

Table 3-8
Existing and Predicted Daily PM Peak Hour Energy Consumption

Alternative	Gasoline Consumption Liters (Gallons)	Change in Energy Consumption Relative to No Action
1996 Existing Conditions	9,300 (2,450)	
2030 Alternative 1	9,100 (2,400)	17% Increase
2030 Alternative 2	7,000 (1,850)	10% Reduction
2030 Alternative 3	9,100 (2,400)	17% Increase
2030 Alternative 4	7,000 (1,850)	10% Reduction
2030 Modified Alternative 5	9,100 (2,400)	17% Increase
2030 Alternative 6	7,000 (1,850)	10% Reduction
2030 No Action	7,800 (2,050)	

Energy consumption in the study area from peak-hour vehicle delay in 2030 would be similar for Modified Alternative 5 and the no-action alternative and less than 1996 energy consumption. Local energy consumption values ranged from somewhat lower to somewhat higher than the no-action alternative values because total vehicle operations would be greater but congestion and delay would be less in 2030 under Modified Alternative 5 (the preferred alternative).

Mitigation

Because no substantial impacts from any build alternative are expected, no mitigation would be required. The transportation control measures to reduce traffic (presented in the Transportation section of this chapter) would decrease energy consumption.

Alternative 7—No Action

Impacts

Compared to 1996 existing conditions, total traffic congestion in the study area would decrease under the no-action alternative because of traffic operation improvements resulting from completion of the Sunset interchange. This would result in a decrease in energy use between existing and 2030 conditions.

Mitigation

Because energy use would decrease, no mitigation measures would be needed.

Geology and Soils

Studies and Coordination

Information provided in this section was obtained from document review, site inspections and fieldwork conducted in the proposed project study area. City of Issaquah and King County critical areas maps and regulations were reviewed. A series of aerial photos of the study area taken between 1936 and 1995 were examined to provide background on historical site conditions. Water well logs on file at the Department of Ecology were also reviewed. Soils information was obtained from the Natural Resource Conservation Service *Soil Survey for King County*. Geologic units were identified through review of published data and subsurface explorations.

A preliminary field exploration was performed in December 1996, including two test borings, followed by 16 test borings in May and June 1998 and five test pits in May 1998. Detailed geologic reconnaissance of the proposed project route was conducted between December 1996 and June 1998. Additional information was compiled from previous studies in the area including geotechnical information prepared for the North SPAR, South SPAR, and Sunset interchange roadway projects, the Issaquah Highlands and Lakeside Industries development projects to the north, and the proposed Park Pointe development project to the east.

Affected Environment

Surface Conditions

The project area extends about 2 km (1.2 miles) generally traversing the base of a west-facing hillside. The northern portion of the study area consists of nearly level to steeply sloped forested areas. The southern portion is nearly level land that includes several large wetland areas.

Geologic Setting

The geology and landforms of the project area are the result of preglacial volcanism and sedimentation, and glacial, interglacial, and postglacial events within the Puget Sound area. Surficial geology units are shown in **Figure 3-5**.

Bedrock underlies the entire Southeast Issaquah Bypass project area. The bedrock consists of volcanic andesite (Tertiary age volcanic rocks) and is exposed at the ground surface in the central part of the project area. Bedrock is estimated at a depth of 15 meters (50 feet) in the southern part of the project area and more than 50 meters (165 feet) in the northern part of the project area (Yount et al., 1985).

Soils composed of glacial, interglacial, and postglacial sediments overlie the bedrock (Booth and Minard, 1992; Walsh, 1984). The most recent glaciation, the Vashon Stade of the Fraser glaciation, covered the entire project area with up to 900 meters (3,000 feet) of ice at its maximum extent (Curran, 1965). The Vashon ice sheet completely melted from the project area approximately 13,000 years ago.

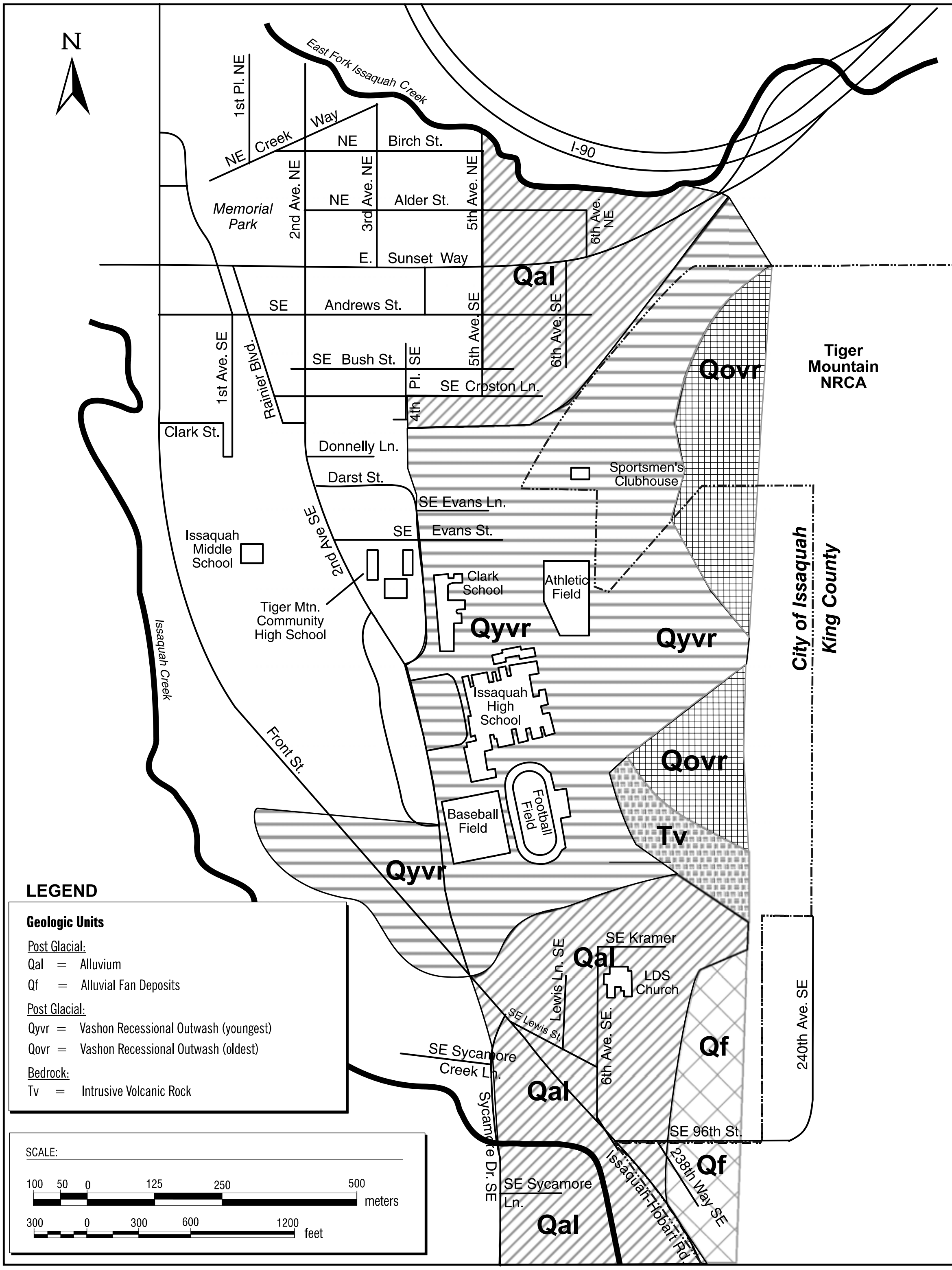

Figure 3-5
Surficial Geology Units

The glacial and interglacial soils consist of sand, gravel, cobbles and boulders (recessional outwash) and silt (glacial lake sediments). Recessional outwash comprises most of the surficial native soils in the central and northern part of the project area.

Erosion, sedimentation, and human activities have modified the land surface across the project area since the last glaciation. The Issaquah Creek valley, in the vicinity of the southern part of the project area, is mantled with 2 to 3 meters (6.6 to 10 feet) of soft organic silt, thin layers of peat, silt, and sand (alluvium) underlain by a higher density alluvium and alluvial fan deposits. The soft alluvium thickens to about 5.2 meters (17 feet) in wetland areas.

Weathering and erosion of native soils have resulted in the development of topsoil and colluvium at the ground surface in the hillside and upland areas. Human activities, including logging, mining, rural residential development, and road construction have resulted in regrading of the ground surface in local areas.

Structural Geology

Bedrock underlies the entire project area. Regional deformation of the earth's crust during late Tertiary time folded and faulted the bedrock in the project area (Booth and Minard, 1992; Walsh, 1984).

A structural feature in the bedrock in the project area is the Sammamish lake syncline. This is a north-northwest trending concave upward fold (i.e., syncline) in the bedrock, with the axis of the fold located across the north portion of the project area. The south portion of the project area is located over the west limb of the syncline, and bedding (i.e., the original bedrock layers, originally near horizontal in orientation) in the bedrock is inclined downward to the southwest.

Deformation of the bedrock caused joints and fractures (cracks with no lateral offset) and faults (cracks with lateral offset) in the rock mass. A major structural feature, referred to as the Seattle fault, is an inferred east-trending fault extending from Eagle Harbor on Bainbridge Island east under Seattle, and continuing east beneath the southern end of Lake Sammamish (Booth and Minard, 1992). The fault has been identified based primarily on geophysical data. The inferred location of the Seattle fault is about 4.8 km (3 miles) north of the project area. However, a 4- to 6-km (2.5- to 3.7-mile) fault zone (oriented north/south) of the Seattle fault has been recently mapped that can be projected through the project corridor area (Johnson et al., 1999). The fault zone is interpreted as a group of paralleling fault lines identified using high-resolution seismic reflection data. New evidence suggests that a major earthquake associated with the Seattle fault, magnitude 7.0 or greater, affected the region about 1,100 years ago.

Several smaller faults and possible faults have been identified and mapped by others in the vicinity of the project area. Many small faults in the bedrock have been observed during past coal mining activities in the vicinity of the project area (Schasse et al., 1994). Other faults covered by soil overburden may exist elsewhere beneath the project area. No large earthquakes (magnitude greater than 5.0) are known to be related to these smaller faults (University of Washington, 1996).

Seismicity

The Puget Sound area is a seismically active region and has experienced thousands of earthquakes in historical time. Seismicity in this region is attributed primarily to the interaction between the Pacific, Juan de Fuca, and North American plates. The Juan de Fuca plate is subducting beneath the North American plate. It is thought that the resulting deformation and breakup of the Juan de Fuca plate might account for the large-magnitude deep-focus earthquakes in the Puget Sound region (Walsh et al., 1999).

Thick deposits of glacial and interglacial sediments occur throughout most of the Puget Sound region. Because of the thick sediment cover, little is known regarding the nature of faults in the underlying bedrock. Based on geophysical and gravity anomalies, several inferred structures have been identified. However, earthquake activity has been postulated for these inferred structures in the study area, especially with regard to the Seattle fault.

Based on past earthquake activity, the Uniform Building Code (International Conference of Building Officials, 1997) assigns the Puget Lowland region a Zone 3 rating for seismic activity on a scale of 1 (lowest) to 4 (highest). Large earthquakes have occurred at depths of 53 to 63 km (33 to 39 miles) beneath the Puget Lowland, such as the 1949 magnitude 7.1 Olympia event and the 2001 magnitude 6.8 Nisqually event (University of Washington, 2002). The expected recurrence interval for earthquakes of magnitude 6.5 is about 35 years, and about 110 years for a magnitude 7.5 earthquake (Noson et al., 1988).

Soil Units

The distribution of surficial soils is generally related to the parent geologic units and topographic slope. Soil units described in the following paragraphs are based on the U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS), formerly known as the Soil Conservation Service (SCS), classification system. The distribution of soil units is shown in **Figure 3-6**. The depth of soils mapping by the SCS typically does not exceed 150 centimeters (60 inches) below the ground surface. Mapping of soil units is based on SCS mapping (1973), as modified by Icicle Creek Engineers, to be consistent with updated topographic information for the project area.

Sensitive Areas

Sensitive areas within and adjacent to the project area are regulated locally by the Issaquah Municipal Code, Chapter 18.10, Environmental Protection, Critical Areas Regulations (City of Issaquah, 1996a), adopted May 20, 2002. Regulated sensitive areas pertaining to geology and soils include steep slopes, seismic hazards, coal mine hazards, landslide hazards, and erosion hazards.

Impacts and Mitigation

Table 3-9 summarizes the approximate areas of the proposed roadway that would be constructed within potential geologic hazard areas. Impacts of all build alternatives in each of these areas are described in the following sections.

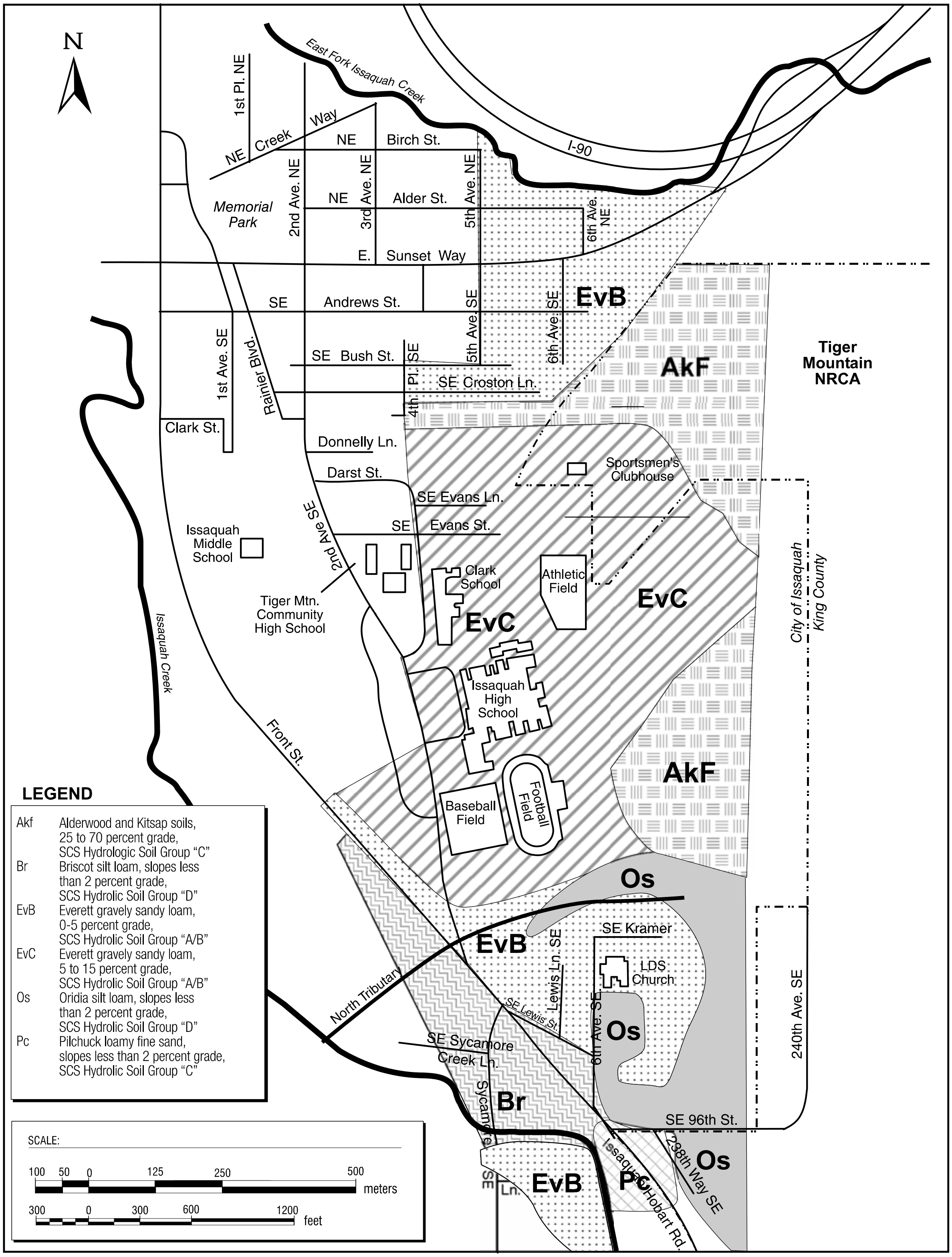

Figure 3-6
Surficial Soils Map

Table 3-9
Amount of Proposed Roadway within Geologically Sensitive Areas

	Steep Slopes	Seismic Hazards	Coal Mines	Landslide	Erosion	Earthworks
Alternative 1	1 (2.5)	3.3 (8.1)	None	0.009 (0.02)	1.4 (3.5)	10.2 (25.2)
Alternative 2	1 (2.5)	0.9 (2.3)	None	0.009 (0.02)	1.2 (3.1)	10.1 (25.1)
Alternative 3	0.7 (1.7)	3.3 (8.1)	None	None	1.6 (3.8)	10.0 (24.7)
Alternative 4	0.7 (1.7)	0.9 (2.3)	None	None	1.2 (3.1)	10.0 (24.7)
Modified Alternative 5	0.9 (2.3)	3.3 (8.1)	None	0.11 (0.28)	1.6 (3.8)	10.3 (25.6)
Alternative 6	0.9 (2.3)	0.9 (2.3)	None	0.11 (0.28)	1.6 (3.8)	10.3 (25.6)
Areas listed in units of hectares (acres in parentheses)						

Steep Slopes

Impacts

The 2002 Issaquah Municipal Code defines steep slopes as slopes greater than 40 percent (22 degrees) within a vertical elevation change of at least 3 meters (10 feet). Slopes inclined steeper than 40 percent grade in western Washington have a higher risk of slope instability than flatter slopes. These slopes are generally stable in their natural condition, but may require special engineering design to improve or sustain the natural stability of the slope if modified by human activities.

Steep slopes are primarily located in the north and central portions of the project area. Local areas of the steep slopes generally occur across the site. Steep slopes are shown in **Figure 3-7**.

Under any of the build alternatives, steep slope areas would be subject to increased erosion and landslide potential. After road construction, impacts on steep slopes would be related to increased water runoff from impervious surfaces, and point source discharge of water onto slopes.

Mitigation

Steep slopes are regulated by the 2002 Issaquah Municipal Code. Currently, no development in steep slope areas is allowed by Issaquah Municipal Code. The steep slope regulations presume that practical alternative routes exist that can avoid steep slopes. However, if no reasonable alternative routes exist, steep slopes may be modified provided that these areas are properly mitigated by design, construction, and operation methods to generally enhance the stability of the affected steep slope areas. The proposed project would follow this approach by providing appropriate cut and fill walls and retaining walls along the proposed project route. Under the preliminary design, large, double stacked retaining walls would be constructed in the northern project area along the east side of the road near the Tiger Mountain NRCA. This work is expected to occur through the city's public agency and utility exemption (IMC 18.10.420) without the need for a steep slope variance.

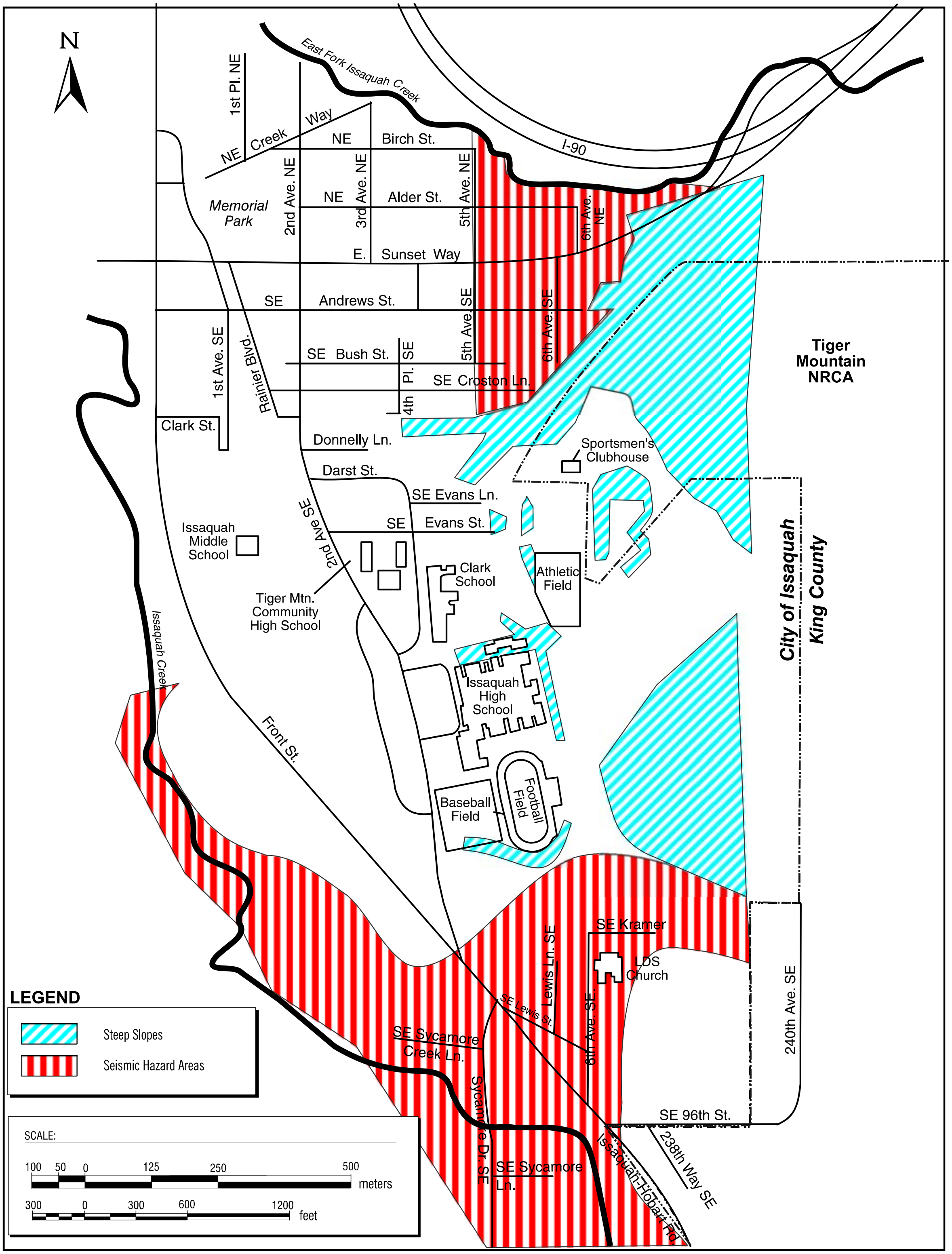

Figure 3-7
Steep Slopes and Seismic Hazard Areas

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Development in steep slope and landslide hazard areas requires a thorough understanding of slope erosion processes, soil/bedrock and groundwater conditions and special design measures to modify steep slopes. Based on preliminary geologic information, recessional outwash and bedrock is at or near the ground surface in many steep slope areas. Modification of steep slopes underlain by these materials may be safely accomplished without impact on steep slopes provided that the geotechnical properties of the underlying soil/bedrock and groundwater conditions are thoroughly evaluated along with proper design measures to replace or enhance the lateral support of the hillside where cuts are made.

Mitigation of impacts within steep slope areas resulting from the road construction and operation would require site-specific geotechnical studies. Slope stability analysis would be conducted in steep slope areas for cuts and fills during the design phase for the development. Structures in steep slope areas would be supported with foundations on firm and unyielding soils or bedrock.

Seismic Hazards

Impacts

The 2002 Issaquah Municipal Code defines seismic hazards as those areas subject to severe risk of earthquake damage as a result of seismically induced settlement or liquefaction, usually associated with areas underlain by cohesionless soils of low density and shallow groundwater. The Puget Sound area is a seismically active region. During liquefaction, soil strength is dramatically reduced as the soil is subjected to vibration or shaking (Kramer, 1996). Loose, saturated sand and silt is particularly susceptible to liquefaction. During earthquakes, landslides may be initiated on slopes that are already only marginally stable. Landslide hazard areas should therefore also be considered seismic hazard areas. Seismic hazard areas are shown in Figure 3-7, and landslide hazard areas are shown in **Figure 3-8**.

Seismic hazards during operation of the road are related to the type of road construction conducted. The potential for liquefaction of fill embankment foundation soils would be reduced as a result of the loading imposed by the embankment and related preload. Also, bridge structures would be affected less by liquefaction if pile- or pier-supported than if supported on shallow foundations. Upland bridge structures would be unaffected by liquefaction potential if they are supported on competent native soils.

Other seismic considerations include the potential for ground settlement (soil densification caused by ground shaking), ground rupture and differential ground displacement (lurching), especially when considering the Seattle fault. These issues are not considered major factors based on existing information. Risk assessment and potential mitigation associated with the Seattle fault would be reviewed during the design studies for this project.

Mitigation

The effects of seismicity would be considered in the design of all roadways and structures. The Puget Sound region is seismically active and lies within seismic risk zone 3 as classified by the 1997 Uniform Building Code. WSDOT recently adopted maps from the USGS 1996 seismic hazards mapping project as a basis for design of highway structures in Washington. Based on the review of these maps, a ground acceleration of 0.28g (acceleration of gravity units) would be appropriate for the proposed project site. Following these standards the proposed project would be designed to accommodate the potential impacts of liquefaction of surface soils and ground shaking during a seismic event.

Coal Mine Hazards

Impacts

The Issaquah Municipal Code (2002) defines coal mine hazards as those areas directly underlain by or affected by coal mine workings such as adits, tunnels, drifts, or air shafts. The principal issues regarding public safety and/or property damage related to abandoned coal mines include 1) sinkholes and related gas emission or concentrations, 2) regional ground subsidence, and 3) mine rock fill (King County, 1999a).

Based on review of available information including Schasse et al. (1994), King County (1990), Walsh (1984 and 1983), Warren et al. (1945), Issaquah (undated), and detailed geologic reconnaissance, no abandoned coal mine workings exist within the project corridor. The nearest documented abandoned coal mine workings occur approximately 0.5 km (0.3 miles) west of the project corridor in an area historically referred to as the Newcastle Coal Mining District (Walsh, 1983). In addition, the bedrock that underlies the project corridor is identified as volcanic rocks (Tv) and consists of igneous rock (compared with sedimentary rock); this type of bedrock is not known to contain coal beds (Booth and Minard, 1992; Walsh, 1984). As previously mentioned, no coal mine hazard areas are located within the project corridor based on available information. No coal mine hazard areas are identified within the project alignment areas based on available information.

Mitigation

No mitigation would be needed.

Landslide Hazards

Impacts

The 2002 Issaquah Municipal Code defines landslide hazard areas to include 1) areas with slopes greater than 15 percent that are underlain by impermeable soils and that include springs or groundwater seepage, 2) areas that have moved during the Holocene epoch (the last 10,000 years), 3) areas where rapid stream or wave erosion has created potentially unstable conditions, or 4) alluvial fans that are subject to inundation by debris flows or similar deposition of sediment.

Landslide hazards refer to the potential for downslope movement of earth materials under the influence of gravity. The mass of earth can range from small surficial slides consisting of less than 1 cubic meter (1 cubic yard) of soil or rock, to large slides comprising thousands of cubic meters of material.

Although this area is identified as an affected steep slope area, the landslide hazard designation does not apply, based on the results of detailed geologic reconnaissance and aerial photograph interpretation. These investigations show

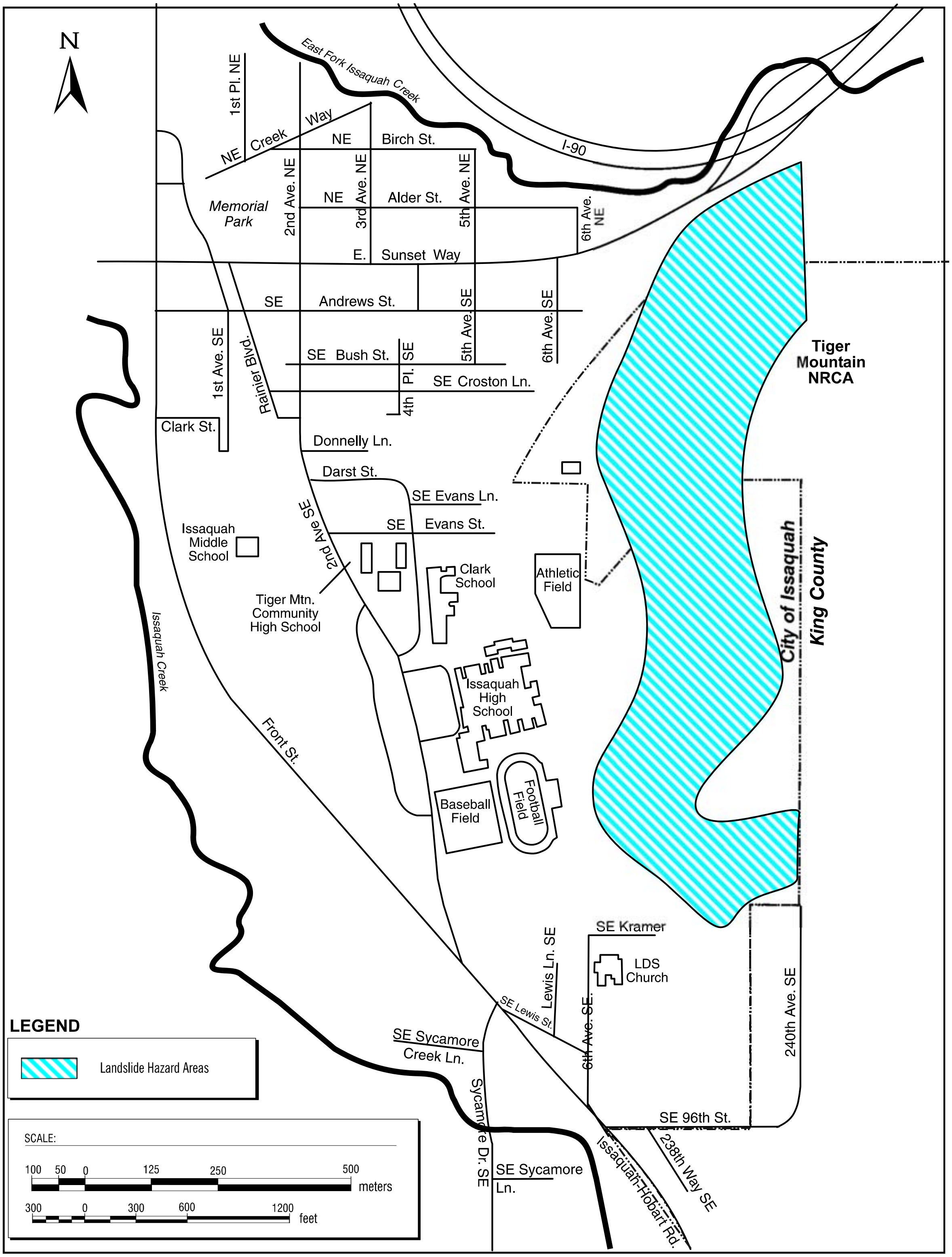

Figure 3-8
Landslide Hazard Areas

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no surface evidence of slope movement. Subsurface explorations completed for this project indicate a lack of impermeable soils associated with springs or seepage in slope areas (boring locations B-10, and B-13A/B through B-17). Two inclinometers were installed in borings on the subject hillside (B-13B and B-14) to monitor for slope movement. The Southeast Issaquah Bypass earth technical report (Icicle Creek, 1998), which includes a map of boring locations, is incorporated herein by reference.

These site-specific studies have determined that the regional landslide hazard designation within the proposed project area does not meet Issaquah's definition for a landslide hazard area. However, until the city formally removes this designation, the impact analysis will assume that the landslide hazard area boundaries have not changed. Landslide hazard areas, as identified by city critical areas maps, are shown in Figure 3-8. As indicated previously, subsequent investigations for this project have suggested that this classification is not warranted for the northern project area.

Detailed geologic reconnaissance conducted by Icicle Creek Engineers in 1998 and aerial photograph interpretation of the area did not reveal surface evidence of past landslide activity such as bare soil scarps, irregular topography, springs or seepage, or groups of toppled or leaning trees.

Subsurface conditions (identified in Borings B-10, and B-13A/B through B-17 in the supplemental draft EIS earth technical report) encountered competent (generally dense to very dense), relatively permeable soils (generally sand or gravel with variable amounts of silt) to the full depth penetrated by these borings. Groundwater in these explorations was relatively deep; greater than 8 meters (26 feet).

Inclinometers were installed in two locations to a depth of 27.2 meters (89.3 feet) and 27.1 meters (88.8 feet), respectively. The baseline readings for the inclinometers occurred on July 6, 1998, with subsequent measurements on December 8, 1998, February 9, 1999, April 7, 1999, July 9, 1999 and March 8, 2000. No measurable ground movement was detected in the inclinometers during this period.

No landslide hazards are within the project alignment areas. The hillside at the north end of the project area where the north alignments cross was regionally classified as a landslide hazard area. However, based on the results of subsurface information obtained for this study, landslide hazards are not expected to result from the proposed project under any of the build alternatives.

Mitigation

Mitigation measures proposed for steep slope areas would also provide effective stabilization measures to mitigate potential landslide hazards.

Erosion Hazards

Impacts

Issaquah Municipal Code (2002) defines erosion hazard areas as all soils designated by the SCS as having "severe" or "very severe" erosion hazard. Erosion of soils is a natural, ongoing, physical weathering process. Removal of vegetation, modification of topography, and managing stormwater runoff need to be carefully considered for all construction projects. Some soils are particularly susceptible to erosion because of particle size gradation and/or density. Erosion hazard areas are shown in **Figure 3-9**.

Potential sources or causes of erosion and sedimentation depend on many factors including grading plans including slope length and gradient, and amount and type of soil exposed, and weather. Potential sources of sediment in developed areas include areas of exposed soil in landscaped areas, roadsides and along stream corridors, and traction sand placed on roads during the winter season. Unless deliberately controlled, increased runoff from impervious surfaces can result in higher erosion rates along unprotected stream corridors and can result in increased sediment deposition in wetlands or in increased offsite sediment transport.

In general, the amounts of sediment produced by these processes following construction would be considerably less than sediment yields during construction, when large areas of soil would be exposed.

Mitigation

Following construction, exposed soil areas would be replaced with erosion-resistant surfaces including paved areas, landscaping, and other features. Best management practices would be followed to prevent substantial sediment impacts. Measures to reduce and control runoff volumes associated with this project are described in the Hydrologic Systems, Floodplains, and Water Quality sections of this chapter.

Appropriate erosion control measures would be specifically developed to address the individual causes and sources of erosion and sedimentation during operation of the proposed roadway. The erosion control system would be flexible to adapt to site specific conditions, and would be regularly monitored and maintained. An erosion and sedimentation control plan would be prepared and followed for all build alternatives. Stormwater runoff would be infiltrated to the extent possible, and detention facilities would be constructed as needed. These facilities are described in more detail in the Hydrologic Systems, Floodplains, and Water Quality sections of this chapter. Erosion control measures would be designed in accordance with city of Issaquah road standards.

Ground Disturbance

Impacts

All build alternatives would require deep cuts and fills at the north end of the project corridor and primarily fills at the south end of the project corridor. The estimated amount of ground disturbance for each alternative would vary slightly, ranging from approximately 10 hectares (24.7 acres) under Alternative 4 to approximately 10.3 hectares (25.6 acres) under Alternative 6.

Mitigation

No mitigation would be needed.

Alternative 7—No Action

The proposed project would not be constructed, and no direct or operational impacts related to earth resources would occur.

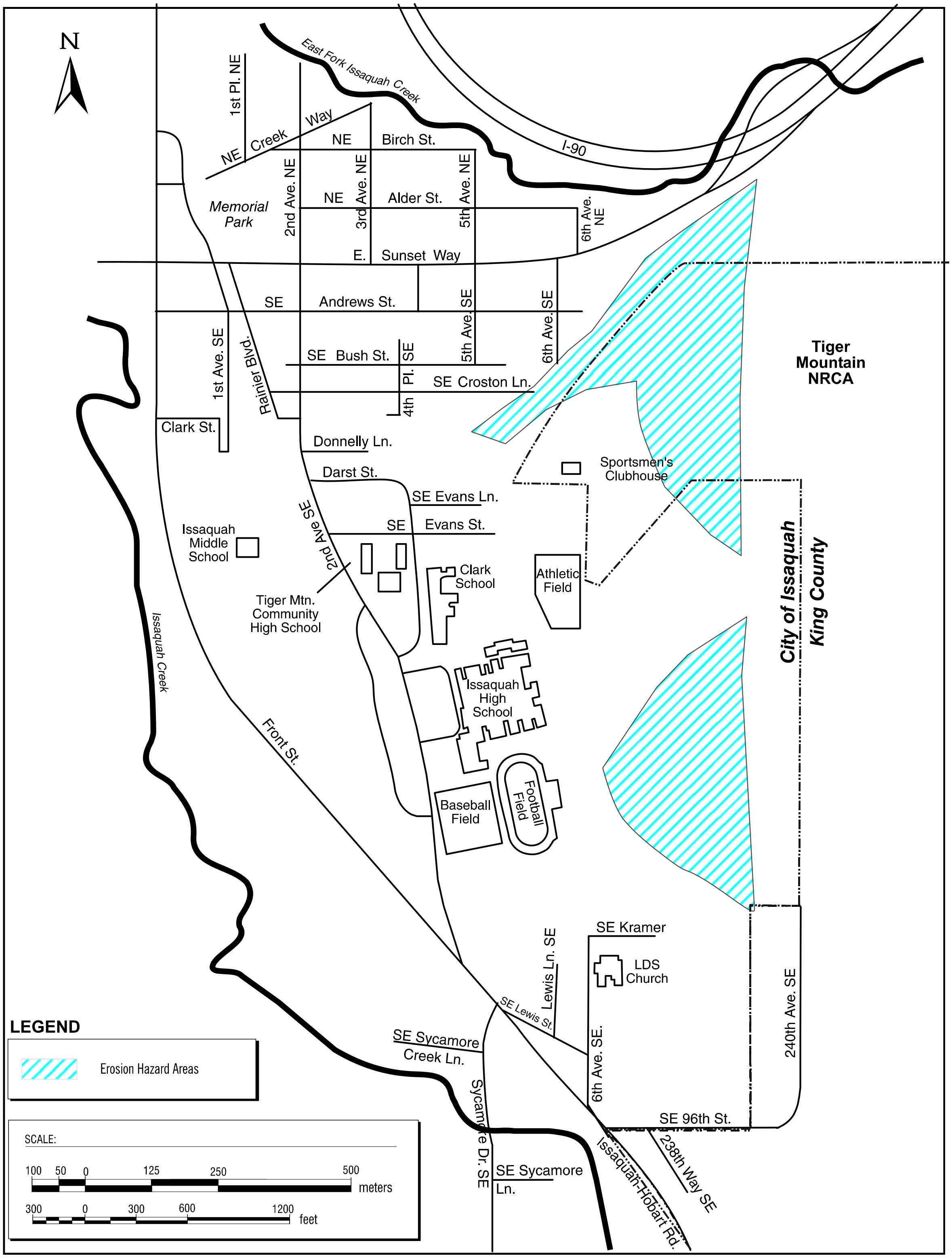

Figure 3-9
Erosion Hazard Areas

Hydrologic Systems

Studies and Coordination

The analyses conducted for this EIS required coordination with several agencies and consulting firms involved in the project to obtain information pertinent to several hydrologic and hydraulic issues. Groundwater resources in the project vicinity have been the subject of comprehensive study in recent years, as has the Issaquah Creek system. The additional information developed and acquired for this project pertains to existing conditions of shallow groundwater, and several wetlands and small streams in the immediate proposed project area. Information on the feasibility of infiltrating stormwater runoff in the proposed project area is available from analyses conducted for two nearby projects: the I-90 Sunset interchange construction project and the proposed Park Pointe development on the east side of the Southeast Issaquah Bypass corridor.

The coordination conducted to obtain all relevant hydrologic and hydraulic information is summarized in this section. The Issaquah Department of Public Works and King County Department of Natural Resources and Parks, Water and Land Resources Division were contacted for streamflow data for the two unnamed tributaries of Issaquah Creek that cross the south end of the project area.

Information was obtained from Icicle Creek Engineers on shallow groundwater levels encountered in boreholes and test pits that were drilled and dug for the project (see the earth technical report for the Southeast Issaquah Bypass, available from the city of Issaquah). Based on the findings of their subsurface exploration work and knowledge of the project site vicinity, Icicle Creek Engineers was also contacted for their expert opinion on the extent of groundwater recharge that occurs in the wetland areas in the south end of the proposed project area.

Drilling logs for water wells in the project vicinity were obtained from the Washington Department of Ecology (Ecology) Northwest Region office (Ecology, 1998), to verify and supplement information on water wells presented in the *Issaquah Creek Valley Groundwater Management Plan* (Seattle-King County Health Department and Issaquah Creek Valley Groundwater Action Committee, 1996) and the *Lower Issaquah Valley Aquifer Wellhead Protection Plan* (Golder et al., 1993).

Additional information on well logs, geotechnical borings, infiltration testing, and geologic and water level maps in the Southeast Issaquah Bypass project area was obtained from reports prepared for the proposed Park Pointe development site (Golder Associates, 2002a and 2002b).

Information on existing drainage systems in the project area and proposed storm drainage plans for the new roadways was obtained from the detailed summary presented by the city of Issaquah in the Concurrence Point 3 packet (City of Issaquah, 2005) prepared for state and federal resource agencies.

Affected Environment

The primary water bodies of concern for this hydrologic analysis include shallow, unconfined, aquifer systems beneath and south of I-90, East Fork Issaquah Creek, the main stem of Issaquah Creek, and two tributaries of Issaquah Creek that cross the Southeast Issaquah Bypass corridor. The south end of the project site also contains extensive wetlands. It appears that infiltration of precipitation and runoff occurs in these wetlands, and that during larger storm events and during wet-test times of the year, these wetlands also discharge extensively to streams and drainage systems that are tributaries of Issaquah Creek. Groundwater seeps emanating in several locations along the hillslope to the east of the project site provide sustained inflows to these wetlands for much of the year.

The northern portion of the project corridor is underlain by porous soils that promote infiltration of precipitation and runoff to a significant extent, and as a result there is a general lack of wetlands and surface drainages in that area. The Issaquah Creek system drains into Lake Sammamish, as does the regional aquifer underlying the site.

Surface Water

The proposed Southeast Issaquah Bypass corridor lies within the drainage basin of Issaquah Creek. Runoff from the southern half of the corridor flows into Issaquah Creek via two unnamed tributaries (called the north and south tributaries for the purposes of this final EIS) and constructed storm drainage systems. Forested and scrub/shrub wetland areas are prevalent in much of the southern portion of the project corridor. Existing drainage patterns in this area relate closely to the interconnection of wetlands and the associated drainage systems that have been constructed to convey wetland outflows. The limited runoff that occurs in the northern half of the corridor flows indirectly into East Fork Issaquah Creek via storm drainage systems in the residential neighborhood to the west of the project site.

Figure 3-10 shows the surface water features in the study area and **Figure 3-11** identifies watershed subbasin boundaries. Two streams are within the project limits: the north and south tributaries of Issaquah Creek flow through the south end of the Southeast Issaquah Bypass corridor. The north tributary is also known as Lewis Lane Tributary and Hope Creek. The south tributary is also known as Kees Creek and Tributary 0199. East Fork Issaquah Creek also flows close to I-90 and East Sunset Way near the north end of the corridor, and the main stem of Issaquah Creek flows parallel to the corridor on the opposite side of Front Street South. The following discussion includes information on stream classifications and related buffer requirements based on the stream rating system adopted by the city of Issaquah.

Issaquah Creek and Minor Tributaries

The south tributary of Issaquah Creek (also known as Kees Creek and Tributary 0199) has its headwaters on Tiger Mountain, on a plateau east of the Southeast Issaquah Bypass project site. This stream flows westward into the Issaquah Creek valley, crossing under 238th Way and Front Street South through large box culverts that were installed in 2004 by King County and the city

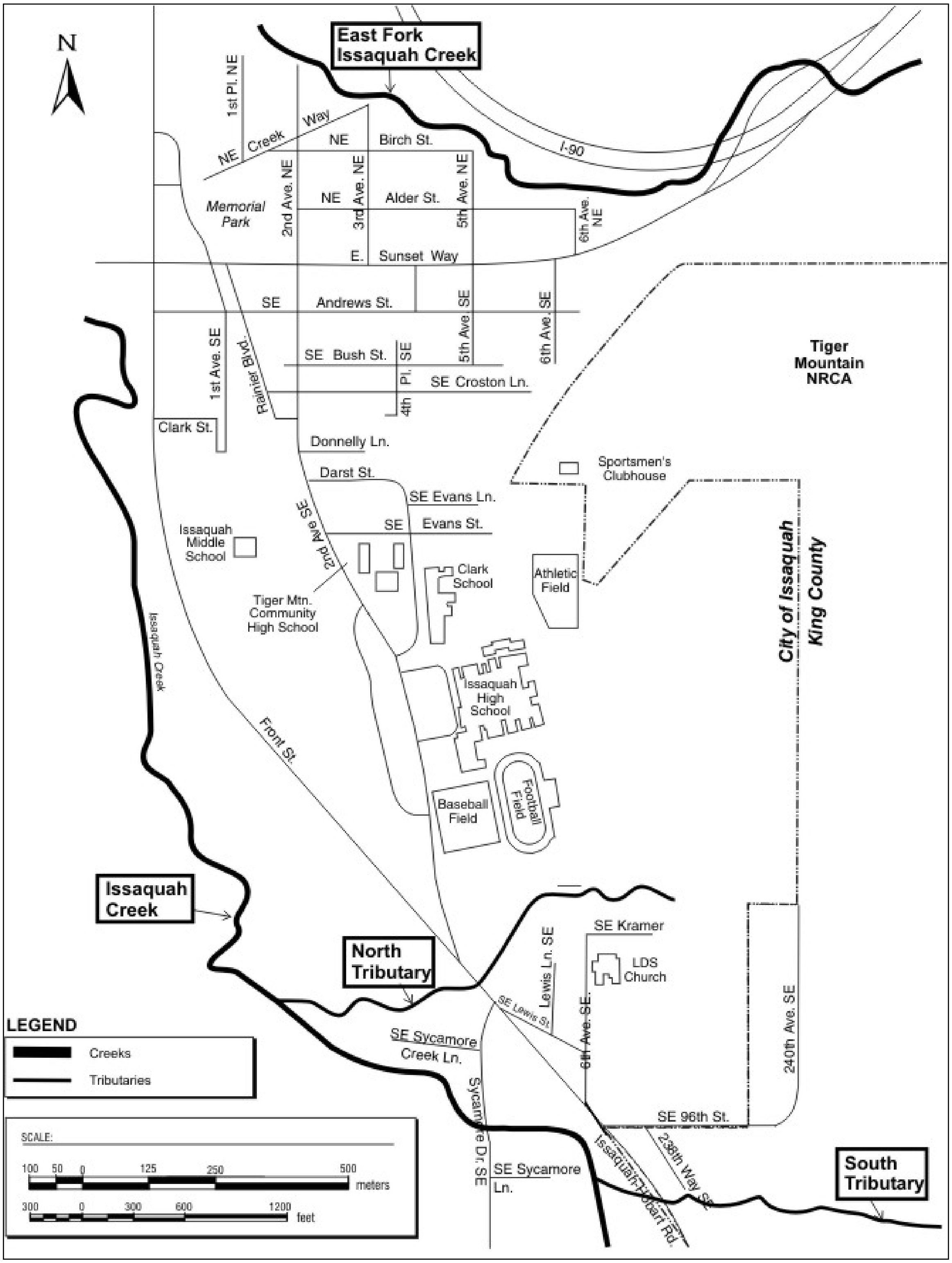

Figure 3-10
Project Area Streams

of Issaquah to replace undersized (18-inch-diameter) concrete pipe culverts. A portion of the stream channel west of Front Street South was also rehabilitated in conjunction with new culvert installation.

The average annual flow in this small perennial stream is estimated to be 0.025 cubic meters per second, or 0.9 cubic feet per second (King County SWM et al., 1991). Based on field reconnaissance conducted for this project, the stream channel is considered to be in relatively poor condition (aside from the areas that were rehabilitated in 2004), with some sediment accumulation where it crosses the Front Street South–Issaquah/Hobart Road corridor just beyond the south end of the project site. Dense vegetation on the channel banks in some locations may cause obstruction of high flows in this channel reach.

The south tributary is rated as a Class 2 stream with salmonids, requiring at least 30-meter (100-foot) buffers (Issaquah, 2004; Parametrix, 2003). More detail on the stream channel is provided in the Southeast Issaquah Bypass streams and fisheries technical report (Herrera, 1998), which is incorporated herein by reference. This stream would not be impacted by runoff from the proposed roadway because all runoff from the roadway would be routed to Issaquah Creek via other natural and constructed drainages. As described in the Wetlands section of this chapter, one of the project's wetland mitigation site options is located south of the south tributary on park land adjacent to Issaquah Creek's main stem. If wetland mitigation were to occur at this site, there is a chance that the lower portion of the south tributary could receive slightly greater or lesser flow than at present if the wetland mitigation alters the local drainage pattern in that area. These minor hydrologic changes could be avoided, or promoted if deemed desirable, in the mitigation site design.

The north tributary of Issaquah Creek (also known as the Lewis Lane Tributary and Hope Creek) crosses the South A alignment on the north side of the LDS Church. This small stream supports cutthroat trout and other resident fish. Until recently, the reach of the stream within the project area was not accessible to salmonids due to downstream fish passage barriers. The barrier on Hope Creek at Issaquah Creek was removed in August 2006, as part of the Hope Creek restoration project that was implemented by the Sustainable Fisheries Foundation and the city of Issaquah. Now that it is fish-passable, the north tributary will likely support juvenile coho, kokanee, steelhead, and other fish species common to small streams (City of Issaquah, 2005a). Consequently the stream could warrant a rating of Class 2 with salmonids, according to the city's critical areas ordinance. Streams in this classification require 30-meter (100-foot) buffers (Issaquah, 2004). In this particular setting, the buffer for the north tributary is the buffer required for the adjacent wetland (Issaquah, 2004). The stream originates as groundwater seeping out of the hillside east of the project corridor, near the base of the hill slope below the Lake Tradition Plateau, and flows through surrounding wetlands toward the west. It appears that the project area between the LDS Church and Issaquah High School drains into this stream. There are no recorded flow data or modeled flow estimates available for this stream. It is likely that this stream flows most of the year.

The north tributary is much smaller than the south tributary to Issaquah Creek. Downstream (west) of the project corridor, this stream flows through private properties and a manmade pond, then crosses Front Street South in a culvert

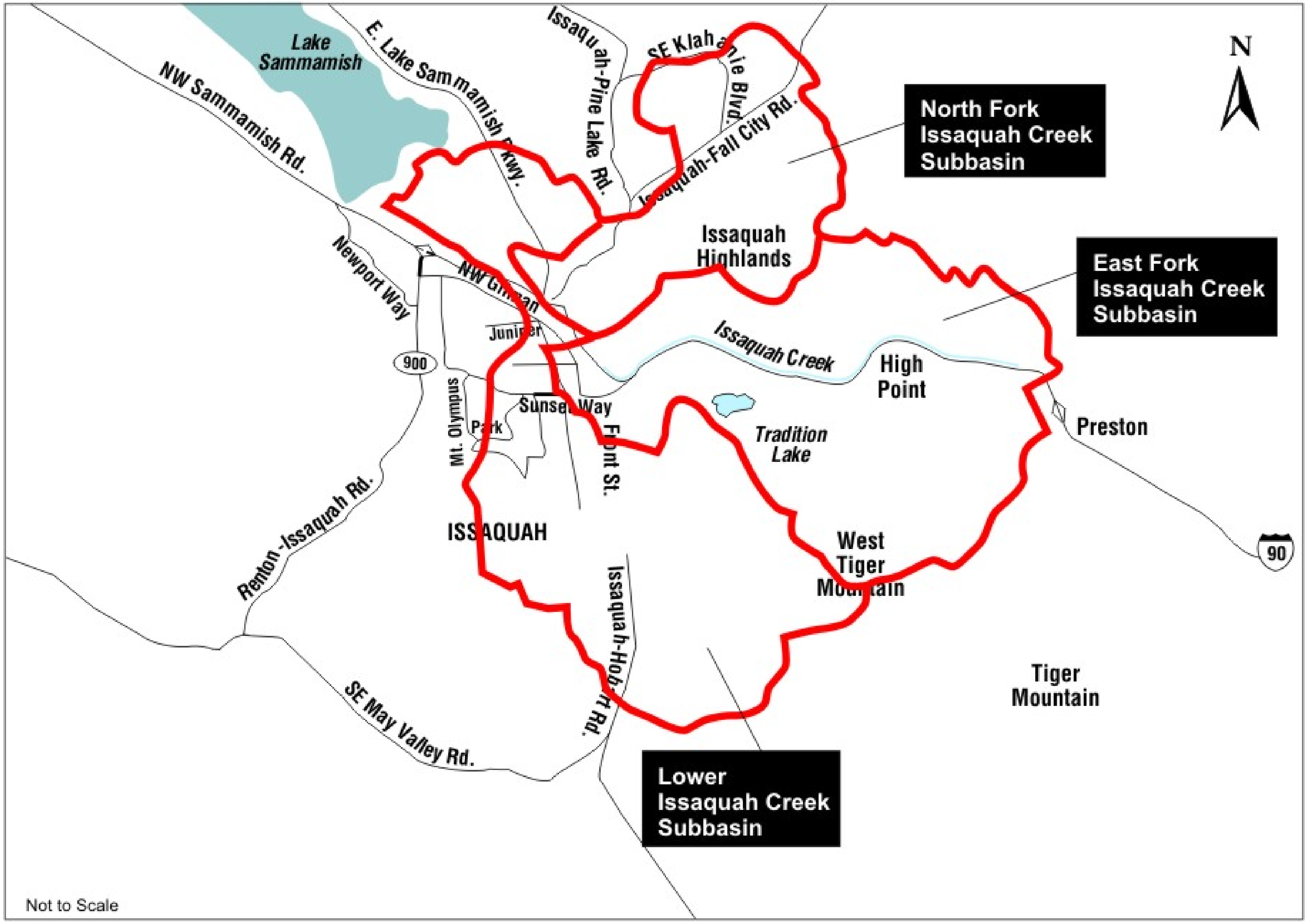

Figure 3-11
Subbasin Boundaries

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and flows into Issaquah Creek via a natural channel. More detailed information on the condition of the north tributary channel is provided in the Fisheries section of this chapter and in the preliminary environmental investigations for the proposed Park Pointe development (HDR, 2002).

As noted previously, wetlands are an important component of the drainage systems in the southern half of the project corridor. Runoff from most of the land area between Issaquah High School and Southeast 96th Street originates in or flows through wetlands prior to reaching constructed drainage ditches and piped storm drain systems that convey flows to Issaquah Creek. The boundaries of wetlands identified in the project area are shown in the Wetlands section of this chapter. Although these wetlands serve an important function for recharge of shallow groundwater, the extent of overland flow in the southern portion of the proposed project corridor indicates that infiltration of surface water is limited, most likely by the high groundwater table. Much of the outflow from the wetland area in the southern part of the site is conveyed in the north tributary to Issaquah Creek. Outflows from the wetlands in this area also occur in several drainage ditches, among them a ditch on the north shoulder of Southeast 96th Street, a ditch along the south edge of the LDS Church property, and several ditches west of 6th Avenue Southeast. There is extensive hydrologic connectivity between the wetlands and the associated downstream conveyance systems in the southern portion of the project area.

Issaquah Creek is the largest tributary draining to Lake Sammamish, contributing approximately 70 percent of the total inflow to the lake (Metro, 1995). The total watershed of Issaquah Creek comprises approximately 14,400 hectares (35,600 acres). The creek is generally in excellent condition and supports several species of salmonids. Issaquah Creek is rated as Class 1, requiring at least 30-meter (100-foot) buffers (Issaquah, 2004; Parametrix, 2003). The mean annual flow in the main stem of Issaquah Creek is approximately 2.5 cubic meters per second (90 cubic feet per second) in the reach to the west of the Southeast Issaquah Bypass corridor (King County SWM et al., 1991). The total annual flow in the main stem of the creek is influenced to a minor extent by inflows from the east fork, but the east fork is its largest tributary.

Flooding has historically occurred in Issaquah Creek and its tributaries. Flooding induced by high flows in Issaquah Creek occurs infrequently (approximately every 10 to 20 years). The last major flood event was in 1996. Flooding occurs east of Front Street South in the southern portion of the project area on various low-lying public and private streets. Flooding conditions may worsen as development continues to occur in the Issaquah Creek watershed if sufficient flooding mitigation is not incorporated with development projects. Details on the floodplain areas in the project vicinity are provided in the Floodplains section of this chapter.

East Fork Issaquah Creek

East Fork Issaquah Creek flows westward through the I-90/East Sunset Way interchange site beyond the north end of the proposed project corridor and into the main stem of Issaquah Creek, approximately 1.7 km (1 mile) west of the overpass bridge in the center of the expanded interchange. The east fork is an excellent quality stream, rated as Class 2 with salmonids upstream of the I-90/East Sunset Way interchange and as Class 1 downstream of the interchange (Parametrix, 2003). Throughout the project area and downstream, East Fork Issaquah Creek requires at least 30-meter (100-foot) buffers (Issaquah, 2004). This stream originates on the northeast slopes of Tiger Mountain, approximately 5.5 km (3.5 miles) southeast of the I-90/East Sunset Way interchange, and flows adjacent to I-90 for much of its length in those reaches upstream of the project site. The mean annual flow in East Fork Issaquah Creek is approximately 0.54 cubic meters per second (19 cubic feet per second) in the I-90/East Sunset Way interchange vicinity (King County SWM et al., 1991). The watershed of East Fork Issaquah Creek, upstream of and including the interchange site, exceeds 2,000 hectares (5,000 acres), most of which is forested.

Flooding also occurs in residential and commercial areas along the creek near its confluence with the main stem of Issaquah Creek in downtown Issaquah. Because most of the watershed of East Fork Issaquah Creek consists of protected lands on and near Tiger Mountain, it is unlikely that flooding problems will noticeably worsen along the lower reach of the creek due to future development in its watershed.

Groundwater

The corridor containing the alternative alignments for the Southeast Issaquah Bypass is located on the eastern edge of the lower Issaquah Valley. The lower Issaquah Valley aquifer underlying this area supplies water to most of the population in the city of Issaquah, and to several developments on the East Lake Sammamish Plateau to the north. The I-90/East Sunset Way interchange at the north end of the project site lies east of the lower Issaquah Valley, but groundwater recharge occurring in this interchange area contributes flows to the lower Issaquah Valley aquifer (Golder, 1993).

Aquifer Systems

The hydrogeology of the lower Issaquah Valley and adjacent upland areas is defined by glacial deposits from the last glaciation period, the Vashon glaciation, and subsequent naturally-occurring erosion and sedimentation during the past 10,000 years. A regional aquifer, known as the lower Issaquah valley aquifer, underlies the entire project site. Local perched and subperched aquifers are associated with recent alluvial deposits, less permeable layers within the glacial deposits, and bedrock. A brief description of the lower Issaquah Valley aquifer system is provided in the following paragraphs. More information on the hydrogeologic characteristics of the project area is contained in the Southeast Issaquah Bypass earth technical report (Icicle Creek Engineers, 1998).

The lower Issaquah Valley aquifer occupies unconsolidated sediments originating from recent alluvial deposits, recessional outwash, deltaic deposits, older lacustrine (lakebed) deposits, and pre-Vashon glacial deposits. The aquifer, which is characterized by permeable zones of sand and gravel stratified with lower-permeability zones, extends approximately 180 meters (600 feet) below the valley floor. The deltaic deposits are highly permeable and are the most important source of groundwater within the aquifer (Golder et al., 1993). Recessional outwash is also highly permeable, and shallow alluvial deposits vary in permeability and may not be fully saturated. The other geologic layers within the aquifer are less permeable and may provide local aquitards (layers of low permeability that store groundwater, but delay its flow).

Perched groundwater creates smaller aquifers near the base of the hillslope along the east edge of the project site. The preliminary environmental investigations for the proposed Park Pointe development (sited adjacent to the central portion of the Southeast Issaquah Bypass corridor) describes two shallow, perched aquifers in detail. These small aquifers are underlain by low-permeability soils and bedrock. Seepage from these aquifers occurs in small springs that drain to wetlands in the project area (HDR, 2002).

Infiltration of precipitation and surface runoff that contributes to groundwater recharge in the project area is variable across the proposed Southeast Issaquah Bypass corridor. Local infiltration rates are affected by soil porosity, confining soil layers that retard downward percolation of water, and groundwater levels. The available information indicates that the depth to groundwater varies considerably across the project site. In some areas the groundwater aquifer is very deep (over 30.5 meters [100 feet] below ground surface near the Issaquah Sportsmen's Clubhouse). In some locations adjacent to the wetland and stream areas, the depth to groundwater is only a few feet below the ground surface. The varying geological conditions in this area, seasonally high groundwater levels near the surface beneath part of the project corridor, and silt lenses in the near-surface soils can greatly impact site-specific infiltration rates. Additional site-specific studies are recommended for determination of design infiltration rates at each proposed infiltration facility. Recent testing conducted at the I-90 Sunset interchange infiltration facility resulted in a revised design (actual) infiltration rate of approximately 0.75 inches per hour.

Water Wells

Well water monitoring and well tests conducted for various studies of the aquifer system provide information on water levels and the capacity of the aquifer. Static water levels range between elevations of 7.5 and 21 meters (25 and 70 feet) (mean sea level [MSL] datum) in wells completed in the central valley area at a wide range of depths, and a few of these are artesian wells. Hydraulic conductivities in the aquifer are estimated to average 60 to 90 meters (200 to 300 feet) per day. Aquifer yields range from 60 to 190 liters per second (1,000 to 3,000 gallons per minute [gpm]) in wells operated by the city of Issaquah and the Sammamish Plateau Water and Sewer District. However, for domestic wells the yields are typically less than 6 liters per second (100 gpm) (Golder et al., 1993).

The Sammamish Plateau Water and Sewer District operates a Class A water supply system that draws from two hydrologic zones: the plateau zone and the Cascade view zone. The plateau zone is the largest supply area, and draws water from the plateau aquifer via five wells and the lower Issaquah valley aquifer via three wells (Sammamish Plateau Water and Sewer District, 2006). The Cascade view zone represents a smaller supply area in the northern portion of the district, further north than the potential range of influence of the Southeast Issaquah Bypass project. The district completed a connection to the city of Seattle's regional water supply pipeline in September 2004 to enable supplemental supply and associated operational flexibility. Plans for using water from the regional system, for which Seattle Public Utilities draws from the Tolt River and Cedar River watersheds, were expected to begin in 2006 (Sammamish

Plateau Water and Sewer District, 2005 and 2006). The water from the regional pipeline will be blended with the district's groundwater withdrawals from the lower Issaquah valley aquifer to serve users in the southern portion of the district's service area north of I-90.

The city of Issaquah also operates a Class A water system that uses the lower Issaquah Valley aquifer as its primary source of water. The city's water rights allow groundwater to be pumped at rates of 16 to 76 liters per second (250 to 1,200 gpm), depending on the well. Although the city currently relies on the lower Issaquah Valley aquifer for most of its drinking water supply, the aquifer cannot be designated as a sole-source aquifer by the U.S. EPA because the Issaquah area has other source options for its water supply. As a member of the Cascade Water Alliance, the city of Issaquah has established a connection to the regional water supply pipeline. In June 2006, Issaquah began drawing from the regional water supply system operated by Seattle Public Utilities to meet current and future growth needs (Issaquah, 2006).

Several private wells have been drilled in the vicinity of the Southeast Issaquah Bypass corridor. It is likely that many of these wells are still being used. Additional information on water wells in the project vicinity, including a map of well locations, is presented in the Southeast Issaquah Bypass waterways and hydrologic systems technical report (Herrera, 1998), incorporated herein by reference.

Regional Groundwater Recharge, Discharge, and Movement

The recharge area for the lower Issaquah Valley aquifer is extensive, covering much of the lower Issaquah Creek valley and uplands on the Lake Tradition plateau and the Issaquah Highlands to the east. Most of the Southeast Issaquah Bypass project site lies within the mapped recharge area for the aquifer (Golder et al., 1993). Only the southern end of the Southeast Issaquah Bypass corridor lies outside the aquifer recharge area mapped for the local wellhead protection plan. In general, the available soil mapping combined with the findings of subsurface explorations conducted for the Southeast Issaquah Bypass and the proposed Park Pointe project supports the understanding that most undeveloped areas within the project limits provide recharge for the lower Issaquah Valley aquifer. Thus, there is hydrologic connectivity between surface water within the Southeast Issaquah Bypass project site, underlying groundwater, and Lake Sammamish further to the northwest of the site.

A trend of declining lower Issaquah Valley aquifer levels was observed in the mid 1990s in some areas. Static water level measurements in one local well (Risdon No. 1) from 1981 through 1994 indicated that a gradual 1-meter- (3-foot-) average decline in water table elevation occurred over that period. The decrease in water levels has caused concern among local groundwater users and suppliers. Declining aquifer levels may indicate that the aquifer is being depleted by increased well withdrawals, loss of recharge due to increased impervious surface coverage in nearby urban areas, and/or climatic change (Ecology et al, 1995). This phenomenon has not been observed throughout the lower Issaquah Valley aquifer, and is also partly a function of precipitation patterns. Aquifer water levels measured in 2001 and 2002 appeared to have a seasonal pattern, but an overall decline in aquifer level could not be identified (King County, 2005).

Therefore it is not certain whether a long-term trend of declining aquifer water supply is occurring in the lower Issaquah Valley aquifer.

Groundwater movement occurs horizontally and vertically and is measured by hydraulic gradients occurring between wells completed in the same aquifer. Within the project area, recharge to shallow groundwater primarily occurs from direct precipitation and infiltration of runoff. The direction of shallow groundwater flow is likely controlled by the topography of the land and by underlying low-permeability strata. Within the immediate project area, shallow groundwater flows in various directions as it moves deeper to the regional aquifer in some locations, and as it emerges as seeps in other locations. Deeper groundwater beneath the Southeast Issaquah Bypass corridor generally flows northwest toward Lake Sammamish and the municipal production wells near I-90 (Golder et al., 1993; Seattle-King County Health Department and Issaquah Creek Valley Groundwater Action Committee, 1996). Additional information on groundwater dynamics in the project vicinity is presented in the Southeast Issaquah Bypass waterways and hydrologic systems technical report (Herrera, 1998), the Southeast Issaquah Bypass earth technical report (Icicle Creek Engineers, 1998), and the proposed Park Pointe development preliminary environmental investigations (HDR, 2002).

Shallow Groundwater Conditions

Geologic conditions are an important factor in this project's design, because large retaining walls are proposed along the North C alignment. Between 1996 and1998, geotechnical investigations were conducted to evaluate soil and groundwater conditions along the proposed route (see the Southeast Issaquah Bypass Earth Technical Report, Icicle Creek Engineers, 1998). The borings performed in the area of the proposed walls indicate relatively uniform soil conditions within the project limits. Five separate borings were conducted between East Sunset Way and approximately Bush Street at ground surface elevations ranging from approximately 170 to 220 feet. These borings showed subsurface conditions of medium dense sandy gravel and cobbles, with boulders becoming very dense below 6 feet. This material is geologically identified as Vashon recessional outwash. Small lenses of perched groundwater were encountered that, when penetrated by the borings, drained into the borings and stopped running. This demonstrates that these lenses are limited in size and will produce only small amounts of water if an excavation encounters them. Based on the boring data, groundwater seepage is not expected to be a significant concern for wall hillslope cuts and retaining wall construction. However, as noted in the mitigation discussion, careful attention to shallow groundwater in these areas would be an important component of the construction effort.

Impacts

The impacts of the various project alternatives on drainage systems and surface and groundwater hydrology would result primarily from the amount of impervious surface area added for the project improvements, and the types of stormwater management facilities used (i.e., whether drainage from the roadways is discharged directly or indirectly to surface waters or infiltrated to recharge local groundwater). Runoff characteristics could also be altered in off-road areas within the project right-of-way, where existing ground cover would be altered or converted to a different type of ground cover (e.g., forest converted to grass or other landscaping). The potential hydrologic impacts of the project are closely related to likely stormwater runoff discharge patterns in the Southeast Issaquah Bypass corridor. Those discharge patterns would be greatly influenced by applicable regulatory requirements for permanent stormwater management facilities.

Proposed Drainage Patterns Affecting Surface and Groundwater Impacts

Peak stormwater runoff flows from any one of the build alternatives would be managed in the manner described in this section. Attachment C to the Concurrence Point 3 packet, Southeast Issaquah Bypass project (Issaquah, 2005b), titled *Revised Stormwater Analysis*, presents a detailed analysis of stormwater impact scenarios for Modified Alternative 5 that was prepared after the issuance of the supplemental draft EIS in 2004. While specific to Modified Alternative 5, that evaluation is also applicable to the other build alternatives. See the Concurrence Point 3 packet for additional information supporting the following discussion, and Figures S-2 through S-7 in the Summary chapter for stormwater pond locations.

Drainage for All North Alignments

Runoff from new impervious surfaces on all north alignments between the high point near the Issaquah High School athletic fields northward to the connection with the I-90/East Sunset Way interchange would be infiltrated to the maximum extent possible. This portion of the proposed Southeast Issaquah Bypass roadway and the adjacent pedestrian walkway/trail would drain into a stormwater pond (North Pond N-1) located at the north end of the project corridor on the south side of East Sunset Way. Discharge from North Pond N-1 in excess of that infiltrated to groundwater would flow to East Fork Issaquah Creek. A second pond along all north alignments (North Pond N-2), for collecting runoff between the high point near the athletic field and the bridge over the north tributary, would be located near the high school athletic fields on the west side of the roadway, and is predicted to effectively infiltrate runoff to groundwater given favorable geologic conditions at this location.

Drainage for South A Alignments

Runoff from the proposed roadway between the bridge over the north tributary and the south end of the project corridor at the intersection with Front Street South would be discharged to surface drainage systems following treatment and peak flow reduction in engineered wet/detention ponds. Infiltration of stormwater at South Pond A-1/S-1 will be done to the maximum extent possible. Runoff to South Pond A-2/S-2, located just south of the north tributary, could be detained effectively within the stormwater pond under normal conditions, but not during extreme storm conditions when Issaquah Creek floods. This is because the proposed stormwater treatment and detention pond in this area would be inundated during infrequent, major storm events due to flooding induced by high water in Issaquah Creek. This pond could provide stormwater detention for project site runoff for all storms up to approximately a 10-year storm event.

Compensatory detention is proposed at detention pond located along the west side of Front Street South (South Pond A-4 or S-3, depending on the alternative) to enable the equivalent of 50-year storm event flow control for the southern portion of the project area, and to provide retrofit of existing street runoff to meet the water quality treatment goals. A combined wet/detention pond (South Pond A-3) would be constructed on the southwest edge of the intersection of the Southeast Issaquah Bypass and Front Street South. All outflows from this pond would be directed to an existing storm drainage conveyance system that carries flow northward along the Front Street South right-of-way to the north tributary of Issaquah Creek.

Drainage for South C Alignments

Runoff from the proposed roadway between the bridge over the north tributary and the south end of the project corridor at 2nd Avenue Southeast would be discharged to surface drainage systems following treatment and peak flow reduction in engineered wet/detention ponds. Infiltration of stormwater at South Pond C-1 will be done to the maximum extent possible. A combined wet/detention pond (South Pond C-2) would be constructed immediately south of the high school athletic field and another combined wet/detention pond (South Pond C-3) would be constructed on the southwest side of the new intersection of 2nd Avenue Southeast, Front Street South, and the Southeast Issaquah Bypass. (This pond may also be located on property located on the west side of South Front Street to provide adequate storage for retrofit of existing stormwater runoff to meet the water quality treatment goals).

South Pond C-2 would discharge into the wetland located north of the former railroad right-of-way. A new 900-mm- (36-inch-) diameter culvert would replace the existing (smaller) culvert through the former railroad right-of-way, to convey pond outflows and wetland outflows southward to the north tributary of Issaquah Creek. South Pond C-3 would discharge to the south via an existing storm drain conveyance system that empties into the north tributary on the west side of Front Street South. Offsite flows would be bypassed around Pond C-3.

Under all alternatives, approximately 2.1 acres of existing impervious surfaces would be converted to vegetation.

Additional Analysis of Proposed Drainage for Modified Alternative 5

Following the issuance of the supplemental draft EIS in 2004, additional stormwater analyses were conducted to evaluate two groundwater infiltration scenarios for Modified Alternative 5 (Issaquah, 2005b). The two scenarios included a base scenario with infiltration at North Pond N-1 only, and an Alternate Scenario for infiltration at North Pond N-1, North Pond N-2, and South Pond S-1. A summary of each pond site and the prospects for infiltration of runoff from that analysis is provided below.

North Pond N-1

North Pond N-1 would be located below the roadway on the valley floor in an area of alluvial soils that have limited infiltration potential. North Pond N-1 is assumed to function as a large wet/detention (combined treatment and flow control) pond with enhanced water quality treatment, but is also evaluated as an infiltration facility in the alternate scenario. If field testing during project design confirms favorable conditions, North Pond N-1 would be designed to maximize infiltration. In addition to further evaluation of infiltration at North Pond N-1, the feasibility of using linear infiltration along the roadway where retaining walls are not proposed would also be evaluated during design. Overflow from this pond would be piped to East Fork Issaquah Creek where a new outfall would be constructed.

North Pond N-2

North Pond N-2 is assumed to function as a detention pond with extensive infiltration. In the supplemental draft EIS, a design infiltration rate of 5 inches per hour was assumed. Very favorable soil conditions are present at this location for infiltrating stormwater. As much roadway runoff as possible would be directed to this pond, given the topography. North Pond N-2 would discharge its overflow (when the rainfall rate exceeds the design infiltration rate) via an 18-inch-diameter outfall pipe to an open grass-lined ditch. This ditch would convey the stormwater to a wetland located immediately south of the Issaquah High School football field (Wetland HS).

South Pond S-1

South Pond S-1 is assumed to function as a large wet/detention pond with enhanced water quality treatment, but is also evaluated as an infiltration facility in the alternate scenario. During design, this site would be subject to detailed infiltration and groundwater testing to verify its infiltration potential. South Pond S-1 would discharge overflow into Wetland GW using a level spreader located in the wetland buffer.

South Pond S-2

South Pond S-2 is assumed to function as a large wet/detention pond with enhanced water quality treatment. Due to its location in the 100-year floodplain of Issaquah Creek, detaining stormwater may not be effective because the pond would be inundated by flooding from Issaquah Creek at about the 10-year recurrence interval flood. To provide the necessary amount of stormwater mitigation for this segment of the project, offsite detention would be provided at South Pond S-3. More detailed hydrologic studies would be conducted during final design to determine the extent to which South Pond S-2 could effectively detain runoff, with the remaining detention storage function provided at South Pond S-3. Infiltration is not proposed at this pond site due to poor soils and shallow groundwater in this area. Depending on site conditions and the final configuration of the facility, stormwater from South Pond S-2 would either discharge into the buffer of Wetland GW using a level spreader or into the north tributary using a culvert outfall.

South Pond S-3

South Pond S-3 is assumed to function as a large wet/detention pond with enhanced water quality treatment. This pond would provide compensatory (offsite) detention for project site runoff entering South Pond S-2, which (as explained previously) cannot achieve full detention capacity due to its location in the Issaquah Creek floodplain. South Pond S-3 would also provide water quality treatment for offsite runoff coming from Front Street South and 2nd Avenue Southeast. This would be achieved by intercepting an existing storm drain line that runs southward along Front Street South to a discharge point at the north tributary of Issaquah Creek. Because the infiltration potential at this site is poor due to the presence of fine-grained floodplain soils, infiltration is not initially proposed at this location but would be evaluated during design. South Pond S-3 would discharge to the north tributary using either a level spreader that would disperse the flow along the stream bank, or via a new culvert outfall.

Drainage Areas

Table 3-10 shows drainage areas within the limits of the Southeast Issaquah Bypass corridor under each of the alternatives, the estimated ground cover characteristics within that area under existing conditions, and the approximate areas of new impervious surfaces and other ground cover proposed in this same area. In the updated analysis of Modified Alternative 5, project areas were recalculated based on a slightly smaller right-of-way boundary, a modified South A alignment, and other minor adjustments.

Table 3-10
Estimated Site Area and Ground Cover Characteristics for Alternatives 1-6

Alternative	Total Area	Existing Impervious Surface Area	Existing Wetland Area	Existing Forest and Open Space Area	Developed Impervious Surface Area	Developed Open Space Area
Alternative 1	11.71 (28.94)	1.63 (4.04)	0.24 (0.59)	9.84 (24.31)	5.63 (13.90)	6.09 (15.04)
Alternative 2	11.30 (27.93)	1.21 (3.00)	0.03 (0.08)	10.05 (24.84)	5.50 (13.58)	5.81 (14.34)
Alternative 3	11.35 (28.04)	1.42 (3.50)	0.24 (0.59)	9.69 (23.94)	5.66 (13.99)	5.69 (14.05)
Alternative 4	10.93 (27.02)	1.00 (2.47)	0.03 (0.08)	9.90 (24.47)	5.53 (13.67)	5.40 (13.35)
Modified Alternative 5	9.91 (24.50)	1.10 (2.72)	0.24 (0.59)	8.57 (21.19)	5.20 (12.86)	4.71 (11.64)
Alternative 6	11.40 (28.17)	1.22 (3.02)	0.03 (0.08)	10.14 (25.06)	5.28 (13.04)	6.12 (15.13)
Areas listed in units of hectares (acres in parentheses)						

Estimated Surface Runoff and Groundwater Recharge Volumes – Alternatives 1–6

Table 3-11 shows the estimated annual surface runoff and infiltration volumes for Alternatives 1-6, assuming average precipitation conditions for the project area (146 centimeters [57.5 inches] of precipitation in a normal year [NOAA, 1992]). The total developed surface discharge volumes and total developed infiltration volumes listed in Table 3-11 reflect the assumption that Southeast Issaquah Bypass roadway runoff in the south end of the project corridor would be discharged to surface waters, whereas almost all of the bypass roadway runoff north of the entrance to the south trail parking lot would be infiltrated. Although the calculated annual runoff and infiltration volumes shown in this table are very rough estimates, they provide a useful means of comparing the likely hydrologic impacts of the alternatives. Details on the assumptions incorporated in the runoff calculations regarding runoff and infiltration characteristics of various types of ground cover are listed at the bottom of Table 3-11.

Table 3-11
Estimated Average Annual Stormwater Runoff and Infiltration Volumes within the Project Limits for Alternatives 1–6

Alternative	Existing Runoff from Impervious Surfaces	Existing Runoff from Forest and Open Space	Existing Runoff from Wetlands	Total Existing Overland Runoff	Total Existing Infiltration	Developed Runoff from Impervious Surfaces	Developed Runoff from Open Space	Developed Infiltration Occurring Naturally	Total Developed Surface Discharge Volume	Change in Surface Discharge Volume	Total Developed Infiltration Volume	Change in Infiltration Volume
1	21,458 (17.4)	14,366 (11.6)	1,752 (1.4)	37,576 (30.5)	79,014 (64.0)	73,914 (59.9)	22,220 (18.0)	48,885 (39.6)	48,052 (39.0)	10,477 (8.5)	96,967 (78.6)	17,953 (14.6)
2	15,960 (12.9)	14,678 (11.9)	245 (0.2)	30,883 (25.0)	80,730 (65.4)	72,221 (58.5)	21,189 (17.2)	46,616 (37.8)	45,329 (36.7)	14,446 (11.7)	94,698 (76.8)	13,968 (11.3)
3	18,622 (15.1)	14,146 (11.5)	1,752 (1.4)	34,520 (28.0)	77,803 (63.1)	74,382 (60.3)	20,752 (16.8)	45,655 (37.0)	46,584 (37.8)	12,064 (9.8)	94,205 (76.4)	16,402 (13.3)
4	13,124 (10.6)	14,458 (11.7)	245 (0.2)	27,827 (22.6)	79,519 (64.5)	72,689 (58.9)	19,721 (16.0)	43,387 (35.2)	43,861 (35.6)	16,034 (13.0)	91,936 (74.5)	12,418 (10.1)
Modified Alternative 5—see Table 3-12												
6	16,078 (13.0)	14,808 (12.0)	245 (0.2)	31,131 (25.2)	81,445 (66.0)	69,328 (56.2)	22,351 (18.1)	49,172 (39.9)	46,491 (37.7)	15,360 (12.5)	94,361 (76.5)	12,916 (10.5)

Runoff volumes listed in units of cubic meters (acre-feet in parentheses)

Assumptions:
90% of precipitation on impervious surfaces produces runoff in existing and developed conditions.
50% of precipitation on wetlands produces runoff.
10% of precipitation on open space and forest areas produces runoff in existing conditions.
55% of precipitation on open space and forest areas infiltrates in existing and developed conditions.
25% of precipitation on open space areas produces runoff in developed condition.

Example calculations:
Runoff from impervious (existing or developed, in cubic meters) = impervious area (hectares [ha]) * 10,000 square meters (sq. meters.)/ha * 0.9 * 1.46 meters annual precipitation.
Runoff from forest and open space in existing condition (cubic meters) = area of forest and open space (ha) * 10,000 sq. meters./ha * 0.10 * 1.46 meters annual precipitation.
Runoff from open space (i.e., landscaping and grass) in developed condition (cubic meters) = area of open space (ha) * 10,000 sq. meters/ha * 0.25 * 1.46 meters annual precipitation.
Runoff from wetlands (cubic meters) = area of wetlands (ha) * 10,000 sq. meters/ha * 0.5 * 1.46 meters annual precipitation.
Off-road flow that infiltrates to ground water (cubic meters) = area of forest and open space (ha) * 10,000 sq. meters/ha * 0.55 * 1.46 meters annual precipitation.
Note: The revised analysis for Modified Alternative 5 is presented in Table 3-12.

As indicated in Table 3-11, each of the build alternatives would result in greater volumes of runoff discharged to surface and groundwater in the southern portion of the project area compared to existing conditions. This is because the alteration of forest and open space areas to create new impervious surface cover would reduce evapotranspiration of water that occurs in the natural soil and vegetation community. Impervious surfaces produce runoff under nearly all storm conditions, whereas much of the rainfall on natural areas is absorbed by the vegetation and evaporated.

Estimated Surface Runoff and Groundwater Recharge Volumes – Modified Alternative 5

Based on the updated analysis of Modified Alternative 5, **Table 3-12** shows the estimated annual surface runoff and infiltration volumes for Modified Alternative 5. Table 3-12 shows this water balance information for two runoff management scenarios: 1) the base scenario, wherein it is assumed that 95 percent of the inflowing average annual runoff volume could be infiltrated at North Pond N-2 but otherwise no site runoff infiltration can be accomplished at the other ponds, and 2) the alternative scenario wherein 95 percent of the inflowing average annual runoff volume is infiltrated at North Ponds N-1 and N-2, and at South Pond S-1. Details on the assumptions incorporated in the runoff calculations regarding runoff and infiltration characteristics of various types of ground cover are provided in Attachment C to the Concurrence Point 3 packet (Issaquah, 2005a).

Table 3-12
Estimated Average Annual Stormwater Runoff and Infiltration Volumes within the Project Limits for Modified Alternative 5

	Overland Runoff [a] (acre-feet)				Infiltration (acre-feet)		
	Runoff from Impervious Surfaces	Runoff from Forest and Open Space	Runoff from Wetlands	Total	Forest and Open Space	Infiltration Facility	Total
Base Scenario – Minimum Infiltration (Pond N-2)							
Existing	11.7	10.2	1.4	23.3	55.8	0	55.8
Proposed	51.4	10.9	0	62.2	23.9	14.3	38.2
Change				+38.9			-17.6
Alternate Scenario – Maximum Infiltration (Ponds N-1, N-2 and S-1)							
Existing	11.7	10.2	1.4	23.3	55.8	0	55.8
Proposed	17.4	10.9	0	28.2	23.9	46.4	70.3
Change				+4.9			+14.5

[a] Runoff volumes listed in units of cubic meters (acre-feet in parentheses). See Appendix 1 in Attachment C of the Concurrence Point 3 packet (Issaquah, 2005) for detailed calculations.

Based on the analysis described in the Concurrence Point 3 packet and summarized in Table 3-12, the following is concluded:

Under the base scenario, the proposed project would result in increased volumes of surface runoff (estimated to be an increase of 38.9 acre-feet in an average year) and decreased volumes of infiltration to groundwater (17.6 acre-feet).

Under the alternate scenario with increased stormwater infiltration, an increase in average annual surface water runoff volume is predicted (4.9 acre-feet) and it is estimated that the average annual groundwater recharge would increase (14.5 acre-feet) relative to current conditions. This is because the alteration of forest and open space areas to create new impervious surface cover would reduce evapotranspiration of water that occurs in the natural soil and vegetation community. Impervious surfaces produce runoff under nearly all storm conditions, whereas much of the rainfall on natural areas is absorbed by the vegetation and evaporated back into the atmosphere. If the greater volume of impervious surface runoff could be infiltrated effectively, a greater volume of groundwater recharge would result.

Groundwater Impacts from All Build Alternatives

Although the following information was developed for Modified Alternative 5, it applies to all build alternatives, because they all have similar amounts of impervious surfaces, and the stormwater management options for each alternative—including ability to infiltrate stormwater—are also similar enough to not warrant a separate analysis of each alternative.

Approximately 68 percent of the proposed Southeast Issaquah Bypass project area (i.e., the northern 4,000 feet of the proposed 5,870-foot roadway) is located within the mapped recharge area of the lower Issaquah valley aquifer. The total recharge area of the aquifer is estimated to be about 2,900 acres (Golder et al., 1993). However, this 2,900-acre surface recharge area is not the only source of recharge to the aquifer.

Large streams (e.g., Issaquah Creek, East Fork Issaquah Creek, and the north fork of Issaquah Creek) and small streams and shallow interflow along valley margins also recharge the aquifer. Golder et al. (1993) estimated that of the 20 to 25 cubic feet per second (15,000 to 18,000 acre-feet per year) total average annual flow associated with the lower Issaquah valley aquifer, only about 10 cubic feet per second (7,000 acre-feet per year) enters the aquifer via direct infiltration through surface soils in the recharge area. The water balance analysis described previously predicts a 17.6 acre-foot decrease in average annual recharge to groundwater under the base scenario, and a 14.5 acre-foot increase in average annual recharge under the alternate scenario. A 17.6 acre-foot decrease in recharge is equivalent to 0.1 percent (or 1/1000) of the estimated annual lower Issaquah valley aquifer flow.

The impact of all build alternatives on the lower Issaquah valley aquifer recharge can also be estimated by considering the amount of new impervious surface area that would be created by the project, and how that could reduce recharge to the aquifer. With just North Pond N-2 infiltrating stormwater, the net amount of impervious surface area that could block recharge to the lower Issaquah valley aquifer is approximately 7 acres (of an estimated 2,900 acres of total aquifer recharge area). This represents a 0.24 percent reduction of surface recharge to the aquifer and about a 0.1 percent (or 1/1000) reduction of total recharge volume to the aquifer. This is identical to what was predicted by the water balance analysis described previously. If substantial infiltration can be accomplished at North Pond N-1 and South Pond S-1 as assumed in the alternate scenario, no reduction in lower Issaquah valley aquifer recharge would occur. This is because nearly all runoff from the entire roadway area overlying the recharge area would be infiltrated.

Direct Impacts – All Build Alternatives

The direct impacts of any of the proposed build alternatives on existing streams and drainage systems are discussed in this section, including a description of long-term operational impacts. Impacts on wetlands in the proposed project area are discussed in the Wetlands section of this chapter.

Direct impacts (e.g., permanent physical alterations) to existing drainage conveyance systems would occur under any of the build alternatives where the new roadway infrastructure would require displacement or replacement of an existing storm drain, culvert, catch basin, or ditch. These types of conveyance system modifications would occur along 6th Avenue Southeast.

Movement of water out of the large forested wetland system in the south end of the project corridor would not be disrupted. This is because the roadway would cross over the north tributary of Issaquah Creek (also known as the Lewis Lane tributary and Hope Creek) and the associated wetland north of the LDS Church on a 75-meter (246-foot) bridge (**Figure 3-12**). The completed span would cross over the north tributary and associated wetland, providing a wide area for flows to pass unimpeded. Existing culverts beneath 6th Avenue Southeast would be extended or replaced to maintain existing flow paths across the roadway corridor south of the LDS Church. The South C alignment would not cross the north tributary, nor would it alter any other major flow pathways (other than via inclusion of a new, larger culvert to replace the existing culvert through the former railroad right-of-way south of Wetland HS).

Indirect Impacts – Alternatives 1–6

The long-term operations of the Southeast Issaquah Bypass under the build alternatives would result in modifications to existing stormwater runoff characteristics in the area. As shown in Table 3-11, all of the build alternatives would result in an increase in surface runoff volumes discharged to streams in the southern portion of the project area. All of the increase in overland flow volume would occur in the south end of the project site (i.e., along the South A or South C alignment).

Under Alternatives 1, 3, and 5, the peak rates of flow from South Pond A-2 and South Pond A-3 would not cause substantial erosion of the channel or flooding of the stream corridor because the outflows from Pond A-3 would be controlled to resemble forested runoff characteristics as required with King County Level 2 flow control criteria. Pond A-2 would not incorporate flow control because of its location in the Issaquah Creek floodplain (the pond outlet would be submerged when Issaquah Creek is at flood stage, rendering it unable to control outflow rates).

Compensatory flow control for the benefit of Issaquah Creek would be provided in Pond A-4 further to the west near the intersection of Front Street and 2nd Avenue Southeast, but Pond A-4 would discharge directly to the Issaquah Creek riparian area and thus would not mitigate increased flow rates in the north tributary. Thus, most of the runoff from new impervious surfaces in the south end

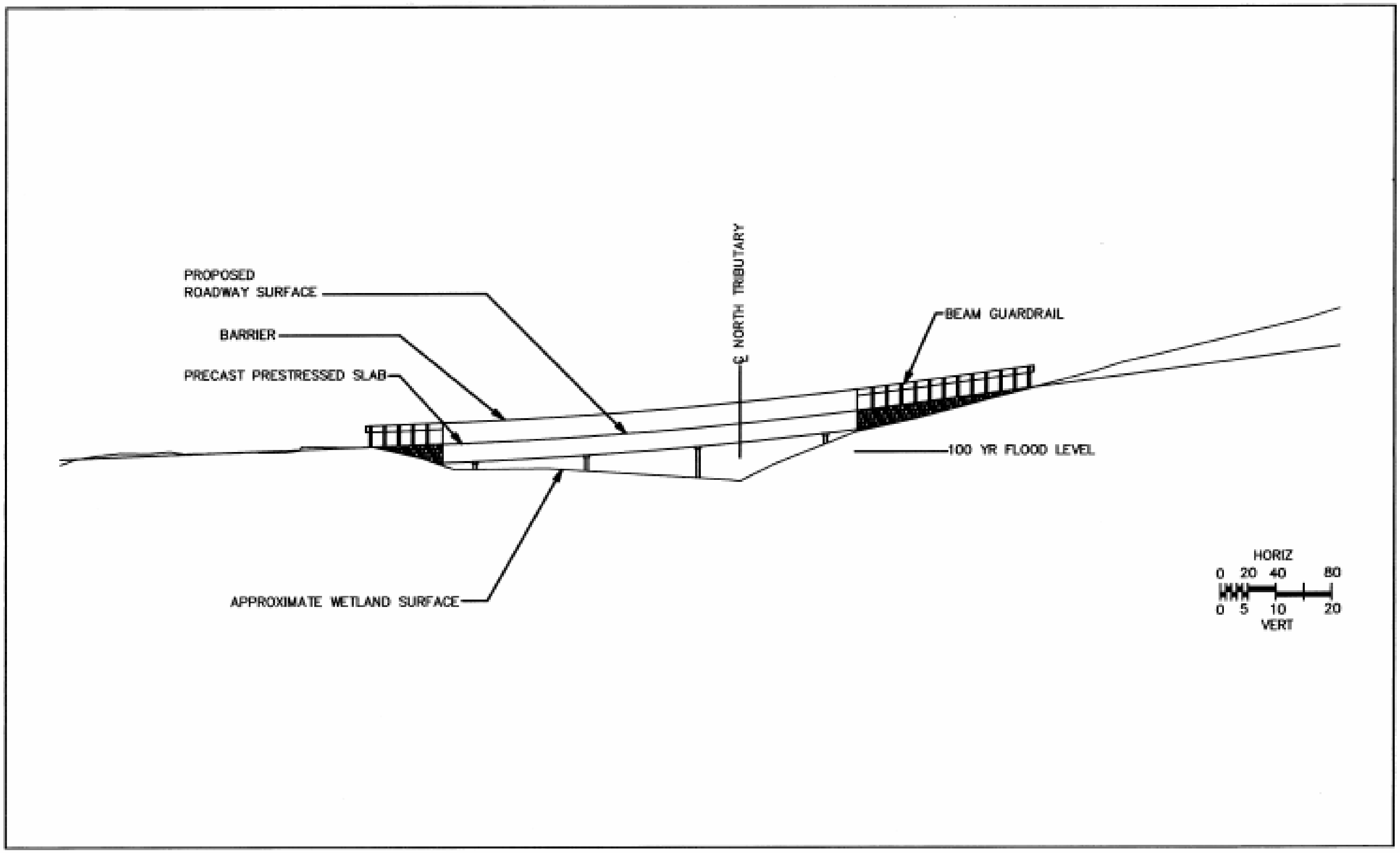


Figure 3-12
Proposed North Tributary Bridge

of the roadway corridor would be controlled to reduce peak flows and the durations of higher flows, but not all of the runoff from new impervious surfaces discharged to the north tributary would be controlled in that manner. Onsite runoff discharged to Issaquah Creek would be completely controlled per King County Level 2 flow control criteria, but there could be minor increases in flow in the north tributary following large storm events because of the inability of Pond A-2 to provide flow control.

Under Alternatives 2, 4, and 6, the peak rates of flow discharged from South Pond C-2 and South Pond C-3 would not be expected to cause substantial erosion of the channel or flooding of the stream corridor because the outflows would be controlled to resemble forested runoff characteristics as required with King County Level 2 flow control criteria. All of the runoff from new impervious surfaces in the south end of the roadway corridor would be controlled to reduce peak flows and the durations of higher flows.

During and after storm events, the north tributary of Issaquah Creek would most likely exhibit a prolonged period of moderate flows for up to a few days. The relatively flat gradient and shallow depth of the north tributary is not conducive to channel erosion, though the increased prevalence of moderately high flows could result in greater incidence of minor overbank flooding between the Southeast Issaquah Bypass roadway and Front Street South. The effects on the north tributary would be less than under Alternatives 1, 3, and 5 because of the greater extent of runoff flow control prior to discharge from onsite ponds to the creek.

Although the new impervious surfaces and associated discharges of site runoff to surface waters in the wet season would tend to cause a slight reduction in the amount of water available for dry season base flows in the north tributary, infiltration of substantial amounts of roadway runoff at South Pond A-1/C-1 would likely help to sustain base flow in the north tributary. It is expected that runoff infiltrated in the vicinity of this proposed pond would travel slowly through the subsurface and reemerge in Wetland GW north of the LDS Church (Beaman, personal communication 2003).

Indirect Impacts – Modified Alternative 5

As noted above, additional analysis of Modified Alternative 5 was conducted to consider two scenarios for groundwater infiltration from the stormwater ponds. This information is provided below.

As with Alternatives 1-6, long-term operations of the Southeast Issaquah Bypass under Modified Alternative 5 would result in modifications to existing stormwater runoff characteristics in the area. As shown in Table 3-12, increased surface runoff volumes would be discharged to streams in the project area. Most of this increase would occur in the north tributary of Issaquah Creek, although some of the increase would occur in East Fork Issaquah Creek at the north end of the corridor.

Under the base scenario (no infiltration assumed at South Pond S-1), the new impervious surfaces and associated discharges of site runoff to surface waters in the wet season would tend to cause a slight reduction in the amount of water available for dry season base flows in the north tributary. Because this tributary receives the majority of its inflow from groundwater seepage emanating at the toe of Tiger Mountain to the east of the proposed roadway corridor, and because those seeps would be unaffected by the project, it is unlikely that this slight reduction in dry season base flow would cause a measurable impact on the stream during the dry season.

The flow control accomplished in Ponds N-1, S-1, S-2, and S-3 would prevent increases in peak flows in Issaquah Creek for storm events up to the 50-year storm event. In more extreme flooding events, such as the 100-year flood, the proposed ponds would discharge uncontrolled overflows at the peak of the runoff hydrograph to the north tributary, East Fork Issaquah Creek, and ultimately the main stem of Issaquah Creek. In the base scenario (no infiltration at these ponds), these overflows in excess of the 50-year peak flow (for which the ponds would be designed to control to forested discharge rates) would likely reach Issaquah Creek in advance of the peak of the flood wave from the entire watershed. Thus, they would not likely induce worsened flooding conditions in downtown Issaquah. In the alternate scenario (maximum infiltration at Ponds N-1, N-2, and S-1), the minor amount of pond overflow in an extreme storm event would have a negligible effect on East Fork Issaquah Creek peak flow and flooding, and a lesser effect on Issaquah Creek compared to the base scenario.

Whether the proposed project would cause impacts on base flows in East Fork Issaquah Creek is subject to geologic interpretation. If extensive volumes of stormwater can be infiltrated at North Pond N-1, it is likely that the infiltrated water would migrate to the underlying the lower Issaquah valley aquifer. Geologic studies have generally concluded that within the lower Issaquah Creek basin, Issaquah Creek and East Fork Issaquah Creek are both losing flow upstream of their confluence (e.g., water infiltrates out of the streambed to underlying groundwater) and are gaining flow downstream of that point (e.g., groundwater flows into the channel) (Golder et al., 1993). This suggests that groundwater recharge occurring in the valley upstream of the confluence of the Issaquah Creek main stem with East Fork Issaquah Creek has limited effect on the hydrology of those stream segments. Therefore, the recharge of stormwater to the lower Issaquah valley aquifer beneath North Pond N-1 would likely have a limited benefit to East Fork Issaquah Creek, but may benefit lower Issaquah Creek below its confluence with the east fork.

A relatively small fraction of the recharged groundwater would also end up in Lake Sammamish without ever entering Issaquah Creek, because the lake is the ultimate discharge point for the lower Issaquah valley aquifer. Relative impacts on streamflows can be roughly quantified by comparing the estimated 17.6 acre-foot decrease in annual groundwater recharge volume under the base scenario to current streamflow rates in Issaquah Creek. On an average annual basis, 17.6 acre-feet per year is equivalent to 0.024 cubic feet per second. Typical summer low flow rates in Issaquah Creek are on the order of 15 cubic feet per second. Thus, the proposed project could potentially reduce the average base flow in Issaquah Creek by about 0.16 percent in the driest time of the year. However, as noted previously, this decrease may only be realized at the lower end of Issaquah Creek where groundwater affects the stream, and this assumes a 100-percent correlation between loss of groundwater recharge and loss of stream base flow, which is an extremely conservative assumption.

Providing additional stormwater infiltration under the alternate scenario would result in no decrease in base flow, regardless of how geology in the area affects subsurface flow movement. This is because groundwater recharge would increase compared to current conditions.

Alternative 7—No Action

The no-action alternative would not result in adverse impacts on existing drainage systems and tributaries of Issaquah Creek in the Southeast Issaquah Bypass corridor, nor would it cause changes in groundwater recharge. This is because there would be no increase in impervious surface coverage or vegetation removal in the project area.

Required Stormwater Mitigation

Stormwater management facilities for all build alternatives would be designed using the guidance and criteria set forth in the 2005 *King County Surface Water Design Manual* or the most current edition, as adopted by the city of Issaquah. The King County manual was recently updated to provide consistency with the Washington Department of Ecology *Stormwater Management Manual for Western Washington*, 2005 edition) and the city will be required to adopt similar standards under the terms of Ecology's Western Washington Phase II municipal stormwater permit. Stormwater management facilities would also be designed to be consistent with the WSDOT *Hydraulics Manual* (WSDOT, 2006).

The project would be required to control peak runoff flows generated on the equivalent area of the new roadway surfaces and on adjacent off-road areas where existing vegetation is altered. If stormwater runoff cannot be infiltrated, the stormwater flow control (detention) system design would have to meet King County Level 2 flow control criteria. Level 2 flow control requires matching predevelopment peak flow rates and flow durations for all storm events, ranging from 50 percent of the 2-year storm to the 50-year storm (King County, 2005).

Consistent with King County's requirements for flow control, the predevelopment condition of the site is considered forested (e.g., the natural presettlement condition) for the purposes of sizing stormwater detention systems for the proposed roadway. Pond facilities would be designed to maximize infiltration and detain as much runoff as possible within the infiltration capabilities of the available pond sites. The volume generated in tributary drainage areas in the 100-year, 24-hour storm event in excess of site infiltration capabilities would be discharged to the adjacent natural discharge point.

It is anticipated that the project would not cause flow rates to increase in Issaquah Creek during flood events. Although the proposed project would be required to reduce peak flow rates in accordance with regulatory criteria, the increased impervious surface area associated with the Southeast Issaquah Bypass roadway under the preferred alternative would result in greater volumes of runoff discharged to Issaquah Creek via the north tributary, and possibly via the east fork if minimal runoff infiltration is feasible in the north end of the project corridor. The discussion of surface water hydrologic impacts presented here is therefore focused primarily on the potential effects of increased volumes of runoff entering Issaquah Creek.

Proposed Mitigation

For direct impacts on existing drainage system features such as culverts, ditches, and catch basins, in-kind mitigation would be provided as needed to maintain flow conveyance capacity and prevent local flooding.

The capacity of existing stormwater conveyance systems in the proposed project area would be evaluated prior to final project design to determine if improvements are needed to handle increased runoff flows. This type of evaluation (an “offsite analysis” contained within a drainage plan report) is required as part of the city of Issaquah permitting process. If improvements are deemed necessary, they would be constructed in conjunction with the new storm drainage facilities in the Southeast Issaquah Bypass corridor.

In compliance with city of Issaquah and King County requirements, and as noted in the preceding impacts analysis, permanent stormwater infiltration/detention facilities would be installed to reduce the adverse impacts of drainage from the equivalent area of all of the new project roadways on nearby wells, surface waters, and existing drainage systems. These facilities would provide suitable protection against adverse flooding and erosive flow consequences that could otherwise occur in Issaquah Creek downstream of the project corridor, and therefore additional flow control measures would not be necessary.

Although available information indicates that infiltration of at least a portion of the site runoff should be feasible at all of the proposed pond sites except for South Ponds S-2 and S-3, additional soil and infiltration rate testing should be performed at all proposed stormwater pond sites to confirm conditions prior to detailed design of the ponds. This testing should consist of several test borings, monitoring well installation, soil grain size analyses, cation exchange capacity testing, and shallow groundwater elevation monitoring. Maximization of infiltration at all proposed pond sites would be a goal for project design.

To offset minor adverse impacts on flow conditions in the north tributary of Issaquah Creek (also known as the Lewis Lane tributary and Hope Creek) resulting from uncontrolled flows at the south end of the roadway corridor, woody debris could be installed in the stream channel to partially impede the rate of flow passing downstream toward Front Street South.

To increase the amount of site runoff that infiltrates the ground, thereby adding to groundwater recharge and reducing effects on the north tributary, the project design would seek to incorporate low-impact development stormwater management techniques to the maximum extent practicable. The project design would include a thorough evaluation of options to maximize infiltration of runoff in off-road landscaped areas that do not drain to engineered flow control facilities, and to incorporate porous pavement or permeable pavers in selected areas. For example, new trailhead parking areas and the pedestrian walkway/trail could be paved with porous materials, and compost amendments could be tilled into grassed road shoulders and landscape planting areas in the roadway corridor to enhance infiltration. Additional low-impact drainage elements may include infiltrating ditches instead of storm drainage pipes, rain gardens incorporated into landscaping, and runoff dispersion into densely vegetated areas.

The retaining walls for both the cuts and fills would be designed with effective drainage behind them, to prevent pore water pressure from building up behind the walls. Drainage captured from behind the walls would be conveyed to facilities designed to infiltrate this water. During construction, boulders and some perched groundwater would probably be encountered due to the presence of small lenses of less permeable soil within the glacial outwash. Engineering controls would be implemented to control this seepage so that pore water pressure does not build up in the fill material, thereby preventing a potentially unstable soil mass. The excavation slopes would also be constructed in a manner that provides temporary stability until the walls are constructed.

Floodplains

Protection of existing 100-year floodplain areas (shown in **Figure 3-13**) are an important part of preventing additional down stream flooding by ensuring that existing storage volumes for flood waters are preserved, and that the volume of runoff water to Issaquah Creek is not increased. All build alternatives would be required to mitigate any floodplain impacts by providing adequate replacement flood storage area. The alternatives that include the South A (6th Avenue Southeast) alignment would result in filling existing floodplain area. All build alternatives would increase runoff volumes due to increased paved areas. The design of the detention ponds will ensure that runoff volumes do not exceed predevelopment rates.

Studies and Coordination

The following studies were used as background information for the analysis of potential floodplain impacts from the Southeast Issaquah Bypass project:

- Issaquah Creek Flood Insurance Study Revisions, Montgomery Water Group, July 2002 revision
- Flood Insurance Rate Map, Federal Emergency Management Agency (FEMA), April 2005
- Current/Future Conditions and Sources Identification Report, Issaquah Creek Basin, published by King County, October 1991
- Final Issaquah Creek Basin and Nonpoint Action Plan, published by King County and Issaquah/East Lake Sammamish Watershed Management Committee, December 1996
- Hydrologic Systems and Floodplains Technical Report, published as part of the Sunset Way/I-90 interchange EIS (Herrera, March 1998)
- King County Sensitive Areas Map Folio, December 1990
- Jurisdictional Wetland Delineation Draft Technical Report (Herrera, June 1998)
- Streams and Fisheries Draft Technical Report (Herrera, June 1998).

Site visits were conducted several times during this study and several long-term residents were interviewed. Several meetings and consultations were also held with the maintenance and engineering staff of the city of Issaquah and King County Public Works Departments to discuss the flooding conditions in the project vicinity.

Affected Environment

Issaquah Creek and the Issaquah Creek Basin have been the subject of studies conducted by the Federal Emergency Management Agency (FEMA), King County, and the city of Issaquah for over the last 10 years. Several areas in the Issaquah Creek basin have experienced flooding problems during major storm events over the past 15 years, including the Lewis Lane Southeast/6th Avenue

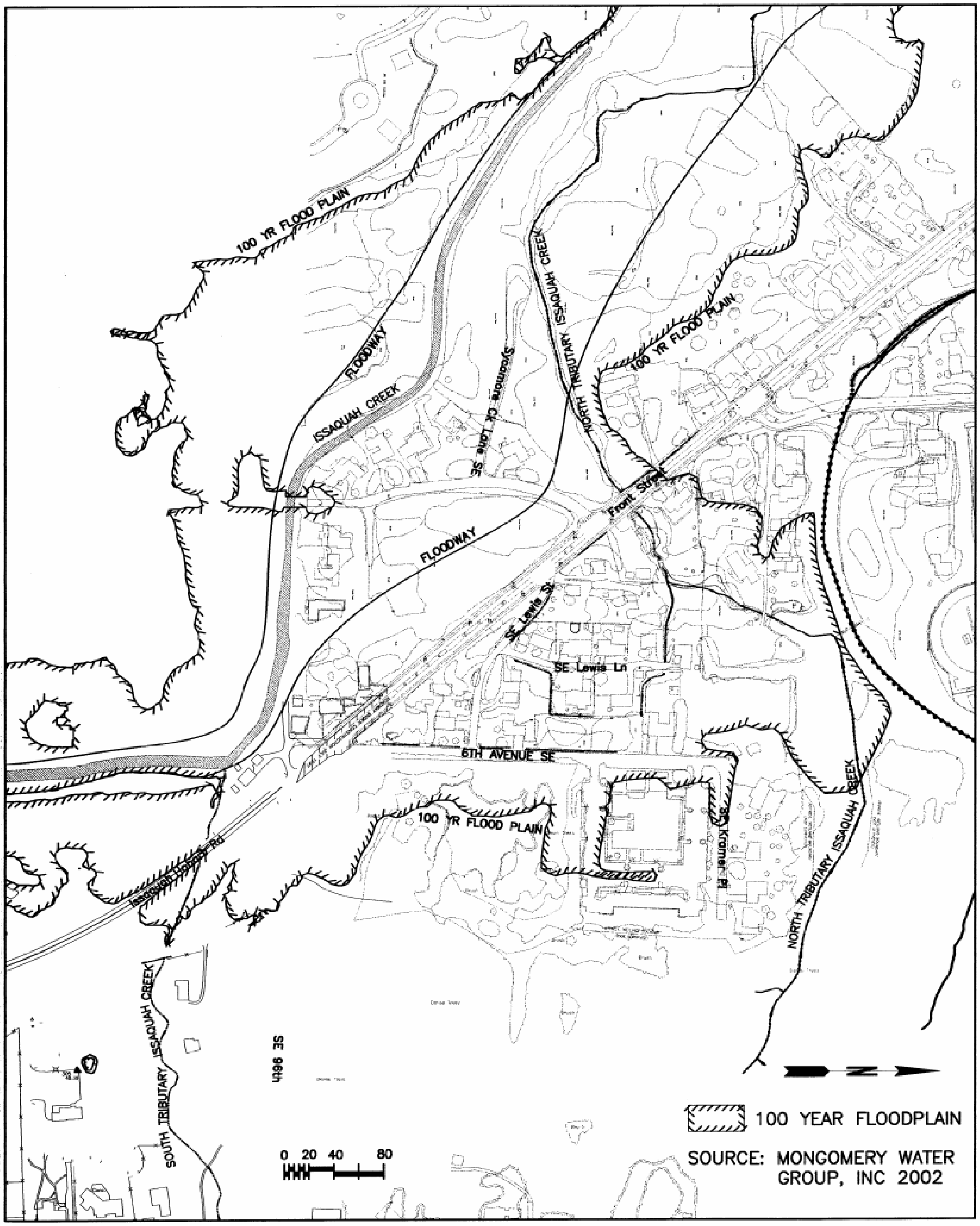


Figure 3-13
Issaquah Creek 100-Year Floodplain

Southeast neighborhood in the south project area. The studies determined the 100-year floodplain elevations in the creek and its tributaries, and determined potential flooding sites during major storm events.

Several solutions for alleviating the flooding problems within the basin were identified, including the need for channel improvement and flow reduction/attenuation from the upper portion of the basin. A study by the Montgomery Water Group entitled *Issaquah Creek Flood Insurance Study Revisions* (July 2002) determined that the limits of the 100-year floodplain within the project area are considerably more extensive than the limits shown on the FEMA maps or in the *Issaquah Creek Basin and Nonpoint Action Plan* (King County, 1996). The results of this study were incorporated into the FEMA flood insurance rate map effective April 19, 2005. It includes much of the lowland area in the southern portion of the project area. The Montgomery Water Group's findings are considered more accurate than the FEMA maps, because areas outside the FEMA 100-year floodplain have experienced flooding problems during several storm events within the past 15 years. These include storms in January 1986, January 1990, November 1990, and February 1996.

The rainfall in January 1990 was classified as a 33-year storm event. The January 1986 and February 1996 rainfall were considered to be 12-year and 16-year storm events, respectively. During the storm events of 1990, the main stem of Issaquah Creek overtopped Issaquah/Hobart Road and flooded the low area at the vicinity of 6th Avenue Southeast. The lowland area through which the proposed Southeast Issaquah Bypass project crosses is a part of the 100-year floodplain, and the proposed Southeast Issaquah Bypass would result in filling a portion of the floodplain.

The Montgomery Water Group 2002 study determined the 100-year floodplains on Issaquah Creek, using an updated flood flow frequency analysis for the hydrological analysis and HEC-RAS modeling for the hydraulic analysis. Detailed aerial photographic mapping from 1998 was used to map floodplain limits. The city of Issaquah uses the floodplain maps for regulatory purposes.

FEMA adopted new flood insurance rate maps based on the Montgomery Water Group study in 2005. Based on this analysis, the limits of the floodplains for the basin were identified and are included in the *Flood Insurance Study Revisions, Issaquah Creek and East Fork* (Montgomery Water Group, Inc., 2002). The report comprehensively discusses the flooding problems within the Issaquah Creek basin and provides a comparison between the limits of the floodplains developed by FEMA and King County.

According to the *Current/Future Conditions and Sources Identification Report* (King County, 1991), the main stem of Issaquah Creek currently experiences flooding problems in the vicinity of the project. The main stem of Issaquah Creek and its tributaries overflow at Sycamore Drive, just to the southwest of the proposed Southeast Issaquah Bypass; flooding several homes and local roads. Bret Heath of the city of Issaquah Public Works Department reports that Issaquah/Hobart Road, just to the south of the project between the Sycamore Drive and 6th Avenue Southeast, experienced flooding and overtopping during the major storm of January 1990. The flood was caused by the high water elevation in the main stem of Issaquah Creek.

Another important factor that contributes to flooding problems along Issaquah Creek is encroachment of development into the floodplain. Floodplain maps were originally prepared in 1973 by the Army Corps of Engineers. Prior to about 1980 there were no floodplain standards that restricted development in floodplain, resulting in many homes being built without anticipation of flood hazards (i.e., elevating structures or not filling within the floodplain). No significant floods occurred between 1951, when most of the valley was farmland, and 1975, after Issaquah had grown significantly. Hence, when flooding problems became apparent starting in 1975, many assumed that flooding was a new problem. In reality, previous floods did occur but did not create much damage because the floodplain had not been developed.

The *Current/Future Conditions and Sources Identification Report* states that the flooding problems along Issaquah Creek and its branches stem from several major factors. Sediments transported by the stormwater runoff from the upper portion of the basin (both from the erosion hazard areas and natural overland sheet flow) are being deposited in the low gradient portions of the creek where the flow has low velocity. The sedimentation problem has reduced the creek flow capacity and has increased the flooding potentials. Also, the loss of upstream flow detention areas, such as natural wetlands, resulting from past development, has increased the rate of flow being conveyed to the downstream area. This has further increased the flooding problems along the lower reaches of Issaquah Creek, including the Southeast Issaquah Bypass project area.

Impacts and Mitigation

Alternatives 1, 3, and Modified 5

Impacts

Due to the amount of new impervious surface planned for the Southeast Issaquah Bypass, there could theoretically be an increase in the rate and volume of stormwater runoff that could in turn potentially increase flooding problems along the main stem of Issaquah Creek. However, because runoff will be detained and discharged into receiving waters at predevelopment rates and duration, adverse impacts on the floodplain from stormwater flows would be low.

The proposed Southeast Issaquah Bypass could also adversely affect the main stem of Issaquah Creek by encroaching into and filling a portion of the floodplain, thereby reducing existing flood storage volumes. Potential impacts on the floodplain from Alternatives 1, 3 and Modified 5 would occur in areas where fill, roadway surfaces, bridge approaches and bridge structures are located within the 100-year floodplain. The area most likely to experience floodplain impacts includes the area along 6th Avenue Southeast from Front Street South to just beyond the north tributary (also known as the Lewis Lane Tributary). The potential floodplain impacts from Alternatives 1, 3, and Modified 5 would be identical—each alternative would fill approximately 3,947 cubic meters (3.2 acre-feet) of floodplain volume.

Because Alternatives 1, 3, and Modified 5 would encroach into the 100-year floodplain of Issaquah Creek and would displace flood storage volume, they could be inconsistent with FHWA regulations requiring that new road construction avoid floodplain encroachments, unless there is no practicable alternative that avoids significant encroachments, or impacts are adequately mitigated (23 CFR 650.111 and 650.113). However, the encroachments entailed by these alternatives are not considered significant because the floodplain risks are low, given the infrequent occurrence of flooding and shallow depths, either due to construction of the project or operationally when the road is in use. A significant encroachment is defined as a significant potential for interruption of a road that is needed for emergency vehicles or provides a community's only evacuation route, a significant risk, or a significant adverse impact on natural and beneficial floodplain values (23 CFR 650.105).

Mitigation

The potential increase in the rate of stormwater runoff associated with the new impervious area would be mitigated by the design and construction of stormwater detention ponds as a part of this project. The ponds would detain the flow rates discharged from the project site into the creeks at the predevelopment rates; therefore no adverse impacts from stormwater flows are anticipated. Filling would be kept to an absolute minimum in the floodplain area and surface of the new road would match existing elevations wherever possible. The loss of floodplain storage could be reduced by placing retaining walls along the bridge approaches to minimize fill quantities within the floodplain. It is anticipated that during very rare flood conditions (i.e., once in 20 years), this portion of the Southeast Issaquah Bypass would be temporarily closed to traffic along with other city streets. After the flood has passed, the road would be cleared of debris, inspected, and reopened to traffic.

Lost flood storage volume would be replaced at the proposed wetland mitigation sites. Two sites are currently under consideration (see the Wetlands section of this chapter). The wetland and floodplain mitigation sites would more than compensate for the lost floodplain volume.

Ground elevations in the 6th Avenue Southeast to Front Street South area are too low to construct a traditional gravity flow detention pond. Therefore, a compensatory storage facility of equal size would be constructed on the westerly side of Front Street South. This detention facility would collect and treat an area equal in size to that of the project area in the 6th Avenue Southeast area. Because flooding currently occurs from water backing up into the project area from the main stem of Issaquah Creek, this mitigation would have an effect equal to constructing a detention facility in the project area, and would not displace any floodplain volume.

Alternatives 2, 4, and 6

Impacts

As with Alternative 1, 3, and Modified 5, the amount of new impervious surface planned for the Southeast Issaquah Bypass could theoretically increase the rate and volume of stormwater runoff, thereby exacerbating flooding problems along the main stem of Issaquah Creek. However, because runoff will be detained and discharged into receiving waters at predevelopment rates, the risk of adverse impacts on the floodplain from stormwater runoff is extremely low.

Impacts on the main stem of Issaquah Creek under Alternatives 2, 4, and 6 would be substantially less than Alternative 1, 3 and 5 because the roadway following the South C alignment would have minimal encroachments into the 100-year floodplain and hence a smaller loss of flood storage volume or impact on flood conveyance. Although the South C alignment follows the former railroad right-of-way, which is considerably higher than the 100-year floodplain elevation, it would need to be widened into the adjacent floodplain area to accommodate the South C alignment which would result in the minor floodplain fill.

Alternatives 2, 4, and 6 would have less encroachment into the 100-year floodplain of Issaquah Creek compared to Alternatives 1, 3, and Modified 5, and thus they are not inconsistent with FHWA regulations requiring new road construction to avoid significant floodplain encroachment (23 CFR 650.111 and 650.113).

Mitigation

Mitigation would be required, similar to Alternatives 1, 3, and Modified 5, but at a lesser scale because floodplain fill would be lower. The potential increase in stormwater runoff associated with the new impervious area would be mitigated by the design and construction of detention ponds as a part of this project. The ponds would detain the flow rates discharged from the project site into the creeks at the predevelopment rates. Lost flood storage volume would be replaced at the proposed wetland mitigation sites.

Alternative 7—No Action

This alternative would not cause any impacts on floodplains.

Floodplain Finding

Under Executive Order 11988, impacts on floodplains are to be avoided or minimization of impacts must be provided. Alternatives with the South A alignment (Alternatives 1, 3, and Modified Alternative 5) result in floodplain impacts as described above. The proposed project would include compensatory storage, provided by proposed stormwater pond facilities and wetland mitigation sites to offset potential floodplain impacts. With this mitigation, no impacts on the 100-year floodplain are expected to occur.

Water Quality

Water quality studies performed for this final EIS looked at several different existing and potential pollutants, and projected future pollutant loadings based on traffic volumes in the year 2030. Pollutant loadings to surface waters such as Issaquah Creek and Lake Sammamish and groundwater impacts on the lower Issaquah Valley aquifer were studied. Water quality degradation in Issaquah Creek and tributary streams and in Lake Sammamish that is due in part to existing urban development and associated roadways in the Issaquah area represents a concern to be addressed as part of the Southeast Issaquah Bypass project. State and federal agencies involved in regional water resource issues and citizens of Issaquah are increasingly focusing on preventing increased pollution from new development that could exacerbate existing problems.

All alternatives, including the no-action alternative, result in increased pollutant loadings in stormwater runoff from new pollution-generating impervious surfaces. The build alternatives mitigate increased pollutant loadings through the use of storm water treatment ponds and infiltration. The no-action alternative also increases pollutants in surface water runoff, due to projections of future traffic increases, although those increases are slightly less than the mitigated build alternatives.

In acknowledgement of these concerns, as expressed by resource agencies involved in the 404 Merger Agreement process during Signatory Agency Committee (SAC) meetings and the biological assessment review, the project plans for the proposed build alternative include a commitment to provide treatment of runoff from the entire Southeast Issaquah Bypass roadway and from a portion of Front Street South, to accomplish no net increase in pollutant loading to surface waters. Plans also include a commitment to install sanitary sewers in the neighborhood adjoining the southern end of the Southeast Bypass corridor. These substantial water quality protection measures bear directly upon the discussion of potential project impacts on water quality described in this section. The no-action alternative would not include these measures.

Studies and Coordination

The analyses conducted for this final EIS required coordination with several agencies and consulting firms involved in the proposed project. This includes Signatory Agency Committee concurrence on the project's preferred alternative and the conceptual mitigation plan for mitigating impacts on aquatic resources. The SAC group includes state and federal resource agencies—including the Department of Ecology, WDFW, USFWS, U.S. EPA, NMFS, and U.S. COE—that are involved in the EIS review process and will have a role in project permitting after the final EIS is issued and the project proceeds into the design phase. This agency and approval process follows steps outlined in the 404 Merger Agreement between the U.S. COE and WSDOT.

Project participants provided information on available surface and groundwater quality data, proposed drainage systems, and appropriate analyses for assessing impacts on Lake Sammamish. The water quality analyses conducted for the North and South SPAR projects and the I-90/East Sunset Way interchange modifications project were used as a basis for similar analyses of the Southeast

Issaquah Bypass project. Related comments received from regulatory agencies on those projects were incorporated into this study.

Groundwater resources in the project vicinity have been the subject of comprehensive study in recent years, as has the Issaquah Creek system. Additional information on existing conditions of East Fork Issaquah Creek was developed for the South SPAR and I-90/East Sunset Way interchange modifications projects. Additional information on wetlands and small streams in the Southeast Issaquah Bypass corridor was developed for this project. A summary of the coordination conducted to obtain all relevant water quality information for this final EIS follows.

- The Issaquah Department of Public Works and King County Department of Natural Resources and Parks, Water and Land Resources Division were contacted to obtain baseline water quality data from the monitoring of Issaquah Creek, East Fork Issaquah Creek, and the Issaquah Creek north fork.
- Two regional experts on Lake Sammamish water quality, Lorin Reinelt (formerly) of the Issaquah Public Works Department, and Jonathan Frodge of the King County Department of Natural Resources and Parks, were contacted for comments on the proposed methods for analyzing construction-phase phosphorus loading impacts on Lake Sammamish.

Several soil samples were collected at the project site for analysis of phosphorus content as part of the erosion impacts analysis. Two of these samples were obtained from boreholes drilled as part of geotechnical investigations for the project, in coordination with fieldwork performed by Icicle Creek Engineers. Coordination was also conducted with the Issaquah Department of Public Works to obtain up-to-date water quality monitoring data in local streams and drainage systems, and to assess options for stormwater management facilities in the project area.

Affected Environment

The primary water bodies within the project area relevant to water quality include: shallow, unconfined aquifer systems beneath and south of I-90, East Fork Issaquah Creek, the main stem of Issaquah Creek, and two small tributaries of Issaquah Creek that cross the Southeast Issaquah Bypass corridor (see Figure 3-10). The south end of the project site contains extensive wetlands. Although these wetlands provide a groundwater recharge function, they also discharge extensive volumes of water to the tributaries of Issaquah Creek. The Issaquah Creek system drains into Lake Sammamish.

Surface Water

The Southeast Issaquah Bypass project area lies within the drainage basin of Issaquah Creek. Issaquah Creek accounts for approximately 70 percent of the total annual inflow to Lake Sammamish (Metro, 1995). Thus, the water quality of Issaquah Creek and its tributaries is a major factor affecting Lake Sammamish water quality. East Fork Issaquah Creek is Issaquah Creek's largest tributary, although it accounts for a small fraction of the total flow at its confluence with the main stem. The south tributary (also known as Tributary 0199 and Kees Creek) is a moderate-sized stream, emanating from headwaters east of the project site on the Tradition Lake plateau. The north tributary (also known as Lewis Lane tributary and Hope Creek) is a very small stream that originates as groundwater seeps on the east edge of the project area in the large forested wetland that surrounds the LDS Church. The limited amount of surface runoff that occurs in the north end of the project corridor flows to East Fork Issaquah Creek. Most of the surface runoff in the southern half of the project site drains to the north tributary to Issaquah Creek.

Existing water quality conditions in surface waters of the project area are described in the following sections, beginning with Lake Sammamish and proceeding upstream through the Issaquah Creek main stem and east fork. Although minimal water quality data are available for the north and south tributaries of Issaquah Creek (which cross through and near the Southeast Issaquah Bypass corridor), these tributaries are likely to have generally excellent water quality for most parameters of concern, because much of their flow comes from groundwater sources and their drainage basins are relatively undeveloped.

Lake Sammamish

Lake Sammamish is approximately 13 km (8 miles) long and 2 km (1.2 miles) wide, with a surface area of 19.8 square kilometers (km) (7.6 square miles), a maximum depth of 32 meters (105 feet), and a mean depth of 17.7 meters (58 feet). The key water quality concern for Lake Sammamish is phosphorus loading from its watershed, as additional inputs of phosphorus may trigger increased algae production that in turn can lead to substantial water quality problems. (Note: in the context of potential impacts on Lake Sammamish, it is important to note that roadways are not typically a major source of phosphorus in runoff.)

The major tributary to the lake is Issaquah Creek, which enters at the south end of the lake and contributes about 70 percent of both the surface water hydraulic flow and total phosphorus loading (Metro, 1995). Tibbetts Creek to the south and Pine Lake drainage to the east contribute about 6 percent and 3 percent, respectively, of the surface water and external total phosphorus load to the lake. Surface water discharge from Lake Sammamish occurs through the Sammamish River at the north end of the lake, and discharge is controlled by a weir in the river at Marymoor Park.

The lake is designated as a resource of statewide significance under the state Shoreline Management Act. Numerous recreational uses such as boating, fishing, water skiing, sail boarding, jet skiing, swimming, and picnicking are available at the lake, and major parks are located at the north and south ends of the lake. The lake's recreational uses and scenic beauty depend on good water quality.

A number of water quality studies and projects focusing on Lake Sammamish have been conducted over the years. The lake has a long history of water quality problems attributable to many sources, including coal mining and logging in the early 1900s, wastewater effluent from the Issaquah sewerage agency between 1940 and the 1960s, and processing waste from a milk processing plant in the mid-1900s.

As the watersheds surrounding Lake Sammamish have become more urbanized, total phosphorus concentrations in Lake Sammamish have increased in recent years. Recent studies have shown that the water quality goals established for the lake in 1989 may not be attained as urbanization continues (Metro, 1995).

An updated water quality management plan for Lake Sammamish was developed in 1996 (Entranco, 1996). This plan states that the overall, long-term management goal is to preserve lake water quality by preventing the expected increase in phosphorus loading to the lake and subsequent increase in algae production and decrease in water clarity. This goal is to be accomplished by applying best management practices (BMPs) to building developments, including structural controls to treat stormwater runoff (e.g., biofiltration swales, wet ponds, infiltration basins, wetland treatment and other biofilters, and possibly alum treatment facilities), and by retrofitting water quality treatment facilities for existing phosphorus sources. The plan also targets water quality protection in basin planning; sensitive area mitigation; development inspection; drainage and steep slope protection; increased maintenance of drainage structures; and education programs for the public, developers, and contractors.

King County has collected water quality data at several monitoring stations in Lake Sammamish in recent years. Data for several water quality parameters spanning the years 1997 through 2005 (posted on the King County Department of Natural Resources and Parks website) indicate that the overall water quality at two stations in the center of Lake Sammamish have met the goals established in the 1996 Water Quality Management Plan for summer (June through September). Secchi depth and mean annual volume-weighted total phosphorus (with the exception of one sample in 2004) was equal to but not less than the 22 μg/L total phosphorus goal (King County, 2006a). The goal for summer (June through September) chlorophyll-*a* levels (2.8 mg/L) was exceeded almost every summer from 1997 to 2005, except for the summers of 1998 and 2001 (King County, 2006a). Water quality data near the outlet of Issaquah Creek from 2000 to 2006 do not show much variance over the 6-year period besides what can be attributed to seasonal variation (King County, 2006a). Based on these data, the lake does not appear to be experiencing accelerated water quality degradation. However, the effects of future growth in the Lake Sammamish watershed can be expected to advance lake degradation unless pollution control measures are implemented throughout the watershed.

The King County *Surface Water Design Manual* (King County, 2005) is followed by the city of Issaquah as a basis for drainage permit approvals. It is widely applied elsewhere in the Lake Sammamish watershed, and includes relatively stringent requirements for stormwater runoff treatment at development and redevelopment sites in watersheds draining to lakes that are sensitive to phosphorus inputs. These treatment requirements are intended to offset increases in phosphorus loading that would otherwise occur, causing the stimulation of algal productivity in certain lakes throughout the county. The sensitive lake protection requirements are applicable to the Lake Sammamish watershed. The goal of these requirements is removal of 50 percent of the phosphorus content in runoff from development sites. It is anticipated that application of these treatment requirements throughout the watershed would help prevent degradation of Lake Sammamish water quality in the foreseeable future.

Issaquah Creek

Issaquah Creek is regulated as a “salmon and trout spawning, noncore rearing and migration habitat” according to state surface water quality standards (WAC 173-201A-200). The Issaquah Creek basin covers approximately 145 square km (56 square miles). Issaquah Creek’s major tributaries are Holder, Carey, Fifteenmile, and McDonald creeks, East Fork Issaquah Creek, and the Issaquah Creek north fork (King County SWM, 1994). Issaquah Creek is the primary source of sediment and phosphorus loading to Lake Sammamish. The average annual total suspended solids loading entering Lake Sammamish from Issaquah Creek is estimated to be approximately 15,800,000 kg (17,400 tons) (Dames and Moore, 1994). Estimates of the average annual total phosphorus loading entering the lake from the creek range from approximately 7,289 kg (8 tons) according to USGS (Embrey and Inkpen, 1998) to 16,400 kg (18 tons) according to a recent stormwater infiltration report written by Golder Associates (Golder, 2003).

King County and the city of Issaquah have identified the following key water quality findings associated with Issaquah Creek:

- Water quality during base flow conditions is generally impaired, with frequent violations of state water quality standards for the numbers of fecal coliform and enterococcus bacteria in Issaquah Creek and tributary waters. Fecal coliform bacteria concentrations are often low, but tend to rise in storm events and in late summer. (Note: in the context of potential impacts on Issaquah Creek, it is important to note that roadways are not typically a major source of fecal coliform bacteria.)
- Average phosphorus concentrations during base flow conditions typically exceed recommended guidelines for Issaquah Creek of 19.5 micrograms per liter (µg/L) total phosphorus (U.S. EPA, 2000). (State water quality standards for nutrients such as nitrogen and phosphorus in streams have yet to be established, but the U.S. EPA recommends limits that are applicable to Issaquah Creek, although these recommended limits are conservative and thus very difficult to achieve).
- During storm flow events, water quality in the creek is often characterized by high concentrations of suspended solids, fecal coliform bacteria, nitrate and nitrite forms of nitrogen, and total phosphorus. Storm flow concentrations for most pollutants exceed state standards or recommended guidelines.
- Benthic invertebrate sampling reveals that the creek’s biological health is poor, due to irregular flows and probably to water quality degradation.
- Prescribed forest practice buffer widths of 7.6 meters (25 feet), applied by the Washington Department of Natural Resources (WDNR) for years in situations where no other permit was involved, are not adequate to perform the primary function of trapping sediment. Erosion of exposed soils and transport of sediments directly into small stream channels was the major water quality problem observed during fieldwork conducted by King County SWM et al. (1991) to identify nonpoint sources of pollution in forest management areas.

In 1994, a basin and nonpoint action plan developed for Issaquah Creek predicted that water quality in the stream would deteriorate markedly with land clearing and development in the upper basin (King County SWM, 1994). That plan was subsequently finalized in 1996. Modeling performed for this plan showed that with current zoning, and mitigation based on the requirements of the 1990 King County *Surface Water Design Manual*, planned developments in the basin could result in substantial increases in the loadings of suspended solids, lead, and phosphorus to Issaquah Creek. However, more stringent requirements for stormwater runoff treatment were set forth in the updated King County *Surface Water Design Manual* (King County, 1998) and subsequently in Ecology's *Stormwater Management Manual for Western Washington* (2001). These supersede the county manual and should reduce the projected pollutant loading increases associated with future development in the basin, resulting in a reduction of water quality degradation in Issaquah Creek. Regardless, future development in the watershed would not likely result in improved water quality in the creek.

Other water quality problems noted in the Issaquah Creek basin include a septic system failure rate of approximately 6 percent (slightly higher than average for the Puget Sound region), and groundwater contamination related to underground storage tanks (USTs) that are concentrated in the downtown Issaquah area (King County SWM et al., 1991).

More recent data collected by King County, through December 2005, indicate that Issaquah Creek continues to be degraded by fecal coliform bacteria and that aquatic organisms and fish in the creek suffer from elevated temperatures in the summer months (King County, 2006b). Four fecal coliform violations of the state criteria occurred at the mouth of the creek during 2005. Nutrient concentrations and total suspended solids were relatively high in the month of May at the creek mouth (King County, 2006b). Violations of the state temperature criteria mainly occurred at the North Fork station in July and August. High levels of nutrients were also measured at the North Fork station in May and August. A 25-year analysis of the data collected from 1979 to 2004 shows that there has been an improvement in water quality at the mouth of the creek, based on decreasing levels of ortho-phosphorus, nitrate, and total nitrogen (King County, 2006b). All three monitoring stations in the creek (mouth of creek, mouth of the north fork, and the main stem) have shown significant increases in water temperature from 1979 to 2004.

The city of Issaquah also conducted monitoring in Issaquah Creek from 1999 to 2002 (Issaquah, 2003). The report summarizing the data noted that fecal coliform concentrations increase as the creek passes through the city, and exceedances of the 100 colonies/100 mL standard occurred up to 50 percent of the time. Fecal coliform concentrations were the highest during storm events and late summer base flow conditions. The tributaries to Issaquah Creek appear to be significant sources of fecal coliform bacteria (Issaquah, 2003). The concentration of total suspended solids appeared to decrease as the creek passed through the city and the 50 mg/L standard was exceeded 24 percent of the time. The fecal coliform and TSS standards were based on the 1997 Ecology rule classifying Issaquah Creek as a Class A water body. Issaquah Creek is classified as a primary contact recreation area in the 2003 Ecology rule, thus the standard for fecal coliform bacteria remains the same as under the 1997 rule (WAC 173-201A-200, -602).

In accordance with Section 303 of the federal Clean Water Act, Ecology publishes a list of degraded surface waters that are not meeting state surface water quality standards on a consistent basis. This is known as the 303(d) list, the most recent of which was published in 2005, reflecting water quality data collected through 2004. Issaquah Creek is on the Ecology 2004 303(d) list of Category V waters (waters that are persistently impaired for at least one designated or characteristic use and that require a "total maximum daily load" [TMDL] study to formally initiate pollution abatement strategies by several parties within the watershed) for low dissolved oxygen concentrations. Issaquah Creek is also impaired by fecal coliform bacteria upstream of the Southeast Issaquah Bypass project site, and as a result a TMDL and an associated water cleanup plan for fecal coliform bacteria were prepared in 2004 (Ecology, 2004). Finally, Issaquah Creek is on the 2004 303(d) list as a Category II water body (waters for which past water quality data indicate potential concerns but that are not impaired to an extent that requires formal action) for pH and elevated water temperatures in the summer months. Fecal coliform contamination is widespread in western Washington and thus is not a unique problem in the Issaquah Creek watershed. It is possible that failing septic systems in the Southeast Issaquah Bypass project area are contributing to fecal coliform bacteria contamination in Issaquah Creek, and to phosphorus loading to Lake Sammamish. Animals, both wild and domestic, are also significant contributors of fecal coliform contamination to streams. The elevated temperatures in Issaquah Creek are a factor in low dissolved oxygen concentrations in the summer months.

East Fork Issaquah Creek

East Fork Issaquah Creek is regulated as a Class A surface water body according to the 1997 Ecology surface water quality standards, and is not explicitly defined under the 2003 Ecology rule. However it can be considered to be a "salmon and trout spawning, noncore rearing and migration habitat" because it drains into Issaquah Creek. The headwaters of East Fork Issaquah Creek are located on the forested northern slopes of Tiger Mountain. Upstream of the I-90/East Sunset Way interchange the east fork channel gradient is relatively steep, and downstream of the interchange the channel gradient flattens as it approaches the confluence with the main stem of Issaquah Creek. The east fork is a relatively energetic stream throughout most of its 12.2-km (7.2-mile) length because of the elevation drop, which has resulted in numerous instances of recent bank erosion in the middle and upper reaches.

When I-90 was constructed in the 1960s, East Fork Issaquah Creek was diverted and the stream channel was confined in many locations. Runoff from I-90 entering the east fork was not detained for peak rate flow control or treated for water quality improvement. Approximately 7.2 km (4.5 miles) of I-90 drains directly or indirectly to the east fork via approximately 50 outfalls (King County SWM, 1994). The east fork stream banks have also been armored and constricted in some locations to facilitate building and road construction along the lower channel (King County SWM et al., 1991).

Water quality data for East Fork Issaquah Creek downstream of the I-90/East Sunset Way interchange were obtained from the King County Department of Natural Resources and Parks, Water and Land Resources Division (formerly Metro) (Frodge, 1997) and the city of Issaquah (2001, 2003). These data, dating back to 1971, were collected near the confluence with the main stem of Issaquah Creek, providing a good historical perspective on background water quality conditions in the creek.

The historical King County data indicate that the east fork typically exhibits good characteristics for dissolved oxygen, temperature, pH, turbidity, zinc, phosphorus, and nitrate+nitrite, but also has concentrations of copper, lead, and fecal coliform bacteria that typically exceed state water quality standards. More recently, data collected by the city indicate low turbidities, no exceedances of recommended phosphorus concentrations, frequent high concentrations of fecal coliform bacteria (exceeding the state standards 25 percent of the time), and occasionally low dissolved oxygen concentrations. The high lead and copper content in the creek could be a natural phenomenon, with some influence from historical mining activities. However, the high fecal coliform bacteria concentrations probably result from ongoing human influences in the basin, including livestock rearing, farming, failing septic systems, and use of fertilizers containing manure. It is likely that the east fork, similar to many streams in the northwest, exhibits elevated turbidities and higher pollutant concentrations during high-flow events when stormwater runoff delivers sediments and other contaminants from the basin into the creek. East Fork Issaquah Creek is not included on Ecology's 2004 303(d) list for any of the pollutant categories.

North Tributary of Issaquah Creek

The north tributary of Issaquah Creek (also known as the Lewis Lane tributary and Hope Creek) is not explicitly classified in Ecology's surface water quality standards (WAC 173-201A) but can be considered to be a stream that provides "salmon and trout spawning, noncore rearing and migration habitat" because it drains into Issaquah Creek. This designation does not acknowledge barriers to fish passage from Issaquah Creek into the project area, which are noted in the Hydrologic Systems and Fisheries sections of this chapter. Water quality data for the north tributary are available from sampling conducted from 1999 to 2001 in conjunction with the proposed Park Pointe development project, and from ongoing monitoring by the city of Issaquah as part of its Resource Monitoring Program (Issaquah, 2001, 2003). According to the preliminary environmental investigations for the proposed Park Pointe project, the north tributary exhibits water quality that "generally complies with Class A standards," as would be expected with its forested drainage area and minimal surrounding development (HDR, 2002). The city's monitoring data (Issaquah, 2003) indicate that the stream exhibits very high levels of fecal coliform bacteria, most likely due to poorly functioning septic systems in shallow groundwater and other natural sources (Ritland 2003, personal communication).

South Tributary of Issaquah Creek

The south tributary of Issaquah Creek (also known as Kees Creek and Tributary 0199) is not explicitly classified in Ecology's surface water quality standards (WAC 173-201A) but can be considered to be a stream that provides "salmon and trout spawning, noncore rearing and migration habitat" because it drains into Issaquah Creek. The only available water quality data for this stream were collected by volunteers in 2003 as part of the city's Aquatic Resource Monitoring Program. These data indicated that the stream exhibits healthy characteristics for dissolved oxygen, pH, temperature, and turbidity. No chemical constituents were monitored. It is expected that this stream exhibits generally excellent water quality characteristics as its drainage basin is almost entirely undeveloped land on Tiger Mountain. The water quality of this stream would not be affected by the Southeast Issaquah Bypass project, as the only potential project linkage to this stream would be associated with environmental enhancements at wetland mitigation site Option #2 at Squak Valley Park.

Groundwater

Information on depths to groundwater in the project vicinity, the direction of groundwater flow, locations of nearby water wells, and mapping of aquifer recharge areas is provided in the Hydrologic Systems section of this chapter. The key aspects of groundwater hydrology as they relate to water quality concerns are as follows:

- According to available water well records, groundwater is present throughout the Southeast Issaquah Bypass project area, generally at depths of greater than 10 meters (33 feet), and it generally flows in directions that parallel the slope of the ground surface topography. At the southern end of the project corridor, the shallow groundwater table elevation approaches the ground surface in a large, forested wetland (Wetland GW).

- Soils throughout the northern portion of the project area are coarse-grained, promoting extensive infiltration of surface runoff that recharges the lower Issaquah Valley aquifer. However, the southern half of the Southeast Issaquah Bypass corridor contains extensive areas of wetlands that are less conducive to groundwater recharge in comparison to the drier northern part of the site. This is because the high water table slows the rate of surface water infiltration beneath the wetlands. Although surface runoff is prevalent in the south end of the project corridor, that area likely contributes to aquifer recharge to a relatively minor extent.

- Groundwater in the project area flows generally northwest toward water supply production wells in the lower Issaquah valley aquifer that are operated by the city of Issaquah and the Sammamish Plateau Water and Sewer District.

- The city of Issaquah relies greatly on the lower Issaquah valley aquifer for most of its water supply, although it is beginning to draw substantial amounts of water from the regional water supply system operated by Seattle Public Utilities to meet future growth needs.

- Several private wells located within the Southeast Issaquah Bypass corridor and to the south and east of the corridor are completed in the shallow, unconfined, aquifer system present in the area.

Information on surficial (shallow, unconfined) and deeper aquifers in the project area is summarized in the *Lower Issaquah Valley Wellhead Protection Plan*

(Golder et al., 1993) and the *Issaquah Creek Valley Groundwater Management Plan* (Seattle-King County Health Department and Issaquah Creek Valley Groundwater Action Committee, 1996). Despite extensive study of these aquifers, their behavior and the interrelationships are not completely understood. It is probable that surface water quality and groundwater quality in the project area are closely related, as evidenced by soils that promote rapid infiltration of runoff and groundwater that resurfaces on hill slopes and stream valleys in the project area.

For the Issaquah Creek Valley Groundwater Management Plan, historical groundwater quality information was compiled from the Washington State Department of Health, the U.S. EPA, and Washington Department of Ecology data sources. Water quality data from all sources indicate that the groundwater quality in the Issaquah groundwater management area is generally excellent. With a few exceptions, groundwater quality in the area meets all Washington State Department of Health standards for public drinking water supplies (Seattle-King County Health Department and Issaquah Creek Valley Groundwater Action Committee, 1996).

Relatively few long-term groundwater quality data are available in these historical records. Monitoring of organic compounds has occurred primarily only around the Cedar Hills landfill and Queen City Farms, in the southern portion of the Issaquah Creek basin several miles from the Southeast Issaquah Bypass project area. Volatile organic compounds (VOCs) have been found in shallow groundwater at chemical spill sites in the northern valley. Trichloroethylene (TCE) was the only volatile organic compound detected during King County monitoring from 2001 through 2004 in the lower Issaquah valley aquifer, and was measured at a much lower concentration than the maximum contaminant level (MCL) (King County, 2005). No other volatile organic compounds have been reported in major aquifers or wells in the Issaquah Creek valley prior to 1994 (Seattle-King County Health Department and Issaquah Creek Valley Groundwater Action Committee, 1996).

Monitored concentrations of inorganic ions in the lower Issaquah Valley aquifer are characteristic of those found in Puget Sound area groundwaters. At some locations, iron, manganese, and other naturally-occurring elements exist in excess of the secondary maximum contaminant levels set by the state. Water quality in the bedrock aquifers is typically inferior to water quality in the unconsolidated aquifers. Some seasonal variation in water quality has been noted (Seattle-King County Health Department and Issaquah Creek Valley Groundwater Action Committee, 1996).

Impacts and Mitigation

The long-term water quality impacts expected for the build alternatives are discussed in this section, along with associated mitigation measures. The evaluation that follows was included in Attachment C to the Concurrence Point 3 packet, Southeast Issaquah Bypass project (Issaquah, 2005a), titled Revised Stormwater Analysis, and replaces the water quality evaluation presented in the supplemental draft EIS. Impacts of the project on wetlands, streams, and drainage systems are discussed in the Wetlands and Hydrologic Systems sections of this chapter. Temporary water quality impacts that would occur during the construction phase of the project are addressed later in the Construction Activity Impacts section of this chapter.

The discussion that follows generally focuses on surface water quality but applies to groundwater as well. Where a distinction is needed to address unique groundwater impacts or mitigation, additional discussion is provided.

Impacts of All Build Alternatives

Surface water and groundwater quality impacts from contaminants in typical roadway runoff could result from the proposed project and would be nearly identical for all of the build alternatives because the amount of drainage from impervious surfaces is similar and the proposed surface water management features would function similarly in all alternatives. Therefore, the discussion below is applicable to all build alternatives, even though it was developed as part of a detailed analysis of Modified Alternative 5.

The build alternatives could have surface or groundwater quality impacts resulting from accidental spills of toxic materials on the roadway surface. The following paragraphs discuss these sources of water quality impacts on both groundwater and surface water.

Pollutant Loading Impacts

All build alternatives would result in greater but similar volumes of overland runoff because of the newly created impervious surface area. Runoff from new roadway surfaces would carry pollutant loads (mass quantities in runoff) to nearby stormwater management facilities and eventually to receiving waters. Pollutants typically present in road surface runoff include oil and grease, hydrocarbons, metals, suspended solids, phosphorus, and toxic organic compounds, all generated by vehicles.

The project site drains westward to the main stem of Issaquah Creek via the north tributary, and also northwestward to East Fork Issaquah Creek. The topographic divide between the east fork and main stem drainage basins is close to the break between the north and south segments of the project alignment.

The Southeast Issaquah Bypass would carry traffic through areas that are currently forested or have local streets with light residential traffic. The forested areas in the northern half of the project area generate very little runoff under existing conditions, and runoff from these areas currently contains little or none of the pollutants common to roadway runoff.

Sand and grit materials would occasionally be applied for improved traction during the winter months on the new roadway, and these materials (sediment) would be carried into the drainage system with stormwater runoff from the roadway. The stormwater treatment facilities planned for the project would remove most or all of these materials, so the effects of traction materials on receiving water quality should be negligible.

Drainage from newly landscaped areas adjacent to the new roadway would be filtered by underlying soils and existing or new vegetation and would likely not contain substantial pollutant concentrations. Therefore, groundwater quality impacts caused by drainage from unpaved areas are not expected to occur to any measurable extent. In some areas of the site, off-road runoff may flow over the ground surface and reach the east fork or main stem of Issaquah Creek indirectly. The effects of this drainage on receiving water quality would likely be negligible.

To assess the effects of the build alternatives on receiving water quality, stormwater pollutant loadings from the proposed roadway in the design year 2030 were estimated. Six representative pollutants were included in the analysis. Pollutant loadings were also estimated for the no-action alternative, to provide a basis for comparison of potential impacts.

These calculations do not focus solely on the area within the project limits. Because all alternatives include plans for treatment of runoff from a portion of Front Street South (drainage to South Pond S-3, A-4, or C-3, depending on the alternative), which is required to meet the goal of no net increase in pollutant loadings to surface water, the pollutant loading calculations included the associated area of Front Street South for both the no-action alternative and the build alternatives. (Note: the descriptions of Pond C-3 in Alternatives 2, 4, and 6 do not specifically identify their use to treat stormwater from Front Street South. However, it should be assumed that they will be needed in order to achieve no net increase in pollutant loadings, because retrofit of existing roadways with water quality treatment facilities is necessary to achieve that goal.)

The pollutant loading calculations for the build alternatives incorporate the likely pollutant removal effectiveness of proposed stormwater treatment systems. The proposed drainage plan includes both infiltration and surface discharge facilities, as described previously in the Hydrologic Systems section of this chapter. Thus, the increased roadway pollutant loading could potentially affect surface and groundwater.

The pollutant loading calculations for the build alternatives were prepared for two stormwater management scenarios: 1) the base scenario wherein 95 percent of the average annual runoff volume entering North Pond N-2 is infiltrated but all other runoff from the project area is treated and discharged to surface waters, and 2) the alternate scenario wherein 95 percent of the average annual runoff volume entering North Pond N-1, North Pond N-2, and South Pond S-1 is infiltrated but all other runoff from the project area is treated and discharged to surface waters. Infiltration ponds would be preceded by a wet pond or other comparably effective treatment system for pretreatment of roadway runoff for groundwater quality protection.

For both the base and alternate scenarios, it was assumed that large wet ponds sized to meet the King County “sensitive lake protection” standard would be used for treatment of runoff discharge to surface waters. Further, it was assumed that treatment of roadway runoff would be accomplished for 91 percent of the average annual roadway runoff volume, which is the standard set forth by both Ecology (2005) and King County (2005) for water quality protection at development sites. Runoff from approximately 151 percent of the project’s new pollution-generating impervious area would be treated, compensating for the less-than-100 percent efficiency of stormwater treatment facilities. **Table 3-13** summarizes the pollutant loading calculations for the project area in the year 2030 for all build alternatives.

Table 3-13
Year 2030 Estimated Pollutant Loadings

	Loading to Groundwater (kg/yr)			Loading to Surface Water (kg/yr)		
	Existing	Proposed Alternative 5	Net Change	Existing	Proposed Alternative 5	Net Change
Base Scenario – Minimum Infiltration (Pond N-2)						
TSS	0	0	0	517	262	–255
COD	4.0	142	+138	1,096	1,845	+749
Zinc	0.08	0.17	+0.09	1.0	0.8	–0.2
Copper	0.07	0.12	+0.05	0.52	0.55	0.0
NO3+NO2	1.3	1.9	+0.6	17	26	+9
TP	0.43	0.80	+0.4	4.7	5.6	+0.9
Alternate Scenario – Maximum Infiltration (Ponds N-1, N-2, and S-1)						
TSS	0	0	0	517	221	–296
COD	4.0	453	+449	1,096	974	–122
Zinc	0.08	0.14	+0.06	1.0	0.47	–0.5
Copper	0.07	0.31	+0.24	0.52	0.30	–0.2
NO3+NO2	1.3	3.6	+2.3	17	15	–2
TP	0.43	2.3	+1.9	4.7	3.0	–1.7

kg/yr – kilograms per year
TSS – total suspended sediment
Zinc – total zinc
COD – chemical oxygen demand
NO3+NO2 – nitrate+nitrite nitrogen
Copper – total copper
TP – total phosphorus.

Under the base scenario, it is estimated that the proposed project would result in reduced or no change in surface water pollutant loadings of total suspended solids (TSS) and metals (the pollutants that aquatic resources are most sensitive to). Increased surface water loadings of chemical oxygen demand and nutrients (nitrogen and phosphorus) are estimated, relative to the no-action alternative. Under the alternate scenario with increased stormwater infiltration, it is estimated that all pollutant loadings to surface waters would decrease relative to the no-action alternative. Pollutant loadings discharged via infiltration systems to underlying groundwater would increase for all of the pollutants analyzed, for both the base and alternate scenarios.

The alternate scenario of increased stormwater infiltration results in reduced impacts on surface waters, with no net increase in loading of all contaminants relative to current conditions, but with increased loading to groundwater. However, this is not due to less treatment of stormwater that would be infiltrated, compared to what is discharged to surface waters. In fact, the removal efficiency for chemical oxygen demand and nutrients is considerably higher in infiltration systems than in wet ponds. If the estimated pollutant loadings to both groundwater and surface water are added together, the alternate scenario would have lower total pollutant loadings compared to the base scenario.

The project plans for the build alternatives also include installation of a network of sanitary sewers in the neighborhood adjacent to the southern end of the Southeast Issaquah Bypass. This sewer system would eliminate untreated discharges of fecal coliform bacteria, nutrients, and other pollutants in domestic wastewater that are currently discharged to surface and groundwater from properties that would be connected to the sewer system. The pollutant loading calculations did not attempt to account for these changes. It is certain that installation of the sanitary sewer system would significantly reduce wastewater-related pollutant loadings to the north tributary, Issaquah Creek, and Lake Sammamish that currently emanate from the project area (and that would continue to occur under the no-action alternative). This beneficial effect would likely more than offset the increase in chemical oxygen demand and nutrient loadings projected to occur under the build alternatives in the base stormwater management scenario (minimum infiltration).

If the alternate stormwater management scenario were realized under the build alternatives, the combination of reduced surface water runoff pollutant loadings and eliminated wastewater pollutant loadings would result in a significant improvement in water quality of the lower reach of the north tributary to Issaquah Creek.

Potential Hazardous Material Spill Impacts

There is a risk of accidental spills of toxic materials on the Southeast Issaquah Bypass roadway, as there is with all other roadways in the project vicinity. The Southeast Issaquah Bypass would promote greater traffic flow through the area compared to normal traffic growth that would occur without the project improvements. Therefore, the hazardous material spill risk in the immediate project area would be considerably greater than at present. Because the Southeast Issaquah Bypass would reduce traffic volumes on Front Street South and East Sunset Way, the risk of hazardous material spills on those roadways would generally be lower in comparison to the no-action alternative.

The risk of hazardous material spills of sufficient volume to contaminate surface waters or groundwaters (i.e., a volume large enough to be reported) was calculated (see Appendix E to the supplemental draft EIS). This calculation used traffic volume data developed for this project for the design year of 2030, traffic accident data compiled by the state of Washington, and information on nationwide highway truck cargoes prepared by the U.S. Department of Transportation. The calculated hazardous material spill risk for the project roadways indicates that spills would rarely occur. The calculated spill risk for the northern and southern segments of the Southeast Issaquah Bypass is one spill approximately every 20 to 35 years.

The calculations of hazardous material spill frequencies prepared for the supplemental draft EIS analysis did not account for the amount of truck traffic encountered within the projected 2030 traffic volumes on the Southeast Issaquah Bypass roadway. This is because the traffic modeling did not distinguish between trucks versus other vehicles. It is likely that the Southeast Issaquah Bypass would promote increased truck traffic through the area in comparison to the no-action alternative. Hazardous material spills resulting from accidents involving trucks would be a greater concern than spills resulting from other automobile accidents, because of greater volumes of spilled materials and because trucks carry a wide variety of toxic materials. A large spill of diesel fuel or other toxic materials from a truck accident would be much more of a concern for aquifer water quality than a small spill of gasoline from a car accident.

Without adequate containment measures, a toxic material spill of large volume on a section of roadway draining to an infiltration facility could adversely affect local groundwater quality. In the case of a spill on a roadway area draining to a wet/detention pond, there would be greater opportunity to isolate and clean up toxic materials and to minimize water quality degradation in Issaquah Creek (and downstream). A toxic material spill that escapes collection could have severe short-term water quality impacts in downstream surface waters.

Although the statistical estimates indicate that this type of water quality problem would be rare, the consequences could be very serious for local well users. Without cleanup actions or other spill containment measures, a toxic material spill draining to a proposed stormwater infiltration pond could affect water supplies at the nearby city of Issaquah wells within a few years. Private wells would not likely be affected by a spill, because no private wells have been identified downgradient of the Southeast Issaquah Bypass corridor (see the Southeast Issaquah Bypass waterways and hydrologic systems technical report (Herrera, 1998) which is incorporated herein by reference, for a map of well locations in the area).

Mitigation for All Build Alternatives

Stormwater Runoff Mitigation

All build alternatives would require permanent stormwater treatment facilities regardless of whether flows are discharged to groundwater or surface water. The stormwater management facilities would be designed consistent with the criteria set forth in the 2005 King County *Surface Water Design Manual* (or most current edition adopted by the city of Issaquah), Ecology's *Stormwater Management Manual for Western Washington* (2005 edition), and the WSDOT *Hydraulics Manual* (WSDOT, 2006, or most current edition at the time of project design). These requirements provide a level of water quality protection consistent with the objectives of the *Issaquah Creek Basin and Nonpoint Action Plan* (King County, 1996c), including improved water quality protection for Lake Sammamish.

As described in the previous Impacts section, all build alternatives incorporate several stormwater treatment facilities to comply with, and exceed, regulatory requirements. Stormwater treatment systems would be designed in accordance with sensitive lake protection guidelines of the King County *Surface Water Design Manual*, which would effectively provide a high level of water quality treatment for the benefit of aquatic habitat and resources in streams downstream of the project corridor. Runoff treatment would not only be provided for the new Southeast Issaquah Bypass roadway, but also for approximately 3.3 acres of Front Street South that currently drains to the north tributary of Issaquah Creek. The stormwater treatment facilities designed into the project would be intended to comply with conservation measures required by the stormwater management requirements under Ecology's National Pollutant Discharge Elimination System (NPDES) Phase II municipal stormwater discharge regulations.

The proposed project would also include installation of a new sanitary sewer system in the neighborhood adjacent to the southern end of the Southeast Issaquah Bypass. This sewer system would eliminate pollutant loadings to the north tributary that are attributable to failing or improperly functioning septic systems.

Based on available subsurface exploration information, it is conceivable that extensive infiltration of stormwater could be accomplished at North Pond N-1 and South Pond S-1. Additional design studies would be performed under Modified Alternative 5 to determine the extent of infiltration that can be achieved at these pond sites, as well as at North Pond N-2. Every effort would be made to maximize the amount of runoff that could be infiltrated in stormwater management ponds, because of the dual benefits of reduced pond sizes and reduced environmental impacts.

Although the proposed stormwater treatment facilities would function to effectively remove pollutants in runoff, the following additional mitigation measures would be implemented during project operations to reduce the potential for pollutants to enter stormwater runoff:

- Minimize the use of pesticides and fertilizers in landscaping maintenance, and use native plantings that thrive with little or no care.
- Provide oil/water separation and floatable material trapping capability in onsite stormwater catch basins for immediate spill containment and ease of cleanup.

Groundwater Mitigation

The developed site would require permanent stormwater treatment facilities for flows infiltrated to groundwater. The stormwater management facilities would be designed consistent with the criteria set forth in the 2005 King County *Surface Water Design Manual* (or most current edition adopted by the city of Issaquah), Ecology's *Stormwater Management Manual for Western Washington* (2005 edition), and the WSDOT *Hydraulics Manual* (WSDOT, 2006 or most current edition at the time of project design). In general, pretreatment to the basic water quality treatment menu is required prior to infiltration.

Accidental Spill Mitigation

Several strategies for protection of surface waters and groundwater in the event of accidental spills are applicable to the design of the Issaquah Southeast Bypass project. These strategies include:

- Effective road design that minimizes the risk of accidents
- Water quality treatment for stormwater generated by the project
- Spill control devices in stormwater facility designs to contain accidental spills
- Spill response plans.

Effective road design is accomplished by following accepted guidelines for transportation design, such as appropriate speed limits, adequate sight distances, signage and signals, and travel lane widths. The project would include several stormwater treatment facilities, as described previously. Spill control devices/features would be included in stormwater facility designs to enable containment of accidental spills long enough to allow the contaminants to be cleaned up. These facilities would complement spill response actions by emergency responders (see following description).

Given the need to protect highly susceptible ground and surface waters, the project would incorporate several features that would minimize the impacts of accidental spills:

- Lined presettling ponds or vaults within the stormwater facilities to isolate contaminants and prevent infiltration to groundwater
- Mechanical devices such as valves or gates in the stormwater presettling ponds, possibly actuated remotely via telemetry, to allow 100 percent containment for short periods of time, allowing for cleanup before impacts on groundwater or surface water occur.
- Hydrocarbon sensors and alarms with telemetry could be installed at stormwater facilities to detect spills remotely. Telemetry of alarms to Public Works Operations could alert spill response personnel immediately upon spill detection. This technology has been applied locally to stormwater facilities at Issaquah Highlands.
- To address the ever-present risk of accidental hazardous waste and contaminant spills in the city, in 2005 the city prepared the spill contingency management plan (SCMP) (Issaquah, 2005b). The plan's purpose is to document the specific requirements, protocols, responsibilities, and materials necessary for city of Issaquah personnel to conduct an emergency spill response during the critical first few hours of an incident on any property within the city limits. The plan was developed to complement the National Incident Management System (NIMS) and the Northwest Area Contingency Plan. It is designed to guide city of Issaquah officials, including Public Works Operations, Public Works Engineering, the Police Department, and Eastside Fire and Rescue, to enable prompt and proper removal of hazardous substances, minimize environmental damage within the city limits, protect human health and the environment, and meet state and federal requirements.

Impacts of the No Action Alternative

The no-action alternative would not cause any alterations in existing runoff and recharge patterns throughout the proposed project area, because no new impervious surfaces would be constructed and no vegetation clearing would be undertaken. Based on pollutant loading estimates prepared for the Concurrence Point 3 packet, Southeast Issaquah Bypass project (Issaquah, 2005a), the no-action alternative would result in lesser average annual pollutant loadings to groundwater compared to Modified Alternative 5. Pollutant loadings to surface waters under the no-action alternative would be lower compared to Modified Alternative 5 if the base scenario of minimal stormwater infiltration were to occur, but would be greater compared to Modified Alternative 5 if the alternate stormwater management scenario were to occur. The ongoing pollutant loadings, with little to no treatment of runoff from project area roadways and increasing pollutant deposition resulting from increased traffic volumes, would contribute to the degradation of water quality in Issaquah Creek and the lower reaches of tributary streams to a slightly greater extent than occurs at present.

The surface water quality impacts of the no-action alternative would also include ongoing pollutant loading to the north tributary of Issaquah Creek (also known as the Lewis Lane tributary and Hope Creek), main stem Issaquah Creek, and Lake Sammamish due to failing or improperly septic systems in the neighborhood adjacent to the southern end of the Southeast Issaquah Bypass corridor. A sanitary sewer system will most likely not be retrofitted in this neighborhood if the Southeast Issaquah Bypass is not constructed.

No mitigation measures for water quality protection would be implemented under the no-action alternative, because no new sources of runoff contamination would be created.

Wetlands

Studies and Coordination

Wetland Delineation Methods

Wetlands were delineated within the vicinity of the proposed project, the potential mitigation areas, and approximately 30 meters (100 feet) beyond the limits of construction. Wetland boundaries were determined using the *Corps of Engineers Wetlands Delineation Manual* (U.S. COE, 1987). This method is required by the city of Issaquah and King County and is consistent with the *Washington Wetlands Identification and Delineation Manual* (Ecology, 1997). Potential wetland areas within the project area were identified as distinct vegetation units (areas having homogeneous physical features or plant characteristics). Features such as species uniformity, dominance, distinct topographic breaks, and obvious similarities in soil or hydrologic indicators define a vegetation unit. A three-parameter approach was used to identify wetlands based on the presence and distribution of field indicators for hydrophytic (wetland) vegetation, hydric soils, and wetland hydrology, as explained in the following section.

Wetland Vegetation

Plant species are divided into three strata: trees, shrubs, and herbaceous species. When over 50 percent of the dominant species in each vegetation unit have a wetland indicator status of obligate wetland (OBL), facultative wetland (FACW), or facultative (FAC), the unit is considered to have hydrophytic (i.e., wetland) vegetation. The wetland indicator status categories are defined by the U.S. COE (1994) and explained in the Southeast Issaquah Bypass wetlands technical report (Herrera, 1998a), and are incorporated herein by reference.

Hydric Soils

Hydric soils are defined as soils that are wet, saturated, or ponded long enough during the growing season to develop anaerobic conditions in the upper strata. Soils were examined by digging test pits at least 41 centimeters (16 inches) deep and 10 centimeters (4 inches) wide, then comparing the soil color (hue, value, and chroma) to chips in the Munsell soil color chart (Kollmorgen Corporation, 1988). Soils with low value and chroma typify hydric conditions. Additional field indicators such as mottling (having spots of contrasting colors), gleying (bluish or greenish coloration), concretions, odor, water presence in the test pit, seepage, and squeeze test results were noted.

Wetland Hydrology

Wetland hydrology is identified by evidence of water present for a consecutive number of days for over 12.5 percent of the growing season of an average rainfall year. Hydrology indicators include flowing water, standing water, and saturated soils. Other characteristics include topographic breaks, watermarks on tree trunks, drift lines, water-stained leaves, and water within 30 centimeters (12 inches) of the soil surface.

Wetland Classification

Three methods of wetland classification were used to describe wetlands in the project area: the U.S. Fish and Wildlife Service (USFWS) classification system (Cowardin et al., 1979), the Washington State Department of Ecology (Ecology) wetlands rating system (Hruby, 2004), and the city of Issaquah rating system (Issaquah, 1995).

Cowardin et al. (1979) devised a system based on physical wetland attributes (i.e., vegetation, soils, and water regime) that has been adopted by the USFWS. Ecology has developed a four-tiered wetland categorization system based on wetland vegetation types, wetland acreage, and number of wetland classes (Ecology, 1993). These four categories are hierarchical: Category I wetlands exhibit outstanding features, and Category IV wetlands exhibit minimal attributes. The city of Issaquah (1995) has adopted a three-tiered wetland rating system that relies on the Cowardin system (Cowardin et al., 1979), the King County (1991) wetlands inventory, wetland acreage, and number of classes. The three classes of wetlands identified by Issaquah are hierarchical: Class 1 wetlands exhibit outstanding features, Class 2 wetlands exhibit moderate attributes, and Class 3 wetlands exhibit minimal attributes (Issaquah, 1995).

Wetland Function Assessment

The habitat functions and values of wetlands identified within the project vicinity were evaluated based on the Washington State Department of Ecology (Ecology) 2004 Washington State Rating System for Western Washington (Hruby, 2004). In this rating system, wetland functions are divided into the following categories: water quality functions, hydrologic functions, and habitat functions. In addition, the wetlands were rated using the city of Issaquah rating system described in the Issaquah Municipal Code (Issaquah, 1995).

Affected Environment

Five wetlands currently exist in the vicinity of the Southeast Issaquah Bypass project. All identified wetlands are in the southern portion of the project area, in the vicinity of the north tributary; no wetlands were identified in the northern two-thirds of the proposed project because this area is upland dominated by outwash soils.

All wetland and wetland buffer impacts must be mitigated. The first priority is to avoid any wetland impacts. If avoidance is not possible, various mitigation measures would be implemented to minimize the impacts. These mitigation measures include modifying design features of the project giving priority consideration to the wetlands, using best management practices, and then compensating for unavoidable adverse impacts. The Department of Ecology recommends compensating for unavoidable adverse impacts associated with this project at a 3-to-1 ratio. In other words, for every acre of wetland impacted, three additional acres must be created. Compensatory wetland area is ideally located either onsite or within the same drainage basin. In accordance with the city of Issaquah code, compensation for unavoidable adverse impacts is required at a 2-to-1 ratio. As such, the Department of Ecology standards exceed the city requirements in this case.

Literature Review Results

Several wetlands and two streams are located within the southern portion of the project area (Herrera, 1997). These wetlands are associated with two unnamed tributaries to Issaquah Creek, identified as the south and north tributaries. The National Wetlands Inventory (NWI) map classifies Issaquah Creek and the south tributary (also known as Kees Creek) as riverine, upper perennial, unconsolidated bottom wetlands that are permanently flooded (USFWS, 1989). The riparian corridor along the south tributary in the project area is identified on the NWI map as a palustrine forested wetland that is seasonally flooded. The north tributary to Issaquah Creek flows into an artificially created pond outside the project area, which is identified on the NWI map as a palustrine unconsolidated bottom wetland that is permanently flooded.

The King County Sensitive Areas Map Folio identifies Issaquah Creek as a Class 1 stream (having outstanding attributes) and shows the south and north tributaries as unclassified streams (King County, 1990). The King County Wetlands Inventory identifies the riparian zone surrounding the south tributary (Issaquah Creek Wetland #5) as a palustrine, scrub-shrub, broad-leaved deciduous wetland dominated by willows and alders (King County, 1991).

The soil survey map of King County identifies six soil types in the vicinity of the project area: Alderwood and Kitsap soils, Everett gravelly sandy loam, Oridia silt loam, Briscot silt loam, Pilchuck loamy fine sand, and Seattle muck (USDA, 1973). The Briscot silt loam, Oridia silt loam, and Seattle muck soil series are classified as hydric soils (USDA, 1988) and are described in this section.

Briscot silt loam is mapped at the southern end of the project area near the intersection of 6th Avenue Southeast and Front Street South. This soil is somewhat poorly drained. The subsoil consists of grayish brown to olive gray fine sandy loam that may be stratified with fine sand and silt loam.

Oridia silt loam is mapped in two areas: an area north of Southeast Kramer Place and another area north of Southeast 96th Street. This nearly level soil is somewhat poorly drained. The subsoil consists of mottled dark gray and grayish-brown silt loam and silty clay loam.

Seattle muck is mapped at the southern edge of the project area near the intersection of 238th Way Southeast and Southeast 96th Street. This organic soil is very poorly drained. The soil profile consists of black to dark reddish-brown muck and mucky peat.

Wetland Delineation Results

Field conditions were evaluated by walking through the entire proposed project area to identify wetland characteristics. Herrera previously delineated four wetlands in the southern portion of the site on June 13, October 7, and December 8, 1997 (Wetlands GW, HS, RD, and VL). Wetland boundaries within the proposed project area were mapped with the assistance of Otak, Inc., who performed engineering field surveys of boundary flags. The 1997 wetland delineations of Wetlands GW, HS, and RD were confirmed in the field by Herrera on January 11, 2005, using a detailed CAD drawing to compare current and previous conditions. During this site visit, Herrera also delineated the boundary of a wetland on the Hope property, located along Front Street South adjacent to the north tributary to Issaquah Creek. The boundary of Wetland VL was also adjusted during this visit. On May 24, 2005, a Herrera biologist performed additional reconnaissance accompanied by a representative from Ecology to discuss wetland ratings (Robohm, 2005). On September 19, 2005, a project biologist performed additional reconnaissance of Wetland GW in support of identifying suitable wetland mitigation opportunities within previously disturbed portions of the wetland.

Table 3-14 summarizes information on these wetlands that was compiled from the literature review and wetland delineations, including the wetland location; approximate size; soil type; overall function rating; federal, state, and local wetland classifications; and recommended buffer widths. Four of these five wetlands are shown in **Figure 3-14** and described below. (The fifth wetland, Hope Wetland, is described in a later subsection.) No wetlands were identified within the northern portion of the Southeast Issaquah Bypass proposed project area (North C).

Table 3-14
Summary of Wetlands in the Project Area

	Wetland HS	**Wetland GW**	**Wetland VL**	**Wetland RD**	**Hope Wetland**
Location	North of former railroad right-of-way and south of Issaquah High School	East of 6th Avenue SE and north of SE 96th Street	West of 6th Avenue SE and east of SE Lewis Lane	South of SE 96th Street and east of Issaquah/ Hobart Road	North of Front Street South and east of north tributary Issaquah Creek
Approximate Size [hectares (acres)]	0.34 hectares (0.85 acres)	10.76 hectares (26.6 acres)	0.20 hectares (0.59 acres)	2.10. hectares (5.2 acres)	4.86 hectares (12 acres) (approx)
SCS Soil Type [a]	Everett gravelly sandy loam	Oridia silt loam	Everett gravelly sandy loam	Pilchuck loamy fine sand	Briscot silt loam
USFWS Classification [b]	PFO seasonally flooded	PFO/PSS/PEM permanently flooded	PSS seasonally flooded	PFO seasonally flooded	PFO/PEM seasonally flooded
Department of Ecology Classification	Category II	Category II	Category II	Category II	Category II
Ecology-Recommended Buffer Width (feet)	110	110	110	110	110
City of Issaquah Classification	Class 1	Class 1	Class 1	Class 1	Class 1
City Buffer Width (feet)	100	100	100	100	100

[a] Soil types are based on Soil Conservation Service (SCS) classification (USDA, 1973).
[b] USFWS classification of wetlands within the project corridor includes palustrine forested (PFO) wetland types (Cowardin et al., 1979).

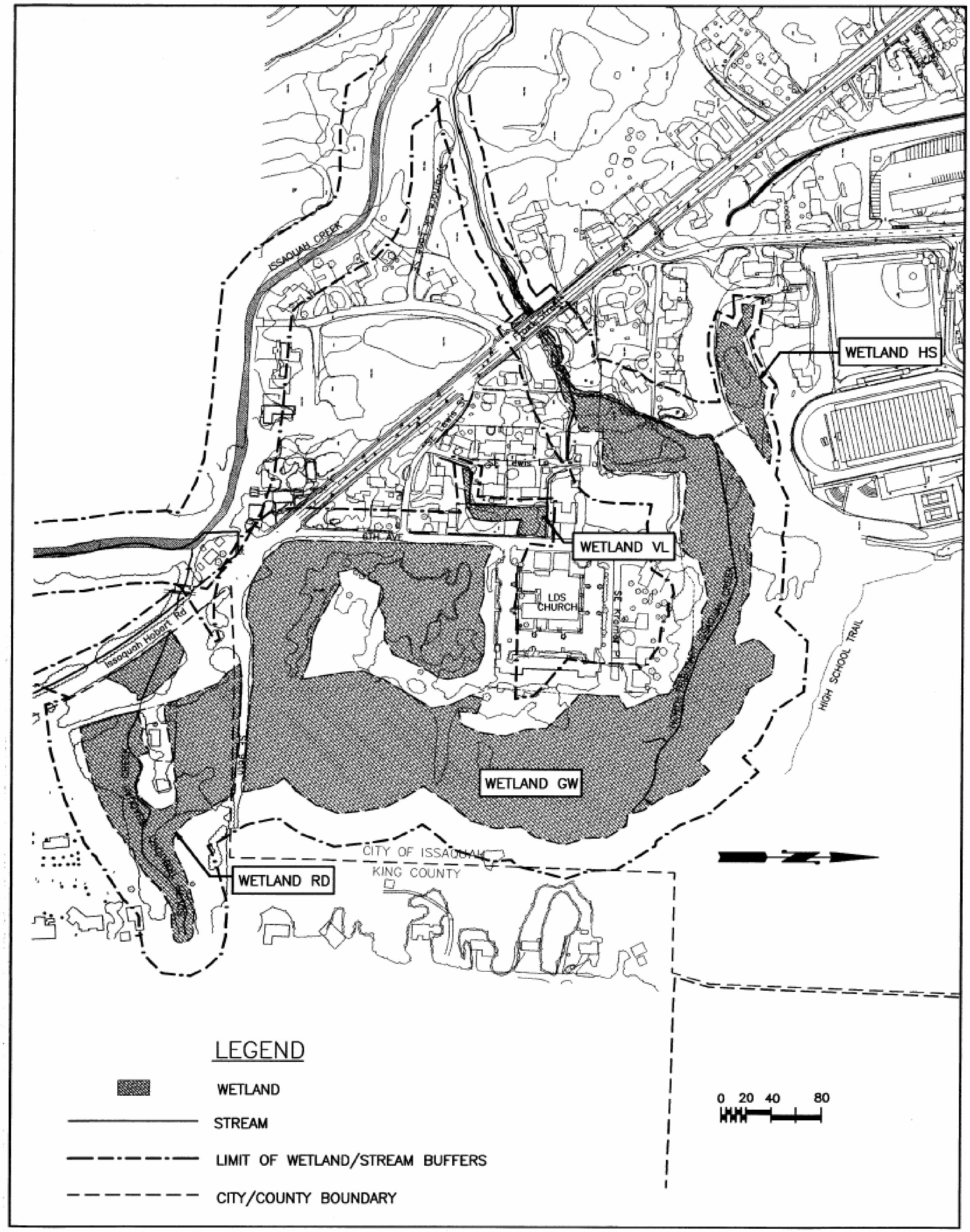


Figure 3-14
Delineated Wetlands HS, GW, VL, and RD

Wetland HS

This 0.4 hectare (1-acre) wetland is located north of the former railroad right-of-way, south of Issaquah High School, and east of 2nd Avenue Southeast (see Table 3-14 and Figure 3-14). This palustrine forested wetland occurs in a depression confined by steep slopes formed by the former railroad right-of-way to the south.

Signs of wetland hydrology observed in Wetland HS include topographic breaks, standing water, and wetland drainage patterns. This depression collects surface water runoff from the surrounding area and from several culverts draining the Issaquah High School athletic fields, which are routed into this wetland. This wetland is hydrologically connected to Wetland GW and the north tributary by a culvert through the former railroad right-of-way. The average annual flow out of this wetland is estimated to be less than 0.14 cubic meters (5 cubic feet) per second.

Wetland HS has moderate species diversity and contains a mosaic of trees growing on hummocks and along the margin of the wetland area. Wetland vegetation in the tree layer includes red alder (*Alnus rubra*), western red cedar (*Thuja plicata*), and black cottonwood (*Populus balsamifera*). The shrub layer is dominated by salmonberry (*Rubus spectabilis*), hardhack (*Spiraea douglasii*), and saplings of red alder and western red cedar. Dominant herbaceous species include reed canarygrass (*Phalaris arundinacea*), lady fern (*Athyrium filix-femina*), slough sedge (*Carex obnupta*), and soft rush (*Juncus effusus*).

The functions of the wetlands on or near the proposed project site were assessed using the method presented in Volume 1 of *Methods for Assessing Wetland Functions* (Hruby et al., 1999). Wetlands GW, HS, RD, and VL are bisected by human-made features, but connected by three culverts, as described in following sections. Therefore, the wetlands are considered to have a surface water connection and are rated as a single wetland unit based on the 2004 Ecology rating system (Hruby, 2004). Wetland HS (and the other connected wetlands) earned moderate performance scores for most of the functions assessed. High performance scores include the potential for reducing/decreasing downstream erosion, the potential for groundwater recharge, habitat suitability for anadromous fish, and habitat suitability for resident fish. More information on the wetland function assessment is included in the conceptual mitigation plan (Issaquah, 2005).

Wetland HS meets the requirements for a Class 1 wetland according to the Issaquah Critical Areas Ordinance rating system (see Table 3-14). The Issaquah Municipal Code specifies a 30-meter (100-foot) buffer for wetlands of this classification. Wetland HS is considered to be a Category II according to the Ecology rating system (Hruby, 2004). Ecology (2005) guidance provides a range of buffer widths between 50 and 300 feet for Category II wetlands. The appropriate buffer width within this range is determined by evaluating the wetland characteristics (e.g., habitat score based on the Ecology rating system) and the impact level (low, moderate, or high) of adjacent land use. The recommended buffer width for Wetland HS is 110 feet because the wetland has a moderate score for habitat functions and is adjacent to moderate impact land use (residential).

Wetland GW

Wetland GW is located at the base of Tiger Mountain and east of Front Street South, and is approximately 27 acres in size. Wetlands in the vicinity of this wetland include Wetlands HS, RD, and VL (see Table 3-14 and Figure 3-14). An abandoned railroad grade separates Wetland HS from Wetland GW, but a culvert connects the two wetlands. Southeast 96th Street separates Wetland RD from Wetland GW, and a culvert located at the intersection of Southeast 96th Street and 238th Way Southeast connects the two wetlands. 6th Avenue Southeast separates Wetland GW from Wetland VL, and the two wetlands are connected by a culvert located under 6th Avenue Southeast.

The outer boundaries of Wetland GW are consistent with that indicated by the 1997 delineation. On September 19, 2005, an upland inclusion was observed within Wetland GW located on the west side of 6th Avenue Southeast (see Figure 3-14). The upland area within Wetland GW on the east side of 6th Avenue Southeast and south of the church parking lot is also potentially larger than that shown in the 1997 delineation (Herrera 1998). If this area is pursued for wetland mitigation purposes (see Proposed Mitigation section), a formal wetland delineation will be conducted.

The source of water for Wetland GW is groundwater seeps along the base of Tiger Mountain that appear to flow year-round. Evidence of wetland hydrology in this wetland includes standing water, flowing water in defined channels, drift lines, saturated soils, and sediment deposits. Surface water in the northern and eastern portion of the wetland discharges directly to the north tributary to Issaquah Creek. At the south portion of the wetland, surface water flows along ditches beside Southeast 96th Street and 6th Avenue Southeast, then flows through a culvert beneath 6th Avenue Southeast, which discharges to Wetland VL. Flows exit Wetland VL via an unnamed ditched stream that reenters Wetland GW and then flows into the north tributary to Issaquah Creek. Surface water also leaves Wetland GW near the south end of 6th Avenue Southeast via a stormwater pipe that connects to the Front Street South stormwater system. That water discharges into the north tributary at the Front Street South culvert crossing of that stream. The average annual flow out of this wetland is estimated to be less than 0.14 cubic meters (5 cubic feet) per second.

Wetland GW is a depressional outflow wetland containing three major plant communities including mixed forest, scrub-shrub, and clearings dominated by emergent species. These communities contain many native species including western red cedar (*Thuja plicata*), red alder (*Alnus rubra*), salmonberry (*Rubus spectabilis*), lady fern (*Athyrium filix-femina*), vine maple (*Acer circinatum*), and devil's club (*Oplopanax horridus*). The emergent community includes reed canarygrass, slough sedge, soft rush, common cattail (*Typha latifolia*), creeping buttercup (*Ranunculus repens*), small-fruited bulrush (*Scirpus microcarpus*), and skunk cabbage (*Lysichitum americium*). The scrub-shrub community associated with the north tributary to Issaquah Creek is dominated by red alder, Pacific willow (*Salix lasiandra*), Sitka willow (*Salix sitchensis*), red-osier dogwood (*Cornus stolonifera*), salmonberry, hardhack, reed canarygrass, and skunk cabbage.

The functions of the wetlands on or near the proposed project site were assessed using the method presented in Volume 1 of *Methods for Assessing*

Wetland Functions (Hruby et al, 1999). Wetlands GW, HS, RD, and VL are bisected by human-made features, but connected by three culverts, as described previously. Therefore, the wetlands are considered to have a surface water connection and were rated as a single wetland unit based on the 2004 Ecology rating system (Hruby, 2004). Wetland GW (and the other connected wetlands) earned moderate performance scores for most of the functions assessed. High performance scores include the potential for reducing/decreasing downstream erosion, the potential for groundwater recharge, habitat suitability for anadromous fish, and habitat suitability for resident fish. More information on the wetland function assessment is included in the conceptual mitigation plan (Issaquah, 2005).

Wetland GW meets the requirements for a Class 1 wetland according to the Issaquah Critical Areas Ordinance rating system (see Table 3-14). The Issaquah Municipal Code specifies a 30-meter (100-foot) buffer for wetlands of this classification. Wetland GW is considered to be a Category II according to the Ecology rating system (Hruby, 2004). Ecology (2005) guidance provides a range of buffer widths between 50 and 300 feet for Category II wetlands. The appropriate buffer width within this range is determined by evaluating the wetland characteristics (e.g., habitat score based on the Ecology rating system) and the impact level (low, moderate, or high) of adjacent land use. The recommended buffer width for Wetland GW is 110 feet because the wetland has a moderate score for habitat functions and is adjacent to moderate impact land use (residential).

Wetland VL

This 0.24-hectare (0.59-acres) scrub-shrub wetland is located in a vacant lot between 6th Avenue Southeast and Southeast Lewis Lane, west of the LDS Church (see Table 3-14 and Figure 3-14). The south end of Wetland VL was redelineated on January 11, 2005, as it was found to be larger than indicated by the 1997 delineation. This wetland has been fragmented by the construction of 6th Avenue Southeast and residential development. Past disturbances from clearing, grading, and ditch excavation have altered this wetland, and it is now confined to a drainage swale that drains to the north tributary to Issaquah Creek.

Wetland VL is a depressional outflow wetland. The source of water for Wetland VL is groundwater and surface water runoff from Wetland GW via a concrete culvert located beneath 6th Avenue Southeast. A level surface water connection between these two wetlands exists at this location. Surface water in Wetland VL discharges to Wetland GW and to the north tributary to Issaquah Creek via an unnamed ditched stream that flows northwest between several residential lots and through a pond. Wetland VL is also bisected by several shallow ditches oriented from east to west, which direct runoff from 6th Avenue Southeast and the LDS Church complex into the large drainage ditch. Evidence of wetland hydrology includes standing water, flowing water in portions of the ditch, and saturated soils. The average annual flow from this wetland is estimated to be less than 0.14 cubic meters (5 cubic feet) per second.

The wetland contains a scrub-shrub plant community that is dominated by Sitka willow and red-osier dogwood. Because it has been disturbed by past clearing and excavation of drainage ditches, both invasive upland (Himalayan blackberry) and native hydrophytic species exist in Wetland VL.

The functions of the wetlands on or near the project site were assessed using the method presented in Volume 1 of *Methods for Assessing Wetland Functions* (Hruby et al, 1999). Wetlands GW, HS, RD, and VL are bisected by human-made features, but they are connected by three culverts, as described previously. Therefore, the wetlands are considered to have a surface water connection and are rated as a single wetland unit based on the 2004 Ecology rating system (Hruby, 2004). Wetland VL (and the other connected wetlands) earned moderate performance scores for most of the functions assessed. High performance scores include the potential for reducing/decreasing downstream erosion, the potential for groundwater recharge, habitat suitability for anadromous fish, and habitat suitability for resident fish. More information on the wetland function assessment is included in the conceptual mitigation plan (Issaquah, 2005).

Wetland VL meets the requirements for a Class 1 wetland according to the Issaquah Critical Areas Ordinance rating system (see Table 3-14). The Issaquah Municipal Code specifies a 30-meter (100-foot) buffer for wetlands of this classification. When rated as a single unit with Wetlands GW, HS, and RD, Wetland VL is considered to be a Category II according to the Ecology rating system (Hruby, 2004). Ecology (2005) guidance provides a range of buffer widths between 50 and 300 feet for Category II wetlands. The appropriate buffer width within this range is determined by evaluating the wetland characteristics (e.g., habitat score based on the Ecology rating system) and the impact level (low, moderate, or high) of adjacent land use. The recommended buffer width for Wetland VL is 110 feet because the wetland has a moderate score for habitat functions and is adjacent to moderate impact land use (residential).

Wetland RD

This palustrine forested wetland is located south of Southeast 96th Street, east of Front Street South, and on both sides of 238th Way Southeast (see Table 3-14 and Figure 3-14). This wetland has been fragmented by 238th Way Southeast, the construction of a house north of the stream channel, and the placement of imported fill at the southwest corner of the intersection of Southeast 96th Street and 238th Way Southeast. The eastern portion of this wetland (east of 238th Way Southeast) extends offsite and covers approximately 2.1 hectares (5.2 acres). The western portion of this wetland, covering 0.3 hectares (0.8 acres), lies between Front Street South and 238th Way Southeast.

The south tributary to Issaquah Creek drains northwesterly through the center of Wetland RD and into Issaquah Creek on the west side of Front Street South. The average annual flow in the south tributary is estimated to be 0.03 cubic meters (0.9 cubic feet) per second (King County et al., 1991). Evidence of wetland hydrology in Wetland RD includes topographic breaks, flowing water in the south tributary of Issaquah Creek, and saturated soils. Within the floodplain of the south tributary, there is evidence that the stream occasionally overtops its banks, and a shallow groundwater table exists at the same elevation as the stream.

The plant community lining the banks of the south tributary to Issaquah Creek consists of a forested wetland dominated by red alder, Sitka willow, salmonberry, and Himalayan blackberry. Other species present include evergreen blackberry, red-osier dogwood, vine maple, creeping buttercup, lady fern, and reed canarygrass.

The functions of the wetlands on or near the proposed project site were assessed using the method presented in Volume 1 of *Methods for Assessing Wetland Functions* (Hruby et al, 1999). Wetlands GW, HS, RD, and VL are bisected by human-made features, but are connected by three culverts, as described previously. Therefore, the wetlands are considered to have a surface water connection and are rated as a single wetland unit based on the 2004 Ecology rating system (Hruby, 2004). Wetland RD (and the other connected wetlands) earned moderate performance scores for most of the functions assessed. High performance scores include the potential for reducing/decreasing downstream erosion, the potential for groundwater recharge, habitat suitability for anadromous fish, and habitat suitability for resident fish. More information on the wetland function assessment is included in the conceptual mitigation plan (Issaquah, 2005).

Wetland RD meets the requirements for a Class 1 wetland according to the Issaquah Critical Areas Ordinance rating system (see Table 3-14). The Issaquah Municipal Code specifies a 30-meter (100-foot) buffer for wetlands of this classification. Wetland RD is considered to be a Category II according to the Ecology rating system (Hruby, 2004). Ecology (2005) guidance provides a range of buffer widths between 50 and 300 feet for Category II wetlands. The appropriate buffer width within this range is determined by evaluating the wetland characteristics (e.g., habitat score based on the Ecology rating system) and the impact level (low, moderate, or high) of adjacent land use. The recommended buffer width for Wetland RD is 110 feet because the wetland has a moderate score for habitat functions and is adjacent to moderate impact land use (residential).

Hope Property Wetland

The Hope property is located to the west of Front Street South, adjacent to the north tributary of Issaquah Creek (see Table 3-14**).** A large wetland (approximately 10 to 15 acres) occurs adjacent to the north bank of the north tributary to Issaquah Creek. This wetland occupies approximately 4.4 acres of the Hope property, with the remainder of the wetland located offsite to the north and west on mostly city-owned properties. The boundary of the portion of the wetland located on the Hope property was delineated during the reconnaissance.

The Hope wetland is a riverine wetland that extends offsite westward to Issaquah Creek. The wetland contains two major plant communities including forest dominated by red alder and an emergent community dominated by invasive reed canarygrass.

The functions of the wetlands on or near the proposed project site were assessed using the method presented in Volume 1 of *Methods for Assessing Wetland Functions* (Hruby et al., 1999). The Hope wetland has high performance scores for most of the functions assessed. Moderate performance scores include potential for groundwater recharge and habitat suitability for wetland-associated mammals. More information on the wetland function assessment is included in the conceptual mitigation plan (Issaquah, 2005).

The Hope wetland meets the requirements for a Class 1 wetland according to the Issaquah Critical Areas Ordinance rating system (see Table 3-14). The Issaquah Municipal Code specifies a 30-meter (100-foot) buffer for wetlands of this classification. The Hope wetland is considered to be a Category II according to the Ecology rating system (Hruby, 2004). Ecology (2005) guidance provides a range of buffer widths between 50 and 300 feet for Category II wetlands. The appropriate buffer width within this range is determined by evaluating the wetland characteristics (e.g., habitat score based on the Ecology rating system) and the impact level (low, moderate, or high) of adjacent land use. The recommended buffer width for the Hope wetland is 110 feet because the wetland has high to moderate scores for habitat functions and is adjacent to moderate-impact land use (residential).

Impacts and Mitigation

The Southeast Issaquah Bypass project's primary goal with regard to Critical Areas is to avoid and minimize impacts on wetlands and their buffers. Recommended mitigation for unavoidable impacts on wetlands is based on a hierarchy of avoiding impacts through careful design; minimizing impacts through best management practices (BMPs); and compensating for unavoidable adverse impacts.

Impacts

All build alternatives would result in permanent impacts on wetlands from the placement of fill, shading, and changes in plant communities. Temporary impacts would be attributable to vegetation clearing, minor grading, equipment staging, and the potential for accidental toxic material spills. **Table 3-15** shows the quantities of permanent and temporary wetland and buffer impacts associated with Alternatives 1 through 6. As a result of the wetland survey conducted in 2005 and the development of Modified Alternative 5, the wetland impacts for this alternative were updated. **Table 3-16** shows the updated permanent and temporary wetland impacts for Modified Alternative 5.

Table 3-15
Wetland and Buffer Impacts for Alternatives 1–6

	Permanent Impacts		**Temporary Impacts**	
	Wetland hectares (acres)	**Buffer hectares (acres)**	**Wetland hectares (acres)**	**Buffer hectares (acres)**
Alternative 1	0.26 (0.65)	1.22 (3.05)	0.21 (0.53)	0.65 (1.62)
Alternative 2	0.06 (0.16)	0.56 (1.39)	0	0.36 (0.89)
Alternative 3	0.26 (0.65)	1.22 (3.05)	0.21 (0.53)	0.65 (1.62)
Alternative 4	0.06 (0.16)	0.56 (1.39)	0	0.36 (0.89)
Alternative 5	(see Table 3-16)			
Alternative 6	0.06 (0.16)	0.56 (1.39)	0	0.36 (0.89)

Note: Updated delineation of Wetland VL will increase wetland impact in Alternatives 1 and 3 by approximately 0.10 acres.

Table 3-16
Updated Wetland and Buffer Impacts for Modified Alternative 5

	Permanent Impacts		Temporary Impacts	
	Wetland hectares (acres)	**Buffer hectares (acres)**	**Wetland hectares (acres)**	**Buffer hectares (acres)**
Wetland VL	(fill) 0.24 (0.59)	–	–	–
Wetland GW	(shade) 0.13 (0.32)	0.15 (0.37)	0.08 (0.20)	0.08 (0.21)
Modified Alternative 5 Total	0.37 (0.91)	0.15 (0.37)	0.08 (0.20)	0.08 (0.21)
Note: The updated wetland assessment for Modified Alternative 5 assumed shade impacts were permanent, whereas the previous assessment for Alternatives 1-6 did not.				

The data in Table 3-15 are not entirely comparable to the data in Table 3-16. For example, wetland shading impacts were not considered a permanent impact in Alternatives 1 through 6, but are for Modified Alternative 5. Also, the boundary of Wetland VL was changed in the reanalysis of Modified Alternative 5, which would result in additional wetland fill for Alternatives 1, 3, and 5 in Table 3-15 (approximately 0.10 acres additional).

Temporary wetland and buffer impacts are also discussed in this chapter under Construction Activity Impacts. Compensatory mitigation for wetland and buffer impacts includes creation, reestablishment, and enhancement of wetlands, as well as restoration and enhancement of wetland buffers. The basic elements of the mitigation plan for the preferred alternative (Modified Alternative 5) are described in this section, with more detail included in the conceptual mitigation plan (Issaquah, 2005).

Alternatives 1 and 3

Wetlands

No wetland impacts are associated with the northern alignments of Alternatives 1 and 3 (North A, North B, and North C). However, the South A alignment of Alternatives 1 and 3 would result in both temporary and permanent impacts on Wetlands GW and VL. Temporary impacts during construction would occur in two locations in Wetland GW covering 0.21 hectares (0.52 acres) and one location in Wetland VL covering 0.006 hectares (0.01 acres) (**Figure 3-15**). Construction of the bridge crossing Wetland GW would temporarily impact 0.15 hectares (0.38 acres). The roadway paralleling 6th Avenue Southeast would affect 0.05 hectares (0.14 acres) of Wetland GW and 0.006 hectares (0.01 acres) of Wetland VL.

Permanent impacts involve filling portions of Wetlands GW and VL to construct the new bypass roadway and reconfigure intersecting streets. One portion of Wetland GW and one portion of Wetland VL would be filled, for a total of 0.26 hectares (0.65 acres) of impacts that include the following:

- The southwest corner of Wetland GW near the intersection of Southeast 96th Street and 6th Avenue Southeast would be filled, amounting to 0.23 hectares (0.58 acres).

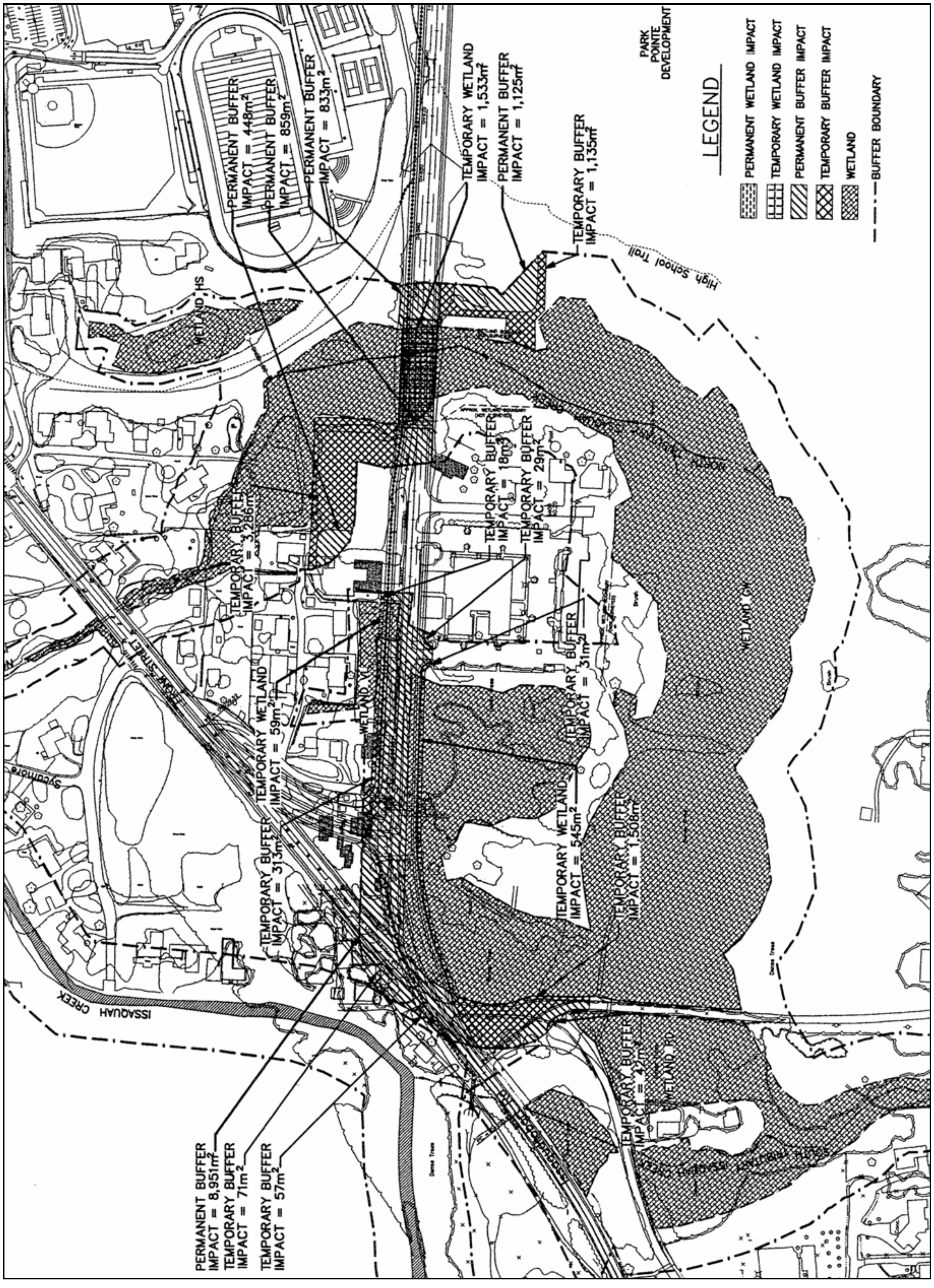


Figure 3-15
Temporary and Permanent Wetland and Buffer Impacts – Alternatives 1 and 3

- The eastern edge of Wetland VL that parallels 6th Avenue Southeast would be filled, amounting to 0.03 hectares (0.07 acres).

Construction of the bridge over the north tributary of Issaquah Creek would bisect Wetland GW and result in indirect impacts. The plant community underneath and adjacent to the bridge would be affected by loss of trees, shading from the bridge structure, and disturbance from maintenance activities such as routine pruning of trees near the bridge. Several trees that provide wildlife habitat in this wetland would be permanently removed, which would degrade the wetland functions in this area. The proposed bridge would also block sunlight from reaching some wetland areas, although these impacts would vary by time and season.

Because portions of Wetland GW are currently forested, the seasonal blocking of sunlight is not expected to greatly affect shrub and herbaceous species that are tolerant of a forested canopy. Periodic maintenance such as pruning vegetation adjacent to the bridge could disturb this area and possibly allow invasive species to colonize the margins of the bridge.

Wetland Buffers

The South A alignment and associated stormwater ponds would encroach into the vegetated buffers surrounding Wetlands GW and VL. Temporary impacts would occur during construction in ten locations within the buffer of Wetlands GW and VL, covering a total of 0.65 hectares (1.62 acres). A total of 1.22 hectares (3.05 acres) of permanent buffer impacts would occur at five locations where vegetated buffers would be replaced with new roadway surfaces and stormwater ponds. The most adverse of these impacts is the permanent conversion of vegetated buffer to a paved roadway.

Alternatives 2, 4, and 6

Wetlands

No wetland impacts would be associated with the North A, North B, or North C alignments. However, direct impacts would occur to Wetland HS from the South C alignment common to Alternatives 2, 4, and 6. The South C alignment would require filling approximately 0.06 hectares (0.16 acres) along the south edge of Wetland HS adjacent to the former railroad right-of-way (**Figure 3-16**). Retaining walls would be used to minimize the amount of wetland fill in this area.

Replacement of the culvert underneath the former railroad right-of-way and construction of two stormwater ponds (South Pond C-2 and North Pond 2) may change the hydrology in Wetland HS. Currently, the water level in Wetland HS is controlled by a culvert (currently partially clogged) underneath the former railroad right-of-way. This culvert would be replaced by a new culvert and the inlet would be configured to reduce clogging. The new culvert would reduce water level fluctuations in the wetland, which helps promote increased plant diversity. Water level fluctuations can reduce plant diversity and favor more tolerant species such as cattails. Although the two stormwater ponds are designed to overflow into Wetland HS during large storm events and may increase the volume of water that passes through the wetland, replacement of the culvert should minimize water level fluctuations.

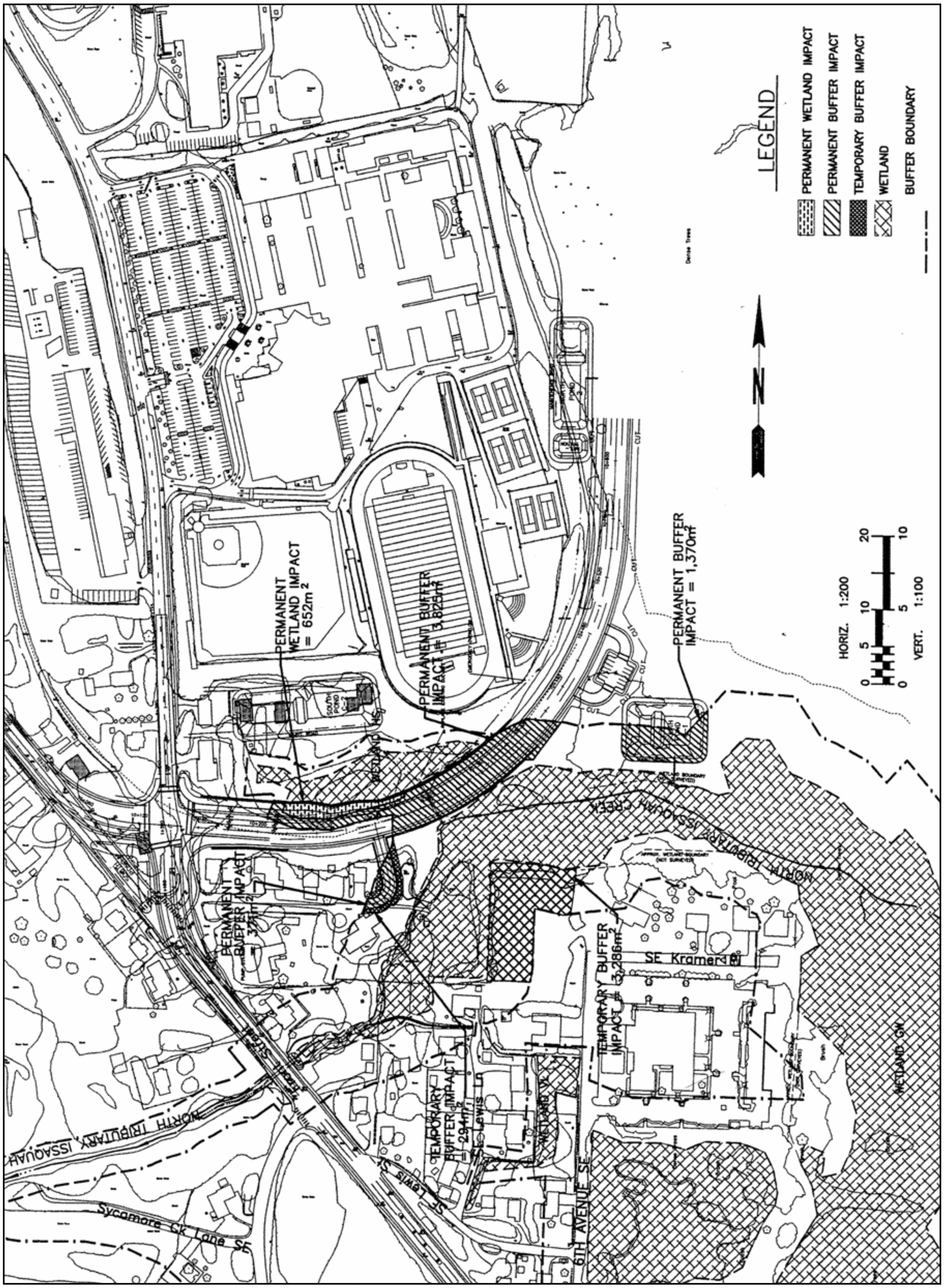


Figure 3-16
Temporary and Permanent Wetland Impacts – Alternatives 2, 4, and 6

Wetland Buffers

The South C alignment and its associated stormwater ponds would encroach into buffers surrounding Wetlands HS and GW. Temporary impacts during construction would occur in two locations of the Wetland GW buffer, covering a total of 0.36 hectares (0.89 acres). Approximately 0.56 hectares (1.39 acres) of permanent buffer impacts would occur in three locations where vegetated buffers would be altered to create the roadway and stormwater ponds. These permanent buffer impacts involve conversion of vegetated buffers around Wetland HS and Wetland GW to create paved roads (0.38 hectares), an area around Wetland GW for an access road (0.04 hectares), an area around Wetland GW for the stormwater south pond C-1 (0.14 hectares), and an area around Wetland GW for the stormwater south pond C-1 (0.14 hectares). Of these impacts, the most substantial would be the permanent conversion of a vegetated buffer to a paved roadway.

Modified Alternative 5

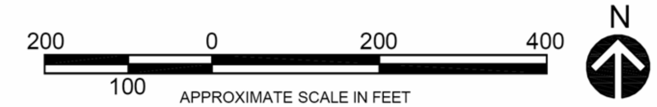
Wetlands

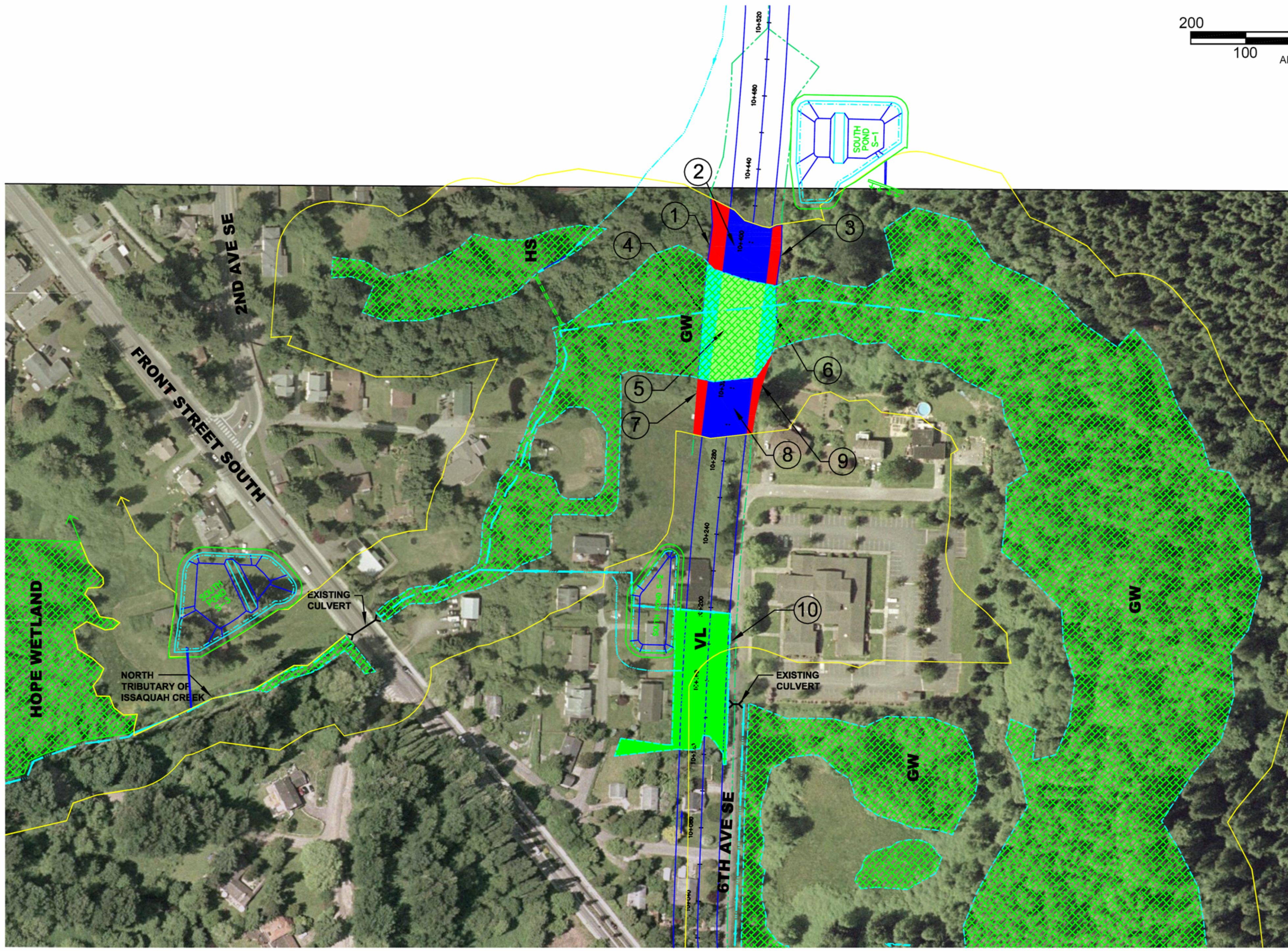
Under Modified Alternative 5, wetland impacts would affect Wetland GW. Both temporary and permanent impacts would result from this alternative. It is important to note that the road design of this alternative conforms to the former Alternative 5 design in the supplemental draft EIS (FHWA et al., 2004), but the old design has been modified, with the road shifted west of Wetland GW to avoid wetland fill and associated buffer impacts.

The Modified Alternative 5 would also result in both temporary and permanent impacts on Wetland VL. Temporary impacts would include potential disturbance of the wetland area and associated buffers as a result of construction activities. Permanent wetland impacts associated with the new Southeast Issaquah Bypass would result in complete fill of this disturbed, shrub-scrub wetland because avoidance is not feasible.

Construction of the bridge over the north tributary of Issaquah Creek would avoid filling of Wetland GW. However, bisecting Wetland GW would result in indirect impacts (shading) to approximately 0.13 hectares (0.32 acres) of the wetland. The plant community underneath and adjacent to the bridge would be affected by the loss of trees, shading from the bridge structure, and disturbance from maintenance activities such as routine pruning of trees near the bridge. Several trees that provide wildlife habitat in this wetland would be permanently removed, which would degrade the wetland functions in this area. The proposed bridge would also block sunlight from reaching some wetland areas, although these impacts would vary with time and season. Because portions of Wetland GW are currently forested, the seasonal blocking of sunlight is not expected to greatly affect shrub and herbaceous species that are tolerant of a forested canopy. Noise from highway traffic could also disrupt the wildlife habitat functions of Wetland GW to some degree.

Based on the updated wetland analysis that was conducted for Modified Alternative 5, temporary wetland impacts during construction would occur within Wetland GW with the construction of Modified Alternative 5. Clearing and grading would occur to the east and west of the new bridge (**Figure 3-17**).





IMPACT TABLE

#	SQUARE FOOTAGE	ACRES	IMPACT
1	3,515	0.08	TEMP
2	8,004	0.18	PERM
3	2,111	0.05	TEMP
4	4,933	0.11	TEMP
5	14,141	0.32	PERM
6	3,870	0.09	TEMP
7	1,675	0.04	TEMP
8	7,852	0.18	PERM
9	1,710	0.04	TEMP
10	25,700	0.59	PERM

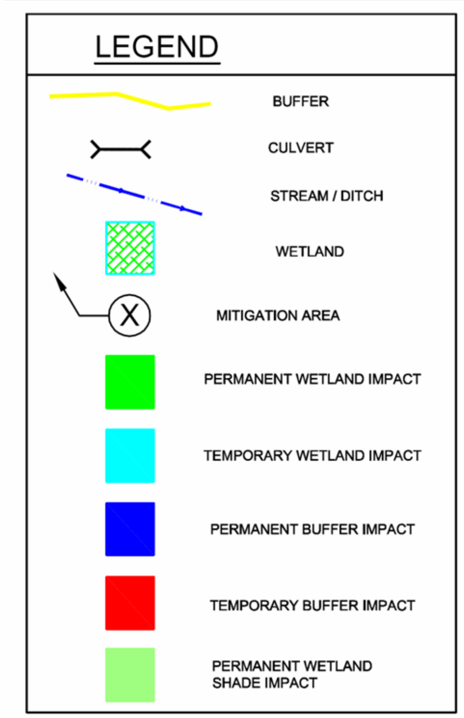


Figure 3-17
Temporary and Permanent Wetland and Buffer Impacts – Modified Alternative 5

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Several trees and shrubs would be removed in the area. The total size of the two affected areas is 0.08 hectares (0.20 acres).

The bridge would be constructed on pilings within Wetland GW. Mitigation of the impact from the pilings would not be required, because fill caused by bridge pilings that are constructed to avoid wetlands is not considered fill by the U.S Army Corps of Engineers (U.S. COE 2002).

Wetland Buffers

The South A alignment would encroach into the vegetated buffers of Wetland GW, causing both temporary and permanent buffer impacts (see Table 3-15 and Figure 3-17). Construction of the bridge that crosses over Wetland GW and the stream would cause a permanent impact on 0.15 hectares (0.36 acres) of buffer area. The project would also temporarily impact 0.08 hectares (0.21 acres) of wetland buffer. The proposed impact areas consist of scrub-shrub vegetation and provide moderate protection of Wetland GW.

Alternative 7—No Action

The no-action alternative would cause no impacts on wetlands or wetland buffers in the Southeast Issaquah Bypass area.

Mitigation

A discussion of proposed mitigation for all build alternatives is provided below. For Alternatives 1–6, the information on wetland and buffer impacts is based on the supplemental draft EIS. However, proposed mitigation sites that were identified in the supplemental draft EIS for Alternatives 1–6 have been replaced by the updated conceptual mitigation plan that was developed as part of the Concurrence Point 3 process for Modified Alternative 5. Because this revised conceptual mitigation plan can accommodate impacts associated with any build alternative, this updated mitigation plan therefore represents all build alternatives.

Alternatives 1 and 3

Impact Avoidance and Minimization

The design of the proposed roadway has been modified in certain locations to minimize impacts on aquatic resources. For example, to minimize impacts on Wetland GW and the north tributary, a 75-meter (246-foot) bridge would be used to completely span the creek and its associated wetland. Although bridge construction would have some impacts, such as vegetation removal and shading, this option would minimize permanent loss of wetlands. Although the bridge would cross the wetland, there would be unrestricted movement of water, nutrients, and wildlife underneath the bridge deck.

Stormwater ponds for Alternatives 1 or 3 have been designed and located to avoid wetland areas as much as possible, although several ponds are located in wetland buffers. Stormwater conveyance systems for the new roadways have been designed to maintain existing wetland hydrologic characteristics.

Compensatory Wetland Mitigation

Unavoidable adverse impacts would occur from construction of the South A alignment along 6th Avenue Southeast. These permanent wetland impacts would involve 0.23 hectares (0.58 acres) of fill in Wetland GW and 0.03 hectares (0.07 acres) of fill in Wetland VL. (Note: the 2005 update to the delineation of Wetland VL would increase this impact by about 0.1 acres). The functions these wetland areas currently provide are rated moderate for flood and stormwater control, water quality improvement, and natural biological support. Based on replacement ratios required by the city of Issaquah (2:1 for Wetland GW and Wetland VL), these impacts would require compensatory mitigation for 0.52 hectares (1.30 acres) of forested and scrub-shrub wetland habitat. See Modified Alternative 5 for the discussion of potential mitigation sites.

Compensatory Wetland Buffer Mitigation

Unavoidable impacts on wetland buffers would occur from construction of the South A alignment along 6th Avenue Southeast. A total of 1.22 hectares (3.05 acres) of permanent buffer impacts would occur at five locations where vegetated buffers would be impacted to create the new roadway and several stormwater ponds. This would include five buffer areas around Wetland GW where the buffers consist of invasive shrubs, paved roads, and residential lots. See Modified Alternative 5 for the discussion of potential mitigation sites.

Alternatives 2, 4, and 6

Impact Avoidance and Minimization

The South C alignment avoids substantial amounts of wetland fill and avoids direct impacts on the north tributary. Impacts in Wetland GW are avoided and impacts on Wetland HS are minimized by the use of retaining walls instead of fill slopes in new roadway areas adjacent to these wetlands. Stormwater ponds have also been designed and located to avoid wetland areas, although several ponds are located in wetland buffers. Stormwater conveyance systems for the new roadways have been designed to maintain existing wetland hydrologic characteristics.

Compensatory Wetland Mitigation

Unavoidable adverse impacts would occur from construction of the South C alignment along the former railroad right-of-way. These impacts would involve 0.06 hectares (0.16 acres) of filling along the southern edge of Wetland HS. The current functions this wetland area provides are rated moderate for flood and stormwater control and water quality improvement. Based on the replacement ratio required by the city of Issaquah (2:1), these fill areas would require compensatory mitigation for approximately 0.13 hectares (0.33 acres) of forested and scrub-shrub wetland habitat. See Modified Alternative 5 for the discussion of potential mitigation sites.

Compensatory Wetland Buffer Mitigation

Unavoidable impacts on wetland buffers would occur from construction of the South C alignment. This would involve conversion of buffer areas surrounding Wetland GW and HS to create the roadway and stormwater ponds. This would include two buffer areas around Wetland GW and one area adjacent to

Wetland HS. Compensatory mitigation for approximately 0.56 hectares (1.39 acres) of impacts on wetland buffers would consist of enhancement to improve their functions. See Modified Alternative 5 for the discussion of potential mitigation sites.

Modified Alternative 5

Modified Alternative 5, based on Alternative 5, was developed to further avoid wetland impacts by realigning the roadway to avoid fill in the western edge of Wetland GW adjacent to 6th Avenue Southeast. Even though impacts on Wetland VL would increase, preserving Wetland GL was given priority because it has higher wetland value.

Mitigation for Modified Alternative 5 is summarized in **Table 3-17** and described in the subsections below as two potential plans: Option 1 and Option 2.

Table 3-17
Summary of Mitigation Proposed for Modified Alternative 5

Impact	Area Affected in hectares (acres)	Compensation Ratio	Mitigation Description	Location on Figures	
				Mitigation Option 1	Mitigation Option 2
Permanent wetland fill: VL	0.24 (0.59)	3:1	At least 0.72 hectares (1.77 acres) of wetland reestablishment as part of Option 1 or Option 2. Existing wetlands would be also be enhanced under both options.	2 and 3 (Figure 3-18)	7 and 8 (Figure 3-19)
Shading impacts: GW	0.13 (0.32)	3:1	0.39 hectares (0.96 acres) of riparian habitat enhancement.	6 (Figure 3-18)	6 (Figure 3-18)
Permanent buffer loss: GW	0.15 (0.37)	1:1	0.15 hectares (0.37 acres) of replaced buffer area.	1 (Figure 3-18)	9 (Figure 3-19)
Temporary wetland and buffer disturbance: GW	0.16 (0.41)	1:1	0.16 hectares (0.41 acres) of wetland and buffer restored and replanted.	4 and 5 (Figure 3-18)	4 and 5 (Figure 3-18)
Note: See also Table 3-12.					

Mitigation of Permanent Impacts

Mitigation of wetland impacts are described in the conceptual mitigation plan (see below). The proposed bridge over Wetland GW would shade plants underneath the bridge and prevent the growth of wetland vegetation. Vegetation is expected to survive on both sides of the bridge and, to some extent, underneath the bridge toward the outer edges. Therefore, the shaded wetland area would most likely continue to function as a wetland. The 0.13 hectares (0.32 acres) of permanent shading impacts on Wetland GW would be mitigated at a 3-to-1 ratio by providing a minimum of 0.39 hectares (0.96 acres) of riparian restoration adjacent to the north tributary to Issaquah Creek. The enhancement activities on the stream would entail removing invasive reed canarygrass, Himalayan blackberry, Japanese knotweed, and other nonnative and invasive plant species to enhance riparian vegetation characteristics, and replanting with native vegetation.

Permanent wetland buffer impacts of 0.15 hectares (0.36 acres) would be mitigated at a 1-to-1 compensation ratio by providing a minimum of 0.15 hectares (0.36 acres) of buffer adjacent to wetland reestablishment on the wetland mitigation site(s) selected (**Figures 3-18 and 3-19**). The functions of this buffer replacement area would be equal to or greater than those of the impacted buffer. A 110-foot buffer is proposed on the mitigation sites between wetland reestablishment or enhancement areas and the adjacent roads or parking lots.

Mitigation of Temporary Impacts

Temporary impacts on wetlands and buffers would be mitigated by replanting and restoring disturbed areas with native vegetation after clearing and construction is complete (see Figure 3-15). The 0.16 hectares (0.41 acres) of temporary impacts on Wetland GW and the buffers of Wetland GW associated with bridge construction along 6th Avenue Southeast would be mitigated at a 1-to-1 ratio by providing 0.16 hectares (0.41 acres) of replanting and restoring disturbed areas with native vegetation after clearing and construction are complete. As indicated above, one of two options for compensatory mitigation would be chosen.

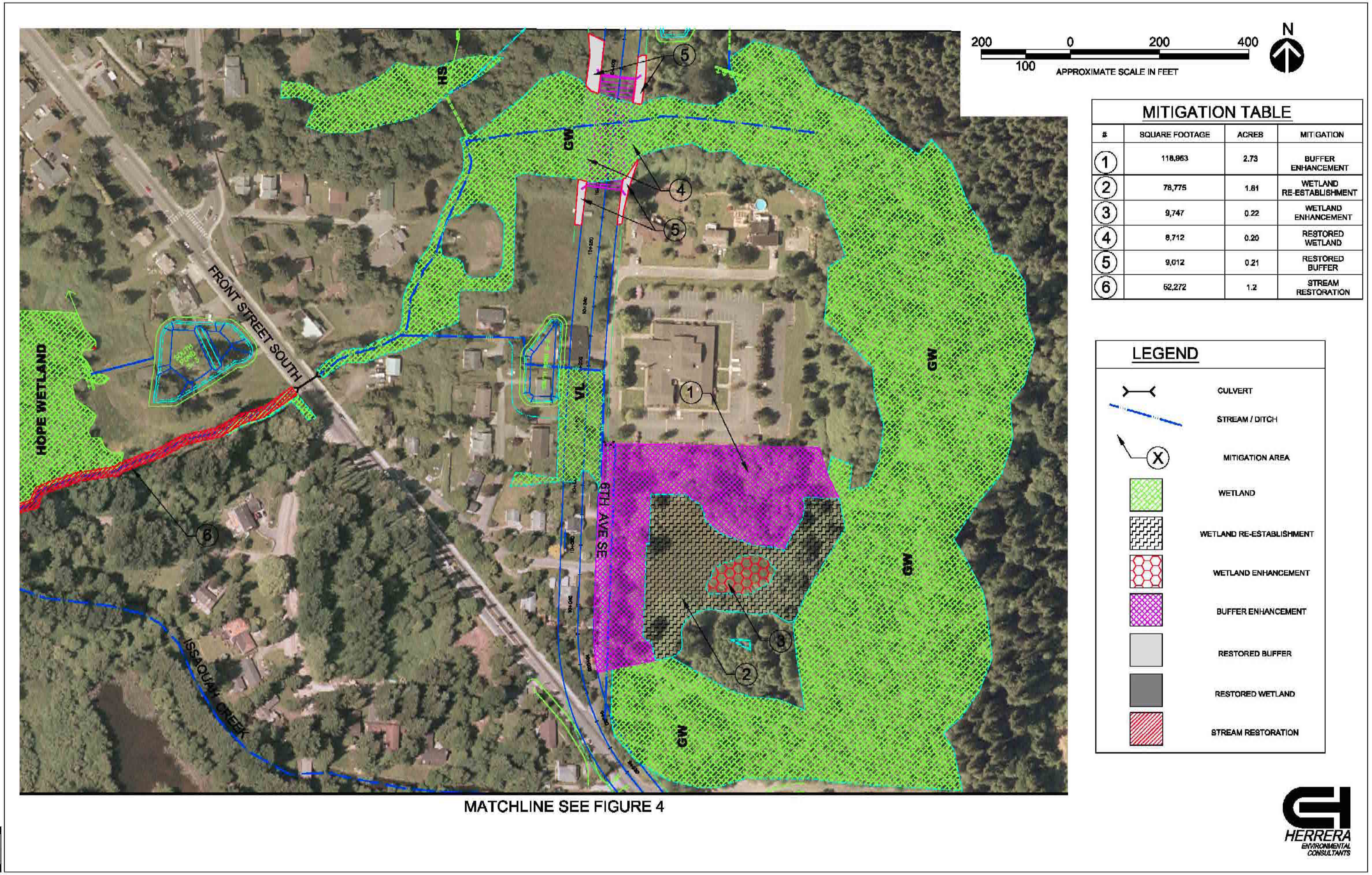
Conceptual Mitigation Plan

The conceptual mitigation plan for the Southeast Issaquah Bypass identifies two options for compensatory mitigation associated with permanent wetland fill impacts (Issaquah, 2005a). Both options (described in this section) are considered to be onsite mitigation because they are in close proximity to the proposed project site and the wetland impacts. Under both options, at least 0.24 hectares (0.59 acres) of permanent impact on Wetland VL would be mitigated at a 3-to-1 ratio, by reestablishing a minimum of 0.72 hectares (1.77 acres) of wetlands (see Table 3-15). This mitigation ratio is recommended by Ecology (2004) for impacts on Category II wetlands.

Additional mitigation in conjunction with wetland reestablishment may include wetland enhancement, buffer enhancement, or stream channel creation. Additional mitigation would be implemented to increase the overall ecological success and functions of the mitigation site. This additional mitigation would be considered mitigation above and beyond what is required according to mitigation replacement ratios. For example, additional mitigation could involve enhancing existing wetlands on a mitigation site by replacing reed canarygrass with native vegetation. This would prevent reed canarygrass from spreading to wetland reestablishment areas, reduce maintenance costs in reestablished wetlands, and support compliance of the invasive plant cover performance standard.

Wetland Mitigation Plan Option 1—Wetland GW

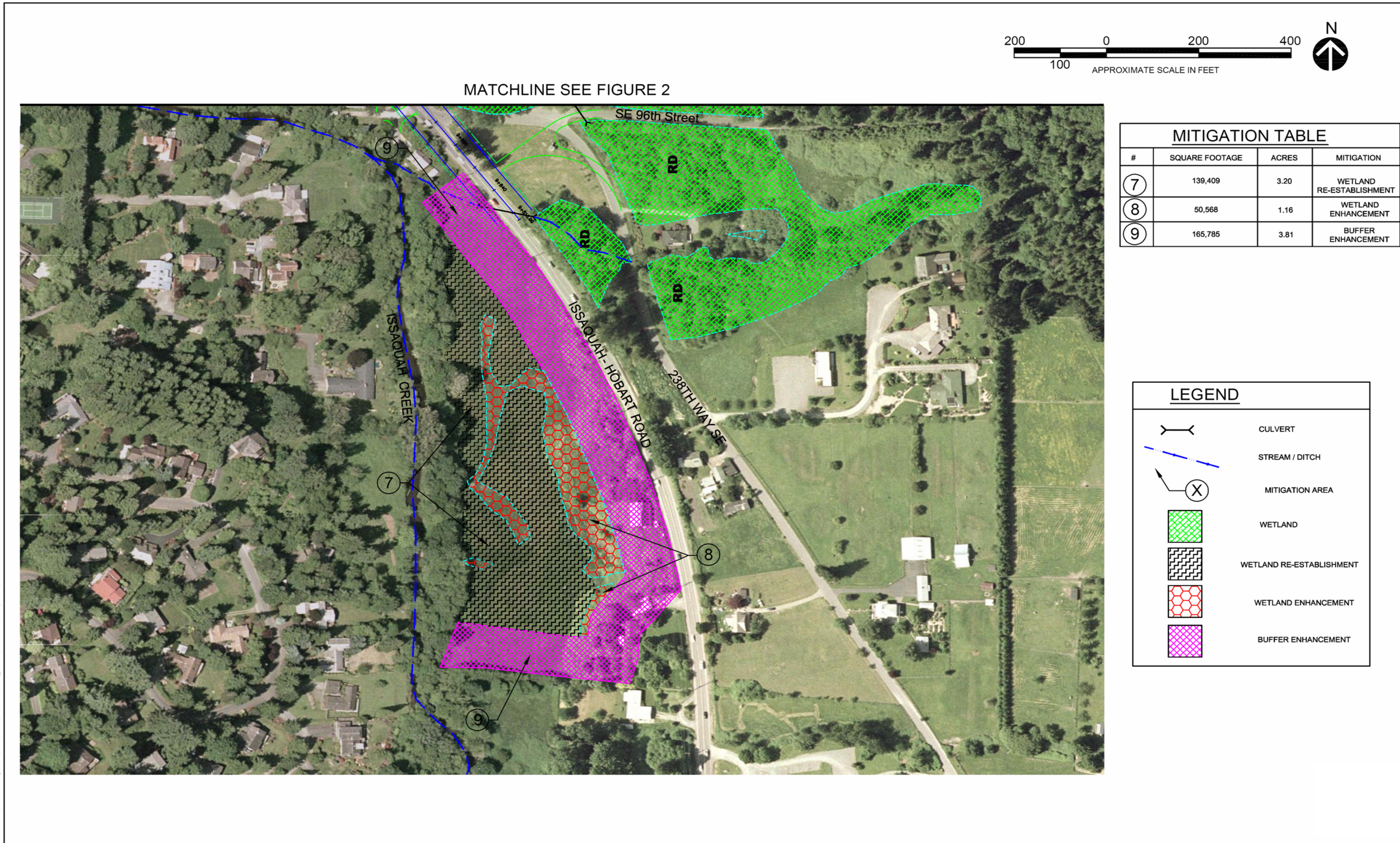
An upland area within Wetland GW (on the east side of 6th Avenue Southeast), and disturbed portions of that wetland provide an opportunity for wetland reestablishment. This potential mitigation area is designated as Wetland Mitigation Area Option 1 on Figure 3-18. This area consists of historic wetland that was filled in association with past development. Mitigation would involve



MITIGATION TABLE

#	SQUARE FOOTAGE	ACRES	MITIGATION
1	118,963	2.73	BUFFER ENHANCEMENT
2	78,775	1.81	WETLAND RE-ESTABLISHMENT
3	9,747	0.22	WETLAND ENHANCEMENT
4	8,712	0.20	RESTORED WETLAND
5	9,012	0.21	RESTORED BUFFER
6	52,272	1.2	STREAM RESTORATION

Figure 3-18
Potential Wetland Mitigation Areas – Option 1



MITIGATION TABLE

#	SQUARE FOOTAGE	ACRES	MITIGATION
7	139,409	3.20	WETLAND RE-ESTABLISHMENT
8	50,568	1.16	WETLAND ENHANCEMENT
9	165,785	3.81	BUFFER ENHANCEMENT

Figure 3-19
Potential Wetland Mitigation Areas – Option 2

reestablishing forested wetland conditions. The boundary of this reestablishment area is based on observations made in the field and aerial photographic interpretation.

If Option 1 were pursued, formal wetland delineations would be conducted to delineate the wetland edge adjacent to this upland inclusion. If a minimum of 0.72 hectares (1.77 acres) of reestablishment area is not available after delineations are conducted, additional wetland mitigation area would be provided at Squak Valley Park (see Option 2), or elsewhere within the same drainage basin within the city of Issaquah. Existing vegetation within the wetland reestablishment area is dominated by Himalayan blackberry, thistle, horsetail, and buttercup. The west, north, and eastern edges of the wetland reestablishment area are contiguous with Wetland GW. Mature forested upland would abut the south edge of wetland reestablishment.

An existing patch of wetland within the reestablishment area would need to be enhanced because it is dominated by reed canarygrass. This is identified as Mitigation Area 3 on Figure 3-18 and is approximately 0.09 hectares (0.22 acres). The owner of this property (Wellington Park Pointe) has been contacted regarding this proposal. The owner is supportive of using this property for Southeast Bypass mitigation. Purchase of this particular piece of property for wetland mitigation would have the added benefit of providing long-term protection, through public ownership, of a large portion of Wetland GW.

Implementation of Option 1 would involve providing a minimum 110-foot buffer between the wetland reestablishment area and the proposed Southeast Bypass to the west and the existing church parking lot to the north (see Figure 3-18). According to Ecology (2005), a 110-foot buffer is recommended between reestablished Category II wetlands and moderate impact land uses. A portion of wetlands proposed for reestablishment will lie within this 110-foot buffer. Existing Wetland GW and the upland area within this buffer zone would also be enhanced where necessary by replacing invasive or exotic vegetation with native vegetation. The city of Issaquah prefers Option 1 for mitigation because of the better potential for success at that location.

Wetland Mitigation Plan Option 2—Squak Valley Park

Figure 3-19 provides a conceptual view of the Squak Valley Park site with its opportunities for wetland reestablishment and enhancement. The city-owned Squak Valley Park site is located between Issaquah Hobart Road and Issaquah Creek just south of Southeast 96th Street. The site is located within the historic floodplain of Issaquah Creek, but was isolated from the stream by a flood control levee that was constructed in the 1930s. The south tributary of Issaquah Creek (also known as Kees Creek and Tributary 0199) flows along the northern edge of the property before draining into Issaquah Creek. The levee that is adjacent to the east side of Issaquah Creek prevents flooding on the site, though it is currently not maintained for this purpose. The site was likely covered by a large forested floodplain wetland prior to historical farming activities and subsequent construction of the levee. Upland grasses dominate the site. Patches of emergent wetland remain on the site and are dominated by reed canarygrass. The boundaries of existing wetlands are based on a delineation conducted by the Army Corps of Engineers in support of a stream restoration project that is proposed for the site. If Option 2 is pursued, reassessment of wetland boundaries would be necessary.

The site provides significant wetland reestablishment and wetland enhancement opportunities (see Figure 3-19). The wetland mitigation plan would be designed to be compatible with the proposed stream restoration project on the site. This stream restoration involves breaching the levee and creating channels, thus reintroducing surface and flood waters to the site. At this time, the project is awaiting federal funding. If this site is selected as the preferred mitigation site for the project, the stream restoration design that has been developed would be modified to maximize the restoration and mitigation opportunities, consistent with the objectives of both projects.

Approximately 3.2 acres of wetland reestablishment area is located on the site, greatly exceeding the 1.77-acre obligation for mitigating impacts on Wetland VL (see Mitigation Area 7, Figure 3-19). Enhancement opportunities are also present on the site, in the form of several existing patches of emergent wetland dominated by reed canarygrass. An area of approximately 1.16 acres of wetland enhancement is available on the site (see Mitigation Area 8, Figure 3-19).

According to Ecology (2005), a 110-foot buffer is recommended between reestablished Category II wetlands and moderate impact land uses. Implementation of Option 2 would involve providing a minimum 110-foot buffer between the wetland reestablishment/enhancement area and Issaquah/Hobart Road, and between the reestablishment area and the south property boundary (see Figure 3-17). Option 2 also proposes to enhance existing wetland and upland areas within this buffer zone by replacing invasive or exotic vegetation with native vegetation.

Wetland Finding

Under Executive Order 11990, impacts on wetlands must be avoided unless no practicable alternative is available. All efforts to minimize wetland impacts should be made. All build alternatives considered for the project would affect wetlands in the southern project area. All build alternatives would require wetland fill and would affect wetland buffer areas. One of the revisions under Modified Alternative 5 was a relocation of the southern alignment to reduce the need for wetland fill. Under this design, the roadway was shifted to the west to avoid the need for wetland fill. As indicated in the preceding discussion, a number of measures would be provided to reduce overall wetland impacts, including replacement wetlands, and wetland and buffer enhancement. With mitigation, the proposed project would reduce potential adverse impacts on wetlands and minimize the overall area affected by the proposed roadway. As agreed with resource agencies during the 404 Merger Agreement review, a conceptual wetland mitigation plan is provided in Appendix F (Volume 2) of this final EIS.

Vegetation and Wildlife

Studies and Coordination

Information on vegetation and wildlife in the proposed project area was obtained from several sources including literature sources, aerial photographic interpretation, and field investigations. Existing information on vegetation and wildlife occurrence in the project vicinity included records from the WDNR Natural Heritage System and the Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species database; biological resource reports written for other projects in the vicinity of the Southeast Issaquah Bypass (David Evans and Associates, 1995 and 1997; Shapiro, 1995 and 1998); and inventories of amphibians, reptiles, plants, birds, and mammals in the Tiger Mountain NRCA (Hallock 1997; Kemp 1995; Haupt, 1997; and Young, 1997).

USFWS was also consulted for documented or potential occurrence of federally listed threatened and endangered, proposed, and candidate wildlife species in the project area. Threatened and endangered species potentially occurring within the project area are discussed in the Threatened and Endangered Species section of this chapter. Biologists from the WDFW Mill Creek office were contacted for specific information on wildlife and habitats in the project area.

Color aerial photographs were used to map habitat types present in the project area. Onsite field investigations were conducted in June and October 1997 and November 2002 to verify the results of the aerial photographic interpretation. A plant species list organized by vegetation strata (herbaceous, shrub, and tree layers) was generated for each plant community. The biological resources technical report for the Southeast Issaquah Bypass contains a list of plant species observed in the project area and nearby habitats (Herrera, 1998a).

Wildlife and existing habitat conditions were observed during ground-truthing for the aerial photographic interpretation and in conjunction with other field tasks performed for this project (i.e., wetland delineations and site reconnaissance). Bird surveys were conducted within the project area in June 1997 and again in May 1998. These surveys occurred at seven locations that were established to assess distinct vegetation communities identified in the project area. Important habitat features such as nests, snags, large trees, and feeding and breeding areas were also documented. An evaluation of the suitability of existing habitat to support other sensitive species in the project area was also conducted at that time.

Vegetation

Affected Environment

Three types of vegetation communities occur in the project area, including upland mixed forest, upland disturbed/shrub areas, and wetlands (**Figure 3-20**). The two upland plant communities (mixed forest and disturbed/shrub) were observed in undeveloped areas along the proposed Southeast Issaquah Bypass alignments, especially in the northern half of the project area. These plant communities include second-growth mixed forest and disturbed areas dominated by invasive shrubs. A distinction between forested and disturbed areas dominated by shrubs was used to identify locations where more than 50 percent of the highest vegetation strata included trees.

The project area lies within the western hemlock forest zone, which is the most extensive forest zone in western Washington (Franklin and Dyrness, 1973). The majority of the mixed forest area in the project area is mid-successional and dominated by western hemlock (*Tsuga heterophylla*) and Douglas fir (*Pseudotsuga menziesii*). Tree sizes in the project area range from saplings to mature second-growth forest. Deciduous trees such as red alder (*Alnus rubra*) and big-leaf maple (*Acer macrophyllum*) occur in areas that recently have been disturbed. Snags and downed logs were observed in low to moderate densities within the project area's forested areas.

The remaining shrub-dominated portions of the project area contain a mosaic of disturbed areas that include: ornamental landscaping and lawns on residential properties; thickets dominated by invasive shrubs such as Himalayan blackberry (*Rubus armeniacus*), evergreen blackberry (*Rubus laciniatus*), and Scot's broom (*Cytisus scoparius*); open areas containing upland grasses and scattered shrubs; and recently colonized areas dominated by native shrubs and tree saplings. These disturbed areas provide a variety of wildlife habitats based on the diversity of shrub and herbaceous species, the amount of edge habitat, and canopy structure.

Wetlands in the southern portion of the project area contain a variety of plant species not found in upland areas. The freshwater wetlands in the project area have been delineated, surveyed, and mapped; these are described in the wetlands technical report for the Southeast Issaquah Bypass (Herrera, 1998b), which is incorporated herein by reference, and in the Wetlands section of this chapter. Four wetland areas (Wetlands HS, GW, VL, and RD) were delineated within the project area. A mixture of emergent, shrub, and forested wetland types are represented in this portion of the project area (Cowardin et al., 1979). The forested wetlands include several black cottonwood (*Populus balsamifera*) and western red cedar (*Thuja plicata*) trees.

The USFWS (2002) identified one species of concern as potentially occurring in the project area, the white-top aster (*Aster curtus*).

Priority Habitats

The WDFW (2002) identifies 20 habitat types in the state of Washington as priority habitats. Priority habitats are areas with unique value to many wildlife species. Four of these priority habitat types have been identified within the project area: freshwater wetlands, riparian areas, urban natural open space, and areas with a high density of snags. As shown in Figure 3-20, the freshwater wetlands (Wetlands HS, GW, VL, RD, and Hope) and riparian areas (north and south tributaries to Issaquah Creek) occur in the southern end of the project corridor. The urban natural open space occurs in the northern end of the project corridor, as identified by upland mixed forest and disturbed/shrub areas, and two areas of high-density snags occur near Issaquah High School.

Freshwater wetlands and riparian areas are designated as priority habitats for several reasons: they have a high vulnerability to habitat alteration, they are limited in occurrence, they are important fish and wildlife movement corridors,

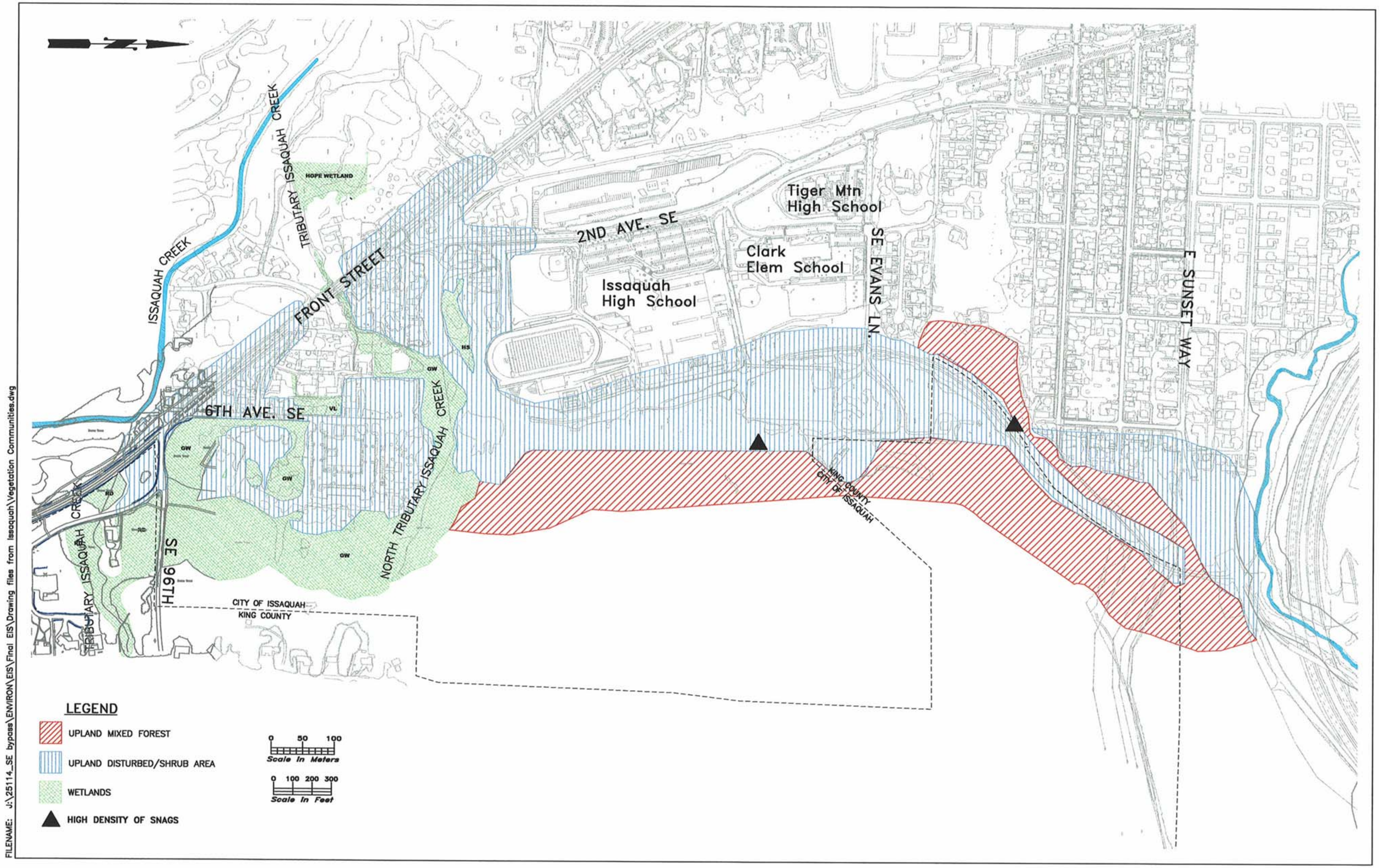


Figure 3-20
Vegetation Communities

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and they support a high diversity of wildlife species. The freshwater wetlands occur in the southern portion of the project area in conjunction with two unnamed tributaries to Issaquah Creek (north tributary and south tributary). The riparian areas of these two tributaries are described in the streams and fisheries technical report prepared for this project (Herrera, 1998c) and incorporated herein by reference.

Urban natural areas occur in the northern part of the project area and extend to the steep forested slopes near the Tiger Mountain NRCA. These areas qualify as priority habitats because they connect other priority habitats and because they are likely to at least partially support state priority species. These upland forested slopes are used as wildlife migration corridors that link habitat on Tiger Mountain with Squak Mountain and the Issaquah Highlands. Modified Alternative 5 would bisect a migration corridor located near Southeast Evans Lane that extends from Tiger Mountain to Issaquah Creek and eventually Squak Mountain.

Two areas with a high density of snags are present in the project area (see Figure 3-20). These areas qualify as priority habitats because they contribute to the diversity of vegetation communities present in the project area and because they are scarce in the vicinity of the project area. Otherwise, snags occur throughout the upland mixed coniferous forest community in the project vicinity in low to moderate densities.

Impacts on Vegetation

The Southeast Issaquah Bypass would replace existing upland and wetland habitat within a transition zone between vast areas of public lands and urban development with a zone of intense human activity. Under any of the build alternatives, the proposed project would result in the removal of mixed forest, disturbed/shrub, and wetland plant communities in the project area. Clearing of trees may make the remaining trees more susceptible to wind blow down, which causes additional soil disturbance and further degrades habitat. Nonnative vegetation adapted to disturbance could also invade the cleared areas. These species, such as Himalayan blackberry, Scots broom, and reed canarygrass (*Phalaris arundinaceae*), out-compete native species that are generally more beneficial to wildlife and can spread quickly through native plant communities. The proposed Park Pointe development adjacent to Issaquah High School would also cause impacts on vegetation in the project area (HDR, 2002).

The no-action alternative would not cause any impacts on vegetation in the project area, because no new roadways would be in operation and existing traffic characteristics would be maintained.

Information on the impacts of vegetation removal on wildlife is presented in the following section under Wildlife.

Mitigation for Vegetation Impacts

Clearing of vegetation in the project area would be reduced to the extent possible to preserve existing habitat and notable trees. BMPs would be implemented during and after construction to reduce impacts on wetlands, limit the extent of vegetation removal, and revegetate disturbed areas.

Wildlife

Affected Environment

This section describes three classes of vertebrate animals (birds, mammals, and amphibians/reptiles) and one class of invertebrates (insects) that occur or are likely to occur in the project area. The biological resources technical report for the Southeast Issaquah Bypass contains a list of the species that were observed or are expected to occur in the vicinity of the project area (Herrera, 1998a). Federal and state-regulated threatened and endangered species are listed in this section but discussed in more detail in the Threatened and Endangered Species section of this chapter.

Birds

Because of the mosaic of habitats within the proposed project area and its location at the transition between the Issaquah urban area and the Tiger Mountain NRCA, the project area provides suitable habitat for a variety of birds. Surveys conducted during June 1997 and May 1998 identified 39 species of birds within the project area. An extensive survey conducted in the NRCA suggests that over 75 species of birds could occur within the project area, either as year-round residents or as seasonal occupants (Haupt, 1997). Approximately equal numbers of bird species were observed in the three primary vegetation communities within the project area: upland mixed forest, upland disturbed/shrub, and wetlands. The areas with high densities of snags provide excellent habitat for songbirds, woodpeckers, owls, and raptors.

The USFWS (2002) identifies wintering bald eagles (*Haliaeetus leucocephalus*) as occurring in the project area from October 31 to March 31. The USFWS also identifies three species of concern as possibly occurring within the project area: northern goshawk (*Accipiter gentilis*), olive-sided flycatcher (*Contopus cooperii)*, and peregrine falcon (*Falco peregrinus*). The WDFW (2002) identified three priority species as possibly occurring within the project area: pileated woodpecker (*Dryocopus pileatus*), band-tailed pigeon (*Columba fasciata*), and Vaux's swift (*Chaetura vauxi*). None of these species were observed in the project area during the field surveys and site visits, but all three priority species identified by WDFW have been observed in the Tiger Mountain NRCA.

Pileated woodpeckers require large (mature or old-growth) dead or dying trees for nesting. Although limited suitable habitat for nesting exists in the project area, more suitable habitat for this species is found in the adjacent Tiger Mountain NRCA and other natural areas. However, nesting could occur in the project area and woodpeckers nesting in adjacent natural areas may use the project area for foraging. Because band-tailed pigeons require mineral springs close to a food source during the breeding and brood rearing season and this habitat is not available in the project area, they are not expected to nest in the project area but may occur as migrants. Vaux swifts are strongly tied to old-growth forests and are more likely found in mature forests surrounding the project area. Vaux swifts may occur in the project area as migrants.

Mammals

Although field surveys conducted for this project resulted in few observations of mammals, it is likely that numerous species of mammals use the available habitat within the project area. The plant communities within the project area provide habitat for a variety of wildlife species that include native, introduced, and domesticated animals. Some wildlife species may use all of these plant communities, while other less mobile species may be dependent on one type of plant community. Depending upon the wildlife species, these habitats may be used for breeding, nesting, and foraging during different seasons of the year and life stages.

The upland mixed forest provides habitat for mammal species that are not dependent on water, such as shrews, mice, chipmunks, squirrels, and rabbits. Other mammals with large ranges (e.g., deer, bear, and coyotes) also use the forested areas as migration corridors. The wetlands in the southern portion of the project area provide habitat for water-dependent mammal species such as raccoon (*Procyon lotor*), opossum (*Didelphis marsupialis*), beaver (*Castor candensis*), and bats.

The results of other mammal surveys in the vicinity of the project area provide an indication of the presence and abundance of mammals. An extensive survey conducted in the Tiger Mountain NRCA by Young (1997) suggests that over 59 species of mammals could occur in the vicinity of the project area. Twenty-four mammal species or signs of these species were observed during the NRCA survey. Most of the smaller mammals observed during the NRCA survey, such as shrews and moles, are likely to be permanent residents within the project area. Large mammals such as deer, bear, and cougar that have large range requirements have been identified in the southern end of the project area. However, it is likely that the project area makes up only a small portion of the range for these species that primarily occupy the adjacent Tiger Mountain NRCA.

The USFWS (2002) identified five species of concern that may occur within the project area: California wolverine (*Gulo gulo luteus*), long-eared myotis (*Myotis evotis*), long-legged myotis (*Myotis volans*), Pacific fisher (*Martes pennanti pacifica*), and Pacific Townsend's big-eared bat (*Corynorhinus townsendii townsendii*).

Reptiles and Amphibians

Reptiles that are expected to occur in the project area depend on upland habitat for most or all of their life cycles. However, riparian and wetland habitat may also be essential for some species. Four species of reptiles were observed in the Tiger Mountain NRCA (Hallock, 1997), which includes adult common garter snake (*Thamnophis sirtalis*), northwestern garter snake (*Thamnophis ordinoides*), western garter snake (*Thamnophis elegans*), and northern alligator lizard (*Elgaria coerulea*). Observations of reptiles reported in other studies conducted near the project vicinity include northwestern garter snake on the Issaquah Highlands site (David Evans and Associates, 1995) and common garter snake in the east Sammamish Plateau access road corridor (Shapiro, 1995).

Six native amphibian species and one introduced species routinely breed in wetlands with ponded water in the Puget lowlands of western Washington, which include three salamanders and four frogs (Richter and Leonard, 1993). Five of these species were observed within the Tiger Mountain NRCA (Hallock, 1997): Pacific tree frog (*Hyla regilla*), red-legged frog (*Rana aurora*), northwestern salamander (*Ambystoma gracile*), rough-skinned newt (*Taricha granulosa*), and ensatina (*Ensatina escholtzii*). The majority of the amphibians were found in Round Lake and the surrounding wetlands.

Observations of amphibians reported in other studies near the project vicinity include six species on the Issaquah Highlands site: red-legged frog, northwestern salamander, ensatina, Pacific giant salamander (*Dicamptodon tenebrosus*), western red-backed salamander (*Plethodon vehiculum)*, and western toad (*Bufo boreas*) (David Evans and Associates, 1995). These observations also include four species on the North SPAR project site (bullfrog [*Rana catesbeiana*], red-legged frog, Pacific chorus frog [*Pseudacris regilla*], and ensatina) (Shapiro, 1998) and four species in the east SPAR corridor (Shapiro, 1995) (Pacific chorus frog, ensatina, long-toed salamander [*Ambystoma macrodactylum*], and western red-backed salamander).

The USFWS (2002) identified four species of concern as potentially occurring in the project area: Cascades frog (*Rana cascadae*), northwestern pond turtle (*Clemmys marmorata marmorata*), tailed frog (*Ascaphus truei*), and western toad (*Bufo boreas*). Only the tailed frog is reported to occur within a 1.6-km (1-mile) radius of the project area.

Insects

The USFWS (2002) identified three species of concern as potentially occurring in the project area: Beller's ground beetle (Agonum belleri), Hatch's click beetle (Eanus hatchi), and Valley silverspot (Speyeria zerene bremeri).

Impacts on Wildlife

Figure 3-21 shows the areas of permanent impacts on vegetation communities that would occur under Modified Alternative 5; the other build alternatives would have similar patterns of disturbance. **Table 3-18** shows the quantity of upland forest, upland disturbed/shrub, and forested wetland vegetation communities affected by the various build alternative2.

Table 3-18
Summary of Impacts on Vegetation Communities

	Total Area	Upland		Forested Wetland
		Forest	Disturbed/Shrub	
Alternative 1 North A / South A	10.62 (26.22)	1.79 (4.42)	8.57 (21.16)	0.26 (0.64)
Alternative 2 North A / South C	10.15 (25.08)	1.79 (4.42)	8.30 (20.50)	0.06 (0.16)
Alternative 3 North B / South A	10.16 (25.12)	3.51 (8.68)	6.39 (15.80)	0.26 (0.64)
Alternative 4 North B / South C	9.70 (23.98)	3.51 (8.68)	6.13 (15.14)	0.06 (0.16)
Modified Alt. 5 North C / South A	10.58 (26.14)	3.60 (8.90)	6.74 (16.65)	0.24 (0.59)
Alternative 6 North C / South C	10.13 (25.04)	3.60 (8.89)	6.47 (15.99)	0.06 (0.16)
Areas listed in units of hectares (acres in parentheses)				

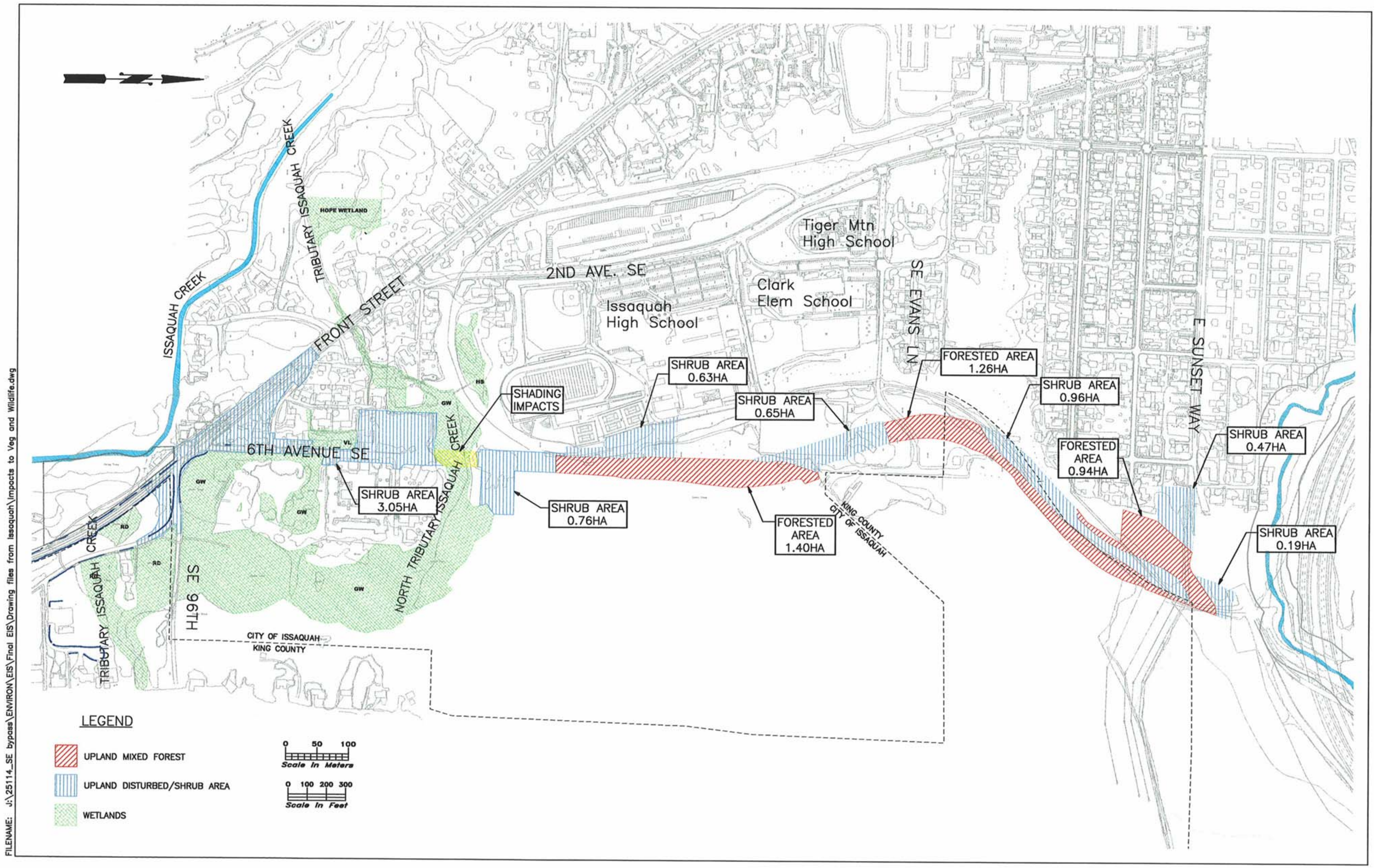

Figure 3-21
Impacts on Vegetation and Wildlife Habitat from Modified Alternative 5 (North C and South A)

The removal of mixed forest, disturbed/shrub, and wetland plant communities in the project area would result in a net loss of habitat, causing the displacement of wildlife. The primary wildlife species affected would be wildlife with small home ranges, wildlife adapted to edge habitats, and wildlife that forage in urban settings.

Vegetation removal may also displace other wildlife species that migrate seasonally through the project area or use the area as a movement corridor between adjacent public lands, such as species with larger home ranges (e.g., black bears and cougars). The riparian corridor associated with the north tributary to Issaquah Creek is used as a migration corridor by mammals that are water-dependent or require tree cover (e.g., raccoons, opossums, coyotes, deer, and bear). Additional impacts on wildlife migration are presented in the following Wildlife Crossings discussion.

Noise and disturbance from operation of the roadway would result in displacement of wildlife to adjacent habitats. Wildlife species that are sensitive to human activity would avoid habitats near the roadway, which may disrupt their foraging or migration activities. Displaced wildlife would need to find new food sources and nesting areas. Such areas are usually occupied, and the competition for limited resources could cause displaced wildlife to perish. Wildlife adapted to edge habitat, smaller areas of habitat, and higher levels of disturbance would likely replace the displaced species. Many of these species are common or widespread, and some may be regarded as pests. Some of these more tolerant species include European starling (*Sturnus vulgaris*), house sparrows (*Passer domesticus*), opossum, raccoon, eastern gray squirrel (*Sciurus carolinensis*), and northwestern garter snake (*Thamnophis ordinoides*). The proposed project would not affect foraging or migratory use of the project vicinity by priority bird species (e.g., pileated woodpecker, Vaux's swift, and band-tailed pigeon).

Impacts specific to each build alternative are described below.

Alternative 1 Impacts on Wildlife

The North A alignment would remove approximately 1.79 hectares (4.42 acres) of upland forest and 4.75 hectares (11.74 acres) of disturbed/shrub habitat for a total of 6.54 hectares (16.16 acres) of upland vegetation in the northern portion of the project area (see Figure 3-21). Impacts on upland vegetation from the North A alignment would include two areas of mixed forest and three areas of disturbed/shrub habitat. The two forested areas that would be affected are located where the new trailhead parking area and North Pond #1 would be created, and where the proposed roadway parallels Issaquah High School. The three disturbed shrub areas that would be impacted are located near the I-90/East Sunset Way interchange where North Pond #1 would be created, and near the proposed roadway that uses the former railroad right-of-way. The North A alignment would also pass directly through one of the areas with a high density of snags identified along the former railroad right-of-way.

The South A alignment would remove approximately 3.81 hectares (9.42 acres) of disturbed/shrub upland vegetation in the southern portion of the project area. Impacts on upland vegetation from the South A alignment would include two areas of disturbed/shrub habitat where South Pond A-1 would be created, and the area along 6th Avenue Southeast.

Impacts on wetland vegetation from the South A alignment would involve filling approximately 0.26 hectares (0.64 acres) of forested wetland area. Impacts on wetlands would include permanent loss from filling approximately 0.03 hectares (0.07 acres) in Wetland VL and 0.23 hectares (0.57 acres) in Wetland GW. Because of the small size of Wetland VL, roadway fill would affect surface water movement in the wetland and its potential as wildlife habitat. Fill in the southwest corner of Wetland GW may cause localized flooding and a change in the plant community, as described above under impacts common to all build alternatives.

The South A alignment includes a 75-meter (246-foot) bridge that would completely span the north tributary and Wetland GW. The bottom of the bridge would be elevated approximately 2 meters (6 feet) above ground elevation, allowing hydrologic connections and wildlife to move through the wetland underneath the roadway. Some wildlife, such as large-sized mammals, may be deterred from crossing underneath a roadway that provides this amount of clearance. However, these animals may pass underneath during off-peak or low-use hours. The introduction of increased noise and activity within the wetlands may deter some wildlife from the immediate area and would fragment the vegetation community.

Among the build alternatives, Alternative 1 would result in the highest loss of upland and wetland vegetation. This would include approximately 10.62 hectares (26.22 acres) of impact on wildlife habitat. Compared to the other build alternatives, the North A alignment would result in less fragmentation of existing habitat than the North B and C alignments, because it follows a former railroad right-of-way and is located farther from the base of Tiger Mountain. Compared to the South C alignment, the South A alignment would remove more wetland habitat and cause more fragmentation of Wetland GW.

Alternative 2 Impacts on Wildlife

The same impacts on upland vegetation as discussed earlier for the North A alignment for Alternative 1 would occur under this alternative. This would include impacts on approximately 1.79 hectares (4.42 acres) of mixed forest and 4.75 hectares (11.74 acres) of disturbed/shrub habitat for a total of 6.54 hectares (16.16 acres) of upland vegetation in the northern portion of the project area.

The South C alignment would remove approximately 3.54 hectares (8.76 acres) of disturbed/shrub of upland vegetation in the southern portion of the project area. Impacts on upland vegetation from the South C alignment would occur where South Pond C-1 would be created, north of the former railroad right-of-way, the residential area near 2nd Avenue Southeast, and where South Pond C-2 would be created. Although some mixed forest is located in this area the dominant vegetation consists of shrubs and saplings.

Impacts on wetland vegetation from the South C alignment would include loss of approximately 0.06 hectares (0.16 acres) of forested wetland area in Wetland HS. Because of the small size of Wetland HS, roadway fill would affect surface water movement in the wetland and its potential as wildlife habitat. Fill in the southwest corner of Wetland HS may cause localized flooding and a change in the plant community, as described above under impacts common to all build alternatives.

The South C alignment would border the edge of Wetland GW in the southern portion of the project area. Some wildlife, such as medium- and large-sized mammals, may be deterred from crossing to adjacent habitat in Wetland HS. In addition, the introduction of increased noise and activity within the wetland may deter some wildlife from the immediate area and would fragment the vegetation community.

Overall, Alternative 2 would result in 10.15 hectares (25.08 acres) of impacts on wildlife habitat from the loss of upland and wetland vegetation. This total is comparable to Alternative 1 but would result in fewer impacts on wetland vegetation.

Alternative 3 Impacts on Wildlife

The North B alignment would remove approximately 3.51 hectares (8.68 acres) of upland forest and 2.59 hectares (6.39 acres) of disturbed/shrub habitat for a total of 6.10 hectares (15.07 acres) of upland vegetation in the northern portion of the project area. Impacts on upland vegetation from the North B alignment would include three areas of mixed forest and five areas of disturbed/shrub habitat. The three forested areas that would be affected are located where the new trailhead parking area and North Pond #1 would be created, an area near the Sportsmen's Clubhouse, and where the proposed roadway parallels Issaquah High School. The five disturbed/shrub areas that would be impacted are located near the I-90/East Sunset Way interchange, where North Pond #1 would be created, the proposed roadway that uses the former railroad right-of-way, an area near the Issaquah High School athletic field, and where North Pond #2 would be created. The North B alignment would pass through an area with a high density of snags identified east of the Issaquah High School athletic field.

The North B alignment would be located closer to the base of Tiger Mountain (i.e., farther east) than would the North A alignment, further encroaching on habitat along the steep forested slopes of the NRCA. However, this alignment would result in less vegetation removal than would be required for the North A and North C alignments.

The same impacts on upland vegetation from the South A alignment as discussed previously for Alternative 1 would occur under this alternative. This would include removing 3.81 hectares (9.42 acres) of disturbed/shrub habitat in the southern portion of the project area.

The same impacts on wetland vegetation as discussed earlier for the South A alignment for Alternative 1 would occur under this alternative. This would include filling approximately 0.26 hectares (0.64 acres) of forested wetland area.

Overall, Alternative 3 would result in 10.16 hectares (25.12 acres) of impacts on wildlife habitat from the loss of upland and wetland vegetation. This would involve greater loss of forested habitat, less loss of disturbed/shrub habitat, and the same loss of wetland habitat as compared to Alternative 1.

Alternative 4 Impacts on Wildlife

The same impacts on upland vegetation as discussed earlier for the North B alignment for Alternative 3 would occur under this alternative. This would include impacts on approximately 3.51 hectares (8.68 acres) of upland forest and 2.59 hectares (6.39 acres) of disturbed/shrub habitat for a total of 6.10 hectares (15.07 acres) of upland vegetation in the northern portion of the project area (see Figure 3-21).

The same impacts on upland vegetation from the South C alignment, as discussed previously for Alternative 2, would occur under this alternative. This would include removing approximately 3.54 hectares (8.76 acres) of disturbed/shrub habitat in the southern portion of the project area.

The same impacts on wetland vegetation as discussed earlier for the South C alignment for Alternative 2 would occur under this alternative. This would include filling approximately 0.06 hectares (0.16 acres) of forested wetland area in Wetland HS.

Overall, Alternative 4 would result in 9.70 hectares (23.98 acres) of impacts on wildlife habitat from the loss of upland and wetland vegetation. Alternative 4 would remove less vegetation and wildlife habitat than any of the other build alternatives.

Modified Alternative 5 Impacts on Wildlife

In the north portion of the alignment, approximately 3.6 hectares (8.9 acres) of upland forest and 2.92 hectares (7.22 acres) of disturbed/shrub habitat for a total of 6.52 hectares (16.11 acres) of upland vegetation would be removed. Impacts on upland vegetation in the north portion of the corridor would include three areas of mixed forest and five areas of disturbed/shrub habitat. The three forested areas that would be affected are located where the new trailhead parking area and North Pond #1 would be created, an area near the Sportsmen's Clubhouse, and in the area where the proposed roadway parallels Issaquah High School. The five disturbed/shrub areas that would be affected are located as follows: 1) near the I-90/East Sunset Way interchange, 2) where North Pond #1 would be created, 3) the proposed roadway that uses the former railroad right-of-way, 4) an area near the Issaquah High School athletic field, and 5) where North Pond #2 would be created. The alignment would pass through an area with a high density of identified snags east of the Issaquah High School athletic field. The proposed Park Pointe development adjacent to Issaquah High School would also cause impacts on wildlife in the project area (HDR, 2002).

In the south portion of the alignment, approximately 3.81 hectares (9.41 acres) of disturbed/ shrub upland vegetation would be removed. Impacts on upland vegetation in this portion of the corridor would include two areas of disturbed/shrub habitat: 1) where South Pond S-1 would be created, and 2) the area along 6th Avenue Southeast.

Impacts on wetland vegetation in the south portion of the alignment would involve filling approximately 0.24 hectares (0.59 acres) of scrub-shrub wetland area. Impacts on wetlands would include permanent loss from filling approximately 0.24 hectares (0.59 acres) in Wetland VL. Because of the small size of Wetland VL, roadway fill would effectively eliminate this wetland and its associated functions that include surface water control and potential wildlife habitat.

The Modified Alternative 5 includes a 73-meter (240-foot) bridge that would completely span the north tributary and Wetland GW in the south portion of the corridor. The bottom of the bridge would be elevated approximately 2 meters (6 feet) above ground elevation, allowing hydrologic connections and wildlife to move through the wetland underneath the roadway. Some wildlife, such as large-sized mammals, may be deterred from crossing underneath a roadway that provides this amount of clearance. However, these animals may use the passage during off-peak or low-use traffic hours. The introduction of increased noise and activity within the wetlands may deter some wildlife from the immediate area and the new bridge would fragment the vegetation community.

Alternative 6 Impacts on Wildlife

The same impacts on upland vegetation as discussed earlier for the North C alignment for Modified Alternative 5 would occur under this alternative. This would include impacts on approximately 3.60 hectares (8.89 acres) of upland forest and 2.92 hectares (7.22 acres) of disturbed/shrub habitat for a total of 6.52 hectares (16.11 acres) of upland vegetation in the northern portion of the project area.

The same impacts on upland vegetation from the South C alignment as discussed previously for Alternative 2 would occur under this alternative. This would include removing approximately 3.54 hectares (8.76 acres) of disturbed/shrub habitat in the southern portion of the project area.

The same impacts on wetland vegetation as discussed earlier for the South C alignment for Alternative 2 would occur under this alternative. This would include filling approximately 0.06 hectares (0.16 acres) of forested wetland area in Wetland HS.

No-Action Alternative Impacts on Wildlife

The no-action alternative would not cause any impacts on wildlife habitat in the project area, because no new roadways would be in operation and existing traffic characteristics would be maintained.

Mitigation for Wildlife Impacts

All build alternatives have been designed to avoid or minimize impacts on sensitive areas such as streams, wetlands, wetland buffers, and steep slopes, thereby reducing impacts on plant communities and wildlife species in the project area. Reducing impacts on sensitive areas does not; however, prevent a net loss of habitat.

To minimize impacts, clearing of vegetation in the project area would be reduced to the extent possible to preserve existing habitat and notable trees. The right-of-way would be landscaped with native plantings that provide cover as well as nesting and foraging habitat for native wildlife. The city of Issaquah has a tree replacement policy that requires replanting the same number of trees that are cleared so the wildlife habitat is replaced (Issaquah, 1995). Snags would be created in areas adjacent to the project area to benefit woodpeckers and other cavity-nesting birds that may be affected by the loss of snag priority habitats.

Structural elements within the stream corridor and riparian area would be retained or replaced at the completion of construction. These elements, including woody debris, snags, rocks, and boulders, provide important places for wildlife to hide, rest, lay eggs, and move in the riparian corridor. In addition, best management practices (BMPs) and a Temporary Erosion and Sedimentation Control Plan (TESC) would be implemented during construction to prevent runoff from exposed soils from entering the stream channel or nearby wetlands. BMPs would be implemented during and after construction to reduce impacts on wetlands, limit the extent of vegetation removal, and revegetate disturbed areas.

Offsite mitigation to protect and enhance wildlife habitat could be accomplished through habitat restoration, designation of nearby open space areas for habitat preservation, or contribution to the Issaquah tree replacement fund. To determine the feasibility of each of these measures and to identify habitat needs in the project area, further study would be needed after a preliminary preferred alternative is selected.

Mitigation specific to each build alternative are described below.

Alternative 1 Mitigation for Wildlife Impacts

Aside from the mitigation measures common to all build alternatives described above, additional mitigation for the loss of wetlands under Alternative 1 would be provided. The preferred approach for mitigation involves creation of a wetland onsite or within the same drainage basin as the disturbed wetlands (Ecology, 1994). The Wetlands section of this chapter provides details on the mitigation proposed at two potential sites located adjacent to Wetland GW.

Alternative 2 Mitigation for Wildlife Impacts

The mitigation measures for impacts on upland habitat for Alternative 2 would be the same as those described for Alternative 1. A lesser amount of wetland area would be created or enhanced to compensate for the decreased area of wetland impacts. Mitigation measures for wetland impacts are described in the Wetlands section of this chapter.

Alternative 3 Mitigation for Wildlife Impacts

The mitigation measures for Alternative 3 are similar to those described for Alternative 1. To the extent possible, the corridor should be landscaped with native trees and shrubs.

Alternative 4 Mitigation for Wildlife Impacts

Mitigation measures for impacts on upland vegetation would be similar to those described for Alternatives 1 and 3. The mitigation measures for impacts on wetlands would be similar to those described for Alternatives 1 and 2.

Modified Alternative 5 Mitigation for Wildlife Impacts

The mitigation measures for upland vegetation for the North C alignment would be similar to those described for the North B alignment under Alternative 3. The mitigation measures for wetland vegetation would be similar to those described for the South A alignment under Alternative 1.

Alternative 6 Mitigation for Wildlife Impacts

The mitigation measures for upland vegetation for the North C alignment would be similar to those described for the North C alignment under Modified Alternative 5. The mitigation measures for wetland vegetation for the South C alignment would be similar to those described for the South C alignment under Alternative 2.

Wildlife Crossings

Affected Environment

The project area can be separated into three sections where impacts on wildlife crossing are a potential issue: the I-90/East Sunset Way interchange, the north project area, and the south project area. Potential impacts related to ecological connectivity are discussed in following sections.

Impacts on Wildlife Crossings

I-90/East Sunset Way Interchange Impacts on Wildlife Crossings

Potential impacts on wildlife associated with operation of the I-90/East Sunset Way interchange are discussed in the final EIS for the Interstate 90–South Sammamish Plateau Access Road and Sunset interchange modifications (FHWA et al., 1999). As stated in that document, the I-90 freeway overpass, which crosses over the East Fork Issaquah Creek at the northern terminus of the project area, provides a north/south corridor below the freeway for wildlife moving between nearby open space areas. Freeway overpasses provide connectivity between the two large open space areas north and south of I-90. These overpasses allow for movement of ground-dwelling species including deer, bears, raccoons, and cougars. One overpass is located at the existing Sunset interchange, and the second is farther east of the interchange area.

The final EIS for the I-90-South SPAR project also states that the increased number of roads and freeway ramps at this location would likely cause a reduction in the use of this crossing by wildlife. Operation of the Southeast Issaquah Bypass would require wildlife to cross underneath the same roadways described for the I-90/East Sunset Way interchange. These roads would receive additional traffic volumes from operation of the Southeast Issaquah Bypass, possibly reducing the use of this crossing by wildlife. The final EIS for the I-90/East Sunset Way interchange states that this wildlife crossing is the least used by wildlife of three north/south crossing points in the project vicinity.

North Project Area Impacts on Wildlife Crossings

Wildlife movement in the northern portion of the project area (i.e., North A, B, and C alignments) is currently limited by the presence of human activities on the existing primitive roads and hiking trails that bisect the area. Wildlife likely moves freely through this area at night, although some animals may easily fall prey on the exposed trails and roads. The majority of wildlife movement in this portion of the project area consists of common small mammals adapted to foraging in suburban areas where bird feeders, gardens, and garbage provide an abundant and accessible food base (FHWA, 2002). Operation of the Southeast Issaquah Bypass would deter some wildlife from the project area, particularly during the daytime. Because no road currently exists in this location, road-killed wildlife would likely increase in this portion of the alignment, particularly during the evening hours. Some of this effect would be offset by the retaining walls proposed in the north alignments, which would restrict wildlife access to the road corridor.

Alternatives 1, 3, and Modified 5 Impacts on Wildlife Crossings

In addition to the impacts described above for all build alternatives, alternatives with the South A alignment would have the additional impacts described below.

South Project Area Impacts on Wildlife Crossings

In the southern portion of the project area, (i.e., South A alignment) wildlife currently moves relatively freely between the forested slopes of the Tiger Mountain NRCA to the east and adjacent residential areas to the west. The proximity of Front Street South at the western edge of the residential area exposes wildlife to vehicular traffic, thereby limiting wildlife movement to Issaquah Creek located west of the residential areas. The South A alternative would provide a bridged crossing of the north tributary to Issaquah Creek and Wetland GW. This bridged crossing would provide a safe travel corridor along the stream channel under the Southeast Issaquah Bypass for wildlife access to nearby residential areas. However, wildlife would still encounter vehicular traffic on Front Street South.

No-Action Alternative Impacts on Wildlife Crossings

The no-action alternative would not cause any impacts on wildlife crossings in the project area, because no new roadways would be in operation and existing traffic characteristics would be maintained.

Mitigation for Wildlife Crossings

After publication of the supplemental draft EIS for the Southeast Issaquah Bypass project, the project proponents and resource agencies met to review impacts and agree on required mitigation for the selected preferred alternative. The results of those discussions are contained in the Concurrence Point 3 packet for the Southeast Issaquah Bypass project (Issaquah, 2005a). This document outlines the agreement for wildlife crossings in the Southeast Issaquah Bypass project corridor.

Alternatives 1, 3, and Modified 5 Mitigation for Wildlife Crossings

Recognizing that more needs to be understood regarding the migration patterns of large mammals between Tiger and Squak mountains, the city agreed during the Concurrence Point 3 issue resolution process to participate monetarily and help initiate a study and planning effort that addresses regional wildlife connectivity. The city also agreed to facilitate a discussion during the project design stage with WSDOT, through an interagency request to evaluate maintenance needs at existing wildlife crossings on I-90 in coordination with WDFW and USFWS.

As noted previously, a 21- x 73-meter (70- x 240-foot) bridge would be installed to cross the north tributary to Issaquah Creek and Wetland GW. The proposed design would use 18.2- to 19.8-meter (60- to 65-foot) spans supported on augered steel, concrete-filled piles. This would permit a shallow structural section for the bridge deck that provides for 1.5 to 1.8 meters (5 to 6 feet) of clearance for wildlife passage. During the Concurrence Point 3 meetings it was agreed that elevating this bridge to 2.4 meters (8 feet), to provide more effective passage for large mammals, would not be necessary because it could not be demonstrated that this would benefit the migration of large mammals. A proposed wildlife crossing near the Issaquah Sportsmen's Clubhouse was eliminated because existing fencing on private property in the area would make this crossing ineffective. This change was acceptable to the resource agencies at the Concurrence Point 3 meetings. Fencing along the roadway, to prevent wildlife from entering the travel lanes, was also determined to be unnecessary. Wildlife signage, as determined appropriate, would be provided along the road corridor to warn drivers of the potential for encountering wildlife.

Alternatives 2, 4, and 6 Mitigation for Wildlife Crossings

Since these alternatives do not involve a bridge over the north tributary, mitigation requirements are minimal. A wildlife crossing that was previously proposed near the Issaquah Sportsmen's Clubhouse was eliminated because existing fencing on private property in the area would make this crossing ineffective. Fencing along the roadway, to prevent wildlife from entering the travel lanes, was also determined to be unnecessary. Wildlife signage, as determined appropriate, would be provided along the road corridor to warn drivers of the potential for encountering wildlife.

Fisheries

Studies and Coordination

Information gathered from published literature sources, maps, and agency correspondence was reviewed to assess the historical and current presence of fish and fish habitat at the Southeast Issaquah Bypass site. The major findings are summarized below as they pertain to fish habitat and usage. The biological assessment for the project describes conditions.

Information regarding fish habitat, potential fish use, and potential impacts in the vicinity of the project site was obtained from several sources, including but not limited to the following:

- *A Catalog of Washington Streams and Salmon Utilization*, Volume 1: Puget Sound Region (Williams et al., 1975)
- King County Sensitive Areas Map Folio (King County, 1990)
- National Marine Fisheries Service correspondence regarding the presence of endangered or threatened species (NMFS, 1997)
- Fisheries data from spawning surveys and juvenile releases from hatcheries for the Issaquah Creek basin from 1986 to 1996 (WDFW, 1997b)
- *Streams and Fisheries Technical Report—Southeast Issaquah Bypass* (Herrera, 1998c)
- Salmonid Stock Inventory (SaSI) database for fish distribution (WDFW, 2002)
- *Stream Inventory and Habitat Evaluation Report* (Parametrix, 2003)
- *Concurrence Point 3 Packet: Southeast Issaquah Bypass Project* (Issaquah, 2005a)
- Southeast Issaquah Bypass biological assessment (Herrera, 2006).

As a part of the proposed project, a King County Level I stream survey was conducted on two tributaries to Issaquah Creek that flow through the original Southeast Issaquah Bypass project area (identified as the south and north tributaries). The stream survey constitutes a special study, using methods outlined by King County. This survey's purpose was to assess fish habitat within the project corridor and identify potential impacts and mitigation measures. The proposed project area has changed slightly since the survey was conducted. The project design no longer proposes to affect the south tributary; however, one of the proposed mitigation sites is located just south of this stream.

Affected Environment

The Southeast Issaquah Bypass project corridor is located in a narrow valley oriented north to south, between Squak and Tiger mountains. Within this valley, Issaquah Creek, designated as Stream #08-0178 using the Washington water resource inventory area (WRIA) coding system, flows north through the city of Issaquah toward Lake Sammamish (Williams et al., 1975). Issaquah Creek is part of the Lake Washington hydrologic unit #17110012 and is designated as *essential fish habitat* (EFH) for Chinook, coho, and sockeye salmon (Pacific Fisheries Management Council [PFMC] 1999). The King County Sensitive Areas Map Folio identifies Issaquah Creek as a Class 1 stream with salmonids. The Issaquah Creek drainage basin, which covers 147.2 square kilometers (km) (56.6 square miles), is composed of 27.7 km (17.3 river miles) of the main stem channel and eleven major tributaries to the main stem (Williams et al., 1975). The tributaries located in the vicinity of the proposed project are East Fork Issaquah Creek (WRIA #08-0183), the north tributary (assigned no WRIA number; also known as Lewis Lane tributary and Hope Creek), and the south tributary (WRIA #08-0199, also known as Kees Creek and Tributary 0199).

East Fork Issaquah Creek flows through the I-90/East Sunset Way interchange area, to the north of the project corridor. Stormwater runoff discharged from the north end of the project site would enter this stream. The north tributary would be directly affected by construction of Modified Alternative 5, as a bridge would be constructed over the stream and associated wetland. The south tributary would not be directly affected by the project; however, a potential mitigation area (Option 2) is located just south of this stream.

Issaquah Creek

The proposed project would not directly impact the main stem of Issaquah Creek. The only tributary to Issaquah Creek that would potentially be impacted by the Southeast Issaquah Bypass project is the north tributary (under Alternatives 1, 3, and Modified 5). In addition, one of the mitigation options is located just south of the south tributary, to the east of the main stem of Issaquah Creek.

Issaquah Creek has been extensively altered from predevelopment conditions by urbanization; historic timber, agricultural, and mining activities; and general development. Much of the stream has been disconnected from its floodplains, some of the banks have been hydromodified large woody debris (LWD) is almost absent, and riparian areas are scattered and of low quality throughout much of the lower watershed (Parametrix, 2002). Pools are scarce and shallow. Despite these problems, there is still suitable salmon spawning and rearing habitat in the main stem, especially in the lowest 4.8 km (3 miles) of the stream. Additional information regarding the current conditions in Issaquah Creek is presented in the Hydrologic Systems, Floodplains, and Water Quality sections of this chapter, and also in the biological assessment report (Herrera, 2006).

Spawning surveys, hatchery practice records, and other resources indicate that Issaquah Creek and its major tributaries are used mainly by fall Chinook salmon, coho salmon, sockeye salmon, winter-run steelhead trout, and cutthroat trout (Streamnet, 2002; WDFW, 1997b). The Issaquah Creek drainage is also utilized by Lake Sammamish kokanee (King County, 2002a). Adult fall Chinook and sockeye salmon spawn within Issaquah Creek during August and September. Coho salmon spawn within Issaquah Creek in the months of October through December. Salmon primarily use the available habitat between river mile 0.0 and 3.0, which is mostly downstream of the project area (WDFW, 1997b). Hatchery-raised coho and Chinook salmon heading further upstream are captured at the Issaquah hatchery where many of them are used as broodstock. Any excess hatchery fish and all other fish heading upstream are passed above the hatchery weir.

Adult wild winter-run steelhead trout enter Issaquah Creek to spawn between March and May. Adult hatchery-raised winter-run steelhead trout enter Issaquah Creek to spawn between December and February. These adults, like the Chinook, coho, and sockeye, mostly use the lowest 4.8 km (3 miles) for spawning and are captured at the hatchery. Excess fish are also passed above the hatchery weir.

Adult sea-run cutthroat trout enter the Issaquah Creek system to spawn between December and February. Most of these fish are collected at the fish hatchery and passed above the hatchery weir. These adults mainly use tributary channels for spawning, such as the south tributary to Issaquah Creek or other areas higher in the Issaquah Creek drainage.

A recent study found that three races of kokanee have been identified in the Lake Sammamish drainage: early-run kokanee that spawn during late summer, middle-run kokanee that spawn from late-September through November, and a late-run type that spawn in late fall (Berge and Higgins, 2003). Human influences have degraded spawning habitat greatly throughout King County, and low streamflows may also affect the chance of survival for kokanee. Hydrologic changes, sedimentation, and water pollutants also pose threats to these fish. Historically, kokanee were found throughout the Lake Washington/Sammamish Watershed area. Berge and Higgins indicated that the early-run kokanee population has declined so severely that they have been declared extinct, and that the late-run type is presently in long-term decline. The Berge and Higgins study also found that the potential limits of freshwater habitat may pose a severe threat to the native kokanee's long-term survival. Recent and planned restoration projects on Issaquah Creek and its tributaries, the use of BMPs during any construction activities in the area, and additional stormwater treatment facilities are expected to improve the habitat conditions for late-run kokanee in Issaquah Creek.

Other fish that may be present in Issaquah Creek include resident cutthroat trout (especially in the upper reaches and tributaries), brook and Pacific lamprey, largescale sucker, mountain whitefish, and various species of sculpin (Parametrix, 2002). A variety of introduced species can be found in the lower reaches of Issaquah Creek, including brown bullhead, black crappie, and largemouth and smallmouth bass (Parametrix, 2002). In addition, there has been one anecdotal, unconfirmed sighting of a juvenile Puget Sound bull trout in the upper reaches of Issaquah Creek, far from the project area. In general, even under predevelopment conditions, it is unlikely that Issaquah Creek provides suitable spawning and rearing habitat for native char. However, adult anadromous bull trout may forage in the project area during salmon spawning and smolt migrations (Berge and Mavros 2001). If present, migratory adult bull trout are likely to occur only in the main stem of Issaquah Creek and in East Fork Issaquah Creek, where suitable resting habitat and forage are present.

Impacts

The impacts on Issaquah Creek would be similar for all build alternatives, as described below. No impacts would result from the no-action alternative.

Stream Channel Impacts

No direct stream channel impacts would occur to Issaquah Creek. All project work is located at a considerable distance from this stream.

Habitat Loss

No direct habitat loss would occur to Issaquah Creek.

Water Quality Effects

No direct riparian clearing would occur for Issaquah Creek. As discussed in the Water Quality section, the proposed stormwater management plans for all build alternatives include treatment of all new roadway runoff, and treatment of runoff from a portion of Front Street South and 2nd Avenue Southeast to an extent that would result in no net increase in annual pollutant loading to streams in the project area. During roadway operations the potential exists for gasoline or other hazardous materials to spill, via the stormwater drainage system, into the local streams that eventually discharge to Issaquah Creek.

Changes in Watershed Hydrology

Increasing the amount of impervious area in a watershed reduces the amount of land surface available to infiltrate rainfall. It also reduces the amount of vegetation that transpires moisture from the soil into the atmosphere. These changes cause water to run off into drainages faster than under natural conditions. Peak flows tend to increase and lead to more damaging flooding, which can be detrimental to stream habitat processes and may cause direct mortality of some fish species. Reduced infiltration from impervious surfaces can also cause lower groundwater levels, leading to less streamflow in late summer. Low streamflows are detrimental to fish species because as water temperature increases, habitat availability decreases. Although all of these changes in watershed hydrology would potentially occur with the project, the proposed stormwater management plan would mitigate the adverse effects of these types of hydrologic changes.

Mitigation

Because no direct impacts on Issaquah Creek would result from the project, mitigation is not required. Operational impacts would be minimized by the following:

- Stormwater runoff from the Southeast Issaquah Bypass roadway and offsite road areas would be treated, to achieve no net loading of pollutants to streams in the project area (see Water Quality section).
- Stormwater would be infiltrated to the maximum extent possible to mimic natural hydrologic characteristics and surface water discharges would be released at predevelopment rates (see Surface Water section).

- The stormwater systems for this project will be designed to allow for the containment and cleanup of hazardous materials spills before they discharge to a stream (see Water Quality section).

East Fork Issaquah Creek

The King County Sensitive Areas Map Folio identifies East Fork Issaquah Creek as a Class 2 stream with salmonids. The lower reaches within the city of Issaquah have similar habitat problems as in the main stem of Issaquah Creek, including lack of floodplain connectivity, scarce large woody debris, low-quality or nonexistent riparian areas, and few pools. Above the city limits and the I-90 crossing, habitat conditions improve markedly (Parametrix, 2002).

Spawning surveys, hatchery practice records, and other resources indicate that East Fork Issaquah Creek is used mainly by fall Chinook salmon, coho salmon, sockeye salmon, winter-run steelhead trout, and cutthroat trout (Streamnet, 2002; WDFW, 1997b). Kokanee may also be present in limited numbers within this tributary. Adult fall Chinook, coho, and sockeye salmon enter East Fork Issaquah Creek to spawn in the I-90/East Sunset Way interchange vicinity during September and October. Other fish present in East Fork Issaquah Creek are the same as those described for Issaquah Creek, with the exception of the warm-water nonnative species.

Impacts

The impacts on East Fork Issaquah Creek would be similar for all build alternatives, as described below. No impacts would result from the no-action alternative.

Stream Channel Impacts

No direct stream channel impacts would occur to to East Fork Issaquah Creek.

Habitat Loss

All build alternatives would result in minor habitat loss at the location of proposed stormwater pond outfalls on the bank of the East Fork Issaquah Creek.

Water Quality Effects

Impacts would be the same as described previously for Issaquah Creek.

Changes in Watershed Hydrology

Impacts would be the same as described previously for Issaquah Creek.

Mitigation

Mitigation would be the same as described previously for Issaquah Creek. In addition, habitat improvements would be included in the stormwater outfall construction on East Fork Issaquah Creek, as would be required by the hydraulic project approval permit.

North Tributary of Issaquah Creek

According to the city of Issaquah rating system (Issaquah Municipal Code 18.10.780), the north tributary would be considered a Class 2S stream because it potentially contains salmonid species (which includes cutthroat trout). The north tributary outflows from Wetland GW, which is fed by springs and seeps located along lower Tiger Mountain. This stream is approximately 0.75 km (0.46 miles) long, with a channel approximately 2 to 3 feet wide and 6 inches deep. The stream's substrate is mainly silt and sand. The banks of the tributary are well-vegetated with native and invasive species. Whereas the north tributary historically discharged directly to Issaquah Creek, at a location west of Front Street South and about 900 feet downstream of the project corridor, the stream currently discharges into the Hope wetland. Physical barriers between the wetland complex and Issaquah Creek, including man-made fill created in the 1960s and beaver dams, present an effective barrier to fish passage except during flooding conditions. Within the wetland complex, there do not seem to be fish passage issues, except perhaps thick reed canarygrass mats that grow in the stream channel. A log weir observed in the stream downstream of the Front Street South culvert, and a small rock dam on private property upstream of Front Street South, both appear to be fish passable, at least during flooding conditions.

A King County Level I stream survey was conducted on October 17, 1997, to provide information on fish habitat in the north tributary. The groundwater spring at the headwaters provides a steady discharge, allowing the creek to flow most months of the year. The north tributary has a defined channel with low banks, but there is little evidence of floodwaters scouring new channels or eroding the banks. The riparian wetland is semi-permanently flooded from a high groundwater table, resulting in standing water and saturated soils on both banks. Although the banks are composed of fine-grained materials, there is little erosion because of the low gradient and the dense vegetation that serves to stabilize the soil.

Four habitat type units were observed during the stream survey, which extended 227 meters (745 feet) from the western boundary of the project corridor to the headwater area. The stream is characterized as a low-gradient system with riffles. The stream channel substrate consists of silt/organic matter with lesser amounts of sand. There are generally no coarse gravels or cobbles in this stream; however, a small area of gravel substrate is present just downstream of Front Street South. Spawning habitat in the project area is considered poor, because of the lack of gravel and cobbles. Three pools were observed in the surveyed reach, consisting of one corner pool caused by bank scouring and two plunge pools formed by rootwads. At the time of the stream survey, these pools had maximum depths ranging between 0.2 and 0.43 meters (9 and 17 inches) with widths within 10 percent of the average stream width, and they lacked woody cover. These three pools provide poor rearing habitat.

The width of the riparian zone along this stream channel is equal to the width of the forested wetland through which it flows. This riparian zone, which averages 60 meters (200 feet) in width, is dominated by red alder (*Alnus rubra*), black cottonwood (*Populus balsamifera*), Pacific willow (*Salix lasiandra*), and western red cedar (*Thuja plicata*) in the tree canopy. Commonly observed shrubs are hardhack (*Spiraea douglasii*), red-osier dogwood (*Cornus stolonifera*), salmonberry (*Rubus spectabilis*), and several nonnative species, including Himalayan blackberry (*Rubus discolor*), evergreen blackberry (*Rubus laciniatus*), English ivy (*Hedera helix*), and American holly (*Ilex opaca*). Despite the forested canopy, there are few trees along the stream channel, and as a result, woody debris is limited along the surveyed reach. Nine logs and a large amount of small debris from shrub branches were observed within the 227 meters (745 feet) of surveyed channel. The woody debris mainly consists of rotten deciduous logs anchored on the bank, forming habitat features such as bridges and weirs.

As described above, salmonid species have been documented using Issaquah Creek for migration, spawning, and rearing. Habitat restoration efforts planned for Summer 2006 will improve fish access to the north tributary (Hope Creek). Juvenile Chinook salmon, which have been seen in the Hope wetland during storm events, will then have better access to the north tributary and the Hope wetland. Coho salmon are likely to use the north tributary for spawning once this habitat becomes available. Steelhead may use the lowest reaches for spawning, but this is unlikely. Cutthroat trout are resident in the north tributary, and sea-run cutthroat may also be present. Kokanee may occur in the north tributary. They have been observed in the nearby south tributary (King County, 2002), which has similar stream characteristics albeit considerably more flow. The substrate in the north tributary is mostly sand and organic silt, which may provide good habitat for juvenile lamprey, which bury themselves in organic silt and filter feed for the first several years of life.

Impacts Common to Alternatives 2, 4, and 6

Impacts on the north tributary of Issaquah Creek are described in the following subsections. No impacts would result from the no-action alternative.

Stream Channel Impacts

No direct stream channel impacts would occur to the north tributary stream.

Habitat Loss

No direct habitat loss would occur to the north tributary stream.

Water Quality Effects

Impacts would be the same as described previously for Issaquah Creek.

Changes in Watershed Hydrology

Impacts would be the same as described previously for Issaquah Creek.

Riparian and Wetland Vegetation Removal and Shading

The overall impacts from riparian vegetation removal along the north tributary under Alternatives 2, 4, and 6 would be minor, because they would occur in a small area where the roadway comes close to the stream. Approximately 20 riparian trees would be removed. Impacts on fish from the removal of riparian vegetation in this small area along the north tributary would be limited to a slight loss of large woody debris recruitment potential and a temporary loss of stream shading until replacement riparian vegetation matures. This impact would be reduced by leaving felled trees in or near the stream channel and planting native riparian vegetation near the location where vegetation was removed for the road.

Leaving the felled trees in the stream channel would increase the amount of large woody debris in the stream, which is currently below optimal conditions. Planting riparian vegetation would ensure a future source of large woody debris.

Mitigation

Mitigation would be the same as described previously for Issaquah Creek.

Impacts Common to Alternatives 1, 3, and Modified 5

Stream Channel Impacts

Alternatives 1, 3, and Modified 5 would result in no direct instream impacts on the main stem of the north tributary. The proposed bypass roadway bridge over the north tributary and the associated wetland (Wetland GW) would shade the associated portion of the stream and approximately 0.13 hectares (0.32 acres) of stream buffer (equal to the shaded area of Wetland GW). The bridge would not cause permanent instream impacts, because the abutments would be located outside the ordinary high water level of the channel and no piers would be located within the channel. Permanent buffer impacts would occur on each end of the bridge. Potential long-term effects of the project are discussed in this section. Temporary impacts during project construction are discussed in the Fisheries portion of the Construction Impacts section later in this chapter.

A small, man-made drainage that runs from Wetland GW to the north tributary in the area adjacent to 6th Avenue Southeast and across from the LDS Church would be impacted by South Pond S-2. This tributary, which is relatively degraded, would be relocated around the pond.

Habitat Loss

Alternatives 1, 3 and Modified 5 would result in minor habitat loss at the location of proposed stormwater pond outfalls on the bank of the north tributary downstream of Front Street South. The proposed bridge over the north tributary stream channel and a portion of Wetland GW would also result in minimal loss of fish habitat because the bridge would span the stream and adjacent wetland. Indirect impacts would result from buffer clearing in the location of the proposed bridge. This area currently contains shrubs, herbaceous vegetation, and approximately 20 young deciduous trees. When riparian vegetation is removed, stream shading is reduced, sometimes leading to higher summer water temperatures. However, the new bridge would serve to shade the stream to a greater extent than the young trees currently do.

Several long-term effects could be expected with the proposed clearing of riparian vegetation for stormwater outfall construction and bridge construction. Habitat for insects, the primary prey species for salmonids and other fish, could be destroyed in the immediate area of clearing. Removal of riparian vegetation would also reduce large woody debris recruitment potential. Large woody debris is important for stream health because the presence of large trees in the channel provides cover for fish and habitat for prey species, and interacts with the water to create stream channel habitat areas. The loss of riparian vegetation would also reduce the amount of organic matter contributed to the stream in the form of leaf and litter fall.

Constructing a bridge would serve to maintain ecological connectivity and fish passage along the north tributary. The only expected impacts on connectivity could occur during the construction phase of the project, if construction debris or disturbed earth were to enter the channel. Impact minimization measures described in the Construction Activities section of this chapter would be implemented to prevent long-term degradation of habitat in the north tributary and its surrounding wetland and riparian area. Temporary impacts would be mitigated as soon as possible, restoring the area to its original condition.

Water Quality Effects

A long-term effect of riparian clearing can be the loss of bank stability, leading to bank failure and sediment input into the stream. The project area is not currently heavily vegetated, and some vegetation is expected to survive under the proposed north tributary bridge, particularly near the edges. Impacts would be reduced by leaving the felled trees in or near the stream channel. Also, the cleared riparian area is not likely to experience heavy erosion, as it is a low-gradient area.

As discussed in the Water Quality section, the proposed stormwater management plans for all build alternatives include treatment of all new roadway runoff, and treatment of runoff from a portion of Front Street South and 2nd Avenue Southeast to an extent that would result in no net increase in annual pollutant loading to streams in the project area. During roadway operations the potential also exists for gasoline or other hazardous materials to spill into the north tributary, via the stormwater drainage system, that discharge to the north tributary. Additionally, as described in the Water Quality section of this chapter, the proposed project includes extending the city's sanitary sewer system to several homes currently on poorly performing septic systems in the neighborhood adjacent to the south end of the proposed Bypass roadway. As a result of these project features, it is expected that water quality would not be degraded in project area streams. Therefore, fish in those streams would not be adversely affected by stormwater runoff from the project area.

Changes in Watershed Hydrology

Impacts would be the same as described previously for Issaquah Creek.

In addition, a review of the geology of the project area around Wetland GW indicates that groundwater movement to the wetland is primarily from the high ground to the east, and out through the north tributary and existing culverts under 6th Avenue Southeast. The new roadway is anticipated to have no discernable impact on these wetlands and resulting streamflow in the north tributary, because existing drainage patterns would be preserved. The small drainage located adjacent to 6th Avenue Southeast across from the LDS Church would be relocated due to the construction of South Pond S-2, causing a minor change in streamflow between the existing and future points where this drainage enters the north tributary.

Riparian and Wetland Vegetation Removal and Shading

Removal of riparian and in some cases upland vegetation can cause a number of long-term effects. When riparian vegetation is removed, stream shading is reduced, sometimes leading to higher summer water temperatures. Bank stability can be compromised, leading to bank failure and sediment input into the stream. Habitat for insects, the primary prey species for salmonids and other fish, is lost. Removal of riparian vegetation also removes large woody debris recruitment areas. Large woody debris is important for stream health because the presence of large trees in the channel provides cover for fish and habitat for prey species, and interacts with the stream in stream channel and habitat forming processes.

Alternatives 1, 3, and Modified 5 cross the north tributary and would have the potential to impact water quality and fish habitat from the removal of riparian and wetland vegetation in and along the north tributary. Some of the removed vegetation would not grow back due to the shading effect of the bridge. However, these impacts would be reduced by leaving felled trees in or near the stream channel and planting native riparian vegetation near where vegetation was removed for the road. The overall impacts on fish habitat from riparian vegetation removal associated with these alternatives would be low to moderate, because they would occur in a relatively small area and would be temporary. The bridge would provide stream shading and overhead cover.

Mitigation Common to Alternatives 1, 3, and Modified 5

Mitigation for all impacts identified in this section would be included in the project plans. The conceptual mitigation plan (Appendix F) describes the elements of the proposed stream mitigation and mitigation for wetland and riparian buffer impacts on the site. One of the project goals is to develop compensatory mitigation to offset project impacts on stream resources, and to have the mitigation functions meet or exceed existing functions that would be impacted. The following impact minimization measures would also be implemented. Floodplain impacts would also be mitigated, as described in the Floodplains section of this chapter.

As additional mitigation to compensate for project impacts, 400 to 500 feet of the north tributary west of Front Street South and adjacent to the Hope property would be restored. Stream habitat restoration would include installation of large woody debris, spawning gravel placement, and other instream improvements to supplement the invasive vegetation removal and riparian vegetation planting that would be conducted for the wetland mitigation. Wetland creation, reestablishment, and buffer enhancement will be provided as part of the mitigation package for all critical area impacts (Option 1 or 2 described in the preceding Wetlands section).

Farther downstream, the proposed Hope Creek (north tributary) restoration project will eliminate the fish passage blockage between the north tributary and Issaquah Creek. The wetland complex near the confluence of the Hope Creek and main stem Issaquah Creek will also be restored as part of this restoration project to improve juvenile salmon rearing areas. The Hope Creek restoration project was proposed by a property owner and the Sustainable Fisheries Foundation. The city of Issaquah also provided a cash contribution of $41,000 to match a $75,000 Community Salmon Fund grant that was obtained for this project. It was constructed during the summer of 2006 and will significantly enhance the success of the proposed Southeast Issaquah Bypass mitigation by allowing anadromous fish to access the restoration area.

Mitigation of the small drainage impacted by South Pond S-2 is required because it is a regulated stream under city code. This degraded stream would be relocated around the pond and enhanced with native vegetation. The other culverted outflow from Wetland GW, at the south end of 6th Avenue Southeast, would also be evaluated to determine whether it can be daylighted and joined with the other drainages near the LDS Church.

South Tributary of Issaquah Creek

The characteristics of the portion of the stream within the project area are described in a technical report on streams and fisheries prepared for the project (Herrera, 1998a). The average width of the wetted channel is 1.2 meters (4 feet) and the average depth is 9 centimeters (0.3 feet). The maximum depth observed in the pools was 0.34 meters (1.1 feet). The average annual flow in this small perennial stream is estimated to be 0.025 cubic meters per second, or 0.9 cubic feet per second (King County, 1991).

Based on early field reconnaissance conducted for this project, the stream channel was found to be in relatively poor condition, with some sediment accumulation resulting in a potential barrier to fish passage where the stream crosses the Issaquah/Hobart Road corridor, just beyond the south end of the project area (Herrera, 1998a). The city of Issaquah and King County subsequently addressed this problem by replacing the undersized culverts beneath Southeast 238th Way and Issaquah/Hobart Road in 2004. The new box culverts provide improved flow and sediment conveyance and allow full fish passage. Dense vegetation on the channel banks in some locations may cause obstruction of high flows in this channel reach. At its confluence with Issaquah Creek, the south tributary is bordered by densely vegetated riparian wetlands (Herrera, 1998a; FHWA et al., 2005b, Appendix A).

The south tributary to Issaquah Creek generally contains more suitable substrate conditions for salmonid spawning than the north tributary, but it is still limited. The dominant substrate present is sand and small gravel, with secondary coverage comprised of silt and organic substrate and larger gravel and cobble (Herrera, 1998b). Large woody debris is relatively scarce in the wetted channel of the south tributary (Herrera, 1998a). During 1998 stream surveys, a total of five logs were observed for 150 meters (500 feet) of surveyed channel, and all of these logs were located upstream of Issaquah/Hobart Road. Most of this large woody debris consists of rotten deciduous logs lying unanchored on the banks. At that time, this woody debris had formed habitat features such as lateral logs and bridges, but the current function is unknown.

Surveys of pool quality indices in the south tributary were conducted in 1998 (Herrera, 1998a). A series of five generally low-quality pools ranging in depths from 0.2 and 0.33 meters (8 and 13 inches) were identified in the lower reaches of this system. These pools generally lacked woody cover and provided poor rearing habitat conditions.

The south tributary has little off-channel habitat, with the exception of riparian wetlands adjacent to the Issaquah Creek confluence. These habitats have been fragmented by historic hydromodification that has effectively disconnected the stream from the wetland habitats (Herrera, 1998b).

Fish species likely to use the lower reaches of the south tributary to Issaquah Creek include coho salmon, resident and sea-run cutthroat trout, and kokanee (Herrera, 1998a; King County, 2002). Chinook salmon may also use the south tributary, but this is generally unlikely due to unsuitable habitat conditions. Steelhead may also occur in the south tributary, but spawning and rearing habitat for steelhead is generally poor in this system. During winter storm events, juvenile steelhead may seek refuge from high streamflows in the lower reaches of the south tributary (Herrera 2006).

Impacts

The impacts on the south tributary of Issaquah Creek would be similar for all build alternatives, as described below. No impacts would result from the no-action alternative.

Stream Channel Impacts

No direct stream channel impacts would occur to the south tributary stream.

Habitat Loss

No direct habitat loss would occur to the south tributary stream.

Water Quality Effects

Impacts would be the same as described previously for Issaquah Creek.

Changes in Watershed Hydrology

Impacts would be the same as described previously for Issaquah Creek.

Mitigation

Mitigation measures would be the same as previously described for Issaquah Creek.

Threatened and Endangered Species

The federal government, acting through the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS, or NOAA Fisheries) and the U.S. Fish and Wildlife Service (USFWS), recognizes four categories of listed plant and animal species: threatened and endangered, proposed, candidate, and species of concern. Proposed species are candidate species for which the listing process has been initiated but a decision on listing is pending. **Candidate species** are those petitioned species that are actively being considered for listing as endangered or threatened under the federal Endangered Species Act (ESA), as well as those species for which NMFS has completed a self-initiated status review and determined that listing is warranted under the Endangered Species Act. **Species of concern** are those species about which NMFS has some concerns regarding status and threats, but for which sufficient information is unavailable to indicate a need to list the species under the Endangered Species Act (NOAA Fisheries, 2006). Proposed species, candidate species, and species of concern are not afforded protection under the law. The Washington Department of Fish and Wildlife (WDFW) also maintains a list of endangered, threatened, candidate, and sensitive species, and refers to this list as *species of concern* in Washington state.

Five listed species were identified as possibly occurring within or near the project area: marbled murrelet (threatened), spotted owl (threatened), Puget Sound Chinook salmon (threatened), Puget Sound bull trout (threatened), and Puget Sound steelhead (threatened). The minimization measures proposed for Chinook and bull trout are also expected to reduce potential impacts on steelhead.

According to WDFW, 18 additional species of concern (not endangered or threatened) could occur within or near the project area (**Table 3-19**). The Puget Sound coho salmon is included in this list.

The biological assessment prepared for the Southeast Issaquah Bypass project in accordance with Section 7 of the Endangered Species Act has been revised since its original submittal in October 2003. This includes removal of bald eagle (de-listed) and change of status of Puget Sound steelhead (from proposed to threatened). The biological assessment evaluates the impacts that the preferred alternative (Modified Alternative 5) would have on the listed species described previously. The updated biological assessment determined that the project would not affect USFWS listed species, because no bull trout are presenting the project area. The biological assessment has been prepared and submitted to NMFS for review. Information on species affected and potential impacts presented in this section was extracted from research conducted for the biological assessment. NMFS was unable to concur that the project is not likely to adversely affect listed Puget Sound Chinook salmon and Puget Sound steelhead. Therefore, FHWA is initiating formal Section 7 consultation with NMFS. This consultation will be completed before there is a final decision on this project.

Marbled Murrelet (Brachyramphus marmoratus)

Species Status

The marbled murrelet was federally listed as a threatened species in October 1992. WDFW also lists this species as threatened. Designated critical habitat for the marbled murrelet consists of 32 critical habitat units within mostly

Table 3-19
Potential Impacts on Federal and State Species of Concern

Common Name	Scientific Name	Presence in Action Area	Potential Impacts
Fish Species			
River lamprey	*Lampetra ayresi*	Present	Sediments and contaminants could enter water
Pacific lamprey	*Lampetra tridentata*	Present	Sediments and contaminants could enter water
Puget Sound Coho Salmon	*Oncorhynchus kisutch*	Unlikely	Sediments and contaminants could enter water
Bird Species			
Peregrine falcon	*Falco peregrinus*	Unlikely	No suitable habitat present
Northern goshawk	*Accipiter gentilis*	Unlikely	Marginal suitable habitat would be removed
Olive-sided flycatcher	*Contopus cooperi*	Likely present	Suitable habitat would be removed
Mammal Species			
California wolverine	*Gulo gulo luteus*	Not present	No suitable habitat present
Pacific fisher	*Martes pennanti pacifica*	Not present	Species not documented in area.
Pacific Townsends western big-eared bat	*Corynorhinus townsendii townsendii*	May be present	Suitable habitat would be removed, increased disturbance.
Long-eared myotis	*Myotis evotis*	May be present	Suitable habitat would be removed, increased disturbance.
Long-legged myotis	*Myotis volans*	May be present	Suitable habitat would be removed, increased disturbance
Reptile and Amphibian Species			
Tailed frog	*Ascaphus truei*	May be present	Removal of riparian vegetation may increase water temperature
Western toad	*Bufo boreas*	May be present	Suitable habitat would be removed
Cascades frog	*Rana cascadae*	Not present	Species not documented in area
Northwestern pond turtle	*Clemmys marmorata marmorata*	Not present	Species not documented in area; only marginal habitat present
Insect Species			
Beller's ground beetle	*Agonum belleri*	Unlikely	Suitable habitat not present
Hatch's click beetle	*Eanus hatchi*	Unlikely	Suitable habitat not present
Valley silverspot	*Speyeria zerene bremeri*	Unlikely	Suitable habitat not present

old-growth forests (USFWS 1996). Designated critical habitat for this species is well outside the project area (61 CFR 26255 26320).

Habitat Requirements and Life History Information

The marbled murrelet is a small seabird that feeds in marine waters and nests inland in mature conifer forests west of the Cascades. Marbled murrelets winter on marine waters. During late spring and summer, reproductive adults fly substantial distances inland to establish nests in late-successional or old-growth coniferous forests, and they have been detected in forests throughout the year. Marbled murrelets are more commonly found inland during the summer breeding season but make daily trips to the ocean to gather food.

The marbled murrelet population in Washington, Oregon, and California nests in most of the major types of coniferous forests in the western portions of these states, wherever older forests remain inland of the coast. Although marbled murrelet nesting habitat characteristics are somewhat variable throughout the range of the species, some general habitat attributes are characteristic throughout its range, including the presence of nesting platforms, adequate canopy cover over the nest, landscape condition, and distance to the marine environment. Individual tree attributes that provide conditions suitable for nesting include large branches (average of 32 centimeters (13 inches), range of 10 to 81 centimeters (4 to 32 inches) in Washington, Oregon, and California) or forked branches, deformities (e.g., broken tops), dwarf mistletoe infections, witches brooms, or other structures large enough to provide a platform for a nesting adult murrelet. These structures are typically found in old-growth and mature forests, but may be found in a variety of forest types including younger forests containing remnant large trees (61 CFR 26255 26320).

Marbled murrelets forage in marine areas 0.3 to 2 km (0.2 to 1.2 miles) from shore. Using their wings, murrelets dive to forage on small schooling fish and pelagic crustaceans. Prey species include Pacific sand lance, anchovy, immature Pacific herring, capelin, and juvenile salmon, as well as euphasiids, mysids, and gammarid amphipods. Murrelets often congregate near localized food sources, resulting in a clumped distribution. The most common murrelet prey is sand lance, to which murrelet distribution and movement are closely linked. Marbled murrelets also congregate loaf, preen, and exhibit wing-stretching behaviors on the water (USFWS 1997; Burger 2002).

Presence in Project Area

The currently defined marbled murrelet critical habitat occurs in old growth forest and other timber stands with suitable characteristics in the Cascade Mountains well to the east of the project area (61 CFR 26255 26320). There is no suitable nesting habitat located within a mile of the site (personal communication, Michael McDonald, WSDOT, June 8, 2006). Murrelets may transit the project area in flight en route between feeding and nesting areas, most likely during dawn and evening hours (61 CFR 26255 26320).

Potential Impacts

Proposed project activities may remove some trees that could potentially be used by murrelets for perches or roosts, although as described above, the habitat suitability of these areas is low. No documented roost trees would be removed.

Temporary disturbance to murrelets may result from construction noise or human activity, but would not cause any long-term harm. Disturbance to murrelets would be limited to construction noise and additional vehicular activity in the area, which is already heavily urbanized.

Impact Minimization Measures

Because no suitable nesting sites or winter roost sites are located within 1.6 km (1 mile) of the project area, no specific impact minimization measures for the marbled murrelet are planned.

Northern Spotted Owl (Strix occidentalis caurina)

Species Status

The Northern spotted owl was first listed by the federal government as threatened on June 26, 1990. The species is listed as endangered by WDFW. The designated critical habitat for this species occurs outside of the project area, in the forested eastern and western slopes of the Cascade Mountains (57 FR 1796 1838) in Washington.

Habitat Requirements and Life History Information

The northern spotted owl requires a large forested environment with a multi-layered canopy, large crowned old-growth trees, and snags (Vforest.evergreen.edu website, 2006). The owl inhabits forests dominated by Douglas fir (*Pseudotsuga menziesii*) and western hemlock (*Tsuga heterophylla*) in coastal forests of Washington and Oregon. At higher elevations on the west slope of the Cascades in Washington and Oregon, stands containing Pacific silver fir (Abies amabilis) are commonly used by owls. Owls use mixed conifer stands that may include Douglas fir, grand fir (*Abies grandis*), and ponderosa pine (*Pinus ponderosa*) on the east slope of the Cascades (57 FR 1796 1838).

The owl requires 2,700 to 4,500 acres of dense old-growth forest or deep, narrow, heavily wooded canyons per breeding pair (Kirk and Franklin, 1992). It generally nests in cool, shaded areas with a well-developed understory. It prefers to nest on the broken top of a snag or on platforms created by Dwarf Mistletoe or hollowed out logs or snags. Its breeding season is from early March to mid-April. The spotted owl preys on a wide variety of animals, but mostly eats small mammals like mice, squirrels, or voles (DeGraaf et al., 1991). The species' main role in the ecosystem is to maintain small mammal populations.

Presence in Project Area

The currently defined northern spotted owl critical habitat occurs in old growth forest and other timber stands with suitable characteristics in the Cascade Mountains well to the east of the project area (61 CFR 26255 26320). There is no suitable nesting habitat located within the immediate project vicinity (Personal communication, Michael McDonald, WSDOT, June 8, 2006).

Potential Impacts

Proposed project activities may remove some trees that could potentially be used by the spotted owl for perches or roosts, although as described above, the habitat suitability of these areas is low. No documented roost trees would be removed.

Impact Minimization Measures

Because no suitable nesting sites or winter roost sites are located within 1.6 km (1 mile) of the project area, no specific impact minimization measures for the spotted owl are planned.

Chinook Salmon (Onchorhynchus tshawytscha)

Species Status

The Puget Sound Chinook salmon was federally listed as threatened on August 2, 1999. The proposed action area is located within the range of the federally listed evolutionarily significant unit (ESU) Puget Sound Chinook salmon (64 CFR 14308-14328). WDFW lists Chinook salmon as a candidate species. The designated critical habitat for Puget Sound Chinook does not include the greater Lake Sammamish watershed that encompasses the project area. Critical habitat has been designated in the greater Lake Washington watershed and the Cedar River (70 CFR 52630-52858). The Issaquah Creek hatchery Chinook are not currently considered to be part of the evolutionarily significant unit (WRIA 8 Steering Committee 2005).

Habitat Requirements and Life History Information

Chinook salmon exhibit a number of life history patterns; however, these can be grouped into two general categories based on their rearing and migratory behavior: ocean-type and stream-type. Ocean Chinook, which include the majority of Chinook populations in the Puget Sound ESU, tend to migrate for spawning in summer and fall months, spawn immediately and tend to use larger streams and river systems. Ocean Chinook typically rear in freshwater for shorter periods, 3 to 4 months, before migrating to estuarine and marine areas as smolts. As adults, ocean Chinook tend to migrate shorter distances staying closer to the continental shore. Chinook salmon in the Lake Washington watershed are ocean-type and typically display a relatively short juvenile residence time in fresh water, approximately 3 to 4 months (WRIA 8 Steering Committee, 2005).

Spawning Chinook salmon require areas of clean gravel with good subsurface flow. If subsurface flow is adequate, Chinook salmon spawn in areas with a wide variety of stream depths, flows, and gravel sizes (Healey, 1998). Preferred spawning habitat is often at pool tailouts or medium riffles with 1 to 3 feet of fast-flowing water, probably because these areas often have good subsurface flows. Juvenile Chinook salmon typically require structurally diverse habitat, including deep pools, undercut banks, rocks, large woody debris and good vegetative cover on stream banks.

Presence in Project Area

Puget Sound Chinook salmon could be encountered in Lake Sammamish, Issaquah Creek, and East Fork Issaquah Creek (WRIA 8 Steering Committee 2005). Two Chinook stocks identified by WDFW occur in the general vicinity of the project area, the Issaquah Chinook and the north Lake Washington tributaries Chinook. Only the former occur within the project area. Issaquah Chinook may also occur in the north and south tributaries, but this is generally unlikely due to unsuitable habitat conditions. The north tributary has no spawning areas and marginal Chinook rearing habitat (Herrera 1998a). Chinook salmon, especially juveniles, may use the lowest reach of the north tributary within the Hope wetland as refuge habitat during high flow conditions.

Potential Impacts

Construction of Modified Alternative 5 could result in potential direct or indirect impacts on Puget Sound Chinook salmon. The proposed bridge crossing over the north tributary and its associated wetland is the area with the most potential to be subjected to water quality impacts and loss of habitat. Some slight changes in riparian vegetation cover along the north tributary could cause temporary changes in water temperature; however, these changes would be negligible and would disappear when new riparian plantings mature. Increases in road density, temporary reductions in large woody debris recruitment potential, potential sedimentation from in-water work, and localized changes to other baseline indicators may result from construction and operation of the project. It should be noted that there is little evidence that this section of the north tributary is used by Chinook salmon. The project's impact on the species is expected to be minor and localized.

Impact Minimization Measures

The general impact minimization measures for fish resources (described in the Fisheries section of this chapter) would be used to reduce potential impacts on Puget Sound Chinook salmon. These include:

- Stormwater runoff from the bypass roadway and offsite road areas would be treated to achieve no net loading of pollutants to streams in the project area.
- Stormwater would be infiltrated to the maximum extent possible to mimic natural hydrologic characteristics.
- In-water work would only occur during WDFW-approved time periods (generally July 1-September 15) when salmon species are least likely to be affected.

To compensate for any potential or real effects, the following measures described in the Fisheries section would be implemented:

- Native riparian vegetation would be planted along the north tributary and East Fork Issaquah Creek in areas near locations where vegetation is removed (and along the south tributary as may be necessary in conjunction with wetland mitigation option 2). This will increase shading and provide cover for fish, habitat for insects, and a future source of large woody debris.
- Additional large woody debris would be placed in the north tributary channel to provide structural complexity, enhance channel forming processes, and provide insect and fish habitat.

Steelhead (Oncorhynchus mykiss)

Species Status

Puget Sound distinct population steelhead were proposed for listing under the Endangered Species Act as a threatened species on March 29, 2006 (71 CFR 15666) and then listing as threatened on May 11, 2007. The proposed project area is located within the Puget Sound distinct population segment (DPS) of steelhead. Critical habitat for Puget Sound steelhead has not yet been designated.

Habitat Requirements and Life History Information

Steelhead exhibit one of the most complex life histories of any species of Pacific salmonid. These salmonids are either anadromous (i.e., steelhead) or freshwater resident (i.e., rainbow trout), and they can spawn more than once. Steelhead typically spend 2 years in freshwater and 2 years in the ocean. However, the anadromous stocks can spend up to 7 years in freshwater prior to smoltification, and returning adults can spend up to a year in fresh water before spawning (NOAA Fisheries 1996).

Washington stocks of steelhead consist of two races, or runs, depending on their spawning timing. Summer-run steelhead migrate upstream from May to November (NOAA Fisheries 1996) and spawn the following spring. Winter-run steelhead migrate to their native streams in the late fall (November through April) and spawn within the next few months, generally before May (Emmett et al. 1991).

Presence in Project Area

Puget sound steelhead may be encountered in Lake Sammamish, Issaquah Creek, East Fork Issaquah Creek, and the smaller tributary streams of Issaquah Creek. WDFW has identified the Lake Washington steelhead as the only stock within the vicinity. This stock has experienced a dramatic decline to very low levels of abundance in recent years and its status is considered to be critical. Steelhead occurring near the project area are likely to be found in the main stem and East Fork Issaquah Creek. Steelhead may also occur at the lowest reaches of the north tributary, but spawning and rearing habitat there is generally poor for this species. During winter storm events, juvenile steelhead are likely to be found seeking refuge from high streamflows in the Hope wetland and lower reaches of the north tributary.

Potential Impacts

Construction of Modified Alternative 5 could result in potential direct or indirect impacts on Puget Sound steelhead. The proposed bridge crossing over the north tributary and its associated wetland is the area with the most potential to be subjected to water quality impacts and/or loss of habitat. Some slight changes in riparian vegetation cover along the north tributary could cause temporary changes in water temperature; however, these changes would be negligible and would disappear when new riparian plantings mature. Increases in road density, temporary reductions in large woody debris recruitment potential, potential sedimentation from in-water work, and localized changes to other baseline indicators may result from construction and operation of the project. It should be noted that there is little evidence that the north tributary is used by steelhead. The project's impact on the species is expected to be minor and localized.

Impact Minimization Measures

The impact minimization measures described for Puget Sound Chinook salmon would also be used to limit potential direct or indirect effects on Puget Sound steelhead.

Bull Trout (Salvelinus confluentus)/ Dolly Varden (Salvelinus malma)

Species Status

The bull trout was first listed on June 10, 1998. It is currently designated as threatened in the coterminous United States (the lower 48 states). WDFW lists bull trout as a candidate species. On January 9, 2001, the Dolly Varden trout was proposed to be designated as "proposed similarity of appearance to a threatened taxon in the entire range" (67 CFR 37699).

The proposed project area is located within the Coastal-Puget Sound distinct population segment (DPS) of bull trout. This population segment encompasses all of the Pacific coast drainages within the coterminous United States north of the Columbia River in Washington. This population segment is considered discrete from other subpopulations due to the geographic segregation and is considered significant to the species. The anadromous forms of bull trout are known to occur only in the Coastal and Puget Sound areas in the coterminous United States (64 FR 58909 58933). Critical habitat is not designated within the project area (64 FR 58909-58933).

Life History Information and Habitat Requirements

The bull trout occurs in four life history forms: anadromous (associated with marine waters), resident (remaining in headwater areas), adfluvial (associated with lake areas), and fluvial (associated with river areas). Fluvial, anadromous, and resident adults can spawn in the same area (WDFW 1998). After spawning, fluvial adults move throughout the upper river areas and remain in pools throughout the winter, spring, and early summer. Bull trout return to their spawning staging areas in late summer. After spawning, anadromous adults begin the downstream migration from late fall through the winter. These adults then enter the estuary area in the spring where they remain until late spring/early summer when they begin their upstream spawning run again (Goetz et al. 2003). Juveniles are usually found in shallow backwater or side channel areas, while older individuals are often found in deeper water pools sheltered by large organic debris, vegetation, or undercut banks (National Archives and Records Administration, 1998).

Bull trout/Dolly Varden, collectively known as native char, are particularly dependent on very cold water and high quality habitat conditions for spawning and rearing. These habitat requirements limit the natural range of this species in the region. Anadromous bull trout are a migratory, highly predatory species known to enter a number of area river systems to feed on the eggs of spawning salmon and outmigrant smolts (Berge and Mavros 2001).

Presence in Project Area

Known fluvial populations of native char in the Lake Washington watershed are limited to high altitude, coldwater tributaries of the Cedar River system. There is one anecdotal sighting of a juvenile char in the upper reaches of Issaquah Creek, far from the project area, but this sighting has not been confirmed. In general, even under predevelopment conditions it is unlikely that Issaquah Creek provided suitable spawning and rearing habitat for native char. However, adult anadromous bull trout may forage in the action area during salmon spawning and smolt migrations (Berge and Mavros 2001). If present, migratory adult bull trout are likely to occur only in Issaquah Creek and the east fork, where suitable resting habitat and forage are present. Nevertheless, this final EIS assumes bull trout are potentially present within the project area.

Potential Impacts

Construction of Modified Alternative 5 could result in potential direct or indirect impacts on Puget Sound bull trout. The proposed bridge crossing over the north tributary and associated wetland is the area with the most potential to be subjected to water quality impacts and/or loss of habitat. Some slight changes in riparian vegetation cover along the north tributary could cause temporary changes in water temperature; however, these changes would be negligible and would disappear when new riparian plantings mature. Increases in road density, temporary reductions in large woody debris recruitment potential, potential sedimentation from in-water work, and localized changes to other baseline indicators may result from construction and operation of the project. It has been noted that there is little evidence that this section of the north tributary is used by bull trout. The expected impacts from the project would be minor and localized.

Impact Minimization Measures

The impact minimization measures described for Puget Sound Chinook salmon would also be used to limit potential direct or indirect effects to Puget Sound bull trout.

Species of Concern

The expected impacts of the proposed project on the state and federal species of concern located within or near the project area are presented in Table 3-19. Seven of the species included on the species of concern list are present or may be present within the habitats of the project area. The impacts on these species would include habitat removal and a reduction in overall ecological connectivity between habitats within the Issaquah Valley, particularly those habitats of smaller species.

The Puget Sound coho salmon is a federal species of concern (NMFS), although it is not currently on the Washington state species of concern list. The proposed project area is located within the ESU of the Puget Sound coho salmon (NOAA Fisheries, 2002). Critical habitat for Puget Sound coho salmon has not been designated. Coho occurring within the project area are likely to be found in the main stem, south tributary, and East Fork Issaquah Creek (King County, 2002a). Coho may also occur in the north tributary, but spawning and rearing habitat is generally poor for this species. During winter storm events, juvenile coho are likely to be found seeking refuge from high streamflows in the Hope wetland and lower reaches of the north tributary. Fish passage into the project area is currently partially blocked by a resident's dam adjacent to Front Street South. Many of the proposed impact minimization measures proposed for other species would help avoid or reduce potential impacts on those species of concern. For example, the measures for threatened or endangered fish species would also benefit coho salmon and lamprey. Bird and bat species would benefit from proposed vegetation and tree replanting, and from preservation of dead snags in the northern project area. Similarly, amphibians, reptiles, and insect species would benefit from proposed wetland and buffer enhancement measures.

The Kokanee salmon (*Oncorhynchus nerka*), that species that originated from non-anadromous parents, is not federally or state-listed in the Issaquah Creek basin and is not classified as a candidate species or species of concern. However, the population is declining, as shown by recent studies (Berge and Higgins, 2003). Early-run kokanee are functionally extinct; middle-run kokanee are still not understood; and late-run kokanee appear to have consistent populations.

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires federal agencies to consult with NOAA's National Marine Fisheries Service (NMFS) on activities that may adversely affect essential fish habitat (EFH).

The objective of this essential fish habitat assessment is to determine whether or not the proposed action may adversely affect designated essential fish habitat for relevant commercially, federally managed fisheries species within the proposed action area. It also describes conservation measures proposed to avoid, minimize, or otherwise offset potential adverse effects on designated essential fish habitat resulting from the proposed action.

When possible, NMFS uses interagency coordination processes to complete EFH consultations with federal agencies. In this case, the EFH consultation is being incorporated into the Endangered Species Act Section 7 consultation process in the biological assessment.

The proposed action would be constructed within areas designated as Chinook and coho salmon essential fish habitat. All streams in the project area are included in designated essential fish habitat for Chinook and coho salmon. The analysis of effects on Chinook and coho salmon described in the biological assessment would also serve for the essential fish habitat determination.

Land Use

Studies and Coordination

The land use analysis in this section was prepared using information on the project area obtained from a variety of sources. Field visits, aerial photographs, and environmental documents provided information on existing conditions in the project area. Planners and city staff were consulted for additional background on existing and planned land uses. Comprehensive plans and zoning ordinances for affected jurisdictions were reviewed to identify plans, policies, and regulations associated with local land uses.

Affected Environment

Most of the proposed project would be constructed within the eastern portion of the city of Issaquah. Sections of the northern alignments under each alternative and the extreme southern portion of the south alignments would cross unincorporated King County land, immediately east and south of the present Issaquah limits.

Land uses in the proposed project area include a mix of residential, school district, recreational, and undeveloped areas. At the northern end, residential uses are located west of the proposed Southeast Issaquah Bypass from the I-90/East Sunset Way interchange to Southeast Evans Street. Residential uses in this area consist primarily of single-family homes. Three schools are located south of Southeast Evans Street: Clark Elementary, Issaquah High, and Tiger Mountain High. The schools include a number of facilities, especially Issaquah High School, where a track, ballfield, and several portable buildings are located. A large athletic field is located east of Clark Elementary and Issaquah High School. The Issaquah Sportsmen's Clubhouse is located northeast of the residential area and schools. The facility includes a clubhouse, shooting range and parking, and is accessed from an unpaved extension of Southeast Evans Street.

East of the proposed project, land is currently undeveloped private property. The land has been characterized by steep terrain, particularly in the north end of the project area. The Tiger Mountain natural resource conservation area (NRCA) borders a small portion of the project area on the north end. A number of formal and informal trails provide access to this resource. Some development has occurred east of the proposed roadway in the southern project area along 6th Avenue Southeast, and in King County along 240th Avenue Southeast.

Also located along the eastern portion of the project area is the proposed Park Pointe development property. This approximately 27.1-hectare (67-acre) site (available developable area) is located east of Issaquah High School and was annexed by the city of Issaquah in 1996. Planned development would include residential uses, consistent with the low density residential land use designation. The overall density would be 5.3 dwelling units per acre. Although not approved at this time, full buildout, as currently designed, is currently envisioned to include 356 residential dwelling units. The ability to develop Park Pointe, including the allowed density, is not dependent on construction of the Southeast Issaquah Bypass project. Presently, the property remains undeveloped, environmental review is not complete, and permit applications for the proposed project have not yet been received by the city of Issaquah from the developer.

South and west of Issaquah High School are single-family houses near and along 6th Avenue Southeast. The Church of Jesus Christ of Latter-Day Saints (LDS Church) is also located on 6th Avenue Southeast, south of Southeast Kramer Place. Residential uses are found adjacent to 2nd Avenue Southeast and Front Street South in the southern project area. Low-density residential and community facility land uses within the city of Issaquah and unincorporated King County are located at the southern terminus of the proposed project area.

Zoning Designations

Zoning designations for the proposed project area were obtained from the city of Issaquah Title 18 – Land Use Code (Issaquah, 1996a) and King County Zoning Code, (King County, 1996a). Zoning for the proposed project area is shown in **Figure 3-22**, and comprehensive plan designations are provided in **Figure 3-23.** Primary land ownership is shown in **Figure 3-24**.

Issaquah Zoning

Within the city of Issaquah in the northern portion of the project area, zoning is a mix of residential designations including *single-family small lot* (SF-SL), *multifamily–high* (MF-H), and *single-family–duplex* (SF-D). A small area on the north side of East Sunset Way is zoned SF-SL, which allows a density of 7.26 dwelling units per acre. The SF-D designation allows the same density of single-family homes as SF-SL, and 14.52 dwelling units per acre for duplex use. The MF-H designation allows 29 dwelling units per acre. East of the I-90/East Sunset Way interchange, land is zoned as Tradition Plateau NRCA, a classification established to protect and preserve the natural environment. This designation covers a portion of the West Tiger Mountain/Tradition Plateau NRCA. NRCAs have been established throughout Washington as areas of outstanding scenic and ecological value and are intended for plant and wildlife habitat, environmental education, and low impact public use.

To the south, along the project area's western boundary, land is zoned SF-SL and MF-H; and an extensive area is designated *community facilities* (CF), to accommodate the schools and their associated recreational facilities. To the east of the CF zone, the proposed Park Pointe development property is zoned SF-SL and SF-S. The southern portion of the Southeast Issaquah Bypass project area is zoned *single-family suburban* (SF-S), which allows a density of 4.5 dwelling units per acre.

King County Zoning

As indicated previously, sections of the proposed alignments would pass through unincorporated King County. The areas through which the potential northern alignments would pass are designated *forest* (F) and *rural area* (RA-5). The forest designation is intended to preserve the forestry land base by limiting permitted uses to single-family dwellings and accessory uses on large parcels. The RA-5 designation is intended to maintain the long-term rural character and minimize land-use conflicts with resource-based operations, including forestry, agriculture, and mineral extraction. This zone would limit land uses and densities to one single-family dwelling unit per 5 acres of land. The proposed project also

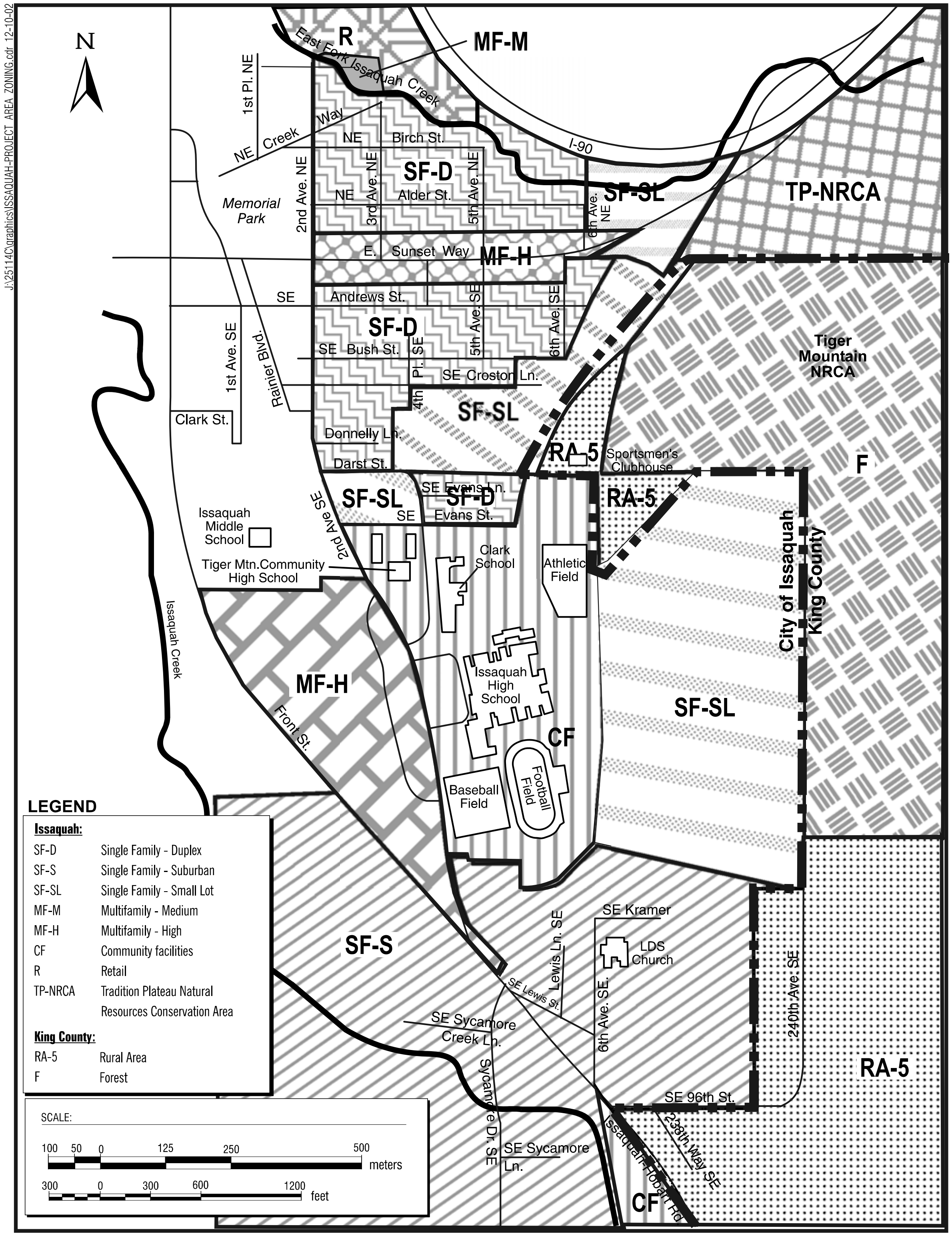

Figure 3-22
Project Area Zoning

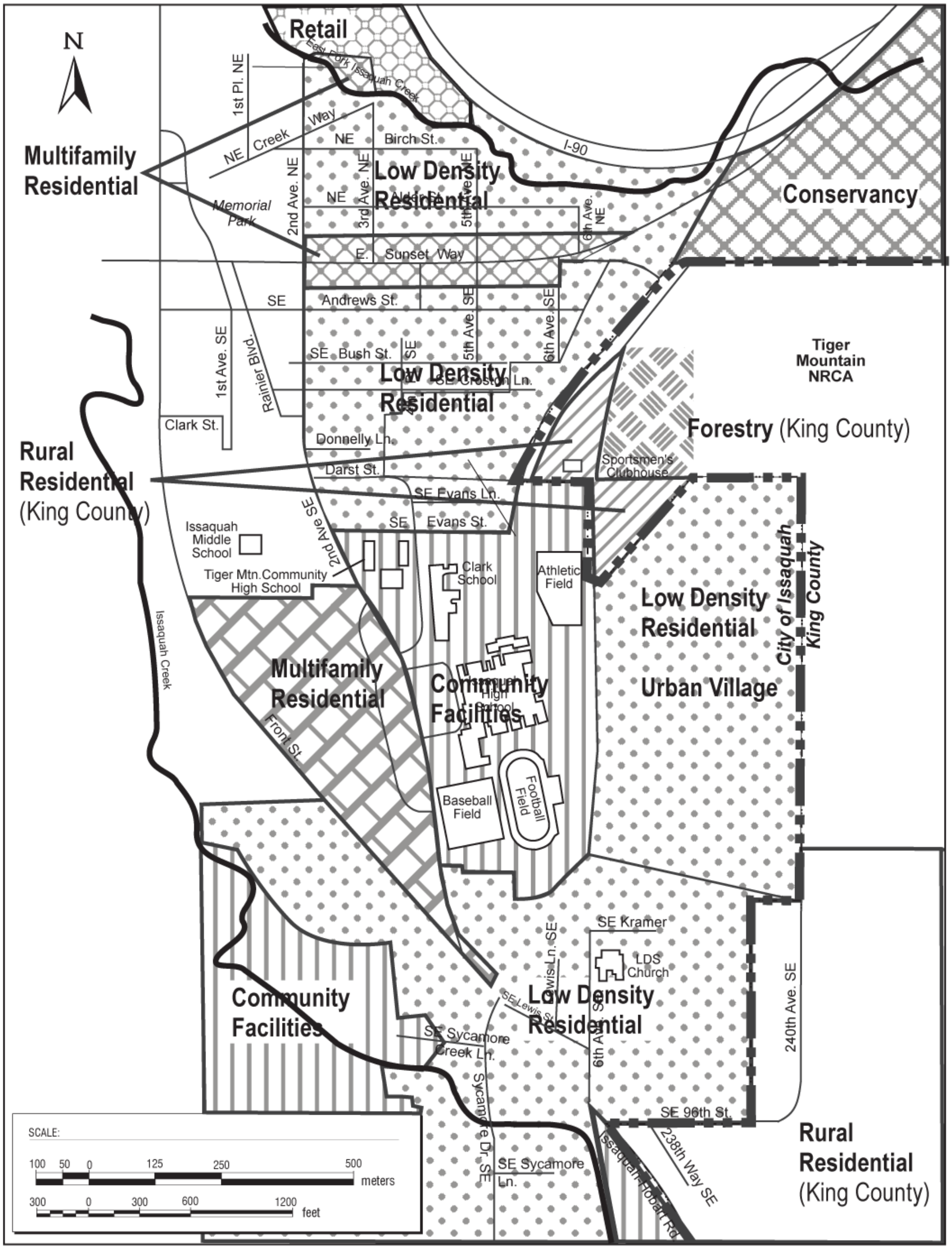

Figure 3-23
Comprehensive Plan Area Designations

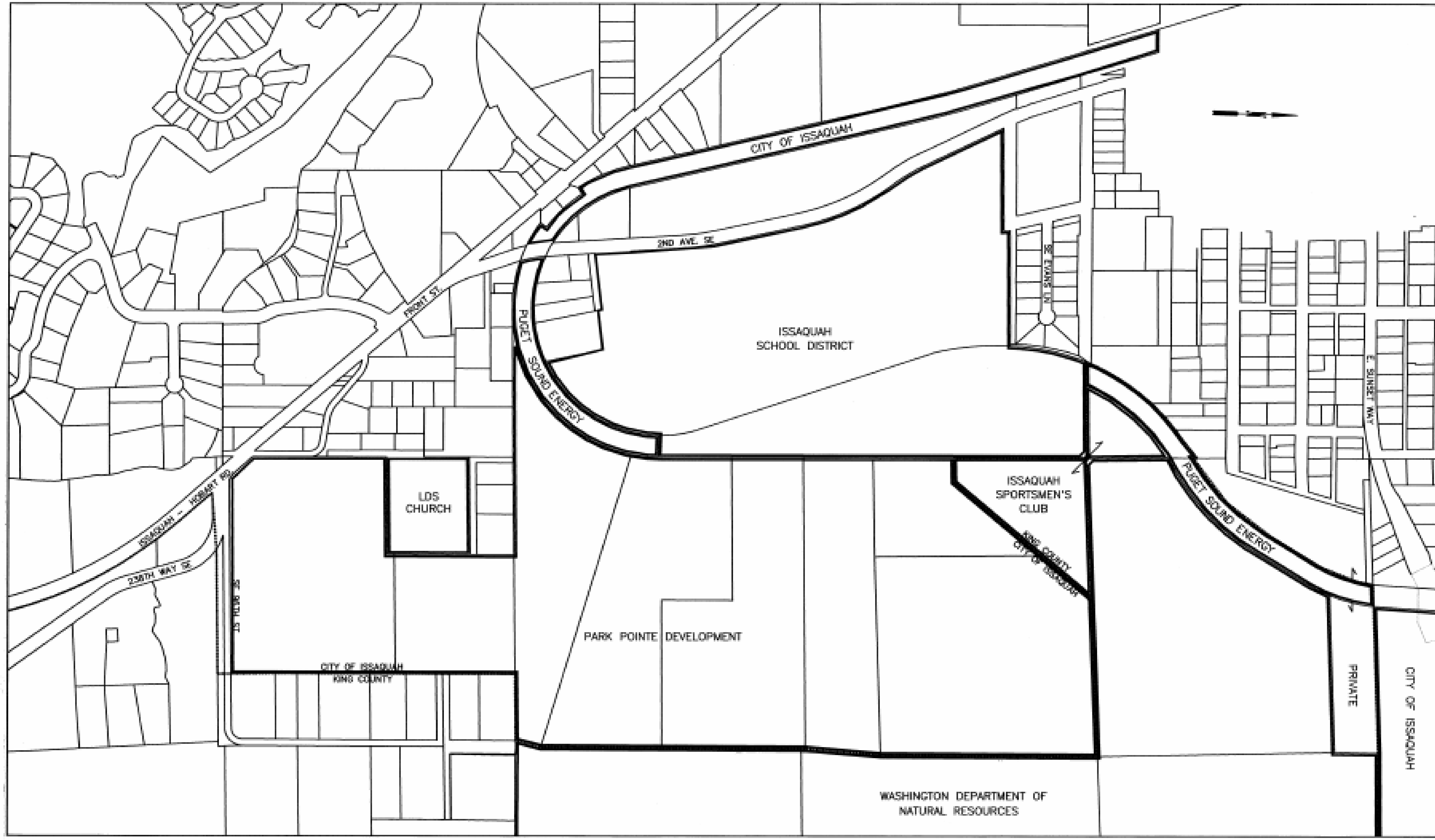

Figure 3-24
Land Ownership Map

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would cross a section of county land zoned RA-5 near the project's southern boundary. County land south of the project's southern terminus is also zoned RA-5.

Impacts and Mitigation

Alternative 1

Impacts

The footprint for this alternative would result in the loss of land currently vacant, or used for recreational and residential purposes. This alternative would result in the need to acquire a total of 87,962 square meters (21.7 acres) of land. The total loss of residentially zoned land under this alternative would be approximately 54,109 square meters (13.3 acres). Current access to Southeast Kramer Place and the LDS Church would be disrupted and would require redesign.

Recreation areas also would be affected under this alternative. The existing informal trail along the former railroad right-of-way would be displaced. Portions of the former railroad right-of-way are currently owned by Puget Sound Energy (PSE) in the northern and southern project areas. In the central portion of the project area the former right-of-way crosses Issaquah School District property. Under all of the build alternatives, displacement of the right-of-way for the proposed Southeast Issaquah Bypass would preclude other uses for the right-of-way in the future.

The proposed northern alignment would displace a portion of the existing informal trail in that area. The South A alignment would displace a small portion of the existing Issaquah Trail within the abandoned right-of-way and along 6th Avenue Southeast. Trail impacts are described in more detail in the Recreation portion of the Social Elements section of this chapter. A total of approximately 30,993 square meters (7.6 acres) of land zoned *community facilities* (CF) would be required.

The current access to the Issaquah High School trailhead could also be displaced by this alternative, as would current access to the Sportsmen's Clubhouse from an unpaved portion of Southeast Evans Street. The alternative would not displace formal trails or active recreation areas within the NRCA. The NRCA and recreational trails are discussed in more detail in the Social Elements section of this chapter. A total of approximately 2,860 square meters (0.7 acres) of land zoned *forest* (F) would be required for the footprint of the North A alignment. Potential right-of-way acquisition area for each alternative are summarized in **Table 3-20.**

Mitigation

The proposed roadway design is intended to help minimize impacts on adjacent land areas and to reduce the amount of land converted to roadway uses. Access to the Issaquah Sportsmen's Clubhouse would be maintained through a new driveway to be provided from the proposed project, near the current access at Southeast Evans Street. The acquisition of adjacent parcels would be compensated at fair market value. Right-of-way acquisition and mitigation is discussed in more detail in the Displacements and Relocations section of this chapter.

Table 3-20
Estimated Right-of-Way Acquisition Area

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Modified Alt. 5	Alt. 6
Residential	54,109 (13.3)	54,388 (13.4)	60,026 (14.8)	60,305 (14.9)	52,249 (12.9)	61,353 (15.1)
Forest	2,860 (0.7)	2,860 (0.7)	19,195 (4.7)	19,195 (4.7)	4,280 (1.0)	4,280 (1.0)
Community Facilities	30,993 (7.6)	45,241 (11.1)	19,650 (4.8)	33,998 (8.4)	25,540 (6.3)	39,908 (9.8)
Total	87,962 (21.7)	102,489 (25.3)	98,871 (24.4)	113,498 (28.0)	82,069 (20.2)	105,541 (26.0)

Areas in square meters (acres)
Note: Areas do not include proposed mitigation sites.

Alternative 2

Impacts

Under this alternative, approximately 102,489 square meters (25.3 acres) of land would be acquired for the proposed project. Of this total, approximately 54,388 square meters (13.4 acres) of residential zoned land would be acquired. The amount of forest land affected by this alternative would be the same as that of Alternative 1. This alternative would use more land zoned for community facilities than Alternative 1, with approximately 45,241 square meters (11.1 acres) of land in the CF zone to be acquired.

Mitigation

Mitigation would be the same as that identified for Alternative 1.

Alternative 3

Impacts

A total of 98,871 square meters (24.4 acres) of land would need to be acquired. Approximately 60,026 square meters (14.8 acres) of land zoned for residential use would be required under this alternative. Approximately 19,195 square meters (4.7 acres) of land zoned F would need to be acquired under this alternative. Approximately 19,650 square meters (4.8 acres) of land zoned CF would be needed. This alternative would not directly displace access to the Sportsmen's Clubhouse.

Mitigation

Mitigation would be the same as that identified for Alternative 1.

Alternative 4

Impacts

Under this alternative approximately 113,498 square meters (28.0 acres) of land would need to be acquired for the proposed roadway. Approximately 60,305 square meters (14.9 acres) of residential land would be needed. The same amount of forest land needed for Alternative 3 would be needed for this alternative. Approximately 33,998 square meters (8.4 acres) of *community facilities* zoned land would also be needed.

Mitigation

Mitigation would be the same as that identified for Alternative 1.

Modified Alternative 5

Impacts

Approximately 82,069 square meters (20.2 acres) of land would be needed for this alternative. Approximately 52,249 square meters (12.9 acres) of residential land would be needed for this alternative. It would require approximately 4,280 square meters (1.0 acres) of designated forest land (zoned as F). Approximately 25,540 square meters (6.3 acres) of land zoned for community facilities (CF) would be needed.

Mitigation

Mitigation would be the same as that identified for Alternative 1.

Alternative 6

Impacts

This alternative would require the greatest amount of land among the build alternatives. Approximately 105,541 square meters (26.0 acres) would need to be acquired. Approximately 61,353 square meters (15.1 acres) of residential land would be needed. This alternative would require the same amount of forest land as Modified Alternative 5. It would also require acquisition of approximately 39,908 square meters (9.8 acres) of *community facilities* property.

Mitigation

Mitigation would be the same as that identified for Alternative 1.

No-Action Alternative

Impacts

Under the no-action alternative, the proposed Southeast Issaquah Bypass would not be constructed. However, other land use changes are expected to continue to occur in the project area. These include changes associated with the recently completed I-90/East Sunset Way interchange and South SPAR project in the north, and with proposed construction of the Park Pointe development project in the south-central project area. Potential changes to land uses within the proposed Southeast Issaquah Bypass project area would occur in accordance with City of Issaquah and King County comprehensive plans and existing zoning regulations.

Density increases are likely to occur along East Sunset Way to accommodate multifamily residential uses. Without the proposed project, regional traffic would continue to use Front Street North and Front Street South as connectors, and traffic congestion would continue to increase in the cultural and business district. Increased traffic would also place additional pressure on other local roads. Use of streets in the Olde Town subarea as connectors would detract from the Issaquah Comprehensive Plan's vision for preserving small-scale, pedestrian-oriented development. However, increased traffic volumes in downtown Issaquah may stimulate economic growth.

In a recent study conducted by the city of Issaquah, potential use of the local neighborhood as a means to avoid congestion on Front Street South was explored. The city has been concerned that completion of the I-90/East Sunset Way interchange would increase neighborhood cut-through traffic around East Sunset Way because of the limited number of arterial streets serving the area. The *Neighborhood Mitigation Study* (Entranco, 2002) assumed that the Southeast Issaquah Bypass might be constructed in the future, and proposed interim measures that the city might adopt to address impacts on the local neighborhood. Although it did not propose alternatives to the Southeast Issaquah Bypass project, the study did support the conclusion that if the roadway were not constructed, improvements of a similar order "could be necessary to provide any substantial congestion relief in the southeast Issaquah area in the future."

Changes associated with the proposed Park Pointe development project near Southeast Evans Street would increase residential density at the eastern edge of the city. As indicated previously, Park Pointe can be developed with or without the proposed Southeast Issaquah Bypass. Since issuance of the supplemental draft EIS, in 2005 the city council approved a new planning designation for the Park Pointe property as low-density residential, removing the former urban village designation. Consistent with this change, current plans for the project show a combination of up to 356 single-family homes, assisted living units and condominium/townhouse style units proposed for the site. The city has continued to require preparation of an EIS to fully evaluate the proposed Park Pointe project's impacts.

As indicated previously, the proposed project is intended to support planned development in the city. If the Southeast Bypass project is not constructed, the city would need to consider potential changes in the level of development that existing and future infrastructure could support. It is expected that such consideration would occur as part of the city's annual review of comprehensive planning efforts, as well as through annual updates to the 6-year transportation improvement program. Presently, it is unlikely that existing zoning would be downgraded to be compatible with lower transportation levels of service should traffic congestion occur without the proposed project. Instead, if congestion increases, other transportation improvements would likely be identified to mitigate new traffic congestion.

Except for the proposed Park Pointe development plans, land uses within the Southeast Issaquah Bypass project area are expected to remain largely the same as they presently are, including single-family and multifamily residential, schools, and open space uses. Failure to construct the Southeast Issaquah Bypass roadway would not avoid future development, as allowed by current zoning and comprehensive plan policy within the proposed roadway project corridor.

Changes to specific elements of the natural environment are discussed within this document, but the effect of introducing a new roadway within the project corridor can also be viewed from a land-use perspective. If the roadway were not constructed, some continuity of existing vegetation could be retained; but dispersed areas of development would still occur, primarily in relation to the proposed Park Pointe development.

These changes would be less noticeable adjacent to the actual development area for Park Pointe, which would require the introduction of an access road with or without the proposed Southeast Issaquah Bypass. As a result of the proposed Park Pointe development, Issaquah High School and the Sportsmen's Clubhouse can expect localized changes to introduce additional urban-like features in their proximity, with or without Southeast Issaquah Bypass construction. In the north adjacent to the Tiger Mountain NRCA, no development is expected to occur in addition to what has been identified previously for the I-90 and East Sunset Way improvements.

Mitigation

No mitigation measures are proposed for the no-action alternative. Mitigation for impacts of future development is expected to be provided by individual projects. The city of Issaquah may consider roadway and other improvements to address traffic congestion that may affect future land-use decisions.

Relationship of the Proposed Project to Plans and Policies

This section discusses local plans and policies that apply to development within the proposed project area. These include city, county, and regional land-use and resource plans. Each plan is described briefly followed by a presentation of the proposed project's consistency, or inconsistency, with the intent of these plans.

City of Issaquah Plans and Policies

Issaquah Comprehensive Plan

The city of Issaquah Final Comprehensive Plan (April 1995, amended 2001 and 2002) includes goals and objectives to guide growth within the city over a 20-year period. The plan would focus future growth within existing city limits and in potential annexation areas. The plan provides goals, objectives, and policies for nine elements including land use, subarea plans, and transportation. The Issaquah Comprehensive Plan has been coordinated with the King County Comprehensive Plan to assure consistency with the county's 20-year goals.

The Comprehensive Plan identifies future land uses that would be similar to those currently in the proposed project area, with the exception of the Park Pointe property. The area along East Sunset Way and south to Southeast Evans Street is expected to remain low-density, residential, with some multifamily uses.

The entire area covering the current schools would remain designated for community facility uses.

There are four subareas identified by the Comprehensive Plan in which the proposed project would occur. Most of the proposed project would occur within the Olde Town subarea. Small sections also would occur within the Lake Tradition, Park Pointe, and Sycamore subareas. The Olde Town subarea encompasses the central business district, which includes the oldest platted areas, historic uses, and the original grid street pattern. As indicated by the Comprehensive Plan, the existing scale and character of this area would be maintained by implementation of land use regulations and transportation planning. The Lake Tradition subarea is largely undeveloped forestry and watershed land, and is intended for low impact recreational use, utility corridors, and as an urban separator for the city of Issaquah and undeveloped portions of King County. The Sycamore subarea is intended primarily as a single-family residential area. The proposed project would be consistent with the city's land-use policies to maintain the Olde Town subarea, and in particular the central business district (CBD).

The proposed project would be consistent with transportation goals in the Issaquah Comprehensive Plan. Traffic congestion was the primary land use concern identified by citizens in the comprehensive plan. The transportation element of the comprehensive plan proposes the Southeast Issaquah Bypass project as the primary means of resolving traffic congestion. The Southeast Issaquah Bypass is listed among the top projects in the city’s 2007–2012 transportation improvement plan. The city’s 6-year capital improvement plan (CIP) is presented as a table within the plan’s transportation element, and identifies projects to which the city has committed over the next 6 years. The proposed Southeast Issaquah Bypass is listed as a capital facility necessary to support the city's land use vision.

Issaquah Municipal Code (Title 18—Land Use Code)

The Issaquah Land Use Code implements the Issaquah Comprehensive Plan and provides zoning designations consistent with the policy direction set by the comprehensive plan. The proposed project area includes zoning designations for single- and multifamily residential use, NRCA, and community facilities.

Generally, the proposed project design would meet regulations in the land use code. The proposed project would, however, require a public agency and utility exception, or a variance, to allow construction within Class I wetland areas under Modified Alternative 5.

Issaquah Wildlife and Recreational Trails Plan

The Issaquah Wildlife and Recreational Trails Plan (1992) provides a framework for establishment and retention of public land in the form of a greenway corridor. This open space was set aside to protect natural areas and associated wildlife habitats. The plan also recognizes that open space can provide numerous recreational and educational opportunities for the surrounding community. As such, the plan establishes goals and policies for the creation and use of multipurpose trails in the planning area that encompasses downtown Issaquah, Squak Mountain, Tibbetts-East Cougar, Tiger Mountain/Tradition Lake Plateau, and the Issaquah Highlands areas. Although there are many established trails within the plan's area of influence, it seeks to integrate existing and new trails into a formal system that is both comprehensive and accessible.

Modified Alternative 5 would cross through areas where existing trails and trailheads, both formal and informal, have been established. The northern alignments would displace portions of the informal trail along the former railroad right-of-way that extends through facilities at Issaquah High School, and new trail connections would be provided. A new trailhead parking area would also be included south of East Sunset Way. By providing new sidewalk and trail sections and new trailhead facilities, the proposed project would maintain connections to existing trails within the city of Issaquah and Tiger Mountain recreation areas.

Issaquah Shoreline Master Program

The Issaquah Shoreline Master Program (1990) guides shoreline uses in the city of Issaquah pursuant to the state Shoreline Management Act. The document provides goals and policies for protection and use of shoreline and wetland areas. It also establishes shoreline designations with regulations and standards for shoreline use.

Where the I-90 off-ramp is proposed to cross East Fork Issaquah Creek, two shoreline designations apply. On the north side of the creek, the shoreline is designated *conservancy riparian*; on the south, the shoreline is designated *urban residential*. Although roads are permitted in areas designated *urban residential*, a conditional use permit would be required for construction in the *conservancy riparian* zone.

For roads, a shoreline setback of 15 meters (50 feet) would be required from the ordinary high-water mark of East Fork Issaquah Creek for the *urban residential* zone, and 18 meters (60 feet) for the *conservancy riparian* zone. Bridges are not subject to any setback requirements. Clearing, grading, filling, and excavating would be subject to a 15-meter (50-foot) setback and would require a shoreline conditional use permit.

Bridges must be designed to 1) allow for flood flow; 2) provide for passage of wildlife; and 3) not lessen streamflow, width, or grade. A proposed stormwater facility and retention pond in the vicinity of East Fork Issaquah Creek would comply with the Shoreline Master Program standards.

Wetlands present in the southern portion of the project area are not designated within the Issaquah shoreline master program.

Issaquah Parks, Recreation, and Open Space Plan

The Parks, Open Space, and Recreation Plan (1995) provides information on existing and planned recreational facilities in the city, as well as capital improvements needed for these facilities. The nearest recreational facilities in the project area are the trails on Tiger Mountain, the city’s Rainier Trail, and the Squak Valley Park. The Tiger Mountain NRCA is identified as a primary open space area and is located immediately east of the proposed Southeast Issaquah Bypass. The proposed project would alter the informal trail network in the project area, but would provide new trail and sidewalk connections to the Rainier Trail and Tiger Mountain. The proposed roadway would encroach upon the extreme western edge of the Tiger Mountain NRCA, but is not expected to greatly affect the use of this resource for low-impact recreational purposes. The proposed trail and sidewalks in the southern project area would be designed to match future trail connections planned for Squak Valley Park.

King County Plans and Policies

King County Comprehensive Plan

The King County Comprehensive Plan (1995) establishes a growth management strategy for King County over a 20-year period, in compliance with the planning goals of the state Growth Management Act. The policies address broad areas such as urban and rural land use, economic development, housing, transportation, the natural environment, and open space. The plan establishes boundaries for the urban growth area (UGA) that direct growth and development away from rural areas and areas where services are not available, thereby containing urban sprawl and protecting open space while making the most efficient use of transportation and utilities.

The majority of the proposed project area is located within the Issaquah urban growth area, with the exception of small portions that would occur in unincorporated King County, within the rural area and a small section within the *forest* (F) zone. Because most of the proposed project would occur within the urban growth area, the project would support the comprehensive plan's growth strategy to target public investment (i.e., new road improvements) in urban growth areas to support new development with adequate infrastructure. The comprehensive plan also allows urban arterials to pass through rural areas; thus, the portions within the *rural area* (RA-5) zone would follow this provision. The proposed project also would assist with traffic flow through the city of Issaquah helping to relieve downtown congestion and facilitating community mobility.

The proposed Southeast Issaquah Bypass could further aid mobility by connecting to recently completed South SPAR improvements that provide a link to the Issaquah Highlands development and the Sammamish Plateau. The Southeast Bypass would contribute to the road network intended to serve new growth in Issaquah Highlands, which would be consistent with the policy direction of the King County Comprehensive Plan.

Beyond the project's southern terminus, land within King County is designated Rural Residential. Crossings of rural areas within the county are not expected to encourage development to more urban densities. These areas have not been identified in the Issaquah Comprehensive Plan as future annexation areas. Thus, changes to a higher density would not occur unless initiated by King County, and the current county comprehensive plan designations indicate that continued rural uses are intended.

The draft EIS dated June 2000 indicated that the proposed project would be consistent with the comprehensive plan policy that would allow arterials that connect parts of the urban growth area to pass through county-designated rural areas. Subsequently, in the December 2002 updated comprehensive plan, this policy was changed and no longer identifies the crossing of rural areas by arterials in the transportation element. Elsewhere in the comprehensive plan, under *rural areas*, the plan states that “new connections between portions of King

County's contiguous urban growth area that must traverse the rural area and are identified in an adopted transportation plan or policy shall be designed to avoid pressure to convert to urban uses." It also states, "transportation facilities that are adjacent to designated agriculture and forest production districts shall be sited and designed to ensure compatibility with resource management."

The Vision 2020 multi-county policy RT-8.7 states that "where increased roadway capacity is warranted to support safe and efficient travel through rural areas, appropriate rural zoning and strong commitments to access management should be in place prior to authorizing such capacity expansion in order to prevent unplanned growth in rural areas."

The build alternatives for the Southeast Bypass would not fully meet these policies. Policy RT-8.7 could be interpreted as placing additional restrictions on arterials that pass through rural areas in the form of potential zoning and access management requirements. Presently, the proposed project does not meet these potential constraints. Regarding zoning, the city's current zoning immediately adjacent to the Southeast Bypass project area is primarily for low-density residential uses, which may be considered more suburban than rural.

Regarding access management, the Southeast Bypass would include two access points to Park Pointe, in addition to the Front Street South and East Sunset Way intersections. This may not strictly meet the definition of a limited-access facility, which may be implied by the RT-8.7 policy. The policy states that access management measures "should" be in place, suggesting that they may not necessarily be required of all arterial projects passing through rural areas. As with other policies, the project proponent may exercise some discretion in determining the extent to which a project must meet planning goals and objectives. Similarly, decision-makers for the proposed project will also be asked to consider this need in relation to approving construction of the Southeast Issaquah Bypass.

The build alternatives do not contain measures intended to specifically avoid a potential conversion to urban uses on rural and forest land within the county. Construction of the proposed roadway would rely on existing zoning on county land that prevents conversion to urban uses. The portion of county land that the proposed project could cross is currently zoned as *rural residential* and *forest*. The land zoned for rural residential use is under single ownership and there are no plans to change that use in the immediate future. The project would be constructed near the Tiger Mountain NRCA. The NRCA designation is intended to maintain the land in its protected status and the proposed project is not likely to affect the resource area.

King County Zoning Code (Title 21A)

The King County zoning code implements the comprehensive plan through the provision of regulations and development standards to support the plan's goals and policies. The zoning code specifies building and construction activity for unincorporated King County and includes zoning classifications, permitted uses, allowable densities, and development standards.

Although most of the proposed project would take place within Issaquah city limits, small portions would cross unincorporated King County. Overall, the portions of the project area affecting county-zoned land are relatively small. The zoning code requires that all new development be adequately served by public facilities and services, including roads. The proposed project would assist with traffic flow through the eastern portion of the city of Issaquah, provide a link to the Issaquah Highlands development from the city's south end, and would be consistent with zoning code provisions for new roads.

Tahoma Raven Heights Community Plan and Area Zoning

The Tahoma–Raven Heights Communities Plan (1984) and Area Zoning (1991) provide plans, policies, and implementing regulations for this subarea which include unincorporated land in the proposed project area. The communities plan has not been revised since its adoption, and much of the document has been superseded by the current King County Comprehensive Plan, with the exception of its policies. Although population growth for the affected planning area was estimated for a ten-year period, annexation of surrounding lands and development of large areas within the Tahoma–Raven Heights planning area and on its periphery were not contemplated.

The plan provides direction for the provision of public services, including transportation. It requires that public services meet existing demands prior to expansion. The proposed project was not included in the plan at the time of its adoption. Issaquah/Hobart Road is identified as the primary travel corridor for the northern portion of the planning area, and several upgrades are recommended to improve safety and traffic flow. Although traffic along Issaquah/Hobart Road was expected to increase, the various improvements (i.e., road widening and realignment) were deemed to meet future needs during the plan’s 6- to 10-year life expectancy.

The area zoning provided implementing zoning designations for the area plan. The *forest-recreation* (F-R) designation in the northern project area is intended to allow forestry and compatible uses. The *general* (G 5) designation would maintain a low-density, rural character. Although conversion of small amounts of rural lands in King County would occur from construction of the proposed project, the impact would not be substantial as large parcels of land would not be isolated from other *forest-recreation* or *rural* lands.

Other Plans and Policies

West Tiger Mountain Natural Resource Conservation Area Management Plan

The West Tiger Mountain NRCA Management Plan (1997) provides goals and policies for protection and management of the Tiger Mountain NRCA. The Tiger Mountain NRCA covers the northern and western slopes of Tiger Mountain State Forest and land within Issaquah's Tradition Plateau area. The Washington Department of Natural Resources (WDNR) is the managing agency for the NRCA. The proposed project would not disturb or directly affect any sensitive areas identified in this plan. The proposed project would not encroach on the NRCA land, and it would not substantially change uses or activities within the NRCA.

Issaquah Creek Basin and Nonpoint Action Plan

The Issaquah Creek Basin and Nonpoint Action Plan (1996) was adopted by a multipurpose team representing the city of Issaquah and King County Surface Water Management. The plan describes existing conditions of streams and wetlands in the Issaquah Creek basin, and it proposes solutions to problems of flooding, water pollution, and loss of habitat within the basin. The plan includes goals and policies to reduce flooding, loss of habitat areas, stream channel erosion, and nonpoint pollution in the Issaquah basin. Recommendations for solving these problems are defined for subbasins within the overall basin area. The proposed project lies mostly within the lower Issaquah Creek subbasin, with the extreme northern project limits lying within the East Fork Issaquah Creek subbasin.

This plan describes the East Fork Issaquah Creek subbasin as being at risk for serious flooding and also notes existing areas of erosion and sedimentation. It describes the habitat in the subbasin as being in generally good condition. The lower Issaquah Creek subbasin is described as having high levels of sedimentation and flooding, which has been worsened by historic and present development within the subbasin. Generally, habitat within the subbasin is described as good for rearing and spawning of salmonids and other fish species. To address these concerns, the report recommends channel and floodplain restoration efforts, floodproofing and elevation programs, open space standards for new subdivisions and short plats, and stormwater retrofitting along I-90.

The proposed project would not directly support recommendations of the Issaquah Creek basin plan. A portion of the proposed project would introduce new impervious surface area within the floodplain. Where the proposed project would cross open areas, vegetation and soils would be replaced by the new roadway, decreasing the upland habitat area. Some existing shrubs and vegetation would be displaced by the new roadway. Despite proposed stormwater treatment facilities along the roadway, the roadway could be a potential source of new pollutants in the area. The proposed project would be designed to minimize these potential impacts as much as possible. Stormwater runoff would be directed to treatment facilities. Habitat restoration measures would be included as mitigation for potential roadway impacts. With proposed mitigation measures, adverse impacts are not expected.

Issaquah Wellhead Protection Plan and Issaquah Creek Valley Groundwater Management Plan

The Issaquah Creek Valley Groundwater Management Plan (Issaquah Groundwater Advisory Committee, 1999) includes information and data from the Issaquah Wellhead Protection Plan (Golder Associates, 1993) and summarizes groundwater data collection and analysis conducted from 1989 to 1992. This material includes both groundwater quality and quantity data as well as rainfall data and streamflow data in a 243-square-km (94-square-mile) area that includes the Issaquah Creek and Tibbetts Creek drainage basins and the Sammamish Plateau. Information in both the groundwater management plan and the wellhead protection plan indicates that maintenance and enhancement of groundwater resources would require careful management. Toward that end, the groundwater management plan includes a number of recommendations to improve the management of groundwater in the Issaquah area. These recommendations include such measures as expanding water quality monitoring, sampling, and analysis. The document also recommends developing an extensive public education program to encourage local water conservation and protection measures.

The proposed Southeast Issaquah Bypass is one of many projects within the city of Issaquah that may influence efforts to protect groundwater resources. The proposed project would not result in direct withdrawals of groundwater for the new roadway. With any roadway a potential for spills exists in relation to accidents that may occur there. The roadway could affect groundwater quantity because of the new impervious surface area it would create. Indirectly, the roadway would also support continued growth in the city, and new development may also affect future groundwater supplies.

The proposed project would include mitigation measures related to roadway runoff and stormwater treatment that are intended to reduce the overall impact on surface and groundwater resources in the project area.

Vision 2020 and Metropolitan Transportation Plan for the Puget Sound Region and Destination 2030

Vision 2020 presents the central Puget Sound region's growth management, economic, and transportation strategy. Within this overall plan, Destination 2030 is the metropolitan transportation plan (MTP) for the region. The 1995 update to *Vision 2020* contains policies and guidelines for implementation of local comprehensive plans and development regulations within central Puget Sound including King, Kitsap, Pierce and Snohomish counties. The plan identifies long-range growth and transportation strategies to fulfill the vision of economically diverse and environmentally healthy communities. By integrating land use and transportation planning, the plan provides a framework for allowing regional growth while maintaining open space, resource lands and an efficient transportation system with travel mode options. Under Destination 2030, policies are provided that are intended to improve regional mobility and access.

Destination 2030 is intended to identify and address the region's long-range transportation needs arising from regional growth. There are five major objectives defined by Destination 2030:

- Support maintenance and preservation of existing transportation infrastructure and services as a high priority.
- Provide stronger links between the transportation system and land use development to encourage growth within defined urban growth areas with balanced investments in multimodal transportation improvements.
- Identify and prioritize projects, programs and policies to improve all modes of transportation and keep up with growth
- Improve the region's financial capacity to fund needed improvements.
- Tailor recommendations at the sub-regional and corridor levels, in recognition of the region's social, physical and cultural diversity.

Destination 2030 identifies regionally important components of the area's metropolitan transportation system (MTS) and includes a complete list of projects and MTS improvements. The Southeast Issaquah Bypass is included in the *Destination 2030* projects list. It would meet goals for improving links between transportation and land use, encouraging growth in urban growth areas, and allowing transportation to keep pace with regional growth. It would reduce traffic congestion in downtown Issaquah, thereby being consistent with both the regional and local land use visions of maintaining the existing scale, character and land uses of Issaquah's central business district (CBD). The Southeast Issaquah Bypass would also provide access and improve mobility to the Issaquah Highlands development. Finally, it would meet multimodal objectives by providing bicycle/pedestrian enhancements and future access to regional trails.

Grand Ridge Annexation and Development Agreement

The Grand Ridge Annexation and Development Agreement (1996), also referred to as the Grand Ridge Joint Agreement, is a three-party agreement between the city of Issaquah, King County, and the Grand Ridge/Glacier Ridge Partnership. The agreement provides guidelines for development of the Issaquah Highlands (formerly known as Grand Ridge) planned community.

This agreement contains a section on transportation improvements and phasing necessary for development of urban portions of the property. The Issaquah Highlands development is located north of the I-90/East Sunset Way interchange, and is therefore outside the proposed project area. Thus, the Southeast Issaquah Bypass would not have direct impacts on that area. It would provide a potential connection to the South SPAR project, and in conjunction with that project would assist the flow of traffic directly to and beyond the Issaquah Highlands development.

Grand Ridge Master Transportation and Finance Agreement

The Master Transportation and Finance Agreement (MTFA) is included in the Grand Ridge Annexation and Development Agreement as an appendix. The MTFA (1996) describes transportation improvements required to serve the Issaquah Highlands development, as well as the responsibility for construction and financing of improvements among Issaquah, King County, and the Grand Ridge/Glacier Ridge Partnership.

The proposed Southeast Issaquah Bypass is included in the MTFA. The agreement states that the Grand Ridge partnership must contribute $1.4 million toward the cost of the proposed Southeast Issaquah Bypass. The city of Issaquah would pay for other aspects of the project, including environmental studies, engineering and design, permitting, and the balance of the corridor's construction costs. The finance agreement, including the portion pertaining to the Southeast Issaquah Bypass, would be consistent with the county and city comprehensive plans that encourage coordinated land use decision-making.

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Social Elements

Studies and Coordination

Population characteristics and growth trends in the project area were determined through review of local comprehensive plans, census data, and other demographic information. Field visits were used to confirm community characteristics. Service providers were contacted regarding public services and utilities within the project area. This section provides analysis for the following social elements: Regional population and community growth, environmental justice population groups, public services and utilities, recreation, transportation services, and pedestrian and bicycle facilities.

Regional Population and Community Growth: Community Cohesion and Mobility

Affected Environment

The proposed Southeast Issaquah Bypass would be constructed in the southeastern portion of Issaquah and adjacent to unincorporated King County. Within Issaquah, the majority of the proposed project route would occur within the Olde Town subarea and the southernmost portion of the project would occur within the Sycamore subarea. The proposed project north of Issaquah High School to the I-90/East Sunset Way interchange would be in the Olde Town subarea. The Olde Town subarea includes the city's central business district (CBD), as well as older residential homes and duplexes east of Front Street South. The city's Olde Town subarea plan acknowledges the significance of the area as Issaquah's civic and cultural center and includes goals to improve traffic conditions and circulation, maintain and enhance the area's neighborhood focus, and preserve and enhance the existing trail and pathway system. The Land Use section of this chapter provides more detail on existing land uses and local plans and policies related to the proposed project area.

The proposed project, located from approximately south of Issaquah High School's athletic field to the intersection of Front Street South and Southeast 96th Street, would be in the Sycamore subarea. This subarea is located at the city's southern edge, and its primary land use is single-family residential development that has occurred over the last twenty years. This area's existing cohesiveness is formed primarily by the character of the residential neighborhoods. The subareas are connected by local streets and arterials, and the Front Street South interchange provides the primary connection to I-90 and regions beyond the city.

Population Characteristics

The proposed project would be located primarily within the city of Issaquah, adjacent to the northernmost portion of the Tahoma-Raven Heights planning area in King County. The population of Issaquah and the unincorporated study area in King County has been increasing over the last decade. This trend is expected to continue as growth in the region continues to increase. **Table 3-21** provides data on population growth and changes in the number of households within the project study area.

Table 3-21
Population and Household Data, 1990 to 2020

Area	1990	2000	2010	2020	Percent Change 1990-2020
Issaquah					
Total Population	7,786	9,492	10,513	12,815	64.5%
Total Households	3,348	4,315	4,779	5,825	73.9%
With 1996 Annexations					
Total Population	N/A	12,695	27,324	30,951	143.8%
Total Households	N/A	5,759	11,967	13,594	136.0%
*includes the Issaquah Highlands					
FAZ 4300					
Total Population	8,578	10,418	11,607	13,432	56.5%
Total Households	3,393	4,247	5,066	5,898	73.8%
Sources: Census 2000; Issaquah, 2000; Puget Sound Regional Council 2001.					

Annexations are expected to greatly add to growth in Issaquah. Housing units also are expected to increase, but at a lesser rate. The average household size in Issaquah in 1990 was 2.4 persons, and this number is expected to decline to approximately 2.2 persons per household by 2020. The average household size in King County in 1990 was 2.4 persons, and this number is expected to decline to approximately 2.2 persons per household by 2020 (PSRC, 2001).

The proposed project would connect with Front Street South where it transitions to Issaquah/Hobart Road, which serves a portion of the Renton Plateau and the Maple Valley area farther south. Population and housing data are based on forecast analysis zone (FAZ) data for the project area. FAZs are planning areas defined by Puget Sound Regional Council information and census tracts. FAZ 4300 is within the northern portion of the Tahoma-Raven Heights community planning area in unincorporated King County and also includes a portion of Issaquah. Although this zone is expected to experience population and household growth in the future, it is projected to grow at a lower rate than the growth expected for all of Issaquah.

Impacts

All Build Alternatives

The proposed Southeast Issaquah Bypass would provide a new north-south connection in the city and facilitate mobility between southeast Issaquah and the downtown area. It would also provide a connection with I-90 for the southeastern part of the city and unincorporated areas to the south, including Hobart and Maple Valley. This connection would provide an alternative for trips that now pass through Issaquah to reach I-90 at the Front Street South interchange. Community cohesion would not be impeded, because the proposed project would link neighborhoods in the northern and southern project areas. The new roadway would be constructed near Issaquah's eastern city limits, where there is very little development. Therefore, the new roadway would not divide eastern and western communities.

Other community impacts resulting from the proposed Southeast Issaquah Bypass would be primarily related to noise and visual changes to the setting. Environmental justice population groups could experience noise and visual impacts as a result of the proposed project. The potential impacts associated with these elements are discussed in the Noise and Visual Quality sections of this chapter. These impacts are not expected to be substantial, and any potential effects they may have on environmental justice groups would not be different from those expected to be experienced by the general population in the project area.

Ultimately, the proposed Southeast Issaquah Bypass would change the community character by contributing toward a more urban setting at the eastern edge of the city. Although this would be different from the existing setting, mitigation measures identified throughout this document are intended to reduce the impact of this change.

Direct impacts on population growth are not expected to result from the new roadway. The proposed road would be located primarily within the Issaquah city limits. The city has no plans to expand in the project area and city zoning would allow only low-density development in this area. Similarly, the King County Comprehensive Plan indicates that current rural zoning would remain for unincorporated lands in the project area. Thus, increased densities are not expected to occur and the new roadway would not affect population growth.

No-Action Alternative

Under the no-action alternative, the proposed Southeast Issaquah Bypass would not be constructed, and existing travel routes in the Issaquah area would remain the same, except for other planned projects that would not improve the traffic congestion that the Southeast Issaquah Bypass is designed to remedy.

The proposed Southeast Issaquah Bypass is not directly connected to individual phases of development at Issaquah Highlands (formerly Grand Ridge), but it represents one of the four transportation components to be constructed for the Issaquah Highlands development, as identified in the Grand Ridge Master Transportation Financing Agreement (MFTA). The MTFA establishes the Grand Ridge partnership’s obligations to pay for any project improvements related to the transportation improvement components of the Issaquah Highlands development. If the proposed Southeast Issaquah Bypass is not constructed, full development of the Issaquah Highlands could still occur, and the temporary connection of the Sunset interchange to East Sunset Way would be made permanent by WSDOT using a new configuration with wider lanes. In this case, travel from new development on the Sammamish Plateau to areas south of Issaquah would involve trips through the central portion of the city rather than around its eastern edge. This travel pattern would result in additional traffic on Front Street South and more congestion in the city, especially during peak travel hours.

For some individuals the resulting congestion and lack of mobility without the Southeast Issaquah Bypass would be perceived as a diminishment to the quality of life in the project area. The need for additional pass-through traffic within the central portion of the city would likely be a greater detriment to neighborhood and business cohesion than would occur with the proposed project.

Because Issaquah is expected to grow in size, it is likely that congestion would continue to be an issue. Without the proposed project, it is likely that congestion would worsen along Front Street South and the Front Street South/I-90 interchange. This could impede cross-town travel and travel north and south. Within the community, mobility impediments and congestion could decrease the connectivity between neighborhoods and businesses.

Mitigation

The project's impacts on mobility are expected to be beneficial, so mitigation measures would not be needed. Potential impacts resulting from the roadway encroaching on the fringe of neighborhoods would be reduced through landscaping and visual screening. Although the proposed project would alter the residential areas it passes through, it would facilitate travel between the northern and southern parts of the city and would not have adverse impacts on community cohesion. Consequently, specific mitigation measures related to this element would not be needed.

Environmental Justice

Affected Environment

Federal agencies are required to identify project impacts under environmental justice regulations. Title VI of the Civil Rights Act of 1964 states that "no person in the United States shall, on the ground of race, color or national origin, be excluded from participation in, denied benefits of, or subjected to discrimination under any program or activity receiving Federal financial assistance." This act was amended at a later date to include gender as an additional category to be protected against discrimination. The Americans with Disabilities Act of 1975 and Section 504 of the Rehabilitation Act of 1973 protect disabled persons. The Age Discrimination Act of 1990 protects the elderly from discrimination. Executive Order 12898 requires federal agencies to determine whether agency actions would have disproportionately high and adverse impacts on minorities and/or low-income populations. A discussion of potential impacts on environmental justice population groups defined by these regulations follows.

Numerous field visits to the project area have occurred during environmental analysis. The purposes of these visits varied and did not always concern community issues; however, no obvious minority or low-income areas were noted. Because environmental justice may not have been the focus of these visits, another reconnaissance was made in April 2004. This visit concentrated on the southern project area, where census data indicated that environmental justice population groups could be located within overall block groups and tracts. The southern project area was also of interest because most of the potential displacements associated with the project could occur there (see the Relocations section of this chapter).

Minority Populations

Census information indicates that, historically, racial diversity in Issaquah has not been high, and city data confirm that Issaquah exhibits less diversity among population groups than the county as a whole (Issaquah, 2000). Population characteristics for the city are shown in **Table 3-22**. The proposed project would occur in the eastern portion of Issaquah and this area is similar in racial composition to the city as a whole.

Table 3-22
Year 2000 Population Characteristics

Race	City of Issaquah	Percent of Total	Local Census Tracts	Percent of Total
White	9,861	88.0%	13,761	88.50%
Black or African American	99	0.9%	102	0.65%
American Indian and Alaskan Native	71	0.6%	99	0.63%
Asian	677	6.0%	419	2.69%
Native Hawaiian or Pacific Islander	12	0.1%	21	0.13%
Some other race	164	1.5%	199	1.28%
Two or more races	328	2.9%	398	2.56%
Hispanic origin	555	5.0%	588	3.78%
Source: Census 2000. Census tract data compiled in Table 3-23.				

Tables 3-23 and **3-24** present population characteristics for census tracts and census bocks in the project area based on data from the 2000 Census. **Figure 3-25** identifies the census tracts and blocks from which project area data was compiled.

Table 3-23
Census Tract Population Characteristics

Race	Tract 321.02	Tract 321.03	Tract 321.04	Tract Total	Percent of Tract Total
White	4,304	3,982	5,475	13,761	88.50
Black or African American	22	32	48	102	0.65
American Indian and Alaskan Native	33	33	33	99	0.63
Asian	51	191	177	419	2.69
Native Hawaiian or Pacific Islander	8	1	12	21	0.13
Some other race	38	89	72	199	1.28
Two or more races	110	124	164	398	2.56
Hispanic origin	70	307	211	588	3.78
Total Tract Population	*4,636*	*4,759*	*6,145*	*15,540*	–
Source: Census 2000.					

Table 3-24
Project Area Census Block Characteristics

	Block 3008	Block 3009	Block 3010	Block 2014	Block 2022	Block 2027	Block 2028	Block 3000	Block 3001	Block 3002	Block 3003	Block 3011	Block Total	Percent of Tract Total[1]
Total	0	63	2	25	121	6	0	73	0	664	28	230	1,212	
White	0	58	2	21	116	0	0	64	0	555	20	224	1,060	87.40%
Black or African American	0	1	0	2	0	0	0	0	0	9	2	2	16	0.01
American Indian and Alaskan	0	0	0	0	0	0	0	2	0	2	1	2	7	0.005
Asian	0	1	0	2	3	0	0	0	0	34	3	1	44	3.63
Native Hawaiian or Pacific Islander	0	0	0	0	0	0	0	0	0	1	0	0	1	0.0008
Some other race	0	1	0	0	0	6	0	0	0	33	0	1	41	3.38
Two or more races	0	2	0	0	2	0	0	7	0	30	2	0	43	3.54
Hispanic origin	0	1	0	0	2	6	0	9	0	59	2	1	80	6.6%[2]

[1] Block total as percent of totals for census tracts 321.02, 321.03, and 321.04.

[2] Census counts Hispanic origin percentage separately from other racial categories.

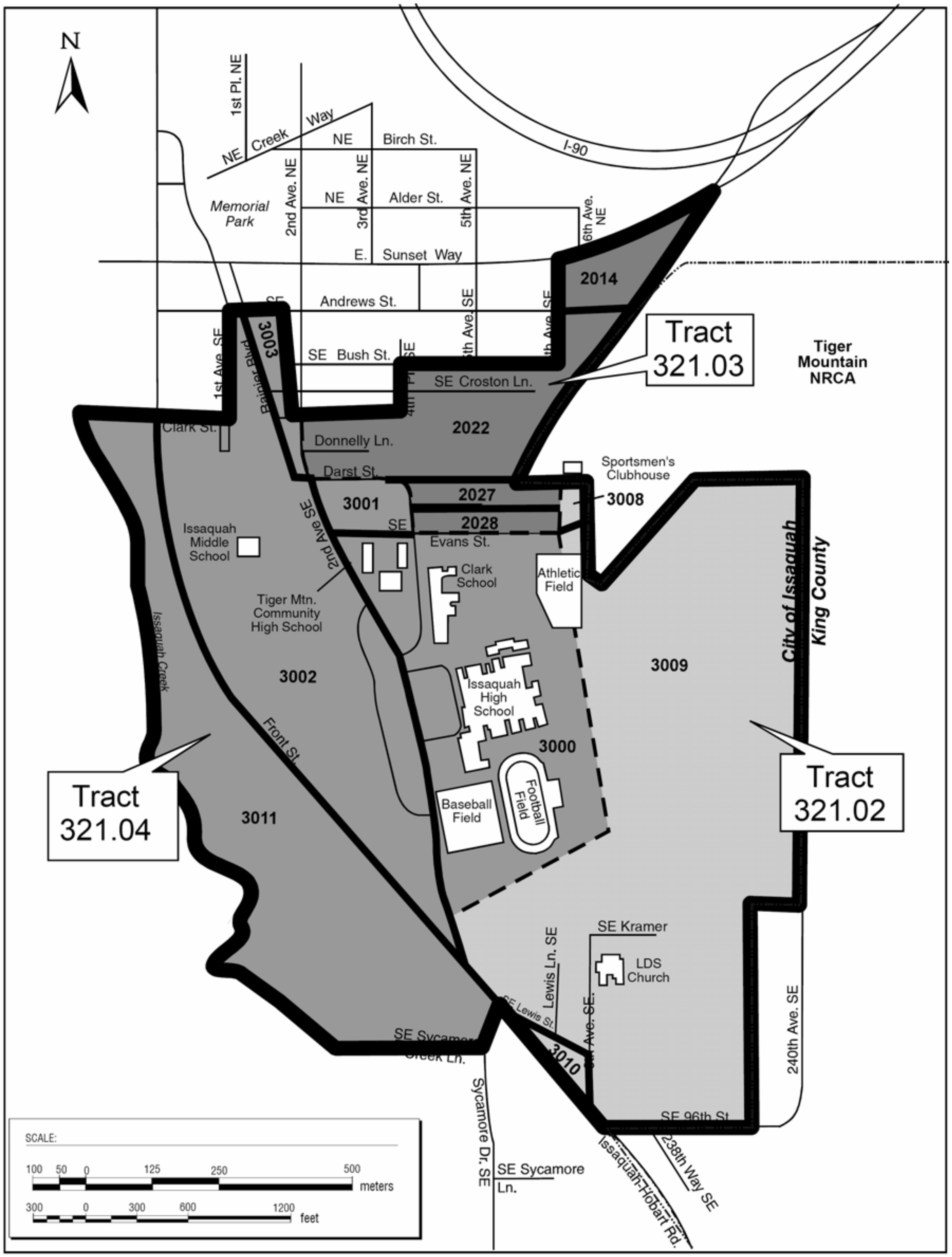

Figure 3-25
Project Area Census Blocks

The census tract data show that minority populations in the three census tracts coinciding with the project area contain approximately 11.5 percent of the population while the white racial group accounts for approximately 88.5 percent of the population. At the census block level within southern Issaquah this distribution is almost identical: the proportion of minority population is approximately 12.6 percent and the proportion of the white racial group is approximately 87.4 percent.

At the census block level, the area where displacements could occur has similarly diversity: 92 percent were of the white racial group (blocks 3009 and 3010). Thus, it can be concluded that the racial diversity within the project area is very similar to the city as a whole, and minority populations are not present at disproportionate levels.

Low-Income Populations

According to the U.S. Department of Health and Human Services poverty guidelines, the poverty threshold in 2007 for individuals was $10,210 and the threshold for a household of four was $20,650 annually. Census tract block group data on income indicate that 55 households (approximately 2.9 percent of the total households) in the three census tracts covering the project area have a total household income of less than $10,000 annually. These data also identify 91 households (approximately 4.9 percent of the total) as having income levels between $10,000 and $19,999 annually. The remaining 1,700 households (approximately 92.1 percent) in these tracts indicate household income levels above federal poverty guidelines for four-person household sizes included in census income data. Individual block data on income are not available. **Table 3-25** shows household income in the project area. As the project proceeds, final design would determine which households would be affected.

Impacts

As indicated by the 2000 Census data, minority and low-income population groups represent approximately 13 percent of the population within the project area. The 2000 Census data also indicate that affected homeowners may have racial characteristics and income levels similar to those of the overall project area.

Two potential low-income households that would be displaced by the proposed project have been identified. One potential low-income household may be displaced under Alternatives 2, 4, and 6. This property is owned by Habitat for Humanity, and the current resident could qualify as low-income to be eligible for participation in the Habitat for Humanity program. Habitat for Humanity of East King County provides homes at no profit and no interest to families who earn less than 50% of the median income for the eastern county. For a single-person household, applicants for the program may not have an income greater than $27,265 annually and for a family of four, the income level may not exceed $39,900 annually (Habitat for Humanity, 2003). Because these thresholds are higher than the federal poverty guidelines indicated earlier, it is not certain that this resident would meet the low-income definition.

Table 3-25
Household Income by Block Group

	Block Group 3, Census Tract 321.02	Block Group 2, Census Tract 321.03	Block Group 1, Census Tract 321.04
Less than $10,000	12	39	4
$10,000 to $14,999	14	14	6
$15,000 to $19,999	20	23	14
$20,000 to $24,999	16	42	5
$25,000 to $29,999	0	62	14
$30,000 to $34,999	10	30	53
$35,000 to $39,999	14	39	18
$40,000 to $44,999	27	54	64
$45,000 to $49,999	10	44	31
$50,000 to $59,999	25	110	17
$60,000 to $74,999	60	83	123
$75,000 to $99,999	59	30	145
$100,000 to $124,999	37	12	119
$125,000 to $149,999	36	9	57
$150,000 to $199,999	12	8	94
$200,000 or more	17	0	117
Total	369	599	881
Source: Census 2000.			

An elderly homeowner has been identified in one residence that would be displaced under Alternatives 1, 3 and Modified 5; however, income data for this homeowner was not investigated.

The proposed project does not directly affect tribal lands; however, tribal groups have expressed concerns for the project's impacts on salmon and other fish species important to these groups. Detailed information on potential impacts on fish and wildlife along with proposed mitigation is provided under Vegetation and Wildlife, Fisheries, and Threatened and Endangered Species. The Water Quality, Hydrologic Conditions, and Floodplains sections also provide information on effects on local water bodies that also relate to fish usage. The Historic and Archaeological Resources section also contains information on tribal consultation for the environmental analysis in this document.

Public Involvement

During the course of environmental analysis for the proposed project, several public meetings and field visits to the project area have occurred. Public outreach has also occurred through use of a newsletter, to inform members of the public about project issues and meetings. In cooperation with the city, a citywide database of individuals and organizations interested in the project was assembled. Periodically during environmental analysis, direct mailings were used to distribute the newsletters to these individuals and organizations. All newsletters mailed to the public and public announcements placed in all newspapers contained the following: “Individuals requiring reasonable accommodation may request written materials in alternative formats, sign language interpreters, physical accessibility accommodations or other reasonable accommodations by contacting Pam Fox at (425) 837-3423 or e-mailing *pamf@ci.issaquah.wa.us*.

A public hearing was held on the draft EIS in June 2000. Over 100 people from the community attended. Environmental justice issues were not specifically raised at the hearing, but comments were made concerning potential displaced homes and the project’s impact on separating portions of the community in the south project area. Although these comments did not specifically address environmental justice issues, it is possible that community cohesion impacts could affect minority populations that may reside near the proposed project routes. Community cohesion impacts are discussed earlier in this Social Elements section, and are not expected to result in disproportionate impacts on any environmental justice population.

The public hearing also included a microphone for oral testimony and a separate meeting room where individuals could privately comment directly to a representative of the city, as opposed to the public microphone setting. Transcripts from these meetings do not reveal any specific environmental justice concerns. The letters and transcripts are provided as a separate volume of the supplemental draft EIS, available from the city of Issaquah.

In July 2004, a public hearing was held on issuance of the supplemental draft EIS. Written comment letters on the supplemental draft EIS were also received. Letters and hearing transcripts, along with responses to these comments are provided in Volume 2 of this final EIS.

Conclusion

No substantial impacts on environmental justice groups are expected to result from the proposed project. Based on census track and block data, population groups within the project area are similar to the Issaquah population as a whole, and are not concentrated along any of the proposed project routes. Additional public outreach will take place in the future. This analysis will be verified through those efforts.

The no-action alternative would result in no disproportionate impact on minority or special needs populations.

Mitigation

No mitigation measures have been identified. As the development of this project proceeds, additional public involvement activities will help to determine whether any environmental justice populations could be affected, and whether mitigation is required.

Public Services

Schools

Affected Environment

The project area is located in Issaquah School District No. 411. There are three schools within the project area. Clark Elementary School (500 2nd Avenue Southeast) and Issaquah High School (700 2nd Avenue Southeast) are located on the east side of 2nd Avenue Southeast, and the eastern boundary of their properties would be adjacent to the central portion of the proposed project alignments. Tiger Mountain High School (355 Southeast Evans Street) is located approximately 150 meters (500 feet) west of the project alignments.

Impacts

The proposed project is expected to result in beneficial impacts on the local transportation system. The Issaquah School District has indicated that travel times for bus routes using Front Street South have increased by 15 minutes per bus route in recent years due to traffic congestion, which has resulted in increased operating costs for the district. School transit would therefore benefit from improvements in local circulation and travel patterns and could use the proposed Southeast Issaquah Bypass for transportation to and from surrounding regions.

The school district has also expressed concerns about noise, air quality, and visual impacts related to the proposed roadway's proximity to existing school buildings. The Noise and Air Quality sections of this chapter provide information on impacts related to those elements. Although the proposed roadway would likely be visible from school buildings and adjoining properties, this visual presence is not expected to result in an adverse impact on school facilities. The proposed project would include landscaping in places to form a visual separation between the roadway and adjacent uses, and would likely include fencing to restrict access at some locations. The Visual Quality section of this chapter addresses visual and aesthetic impacts and proposed mitigation measures.

Two of the three north alignments (North A and North C) would require acquiring a portion of the athletic field for the roadway right-of-way. Under Alternative 4 and Modified 5 the roadway would be built on the east side of the athletic field and access from the adjacent trail to the field would be maintained. (See discussion of athletic field impacts under Recreation, below). Under this design the roadway centerline would be approximately 213 meters (700 feet) east of Clark Elementary School and 91 meters (300 feet) east of Issaquah High School. Students using these facilities would likely notice differences between the present environment there and future conditions under the proposed action. More specific potential impacts related to the proposed road's proximity to school facilities are discussed in the Noise and Air Quality sections of this chapter. Under Alternative 1 and 2 the roadway would be built on the west side of the athletic field and access from the adjacent trail to the field would be cut off from the school. This will require students to use a cross-walk across the new roadway to access the fields, creating a significant inconvenience.

The proposed roadway would introduce a new physical barrier between Issaquah High School, Clark Elementary School, and the Tiger Mountain NRCA to the east. As noted by school district officials, outdoor areas near the schools serve as living laboratories for science classes and students use local trails for athletic training activities. While the proposed roadway would create a new separation between the schools and the NRCA, the proposed project includes provisions to maintain connections to the NRCA, either via existing trails or through new trail connections. The roadway would include a signalized pedestrian crossing at the Park Pointe intersection to provide access from the schools to the trails leading to Tradition Lake.

Mitigation

As noted previously, the proposed project would include measures to address potential impacts on the schools. In addition to these measures, the roadway would include a signalized pedestrian crossing at the Park Pointe intersection to provide access from the schools to the trails leading to Tradition Lake.

Temporary disruptions would occur during construction (see the Construction Impacts section of this chapter). Noise and dust impacts and mitigation measures are addressed in the Noise, Air Quality, and Construction Activity Impacts sections of this chapter. Visual impacts and mitigation measures are identified in the Visual Quality section of this chapter.

Fire and Police Services

Affected Environment

Police protection within the city of Issaquah is provided by the Issaquah Police Department. The police department is located at 132 East Sunset Way, approximately 0.8 km (0.5 miles) northwest of the project area, in downtown Issaquah.

The city of Issaquah has three fire stations. Station 71 is located at 190 East Sunset Way, approximately 0.8 km (0.5 miles) northwest of the project area. The headquarters is located at 175 Newport Way, approximately 4 km (2.5 miles) northwest of the project area, and the third is located at 1770 NW Maple Street, approximately 4 km (2.5 miles) west of the project area. Each station is staffed with firefighters and support equipment, and the fire department also provides emergency medical services.

Impacts

The proposed project is expected to have beneficial impacts on fire and police service emergency response times in the region. The new roadway would provide a direct connection to I-90 for travel to neighboring regions when emergency mutual aid requests occur. Southeast Issaquah Bypass traffic is expected to relieve congestion elsewhere in the city and the resulting improvements in traffic flow also would be expected to have a beneficial impact on response times within the city.

Mitigation

Because operational impacts on fire and police services would not occur, mitigation would not be required.

Temporary disruptions would occur during construction (see the Construction Impacts section of this chapter). Noise and dust impacts and mitigation measures are addressed in the Noise, Air Quality, and Construction Activity Impacts sections of this chapter. Visual impacts and mitigation measures are identified in the Visual Quality section of this chapter.

Churches, Cemeteries, and Government Institutions

Affected Environment

Within the project area, the Church of Jesus Christ of Latter Day Saints (LDS Church) is located at 1100 6th Avenue Southeast, on the east side of the street. Beyond the project boundaries, the Mountain Creek Methodist Church is located at 400 2nd Avenue Southeast, approximately 150 meters (500 feet) west of the project area; the Seventh Day Adventist Church is located at 425 East Sunset Way, approximately 305 meters (1,000 feet) northwest of the project area; and the First Church of Christ Scientist is located a 9806 238th Way Southeast, approximately 150 meters (500 feet) south of the project area. No other churches, cemeteries, or government and social institutions are located in the project area.

Impacts

Under Alternatives 1, 3, and Modified 5, the proposed road would introduce new traffic around the LDS Church on 6th Avenue Southeast, which could increase noise and dust associated with vehicles using the road. Under these alternatives the proposed project would include new access to the church via Southeast Kramer Place. Officials have also expressed concerns about noise and visual impacts on the church and these impacts are discussed in the Noise and Visual Quality sections of this chapter.

For all build alternatives, potential noise and visual impacts could also occur at the Issaquah Sportsmen’s Clubhouse, where the proposed project could require a portion of this property. Its proximity to the Southeast Issaquah Bypass could alter the current setting. With mitigation, this impact would be diminished and would not result in displacement or alteration of the clubhouse itself.

Mitigation

Temporary disruptions would occur during construction (see the Construction Impacts section of this chapter). Noise and dust impacts and mitigation measures are addressed in the Noise, Air Quality, and Construction Activity Impacts sections of this chapter. Visual impacts and mitigation measures are identified in the Visual Quality section of this chapter.

Utilities

Affected Environment

Sanitary Sewer and Stormwater Drainage

The city of Issaquah provides sewer service in the proposed project area. The following sewer lines exist in the project area:

- An 8-inch sanitary sewer line is located in Southeast Evans Street between 3rd Avenue Southeast and 2nd Avenue Southeast, approximately 305 meters (1,000 feet) west of the project area.
- An 8-inch sanitary sewer line extends approximately 230 meters (750 feet) south of Southeast Evans Street in 2nd Avenue Southeast.
- An existing 8-inch sanitary sewer and 4-inch force main are located at the intersection of 2nd Avenue Southeast and Front Street South. This 8-inch line has recently been extended along Front Street South to Southeast 96th Street. A new pump station was constructed at the 2nd Avenue Southeast/Front Street South intersection and began operating in spring of 1998.
- A sanitary sewer line is located in 6th Avenue Northeast and Southeast Andrews Street, approximately 122 meters (400 feet) northwest of the project area.

Water Supply

The city of Issaquah would provide water service in the project area. The following water lines are located in the project area:

- A 12-inch line is located in Southeast Evans Street at the intersection with the former railroad right-of-way. This line extends approximately 90 meters (300 feet) north of Southeast Evans Street in the former railroad right-of-way, and extends west in Southeast Evans Street to a 12-inch line that extends south approximately 230 meters (750 feet) to Issaquah High School. This line connects to an 8-inch line that extends east to the former railroad right-of-way, then runs south for approximately 150 meters (500 feet) to the south side of the high school, where it turns west and extends to 2nd Avenue Southeast. An 8-inch line also extends east to the Sportsmen's Clubhouse.
- A 12-inch line runs southeast in Front Street South to 6th Avenue Southeast where it connects to a 10-inch line, and continues south to the city limits. The 10-inch line extends approximately 90 meters (300 feet) north to an 8-inch line that extends 90 meters east, then 90 meters north behind the LDS Church to connect with a 6-inch line that extends 90 meters west, then 90 meters south to reconnect with the 10-inch line in 6th Avenue Southeast.
- An 8-inch water main in East Sunset Way at the northern end of the proposed project route connects to a 12-inch main located within the former railroad and power line right-of-way.

Electricity

PSE provides electrical service in the project area. There is an existing 115-kilovolt (Kv) power line on overhead poles along the former railroad right-of-way. This line connects to the east-west 115-Kv line on the south side of East Sunset Way. Overhead lines also extend north along 6th Avenue Southeast.

Natural Gas

PSE serves the project area. There is a 5-centimeters (2-inch) gas line located in East Sunset Way, east of 6th Avenue Northeast.

Telecommunication Services

U.S. West, World Com, Level 3 Communications, and AT&T provide telecommunication services in the project area. There are existing World Com and AT&T fiber-optic cables in East Sunset Way. U.S. West has four ducts (passageways through which cables are routed) along East Sunset Way east of 6th Avenue Northeast in the north, a duct-run cable along Front Street South, and buried cables in 6th Avenue Southeast and Southeast Kramer Place. Two buried cables extend from the west side of Front Street South to Sycamore Drive. U.S. West also has an aerial cable in 2nd Avenue Southeast, which intersects Front Street South, and aerial cables on Southeast 96th Street and along 238th Way Southeast. A cell phone tower is located on the northwesterly portion of the Sportsmen's Clubhouse property.

Cable Television

TCI Cablevision serves the project area. There are existing cable lines within East Sunset Way, Front Street South, Southeast Lewis Street, 6th Avenue Southeast, Southeast Kramer Place, and Southeast 96th Street.

Solid Waste Collection

Waste Management provides solid waste and curbside recycling services within Issaquah. Solid waste collection is provided for residential and commercial customers. Commercial routes use the I-90/East Sunset Way interchange seven days a week, and residential pick-up via East Sunset Way occurs every Thursday. Residential service also is provided to 6th Avenue Southeast and side streets in the southern project area on Thursdays, and residential routes also use Front Street South. Commercial waste is taken to the Cedar Hills landfill via the Issaquah/Hobart Road.

Impacts

Once constructed, the proposed project is not expected to have impacts on stormwater drainage, natural gas, telecommunications, or cable television services because no new lines or connections would be needed. The proposed project would require electricity for proposed streetlights and signalization, but this use is not expected to result in a substantial new demand on electric supply. It is also possible that some demand on water supply could result from potential irrigation associated with proposed roadway landscaping. The proposed project would include extension of new sewer lines in the south project area. An 8-inch sewer line would be installed beginning at Southeast Lewis Lane near Front Street South, extending to 6th Avenue Southeast from Southeast Lewis Lane to Southeast Kramer Place, and then along Southeast Kramer Place to its eastern end. Side sewers would also be constructed along with the sewer main. These improvements would provide sanitary sewers to local residences and the LDS Church, replacing reliance on existing septic systems. Existing capacity is sufficient to accommodate new utilization and no substantial changes to sewer service would result from the proposed extension.

The no-action alternative would have no impact on utility providers. However, without the Southeast Issaquah Bypass, response times for emergency services would likely increase in relation to expected traffic increases and congestion within the Issaquah area.

Mitigation

Because substantial impacts on utilities would not occur, mitigation would not be required. Temporary disruptions would occur during construction (see the Construction Impacts section of this chapter). Noise and dust impacts and mitigation measures are addressed in the Noise, Air Quality, and Construction Activity Impacts sections of this chapter. Visual impacts and mitigation measures are identified in the Visual Quality section of this chapter.

Recreational Resources

Affected Environment

The primary recreational facilities in the immediate project area include the Tiger Mountain NRCA, Squak Valley Park, the Sportsmen's Clubhouse, the Rainier Trail and the Issaquah Trail **(Figure 3-26)**. Several sports facilities on the Issaquah High School campus are also available for public recreational use.

West Tiger Mountain/Tradition Plateau Natural Resource Conservation Area

The Washington Department of Natural Resources and the city of Issaquah manage the 1,780-hectare (4,400-acre) West Tiger Mountain/Tradition Plateau natural resource conservation area (Tiger Mountain NRCA). Established in 1989, the NRCA includes the northern and western slopes of the Tiger Mountain State Forest and the city of Issaquah's Tradition Plateau land. The NRCA is criss-crossed by an extensive network of hiking trails accessed by several trailheads with formal and informal parking areas. Because it is close to the Seattle metropolitan area and has easy access to I-90, the NRCA is heavily used and receives approximately 150,000 visitors annually. The Tradition Plateau unit contains over 200 hectares (500 acres) and is the most heavily used unit for recreation in the NRCA. It provides forested hiking trails and includes access to trails around Tradition Lake. The NRCA's primary goals include protection of natural resources and wildlife habitat areas, opportunities for environmental education, and low-impact recreational use.

Squak Valley Park North

Squak Valley Park North is an undeveloped city park located on a 10-acre site located just off Front Street South at the south end of the project area. The site currently consists of an open field located between Front Street South and Issaquah Creek. The city is planning to improve Squak Valley Park in a few years with passive recreation improvements, trails, and parking. A habitat restoration project is also proposed along Issaquah Creek.

Issaquah Sportsmen's Clubhouse

The Issaquah Sportsmen's Clubhouse is a nonprofit organization that owns and operates an open air shooting range located just outside the Issaquah city limits at 600 Southeast Evans Street. The facility is open to the public and includes

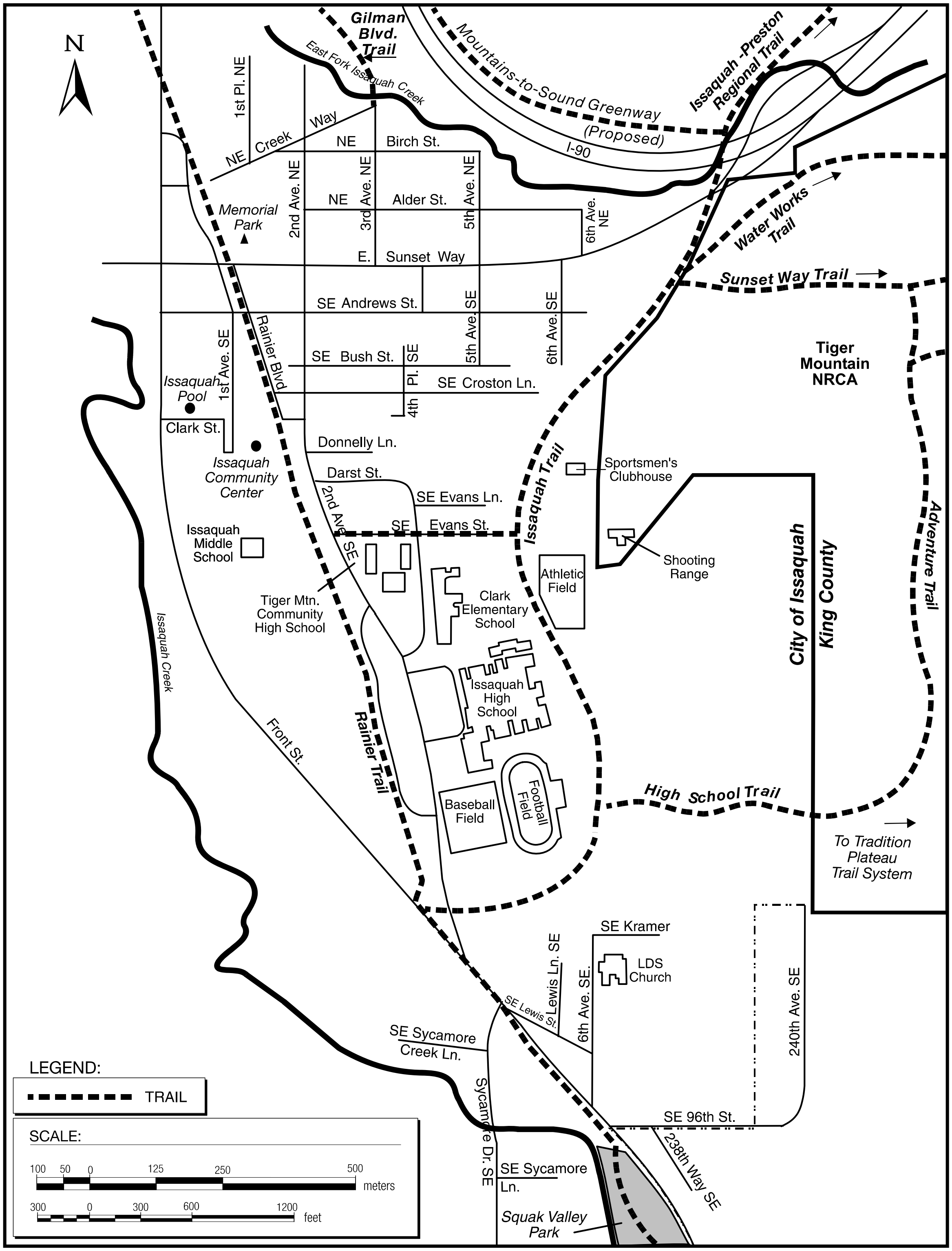

Figure 3-26
Parks, Trails, and Recreational Facilities

several ranges of different lengths for different types of firearms. The range is used for firearms training, practice and competition. The facility is a popular practice range used frequently by officers from several area police and sheriff departments. The club has operated in the same general location for over 70 years.

The shooting range and related properties and facilities have been improved over the past 12 years with grant funding from the Firearms and Archery Range Recreation Program managed by the Washington Interagency Committee for Outdoor Recreation (IAC). IAC grants have been used to relocate the clubhouse building, improve vehicle access, install noise control devices, and make safety improvements. Vehicle access to shooting range is via an unpaved extension of Southeast Evans Street. The roadway is located within an easement across property currently owned by the Issaquah School District (**Figure 3-27**).

The Rainier Trail is a 14-foot wide multi-use trail that follows the former Burlington Northern railroad right-of-way west of 2nd Avenue Southeast. The trail is owned and maintained by the city of Issaquah. The developed portion of the trail within the project area ends at 2nd Avenue Southeast. Hikers and cyclists can continue eastward along a well-established, heavily used, existing trail known locally as Issaquah Trail. This trail is located on Issaquah School District and Puget Sound Energy property.

The Issaquah Trail is located within the abandoned railroad right-of-way that extends east from 2nd Avenue Southeast and north to East Sunset Way. Issaquah Trail provides direct and indirect access to the extensive trail system within the Tiger Mountain NRCA. The right-of-way is part of the old rail network that once served the Issaquah area. Beginning in 1888, the Seattle, Lake Shore & Eastern Railroad (SLS&E) operated in the area. It was later sold to the Northern Pacific Railroad Company, which merged with Burlington Northern (BN) in 1970.

The railway was abandoned about that time, when I-90 was built and the lower cost of truck transportation combined with the interstate highway system caused the popularity of rail use to decline. The railroad route was previously connected to routes on both sides of Lake Sammamish, Tiger Mountain, and the Issaquah Highlands. Most of these lines have since been abandoned as new development has come to the area. The trail is frequently used by students from nearby Issaquah High School for team sport conditioning and physical education classes. It connects to other trails located north and south of I-90 near the Sunset interchange, providing access to the King County regional trail network and the Mountains to Sound Greenway.

Issaquah School District Recreational Facilities

Three sports facilities on the Issaquah High School campus are regularly used by the public for recreational purposes. A 1.4-hectare (3.5-acre) athletic field (also known as the Upper Field) is located northeast of the Issaquah High School campus. This field has two 18.3-meter (60-foot) baseball/softball diamonds and track/field facilities (shot put and javelin). The south diamond was developed for use primarily by the girls' varsity softball team. The field was developed by the school district in response to federal requirements under Title 9, to address the imbalance between boys' and girls' sports facilities and programs in public schools.

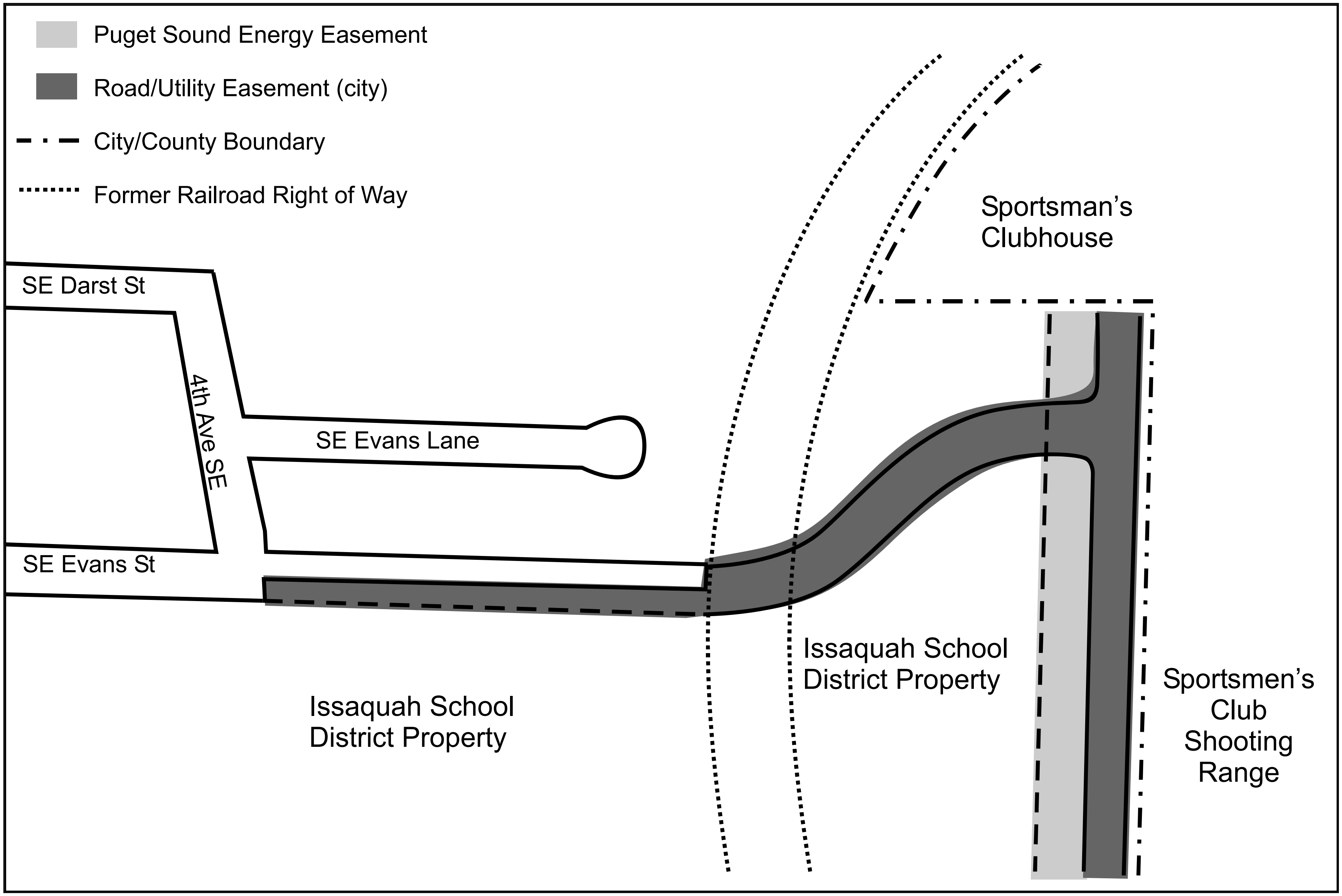

Figure 3-27
Issaquah Sportsmen's Clubhouse Access Road

Southeast Evans Street provides access to an unpaved parking area in the northwest corner of the site. The Issaquah Little League uses these ball fields for scheduled practices and games. Both fields are heavily used and typically experience over 230 bookings a year.

The Issaquah High School baseball field, located at the south end of the campus adjacent to 2nd Avenue Southeast, is a regulation diamond used primarily for interschool competition. However, the field is very popular for nonschool events and typically experiences over 100 bookings a year.

The Issaquah High School football field and track is located at the south end of the high school campus. The football field is an Astro-Play infill type all-weather field that permits year-round use. The running track has a rubberized surface that also permits year-round use. Users of this facility include Eastside FC, Issaquah Lacrosse Club, Issaquah Soccer Club, Issaquah Steelhead Football, Special Olympics, Washington State Soccer Association, Greater Seattle Soccer League, Hibernian & Caledonian Football Club, Washington State Youth Soccer Association and Issaquah Parks and Recreation. The football field and track receive the heaviest nonschool use of the three high school facilities, experiencing over 370 bookings a year.

Impacts

Impacts on recreational resources and proposed mitigation for each alternative are discussed below. Additional information on recreational resources covered by Section 4(f) regulations is provided in Chapter 4.

Alternatives 1 and 2

These alternatives would not directly impact the NRCA, the school athletic field, Issaquah Sportsmen's Club facilities, or Squak Valley Park. Constructing a new four-lane road along the western edge of the NRCA and near several other heavily used recreational facilities would result in increased noise levels, vehicle emissions and decreased visual quality for users of these facilities.

Both alternatives would cross the existing alignment of Southeast Evans Street thereby eliminating direct vehicle access to the Sportsmen's Club facilities and the athletic field. A small, unpaved portion of Southeast Evans Street, which was constructed using grant funds from the Interagency Committee for Outdoor Recreation, would be converted to right-of-way for the Southeast Issaquah Bypass under Alternatives 1 and 2.

The North A portion of Alternative 1 would also displace approximately 1,040 meters (3,412 feet) of the Issaquah Trail located within the former railroad right-of-way. The South C portion of Alternative 2 would displace an additional segment of the Issaquah Trail increasing the total amount of trail displacement to approximately 1,535 meters (5,036 feet). Alternative 2 would also require the reconfiguration of up to 40 meters (131 feet) of the Rainier Trail at its terminus at 2nd Avenue Southeast. The trail would be reconfigured to accommodate the new Southeast Bypass/2nd Avenue Southeast intersection and to more directly align the trail with the new 4.2-meter- (14-foot-) wide pedestrian/bicycle trail to be provided along the western side of the proposed bypass roadway. Alternative 2 would also displace the existing (unofficial) trailhead parking area located just off of 2nd Avenue Southeast within the former railroad right-of-way.

Alternatives 3 and 4

These alternatives would not directly impact the Issaquah High School recreation facilities or Squak Mountain Park. Alternatives 3 and 4 would require acquisition of approximately 4,920 square meters (1.21 acres) of land from the NRCA for public right-of-way. Constructing a new four-lane road along the western edge of the NRCA and near several other heavily used recreational facilities would result in increased noise levels, vehicle emissions and decreased visual quality for users of these facilities.

The North B alignment of Alternatives 3 and 4 would directly impact the two parcels containing the Issaquah Sportsmen's Club clubhouse and rifle range. A total of approximately 2,587 square meters (0.64 acres) of property would be acquired from these two parcels for right-of-way. Access to the clubhouse from Southeast Evans Street would be maintained with a slightly modified alignment near the clubhouse property. However, direct access to the shooting range via Southeast Evans Street would be eliminated, and major portions of the IAC-funded access road to the rifle range would be converted to right-of-way to accommodate the Southeast Issaquah Bypass.

The North B portions of Alternatives 3 and 4 would also displace short lengths of the Issaquah Trail in two locations. One area is northeast of the Issaquah Sportsmen's Club clubhouse where the new road would cut diagonally across the existing trail and the other is at the site of North Pond 2 located adjacent to the high school tennis courts. The South C portion of Alternative 4 would displace approximately 495 meters (1,624 feet) of the Issaquah Trail located within the former railroad right-of-way and require the same reconfiguration of the Rainier Trail at 2nd Avenue Southeast, as described previously for Alternative 2. The reconfigured trail would be realigned more closely with the new pedestrian/bicycle trail to be provided along the western side of the proposed bypass roadway.

Alternatives 5 (Modified) and 6

These alternatives would not directly impact the NRCA or Squak Valley Park. Construction of a new four-lane roadway along the western edge of the NRCA and near several other heavily used recreational facilities would, however, increase noise levels and vehicle emissions and would diminish visual quality for users of these nearby facilities.

Alternatives 5 and 6 would directly affect the Issaquah High School athletic field. The bypass roadway would encroach approximately 24 meters (78 feet) into the field, affecting approximately 715 square meters (0.22 acres) of the field area. The athletic field would be extended to the west, and the north softball diamond relocated, to allow continued use of these facilities.

The North C portions of Alternatives 5 and 6 would require acquisition of approximately 2,490 square meters (0.62 acres) of property from the westernmost Sportsmen's Clubhouse parcel. Access to the clubhouse and shooting range from Southeast Evans Street would be eliminated and replaced by access from a new roadway constructed as part of the proposed Park Pointe development. The new roadway would connect to the Southeast Issaquah Bypass roadway at a new signalized intersection. If Park Pointe is not constructed, the entrance could be modified to accommodate the Sportsmen's Clubhouse only.

Modified Alternative 5 would displace approximately 440 meters (1,443 feet) and Alternative 6 approximately 935 meters (3,067 feet) of the Issaquah Trail located within the former railroad right-of-way. Alternative 6 would involve the same reconfiguration of the Rainier Trail at 2nd Avenue Southeast as described previously for Alternatives 2 and 4. The reconfigured trail would be realigned to directly connect with the new pedestrian/bicycle trail to be located along the western side of the proposed bypass roadway. Alternative 4 would also displace the existing (unofficial) trailhead parking area located just off of 2nd Avenue Southeast (within the former railroad right-of-way).

Alternative 7—No Action

Under the no-action alternative, trails and recreational facilities would remain the same. Opportunities for future trail connections and improvements associated with the proposed project would not occur. Improvements related to traffic congestion and access provided by the proposed project would not be made, and visitors to local recreational facilities may experience delays in traveling to and from public recreation areas in the future.

Existing pedestrian and bicycle travel would continue along the combined formal and informal trail route. Bicyclists and pedestrians may experience delays and potential conflicts with vehicles as traffic within the city increases.

Mitigation

Alternatives 1 and 2

The direct access to the clubhouse and shooting range from Southeast Evans Street lost under Alternatives 1 and 2 would be replaced with by a new right-in/right-out-only roadway directly connected to the Southeast Issaquah Bypass.

A new 4.2-meter- (14-foot-) wide pedestrian/bicycle trail would be provided along the entire western side of the proposed bypass roadway as mitigation for displacement of major portions of the Issaquah Trail under both Alternatives 1 and 2. A grade-separated pedestrian crossing over or under the proposed Southeast Issaquah Bypass roadway could also be constructed to facilitate safe crossing to Tiger Mountain trails.

The existing (unofficial) trailhead parking lost because of construction of Alternative 2 would be replaced by a new trailhead parking area located just east of the proposed bypass roadway adjacent to the high school trail (see Figure S-3 in the Summary chapter). Alternatives 1 and 2 would both include new trailhead parking in the northern portion of the project area just south of East Sunset Way (see Figures S-2 and S-3 in the Summary chapter). The new trailhead parking area would provide much needed parking and convenient access to trails within the NRCA and the Mountains to Sound Greenway.

Alternatives 3 and 4

As mitigation for property acquisition impacts on the NRCA under Alternatives 3 and 4, the city is proposing to acquire an undeveloped parcel located adjacent to the NRCA to replace recreation land and wildlife habitat lost to construction of the

Southeast Bypass roadway. The proposed replacement parcel is approximately 1.2 hectares (3 acres), heavily forested on its eastern half, and surrounded on three sides by the NRCA. If acquired, a heavily used segment of the Sunset Trail would become protected by public ownership.

The lost direct access to the shooting range from Southeast Evans Street would be replaced with access from a new road constructed as part of the Park Pointe development. That new road would connect to the Southeast Issaquah Bypass at a new signalized intersection.

A new 4.2-meter- (14-foot-) wide pedestrian/bicycle trail would be provided along the entire western side of the proposed bypass roadway to provide a continuous pathway for pedestrians and bicyclists between the end of the Rainier Trail and other trail connections near the I-90/Sunset interchange. As indicated for Alternatives 1 and 2, additional mitigation could be provided by constructing a pedestrian overpass or underpass between the schools and Tiger Mountain trails.

The existing (unofficial) trailhead parking displaced by Alternative 4 would be replaced by a new trailhead parking area located just east of the proposed bypass roadway adjacent to the high school trail (see Figure S-4 in the Summary chapter). Both Alternatives 3 and 4 would include new trailhead parking in the northern portion of the project area just south of East Sunset Way (see Figures S-4 and S-5 in the Summary chapter). The new trailhead parking area would provide much needed parking and convenient access to trails within the NRCA and the Mountains to Sound Greenway.

Alternatives 5 (Modified) and 6

To mitigate impacts on the school athletic field, the field would be extended to the west, and the north softball diamond relocated, to allow continued use of these facilities.

The lost direct access to the clubhouse shooting range from Southeast Evans Street would be replaced with access from a new road constructed as part of the Park Pointe development. That new road would connect to the Southeast Issaquah Bypass at a new signalized intersection. If Park Pointe is not constructed, a new connection to the clubhouse would be provided from the Southeast Bypass roadway.

As with the other build alternatives, a pedestrian/bicycle trail would be provided along the entire western side of the proposed bypass roadway under Alternatives 5 and 6 to provide a continuous pathway for pedestrians and bicyclists between the end of the Rainier Trail and other trail connections located north and south of the I-90 Sunset interchange. As indicated for Alternatives 1 and 2, additional mitigation could be provided by constructing a pedestrian overpass or underpass between the schools and Tiger Mountain trails.

The existing (unofficial) trailhead parking displaced by Alternative 6 would be replaced by a new trailhead parking area located just east of the proposed bypass roadway adjacent to the high school trail (see Figure S-6 in the Summary chapter). Both Alternatives 5 and 6 would include new trailhead parking in the northern portion of the project area just south of East Sunset Way (see Figures S-6 and S-7 in the Summary chapter). The new trailhead parking area would provide much needed parking and convenient access to trails within the NRCA and the Mountains to Sound Greenway.

Conversion Policies of the Interagency Committee for Outdoor Recreation

The Interagency Committee for Outdoor Recreation (IAC) follows specific conversion policies to protect recreation lands acquired, developed or improved with IAC grant assistance. IAC grant money was used to relocate the historic Issaquah Sportsmen's Clubhouse, make safety and noise reduction improvements at the shooting range, and to construct the gravel road that currently provides access to and between the clubhouse and the shooting range.

All of the build alternatives described above would involve conversion of varying amounts of Sportsmen's Club recreation land or access road property to nonrecreation uses. The city has coordinated with IAC staff regarding these resources and has determined that potential impacts created by all build alternatives would occur after the date that IAC funding conditions expire. Therefore, none of the proposed build alternatives would require IAC review and approval.

Alternatives that include the North B alignment (Alternatives 3 and 4) would be less preferable to IAC than other alternatives because the North B alignment physically separates the clubhouse from the shooting range and eliminates the access road connection between the two facilities. People taking gun safety courses at the clubhouse, for example, would no longer be able to walk from the clubhouse to the shooting range, but would instead have to drive several miles out of the way to access the shooting range. The North B alignment would also eliminate onsite parking on the clubhouse property that would be difficult to relocate on another portion of the site. A number of underground utilities and drainfields on the site may also have to be relocated.

Transportation Services

Affected Environment

King County (Metro) provides transit to the proposed project area. Route 200 provides local weekday service within the city, including service to Issaquah High School via 2nd Avenue Southeast. Routes 200, 209, 214, 269, and 927, operate on East Sunset Way, 2nd Avenue Southeast and Front Street South in Issaquah and provide service to downtown Seattle. Routes 209, 210, 214, 269, and 271 provide weekday and weekend service between Issaquah and Seattle and other cities. Sound Transit routes 554, 555, and 556 provide express route service between Issaquah, Bellevue, and Seattle via I-90.

A park-and-ride lot is located at the intersection of Southeast Newport Way and SR 900, approximately 2.4 km (1.5 miles) west of the proposed project route. This lot provides 400 spaces and is currently at capacity or above. This lot is currently closed while Sound Transit constructs a new 800-space parking garage at this location. Temporary parking lots are available during construction. Reopening of the new park-and-ride, which costs $29.5 million, is scheduled for early 2008. A new 1,000-space parking garage was opened in the Issaquah Highlands area on the north side of I-90 in February 2006. This cooperative venture between Metro and Sound Transit is served by Sound Transit Route 554 and a new Metro Transit route (Route 218), and provides park-and-ride service to Seattle via high-occupancy-vehicle (HOV) lanes on I-90.

No public transit service is provided south on Issaquah/Hobart Road because the population centers south of Issaquah (e.g., Maple Valley, Covington) are better served by routes going west towards Renton and Kent rather than north to Issaquah.

Impacts

Transit service within the proposed project area is limited. Transit routes using East Sunset Way and the I-90/East Sunset Way interchange could be affected by congestion and traffic delays during project construction. However, after construction, travel in these areas would improve. Transit in the southern portion of the city (Route 200) currently extends to the intersection of Front Street South and 2nd Avenue Southeast, approximately 460 meters (1,500 feet) northeast of the southern end of the proposed Southeast Issaquah Bypass. Because transit service does not extend to the southern portion of the proposed project, no impacts are expected there.

Under the no-action alternative, existing transit routes would continue and opportunities for expansion along the new road would not occur. This could affect transit service to the southeastern portion of the city. If future service is extended farther south, transit would need to use Front Street South or 2nd Avenue Southeast. However, the city is not aware of any plans by Metro or Sound Transit to extend transit service south of the city. As traffic continues to increase on city streets, transit vehicles would likely experience travel delays, especially at peak-hour times.

Mitigation

Transit service would benefit from reduced congestion as a result of the proposed project and mitigation would not be required. Transit service could be extended to include the Southeast Issaquah Bypass to provide service to the southern project area and points south.

Pedestrian and Bicycle Facilities

Affected Environment

There are few existing pedestrian and bicycle facilities in the project area. East Sunset Way in the north project area has sidewalks, and Front Street South in the southern project area has sidewalks and bicycle lanes. Recreational trails and connections to the Tiger Mountain trail network are discussed in the Recreational Resources section of this chapter.

Impacts

Alternatives 1, 3, and Modified 5

The new roadway would include bicycle lanes on each side of the road. The proposed bicycle lanes would be approximately 5 feet wide and would be paved in both directions along the outside edge of the road.

As indicated previously, the proposed sidewalk along the western side of the roadway would be 14 feet wide, to match the existing Rainier Trail. On the east side of the roadway, sidewalks would have a more conventional 5-foot width. The trail and the sidewalk would provide connections to the existing trails that connect with recreational opportunities on Tiger Mountain.

Under the South A alignment, sidewalks would be extended along 6th Avenue Southeast in the south to connect with Front Street South. These sidewalks would provide for future connections with trails planned within the city's Squak Valley Park near the southern limits of the proposed Southeast Issaquah Bypass.

Alternatives 2, 4, and 6

Impacts on existing pedestrian and bicycle facilities would be similar to those described for Alternatives 1, 3, and Modified 5. In addition to the sidewalks noted under Alternatives 1, 3, and 5, these alternatives would continue the proposed sidewalk and trail design along the former railroad right-of-way, to connect with the existing Rainier Trail near 2nd Avenue Southeast. Paved bicycle lanes would be provided throughout the project area. In the south, these bicycle lanes would connect with existing bicycle lanes on Front Street South.

Mitigation

New pedestrian and bicycle facilities would be provided under all build alternatives as described above. Fencing or other barriers may be provided at places along the proposed roadway to reduce or eliminate opportunities for illegal crossings ("jaywalking") and safety hazards associated with such activity. The roadway would include a signalized pedestrian crossing at the Park Pointe intersection to provide access from the schools to the trails leading to Tradition Lake.

Economics

Studies and Coordination

To prepare this analysis, a number of reports and studies were reviewed, field investigations conducted, and issues discussed with government officials. The overall framework of the analysis was prepared using the FHWA Technical Advisory T6640.8A, *Guidance for Preparing and Processing Environmental and Section 4(f) Documents*, National Cooperative Highway Research Report-122, *Summary and Evaluation of Economic Consequences of Highway Improvements,* and the Washington Department of Transportation (WSDOT) *Environmental Procedures Manual* (July 2001).

The technical studies reviewed included general planning documents and published reports on existing land use and proposed development. These included the adopted city of Issaquah and the King County zoning codes and comprehensive plans, and project-specific information related to planned land use development in the project study area. Particular care was taken to locate existing and proposed commercial (retail and office) development in and near the study area. The technical analysis conducted for the proposed Southeast Issaquah Bypass on existing and forecast transportation patterns was also reviewed to characterize travel patterns linking area residential development, retail commercial districts, and places of employment.

Field investigations were conducted to view existing land uses and topography. This effort recorded the general sizes and types of retail commercial development located in and near the project study area.

A number of local experts, including local government land use planners and developers, were contacted and interviewed during the preparation of this analysis. The Issaquah Department of Finance and the King County Department of Assessments were also contacted to obtain information on property tax rates, assessments, and potential impacts on property values and local government tax revenues. Additional local government records were obtained from local government web pages.

Previous studies conducted in support of this analysis included two separate studies: an economics technical report (Parsons Brinckerhoff, 1998), and an economics technical memorandum (Parsons Brinckerhoff, 2000), which are incorporated herein by reference. These reports were summarized in the Southeast Issaquah Bypass draft EIS (2000). The analysis in this document updates and expands on this previous analysis of potential economic impacts of the project alternatives.

Affected Environment

The study area for the proposed Southeast Issaquah Bypass is located southeast of the Issaquah city center. Issaquah is a rapidly growing suburban city located approximately 24 km (15 miles) east of Seattle. It lies adjacent to the I-90 corridor, which is the major east-west interstate crossing the Cascade Mountains and linking the Seattle-Bellevue metropolitan area to eastern

Washington. Historically, the city has been known as a bedroom community of Seattle and Bellevue.

In addition to lying along the I-90 corridor, the city of Issaquah is also located at the junction of several principal arterial roadways. SR 900 connects Issaquah to the industrialized city of Renton to the southwest. The Front Street South–Issaquah/Hobart Road serves the rural and developing areas of May Valley and Hobart to the southeast. The East Lake Sammamish Parkway follows the eastern shore of Lake Sammamish and connects Issaquah to the city of Redmond. In addition, the Issaquah/Fall City Road provides highway access to I-90 for residents of the Sammamish Plateau north and east of the city. With these important transportation linkages, urban development in Issaquah has increasingly catered to providing goods and services for the eastern portion of eastern King County. The surrounding residential area has also supplied highly qualified workers for the city's emerging employment base, particularly for the recently constructed office complexes along I-90.

However, the city of Issaquah remains one of King County's smaller cities. Its 2005 estimated population was 17,060, and the population of the county was estimated to be 1,808,300 (Office of Financial Management, 2006). Issaquah is nestled among the foothills of the Cascade Mountains, with Cougar Mountain located west of the city and Tiger Mountain to the east. The historic city center is located south of I-90 in the valley floor, although new residential development has occurred on surrounding hillsides in recent years.

Impacts

Travel Patterns

Impacts of Build Alternatives

I-90 is the major east-west highway for the Seattle-Bellevue metropolitan area, and residents of large areas of eastern King County travel long distances to access the highway for morning and evening commutes to places of work located primarily west of Issaquah. To the north of the city, the two primary arterials traverse developing lands. Both primary arterials provide access to I-90 at the Front Street South interchange. Over the past decade, these partially limited access roadways have been widened and improved to meet increasing traffic volumes. In contrast, the two primary arterial roadways to the south funnel through older residential neighborhoods and commercial districts of Issaquah before reaching I-90. SR 900 on the east side of Cougar Mountain skirts the western edge of the city center and provides direct access to I-90 at the SR 900 interchange. The Issaquah/Hobart Road intersects Front Street south of the city center. Traffic traverses the central core of the city before reaching the Front Street North interchange on I-90.

The Issaquah/Hobart Road and Front Street South arterial corridor provides through-traffic access to I-90 for the city and developing residential areas to the south, and provides direct access to Issaquah's central city businesses and commercial establishments. This dual purpose of serving through traffic and local business traffic can result in severe congestion and lack of sufficient parking, especially during morning and evening commute hours. This congestion during early morning and late afternoon weekday hours increases travel times for workers and customers of Front Street South businesses.

The potential construction of the Southeast Issaquah Bypass would result in changes in travel patterns within the city of Issaquah. In general, traffic originating to the south of the city and destined to access I-90 currently travels through the city core and increases traffic congestion along Front Street South, especially during morning and evening commute periods. Construction of the Southeast Issaquah Bypass would direct this through traffic to the east of the city core at the I-90/East Sunset Way interchange. For more detail, see the Transportation Impacts discussion in this chapter.

Impacts of No-Action Alternative

The no-action alternative is not expected to result in travel pattern changes in Issaquah, based on projects planned in the city's current transportation improvement program plan, although overall travel demand will continually increase over time in response to new development. As summarized in Chapter 2, many alternatives to the Southeast Issaquah Bypass were evaluated in detail during project studies. If the Southeast Issaquah Bypass is not constructed, the city would return to the planning process to reevaluate those alternatives that were rejected in the past. This may require significant changes to the city's transportation policy if other capacity improvement projects, such as widening of Newport Way or Front Street South, are to be considered as viable alternatives having the support of the community. Or, the city can adopt a lower level of service in its transportation system, thereby effectively delaying the need for—and decisions on—future transportation improvements.

In all probability, selection of the no-action alternative will result in deferral of transportation improvements between I-90 and Issaquah/Hobart Road for at least another ten years, which is the time it took for environmental review of the Southeast Issaquah Bypass to be completed. In the meantime, local traffic and through commute traffic would continue to travel along South Front Street and 2nd Avenue Southeast. Over time, increased residential development in Issaquah and unincorporated King County to the south of the city, as allowed under current land use regulations, is expected to increase traffic and congestion along Front Street South. The increased congestion would also continue to further increase the amount of traffic through adjacent residential neighborhoods in an attempt to avoid congestion on the primary arterials.

Regional Economy

Impacts of Build Alternatives

The city of Issaquah is located in eastern King County and is part of the U.S. Census-designated Seattle-Tacoma standard metropolitan statistical area (SMSA). This designation reflects a comprehensive analysis of the economic ties of the central Puget Sound counties. King County is centrally located, with Snohomish County to the north and Pierce County to the south. Together, these three counties comprise the first, second, and third most populated counties in the state of Washington. Moreover, they have the first, second, and third highest employment of all counties in the state. King County also has the largest employment base of all counties in the state. In 2001, the Washington

Employment Security Department estimated the average annual employment to be 1,173,300 (Washington Employment Security Department, 2002). An estimated 63,000 jobs, or slightly greater than 5 percent, are in the construction sector.

In 2000, the Seattle-Tacoma SMSA had a total of over 1.6 million jobs. In comparison to total employment in Washington, the multicounty area has nearly 60 percent of all jobs in the state. The region has a diverse economy. It is a regional finance and services center for the Pacific Northwest region and a major manufacturing center for transportation equipment (airplanes) and wood products. The region is home to The Boeing Company, Costco, Microsoft, Weyerhaeuser, and Washington Mutual. In addition, the region's geographic location and major port facilities in Tacoma and Seattle make it one of the nation's west coast gateways for import/export trade with East Asia.

Construction of either of the build alternatives would not affect the regional movement of goods and services. The proposed construction of the Southeast Issaquah Bypass would not directly result in either a net increase or decrease in regional jobs.

Impacts of No-Action Alternative

The no-action alternative would not be expected to affect the regional economy or directly affect regional jobs.

Local Economy

Impacts of Build Alternatives

Historically, the Issaquah area's economy was based on local coal mining, farming, and logging. Through the early decades of the 20th century, the population fluctuated between approximately 500 and 1,000 with the changing boom and bust cycles of the local resource-based economy. Toward the middle of the century, the local economy expanded to include dairy farming to meet the growing Seattle metropolitan area's increasing demands. The city, however, remained fairly small until the 1940 opening of the Lake Washington floating bridge and the construction of I-90 in the 1970s.

Today, Issaquah is a growing urban center and is fast becoming a new business destination on the Eastside. There were an estimated 1,159 businesses and over 16,270 jobs based in the city in 2003 (King County, 2005).

The city is attracting high-tech and retail giants. Major high-tech employers located in Issaquah include: Siemens Medical Systems, Western Wireless, Boeing Computer Services, Applied Precision Technologies, and Zetec. Microsoft has options to purchase 25 hectares (63 acres) for the planned construction of 111,483 square meters (1.2 million square feet) of office space. This expansion would provide jobs for up to 12,000 workers. The world-renowned Boehm Candies chocolate factory has been in Issaquah since 1956. Hedges Cellars has a wine tasting and banquet facility in the city. In 1995, the headquarters of Costco moved from nearby Kirkland to Issaquah. Other national retailers include: Fred Meyer, The Home Depot, Lowe's Home Improvement Store, and Washington's first Krispy Kreme donut store.

These businesses are located in the city's several mixed-use retail and office complexes, most of which are north of I-90. Many of the city's retail shops, department stores, and restaurants are located along Northwest Gilman Boulevard, a principal arterial fronting on the south side of I-90. The city's downtown business district, however, is along Front Street South.

The Front Street South business district stretches approximately six blocks from Northwest Gilman Boulevard south to East Sunset Way. Front Street South was the historic main street of the city and continues to be the downtown heart of Issaquah. Located here are dental and professional offices, two banks, a hardware and grocery store, shops, the Issaquah Press (the town's weekly newspaper), an art gallery, and several restaurants, as well as the early 1900s train depot museum, the restored Village Theatre, and the Westfarm Foods butter plant (formerly Darigold). The Issaquah Historical Society works closely with Downtown Issaquah Association, the Greater Issaquah Chamber of Commerce, and the city to maintain the historic charm and visibility of the towns' beginnings in logging, dairy farming, and coal mining.

On May 18, 2000, the Greater Issaquah Chamber of Commerce adopted a resolution in support of the proposed Southeast Issaquah Bypass project. A copy of this resolution was submitted to the city of Issaquah during the EIS scoping period and was published in the draft EIS (June 2000). In particular, this resolution recognized that the project would have a number of benefits, including 1) reduced traffic on Front Street South that would "allow for easier access to the commercial and municipal districts in the historic downtown area" and 2) an alternative route that would "allow commuting and commerce to continue with less interruption" in the event of an obstruction on Front Street South. Since the adoption of this resolution, the Greater Issaquah Chamber of Commerce has continued to support the proposed project.

The proposed construction of the Southeast Issaquah Bypass would not directly result in either a net increase or decrease in local jobs. No businesses would be relocated as part of this project, so a change in the number of permanent jobs would not be expected to result from the project. In addition, no properties currently used for commercial land uses or properties zoned for commercial uses would be affected by right-of-way acquisition for either of the build alternatives. Moreover, the annual operations and maintenance activities associated with the proposed Southeast Issaquah Bypass would likely be assumed by existing road crew staff at the city of Issaquah. No new jobs would be created as a result of the proposed project.

Impacts of No-Action Alternative

The no-action alternative would not be expected to directly affect local jobs. Continued congestion may affect economic activity along Front Street South. The specific number of jobs that might be affected cannot be estimated, but this number is expected to be minor compared to the total number of jobs in Issaquah.

Future Growth and Economic Trends

Impacts of Build Alternatives

The city of Issaquah estimates that by 2015 an additional 9,800 jobs will be located in the city. The city hopes to continue to develop into an attractive community that will provide affordable housing and jobs for residents. At the same time, the city's strategy also includes "preserving the city's small town atmosphere" (Issaquah Comprehensive Plan Amended, effective 2002).

In June 2002, the Issaquah Planning Department issued a summary list of pending and recently approved projects. As of 2006, approved large nonresidential projects included the Rowley office building (98,175 square meters [88,000 square feet]), and approximately 74,322 square meters (800,000 square feet) of office space and 4,645 square meters (50,000 square feet) of retail space as part of the proposed Talus development on the east hillside of Cougar Mountain. Approved smaller-scale nonresidential development includes a car dealership, the 18th and Gilman office building, and the Hyla Crossing office complex.

The largest proposed development in the immediate vicinity of the proposed Southeast Bypass is the Issaquah Highlands project. This urban village mixed-use development is under construction north of the East Sunset Way interchange on I-90. Upon completion, this development is proposed to have approximately 3,200 residential units (single- and multifamily units), 278,709 square meters (3 million square feet) of office space (including the proposed new Microsoft campus) and 46,452 square meters (500,000 square feet) of retail space.

The Park Pointe development is also proposed adjacent to the east of the Southeast Issaquah Bypass. Since issuance of the supplemental draft EIS in 2004, the city council approved a new planning designation for the Park Pointe property as low-density residential, removing the former urban village designation. Consistent with this change, current plans for the project show a combination of up to 356 single-family homes and town house units proposed for the site. The city has continued to require preparation of an EIS to fully evaluate the impacts of the proposed Park Pointe project. This project is still under review by the city of Issaquah, as the environmental review process has not been completed. Development of the Park Pointe project under current land use and zoning designations is not dependent on the Southeast Issaquah Bypass roadway; access to the site via existing streets is available.

Local Government Tax Revenues

Impacts of Build Alternatives

Typically, the three largest sources of local government revenues are property taxes, sales and use tax, and business and occupation taxes. Washington does not have either a personal or corporate income tax. Other sources of local government revenue include other taxes, licenses and permit fees, intergovernmental service revenues, charges for utility services, and other miscellaneous fees. Together these revenues fund local government expenditures for services including: general government services, police, fire, utilities, transportation, recreation, social services, road construction and maintenance, and long-term debt service.

The adopted 2006 city of Issaquah budget was $68,241,137. A total of $29,472,879 was from the general fund. Other revenues were from the special revenues, debt service, capital projects, enterprise funds, and internal service funds. In the city of Issaquah, the three primary sources of funds to the general fund are sales tax (28.2 percent), property tax (18.3 percent), and utility taxes (13.6 percent). The sales tax rate, including the local levy, is 8.8 percent and the business and occupation tax rate is 0.0008 per gross income per quarter. The total budgeted revenues from sales and property tax for 2005 were $10,310,325 and $5,069,421, respectively. For 2005, the business and occupation taxes were budgeted to total $1,914,508, or only 6.5 percent of the general fund.

Due to the rapid rate of urban development in the city of Issaquah over the past decade, revenues from both sales tax and property taxes have increased dramatically. In 1992, sales tax revenue totaled $2,194,896. In 1992, property tax revenues totaled $1,340,980. Hence sales and property tax revenues over the past decade have increased by approximately 320 percent and 150 percent, respectively. Anticipated urban development is expected to increase these sources of revenues in the future.

The proposed construction of the Southeast Issaquah Bypass would result in a relatively small loss of long-term property tax revenues to the city of Issaquah. The project would convert taxable property to nontaxable public road right-of-way due to required property acquisition. The anticipated loss of property tax revenue under the various build alternatives would from approximately $8,000 to $11,000 per year. Considering that the city of Issaquah 2006 budget estimated total property tax revenues to be $5,069,421, the potential loss of property tax revenues to the city of Issaquah would be approximately 0.22 percent. This potential loss of revenue would be less than 0.01 percent of the city's total budgeted revenue for 2006, which would not be a substantial loss of revenue. Construction of the proposed project would not result in substantial economic impacts on local government property tax revenues. Sales tax and business and occupation tax revenues could be expected to increase as a result of constructing the proposed project, due to reduced congestion, improved access to businesses (especially retail and restaurant businesses), and potential revitalization of the historic downtown area. The build alternatives would also require approximately 10 hectares (24 acres) of right-of-way to be acquired at an estimated cost of $5.1 million, based on an average rate of $1.574 per $1,000 of assessed value.

Property Values

Impacts of Build Alternatives

The city of Issaquah's 2006 adopted budget reported that the total assessed valuation of all properties within the incorporated city limits was $3,734,157,054. The regular tax levy rate to support the city's general fund was 1.25007 per $1,000 of assessed value. The total rate for regular and excess levies was 0.31276 per $1,000 of assessed value.

The average house price in Issaquah as of March 2004 was $429,177, and the average monthly rental rate was $1,100. In contrast, the average house price in all of King County was $353,222, and the average monthly rental rate was $840.

Hence the cost of housing in Issaquah is above the average cost of housing in King County overall. These trends continue unchanged into 2007.

The proposed project could influence the market values of local properties along Front Street South and along the Southeast Issaquah Bypass. Unlike assessed values, market values are a product of local preferences and are subject to economic conditions under a variety of influences, including local and regional development. Market values are generally determined by real estate transactions over a period of time, and there is no accepted percentage that may be applied to the assessed value to determine existing or future market valuation.

Over the long term, the Southeast Issaquah Bypass could lead to increased property values along the Front Street South corridor. Traffic volumes and congestion are expected to decrease on Front Street South, improving access and parking to local businesses, which could make it more desirable for businesses to be located there. Increased demand would likely result in an increase in property values in the commercial district. Property sales prices and commercial lease rates would likely increase. In addition, the value of residential properties adjacent to Front Street South and the historic commercial district could also increase.

In contrast, the Southeast Issaquah Bypass could adversely affect the value of developed properties (particularly residential properties) adjacent to the new roadway. Increased traffic volumes and the associated increase in noise, dust, and air pollution levels could result in lowering the perceived desirability of these properties. However, improved access to other Issaquah neighborhoods and to I-90 could also increase the values of developed and undeveloped properties in this area.

Consequently, some individuals could view the proposed Southeast Issaquah Bypass as detrimental, while others may view proximity to the new roadway as advantageous for improved transportation mobility. Both perceptions can influence the market value of properties.

Property value trends in Issaquah and King County over the past decade have generally increased. If the long-term regional economy continues to be strong, any temporary decrease in market value that may occur would likely be offset. Conversely, should the local economy experience a downturn, property values would likely decrease regardless of whether the proposed project is constructed. Overall, the proposed project represents only one factor in determining future market values, and therefore is not expected to have a measurable influence on property values in the project area.

Impacts of No-Action Alternative

Compared to the build alternatives, the no-action alternative could have a dampening effect on property values, both locally and regionally. Without the Southeast Issaquah Bypass, local and through traffic would continue to use Front Street South. Future residential development of properties to the south of Issaquah would likely increase traffic volumes and congestion along this route. This impact would also increase associated levels of noise, light and glare, dust, and air pollution. Increased traffic volumes would also be expected to lengthen the peak commute period.

All of these impacts would likely decrease the perceived desirability of the commercial, multifamily, and single-family residential properties along the existing Front Street South corridor. In addition, the no-action alternative would not provide improved access to existing undeveloped properties along the Southeast Issaquah Bypass route, which could continue to reduce these properties' market value.

Mitigation

To minimize potential adverse impacts on the existing Front Street South commercial district and the potential for lowered property values along the Southeast Issaquah Bypass, the following mitigation measures could be considered:

- Installation of directional signs to the Front Street South commercial district along the new Southeast Issaquah Bypass.
- Preparation of educational materials to help people rediscover the downtown core businesses and retail shops.
- Advertisements for the Front Street South commercial district following construction of the new Southeast Issaquah Bypass.

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Displacements and Relocations

Studies and Coordination

Assessor's maps and records were obtained from the King County Assessor's Office (2007 values), along with property values from available sources (e.g., *Zillow.com*). Along with assessor's information, field investigations and aerial photographs of the project area were used to identify potential displacements and relocations as a result of the proposed project alternatives. WSDOT information related to compensation for displaced properties under the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended was consulted.

Affected Environment

This section discusses potential displacements and relocations of residences and businesses that could be affected by the proposed project alternative. The proposed project study area includes the corridor beginning with the existing I-90/East Sunset Way interchange in the north and extending south approximately to the intersection of Front Street South and Southeast 96th Street. Numerous parcels are located along the proposed project route, including developed and undeveloped properties. Individual land uses in the project area, and right-of-way acquisition amounts, are identified in the Land Use section of this chapter. Population characteristics are identified in the Social Elements section.

Depending on the location and amount of new right-of-way that would be needed under the proposed project alternatives, full or partial acquisition of structures or properties would be necessary. Where potential displacements or property acquisition would occur, compensation under the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended is discussed below.

Table 3-26 summarizes the potential displacements discussed below under Impacts. Locations of potential displacements under the build alternatives are shown in Figures S-2 through S-7 in the Summary chapter. Total assessed value (land and improvements) and sizes are also summarized. This estimate of potential displacements has changed since the 2004 supplemental draft EIS was issued, due to repositioning of the detention pond along South Front Street to another property (to be consistent with the proposal in Modified Alternative 5) and addition of a new house that was recently constructed along Lewis Street. These updates either added or subtracted a single displacement from the previous data in the supplemental draft EIS.

Impacts and Mitigation

Displacement of single-family residences would result from right-of-way acquisition and proposed surface water detention ponds needed to treat new stormwater runoff from the road. All except one of these displacements would occur along the south alignment, and one displacement would occur along the north alignment. In addition to potential displacement of these homes, full and partial land acquisitions of parcels adjacent to the proposed project route would occur. No businesses would be displaced any of the build alternatives.

Table 3-26
Summary of Displacements by Alternatives 1–6

	Number of Residences Displaced	Average Assessed Value	Average Size
Alternative 1	8	$317,000	149 square meters (1,604 square feet)
Alternative 2	6	$263,000	99 square meters (1,066 square feet)
Alternative 3	9	$293,000	136 square meters (1,461 square feet)
Alternative 4	7	$240,000	87.3 square meters (940 square feet)
Modified Alternative 5	8	$300,000	149 square meters (1,605 square feet)
Alternative 6	6	$263,000	99 square meters (1,066 square feet)

Impacts

Alternative 1

Alternative 1 would displace eight residences. Through conversations with Issaquah staff persons and review of public hearing records and communications, it was determined that the majority of the homes that would potentially be displaced under the build alternatives are owner-occupied. It is possible that up to three of these homes may be renter-occupied.

Alternative 2

The proposed roadway and associated improvements under Alternative 2 would displace six residences. Up to three displaced homes may be renter-occupied.

Assessor's records indicate that one home that would be potentially displaced under this alternative is affiliated with Habitat for Humanity, a nonprofit organization that constructs affordable housing throughout the country. While a down payment is required, no profit is included in the sales price and no interest is charged on the mortgage, making these homes affordable to many low-income families.

Alternative 3

Alternative 3 would result in the displacement of nine residences. Up to three of these homes may be renter-occupied.

Alternative 4

This alternative would result in the displacement of seven residences. Up to three of these homes may be renter-occupied. The Habitat for Humanity house discussed under Alternative 2 is also potentially affected by this alternative.

Modified Alternative 5

Under this alternative, eight residences would be displaced. Up to three of these homes may be renter-occupied.

Alternative 6

This alternative would displace six residences. Up to three of these homes may be renter-occupied. The Habitat for Humanity house discussed under Alternative 2 is also potentially affected by this alternative.

Alternative 7—No-Action

The proposed project would not be constructed, and potential residential displacements and right-of-way acquisition identified for the build alternatives would not occur.

Mitigation

Replacement Housing

Where residential displacements occur, right-of-way acquisitions would be conducted under regulations provided in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. These regulations require provisions of relocation resources to be made available to all affected residential and business owners without discrimination. All property owners would be compensated at fair market value and relocation assistance would be provided in locating suitable replacement housing. Where access to properties is affected, new access would be provided or properties would be acquired, as described previously.

Data in Table 3-26 indicate that average assessed values of displaced residences range between approximately $240,000 and $317,000, and have relatively low floor area. Since market value is normally much higher than assessed value, these estimates should be escalated to reflect true values. Based on a review of likely market values for these properties (based on estimates from Zillow.com), the likely market values of these displaced residences range between $340,000 and $444,000, with an average of approximately $400,000.

According to the Northwest Multiple Listing Service, in June 2007 the median selling price for single-family houses in King County was approximately $435,000, and in the Issaquah/south Bellevue area it was $640,000. This includes new houses as well as existing houses. Thus, Issaquah as a whole has considerably higher housing costs than the rest of the county.

Although some houses within the $400,000 price range are available within the city, they are not nearly as plentiful as higher-cost houses. For example, using an on-line real estate listing service that uses Northwest Multiple Listing Service data, approximately 226 homes were listed for sale in the local Issaquah area in September, 2007. Of these, only 12 were listed under $400,000. Thus, if the cost estimates for the displaced residences are accurate, residences that would be displaced by the Southeast Issaquah Bypass project represent the lower end of the available housing costs in Issaquah because few are for sale in that price range. Although this limited supply could make it difficult to find replacement housing at a similar cost in the local area, they are available. For example, new housing in Talus and Issaquah Highlands includes affordable housing units that sell for less than $400,000 (typically townhouses) and nearby condominiums are plentiful in that price range (and have similar square footage of floor area to the displaced residences). Alternatively, more affordable housing can be found in more rural areas of King County where housing costs are less expensive, but this would involve a longer commute.

Alternatives 2, 4, and 6 could potentially displace a Habitat for Humanity home. This residence would likely need special consideration in finding suitable replacement housing in the city, such as identifying and purchasing a similar replacement house. Should this be required, as verified during final design, appropriate accommodations would be provided.

Housing of Last Resort

Under state and federal laws, no person is required to move from his or her residence unless a comparable replacement property is available for sale or rent within the potential displaced person's financial capabilities. The location and sale or rental price of the comparable property must be made available in writing to the affected persons. In the event that replacement housing may not be available within a local resident's financial capabilities, several alternative solutions may be used as housing of last resort, including:

- Purchasing housing for the displaced person and renting or selling the acquired dwelling at a price within the person's financial means
- Renovating existing housing
- Providing financing for homeowner-occupants with low incomes and/or poor credit ratings who have occupied their home for at least 180 days
- Entering into partnerships with public or private agencies that provide housing for low-income persons.

The city of Issaquah would work with affected property owners to assure that appropriate replacement housing opportunities are made available to all potentially displaced residents in the proposed project area.

Historic and Archaeological Resources

Studies and Coordination

Cultural resources were identified through review of previous archaeological and historical investigations in the proposed project vicinity and research of information on environments, prehistory, ethnography, and history, emphasizing aspects affecting probability of site occurrence in the project area, and a field survey. Sources consulted included records at the Washington Office of Archaeology and Historic Preservation (OAHP), the Northwest Collection and other sources at the University of Washington libraries, the Issaquah Historical Society, King County Historic Preservation Program, the federal Bureau of Land Management (BLM), Washington State Archives Puget Sound Branch, and WSDOT. Site forms, the National Register of Historic Places, the State Historic Property Register, the King County Historic Sites survey, historic maps, including General Land Office (GLO) survey plats, King County property records, and WSDOT aerial photographs were examined.

Several individuals with personal knowledge of historical resources in and around the project area also provided information. The Snoqualmie, Tulalip, and Muckleshoot tribes were contacted in January 1997 and October 1999 regarding sites or other areas of concern in the project area. The Muckleshoot Indian Tribe submitted written responses in August 2000 and July 2004 and comments are responded to in Volume 2 of this final EIS. The Tulalip Tribes submitted a written response to WSDOT in May 2003 that included a list of standard operating procedures they wished to see followed during project design and construction.

A revised cultural resources technical report for the Southeast Issaquah Bypass was submitted to WSDOT in early 2003. The revised report included an expanded *area of potential effect* as well as analysis of several additional potential historic sites. EIS team members coordinated closely with King County and WSDOT cultural resources staff during preparation of the revised report. A copy of the report was also sent to the Tulalip Tribes (at the tribe's request).

In June 2003, OAHP notified WSDOT in writing that they had completed review of the revised cultural resources technical report under the provisions of Section 106 of the National Historic Preservation Act. OAHP concurred with the expanded area of potential effect and agreed with the EIS team that one additional historic building in the project area was potentially eligible for the national register. In January 2005, OAHP notified WSDOT in writing that the current project as proposed, with Modified Alternative 5 as the preferred alternative, would have no adverse effect on National Register eligible or listed historic and cultural resources.

Affected Environment

History of the Area

The oldest known evidence of human occupation in the central Puget Lowlands dates to 12,000 years ago. About 5,000 years ago, larger populations organized in more complex ways and exploited a wide range of locally available resources.

Euroamerican contact occurred in the late 18th and 19th centuries, changing the native populations, community composition, and cultural traditions.

The Issaquah area and Snoqualmie River valley were occupied during the ethnohistoric period of the 18th and 19th centuries by the Sammamish and Snoqualmie tribes. The Sammamish were a politically autonomous Coast Salish-speaking group with close social ties to the Duwamish and Snoqualmie. Several researchers have considered them a sub-group of the Duwamish based on language (Gibbs, 1877; Lane, 1975; Waterman ca. 1920). Although the Sammamish did not have direct access to Puget Sound during the ethnohistoric period, they had rights to resource areas on the Sound through kinship and marriage. Subsistence, however, focused on resources of the valleys, foothills, lakes and rivers (Lane, 1975). The Snoqualmie occupied the Snoqualmie River valley and surrounding hills east of Sammamish territory.

Like other American Indian groups, the Sammamish and Snoqualmie suffered substantial population losses due to epidemic diseases of the 18th and 19th centuries. Smallpox apparently infected residents of Puget Sound in the mid-1770s, and several other epidemics further reduced populations in the 19th century (Boyd, 1990). Under terms of the Point Elliott Treaty of 1855, the surviving Sammamish and Snoqualmie were assigned to the Tulalip (Snohomish) Reservation, while other subgroups of the Duwamish were sent to the Port Madison (Suquamish) Reservation. Few Sammamish or Snoqualmie relocated to their assigned reservations, most preferring to remain in their traditional territory (Ruby and Brown, 1986:72). The Snoqualmie recently received federal recognition as a tribe.

The Issaquah area was originally known as Squak Valley, a name probably derived from the Native American term for the land at the mouth of Issaquah Creek on the south shore of Lake Sammamish. The earliest Euroamerican settlement in the area began in the early 1860s, soon after coal was discovered at Squak Mountain. The community of Squak grew slowly until 1888 when the Seattle, Lake Shore & Eastern Railroad (SLS&E) built a rail line through the valley. The primary rail shipper in the Squak Valley was the Seattle Coal and Iron Company located in present-day Issaquah. Soon after arrival of the rail line, the Squak community changed its name to Gilman in honor of the railroad’s primary booster, Daniel Gilman (Bagley, 1929).

Coal from the Issaquah mines remained an important economic resource until operations ceased in 1904. Although the mines reopened in 1912, and were operated by several different companies, the final closure came in 1921. Some smaller individual operators continued coal mining on a smaller scale from the mid-1920s to the early 1960s, in mines formerly worked by the larger companies or in newly excavated shafts (Bagley 1929:771-773; Edwards Fish 1981:80-83).

Hops became an important crop after 1868 when the Wold brothers bought seedling to plant on their recently purchased land in the Squak Valley. Accounts suggest that they gradually expanded the crop to over 50 acres, employing more than 100 Native Americans and some white families to assist in the production. Hops was one of the economic mainstays of the region, purchased by brewers in England and Germany as well as locally until the mid-1890s when fluctuating prices depressed the market. By the turn of the century, a disease had also wiped out almost all of the crops in the area (Bryant, 2000:21-23; Kolin, 1997:8).

The logging and sawmilling industry had also begun to flourish in the Issaquah area in the late 19th century, buoyed by the construction of the railroad and easier transportation to major markets. By the early 20th century it had begun to replace coal as the area's major economic mainstay. One of the earliest local mills was built by the SLS&E to produce lumber for construction of railroad trestles and evidently was then sold to Joe Donlan, son of local homesteader Michael Donlan, possibly in 1891. By 1910, there were three lumber mills and six shingle mills within 4 miles of Issaquah. Many of these companies had changed hands or were closed by the late 1920s. At the same time, a new venture, the Issaquah Lumber Company, built a mill just south of town along the west side of what is now Front Street South and Issaquah/Hobart Road. The company had an auspicious beginning by opening a month before the stock market crash that signaled the beginning of the Great Depression. Although the company survived the Depression, a fire destroyed much of the mill in May 1940. Rather than rebuild at the Issaquah site, operations were moved to Monohon on the east side of Lake Sammamish. Logging and milling continued in the area during and after World War II, but on a reduced scale. More of the cleared land was used for housing and recreational development, while earlier resource-based industries declined in economic importance (Bagley 1929:770-771; Erickson 2002:41-46).

Efficient roads were slow in coming to the Squak Valley, as they were to most rural towns in the American West. Typically beginning as trails, the routes used by area residents did not change in destination as much as they changed in appearance. Although road transportation would become an important element in the growth of Issaquah in the late 20th century, the railroad played an important role in transforming the area. However, the increasing popularity of automobiles, the lower cost of truck transportation, and the development of the state highway system played major roles in the decline of railway traffic. As part of the railroad line into Issaquah was being abandoned, the new I-90 was being built.

Historic and Archaeological Sites

Three previously recorded sites are located within the Southeast Issaquah Bypass area of potential effect:

- 45-KI-451 – the Seattle, Lake Shore & Eastern Railroad grade
- 17-51 – the White Swan Inn
- The Issaquah Sportsmen's Clubhouse.

One archaeological site (17-66) and seven historic buildings were also identified during the cultural resources survey of the Southeast Issaquah Bypass:

- 17-66 includes two concrete foundations, several concrete slabs, fruit trees and a row or hedge of holly trees. The site probably represents the Michael Donlan homestead, patented in 1889.
- SEB 02-01 is a one and a half-story wood frame house that sits close to the west side of the road at 1025 Front Street South. Although the building was constructed in 1932 or 1933, it was moved from Newport

Way and Front Street South (KCPC Parcel 3324069024) to its current location around 1970.

- SEB 02-02 is located at 1035 Front Street South, just south of SEB 02-01 and was also moved to this location around 1970 (KCPC Parcel 3424069156). King County assessment records show 1948 as the construction date, but the historical property tax card photograph is labeled 1944. The one story house has a roughly rectangular floor plan, composition hip roof, with a front entrance the east side and another on the north.

- SEB 02-03 is located at 555 Southeast Lewis Street and was built by Peter Favini, an Italian immigrant, in 1929 (KCPC Parcel 3424069191). This one-story vernacular, residential bungalow is 42 feet by 26 feet, has a front gable roof with gable porch, a concrete block foundation, and horizontal wood siding with patterned shingles on the gables.

- SEB 02-04 is a Craftsman-style house located at 885 2nd Avenue Southeast, built by Lawrence P. Campbell, Sr. in 1923. This one and a half story rectangular frame building remains on its original site and contains elements of the craftsman style including broad roof overhangs, exposed rafter tails, and decorative triangular braces under the gables and dormers.

- SEB 02-05, located at 935 2nd Avenue Southeast, was built in 1938 and is similar in design to SEB 02-02 which is a short is distance south on Front Street South. The 2nd Avenue Southeast house is one story, with a hip roof, exposed rafter tails, wood shingle siding, and fixed six light windows. This house was moved at least two time from previous locations on Front Street South, before it was sited at its current address in 1963 (KCPC Parcel 3424069102).

- SEB 02-06, located at 910 2nd Avenue Southeast, is a one-story wood frame house with an attached 19 feet by 18 feet carport. The exterior walls sided with shakes and the side gable roof is composition. The house was built in 1935 and moved to its current location in 1966 (KCPC Parcel 3424069183).

- SEB 02-07 is just south of the Sportsmen’s Clubhouse rifle and pistol range and was built in 1938 by the WPA at the same time as the clubhouse. The King County property card refers to the building as the caretaker’s improvement (KCPC Parcel 3424069120). The one-story, rectangular frame building was set on wood posts and concrete blocks and was of double-wall frame construction. A 1961 extension of the building on its north end added another room and since then, other additions have included a frame and corrugated plastic porch, a covered storage shed, and an enclosure for a hot water tank.

Eligibility for National Register of Historic Places

Of the 11 recorded sites and buildings within the Southeast Issaquah Bypass area of potential effect (described in the previous section), two buildings have been determined eligible for the National Register of Historic Places (NRHP): the

Issaquah Sportsmen's Clubhouse and the White Swan Inn (17-51) (Turner, 1998). The clubhouse is also a King County landmark and is listed on the Washington Heritage Register. A third, the Campbell house (SEB 02-04), is recommended to be eligible for the NRHP because it is a good example of a vernacular architecture style that was important in the development of the community's residential character.

The SLS&E (45-KI-451) and the Donlan homestead (17-66) were previously determined not eligible for the NRHP because they lacked integrity (Griffith 1999; Turner 1998). Four newly recorded buildings (SEB 02-01, -02, -05, and -06) are also recommended ineligible, because they were moved from their original locations and no longer retain integrity of location, setting, feeling, and association. Two other sites (SEB 02-03 and 02-07) are also recommended ineligible because modifications have damaged their integrity of design, materials, workmanship and feeling.

Impacts and Mitigation

Important cultural resources are subject to additional determination of effect and design of mitigation measures. Two such historic properties exist within the proposed project area: the White Swan Inn (17-51) and the Issaquah Sportsmen's Clubhouse. These properties are discussed separately in the subsections below.

The criteria of adverse effect (36 CFR 800.5) state that an adverse effect occurs when an action alters the characteristics of a property that qualify it for the National Register of Historic Places in a manner that would diminish the property's integrity of location, setting, design, materials, workmanship, feeling, or association. The White Swan Inn and the Sportsmen's Clubhouse would not be adversely affected by the preferred alternative. In addition, Alternatives 1, 2, Modified 5, and 6 would not adversely affect the Issaquah Sportsmen's Clubhouse. Alternatives 3 and 4, however, would adversely affect this historic property.

The no-action alternative would not affect any of the cultural resources within the Southeast Issaquah Bypass project area.

White Swan Inn

Impacts

The White Swan Inn (17-51) would not be adversely affected by any of the build alternatives. This alternative would include sidewalk replacement north of the building and construction of stormwater ponds just east. East Sunset Way was realigned as part of the South SPAR project, and the road grade in front (north) of the White Swan was maintained. The relationship of the road to the White Swan is an important element of the property's significance. The grade would remain unchanged under the preferred alternative.

Mitigation

No mitigation measures would be required.

The Issaquah Sportsmen's Clubhouse

Impacts

The Issaquah Sportsmen's Clubhouse building would not be physically altered by any of the build alternatives. However, Alternatives 3 and 4 would adversely affect the clubhouse by changing the site's park-like setting, separating the clubhouse from the rifle and gun range, reducing parking, and changing access. These changes alter the setting and feeling and association of this historic property.

The northern portions of Alternatives 1 and 2 follow the former railroad right-of-way to the north and west of the clubhouse. The centerline of the new roadway would be located approximately 62 meters (203 feet) west of the clubhouse building. This alignment would maintain access between the clubhouse and range and clubhouse parking. Trees would be removed along the proposed Southeast Issaquah Bypass, but the park-like setting around the clubhouse would be maintained by creating berms and planting trees, such as Douglas fir, cedar, or alder, and native shrubs. Lighting along the road would also be focused away from the clubhouse and onto the roadway and shoulder.

The northern portions of Alternative 3 and 4 are east of the clubhouse, and the roadway is recessed about 2.5 to 4 meters (8 to13 feet) below grade. Although recessing the road would provide some visual and noise relief, the roadway cut would be only 10 meters (33 feet) from the clubhouse. This boundary would remove most of the parking area adjacent to the clubhouse and would necessitate acquisition of land from the Sportsmen's Club. The roadway would remove the park-like setting along the east boundary of the clubhouse. Constructing an earthen berm between the Sportsmen's Clubhouse and the new roadway and landscaping the berm with native trees and shrubs to screen the clubhouse from the adjacent roadway would help to partially recreate the existing park-like setting.

Access to the clubhouse, via Southeast Evans Street would be maintained within the Alternatives 3 and 4, but direct access to the rifle and gun range is eliminated. Activities sponsored by the Sportsmen's Club require moving back and forth between the clubhouse and range. Currently, users are able to walk or drive the 150 meters (492 feet) between the two facilities in minutes. Alternatives 3 and 4 would create a 2.35-km (1.5-mile) trip between the clubhouse and range via city streets and the Southeast Issaquah Bypass. Although the range does not contribute to the clubhouse's historical significance, the Sportsmen's Club operates and maintains the facility, and the range is a primary reason for the club.

Construction of Alternatives 3 and 4 would change the association of the clubhouse and range, isolating the clubhouse from the range, and possibly marginalizing the usefulness of the building, which could lead to its abandonment. This degree of potential impact would create an "adverse effect" on the clubhouse building according to the criteria of adverse effect which states than an adverse effect occurs "when an action alters the characteristics of a property that qualify it for the National Register in a manner that would diminish the property's integrity of location, setting, design, materials, workmanship, feeling or association" (36 CFR 800.5).

The northern sections of Alternatives 5 and 6 are west of the clubhouse. Alternatives 5 and 6 would require approximately 2,490 square meters (0.61 acres) of land from the clubhouse site. The centerline of the new road would be approximately 36 meters (118 feet) west of the clubhouse building. The association of the clubhouse and rifle and gun range would be maintained under these alternatives, although access to the facilities would change. The effect of Alternatives 5 and 6 would be the same as Alternatives 1 and 2. The park-like setting would be maintained with berms, native tree and shrub plantings, and focused lighting. Alternatives 5 and 6 would remove access to the clubhouse from Southeast Evans Street, but would replace it with access from the Southeast Issaquah Bypass, near the rifle and gun range.

Mitigation

To minimize visual effects, berms would be constructed between the clubhouse and the Southeast Issaquah Bypass. Landscaping would be employed to maintain the park-like setting, and light standards would be placed so as not to flood the clubhouse and grounds with light.

Measures for mitigating changes in the setting, feeling, and association of the Issaquah Sportsmen's Clubhouse could include:

- Replacing the existing parking area displaced by the Southeast Issaquah Bypass.
- Moving the clubhouse closer (south or east) to the range, so both facilities are east of the Southeast Issaquah Bypass. This is only feasible if the clubhouse can structurally withstand the move.
- Moving the clubhouse and range to a new location, if the building can be moved.
- Creating an oral history of the Issaquah Sportsmen's Clubhouse by interviewing members and their families, users, neighbors, and city and county personnel. Augment interviews with photographs of the clubhouse and range.
- Supporting an inventory of historical and archaeological resources in Issaquah and creating walking tours of historic buildings, markers for historic buildings and sites, and brochures available to schools, libraries, the museum, Chamber of Commerce and local businesses.
- Developing Issaquah history documents, which might include topics such as Native American occupation and use of the area, mining, logging and milling, transportation (trails, railroads, and roads), settlement, ethnic groups, and the development of municipal government. Such histories, or contexts, are used as the basis for evaluating historical properties, but are also useful tools for teachers and librarians, as well as sources of information for local residents.
- Creating road and trail signs or an exhibit that discuss the sites and buildings along or near the Southeast Issaquah Bypass, including the White Swan Inn, the Seattle Lake Shore & Eastern (SLS&E) Railroad, the Gilman Water Company/Old Issaquah Water Works, the Donlan

homestead and lumber mill, the Issaquah Lumber Company, and the Campbell house.

Proposed mitigation measures would be developed in coordination with the city of Issaquah, local historical organizations such as the Issaquah Historical Society who are familiar with past and current historic preservation projects. All mitigation measures would meet accepted professional standards, as detailed in a memorandum of agreement (MOA).

Hazardous Materials

Studies and Coordination

The investigation of historical and current site conditions regarding hazardous materials included:

- Review of available reports, federal and state databases, and historical information
- Identification of water and sewage systems in the project area
- Interviews with local property owners
- Visual reconnaissance of the project corridor.

Environmental Records Review

A review of pertinent environmental records maintained by the U.S. EPA and Department of Ecology was conducted for facilities that currently occupy or previously occupied properties within a specified search distance of the project corridor. The purpose of the environmental records review was to obtain and review records that would help evaluate the potential for hazardous materials in connection with the subject property and offsite sources. The records reviewed included recent listings available either as digital copies secured from agency electronic on-line sources, or as hard copies provided by the specified agencies. Those facilities found within a distance of 0.8 to 1.6 km (0.5 to 1 mile) from the project area were evaluated for potential impact.

The U.S. EPA databases searched include the following:

- National Priorities List (NPL)
- Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) List
- Resource Conservation and Recovery Act (RCRA) Treatment, Storage, and Disposal (TSD) Facilities List
- RCRA Notifiers List
- Emergency Response Notification System (ERNS) database.

Ecology databases searched include the following:

- Registered Underground Storage Tank (UST) List
- Leaking UST (LUST) List
- Confirmed and Suspected Contaminated Sites (C&SCS) List
- Toxics Cleanup Program (TCP) Site Register
- TCP Hazardous Sites List.

Historical Site Conditions

Historical site conditions within the project area were evaluated by reviewing readily available information, including historical aerial photographs and maps. Fire insurance maps and city directories are not available for the project corridor.

Historical aerial photographs of the project area and adjacent areas for the years 1936, 1956, 1968, 1977, 1985, and 1995 were reviewed. Buildings and vehicles are recognizable, but details of the building use or vehicle type typically are not discernible. Information obtained from the various photographs is presented in the hazardous materials technical report (incorporated herein by reference) and summarized in this section.

Several historical maps were reviewed, including a USGS topographic map dated 1895 and Kroll maps dated 1965 and 1987. These maps provide information on prior use and ownership in the study area.

Interviews

Several interviews were conducted to obtain information on the history and current conditions of the respective properties and adjacent areas, to evaluate the potential presence of hazardous materials. The interviews included two property owners along the proposed alternatives.

Additional interviews were conducted with a representative of the city of Issaquah regarding potable water and septic systems along the proposed alignments; a representative of Puget Sound Energy (PSE) regarding transformers along the proposed alignments; and representatives of the city of Issaquah, Ecology, and the King County Health Department regarding the former landfill located on Southeast Evans Lane.

Affected Environment

Few existing hazardous materials sites are located within or adjacent to the proposed Southeast Issaquah Bypass (see **Figure 3-28**). A north/south-trending electric distribution line is present along or near much of the project area. A former trapshooting range west of the current shooting range and a former landfill site near Southeast Evans Lane were identified in the northern portion of the project area. Residential areas adjacent to the proposed project may include hazardous materials such as residential heating oil. Electrical transformers may contain mineral insulating oil or other polychlorinated biphenyl (PCBs). Residences over ten years old could include asbestos or lead-based paint.

Historical Site Conditions

Historical aerial photographs for the years 1936, 1956, 1968, 1977, 1985, and 1995 were reviewed. In the 1936 photograph, a clearing is present west of the site near the current location of Southeast Evans Lane. This clearing may represent a landfill that was operating near this location, possibly as early as 1936. In the 1956 photograph, several structures and cleared areas are present in the Issaquah Sportsmen’s Clubhouse area. The cleared areas likely represent the shooting ranges. The clearing located west of the site near the current location of Southeast Evans Lane appears as a high area surrounded by a ravine to the east and north. In the 1968 photograph, a small residential development is

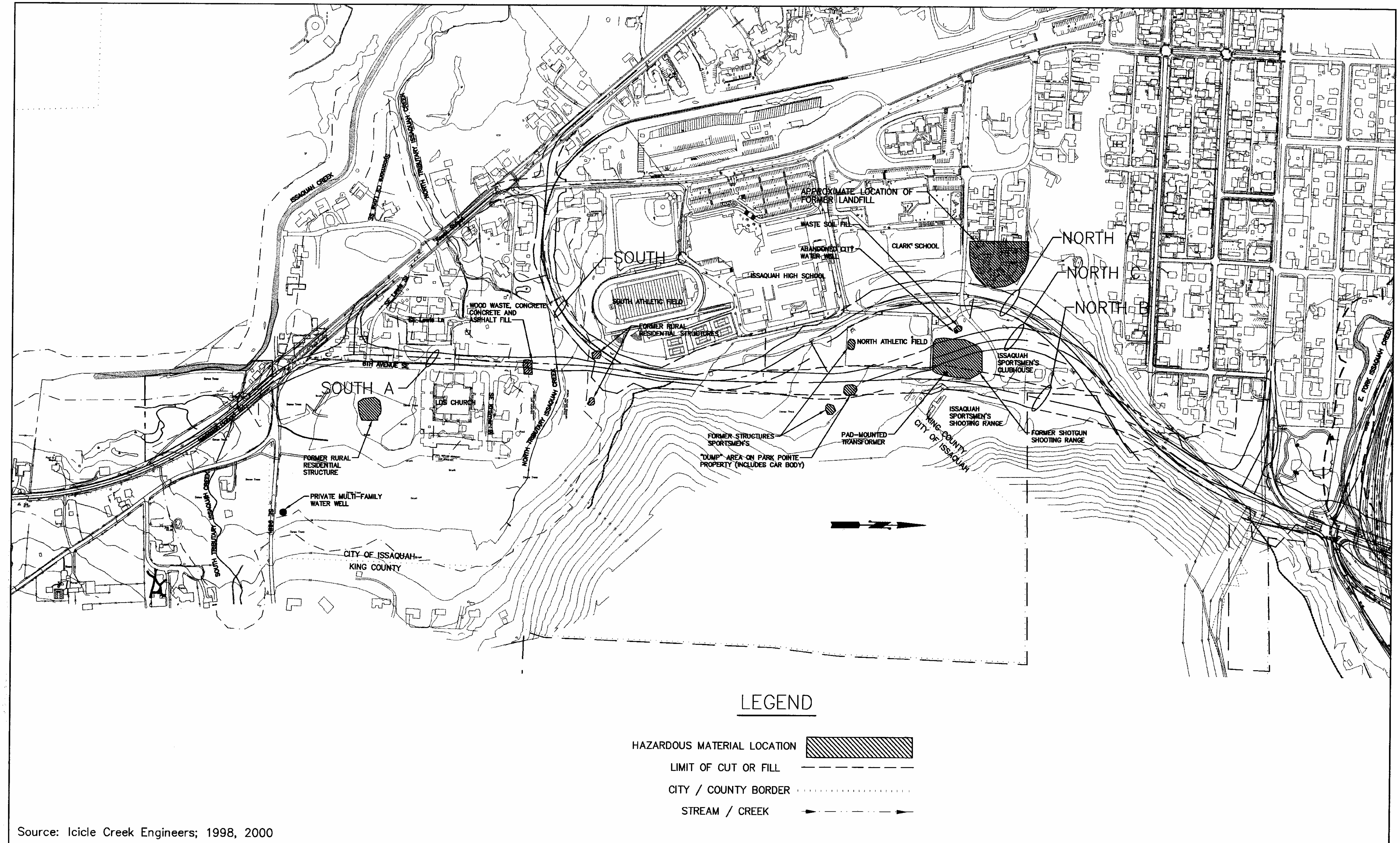

Figure 3-28
Existing Hazardous Materials Locations

present along Southeast Evans Lane. Issaquah High School facilities are present to the south of Clark School, including buildings and parking lots, and a large athletic field near the south end of the former railroad right-of-way. The 1995 photograph shows the additional athletic field for Issaquah High School to the east of Clark School and west of the Issaquah Sportsmen's Clubhouse, and the Issaquah Sportsmen's Clubhouse at its current location north of Southeast Evans Lane.

Environmental Records Review

As part of the environmental records review, the Ecology LUST list indicated that no sites are located directly within the proposed project area. This list does identify five facilities located within 0.8 km (0.5 miles) from the project area (**Table 3-27** briefly describes these facilities). However, these facilities are located in an apparent downgradient direction and are a considerable distance from the project area, so they are unlikely to have contaminated the project area. Based on this assessment, agency files were not reviewed for these facilities.

Table 3-27
Sites Identified during Environmental Records Review

Site Number	Business Name	Site Address	Regulatory List
1	Issaquah School District bus garage	805 2nd Avenue SE	LUST
2	Old Issaquah police station	132 East Sunset Way	LUST
3	Texaco service station	15 East Sunset Way	LUST
4	Issaquah Feed & Service	232 Front Street South	LUST
5	Grange Supply Inc.	145 NE Gilman Boulevard	LUST

LUST = Listed as Department of Ecology leaking underground storage tank site.

Several issues arose from the interviews conducted for this project. Neighborhood dumping has occurred at two locations on the Park Pointe property. One dump site on the southeast portion of the property has been cleaned up. A former trap shooting range was previously operated by the Issaquah Sportsmen's Clubhouse on a parcel located west of the current shooting range and north of Issaquah High School's north athletic field. This area is currently owned by the Issaquah School District. Also located on this parcel are two water wells that were installed by the city of Issaquah. A hazardous materials report on the Sportsmen's Clubhouse site was prepared for the Seattle-King County Department of Public Health and Washington Department of Ecology in November 2001. The area currently occupied by single-family residences along Southeast Evans Lane was used as a landfill site by local citizens, possibly in the 1940s and 1950s. The landfill was taken out of use when the area was developed with single-family residential housing, sometime in the 1960s.

Three pole-mounted electrical transformers were tested for polychlorinated biphenyls (PCBs), and PCB concentrations range from 23 to 34 parts per million (ppm). One pole-mounted transformer was tested at less than 1 ppm PCBs. One pole-mounted transformer has not been tested but because it was manufactured in 1990, it is not expected to contain PCBs.

Impacts and Mitigation

Alternative 1

Impacts

The risk of environmental liability and impacts related to hazardous materials resulting from the ownership, construction, and operation of Alternative 1 is expected to be low, because this alignment is east of the former landfill located at the eastern end of Southeast Evans Lane. Operation of Alternative 1 could result in the possible release of hazardous materials in the form of spills during vehicle accidents. Such releases would be equally likely under the each of the build alternatives.

Mitigation

Mitigation of direct impacts from hazardous materials would not be required for Alternative 1. An existing statewide emergency response action should be available for releases of hazardous materials that may occur during operation. Assessment and cleanup of a spill should be conducted in accordance with the appropriate emergency response plan.

Alternative 2

Impacts

The risk of environmental liability and impacts related to hazardous materials resulting from the ownership, construction, and operation of Alternative 2 is expected to be low, because this alignment is east of the former landfill located at the eastern end of Southeast Evans Lane. Operation of Alternative 2 could result in the possible release of hazardous materials in the form of spills during vehicle accidents. Such releases would be equally likely under the each of the build alternatives.

Mitigation

Mitigation of direct impacts from hazardous materials would not be required for Alternative 2. An existing statewide emergency response action should be available for releases of hazardous materials that may occur during operation. Assessment and cleanup of a spill should be conducted in accordance with the appropriate emergency response plan.

Alternative 3

Impacts

The risk of environmental liability and impacts related to hazardous materials resulting from the ownership, construction, and operation of Alternative 3 is expected to be moderate, because this alignment encounters the eastern boundary of the former trap shooting range located west of the current Issaquah Sportsmen's Clubhouse shooting range. Elevated levels of lead and polycyclic aromatic hydrocarbons (PAHs) in soil and groundwater are suspected from broken clay pigeons at this site. Persons exposed for long periods of time to mixtures of PAHs have an increased risk of cancer. Immediate health effects from low-level PAH exposure alone is rare. Eye and skin irritation is usually a result of exposure to another substance or irritant. The Department of Ecology report for the club site indicated that the site's hazard ranking, an estimation of the potential threat to human health and/or the environment relative to all other Washington state sites assessed at this time, has been determined to be a 4, where 1 represents the highest relative risk and 5 the lowest.

Operation of Alternative 3 could result in the possible release of hazardous materials in the form of spills during vehicle accidents. Such releases would be equally likely under the each of the build alternatives.

Mitigation

Mitigation of direct impacts from hazardous materials would be required for Alternative 3. A preliminary site assessment (PSA) is recommended for the former trap shooting range, to document existing lead and PAH levels in soil and groundwater. An existing statewide emergency response action should be available for releases of hazardous materials that may occur during operation. Assessment and cleanup of a spill should be conducted in accordance with the appropriate emergency response plan.

Contaminated soil encountered during construction activities will require stockpiling and testing to confirm regulatory classification and the most cost-effective management strategies. MTCA method A or B cleanup levels could be used to determine disposal methods where small amounts of contaminated soils are present and soils need to be removed and disposed of quickly, as would be the case in this project.

Soils failing the toxicity characteristic leaching procedure (TCLP) or exceeding other dangerous waste criteria would need to be handled as Washington state dangerous waste. Generators of dangerous waste are required to obtain an identification (ID) number for each site. This can be done after soils have been determined to be dangerous waste. If preconstruction explorations are used to determine where dangerous waste will be encountered, an ID number and planning for soil handling and disposal can be completed prior to construction. This would reduce soil handling time and potential for exposure or release to the environment, as soils could then be loaded onto trucks during excavation and hauled to appropriate treatment or disposal facilities.

Handling options for contaminated soils include:

- Soils that do not exceed method A cleanup levels could be placed under roadways, if adequate fill capacity exists and soils meet geotechnical fill requirements.
- Soils that do not exceed dangerous waste criteria or are in excess of what is required for fill could be transported to a landfill or treatment facility, depending on the contaminant.
- Soils designated as dangerous waste would be transported to a hazardous waste landfill or incinerator.

Alternative 4

Impacts

The risk of environmental liability and impacts related to hazardous materials resulting from the ownership, construction, and operation of Alternative 4 is expected to be moderate, because this alignment encounters the eastern boundary of the former trap shooting range located west of the current Issaquah Sportsmen's Clubhouse shooting range. Elevated levels of lead and polyaromatic hydrocarbons (PAHs) in soil and groundwater are suspected from broken clay pigeons at this site.

Operation of Alternative 4 could result in the possible release of hazardous materials in the form of spills during vehicle accidents. Such releases would be equally likely under the each of the build alternatives.

Mitigation

Mitigation of direct impacts from hazardous materials would be required for Alternative 4. A preliminary site assessment is recommended for the former trap shooting range, to document existing lead and PAH levels in soil and groundwater. An existing statewide emergency response action should be available for releases of hazardous materials that may occur during operation. Assessment and cleanup of a spill should be conducted in accordance with the appropriate emergency response plan.

Contaminated soil encountered during construction activities will require stockpiling and testing to confirm regulatory classification and the most cost-effective management strategies. MTCA method A or B cleanup levels could be used to determine disposal methods where small amounts of contaminated soils are present and soils need to be removed and disposed of quickly, as would be the case in this project.

Soils failing the toxicity characteristic leaching procedure (TCLP) or exceeding other dangerous waste criteria would need to be handled as Washington state dangerous waste. Generators of dangerous waste are required to obtain an identification (ID) number for each site. This can be done after soils have been determined to be dangerous waste. If preconstruction explorations are used to determine where dangerous waste will be encountered, an ID number and planning for soil handling and disposal can be completed prior to construction. This would reduce soil handling time and potential for exposure or release to the environment, as soils could then be loaded onto trucks during excavation and hauled to appropriate treatment or disposal facilities.

Handling options for contaminated soils include:

- Soils that do not exceed method A cleanup levels could be placed under roadways, if adequate fill capacity exists and soils meet geotechnical fill requirements.
- Soils that do not exceed dangerous waste criteria or are in excess of what is required for fill could be transported to a landfill or treatment facility, depending on the contaminant.
- Soils designated as dangerous waste would be transported to a hazardous waste landfill or incinerator.

Modified Alternative 5 (Preferred Alternative)

Impacts

The risk of environmental liability and impacts related to hazardous materials resulting from the ownership, construction, and operation of Modified Alternative 5 is expected to be high, because this alignment passes directly through the former trap shooting range located west of the current Issaquah Sportsmen's Clubhouse shooting range. Elevated levels of lead and polyaromatic hydrocarbons (PAHs) in soil and groundwater are suspected from broken clay pigeons at this site.

Operation of Modified Alternative 5 could result in the possible release of hazardous materials in the form of spills during vehicle accidents. Such releases would be equally likely under the each of the build alternatives.

Mitigation

Mitigation of direct impacts from hazardous materials would be required for Modified Alternative 5. A preliminary site assessment is recommended for the former trap shooting range, to document existing lead and PAH levels in soil and groundwater. An existing statewide emergency response action should be available for releases of hazardous materials that may occur during operation. Assessment and cleanup of a spill should be conducted in accordance with the appropriate emergency response plan.

Contaminated soil encountered during construction activities will require stockpiling and testing to confirm regulatory classification and the most cost-effective management strategies. MTCA method A or B cleanup levels could be used to determine disposal methods where small amounts of contaminated soils are present and soils need to be removed and disposed of quickly, as would be the case in this project.

Soils failing the toxicity characteristic leaching procedure (TCLP) or exceeding other dangerous waste criteria would need to be handled as Washington state dangerous waste. Generators of dangerous waste are required to obtain an identification (ID) number for each site. This can be done after soils have been determined to be dangerous waste. If preconstruction explorations are used to determine where dangerous waste will be encountered, an ID number and planning for soil handling and disposal can be completed prior to construction. This would reduce soil handling time and potential for exposure or release to the environment, as soils could then be loaded onto trucks during excavation and hauled to appropriate treatment or disposal facilities.

Handling options for contaminated soils include:

- Soils that do not exceed Method A cleanup levels could be placed under roadways, if adequate fill capacity exists and soils meet geotechnical fill requirements.
- Soils that do not exceed dangerous waste criteria or are in excess of what is required for fill could be transported to a landfill or treatment facility, depending on the contaminant.

- Soils designated as dangerous waste would be transported to a hazardous waste landfill or incinerator.

Alternative 6

Impacts

The risk of environmental liability and impacts related to hazardous materials resulting from the ownership, construction, and operation of Alternative 6 is expected to be high, because this alignment passes directly through the former trap shooting range located west of the current Issaquah Sportsmen's Clubhouse shooting range. Elevated levels of lead and PAHs in soil and groundwater are suspected from broken clay pigeons at this site.

Operation of Alternative 6 could result in the possible release of hazardous materials in the form of spills during vehicle accidents. Such releases would be equally likely under the each of the build alternatives.

Mitigation

Mitigation of direct impacts from hazardous materials would be required for Alternative 6. A preliminary site assessment is recommended for the former trap shooting range, to document existing lead and PAH levels in soil and groundwater. An existing statewide emergency response action should be available for releases of hazardous materials that may occur during operation. Assessment and cleanup of a spill should be conducted in accordance with the appropriate emergency response.

Contaminated soil encountered during construction activities will require stockpiling and testing to confirm regulatory classification and the most cost-effective management strategies. MTCA method A or B cleanup levels could be used to determine disposal methods where small amounts of contaminated soils are present and soils need to be removed and disposed of quickly, as would be the case in this project.

Soils failing the toxicity characteristic leaching procedure (TCLP) or exceeding other dangerous waste criteria would need to be handled as Washington state dangerous waste. Generators of dangerous waste are required to obtain an identification (ID) number for each site. This can be done after soils have been determined to be dangerous waste. If preconstruction explorations are used to determine where dangerous waste will be encountered, an ID number and planning for soil handling and disposal can be completed prior to construction. This would reduce soil handling time and potential for exposure or release to the environment, as soils could then be loaded onto trucks during excavation and hauled to appropriate treatment or disposal facilities.

Handling options for contaminated soils include:

- Soils that do not exceed method A cleanup levels could be placed under roadways, if adequate fill capacity exists and soils meet geotechnical fill requirements.
- Soils that do not exceed dangerous waste criteria or are in excess of what is required for fill could be transported to a landfill or treatment facility, depending on the contaminant.

- Soils designated as dangerous waste would be transported to a hazardous waste landfill or incinerator.

Alternative 7—No Action

Because the proposed Southeast Issaquah Bypass would not be constructed under the no-action alternative; direct and operational impacts related to hazardous materials are not expected.

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Visual Quality

Studies and Coordination

A visual quality assessment for the proposed project area was conducted at several locations within three general viewsheds. The assessment included field visits and ground-level and aerial photographs of the proposed project. Potential visual impacts were determined by comparing existing views with views expected to result from construction of Modified Alternative 5. The FHWA document Visual Impact Assessment for Highway Projects was consulted and visual quality impacts were analyzed using the following FHWA criteria on vividness, intactness, and unity:

- Vividness: The memorability of the visual impression created by contrasting landscape elements as they combine to form a striking and distinctive visual pattern.
- Intactness: The integrity of visual order in the natural and human-created landscape, and the extent to which the landscape is free from visual encroachment.
- Unity: The degree to which the landscape's visual resources join together to form a coherent, harmonious visual pattern. Unity refers to the compositional harmony or inter-compatibility between landscape elements.

A qualitative assessment of potential impacts was made based on these three characteristics. The viewer groups considered included local residents, vehicle drivers and passengers, and recreational trail users. The visual resources evaluated include landforms, vegetation, water bodies, and elements of built structures. A quantitative matrix of potential impacts was prepared based on combined scores from views in several directions at different viewpoint locations, including views both from and toward the proposed roadway. Views were rated according to values on a scale of 1 to 10, with 1 referring to the lowest quality and 10 indicating the highest quality.

Affected Environment

The proposed project would be constructed along a corridor extending from the I-90/East Sunset Way interchange in the north to near the intersection of Issaquah/Hobart Road and Southeast 96th Street in the south. It may also include the southern end of 2nd Avenue Southeast near Front Street South. Much of the corridor is located within a low-density rural residential area in eastern Issaquah and King County. Views and visual patterns change along the corridor.

Existing views throughout the proposed project corridor are dominated by forested conditions. Mixed evergreen and deciduous trees cover much of the project area and where trees have been displaced, suburban or semi-rural residential development has occurred. Residential neighborhoods are located in the northern and southern view area and are adjacent to the Southeast Issaquah Bypass. Issaquah High School is located along the central portion of the project area. In the area adjacent to the east portion of the proposed highway project, the Tiger Mountain national resource conservation area (NRCA) occupies the north area and the proposed Park Pointe development would occupy the south area. The southern project area near 2nd Avenue Southeast and Front Street South is composed primarily of suburban residential development. The southernmost project area is dominated by dense vegetation and existing low-density residential development along 6th Avenue Southeast. **Photographs 1 through 8** provide representative ground-level views of the existing setting at key locations along the proposed project route.

Existing vegetation screens many current views along the proposed alternatives. Three general viewsheds were considered for representative views in the proposed project area:

Viewshed 1 (Photographs 1 through 3)

In the Viewshed 1 area (in the northern third of the project area), the city's eastern residential portion transitions to the undeveloped Tiger Mountain NRCA. Existing views in the residential neighborhood along East Sunset Way, Southeast Andrews and Bush streets, and 6th Avenue Southeast are primarily foreground views of adjacent homes, yards, fences, and neighborhood streets. Mixed evergreen and deciduous trees mostly screen distant views to the south and east. Many views along East Sunset Way are currently disturbed by ongoing activities associated with the I-90/East Sunset Way interchange construction.

Viewshed 2 (Photographs 4 and 5)

In the Viewshed 2 area (in the central third of the corridor), trees and understory vegetation limit views around the Sportsmen's Clubhouse area. Views from Issaquah High School are less obstructed than other areas in the foreground. Vegetation is encountered in the middle areas, and mountaintops are visible at times above the trees in the distance. From the southern end of the high school, the school grounds and athletic fields are visible in the foreground and vegetation partially obscures distant views to the south and east.

Viewshed 3 (Photographs 6 through 8)

Viewshed 3 (in the southern third of the project area) includes the area south of Southeast Kramer Place to Southeast 96th Street. This area is forested with mixed evergreen and deciduous trees but also includes residential development and the LDS Church on 6th Avenue Southeast. Immediate views are of the surrounding neighborhood including residential homes, fences, yards, and streets. Dense trees and vegetation are visible to the east and there are occasional views of mountaintops in the distance. This area also includes the 2nd Avenue Southeast and Front Street South neighborhood, which consists mainly of views of single-family residences.

Existing views in the project corridor generally score within the moderately high range of visual quality ratings, with overall values that range from 6.8 to 8.1 on the FHWA visual quality scale. Residential areas score average to moderately high, because many of these areas are low-density, single-family homes with fenced yards and landscaping. Middle ground views in most areas rank moderately high depending on vegetative conditions, which are affected by

Photograph 1
From East Sunset Way, Looking Northeast
(Viewshed 1)

Photograph 2
Bush Street and 6th Avenue Northeast, Looking Southeast
(Viewshed 1)

Photograph 3
From Tiger Mountain, Looking West (Viewshed 1)

Photograph 4
Near Issaquah High School Athletic Field, Looking North (Viewshed 2)

Photograph 5
Near Sportsmen's Clubhouse, Looking Northeast
(Viewshed 2)

Photograph 6
From Southeast Kramer Place, Looking Northwest
(Viewshed 3)

Photograph 7
From LDS Church, Looking West
(Viewshed 3)

Photograph 8
From 238th Way Southeast, Looking North
(Viewshed 3)

seasonal changes. Background views rank moderately high to high in places where mountains are easily visible.

Visual Quality Ratings

Existing and developed views at several representative locations were scored using the FHWA visual quality ratings. **Table 3-28** provides a summary of these scores, using average scores for developed conditions based on renderings and project design drawings. Three general viewshed locations were evaluated, covering the northern, central, and southern project areas. Viewshed locations are shown in **Figure 3-29**. Representative photographs of the existing setting are presented in Photographs 1 through 8. **Figures 3-30 through 3-33** provide renderings of the proposed project at representative locations in each viewshed area. Existing visual quality ratings generally rank at the “high average” level throughout the project area. Because the proposed project would decrease vegetative views and allow development and human-made features to further encroach upon existing neighborhoods, the overall developed ratings would be lower. Ratings for the build alternatives include changes at representative viewshed locations, and averages based on renderings of the proposed project alignments within the view areas evaluated along the proposed project route. Averages are used because the expected results would not vary significantly between alternatives, due to similarities in the project design and location.

Table 3-28
Visual Quality Ratings

Location	Existing	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Mod. Alt. 5	Alt. 6	Average Rating for Build Alternatives	Average Change
Viewshed 1									
From E. Sunset Way looking northeast	6.45	5.25	5.25	5.25	5.25	5.25	5.25	5.25	1.20
At Bush Street and 6th Avenue SE looking east and south	6.33	6.25	6.25	6.25	6.25	6.25	6.25	6.25	0.08
From Tiger Mountain looking west	6.25	5.50	5.50	6.05	6.05	5.75	5.75	5.77	0.48
Viewshed 2									
Near Sportsmen’s Clubhouse looking north and east	7.50	7.25	7.25	6.25	6.25	7.33	7.33	6.94	0.55
Near Issaquah High School athletic field looking north	6.50	5.30	5.30	5.10	5.10	4.95	4.95	5.12	1.38
Viewshed 3									
From SE Kramer Place looking northwest	6.60	5.75	6.58	5.75	6.58	5.75	6.58	6.17	0.44
Near LDS Church on 6th Avenue SE looking northeast	6.70	5.00	6.66	5.00	6.66	5.00	6.66	5.83	0.87
Near 2nd Avenue SE and Front Street S. looking east	6.55	6.55	5.20	6.55	5.20	6.55	5.20	5.88	0.68
Average all views and average difference	**6.61**	**5.88**	**6.00**	**5.91**	**6.03**	**5.87**	**6.00**	**5.95**	**0.66**

FHWA visual rating scale: 10 = very high; 9 = high; 7, 8 = moderately high; 4, 5, 6 = average; 2,3 = moderately low; 1 = low.

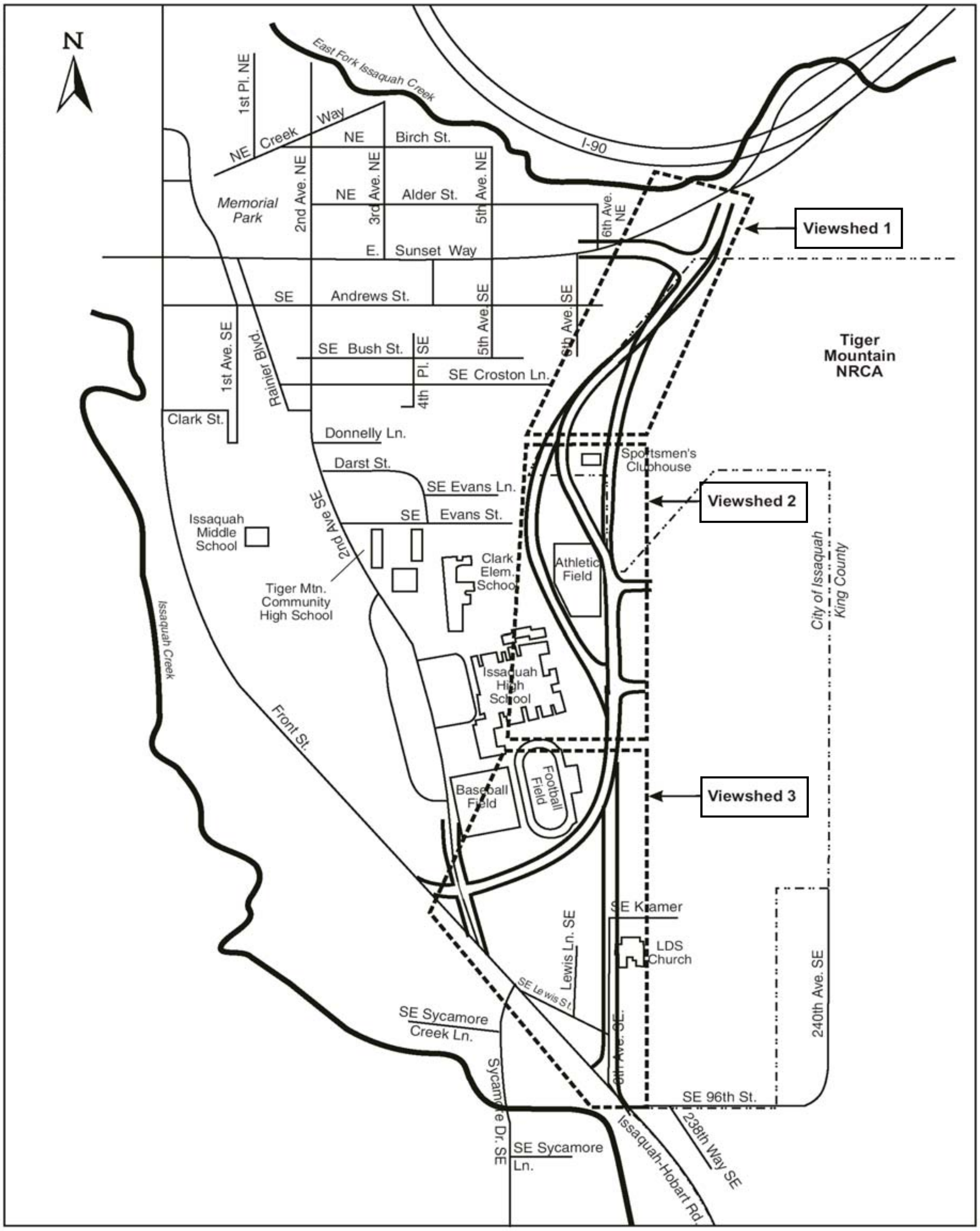


Figure 3-29
Visual Quality Viewshed Locations

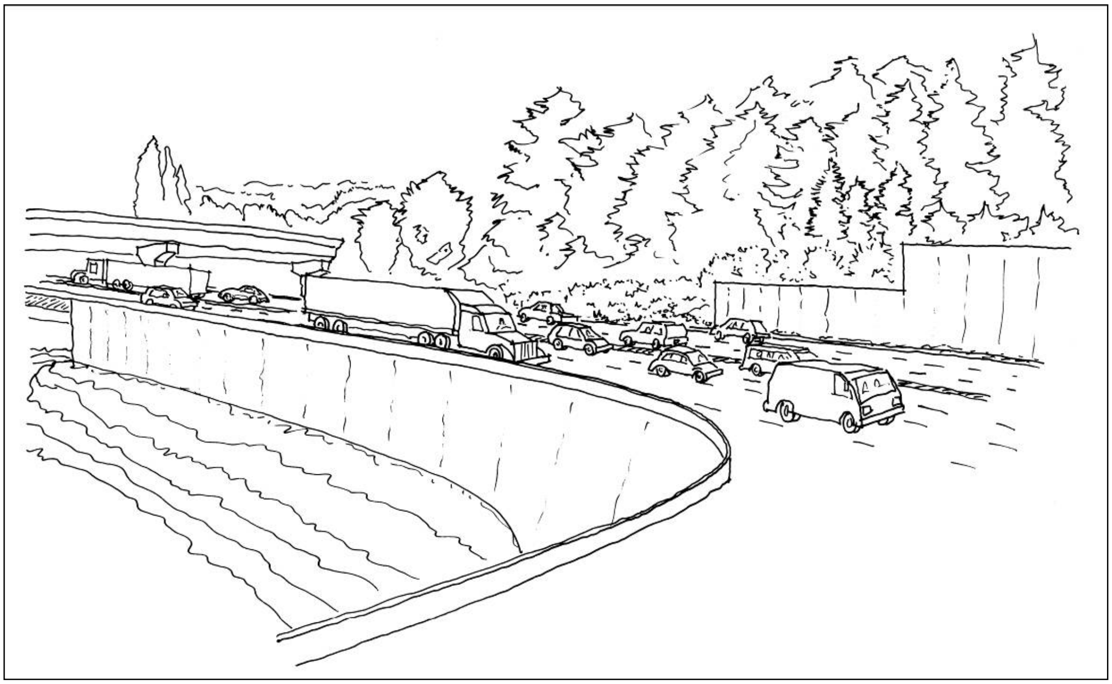


Figure 3-30
Proposed View at East Sunset Way Near I-90, Looking Northeast (Viewshed 1)

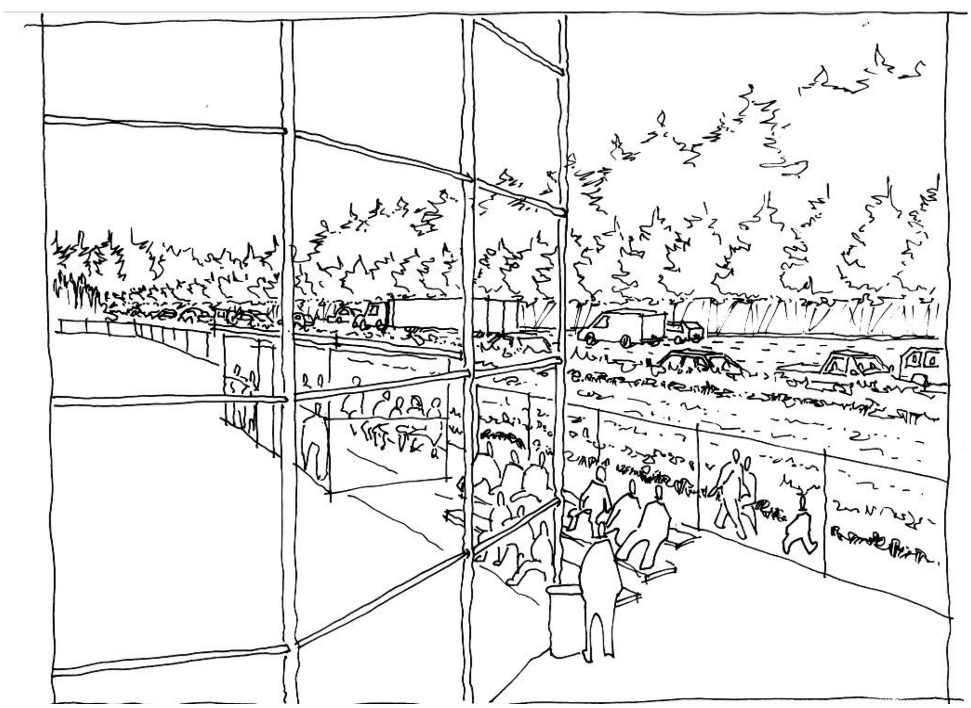
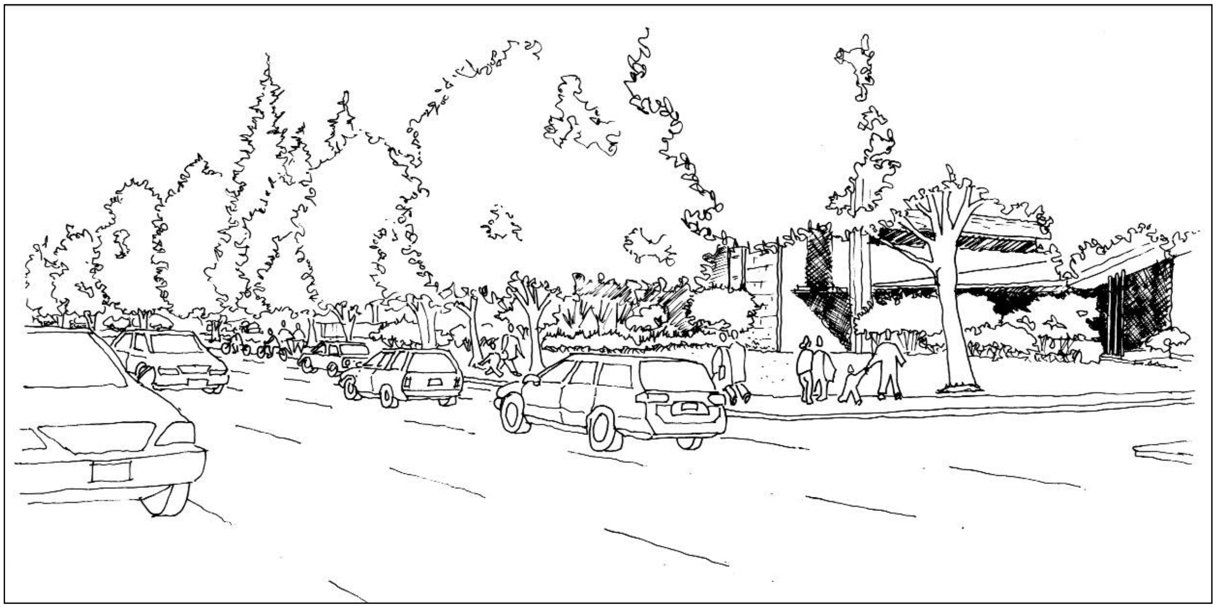
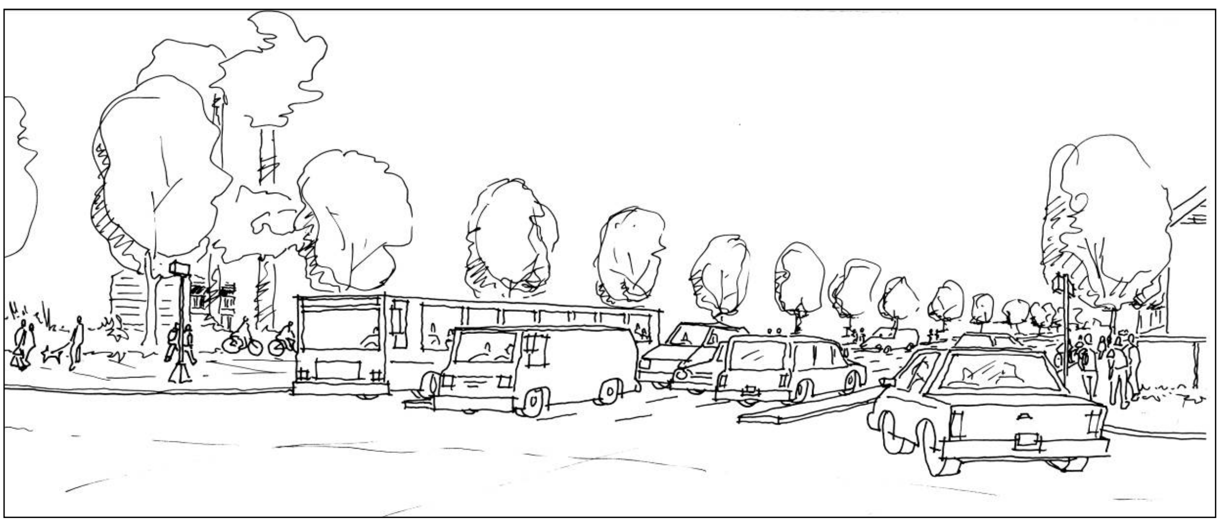


Figure 3-31
Proposed View at High School Athletic Field, Looking Northeast (Viewshed 2)



(Note: potential view for South A Alignment only)

Figure 3-32
Proposed View at LDS Church, Looking Northeast (Viewshed 3)



(Note: Potential view for South C alignment only)

Figure 3-33
Proposed View at 2nd Avenue Southeast, Looking East (Viewshed 3)

Generally, Alternatives 1 and 2 would have a greater presence in the north project area because they would be located closest to existing homes and buildings. In the central project area near Issaquah High School, portions of the project and the vehicles using the proposed roadway would be visible from various locations near the school. In the south project area, each of the build alternatives would intensify the level of development visible from existing residential areas.

This impact may be slightly greater for Alternatives 1, 3, and 5 where the proposed bridge and roadway would pass through a somewhat less developed area, although the degree of change would also be relatively high near the new intersection at 2nd Avenue and Front Street.

The visual ratings listed in Table 3-28 indicate that the average change in ratings for all build alternatives would result in a decrease of approximately 0.66 in the visual quality rating. When the greatest rating change is considered for each alternative, the average decrease in visual quality would be approximately 0.95. Therefore, the developed conditions are expected to result in a diminishment of existing views in a range of approximately 0.66 to 0.95, resulting in a visual rating from 5.95 to 5.66 on the FHWA scale. Based on this scale, the proposed project may result in altering existing views that are rated at the upper end of average (and in some cases moderately high) to values that are equivalent to a setting with a more average visual quality.

This result would reflect the general urbanization that would occur within the proposed project corridor by introducing the new roadway in an area where development is currently relatively low. Residents in the project area, particularly those in closer proximity to the proposed roadway and employees and students at the local schools, are expected to be the primary viewer groups affected. Local recreational trail users would also be affected; however, this group is expected to vary in makeup between regular users and occasional visitors.

Impacts

Impacts Common to All Build Alternatives

Any of the build alternatives would alter the current views by introducing a new roadway. In places, associated concrete sidewalks, retaining walls, and stormwater ponds would also be visible. Vegetation would be removed along the Southeast Issaquah Bypass, opening new views to and from the roadway. Traffic signals and illumination would be provided at the proposed intersections with East Sunset Way and at Southeast 96th Street. Overall, the proposed project would reduce the generally rural atmosphere at the eastern city limit by introducing a new human-created feature. Most of these impacts would be the same throughout the project area. The proposed project would be constructed east of existing residential and community facilities where current views are dominated by vegetation and mountain backdrops.

Under all of the build alternatives, the proposed roadway could also be visible to individuals using nearby recreational trails in the Tiger Mountain natural resource conservation area (NRCA). Looking east to west, existing views from these trails generally transition from vegetation to residential development.

The visibility of the new roadway would be affected by existing topography and vegetation. From nearby trails, the topography slopes steeply in places toward the residential neighborhood below. Portions of the new roadway would likely be visible from these trails, although other views could be partially obstructed by tall trees and vegetation. From some locations, the new roadway could produce a stronger visual separation than currently exists between developed and undeveloped areas. View changes along the project area under each alternative are discussed below.

In addition to these impacts that are common to all of the build alternatives, impacts that are specific to each of the alternatives are described below.

Alternative 1

In Viewshed 1, many homes are located below the grade of the proposed highway, so views from residences toward the proposed roadway are expected to be obscured by topography and existing vegetation. The roadway itself would be largely screened by vegetation, but portions of proposed retaining walls may be visible through the trees. In the north project area, retaining walls would be required immediately south of the Sunset interchange, to accommodate cuts and fills of up to approximately 12 meters (40 feet) and 9 meters (30 feet), respectively. The maximum height of individual retaining walls would be approximately 9 meters (30 feet), because the walls would be stepped to reduce visual impacts. Portions of these walls could be visible from nearby and distant properties, although topography and vegetation is expected to obscure much of their visibility. Vehicles traveling along the roadway would be largely hidden, but occasional instances of light and glare from vehicle windshields or headlights could likely be visible, especially at night.

In its most visible location in the northern viewshed, the new roadway would alter existing views where the proposed Southeast Issaquah Bypass would intersect with the eastern terminus of East Sunset Way. It is likely that the roadway intersection and accompanying retaining walls would be visible from the residential neighborhood to the west. A new stormwater detention pond and trailhead parking area would also be visible immediately east of the White Swan Inn. Partial views of the roadway and vehicles using the road would also be visible through the trees along some areas of existing trails on Tiger Mountain to the east. This intersection has recently been altered by construction of the Sunset interchange, which opened in Summer 2003. Construction of the proposed Southeast Issaquah Bypass would add to the level of visual change that is occurring in this location, as Issaquah becomes more urbanized.

Alternative 1 would include the North A alignment, which would locate the new roadway closest to the Southeast Evans Street and Issaquah High School neighborhoods where its visibility would be increased by the proximity to the roadway. Under Alternative 1, the greatest visual change related to the proximity of the new roadway would result from proposed noise walls. Two new walls would be constructed, one approximately 2 meters (6.6 feet) high and 200 meters (656 feet) long. The other wall would be approximately 3 meters (10 feet) high and 387 meters (1,270 feet) long. These walls would alter foreground views to the east, particularly near the high school where the larger wall would be located.

In Viewshed 3, Alternative 1 would introduce a new roadway through the existing low-density residential neighborhood along 6th Avenue Southeast. It would also include a new bridge over the existing wetland area north of Southeast Kramer Place, which would further alter existing residential views. These facilities would alter views in this neighborhood, contributing to a change in its existing suburban character toward one of a more urbanized setting.

Alternative 2

Impacts in the northern project area (Viewshed 1) would be the same as those described for Alternative 1. The proposed noise walls identified for Alternative 1 would also be constructed under this alternative. View impacts in the central project area (Viewshed 2) would also be the same as those previously described for Alternative 1. In the southern project area (Viewshed 3), this alternative would include the South C alignment, where portions of the roadway would be visible from the southern end of the high school property. A new intersection would be created at 2nd Avenue Southeast and Front Street South. This improvement would be visible from existing residences in the area, increasing this area's developed conditions. A new stormwater pond would also be visible on the north side of the proposed roadway in this location.

Retaining walls ranging in height from approximately 0.75 to 2.75 meters (2.5 to 9 feet) could be visible from some properties south of the high school football field. Two approximately 1.4-meter- (4.5-foot-) high retaining walls along the proposed driveway east of 2nd Avenue Southeast would be visible from nearby properties.

Alternative 3

In the north (Viewshed 1), the roadway would be located the farthest to the east and would be somewhat less visible from existing residential areas. Proposed changes at the intersection with Sunset Way would remain the most visible to local residents. Retaining walls would be required immediately south of the Sunset interchange, to accommodate cuts and fills of up to approximately 12 meters (40 feet) and 9 meters (30 feet), respectively. The maximum height of individual retaining walls would be approximately 9 meters (30 feet), because the walls would be stepped to reduce visual impacts. Portions of these walls may be visible to surrounding properties. View impacts in the central area (Viewshed 2) would also be somewhat less than those expected for Alternatives 1 and 2, due to the more easterly roadway location. Noise walls would not be required near the high school, eliminating this potential visual alteration to the existing setting. In the southern project area (Viewshed 3), changes would be the same as those expected for Alternative 1. These changes would include the alterations of the views in the 6th Avenue Southeast area near the existing LDS Church and the Lewis Lane neighborhood.

Alternative 4

Views in the northern (Viewshed 1) and central (Viewshed 2) project areas would be similar to those expected under Alternative 3. View changes in the south (Viewshed 3) would be the same as those described for Alternative 2.

Modified Alternative 5

Under this alternative, the northern roadway alignment would be shifted slightly farther east than under Alternatives 1 and 2. As a result, the roadway's view impacts on views from existing residential areas in Viewshed 1 would be somewhat lower than impacts under Alternatives 1 and 2. Near Sunset Way, view impacts would remain largely the same as for other alternatives moving south within Viewshed 1, however potential view impacts would be somewhat diminished by the eastward shift of this alignment. Retaining walls would be required immediately south of the Sunset interchange, to accommodate cuts and fills of up to approximately 12 meters (40 feet) and 9 meters (30 feet), respectively. The maximum height of individual retaining walls would be approximately 9 meters (30 feet), because the walls would be stepped to reduce visual impacts. Portions of these walls may be visible from surrounding properties in this location. In the central area (Viewshed 2), moving the roadway further away from existing school buildings would also help reduce potential view impacts expected there. In the southern project area (Viewshed 3), potential impacts would be the same as described for Alternative 3.

Alternative 6

Under this alternative, view impacts in Viewsheds 1 and 2 would be the same as those expected under Modified Alternative 5. View impacts in Viewshed 3 would be the same as those described for Alternative 2.

Alternative 7—No Action

Under the no-action alternative, the proposed roadway would not be constructed, and views in the project area would remain unchanged.

Mitigation

The proposed project would be designed to reduce visual intrusion on surrounding areas as much as possible. Walls and other structures that may have relatively high visibility would be painted to blend with existing vegetation and topography, and vegetative plantings would be used to screen the roadway and other structures from surrounding viewers. Roadside vegetation should follow guidance provided by the WSDOT Roadside Classification Plan (RCP), and at a minimum should meet the Treatment Level 2 standards presented in the Roadside Classification Plan. The use of large concrete retaining walls would be minimized where possible, and materials for such walls would be compatible with the surrounding environment to the extent possible.

Construction Activity Impacts

Construction Activity Impacts

Except as noted, the evaluation of construction activity impacts and mitigation applies to all build alternatives.

Air Quality

Impacts

Construction activities would temporarily generate particulate matter and small amounts of carbon monoxide (CO) and nitrogen oxides (NO_x). If not properly mitigated, fugitive dust would escape from the construction site and from soil blown from uncovered trucks carrying materials. Vehicles leaving the site would deposit mud on public streets, which would become a source of dust after it dries. Construction equipment would emit carbon monoxide and nitrogen oxides. These emissions would be greatest during the excavation phase, because most emissions would be associated with removal of dirt from the site.

Dust emissions would be associated with demolition, land clearing, ground excavation, cut-and-fill operations, and roadway and interchange construction. Particulate emissions would vary from day to day, depending on the level of activity, specific operations, and weather conditions. Particulate emissions would depend on soil moisture, silt content of soil, wind speed, and the amount and type of equipment operating. The quantity of particulate emissions would be proportional to the area of the construction operations and the level of activity. Based on field measurements of suspended dust emissions from construction projects, an approximate emission factor for construction operations would be 1.2 tons per acre of construction per month of activity (U.S. EPA, 1985). Emissions would be reduced if less of the site is disturbed or mitigation is performed.

Several residences are within 100 meters (300 feet) of the proposed Southeast Issaquah Bypass alignments. At that distance, dust from construction activities would be noticeable if uncontrolled. Modified Alternative 5 would require mitigation measures to comply with Chapter 70.94 RCW Clean Air Act, Chapter 173-400 WAC, and the Puget Sound Clean Air Agency (PSCAA) regulations that require dust control during construction and prevention of mud deposition on paved streets. Measures to reduce deposition of mud and emissions of particulate matter are identified in the following Mitigation section.

In addition to particulate emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate carbon monoxide and nitrogen oxides in exhaust emissions. These emissions would be temporary, limited to the immediate area surrounding the construction site, and would contribute a small amount compared with automobile traffic in the project area.

Some phases of construction, particularly during paving operations using asphalt, would result in short-term odors. Odors might be detectable to some people near the project site, and would be diluted as distance from the site increases.

No onsite burning of slash or other debris would be allowed during construction. Because no asphalt batching or gravel crushing would occur onsite, no stationary source permits would be required.

Mitigation

Particulate emissions (in the form of fugitive dust during construction activities) are regulated by the Puget Sound Clean Air Agency. According to PSCAA Rule 1, Section 9.15, fugitive dust from construction activities shall not be injurious to human health, plants and animals, or property, and shall not unreasonably interfere with the enjoyment of life and property. Additionally, a person may not operate a vehicle that deposits particulate matter on a paved, public highway (PSCAA Rule 1, Section 9.15). WSDOT has entered into a memorandum of agreement (MOA) with the PSCAA regarding fugitive dust from construction projects. The Southeast Issaquah Bypass project would comply with the requirements outlined in this memorandum of agreement.

Construction impacts would be reduced by incorporating mitigation measures into the construction specifications, as required by the Department of Ecology *Stormwater Management Manual for Western Washington,* 2001 edition best management practices. The following source control best management practice (BMP) mitigation measures would be implemented as required, to control PM_{10}, deposition of particulate matter and emissions of carbon monoxide and nitrogen oxides during construction:

- Lower speed limits in the construction area. High vehicle speeds increase the amount of dust stirred up from unpaved roads.
- As soon as feasible, upgrade unpaved road surfaces by installing base course crushed rock and paving.
- Spray exposed soil with water to reduce emissions and deposition of particulate matter.
- Use a dust palliative such as anionic Polyacrylamide (PAM), applied at the rate of one half-pound of PAM per 1,000 gallons per acre, to suppress dust emissions.
- Cover all trucks transporting materials, wet materials in trucks, or provide adequate freeboard (space from the top of the material to the top of the truck) to reduce dust and deposition of particulates during transportation.
- Provide wheel washers to remove particulate matter from wheels, wheel wells, fenders, tailgates, and running boards that would otherwise be carried offsite by vehicles. This would decrease deposition of particulate matter on area roadways.
- Remove particulate matter deposited on paved, public roads to reduce mud on area roadways by using high-efficiency vacuum trucks.
- Route and schedule construction trucks so that traffic delays are reduced during peak travel times. This will reduce secondary air quality impacts caused by reduced traffic speeds while waiting for construction trucks.
- Construct stabilized construction entrances where trucks enter public roads, to reduce mud track-out.
- Gravel or pave haul roads to reduce particulate emissions.

- Require appropriate emission-control devices on all gasoline or diesel fuel-powered construction equipment, to reduce carbon monoxide and nitrogen oxide emissions in vehicular exhaust. Use relatively new, well-maintained equipment to reduce carbon monoxide and nitrogen oxide emissions.
- Preserve natural vegetation and replant vegetative cover as soon as possible after grading, to reduce windblown particulates in the area.

Noise

Impacts

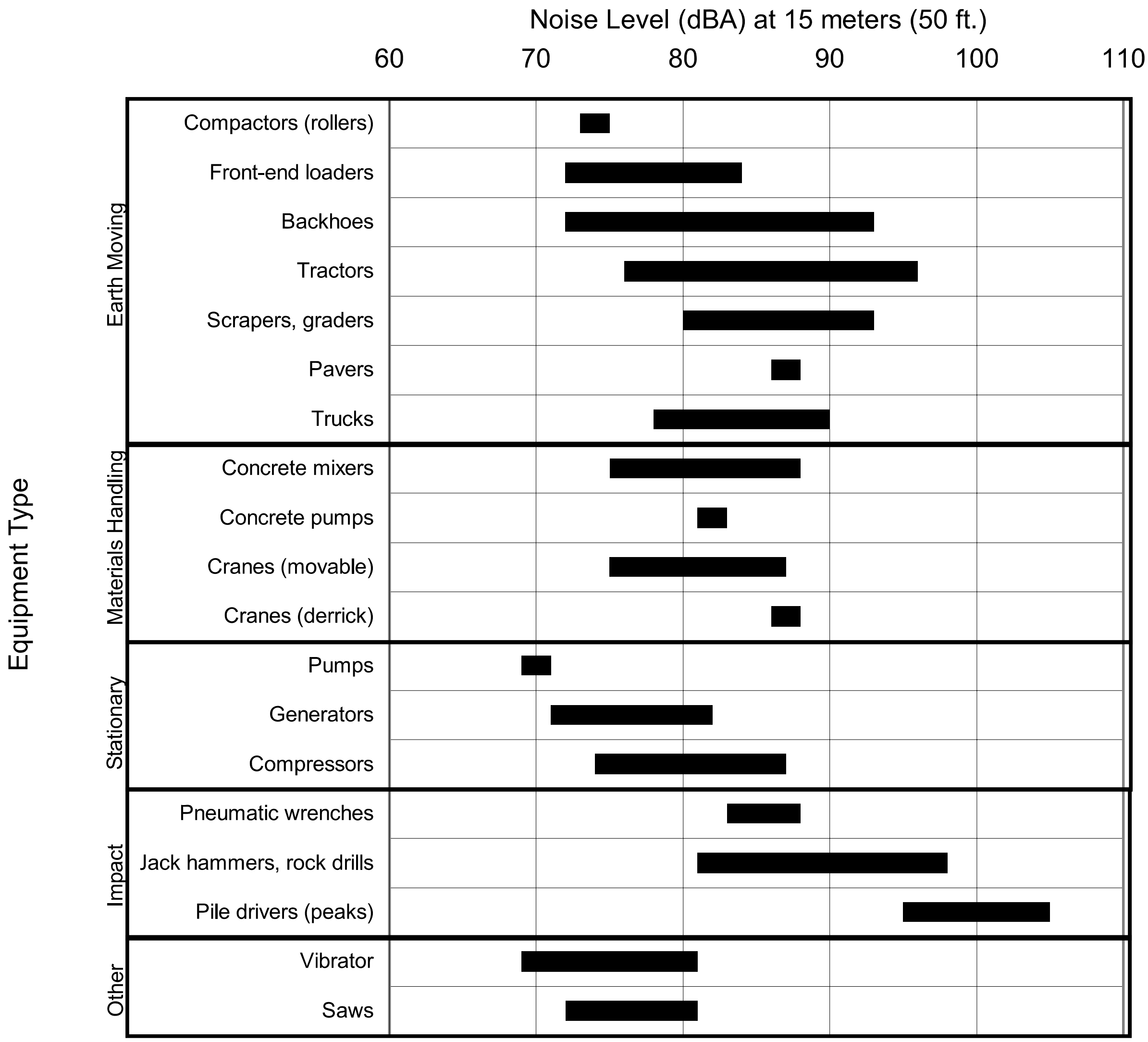
Construction would usually be carried out in several reasonably discrete steps, each with its own mix of equipment and consequently its own noise characteristics. Roadway construction would involve clearing, cut-and-fill activities, removing or reconditioning old roadways, and paving.

The most prevalent noise source at construction sites would be the internal combustion engine. Engine-powered equipment includes earth-moving equipment, material-handling equipment, and stationary equipment. Mobile equipment operates in a cyclic fashion, and stationary equipment (i.e., generators and compressors) operates at sound levels fairly constant over time. Because trucks would be present during most phases and would not be confined to the project site, truck noise 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 intermittent, occurring seasonally during an approximately two-year construction period. Construction noise impacts would depend on the type, amount, and location of construction activities. The type of construction methods would establish the maximum noise levels of the construction equipment used. The amount of construction activity would quantify 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 working on projects under Modified Alternative 5 would be similar to typical maximum construction equipment noise levels presented in **Figure 3-34.**

As shown in this figure, maximum noise levels from construction equipment would range from 69 to 106 decibels (dBA) at 15 meters (50 feet). Construction noise at residences farther away would decrease at a rate of 6 dBA per doubling of distance from the source. The number of occurrences of the maximum noise level (L_{max}) would increase during construction, particularly during pile-driving activities. Because some equipment would be turned off, idling, or operating at less than full power at any time, and because construction machinery is typically used to complete short-term tasks at any given location, average noise levels (L_{eq}) during the day would be less than maximum noise levels presented in Figure 3-34.

Construction workers would also be subject to construction noise while working onsite. Construction noise levels would be reduced by the construction practices identified in the following Mitigation section.



Source: EPA, 1971 and WSDOT, 1991.

Figure 3-34
Construction Equipment Noise Levels

Mitigation

Construction noise can be reduced by using enclosures or walls to surround noisy equipment, installing mufflers on engines, substituting quieter equipment or construction methods, minimizing operation time, and locating equipment farther from sensitive receptors. To reduce construction noise at nearby receptors, the following mitigation measures could be incorporated into construction plans and contractor specifications:

- Limiting noisier construction activities to between 7 AM and 10 PM, to comply with Department of Ecology (Ecology) noise regulations and reduce construction noise impacts during sensitive nighttime hours
- Equipping construction equipment engines with adequate mufflers, intake silencers, and engine enclosures to reduce their noise by 5 to 10 dBA (U.S. EPA, 1971)
- Specifying the quietest equipment available to reduce noise by 5 to 10 dBA
- Turning off construction equipment during prolonged periods of nonuse to eliminate noise from construction equipment during those periods
- Requiring contractors to maintain all equipment and train their equipment operators, to reduce noise levels and increase operational efficiency
- Locating stationary equipment away from sensitive receptors to decrease noise from this equipment in relation to the increased distance
- Constructing temporary noise barriers or curtains around stationary equipment that must be located close to sensitive receptors, to decrease noise levels at nearby sensitive receptors.

Energy

During construction of the Southeast Issaquah Bypass, energy would be required, primarily in the form of fossil fuels and petroleum products. Energy would be consumed for manufacturing materials, operating construction machinery, and using trucks to haul materials. The total amount of energy used during construction would not have a substantial impact on energy supplies or fuel availability in the project area. Construction energy use would be reduced through good operating practices.

Because impacts would be minimal, no specific mitigation would be needed. Energy used during construction could be reduced using methods to increase efficiency and conservation of resources. Keeping construction equipment in good repair, routing and scheduling construction trucks to avoid traffic congestion, reducing the number of truck trips, and turning off construction equipment rather than allowing it to idle during long periods of inactivity would reduce energy consumption.

Geology and Soils

Impacts

Table 3-29 summarizes potential impacts related to earth resources that could occur during construction within and adjacent to the project corridor.

Steep Slopes

Impacts on steep slopes during construction would relate to earthwork activities including clearing and grading (cuts and fills), retaining wall construction, utility installation, and the installation of temporary and permanent erosion control measures. During construction, steep slopes created by earthwork activities and within natural steep slope areas would be subject to increased erosion and landslide potential.

Table 3-29
Summary of Impacts Related to Earth Resources during Construction

	Steep Slopes	Seismic Hazards	Coal Mine Hazards	Landslide Hazards	Erosion Hazards
Alternative 1	Yes (10)	Yes (32)	No (0)	Yes (0)	Yes (14)
Alternative 2	Yes (10)	Yes (9)	No (0)	Yes (0)	Yes (12)
Alternative 3	Yes (7)	Yes (33)	No (0)	No (0)	Yes (16)
Alternative 4	Yes (9)	Yes (9)	No (0)	No (0)	Yes (12)
Modified Alternative 5	Yes (9)	Yes (32)	No (0)	Yes (0)	Yes (14)
Alternative 6	Yes (9)	Yes (9)	No (0)	Yes (0)	Yes (16)
Alternative 7 (No Action)	No (0)	No (0)	No (0)	No (0)	No (0)
Percentage of total project area affected					

Seismic Hazards

No specific impacts related to seismic hazard areas are expected during construction other than impacts related to the design of the road for mitigation of seismic hazards.

Coal Mine Hazards

Based on available information, it has been determined that no coal mine hazards exist within the project alignment areas.

Landslide Hazards

Impacts on landslide hazard areas would be the same as described previously for steep slopes.

Erosion Hazards

Soil exposed during the construction process is vulnerable to erosion. Therefore, effective erosion and sediment control measures would be required to minimize the erosion and transport of sediment from graded areas.

Geomorphic processes that can generate increased quantities of sediment during construction include sheet wash and rill erosion. The thin layer of water runoff that causes sheet wash erosion is much more effective in moving soil when the vegetative cover is removed. Where surface water becomes concentrated on exposed soil, rills are likely to develop and result in additional soil erosion. Stream corridors can experience either increased erosion or sedimentation as a result of increased stormwater runoff or sediment load.

Ground Disturbance

The project build alternatives would require deep cuts and fills at the north end of the project corridor and primarily fills at the south end of the project corridor. Impacts associated with cuts and fills would be related to the stockpiling of excavated soil, erosion control, and changes to the groundwater system regarding the water table and flow path. Retaining walls would be required, primarily at the north end of the project corridor. Estimated areas of ground disturbance are shown in **Table 3-30.**

Table 3-30
Ground Disturbance for Alternatives 1–6

Alternative	Area of Disturbance
Alternative 1	Approximately 11.7 hectares (28.9 acres)
Alternative 2	Approximately 11.3 hectares (27.9 acres)
Alternative 3	Approximately 11.3 hectares (27.9 acres)
Alternative 4	Approximately 10.9 hectares (26.9 acres)
Modified Alternative 5	Approximately 11.8 hectares (29.2 acres)
Alternative 6	Approximately 11.4 hectares (28.2 acres)

Mitigation

Mitigation for construction impacts would be the same as identified in the Geology and Soils section of this chapter, with the following exceptions:

Erosion Hazards

Appropriate erosion and sediment control measures during construction would be specifically developed to reduce the potential for adverse erosion and sedimentation for the project. Potential sources or causes of erosion and sedimentation depend on many factors including seasonal weather patterns, construction methods, soil stockpile areas, grading plans including slope length and gradient and amount and type of soil exposed.

The proposed project would incorporate mitigation in the form of construction site erosion controls, based on regulatory requirements. The city of Issaquah requires a comprehensive erosion and sedimentation control plan (ESCP). Because portions of the Southeast Issaquah Bypass corridor lie within unincorporated King County, the county's erosion and sedimentation control requirements also apply. Construction work would also require a National Pollutant Discharge Elimination System (NPDES) permit from the Department of Ecology for stormwater discharges associated with construction activities. The NPDES permit process requires development of a stormwater pollution prevention plan (SWPPP), based on the same types of erosion and sediment control measures needed to satisfy the city of Issaquah and King County.

The ESCP must incorporate details on site locations where certain BMPs would be applied. To ensure compliance with the NPDES permit, the erosion and sedimentation control plan would address all of the minimum requirements set forth in Ecology's *Stormwater Management Manual for Western Washington.* The types of BMPs likely to be used include:

- Diversion of offsite runoff around work areas
- Silt fencing sediment containment measures on the perimeter (downslope) of work areas
- Sediment ponds and traps
- Mulch spreading or other temporary ground cover in areas where soils are exposed for a period of time
- Erosion control blankets or comparable soil stabilization measures on steeper slopes and embankments
- Staging of clearing and grading work to limit the extent of disturbed soil at any time
- Rock surfacing in areas of construction site access and equipment parking.

The construction project would also include monitoring of stormwater runoff quality discharged from site. If monitoring indicates that runoff quality exceeds the standards imposed in the NPDES and/or city and county permits, all related construction work would cease, and additional BMPs would be implemented or construction techniques would be modified to bring the project into compliance with those permit conditions.

Ground Disturbance

Modified Alternative 5 would require grading by cuts and fills, which would permanently change the existing topography and would require approximately 11.8 hectares (29.2 acres) of disturbed area.

Slope-support structures such as retaining walls would be required at the north end of the North C alignment. The purpose of slope-support structures would be to reduce disturbed areas and replace the lateral support of cut slopes or support fill embankments. Methods of slope support could include rockeries, mechanically stabilized earth (MSE) geogrid systems, reinforced concrete cantilever walls, or soldier pile walls.

Potential effects of roadway grading on aquifer systems include 1) localized interception of groundwater in roadway and utility cuts (primarily the subperched aquifer), 2) potential obstruction of lateral flow resulting from the placement of roadway embankment fill (primarily in and near wetland crossings), and 3) localized compaction and possible reduction in permeability of surficial soils, resulting from operation of heavy equipment and fill placement. Modified Alternative 5 would cause less impact on groundwater flow, because the alignment area would not completely cross the flow path of an identified wetland.

The suitability of material for use as structural fill would depend on the soil's gradation and moisture content. As the amount of fines (portion passing the U.S. No. 200 sieve) increases, soil becomes increasingly sensitive to small changes in moisture content and adequate compaction becomes more difficult to achieve. The native soils in cut areas may be reused for structural fill provided that the moisture content is at or near optimum for compaction. Some of the surficial weathered soils contain a high fines content and may not be suitable for reuse as structural fill if placement occurs during wet weather. The Vashon recessional outwash (Qyvr and Qovr soil types) typically contains a low proportion of fine-grained material and could be used during wet weather, depending on the amount of precipitation.

Soils considered unsuitable for reuse as structural fill in roadway embankments include topsoil strippings and organic matter (primarily tree roots), and organic soil (in alluvial areas) that is removed during the site preparation process.

Hydrologic Systems

Impacts

Under any of the build alternatives, erosion of disturbed soils in the Southeast Issaquah Bypass corridor could result in clogged ditches, storm drains, and catch basin inlets, which would reduce conveyance capacity and potentially result in localized flooding during heavy storm events. These impacts are of particular concern along 6th Avenue Southeast and Southeast 96th Street (Alternatives 1, 3, and 5) and along Front Street South and 2nd Avenue Southeast near the new roadway intersection that would be created under Alternatives 2, 4, and6. The southern end of the project site contains most of the existing storm drainage facilities in the project corridor. The project construction activity is expected to require approximately two years to complete, therefore cumulative runoff conveyance impacts could occur over the course of two rainy seasons during that timeframe.

Eroded soils that escape sediment trapping facilities within the construction site could be deposited in East Fork Issaquah Creek and in particular in the north tributary to Issaquah Creek (also known as the Lewis Lane Tributary and Hope Creek). They could also be deposited in the main stem of Issaquah Creek farther downstream of the project area. The sediments could potentially reduce the channels' flow conveyance capacity and contribute to increased flooding on lands adjacent to sections of stream channel that experience sediment accumulation. This impact would likely be minor in the east fork and main stem of Issaquah Creek given the channel size, but could be major in the north tributary to Issaquah Creek.

Sediment quantities that could potentially be transported off the project site during the anticipated two years of construction were estimated for this study. These erosion estimates were originally prepared for the North B and South B alignments (i.e., Alternative 4 from the supplemental draft EIS published in 2004).

The Southeast Issaquah Bypass water quality technical report (Herrera, 1998) (prepared for the original draft EIS and incorporated herein by reference) contains details on the calculation of potential soil erosion volumes during the construction phase. The Southeast Issaquah Bypass water quality supplemental technical memorandum (Herrera, 2000) discusses slight modifications to those erosion estimates. The erosion estimates discussed in those documents assumed that the entire site area would be disturbed for a full year of construction of the entire Southeast Issaquah Bypass roadway, and that the project would be completed in one year. Because the project construction would be spread over a longer time frame than assumed in 2000 and the site disturbance would be staged accordingly, it is likely that the estimated erosion volumes are higher than could occur in a one-year period.

In addition to soil erosion volume estimates, the total areas of construction site disturbance under Modified Alternative 5 indicate soil erosion and offsite sediment transport could occur. Because the following Water Quality section summarizes soil erosion information, this section limits the discussion to the impacts and related mitigation measures not included in that section.

If construction site runoff were discharged to surface drainage systems and inadequate BMPs were applied to prevent erosion and trap sediments in runoff, sediment-laden runoff would likely reach East Fork Issaquah Creek and a potentially substantial amount of sediment-laden runoff could be discharged, primarily to the north tributary to Issaquah Creek. The sediment loading to these waters would occur mostly during the wet season (from October through April in successive years of construction). The majority of the loading would occur before permanent improvements (such as pavement and landscaping) are in place or established. If construction site runoff is directed to infiltration ponds or to undisturbed areas of native soils and ground cover, much of the potential offsite sediment loading could be avoided.

To determine whether the potential sediment loading to surface waters would have a major impact, it is useful to compare it to estimates of total sediment loading carried into Lake Sammamish each year. As discussed in the Southeast Issaquah Bypass water quality technical report (Herrera, 1998) (incorporated herein by reference), the conservatively estimated loading of sediments in construction site runoff would represent approximately 0.5 percent of the total estimated sediment loading generated at construction sites in the Lake Sammamish basin during a typical year. Based on this comparison, it is expected that the project construction activities would not cause major impacts on channel conveyance capacity in the east fork and main stem of Issaquah Creek. However, without diligent maintenance of erosion and sediment control facilities, adverse sedimentation impacts might be unavoidable in the north tributary to Issaquah Creek in the southern project area, because of the stream channel's proximity to work areas. Minimal, if any, construction impacts would be expected in the south tributary to Issaquah Creek (also known as Kees Creek and Tributary 0199) because it lies beyond the proposed area of disturbance for bypass roadway construction under any of the build alternatives. If Mitigation Option 2 (at Squak Valley Park) were implemented, construction of the wetland mitigation site could have a minor short-term effect on sediment loading to the lower reach of the south tributary. The conceptual plan for this option does not currently include connection of the mitigation site into the south tributary.

Mitigation

The proposed project would incorporate mitigation for soil erosion impacts into a comprehensive erosion and sedimentation control plan, in accordance with city of Issaquah requirements. Construction work for the overall project would also require a National Pollutant Discharge Elimination System (NPDES) permit from the Department of Ecology for stormwater discharges associated with construction activities. The NPDES permit process requires development of a stormwater pollution prevention plan (SWPPP), based on the same types of erosion and sediment control measures needed to satisfy city of Issaquah permit requirements. Details on specific elements of the erosion and sediment control mitigation for the project are discussed in the following Water Quality (Construction Impacts) section. This section summarizes additional mitigation measures that would be taken to reduce or prevent adverse impacts on nearby drainage systems and stream channel hydraulic conditions.

To prevent reductions in flow conveyance capacity in drainage ditches and piped systems, the following mitigation measures would be implemented:

- Existing drainage inlets and catch basins in and near work areas would be clearly marked and protected as necessary, to prevent silt-laden runoff from directly entering them.
- No material would be placed or dumped into drainage ditches that are not to be permanently filled as part of the project.
- Heavy equipment would not be operated within stream channels, and equipment operations on the channel banks would be limited to the maximum extent possible.
- Stockpiles of excavated soil and construction materials would be located away from the water's edge, outside of the designated stream buffer.
- Mulch, coir fabric, erosion control blankets, or other suitable materials would be placed to stabilize disturbed channel bank areas immediately following the disturbance.
- Permanent stream bank and buffer vegetation plantings, grass seeding, or bioengineered bank protection would be put in place as appropriate, immediately following completion of construction work for the north tributary bridge crossing and for new stormwater pond outfalls to East Fork Issaquah Creek and the north tributary of Issaquah Creek.
- Accumulations of sediment in drainage ditches and piped systems would be cleaned out as needed, during and/or following construction, to restore conveyance capacity.

Floodplains

Impacts

Construction of the project could potentially create an impact on the floodplain if mitigation is not provided before construction is completed. For example, floodplain fill will be required in certain locations to construct the roadway. This fill should be mitigated as described previously in the section on permanent floodplains impacts before a substantial amount of roadway construction commences. Also, erosion control facilities should be in place before the rainy season can cause erosion and sedimentation in local drainages, and stormwater management facilities should be in place before impervious surfaces area created. Operational impacts of construction that could potentially affect the floodplain would be limited to inundation of the construction site by flooding, which would be a very rare possibility.

Mitigation

Mitigation measures would not be required as long as proposed mitigation is carefully scheduled over the multi-year construction period. Erosion control facilities should be constructed prior to onset of the rainy season in the fall, and stormwater facilities should be in place before paving of the roadway commences. Should extreme flood conditions be forecasted, appropriate measure should be taken to remove equipment and materials out of the floodplain.

Water Quality

Impacts

All six build alternatives would have similar construction activity impacts on receiving water quality. During construction, erosion of disturbed soils in the Southeast Issaquah Bypass project area would potentially result in the transport of increased sediment loads to East Fork Issaquah Creek, and would likely result in the transport of increased sediment loads to the north tributary to Issaquah Creek and the main stem of Issaquah Creek downstream. The proposed construction site drainage plans would conceivably include extensive infiltration of construction site runoff, although the feasibility of this approach requires further investigation. The proposed permanent stormwater management ponds in the project corridor could be used as temporary sedimentation and infiltration ponds during construction, although care would have to be taken to prevent the sediment loading from decreasing the native soils' capacity to infiltrate runoff following construction. For the purposes of this analysis it is assumed that all surface runoff from disturbed areas in the southern half of the project site would flow into the north tributary to Issaquah Creek. Some of this sediment loading would reach the main stem of Issaquah Creek and Lake Sammamish farther downstream. The elevated suspended sediment content in these waters could increase turbidity and would potentially increase the concentrations of some pollutants, including phosphorus, which is naturally present in the erodible soils. The BMPs for erosion and sediment control during construction outlined in the King County *Surface Water Design Manual* (King County, 2005) or an equivalent stormwater manual would be followed. These practices would greatly reduce these potential impacts.

Leaks, drips, and spills of fuels, engine fluids, solvents and other construction products such as paints could also contaminate the construction site soils, and this contamination could pass to receiving waters if those soils erode. Eroded soil and sediments on construction sites typically carry absorbed pollutants such as hydrocarbons, oils, metals, and miscellaneous toxic organic compounds. If these contaminants are present in construction site runoff that infiltrates the ground, shallow groundwater quality could potentially be affected. Implementation of effective erosion and sediment control measures can substantially reduce the potential for this type of contaminant transport to occur.

It is anticipated that project construction activities would require approximately 2 years to complete. Erosion-related water quality impacts would occur over the course of that time frame, with most of the impacts occurring in the rainy seasons in successive years. Water quality impacts during the concluding months of construction would likely be much lower as the new roadways are finished, landscaping is established, and soils are stabilized.

Although mitigation measures cannot completely prevent erosion and sedimentation impacts in practice, mitigation measures to combat erosion and sediment transport would be strictly required as part of the project to comply with city of Issaquah, King County, and Washington state requirements. If diligent maintenance of erosion and sediment control facilities is not implemented during the rainy season, these impacts could be substantial, particularly due to the proximity of construction work to the north tributary to Issaquah Creek, high-quality wetlands, and the main stem of Issaquah Creek.

The various build alternatives would all require disturbance of approximately 28 acres of land during construction. It can generally be expected that a greater area of construction disturbance would translate into greater potential for soil erosion-related water quality impacts. However, the extent of grading activity on sloped ground is also a key factor in the potential for soil erosion. The north and south alignment alternatives share many of the same land areas, but there are some minor differences related to erosion potential. The North B and South C alignments would require grading of slightly steeper slopes in comparison to the other alignments, and thus could result in slightly greater erosion and associated offsite sediment transport. The North B alignment would traverse a mild rise in the ground topography near the Issaquah Sportsmen's Clubhouse to a greater extent than the North C alignment, and the North A alignment would not pass through that area. The South C alignment would require grading of fill slopes in proximity to wetlands and the north tributary.

Potential volumes of soil erosion during construction were calculated previously for the draft EIS in 2000. The previous estimates are likely conservative, because not all of the site would be disturbed at once, as assumed in the June 2000 draft EIS. The two-year construction duration would likely result in a staged sequence of site disturbance. However, in comparison to impacts identified in the draft EIS, the duration of potential erosion-related water quality impacts would be longer.

It was previously estimated in the supplemental draft EIS that if all construction site runoff were collected and discharged to surface drainage systems, the total mass of eroded soil and sediment that would enter the east fork and main stem of Issaquah Creek during the single year of construction activity would be approximately 11,700 kg (12.9 tons), or 7.4 cubic meters (9.6 cubic yards). Most of the sediment loading would reach the main stem of Issaquah Creek via the north tributary that traverses the site south of Issaquah High School , as opposed to via the east fork. In this conservative scenario where all construction site runoff is discharged to streams and all site work is completed in one year, it was estimated that approximately 5 kg (11 lbs) of total phosphorus would be transported offsite and carried with eroded soil into Lake Sammamish during that year. With a two-year construction duration now anticipated, it is likely that lesser amounts of sediment and associated phosphorus loading would reach area streams and Lake Sammamish each year.

Potential effects of phosphorus loading can be understood by comparison to the estimated total annual phosphorus loading to the lake from all active construction sites. Accounting for sediment trapping facilities and natural deposition in the basin between the sources of erosion and Lake Sammamish, the total annual phosphorus loading to the lake from active construction sites was estimated by Metro (1995) to be about 540 kg (1,190 lbs) per year on average (3 percent of 18,100 kg). Thus, the phosphorus in sediments discharged in site runoff from the proposed project site during one year of construction would constitute approximately 0.9 percent of the total annual construction-related phosphorus loading to Lake Sammamish, using conservative assumptions. Therefore, this loading would be minor in comparison to the total construction-related phosphorus loading that enters the Issaquah Creek system and Lake Sammamish in a typical year.

Moreover, if extensive infiltration of construction site runoff can be achieved, much of the potential phosphorus loading to Lake Sammamish would not occur. Furthermore, King County Metro (1995) indicates that phosphorus loading from construction sites is a minor factor influencing the lake's phosphorus concentrations and related algal production relative to other sources of phosphorus, such as internal recycling of phosphorus from lake sediments and external loading of phosphorus in runoff from developed lands in the watershed.

In a worst-case scenario where relatively limited sediment control facilities are employed and all construction site runoff is discharged to the Issaquah Creek system, Lake Sammamish would not suffer major phosphorus-related impacts from the Southeast Issaquah Bypass project alone. However, the effects of erosion from the project site coupled with erosion from other developed lands in the watershed could contribute to cumulative adverse water quality impacts in Lake Sammamish over time. Of more concern would be the suspended sediment loading to tributary streams, and the potential effects of increased turbidity on fish and instream habitat.

Under the no-action alternative, no construction would occur in the Southeast Issaquah Bypass area and therefore no construction-related water quality impacts would occur.

Mitigation

The proposed project would incorporate mitigation in the form of construction site erosion controls, based on regulatory requirements. The city of Issaquah requires a comprehensive erosion and sedimentation control plan (ESCP). Because portions of the Southeast Issaquah Bypass corridor lie within unincorporated King County, the county's erosion and sedimentation control requirements also apply. Construction work would also require a National Pollutant Discharge Elimination System (NPDES) permit from the Department of Ecology for stormwater discharges associated with construction activities. The NPDES permit process requires development of a stormwater pollution prevention plan, based on the same types of erosion and sediment control measures needed to satisfy the city of Issaquah and King County.

The erosion and sedimentation control plan must incorporate details on site locations where certain BMPs would be applied. To ensure compliance with the NPDES permit, the plan would address all of the minimum requirements set forth in Ecology's *Stormwater Management Manual for Western Washington* (Ecology, 2005). The types of BMPs likely to be used include:

- Diversion of offsite runoff around work areas
- Silt fencing, compost mulch berms, and/or other sediment containment measures on the perimeter (downslope) of work areas
- Sediment ponds and traps
- Mulch spreading, temporary seeding, or other temporary ground cover in areas where soils are exposed for a period of time
- Erosion control blankets or comparable soil stabilization measures on steeper slopes and embankments
- Plastic covering of soil stockpiles
- Staging of clearing and grading work, to limit the extent of disturbed soil at any time
- Rock surfacing in areas of construction site access and equipment parking.

In accordance with NPDES permit requirements, the construction project would also include monitoring of stormwater runoff quality discharged from the site. If monitoring indicates that the runoff quality fails to meet standards established in the NPDES permit or city and county permits, additional BMPs would be implemented or construction techniques would be modified to bring the project into compliance with permit conditions.

Although these BMPs are extremely important to protect downstream resources, it is not possible to completely prevent erosion and trap sediments. Thus, some sediment would likely be transported offsite. If construction site runoff is discharged to ditches and storm drains, the untrapped sediments would reach nearby drainage systems, wetlands, small streams, and East Fork Issaquah Creek, and ultimately pass farther downstream to the main stem of Issaquah Creek and Lake Sammamish. The Issaquah Creek north tributary would likely be affected most, due to its small size and location with respect to construction site disturbance and concentration of site runoff discharges. Due to prevailing soil characteristics in the northern portion of the Southeast Issaquah Bypass corridor and the distance between construction areas and East Fork Issaquah Creek, it is unlikely that major sediment containment problems would occur in East Fork Issaquah Creek.

It may be possible to use some or all of the proposed permanent stormwater management ponds as sedimentation ponds (and possibly infiltration ponds) during construction. Where the permanent facilities are infiltration ponds, these temporary sedimentation/infiltration ponds should be designed, constructed, and operated to prevent clogging of the infiltration surface at finished grade. For example, excavations for temporary sedimentation/infiltration ponds would be halted approximately 3 to 5 feet above the proposed bottom elevations of the permanent infiltration ponds, to protect the infiltration capacity of the native soils underlying those areas. After site stabilization is accomplished in the tributary drainage area to a particular infiltration pond, the excavation would be completed to the desired finished grade of the infiltration facility. Permanent wet/detention ponds could be used as sedimentation ponds during the construction phase without concern for clogging of underlying soils. To make effective use of sedimentation ponds during most of the construction period, the storm drainage facilities needed to convey flows to the ponds would have to be built as early as possible. Alternative means of accomplishing sediment retention for construction site runoff would also be explored during preparation of the erosion and sedimentation control plan.

To minimize water quality impacts, the following measures would be stressed in the erosion and sedimentation control plan and the stormwater pollution prevention plan:

- At least one or two individuals would be responsible for inspecting and maintaining erosion and sediment control measures and other pollution prevention measures. At least one of these individuals would require Erosion and Sediment Control Lead certification per Ecology's requirements. These individuals must be trained in the effective application of different types of BMPs and the needed frequency of monitoring and maintenance.
- Designated waste disposal containers for garbage, used engine parts, waste oil, and other potentially polluting materials would be well-marked and placed in high-use areas on the construction site.
- Containers for paints, solvents, oil, and other toxic materials would be stored in a covered location when not in use.
- Toxic material spills and leaks would be immediately reported and contaminated soil would be put in storage containers for appropriate offsite treatment and disposal as soon as possible.
- Existing storm drain inlets, catch basins, and culverts that are to remain onsite and in adjacent areas would be clearly marked prior to clearing and grading. These inlets would be protected by filter fabric covers, silt fencing, removable covers, or other means to prevent sediments from entering ditches and underground storm drain pipes that discharge to Issaquah Creek and tributary streams.
- All parking and maintenance areas for vehicles and equipment would be covered with gravel or other stable material to prevent erosion of underlying soil, and these areas would be located as far as possible from wetlands and streams.
- Construction site access roads would be limited to the absolute minimum, to reduce the extent of sediment tracking offsite. Exit points from the site would be equipped with a tire wheel wash facility for use by all vehicles exiting the site. The tire wheel wash pad would drain to a sediment trap or pond or to a dead-end sump for cleanout. Surrounding roads would be swept regularly if sediments were tracked onto these roadways.
- To the maximum extent possible, vegetation removal would be minimized and vegetated buffers would be maintained along the East Fork Issaquah Creek banks and the unnamed tributaries of Issaquah Creek in the south end of the project corridor.

In addition to the erosion control and pollution prevention mitigation measures listed previously, runoff infiltration potential can be maximized if soil compaction is limited. To accomplish this, heavy equipment use would be restricted in site areas that do not require intensive grading and structural preparation work. To the maximum extent possible, overland runoff would be routed to temporary infiltration facilities to prevent eroded soil and sediments from being transported offsite. To prevent the infiltration soil surface from clogging, the various infiltration facilities would need to be protected by upstream settling facilities (such as sediment traps, catch basin sumps, and wet vaults). Accumulated sediment would be frequently removed, particularly during the wet season.

The construction schedule would incorporate permanent landscaping and soil stabilization as soon as possible, in areas where construction activity is completed. For instance, as soon as the road base, curbs, and permanent storm drainage systems are in place in the Southeast Issaquah Bypass corridor, permanent vegetation would be seeded and planted in disturbed areas outside the roadway limits. This measure would limit erosion and would not hinder construction access for final grading and paving. The larger excavation and earth fill slopes on the site would present the greatest potential for erosion, and special attention would be given to stabilizing them accordingly. These areas would include the deeper excavation slopes and longer fill slopes in the northern half of the Southeast Issaquah Bypass corridor.

The no-action alternative would require no construction activity in the project area, therefore no mitigation measures would be needed.

Wetlands

Impacts Common to Alternatives 1, 3, and Modified 5

Temporary impacts on Wetlands GW and VL and their protective buffers would occur during clearing and grading activities in and around areas of permanent wetland fill and construction of the new bridge over the north tributary. Approximately 0.21 hectares (0.53 acres) of wetland area and 0.65 hectares (1.62 acres) of wetland buffer would be temporarily disturbed during construction. **Table 3-31** summarizes the temporary wetland and buffer impacts that would occur with each build alternative.

Table 3-31
Temporary Wetland and Buffer Impacts during Construction

	Wetland Impacts		Buffer Impacts	
	Hectares	Acres	Hectares	Acres
Alternative 1	0.21	0.53	0.65	1.62
Alternative 2	0	0	0.36	0.89
Alternative 3	0.21	0.53	0.65	1. 62
Alternative 4	0	0	0.36	0.89
Modified Alternative 5	0.08	0.20	0.08	0.21
Alternative 6	0	0	0.36	0.89

Temporary impacts on wetlands under Modified Alternative 5 were reassessed in 2005, resulting in lower a lower degree of impact (see previous Wetland section for discussion under permanent impacts).

Impacts Common to Alternatives 2, 4, and 6

Temporary construction impacts on Wetlands GW and HS would be avoided by restricting ground disturbance to areas of permanent wetland fill. Retaining walls would be constructed between roadway construction areas and Wetlands GW and HS, to restrict equipment operation in adjacent wetland areas.

However, temporary impacts on the buffer area around Wetlands GW and HS would occur during clearing and grading activities in and around areas of permanent wetland fill. Approximately 0.36 hectares (0.89 acres) of buffer area would be disturbed during construction.

Mitigation

Disturbed areas would be restored by returning the ground to its original grade and replanting with native wetland vegetation. Low ground pressure equipment and equipment mats would be used whenever possible to minimize temporary construction impacts. Low ground pressure equipment has oversized tires or tracks to spread the weight of the equipment over a larger area, resulting in less rutting and soil disturbance. Equipment mats are large rubber mats that can be placed in wetland areas for equipment to sit on while working. This reduces the disturbance from wheels and tracks and spreads the weight of the equipment over a large area. Vegetation that has been crushed under low ground pressure equipment or where equipment mats are used grows back very quickly, as opposed to areas where recontouring and revegetation is necessary.

All temporary wetland impacts would be mitigated as previously discussed in the section on permanent wetland impacts. This mitigation is incorporated into the conceptual mitigation plan. Under Modified Alternative 5, the total area of 0.16 hectares (0.41 acres) of temporary wetland and buffer impact would be mitigated at a 1-to-1 ratio in accordance with city of Issaquah requirements.

To minimize impacts on wetlands, the following best management practices would be implemented:

- A temporary erosion and sedimentation control plan (TESCP) would be implemented during construction, in accordance with requirements of the King County *Surface Water Design Manual* (King County, 1998).
- Prior to construction the limits of clearing would be marked and temporary erosion control devices (silt fencing, straw bales, etc.) would be placed to prevent runoff of sediment into the wetlands.
- Clearing, grading, and other construction activities during the rainy season (October 1 through April 30) would follow strict wet-weather-permit requirements for allowable turbidity in construction site runoff.
- The stormwater facilities would be constructed and be in operation before the addition of any new impervious surfaces.

- All stockpiles of soils would be covered with impervious materials when left unattended or during rain events.
- Exposed soils throughout the project area that are not intended to be converted to roadways or stormwater ponds would be hydroseeded or revegetated with native species indigenous to the area as soon as possible after grading to minimize erosion potential.
- All refueling operations would be conducted away from the wetlands, and a spill prevention, control, and countermeasures (SPCC) plan would be prepared by the contractor prior to any construction activities. Once construction begins, the contractor would be responsible for implementing the SPCC plan.

Vegetation and Wildlife

Impacts

Vegetation removal during construction would result in displacing or eliminating wildlife within the construction area and adjacent habitats. Less mobile wildlife species such as nesting birds, small mammals (e.g., shrews, mice, chipmunks, squirrels, and rabbits), reptiles (e.g., snakes and lizards), and amphibians (frogs, toads, and salamanders) would be affected. Animals that nest and forage in surface soils and plant communities disturbed by construction could suffer direct mortality or be displaced into adjacent habitats. Construction activities on the edge of a stream channel or in a wetland area that is to be permanently filled may have detrimental effects on amphibians such as frogs, toads, and salamanders. Because wildlife populations are generally maintained at or near full capacity, most wildlife displaced from the project area would likely perish.

Mitigation

Structural elements within the stream corridor and riparian area would be retained or replaced at the completion of construction. These elements, including woody debris, snags, rocks, and boulders, provide important places for wildlife to hide, rest, lay eggs, and move in the riparian corridor. In addition, BMPs and an erosion and sedimentation control plan would be implemented during construction to prevent runoff from exposed soils from entering the stream channel or nearby wetlands. BMPs would be implemented during and after construction to reduce impacts on wetlands, limit the extent of vegetation removal, and revegetate disturbed areas.

Fisheries

Impacts Common to Alternatives 1, 3, and Modified 5

Construction of the new bridge over the north tributary would involve permanent impacts on 0.15 hectares (0.37 acres) of riparian and wetland buffer. The clearing activities may require heavy equipment operation close to the north tributary stream channel. Most of the larger vegetation removed from under the footprint of the new bridge crossing over the north tributary would not grow back. Stream shading would increase, as approximately 0.24 hectares (0.59 acres) of the riparian corridor would be under the bridge. Although stream shading is a beneficial effect, additional impacts may result from the loss of riparian vegetation that stabilizes the stream banks and provides large woody debris. For example, sediments could enter the stream during construction and adversely impact the migration, feeding, and spawning behavior of fish exposed to turbid water. Sediment-laden water could adversely impact the health of fish by clogging gills and abrading skin, and could adversely impact other aquatic organisms that are a food source for fish. Sediment in high quantities can also alter the ability of fish to find habitual spawning and rearing areas by filling in pools and embedding spawning gravels. Impacts on the stream and riparian corridor during construction are expected to be low because heavy equipment would be operated from outside of the stream corridor.

Accidental spills of chemicals and other hazardous materials during construction (including diesel and other fuels, hydraulic fluids, oils, grease, chemicals, and concrete leachates) could enter streams in or near the project area. The severity of impacts would depend on the amount spilled, the distance to a creek, the buffer capacity of vegetation and soils between the spill and the creek, and the amount of stormwater runoff occurring at the time of the spill. Leaks or accidental spills that reach the streams within the project area during construction could potentially kill or harm fish or the aquatic organisms they feed on, through acute toxicity from large spills or the bioaccumulation of components of repeated small spills. The area immediately adjacent to the north tributary and areas adjacent to or within Wetland GW would be most at risk for spills.

Mitigation for Alternatives 1, 3, and Modified 5

Mitigation for all construction-related impacts would be provided. Bridge construction work and other activities that could produce high-intensity vibrations or shock waves within 91 meters (300 feet) of the north tributary would be performed only during WDFW-approved work windows (generally July 1–September 15).

Low ground pressure construction equipment with oversized tires or tracks would be used to spread the weight of the construction equipment over a larger area, resulting in less rutting and soil disturbance in wetland and riparian areas. If practical, large rubber equipment mats may also be used to reduce the disturbance from wheels and tracks. Disturbed areas would be restored as soon as possible, by returning the ground to its original grade and replanting with native riparian vegetation.

The risk of sediment input to streams would be minimized by implementing temporary erosion and sediment controls, according to the requirements and recommendations of the King County *Surface Water Design Manual* (King County 2005) and the Department of Ecology's *Stormwater Management Manual for Western Washington* (Ecology 2005). These measures would greatly reduce sediment impacts on all streams and fish within or near the project area.

Construction contractors would be required to prepare a spill control plan and have equipment necessary for containing and cleaning up hazardous materials at all jobsites. Also, refueling and maintenance of construction equipment would not take place within 91 meters (300 feet) of any stream or wetland. Spill containment booms would be set up around the work area in the stream corridor, especially on the downstream side, to prevent any spills of fuels or other hazardous materials from traveling downstream.

Impacts Common to Alternatives 2, 4, and 6

Road construction near the north tributary may require removal of a small amount of riparian vegetation. This vegetation removal would be limited to approximately 20 trees growing at the base of the existing railroad embankment north of the stream. It is unlikely that these trees would provide any direct stream shading benefits, because they are far from the stream and located north of it. Removing this riparian vegetation would probably not eliminate cover that fish use as protection from overhead predators such as ospreys, kingfishers or other species. Because the area of riparian vegetation removal is relatively small, impacts on fish species would be very minor.

Road construction and right-of-way clearing would temporarily expose soils along the entire length of the project that could be transported by storm runoff to streams and rivers within the project area, depending on the amount of disturbed area exposed and the storm event.

Leaks or accidental spills of chemicals or other hazardous materials during construction could reach streams within the project area, potentially killing or harming fish or the aquatic organisms they feed on. The area immediately adjacent to the north tributary and the area adjacent to or within wetlands GW and HS would be most at risk for spills under Alternatives 2, 4, and 6.

Mitigation for Alternatives 2, 4, and 6

Construction activities adjacent to the north tributary and other activities that could produce high-intensity vibrations or shock waves within 91 meters (300 feet) of the stream would be performed only during WDFW-approved work windows (generally July 1–September 15). Large trees felled to make way for the project would be placed in or near the north tributary channel to provide additional cover in the short-term and a source of large woody debris.

The risk of sediment input to streams would be minimized by implementing temporary erosion and sediment controls, according to the requirements and recommendations of the King County *Surface Water Design Manual* (King County 2005) and the Department of Ecology's *Stormwater Management Manual for Western Washington* (Ecology 2005). These measures would greatly reduce sediment impacts on all streams and fish within or near the project area.

Construction contractors would be required to prepare a spill control plan and have equipment necessary for containing and cleaning up hazardous materials at all jobsites. Also, refueling and maintenance of construction equipment would not take place within 91 meters (300 feet) of any stream or wetland. Spill containment booms would be set up around the work area in the stream corridor, especially on the downstream side, to prevent any spills of fuels or other hazardous materials from traveling downstream. Construction activities adjacent to the north tributary and other activities that could produce high-intensity vibrations or shock waves within 91 meters (300 feet) of the stream would be performed only during WDFW-approved work windows (generally July 1–September 15). Large trees felled to make way for the project would be placed in or near the north tributary channel to provide additional cover in the short-term and a source of large woody debris.

Threatened and Endangered Species

Impacts

For the species potentially inhabiting the general project region, construction activities may affect localized habitat areas. No marbled murrelet, or northern spotted owl nesting or roosting sites are located in the area; therefore, minimal impacts on these species are expected during construction. Construction activities, including noise and dust, would likely prevent random use of local habitat by birds traversing the area when construction is taking place. Such temporary disturbances would not be expected to cause long-term harm to species of concern.

The reach of the north tributary over which the new roadway bridge would be constructed is presumed to carry listed species, although presence has not been documented. Slight changes in riparian vegetation cover along the north tributary could cause temporary changes in water temperature, which could affect fish habitat; however, these changes would be negligible and would disappear when new riparian plantings mature. Temporary reductions in large woody debris recruitment potential, potential sedimentation from in-water work, and localized changes to other baseline indicators may result from construction of the project. These activities may affect potential fish habitat for a short period of time, but are not expected to have significant or long-term effects.

Mitigation

Proposed stormwater treatment and mitigation measures would be used to limit potential impacts on streams during construction activities. Temporary disturbances to riparian areas associated with clearing of vegetation or movement of people and equipment in the area could result in modifications to existing streamside vegetation. These changes are expected to be minor and would not remain once new riparian plantings mature. The impact minimization measures described previously in the Fisheries and Water Quality sections of this chapter would also be used to limit potential direct or indirect effects to fish species. Therefore, construction of the proposed project under all build alternatives is not expected to appreciably diminish the value of critical habitat for listed species in the project area.

Land Use

Impacts

During construction, noise and dust from operation of heavy trucks and machinery would impact surrounding land uses adjacent to the project area. However, these impacts would not be permanent and would differ depending on the stage of the project under construction.

Residents of neighboring streets and students and teachers at Issaquah High School and Clark Elementary School would be subject to noise and dust during different stages of construction in the northern project area, as would members of the Issaquah Sportsmen's Clubhouse. Dust and noise impacts would be experienced by residents and members of the LDS Church in the southern project area. In addition, outdoor school activities could be limited, especially at the athletic field during different construction phases. Access to the field would particularly be limited under Modified Alternative 5 where the North C alignment would require a portion of the field for construction of the proposed roadway.

Traffic congestion also could occur near the schools in the afternoon when classes end. Travel disruption and delays for residents and school buses would occur depending on the truck route selected and the associated schedule. Access to the Sportsmen's Clubhouse and the LDS Church could be interrupted briefly during the project's initial stages.

A location along the proposed project corridor would be required for storage of construction equipment and material. This location may vary as construction occurs. Noise and congestion at these areas may be more concentrated and cause temporary disturbances to nearby land uses.

Mitigation

Alternate routes to the Sportsmen's Clubhouse and the LDS Church would be required to prevent interruption of these uses. Additional mitigation measures are identified in the Air and Noise sections of this chapter.

Social Elements

Community Cohesion and Mobility

Impacts

Construction activities would disrupt residents and local travel patterns near East Sunset Way and in the area of 6th Avenue Southeast and the Front Street South intersection. Potential travel delays and traffic congestion could occur as construction takes place. Residents of the East Sunset Way and 6th Avenue Southeast neighborhoods also could experience disturbances from noise and dust during construction.

Mitigation

Construction impacts would be temporary, and measures to reduce congestion and control noise and dust would be provided. Other measures to minimize disruption to the community due to construction activities will also be instituted, such as variable message warning signs, traffic flaggers, control of work hours to avoid peak commute periods, and night work hours. Specific mitigation for these impacts is provided in Transportation, Noise, and Air Quality sections of this chapter.

Public Services

Impacts

School bus routes that use East Sunset Way or 6th Avenue Southeast could be affected by traffic congestion and travel delays during construction. Clark Elementary and Issaquah High School could experience disturbances from dust and noise during construction. Emergency service response times could be affected by traffic congestion and travel delays during construction activities.

The LDS Church on 6th Avenue Southeast could experience disturbances from noise and dust during construction activities. Access to the church could be impeded during construction by Modified Alternative 5 where the South A alignment of the proposed road would use 6th Avenue Southeast.

Mitigation

Mitigation measures for traffic, noise, and dust are identified in the Transportation, Noise, and Air Quality sections of this chapter. Measures to minimize disruption to the community due to construction activities will be instituted, such as variable message warning signs, traffic flaggers, control of work hours to avoid peak commute periods, and night work hours. In addition to traffic control measures, the proposed project could provide escorts for emergency service vehicles during construction. Temporary access would be provided to the LDS Church during construction.

Utilities

Impacts

Utility lines in the project area could be encountered during construction. Lines located along within, or adjacent to, the proposed project could require replacement or relocation as a result of construction activities. This could result in temporary disruptions in service to local residences and businesses. The individual lines that could be affected are addressed in the following sections.

<u>City Utilities</u>

Water, sewer and stormwater services may require relocation or replacement under all build alternatives.

<u>Telecommunications</u>

Phone lines in East Sunset Way could require relocation or replacement .

<u>Natural Gas</u>

The natural gas line in East Sunset Way could require replacement or relocation .

<u>Electricity</u>

Power lines along the south side of East Sunset Way could require replacement or relocation .

<u>Cable Television</u>

Existing cables on East Sunset Way, Southeast Lewis Street, Southeast Kramer, and Southeast 96th Street could require replacement or relocation under all build alternatives.. Existing city utilities will also be relocated or replaced to maintain service to all properties.

Additional construction activities associated with the proposed sewer line extension in the south project area could add noise, dust and potential traffic delays. This activity may also increase the duration of construction work in this area.

Mitigation

Advance notice would be provided to emergency services and schools regarding construction delays and detours. Issaquah would cooperate with local utility providers where potential disruptions of service or relocations would be needed. Advance notice would be provided to residences and businesses regarding potential interruptions of service and construction schedules.

Recreational Resources

Impacts

All of the build alternatives would generate temporary construction impacts such as increased dust, erosion, noise, and exhaust fumes from construction equipment in the immediate vicinity for up to a year. None of these construction activity impacts are expected to be so severe that they seriously impair the use and enjoyment of existing recreational facilities.

Mitigation

Mitigation measures would not be required.

Transportation Services

Impacts

Bus routes using East Sunset Way could experience travel delays and traffic congestion during periods of heavy construction.

Mitigation

Mitigation measures for traffic congestion are identified in the Transportation section of this chapter. Advance notice of construction schedules would be provided to King County Metro.

Pedestrian and Bicycle Facilities

Impacts

Bicyclists and pedestrians using local roads and trails could experience travel delays and traffic congestion similar to that experienced by vehicles as a result of construction activities. Noise and dust may interfere with bicycle and pedestrian travel. Some bicyclists and pedestrians may choose to avoid traveling in the project area during times of extended construction activity.

Mitigation

Mitigation measures for traffic, noise, and dust are identified in the Transportation, Noise, and Air Quality sections of this chapter.

Economics

This discussion of construction impacts is divided into two sections:
1) construction impacts on travel patterns, the regional and local economy, local

government tax revenues, and property values, and 2) potential mitigation measures for impacts that could result from the proposed project.

Travel Patterns

Impacts

During construction, travel patterns on Issaquah arterials serving downtown commercial districts would be closed or partially closed for short periods of time during the approximately 12- to 24-month construction period. In particular, traffic along East Sunset Way and Front Street South would be affected when the new Southeast Issaquah Bypass roadway is connected to existing streets. At the south end of the project area, this would occur near 6th Avenue Southeast for Alternatives 1, 3, and 5 and in the vicinity of 2nd Avenue Southeast for Alternatives 2, 4, and 6. Because these roadways are currently used for both commute traffic and local travel to downtown commercial districts, it would be extremely important to minimize these adverse effects on traffic.

Mitigation

- Closure or partial closure of East Sunset Way and Front Street South should be planned, to minimize the construction activities needed to connect the Southeast Issaquah Bypass and existing streets.
- Closure or partial closure on these streets should be limited to nighttime or weekend periods.
- If possible, closure or partial closure of these streets during shopping hours should not occur during seasonal heavy shopping periods (i.e., December).
- During closure or partial closure, a detour route to reach downtown commercial districts should be clearly signed. Detour routes should be published in area newspapers.

Regional and Local Economy

Impacts

Economic impacts during construction of the build alternatives would primarily be associated with potential short-term employment impacts. For Modified Alternative 5, the total construction cost for the proposed project is estimated to be $31.7 million of the overall $43.5 million project cost (**Table 3-32).** The other five build alternatives will have a similar, or slightly lower construction cost. Construction is expected to take place over a 12- to 24-month period.

Table 3-32
Estimated Construction Costs and Jobs

	Construction Cost	Direct Jobs	Indirect Jobs	Induced Jobs	Total Jobs
Modified Alternative 5	$331,708,170	223	573	422	1,218
No-Action Alternative	$0	0	0	0	–

Note: Cost estimate used 2002 dollars and inflated the cost 3% per year for cost estimate dollars for 2009.

The direct employment effects would be limited to the project jobs and associated wages for workers involved primarily in the construction sector of the regional economy. The Federal Highway Administration (FHWA) has conducted studies of employment impacts resulting from federal expenditures on highway projects (Keane, 1996). The FHWA estimates that a total of 7,900 full-time jobs are directly created for every $1 billion expended. Using this job multiplier, an estimated 223 direct jobs would be created. The no-action alternative would not involve any construction and would not result in employment impacts.

The number of direct jobs needed for the project determines whether the work force or the regional labor market would be sufficient to meet the demand from construction. For this project, workers filling these jobs would not be limited to workers residing only in the city of Issaquah, because the city is located in a large metropolitan area. In 2000, there were approximately 62,964 workers employed in the construction sector in King County (Washington Employment Security Department, 2002). The demand for 223 direct jobs for the construction of the proposed project would comprise only a small percentage of the existing construction work force in the county.

Construction of the proposed project would also create a demand for workers to fill jobs with local, regional, and national suppliers for the construction project. FHWA research indicates that a total of 19,700 full-time equivalent (FTE) jobs would be indirectly created for every $1 billion of expenditures. The wages paid to workers would be spent in the community, which in turn would create the demand for an additional estimated 14,500 FTE induced jobs from these local expenditures (Keane, 1996). Based on these multipliers, an estimated 573 indirect and induced jobs would be created. These figures would comprise a very small percentage of the regional work force.

Mitigation

Adverse impacts on the regional or local economy would not be expected under Modified Alternative 5, so no mitigation measures are recommended.

Local Government Tax Revenues

Impacts

Construction of the proposed build alternatives would result in the purchase of construction materials, and workers would purchase goods and services. These purchases would increase sales tax revenues to local government.

The estimated cost to construct the proposed build alternatives includes an estimate of the sales tax that would be paid from the purchase of construction supplies. The purchase of these supplies would be expected to occur primarily within the region, not just within the city of Issaquah. The amount of sales tax from construction activities would range between approximately $1.3 million and $1.6 million. The sales tax revenues would be distributed to local governments based on the location of the sales and state statutes regarding what percentages are distributed to the state of Washington and what percentage is distributed to the local government. The 2002 adopted King County budget anticipated approximately $325 million in sales tax revenue, thus the estimated sales tax revenue to King County would be expected to be a small percentage of the total annual sales tax revenue.

Local businesses in the Issaquah area, however, would temporarily benefit from construction of the proposed Southeast Issaquah Bypass. Workers would be employed locally at the construction site and would likely spend money for food and sundries at local stores. In addition, expenditures would be spent along the construction workers' commute routes. Local retail sales would temporarily increase during the construction period of the proposed Southeast Issaquah Bypass but would not likely result in a noticeable increase in the region.

Mitigation

Adverse impacts on local government tax revenues would not be expected under Modified Alternative 5, so no mitigation measures are recommended.

Property Values

Impacts

During construction, increases in air, noise, and traffic impacts in the immediate construction area could temporarily affect property values. Property values are not expected to be greatly affected over the long term.

Mitigation

Adverse property value impacts would not be expected during the construction period, so no mitigation measures are recommended. However, property owners and real estate agents working in the Issaquah area should be provided with information that could be used to advise prospective property sellers or property buyers of the planned road improvements, construction activities, and duration of construction. This would ensure that full disclosure occurs for any potential real estate transactions during the construction period.

Displacements and Relocations

Impacts

Some residences would experience temporary disruptions in access to their properties as a result of construction activities. Residences on Southeast Lewis Lane and Southeast Kramer Place could also experience similar disruptions during construction in the southern portion of the project area, especially under Alternatives 1, 3, and Modified 5. Temporary access measures could be needed to assure that access is not deprived.

Mitigation

Property acquisitions would be compensated at fair market value under the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Temporary access provisions would be made where appropriate.

Historic and Archaeological Elements

Impacts

Vibrations due to construction may affect the White Swan Inn (17-51) and the Issaquah Sportsmen's Clubhouse. Although these vibration levels are likely to be felt by residents, they are unlikely to cause property damage and are not an adverse effect.

Mitigation

No mitigation measures would be required.

Hazardous Materials

Impacts

Construction of the proposed project would potentially affect areas where historical and current use has included the use, generation, storage, release, or disposal of hazardous materials and petroleum products. Impacts would be related to contained hazardous materials, demolition of existing structures, and construction in areas of potential soil or groundwater contamination. Potential hazardous material impacts related to construction of the proposed alignments are described in the following sections. **Table 3-33** summarizes construction impacts and mitigation measures for all build alternatives.

Contained Hazardous Materials

It is likely that heating oil storage tanks, both undergound and aboveground, and possibly other contained hazardous materials, are present at residential properties, the former landfill area, and other structures along the project corridor. The presence of contained hazardous materials, including petroleum products in underground storage tanks (USTs), aboveground storage tanks (ASTs), pole- and pad-mounted electrical transformers, and other containers at the site, could result in an impact on human health and the environment if not mitigated.

Residential heating oil underground storage tanks (less than 1,100-gallon capacity) are exempt from regulation by the state of Washington; however the Issaquah Building Department and the King County Fire Marshal require that underground storage tanks no longer in use be emptied and removed (or abandoned in place in King County) after obtaining the required permits.

Several pole-mounted electrical transformers are present in the project area and could be removed and possibly relocated during construction. These transformers contain mineral insulating oil and several also contain PCBs. The potential hazardous material-related impact of these transformers could be mitigated by proper management by PSE, the electrical utility.

Demolition of Existing Structures

The demolition, removal, and disposal of existing site residences and other structures during construction could release materials, including asbestos-containing materials (ACM) and lead paint, that are hazardous to human health and the environment when disturbed and/or disposed of inappropriately.

Table 3-33
Potential Hazardous Materials Impacts and Mitigation Measures

Alt.	Construction Activity Impacts	Mitigation Measures
1	Contained hazardous materials include underground and aboveground storage tanks (USTs/ASTs) and transformers that may exist at structures to be demolished, and may exist in former landfill area. Demolition of no structures on north end and ten structures on south end. Construction in potentially contaminated areas of former landfill, near USTs/ASTs that may exist, former residences, former railroad right-of-way, and area of waste fill.	Arrange with PSE to remove and relocate transformers. Assess structures to be demolished for USTs/ASTs, remove if present. Assess areas of potential contamination, remediate if needed. Conduct predemolition asbestos and lead surveys, remove and dispose as needed.
2	Contained hazardous materials include transformers and USTs/ASTs that may exist at structures to be demolished, and may exist in former landfill area. Demolition of no structures on north end and five structures on south end. Construction in potentially contaminated areas of former landfill, near USTs/ASTs that may exist, former residences, and former railroad right-of-way.	Arrange with PSE to remove and relocate transformers. Assess structures to be demolished for USTs/ASTs, remove if present. Assess areas of potential contamination, remediate if needed. Conduct predemolition asbestos and lead surveys, remove and dispose as needed.
3	Contained hazardous materials include transformers and USTs/ASTs that may exist at structures to be demolished, may exist in former shotgun shooting range, and waste and fill area. Demolition of one structure on north end and ten structures on south end. Construction in potentially contaminated areas of, near USTs/ASTs that may exist, former residences, former railroad right-of-way, former shooting range, and former waste fill area.	Arrange with PSE to remove and relocate transformers. Assess former shotgun shooting range for contained hazardous materials and contamination, remove and remediate as needed. Assess structures to be demolished for USTs/ASTs, remove if present. Assess areas of potential contamination, remediate if needed. Conduct predemolition asbestos and lead surveys, remove and dispose as needed.

Table 3-33 (continued)
Potential Hazardous Materials Impacts and Mitigation Measures

Alt.	Construction Activity Impacts	Mitigation Measures
4	Contained hazardous materials include transformers and USTs/ASTs that may exist at structures to be demolished, and may exist in former shotgun shooting range. Demolition of one structure on north end and five structures on south end. Construction in potentially contaminated areas of, near USTs/ASTs that may exist, former residences, former shotgun shooting range, and former railroad right-of-way.	Arrange with PSE to remove and relocate transformers. Assess former shotgun shooting range for contained hazardous materials and contamination, remove and remediate as needed. Assess structures to be demolished for USTs/ASTs, remove if present. Assess areas of potential contamination, remediate if needed. Conduct predemolition asbestos and lead surveys, remove and dispose as needed.
5 (mod)	Contained hazardous materials include transformers and USTs/ASTs that may exist at structures to be demolished, and may exist in former shotgun shooting range and former landfill area. Demolition of no structures on north end and ten structures on south end. Construction in potentially contaminated areas of, near USTs/ASTs that may exist, former residences, former shotgun shooting range, former landfill area, and former railroad right-of-way.	Arrange with PSE to remove and relocate transformers. Assess former shotgun shooting range and former landfill area for contained hazardous materials and contamination, remove and remediate as needed. Assess structures to be demolished for USTs/ASTs, remove if present. Assess areas of potential contamination, remediate if needed. Conduct predemolition asbestos and lead surveys, remove and dispose as needed.
6	Contained hazardous materials include transformers and USTs/ASTs that may exist at structures to be demolished, and may exist in former shotgun shooting range and former landfill area. Demolition of no structures on north end and five structures on south end. Construction in potentially contaminated areas of, near USTs/ASTs that may exist, former residences, former shotgun shooting range, former landfill area, and former railroad right-of-way.	Arrange with PSE to remove and relocate transformers. Assess former shotgun shooting range and former landfill area for contained hazardous materials and contamination, remove and remediate as needed. Assess structures to be demolished for USTs/ASTs, remove if present. Assess areas of potential contamination, remediate if needed. Conduct predemolition asbestos and lead surveys, remove and dispose as needed.

Asbestos, commonly used in construction for insulation, fireproofing, and soundproofing, is known to cause cancer and other respiratory problems. Lead, often found in lead pipes, copper pipes with lead solder, and interior and exterior painted wood, siding, window frames, and plaster, can result in lead poisoning if inhaled or ingested during demolition. Potential impacts related to the demolition of existing structures would be related to worker safety and could be mitigated by identification, removal, and proper disposal.

Construction in Potentially Contaminated Areas

Construction activities (e.g., grading and dewatering) in areas of potential soil and/or groundwater contamination could have an impact on human health and the environment. Grading and dewatering activities in these areas during construction could cause worker exposure to the contaminants. Grading in areas of contaminated soil and groundwater could mobilize contaminants. Dewatering in areas of contaminated soil and groundwater could result in contamination in the area where the water is discharged.

Potentially contaminated areas at the project site may exist in the vicinity of contained hazardous materials and other areas located along or adjacent to the planned alternative alignments, specifically in the area of heating oil tanks related to residences, the Issaquah Sportsmen's Clubhouse shooting ranges (current and former), the former landfill area and the former railroad right-of-way. Contaminants typically associated with shooting ranges include lead and polyaromatic hydrocarbons (PAHs) from broken clay pigeons.

Other areas of potential contamination that may exist at the site were not identified during this study. If present, this impact could be mitigated by assessment and remediation. If soil and groundwater contamination is suspected during clearing and grading activities in other project areas, these impacts could be similarly mitigated by assessment and remediation.

Mitigation

The potential impacts related to contained hazardous materials could be mitigated by identification, removal, and proper disposal as necessary. A preliminary site assessment would be conducted prior to acquisition of properties to further evaluate the presence of underground and aboveground tanks, drums, and other containers of hazardous materials at the site. The contained hazardous materials could be identified so that proper removal and disposal could be completed prior to clearing, demolition, and grading activities. Any impacted USTs should be removed. If a product release is confirmed during removal, the release is regulated by the Department of Ecology under the Washington Model Toxics Control Act (MTCA). The removal or relocation of any electrical transformers would be conducted by PSE.

A predemolition asbestos and lead survey would be conducted. If regulated amounts of asbestos-containing material and lead are identified, removal would proceed by a qualified contractor using air quality monitoring to ensure worker safety. Disposal of these materials would be in accordance with applicable regulations.

The potential impacts related to areas of potential soil and groundwater contamination can be mitigated by identification, removal, and proper disposal. A preliminary site assessment would be conducted near the former landfill and at the former trap range prior to property acquisition to further evaluate soil and groundwater conditions. In the event that soil and/or groundwater contamination is identified and the property is still acquired, the impact would be mitigated by remediation in accordance with MTCA.

Soil conditions along the former railroad right-of-way and in the vicinity of former structures would be evaluated as construction grading occurs. If contaminated soil is suspected, it would be assessed and remediated as necessary. Prior fill along the South A alignment would be evaluated and removed; if contamination is suspected, fill would be disposed of appropriately and soil and groundwater would be assessed.

Visual Quality

Impacts

During construction, the number and movement of trucks and equipment in the project area, including light and glare, would be noticeable from surrounding properties. Areas used for storage of construction equipment and materials, as well as staging areas for construction activities could be noticeable in various locations along the project corridor.

Mitigation

Project staging and storage areas should be located away from existing neighborhoods and outside the view range of local trails wherever possible. Construction hours could be limited, especially during evening hours to avoid visual disturbances related to vehicle lights and illumination.

Irreversible and Irretrievable Commitment of Resources

The implementation of the build alternatives described in this document would require the commitment of natural, physical, human, and fiscal resources. For this alternative, this commitment would be irretrievable and irreversible in the sense that, once committed, the resources devoted to construction of the proposed project would no longer be available for other activities. For all practical concerns, land used for the new facilities would reflect an irreversible commitment. The loss of land would include biological resources such as wetlands, vegetation, and wildlife habitat, which would also be irreversibly lost in constructing the proposed project.

Although mitigation measures are proposed to minimize these losses, any commitment to use land would reflect an irreversible choice to alter the physical features of that land and displace plant and animal species. In a number of instances, this loss of habitat and displacement results in the death of some plant and animal species that are forced to compete for increasingly scarcer places to live. Although some species would likely perish, the proposed project is not expected to result in the death of federally listed threatened or endangered species.

Considerable amounts of labor, energy, and highway construction materials such as cement, aggregate, and bituminous material would be expended in constructing the new roadway. These resources are in generally good supply, and the proposed project would diminish but not deplete overall supplies. It is therefore not expected to substantially impact their availability for future uses. Project construction would also involve a one-time expenditure of state and federal funds that would not be retrievable.

The commitment of these resources is based on the concept that residents in the immediate area, region, and state would benefit from improvements to the transportation system. These benefits are expected to consist of improved accessibility and safety, time savings, and a greater availability of quality services. Therefore, these benefits are anticipated to outweigh the commitment of the resources used in their construction.

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Relationship of Short-Term Uses of Environment and Long-Term Productivity

The proposed project would have short and longer-term impacts on elements of the built and natural environment. During construction, temporary impacts on noise levels, air quality, and local traffic are expected. Residences and businesses in the project area may experience congestion and impacts associated with noise and dust from construction. Delays related to construction activities and potential traffic detours would likely occur at this time.

Long-term impacts would result from the decision to locate the proposed roadway on local land resources. Loss of vegetation, soils, and wetland areas would occur. Single-family residences would be displaced under Modified Alternative 5 and wetland losses would occur. Although Modified Alternative 5 would benefit the local community, the decision to construct the proposed project would require a fundamental choice between using existing natural areas for new roadway construction versus maintaining existing conditions without providing potential transportation improvements.

The project area's existing rural character would be altered by the presence of a new arterial. Although mitigation measures are expected to reduce this impact, the proposed project would introduce a major roadway in the sparsely developed project area.

These impacts would be balanced against expected improvements associated with congestion relief and local mobility. Traffic movement and downtown congestion within the city of Issaquah are expected to improve, and new access to an I-90 interchange would provide a long-term connection for major east-west travel. The proposed project is part of current local and regional transportation plans that consider the need for present and future traffic improvements under the context of land use and development projections for the project area. Within the state, the Growth Management Act requires communities to coordinate expected land use growth with appropriate infrastructure improvements needed to support that growth. Issaquah and King County's comprehensive planning efforts recognize this need, and the proposed project would be consistent with the land use and transportation policies in these documents.

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Secondary and Cumulative Impacts

Secondary and Cumulative Impacts

Except as noted, the evaluation of secondary and cumulative impacts and mitigation applies to all build alternatives.

Secondary and cumulative impacts may occur in the study area. Generally, secondary impacts occur as a result of a proposed project action, but take place later in time than the initial action. Cumulative impacts occur as a result of the combined effects of several proposed project actions that may take place in the project area. Several planned and proposed projects were considered in relation to potential cumulative impacts associated with the Southeast Issaquah Bypass. These include baseline transportation improvements and land use development projects in the project area including the recently completed North SPAR and South SPAR/Sunset interchange projects.

The proposed Park Pointe development project was given special consideration because of its potential location immediately east of the proposed Southeast Bypass project's central section. After issuance of the supplemental draft EIS in 2004, the city council in 2004 approved a new planning designation for the Park Pointe property as low-density residential, removing the former urban village designation. Consistent with this change, current plans for the project show a combination of up to 356 single-family homes and town house units proposed for the site. The city has continued to require preparation of an EIS to fully evaluate the impacts of the proposed Park Pointe project. Therefore, this section notes where potential impacts may be related to the combined effect caused by the proximity of the Southeast Bypass and the Park Pointe development. As noted in the Land Use discussion, these two projects are not related (i.e., one is not dependent on the other), and the Southeast Bypass may be constructed regardless of whether Park Pointe development occurs, just as the Park Pointe project may be developed without Southeast Bypass construction. As with the Southeast Issaquah Bypass, no permits have been issued for the Park Pointe project, and the proposed project's site plan continues to undergo environmental review by the city.

Air Quality

Impacts

Secondary impacts on air quality were evaluated by modeling the intersections with the highest traffic volume and worst level of service where traffic flows potentially would be affected by the Southeast Issaquah Bypass project, even if the intersections were not part of the proposed action.

Along with projected future traffic volumes, cumulative impacts—including impacts of the newly constructed North SPAR, South SPAR, and Sunset interchange modifications—were included in the air quality analysis for this project. The projects included in this analysis would cumulatively divert sufficient traffic from the Front Street South interchange to eliminate the exceedance of the NAAQS that was predicted under the no-action analysis.

Mitigation

Additional mitigation beyond that identified under operational impacts is not proposed.

Noise

Impacts

The noise analysis for the Southeast Issaquah Bypass project includes traffic associated with other projects in the Issaquah area, including the newly constructed South SPAR/Sunset interchange and the North SPAR. Therefore, the direct impacts analysis already includes secondary and cumulative effects on the noise environment.

Mitigation

Mitigation measures would be the same as those provided in the analysis of direct impacts.

Energy

Impacts

The energy analysis presented in the main Energy section of this chapter included the effects of other projects in the Issaquah area on energy consumption in the study area (including the recently completed Sunset interchange and Highland Drive). Therefore, the direct impacts analysis already includes secondary and cumulative effects related to energy.

Mitigation

Mitigation measures would be the same as those provided in the analysis of direct impacts.

Geology and Soils

Impacts

No secondary impacts on earth resources are expected for the build alternatives. The extent of cumulative impacts would depend on the overall compliance of adjacent area developments associated with mitigation of earth resource considerations. Cumulative impacts would result from this project and other projects; however, BMPs would be used to reduce erosion and sedimentation impacts. Along with other proposed projects, the project would potentially contribute to overall water quality degradation within the Issaquah Creek watershed if not properly mitigated.

Mitigation

These impacts are not expected to be substantial, and mitigation beyond the measures identified in the preceding impacts analysis would not be needed.

Hydrologic Systems

Impacts

The Southeast Issaquah Bypass project, in combination with the proposed Park Pointe development and other recently constructed transportation improvement projects, may result in secondary and cumulative impacts on receiving waters during construction activities and long-term operations. The transportation projects considered in this assessment of secondary and cumulative impacts are the South SPAR, I-90/East Sunset Way interchange, and North SPAR projects, all of which have been constructed in the last few years. The South SPAR and North SPAR projects were constructed mostly through previously undeveloped areas.

The Park Pointe development proposes to discharge all of its runoff to an infiltration system, up to the 100-year event, without overflow occurring to the north tributary to Issaquah Creek. This development proposal also includes collecting and bypassing offsite (upslope, east) seepage and runoff for direct discharge to the north tributary. Thus, there would be no secondary and cumulative effects associated with the Park Pointe development.

The Southeast Issaquah Bypass project could contribute to secondary and cumulative effects on hydrologic systems, in combination with the other transportation improvement projects identified above. The South SPAR and I-90/East Sunset Way interchange projects resulted in increased runoff volumes discharged to East Fork Issaquah Creek over the long term. As described previously in the analysis of stormwater runoff effects of Modified Alternative 5 on East Fork Issaquah Creek, if stormwater runoff cannot be infiltrated at North Pond N-1, a slight increase in the average annual flow in East Fork Issaquah Creek would occur in the wet season, and a slight decrease in dry season base flow could occur in the creek. These hydrologic changes would add to similar changes that occurred due to the South SPAR and I-90 interchange projects. The cumulative effect of these hydrologic changes in east fork flow characteristics would be minimal in comparison to the flow carried in this stream in both the wet season and dry season. The North SPAR project would not affect drainage systems or groundwater in the immediate vicinity of the Southeast Issaquah Bypass.

The other transportation improvement projects identified above could contribute to secondary and cumulative effects associated with construction site sediments entering Issaquah Creek. Construction activities at these project sites may result in cumulative sediment deposition impacts in lower Issaquah Creek, due to transport of eroded sediments in surface runoff from the construction sites. The previous construction of the South SPAR and I-90/East Sunset Way interchange projects resulted in sediment transport to the east fork and lower main stem channel of Issaquah Creek. Therefore, sediment loading in construction site runoff from the Park Pointe development site could combine with sediment loading from the Southeast Issaquah Bypass project site, and sediments from these recent transportation construction projects, farther downstream in Issaquah Creek, near the creek mouth at Lake Sammamish.

The cumulative sediment loading from the other transportation improvement projects would likely be much greater than the sediment loading generated in runoff from the Southeast Issaquah Bypass construction site. Under extreme circumstances, sediments deposited in the lower reach of Issaquah Creek could reduce the conveyance capacity of the channel, thereby raising water levels slightly. However, this fine-textured sediment would move downstream into Lake Sammamish, maintaining channel conveyance capacity.

Cumulative impacts could occur in the north tributary to Issaquah Creek as a result of construction activities for the Southeast Issaquah Bypass and the Park Pointe development. This small stream would receive runoff from much of the Southeast Issaquah Bypass construction site and nearly all of the Park Pointe construction site until its permanent stormwater infiltration system is installed. The cumulative effects of sediment deposition in the stream could include reduction in channel conveyance capacity and an increase in local flooding along the stream corridor. If the two projects were constructed during the same time period, the cumulative impacts would probably be more pronounced.

It is probable that the other transportation improvement projects identified above would collectively reduce infiltration of runoff over the long-term. However, the Southeast Issaquah Bypass project may not contribute to these impacts if the project can achieve stormwater infiltration in one or both of the North Pond N-1 and South Pond S-1 sites, in addition to infiltration at North Pond N-2 as discussed earlier in this chapter. In the event that it is determined that infiltration cannot be relied upon extensively for the northern portion of the Southeast Issaquah Bypass alignment, the project would contribute to a cumulative reduction in groundwater recharge. These potential cumulative impacts are important because the lower Issaquah Valley aquifer has experienced increasing losses of recharge areas due to expanding urban development. This has resulted in lower aquifer water levels that are a concern to local well users and operators. Groundwater supply for Issaquah and Sammamish Plateau utility wells would be slightly reduced by the cumulative reduction in recharge. The recent connection of the city of Issaquah water system to the regional supply pipeline provides a reliable alternate water supply source to offset the impacts of a possible declining aquifer recharge.

Declining groundwater elevations could contribute to more frequent and prolonged incidences of dry conditions in North Fork Issaquah Creek at the driest times of year. Historically, this creek has dried up very rarely and for short periods of time. In recent years, it has dried up several times, for longer periods of time. This problem has captured a lot of local attention and is a serious consequence of urban development. If groundwater recharge is further reduced in the future, and if there is a hydrologic connection between the project area and the Issaquah Creek north fork (which has not been determined), the reduction in flow in the north fork could be exacerbated.

The other transportation improvements identified above would likely result in greater volumes of surface runoff entering Issaquah Creek, due to the greater extent of impervious surfaces and the inability of some of these projects to implement infiltration facilities. The recently constructed South SPAR and I-90/East Sunset Way interchange projects attempted to include infiltration of runoff to the maximum extent possible to prevent adverse impacts downstream, although the success of those infiltration systems has proven to be less than planned for. The North SPAR project primarily included surface discharge facilities in the drainage system.

The Southeast Issaquah Bypass would generate slightly greater flow volumes in the Issaquah Creek system during the wet season. The cumulative effect of increased streamflow could slightly prolong the duration of flooding conditions near the mouth of Issaquah Creek during extreme events, but increased flow volumes are not likely to result in higher flood elevations because of the timing of runoff discharges to the creek system.

In the dry season, those project areas where infiltration is reduced would contribute less shallow subsurface flow to streams, and therefore summer base flows in the main stem of Issaquah Creek would be slightly reduced. As discussed in the Hydrologic Systems section of this chapter, these low-flow impacts would not be substantial due to the amount of flow in Issaquah Creek throughout the dry season. However, the problem of elevated temperatures in Issaquah Creek could creep farther downstream if streamflow rates are reduced slightly in the dry season.

The Southeast Issaquah Bypass and Park Pointe projects could collectively result in disruptions of shallow subsurface flow and groundwater seepage moving westward at the toe of Tiger Mountain. Some existing groundwater seeps in the central and northern portions of the proposed project corridor would be intercepted by the new roadway shoulder and retaining walls. It is likely that those flows would infiltrate back into the ground as presently occurs, but in a different location (along the eastern road shoulder and behind retaining walls as opposed to further to the west). The Park Pointe project drainage plans include interception of runoff and shallow subsurface flow moving down the slope from offsite areas toward the proposed project corridor. That diversion, coupled with the effects of the Southeast Issaquah Bypass roadway, would be a minor change in the hydrologic connectivity of the shallow groundwater system, small wetlands, and recharge areas for the underlying aquifer.

Attachment B to the Concurrence Point 3 packet presents detailed information in a letter from the FHWA regarding the potential for the Southeast Issaquah Bypass to induce additional development in the project vicinity. The findings of the FHWA analysis indicate that substantial growth would not be triggered by the Southeast Issaquah Bypass project, and therefore it is not expected that significant secondary and cumulative impacts on the Issaquah Creek system and the lower Issaquah Valley aquifer would occur due to future growth as a result of the bypass project. Other development projects in the area would be expected to employ infiltration of runoff to the maximum extent possible. However, it is probably not feasible for all future projects to entirely avoid surface discharges of runoff. Even with the most effective stormwater detention systems and greater use of low impact development principles, newly developed project sites generally produce greater surface runoff volumes than undeveloped sites. Therefore, Issaquah Creek flooding impacts could increase slightly over time due to prolonged high water conditions.

In a larger context, the road improvement projects considered in this assessment of secondary and cumulative impacts would cover a minor proportion of the total Issaquah Creek basin area. Therefore, other land uses throughout the basin can be expected to have a greater influence on groundwater recharge and stormwater runoff patterns in this basin.

Mitigation

Stormwater runoff from the Southeast Issaquah Bypass project would be infiltrated to the maximum extent possible, and surface runoff would be controlled with detention systems designed to prevent impacts on Issaquah Creek flooding conditions (i.e., Level 2 flow control in accordance with the King County *Surface Water Design Manual*). Therefore, no additional mitigation to reduce potential secondary and cumulative impacts is proposed for the project.

Floodplains

Impacts

Secondary floodplain impacts would occur under all build alternatives due to long-term changes to hydrologic conditions within the Issaquah Creek basin. These changes are due to higher peak flows during extreme precipitation events. Higher peak flows in the receiving waters would result in higher flood levels within the floodplains.

The Issaquah Highlands development, South SPAR, I-90/East Sunset Way interchange, and Park Pointe development all have potential for altering hydrologic conditions in the east fork and main stem of Issaquah Creek by increasing peak streamflows during extreme precipitation events, such as the 100-year event. However, these impacts are expected to be mostly mitigated by their project-specific mitigation measures, because these projects are required to comply with the stormwater detention requirements set forth by the city of Issaquah, King County, and WSDOT.

The secondary impacts of Alternatives 2, 4, and 6 would be slightly less than for Alternatives 1, 3, and 5, because wetland impacts would be smaller and floodplains would not be affected. Cumulative impacts would be similar among all build alternatives.

Mitigation

As with the other proposed projects noted previously, the Southeast Issaquah Bypass project would include the use of best management practices as specified by Issaquah, King County and WSDOT regulations. These measures would be expected to significantly reduce the potential for secondary and cumulative impacts on floodplains under all but the most extreme flood events.

Water Quality

Impacts

The Southeast Issaquah Bypass project, in combination with other transportation and development projects identified in the previous sections, may result in secondary and cumulative impacts on receiving water quality. Because most of the proposed project sites are within the Issaquah Creek watershed, the majority of site runoff would drain to the lower reach of Issaquah Creek. Surface drainage from the local transportation projects and from the Southeast Issaquah Bypass project would flow to Lake Sammamish, and therefore these projects could have a cumulative impact on Lake Sammamish water quality. No other ongoing or proposed transportation projects in the vicinity would affect shallow groundwater in the immediate vicinity of the Southeast Issaquah Bypass project site.

The potential cumulative effects of other development in the project vicinity would be associated with the following types of water quality impacts:

- Sediments and pollutants in construction site runoff entering the north tributary to Issaquah Creek, East Fork Issaquah Creek, and the main stem of Issaquah Creek downstream
- Accidental spills of toxic materials entering these creeks or the lower Issaquah Valley aquifer due to vehicular accidents
- Minor increases in surface water loadings of suspended solids, metals, and other pollutants that are common in roadway runoff
- Cumulative phosphorus loading impacts on Lake Sammamish.

Construction Impacts

Cumulative impacts of construction activities on downstream water quality would be greater if the Park Pointe development is under construction at the same time as the Southeast Issaquah Bypass. For instance, turbidity levels in lower Issaquah Creek would likely be higher if excavation and grading activities are ongoing simultaneously at several large construction sites. Turbidity levels in the Issaquah Creek north tributary could be higher if the Southeast Issaquah Bypass and Park Pointe projects are built at the same time and ineffective erosion and sediment control measures are implemented.

During the construction phase of these projects, surface runoff could potentially carry eroded soil and sediments from the construction sites into Lake Sammamish via the Issaquah Creek system. Sediments and other pollutants that may be present in construction site runoff from the Park Pointe development could combine with sediment and pollutant loadings from the Southeast Issaquah Bypass project farther downstream in Issaquah Creek, near the mouth at Lake Sammamish.

The erosion-related water quality impacts of the Southeast Issaquah Bypass construction activities are expected to be minor and mostly reducible through diligent implementation of construction-site BMPs, although the phosphorus in sediments that escape containment could contribute to cumulative impacts on Lake Sammamish water quality.

Aside from the recently completed North SPAR, South SPAR, and I-90/East Sunset Way interchange projects, no other transportation improvement projects are planned for the area that are of similar size to the Southeast Issaquah Bypass project. If other construction projects are identified, they would be required to implement BMPs for erosion control, sediment control, and pollution prevention similar to those required of the Southeast Issaquah Bypass project. However, if several project sites were under construction at once, the combined effect of minor sediment loading from each site could be a noticeable increase in turbidity in the lower reach of Issaquah Creek and a short-term increase in the amount of phosphorus entering Lake Sammamish from Issaquah Creek.

High turbidity levels could adversely affect fish and other aquatic organisms in the lower reach of Issaquah Creek, and to a lesser extent in Lake Sammamish near the mouth of the creek. Lake Sammamish could experience a short-term increase in phosphorus concentration, which could slightly worsen related water quality problems in the lake for a period of time commensurate with construction activities. Any resultant increases in phosphorus loading to the lake in suspended sediments would also contribute to internal phosphorus loading in Lake Sammamish. Eroded soils and sediment transported to the lake would ultimately settle to the lake bottom. Phosphorus could leach back out of these sediments in the future and be reintroduced into the water column (thus increasing internal phosphorus loading) during the lake's seasonal cycle of reduced oxygen concentrations in the hypolimnion (the bottom layer of the water column).

Permanent Impacts

The potential for damaging releases of toxic materials in vehicular accidents can be considered a secondary and cumulative impact of transportation improvement projects, although this type of threat to water quality is common to the entire urbanized Puget Sound area. Accidental spills would be expected to occur infrequently on all of the roadways in the Issaquah area.

Of the secondary and cumulative water quality impacts, the potential for long-term increases in phosphorus loadings discharged to Lake Sammamish is of greatest concern. Because the Southeast Issaquah Bypass project is expected to result in no net increase of phosphorus and other pollutant loadings discharged to the lake, it would not contribute to these potential impacts.

Future urban growth will likely occur in the Issaquah area and elsewhere in the Lake Sammamish watershed. Combined with drainage from existing developments, runoff from these future developments would potentially exacerbate Lake Sammamish water quality problems. These secondary impacts are not discussed in detail in this report, because the extent to which greater development will occur in the watershed is uncertain. As noted previously and documented in Attachment B to the Concurrence Point 3 packet (Issaquah 2005a), the Southeast Issaquah Bypass project is not expected to induce growth in the project vicinity. Therefore, the project is not expected to result in significant water quality impacts in Issaquah Creek and Lake Sammamish associated with growth enabled or hastened by the project.

Future urban development would be expected to employ infiltration of runoff and stormwater treatment to the maximum extent possible. However, it is unlikely that all future projects will entirely avoid surface discharges of runoff. Even with the most effective stormwater treatment systems, newly developed project sites generally produce greater surface runoff pollutant loadings than undeveloped sites, because stormwater treatment systems cannot completely remove the increased quantities of pollutants. Therefore, pollutant loadings to lower Issaquah Creek and Lake Sammamish could increase either with or without the proposed project. Stormwater treatment facilities that can be used at development sites are becoming more effective as design guidance improves over time, and that should help to reduce the extent of cumulative water quality effects on surface waters.

As discussed in the Hydrologic Systems section of this chapter, future development in the Issaquah Creek basin area would be expected to have a greater influence on water quality and groundwater than would the Southeast Issaquah Bypass alone.

Under the no-action alternative, the potential for secondary or cumulative impacts on surface or groundwater quality would result from the higher surface runoff pollutant loadings expected with increased development and traffic in the area. Existing roads in the project vicinity that do not drain to stormwater treatment facilities would be burdened with greater traffic volumes, likely resulting in slightly worse stormwater quality than would occur if the Southeast Issaquah Bypass were constructed with stormwater treatment facilities and other water quality mitigation measures in place. In combination with runoff from other transportation improvement projects in the vicinity, the no-action alternative would thus result in additional minor impacts on water quality in the Issaquah Creek system.

Mitigation

Runoff from the new roadways within the project site would be treated in accordance with King County and city of Issaquah requirements. Other transportation improvement projects in the vicinity will also implement similar mitigation measures to minimize adverse impacts on water quality. The Southeast Issaquah Bypass project also proposes to extend the sanitary sewer system to several residences currently served by poorly functioning septic systems in a neighborhood adjacent to the south end of the project corridor. This would reduce polluting loading to the north tributary to Issaquah Creek and to the main stem of Issaquah Creek and Lake Sammamish downstream. This beneficial measure would further reduce the potential for any secondary and cumulative effects on receiving water quality.

If the Southeast Issaquah Bypass and Park Pointe projects are constructed at the same time, joint stormwater management facilities for construction site runoff control and treatment should be pursued if feasible. This would provide opportunities for larger sizes of stormwater sedimentation and/or infiltration facilities, and potentially greater attention to maintenance of those facilities.

Wetlands

Impacts

All build alternatives would result in secondary impacts on wetlands by permanently altering local hydrologic conditions and habitat in wetlands and in the north tributary to Issaquah Creek. These secondary impacts could include: increased runoff volumes, locally reduced groundwater recharge, shading of vegetation, and colonization by invasive species.

Construction of the Southeast Issaquah Bypass roadway would increase the amount of impervious surface area, resulting in greater surface water runoff volumes to adjacent wetlands and Issaquah Creek tributaries. In addition, soils may be compacted during construction activities, potentially contributing to a decrease in soil permeability, infiltration, and water storage capacity. Although stormwater detention facilities would be provided to mitigate the impacts of increased runoff flow rates, these facilities would not abate increased runoff volumes.

Loss of wetland acreage and the accompanying loss of stormwater detention provided by this wetland may reduce recharge to the shallow groundwater system. This groundwater serves to supply hydrology to wetlands, even during drought periods.

The bridge associated with the project would shade a small portion of Wetland GW and the north tributary to Issaquah Creek. Depending on the design of the roadway in this area, surrounding wetland and/or buffer vegetation could also be stunted by increased shading.

Colonization by nonnative and/or invasive vegetation species could occur as a result of disturbance to the area, either during construction or on a long-term basis.

The Southeast Issaquah Bypass project in combination with housing developments and transportation improvement projects in the vicinity would result in cumulative impacts on wetlands. Impacts could occur during construction activities and/or as a result of long-term operations. The proposed Park Pointe project, located east of the proposed bypass roadway alignment, does not propose any wetland filling.

Mitigation

As discussed previously, the stormwater detention facilities associated with the Southeast Issaquah Bypass project would mitigate the secondary impacts of increased runoff flow rates and decreased stormwater detention capacity resulting from wetland losses. Infiltration would also be employed to the maximum extent practicable to minimize impacts on groundwater hydrology that could affect wetlands. The Parke Point project is proposing to infiltrate stormwater, which will also help to mitigate secondary impacts that could affect wetlands.

Vegetation and Wildlife

Impacts

All build alternatives would result in secondary impacts on vegetation and wildlife, due to replacement of existing upland and wetland habitat with a zone of intense human activity. The removal of mixed forest, disturbed/shrub, and wetland plant communities in the project area would result in a net loss of habitat, causing the displacement of wildlife. Vegetation removal during construction would result in displacement or elimination of wildlife within and adjacent to the construction area.

Tree clearing may make the remaining trees more susceptible to wind blow down, which could cause additional soil disturbance and further degrade habitat. Nonnative vegetation adapted to disturbance could also invade the cleared areas. These species (i.e., Himalayan blackberry, Scots broom, and reed canarygrass) out-compete native species that are generally more beneficial to wildlife, and can spread quickly through native plant communities.

The Southeast Issaquah Bypass would result in the direct loss of wetland habitat although, due to its small size, the affected wetland (VL) has a limited capacity to support songbirds, small mammals, reptiles, and amphibians.

The Southeast Issaquah Bypass project, in combination with the Park Pointe development, may result in cumulative impacts on vegetation and wildlife during both construction activities and long-term operations, due to the loss of upland forest (both mixed and coniferous), palustrine wetlands, and disruption in wildlife corridors.

Mitigation

Mitigation for impacts on native vegetation and wildlife habitat would be based on mitigation requirements for other environmentally critical areas such as wetlands, streams, steep slopes, and notable trees. Compensation requirements for these critical areas benefit wildlife, but they do not prevent a net loss of habitat. Native species plantings in the roadway right-of-way that benefit wildlife and the creation of snags would maximize habitat potential. Offsite mitigation near the project area could be accomplished through habitat restoration, designation of areas for habitat preservation, or planting trees in selected areas where they could provide habitat benefits. Allocating additional lands for preservation, based on their value to wildlife and fisheries resources and proximity to existing natural areas, would help ensure the continued existence of the diverse populations of wildlife and fisheries in the area. Potential cumulative effects on wildlife would be partially offset through the city's commitment to participate monetarily and to facilitate the initiation of a study and planning effort that addresses regional wildlife connectivity. The city also intends to facilitate a discussion during the project design stage with WSDOT through an inter-agency request to evaluate maintenance needs at existing wildlife crossings on I-90 in coordination with WDFW and USFWS.

Fisheries

Impacts

The Southeast Issaquah Bypass project, in combination with the Park Pointe development and the transportation improvements identified in the previous sections, may result in cumulative impacts on fish during both construction activities and long-term operations, unless effective mitigation is implemented.

Although stormwater runoff from the Southeast Issaquah Bypass project site and these other project sites would be treated to reduce impacts on fish, the cumulative effects from the loss of pervious areas in uplands and wetlands, and the potential for sediment input into local streams, could be substantial if not mitigated effectively.

The Southeast Issaquah Bypass and additional projects in the area could contribute cumulatively to an increase in impervious surfaces, a loss of groundwater recharge areas, slight reductions in dry season base flows in project area streams, and general disturbance that could introduce sediments into the Issaquah Creek system. However, because the Southeast Issaquah Bypass project includes a commitment to result in no net increase in pollutant loading to surface waters, it would not contribute to secondary or cumulative runoff pollution effects on fish.

Mitigation

The proposed project would control construction site sediments and treat stormwater runoff quantity, quality, and flow durations to match predevelopment conditions or better, and would create or improve fish habitat through mitigation measures. Thus, the project would not contribute to cumulative degradation of fish resources.

Threatened and Endangered Species

Impacts

The proposed project, combined with other development and transportation projects identified above, would result in secondary and cumulative impacts on threatened and endangered species, unless effective mitigation is implemented.

The only other new development proposed in the project area is Park Pointe, as previously described. Assuming that stormwater treatment and infiltration associated with the Southeast Issaquah Bypass and the Park Pointe development could be managed as planned, the impacts on peak and base flows to the Issaquah Creek drainage would likely not be measurable. However, if infiltration of stormwater to match predevelopment conditions does not occur, the addition of impervious surfaces could cause additional impacts on some baseline indicators for threatened salmon.

Mitigation

Mitigation measures in the form of stormwater runoff controls and habitat enhancement and restoration are incorporated into the Southeast Issaquah Bypass project. These mitigation actions have been reviewed and approved by federal agencies to meet the requirements of the Endangered Species Act. The Park Pointe development is also proposing similar mitigation. Consequently, the Southeast Issaquah Bypass is not expected to result in any cumulative adverse impacts on threatened and endangered species.

Land Use

Impacts

With construction of the Southeast Issaquah Bypass, development of land in the project vicinity may be encouraged. For example, the multifamily residential use proposed in the Issaquah Comprehensive Plan along East Sunset Way could be developed sooner than anticipated, with the Southeast Issaquah Bypass in operation. These changes could occur under any of the proposed alternatives and in combination with other recently constructed projects. Along with the recently completed South SPAR/Sunset interchange and North SPAR projects, the proposed Southeast Issaquah Bypass could help encourage development of the Sammamish Plateau.

Generally, the proposed project's role in supporting planned development within the city would contribute to the expected conversion of currently undeveloped land to mostly urban uses. As Issaquah grows, cumulative impacts associated with such development may include an overall reduction in open space and associated wildlife habitat, increases in demands for urban public services and facilities, and increases in noise, light and glare, and human activities, all of which contribute to a more urban character within the city.

Zoning and land uses identified within city and county plans and regulations indicate a desire to maintain low-density residential uses in much of the project area, with the specific exceptions of high-density residential development at Park Pointe and along East Sunset Way. The extreme eastern city limits, as well as county land to the east, are constrained from development by the presence of steep slopes and the Tiger Mountain NRCA. The Park Pointe property extends north from Southeast 96th Street to the Issaquah shooting range and Sportsmen's Clubhouse, further limiting additional development beyond what is now proposed there.

A concern expressed by many citizens is the new roadway's potential influence on local growth and development. However, because growth in the project vicinity is significantly limited by land use regulations, the secondary impacts of the proposed roadway are limited. Opportunities for infill development, or an increase in local density, could be greatest in the areas south and southwest of the proposed roadway. The area north of Issaquah High School, from Evans Lane to the north, is currently zoned for single-family and duplex uses.

South of the high school, near Southeast Lewis Lane and the Sycamore subarea, zoning within Issaquah is almost exclusively single-family suburban (4.5 dwelling units per acre). Farther south along Issaquah/Hobart Road the primary zoning within King County is either *rural area-5* or *rural area-10,* providing for one dwelling unit per 5 or 10 acres, respectively. These zoning designations offer little potential for significant additional growth, because density is low and the availability of vacant land is limited.

The proposed Southeast Issaquah Bypass would introduce a new connection to I-90 and, along with the recently completed South SPAR/Sunset interchange and North SPAR projects. This new connection would result in easier access to the freeway and Sammamish Plateau on the north. This convenience may make the eastern portions of the Olde Town and Sycamore subareas, and adjacent county land, more attractive for potential residents.

It should be noted that this subject remains under study, and a direct causal relationship between highway construction and higher development densities is not yet definitive. Two studies completed in 2003 have noted that factors other than road investments (including schools, taxes, water/sewer improvements, population density, housing quality, and community receptiveness) may influence growth significantly (Hartgen, 2003a, 2003b). Therefore, although proposed highway construction may have the potential to attract interest in development nearby, the greatest limitation to the realization of increased density in the Southeast Bypass project area would remain city and county zoning designations that allow only rural levels of development there. Construction of the Southeast Issaquah Bypass may have the potential to increase zoning density changes, as well as requests for local property rezones. Despite this potential, current city and county planning regulations are expected to determine future land use changes within, and adjacent to, the proposed roadway corridor. There are no proposals for zoning changes in the project vicinity, and current city planning efforts are focused in other parts of the city where added density would be more acceptable and accommodating (i.e., along Gilman Boulevard).

In assessing secondary and cumulative impacts based on existing land use regulations, it is difficult to determine the effectiveness such controls might have. Under current growth management intentions, areas within urban growth boundaries have been identified as areas to which future development would be directed. Urban growth boundaries generally consist of urban or city limits, while unincorporated land is frequently retained for lower-density or rural uses. Such is the relationship between Issaquah in the southern project area and unincorporated King County to the south and east.

Thus, while existing zoning within Issaquah is intended to maintain low-density development in these areas, adjacent neighborhoods are within the established urban growth boundary (as is all city land). At some time in the future, these areas may be subject to density increases, especially if such increases might leave rural lands undeveloped. Although construction of the Southeast Issaquah Bypass could hasten the acceptance of higher densities in the project area, it is also clear that failure to construct the new roadway would not prevent such increases in density in the future. Nor would it prevent new development in the area as indicated by the proposed Park Pointe project.

These considerations were weighed during city comprehensive planning efforts and resulted in designation of the Park Pointe site for future development at the densities proposed there, pending the outcome of project-specific environmental review by the city of Issaquah. A similar relationship exists for the proposed Southeast Issaquah Bypass and other local transportation projects, which are also identified within local plans. Given adoption of these plans through the public comprehensive planning process, the projects now proposed have been deemed appropriate for their locations pending project-specific environmental evaluation.

Directing future growth to urbanizing areas such as Issaquah was affected by the 1999 federal listing of salmon species as threatened, in that the effectiveness of past land use planning efforts throughout the Puget Sound region has come into question. One result has been the suggestion that it will likely require more effective and far-reaching land use regulations and growth management practices to control or prevent development within sensitive areas or otherwise inappropriate locations that could affect native species. Moreover, such regulations also would serve to prevent fragmentation of important habitat areas and piecemeal intrusions into undeveloped areas.

Because the Southeast Issaquah Bypass location has not been considered inappropriate for the proposed use, existing regulations are expected to adequately guide development there. Potential secondary and cumulative impacts of development within the proposed project area are not expected to exceed development expectations for the area or adjacent land.

As part of the Concurrence Point 3 process under the Interagency 404 Merger Agreement, the U.S. EPA requested information on induced growth and induced travel, and a description of how those factors were incorporated into the environmental and traffic modeling analyses. This request, along with FHWA's response, is included in Attachment B to Concurrence Point 3 (Issaquah, 2005b). The response from FHWA addressed many subjects relating to cumulative impacts of growth, including traffic modeling, travel patterns, and the local comprehensive planning process. Both WSDOT and FHWA were satisfied that U.S. EPA's concerns regarding induced growth and induced travel were answered in the Concurrence Point 3 packet.

Mitigation

Maintaining the existing zoning regulations for land adjacent to the proposed Southeast Issaquah Bypass and nearby areas would help to manage development in the vicinity of the new roadway and avoid significant cumulative impacts.

Social Elements

Community Cohesion and Mobility

Impacts

The proposed project would not result in substantial adverse secondary or cumulative impacts on community cohesion. The provision of additional transit, pedestrian and bicycle facilities as part of the Southeast Issaquah Bypass may extend the life of proposed roadway and further promote the city's mobility goals, which is a beneficial secondary effect.

When this project is evaluated in combination with other potential projects, the following cumulative impacts may occur. Traffic volumes in the eastern portion of the Olde Town subarea and the northeast portion of the Sycamore subarea would increase; the proposed Southeast Issaquah Bypass would enhance mobility for local and regional residents; and a new transportation link for travel between the Sammamish Plateau and the Maple Valley regions would be provided, which introduce a new association between these areas and unify local residents.

Mitigation

Cumulative impacts related to mobility are expected to be beneficial and would not require mitigation.

Population and Regional Growth

Impacts

In combination with the new South SPAR/Sunset interchange and North SPAR projects, the proposed Southeast Issaquah Bypass would strengthen connections to neighboring regions and facilitate travel there, particularly to the Sammamish Plateau. The Southeast Issaquah Bypass would support planned development, especially full development of the proposed Park Pointe project. Because the roadway is expected to attract vehicles currently using other key streets in the city, including Front Street South and Southeast Newport Way, it would also support other planned projects, such as the recently approved Talus development on the west side of the city. In this manner it could facilitate overall population growth in the city, along with increased employment, housing and commercial development. As indicated in the Land Use section, this would result in expanding the urban character of the city.

Secondary impacts may arise as a result of increased local vehicle trips that expose more individuals to the proposed project area. Improved travel conditions and enhanced mobility could also influence these decisions. Because Issaquah and its neighboring regions are experiencing steady population increases, growth in these areas is expected to continue. Although the proposed project is not expected to be the direct cause of local population increases beyond potential full development of the Park Pointe site, it could have an indirect effect on the rate and timing of when expected growth may occur. As noted in the Land Use section, the relationship between new roadways and growth is currently under study. At this time, the combined effects of the Southeast Issaquah Bypass and other projects in the area are not expected to result in population growth levels beyond what is predicted and planned for under current growth management regulations. The exact growth rate experienced by Issaquah in the future will also be influenced by unpredictable elements such as local and regional economic and market conditions.

Mitigation

No mitigation is proposed.

Environmental Justice

Impacts

Although the combined projects may reach more individuals in and near the proposed Southeast Issaquah Bypass project area, no disadvantaged neighborhoods or minority population groups have been identified by Census data. Because this data indicate that these individuals are not present in large numbers locally and no special interest groups or minority populations have been observed at public events for this project, it is expected that these groups would not be disproportionately affected in relation to potential impacts on project-area residents.

Mitigation

Because cumulative impacts would not be expected, no mitigation is proposed.

Public Services

Impacts

The proposed road is not expected to generate new growth beyond its potential role in enabling maximum development of the Park Pointe site. However, development under existing zoning could result from the demand for new residential or commercial projects. Thus, the new transportation facilities could increase the rate of expected growth in the project area, which could also add to the demand for emergency services or new school bus routes. To the extent that growth may occur faster than presently projected, the proposed project could have secondary impacts of increasing the demand for public services sooner than currently expected.

Beneficial cumulative impacts could result from new transportation facilities. These facilities would provide regional improvements that would be expected to decrease the overall response and delivery times for police and fire emergency vehicles, and school buses. The proposed improvements would also increase safety conditions by adding capacity and improving traffic flows throughout the project area. Safer conditions may decrease calls for emergency services, although the new facilities are expected to increase the total number of vehicles traveling through the area.

Mitigation

Ultimately, the proposed project is expected to have beneficial secondary and cumulative impacts on response times and mobility, therefore mitigation would not be needed.

Utilities

Impacts

Similar to public services, secondary and cumulative impacts on utilities could also be affected by changes in the rate of expected population increases as a result of the Southeast Issaquah Bypass and other transportation improvements. The proposed projects could affect the provision of new facilities, to the extent that new roadways might encourage anticipated development to occur sooner than is currently projected. Under the concurrency requirements in the Issaquah and King County comprehensive plans, any new development must have adequate utility service prior to approval. Therefore, new impacts on the demand for services would not occur, and potential secondary and cumulative impacts on utilities are not expected to adversely affect local providers.

Mitigation

No adverse impacts would occur and mitigation would not be needed.

Recreational Resources

Impacts

Cumulative impacts on the existing trail system could result from the Park Pointe development and any other projects in the area.

When completed, the new roadway facilities would carry greater traffic volumes, which could lead to a cumulative increase in noise levels at trail locations near roadways. These impacts would diminish as the trail distance from the road increases. Long-term cumulative impacts are expected to be beneficial, as the result of new trail connections and trailhead improvements included with the proposed design of transportation projects.

Mitigation

The proposed project would not result in secondary or long-term cumulative impacts. Mitigation would not be needed.

Transportation Services

Impacts

Although the proposed build alternatives will not result in any new land development projects that wouldn't be possible without the project, future development under existing zoning could result in new residential and commercial opportunities in the project area. If new facilities are constructed, they could change the timing of expected growth in the project area, which could add to demands for additional transit services and/or new bus routes. To the extent that growth may occur faster than presently projected, the proposed road improvements could have the secondary impact of increasing the demand for such services sooner than currently expected. Transportation services could operate slightly more efficiently at the SR 900 and Front Street South/I-90 interchanges if the Southeast Issaquah Bypass project is completed, in addition to the newly constructed South SPAR/Sunset interchange and North SPAR projects. This is because the new links would shift some traffic to the I-90/East Sunset Way interchange.

Mitigation

Secondary and cumulative impacts would be minor. No mitigation measures would be needed.

Pedestrian and Bicycle Facilities

Impacts

The Southeast Issaquah Bypass would contribute cumulative impacts on trails and bicycle facilities that are similar to other locally proposed transportation improvements. In places, the proposed Southeast Issaquah Bypass would be integrated with local trails to preserve existing connections. New bicycle lanes would be provided with the proposed roadway. These facilities could be combined with improvements associated with other proposed transportation projects to contribute to the network of trails and bicycle routes in the area. Thus, the overall cumulative impacts of these projects are expected to have beneficial effects on nonmotorized travel opportunities.

Mitigation

Mitigation measures would not be needed.

Economics

Impacts

Construction of the Southeast Issaquah Bypass could result in secondary impacts through the creation of jobs in the Issaquah area, particularly in the city's historic downtown area. The diversion of traffic and anticipated reduction in traffic volumes and congestion would be expected to enable local residents to access downtown businesses and services. Improved access could lead to increased business activity and retail sales. This in turn could result in local businesses hiring additional workers and new businesses could move to the commercial district. Increased business sales would also generate increased sales tax revenues for local governments. Considering few undeveloped commercially zoned parcels are located in the project area, the number of new jobs resulting from the Southeast Issaquah Bypass project would likely be small compared to total existing employment in Issaquah.

Because Front Street South congestion would be reduced, downtown businesses are expected to benefit over time. Convenience purchases would not likely be diverted to commercial districts outside the city of Issaquah. As such, there would not likely be adverse impacts on retail sales tax revenues to local governments in the Issaquah area.

Access improvements associated with the Southeast Issaquah Bypass and other planned roadway improvements would be expected to have beneficial cumulative impacts on the local economy. In combination with the recently completed North and South SPAR road projects, the Southeast Issaquah Bypass project would improve access to the southern end of the Front Street South commercial district for future residents north of I-90. It would also provide an alternative route from the new East Sunset Way interchange on I-90 to access downtown shops, especially for residents located further east along I-90.

Mitigation

Economic secondary and cumulative impacts are not anticipated to be adverse. No mitigation measures are recommended.

Displacements and Relocations

Impacts

Secondary impacts related to potential displacements would be minimal. A minor decrease in available housing would occur over time. When combined with other potential projects in the area, cumulative impacts from the proposed Southeast Issaquah Bypass would result in an incremental decrease in available residential housing in Issaquah. Future development within the city is expected to provide additional housing opportunities at a variety of prices, and would likely offset any decreases in the number of homes resulting from project displacements.

Mitigation

No additional mitigation measures are proposed.

Historic and Archaeological Resources

Impacts

The Southeast Issaquah Bypass, together with other proposed transportation improvement projects in the area, will not result in an increase in identifiable impacts on known historical and archaeological resources in the project area. However, not all cultural resources have been identified.

In King County, prehistoric sites have been recorded primarily along the saltwater shoreline. Fewer have been found along inland rivers, streams, and in upland settings because of dense vegetation. Those that have been discovered were most often found by investigations prompted by environmental legislation. The recent increased pace of development in King County may result in additional discoveries. Transportation projects planned over the next two decades may provide opportunities to document and salvage information from prehistoric and historical resources.

Mitigation

No mitigation measures are required.

Hazardous Materials

Impacts

No secondary impacts are expected to be associated with hazardous materials. Cumulative impacts associated with hazardous materials include impacts from other planned transportation improvement projects, including the recently completed North SPAR and South SPAR/Sunset interchange modification projects. The long-term cumulative impact of the Southeast Issaquah Bypass, together with the other proposed transportation improvement projects in the study area, would represent a slight increase in the risk of accidental hazardous materials spills due to increased traffic volumes.

Mitigation

Impacts would be minimal and additional mitigation would not be needed.

Visual Quality

Impacts

When considered with other planned development in the project area, the proposed project would introduce additional pavement and concrete along the corridor, and contribute to the general cumulative displacement of trees and vegetation associated with the increased urbanization occurring in the area. The main development proposals in the project area include improvements provided at East Sunset Way and I-90 in connection with the Sunset interchange project, and the proposed Park Pointe residential development project. In association with these projects, the proposed Southeast Issaquah Bypass would represent another element in the alteration of the visual character of the eastern portion of the city. Largely undeveloped in the past, the eastern city limit is currently undergoing a transition to more urbanized uses.

Despite these changes, portions of the project corridor would remain in low-density uses and, as the roadway transitions to the Tiger Mountain natural resource conservation area (NRCA), less developed conditions would remain. For viewers from the west, this transition may help screen the project to some extent. From the east, the project would help define the limit of urbanized uses encroaching on Tiger Mountain. With the proposed Park Pointe development, urbanization would extend visual changes further east and higher on the mountain as topography rises. Although open space and landscaping would be components of the proposed development, the overall level of new construction represented by the proposed roadway and the Park Pointe development would contribute to a more developed appearance. This change would be visible to viewers looking toward this area from neighborhoods nearby, and partial views may be noticeable at greater distances.

Mitigation

The Southeast Issaquah Bypass project and other development in the city would include landscaping to help conceal new structures. Additional visual mitigation measures would likely be included with new development projects, which would be expected to assure that adverse visual impacts do not result.

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Chapter 4

Section 4(f) Evaluation

Chapter 4 Section 4(f) Evaluation

Section 4(f) of the 1966 Department of Transportation Act originally mandated the national policy to protect certain public lands and all historic sites from the adverse effects of highway projects. The original law is now implemented by 23 C.F.R. 771.135(a)(1) (i) and (ii), which prohibits the Federal Highway Administration from approving the "use" of land from a significant publicly owned park, recreation area, wildlife or waterfowl refuge, or from a significant historical site, unless a determination is made that:

- There is no feasible and prudent alternative to the use of land from the property; and
- The action includes all possible planning to minimize harm to the property resulting from such use.

"Use" is defined in 23 C.F.R. 771.135(p) as occurring when:

- Land is permanently incorporated into a transportation facility;
- There is a temporary occupancy of land that is adverse in terms of the statute's preservationist purposes; or
- There is a "constructive use" of land.

"Constructive use" occurs when a transportation project does not physically use land from a Section 4(f) resource, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired. Substantial impairment occurs only when the protected activities, features, or attributes of the resource are substantially diminished.

Identified Section 4(f) Properties

Nine Section 4(f) resources are located in the project area (see **Figure 4-1**). Each resource is described below.

White Swan Inn

The White Swan Inn is a privately owned historic wood-frame building located at 605 East Sunset Way. This building was originally constructed in 1916 as a single-family residence. It was remodeled in 1931 or 1932 into the White Swan Inn, and operated as a roadside café along the old Sunset Highway (now East Sunset Way) during the 1930s and 1940s. In 1948 the building was transformed into residential apartments. For much of this period, Sunset Highway was the major road leading from Puget Sound to Snoqualmie Falls and beyond. The White Swan Inn is eligible for listing on the National Register of Historic Places because of its association with an important period in the development of transportation and commerce in Washington State and particularly with the evolution of automobile and highway dining.

Campbell House

The Campbell house is a privately owned one-and-a-half-story rectangular frame Craftsman-style house built in 1923. This historic home is located at 885 2nd Avenue Southeast. Elements of the craftsman style incorporated into the house's design include broad roof overhangs, exposed rafter tails, and decorative triangular wood braces under the gables and dormers. The Campbell house is considered eligible for the National Register of Historic Places because it is a good example of an architectural style that was important in the development of the community's residential character.

Issaquah Sportsmen's Clubhouse

The Issaquah Sportsmen's Clubhouse is a privately owned historic building located just east of the Issaquah city limits at 23600 Southeast Evans Street. The Works Progress Administration (WPA) built the one-story clubhouse in 1937. The building was moved approximately 183 meters (600 feet) north of its original location in 1993. Relocation of the building was funded by a grant from the Washington Interagency Committee for Outdoor Recreation (IAC). The clubhouse was designated a King County landmark in 1997 and received listing on the Washington Heritage Register and the National Register of Historic Places in 1998. This was based on its architectural style as the best-preserved, most intact example of a rustic-style New Deal-era community building in the Issaquah area and its broad themes of recreation and government. The building is used for social events and firearm safety courses sponsored by the Issaquah Sportsmen's Clubhouse.

West Tiger Mountain/Tradition Plateau Natural Resource Conservation Area

The Washington Department of Natural Resources and the city of Issaquah manage the 1,780-hectare (4,400-acre) West Tiger Mountain natural resource conservation area (NRCA). Established in 1989, the NRCA includes the northern and western slopes of the Tiger Mountain State Forest and the city of Issaquah's Tradition Plateau land.

The NRCA is criss-crossed by an extensive network of hiking trails accessed by several trailheads with formal and informal parking areas. Because it is close to the Seattle metropolitan area and has easy access to I-90, the NRCA is heavily used and receives approximately 150,000 visitors annually.

All six build alternatives for the Southeast Issaquah Bypass project would use the Tradition Plateau Unit of the NRCA either directly or indirectly. This area contains over 200 hectares (500 acres) and is the most heavily used unit for recreation in the NRCA. It provides forested hiking trails and includes access to trails around Tradition Lake. The NRCA's primary goals include protection of natural resources and wildlife habitat areas, opportunities for environmental education, and low-impact recreational use.

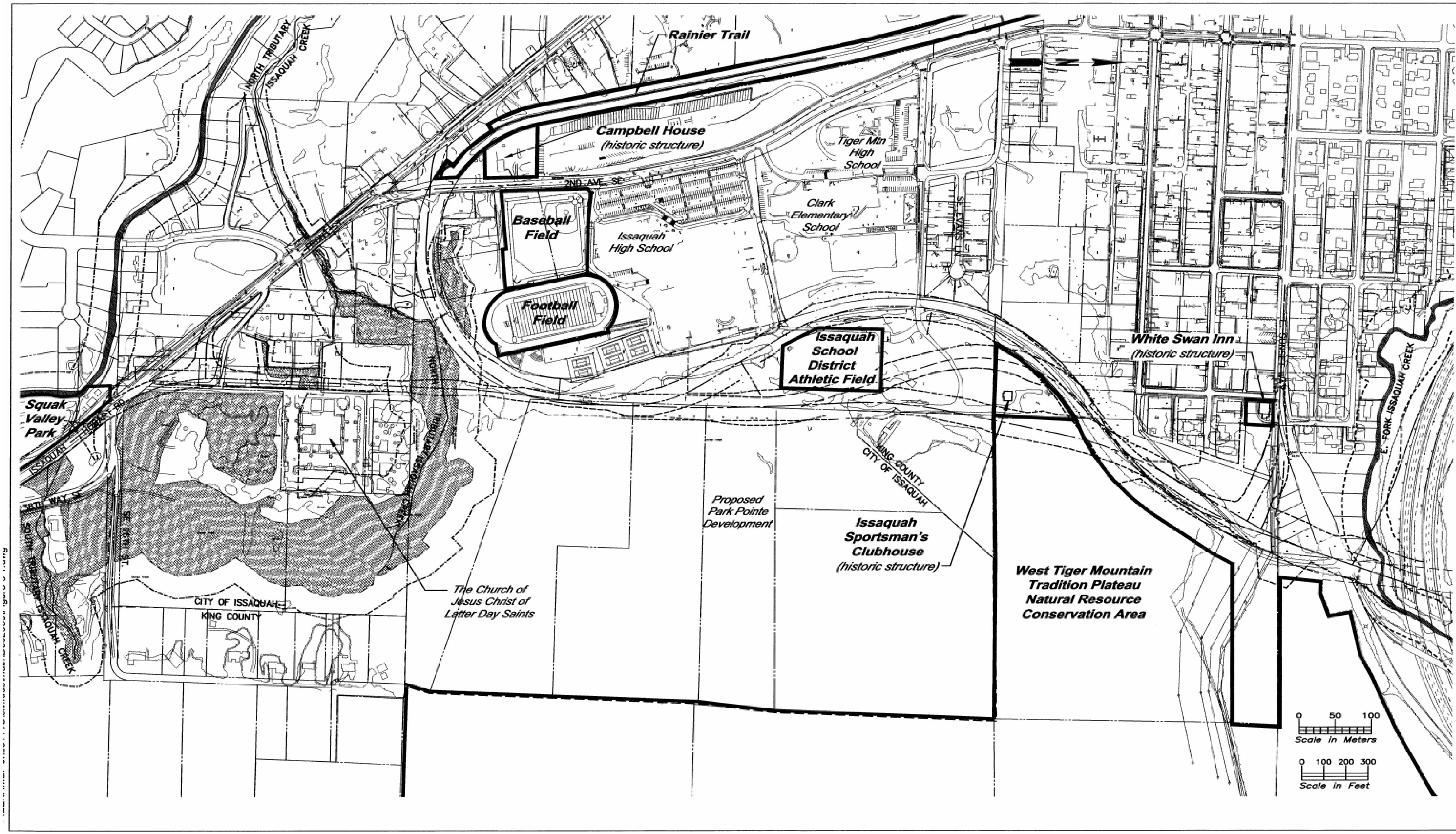

Figure 4-1
Identified Section 4(f) Properties in the Project Area

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Issaquah School District Athletic Field

The Issaquah School District owns and maintains a 1.4-hectare (3.5-acre) athletic field located northeast of the Issaquah High School campus (called the upper field). This area has two 18.3-meter (60-foot) diamond baseball/softball fields and track/field facilities. The entire site is fenced, and an unpaved roadway connecting to Southeast Evans Street provides access to an unpaved parking area in the northwest corner of the site. The Issaquah Little League also uses these ball fields for scheduled practices and games. Both fields are heavily used and typically experience over 230 bookings a year. Because the athletic field serves public recreational purposes, as well as high school athletics, it qualifies as a Section 4(f) property.

Issaquah High School Baseball Field

The Issaquah High School baseball field is a regulation diamond used primarily for interschool competition. However, the field is very popular for nonschool events and typically experiences over 100 bookings a year. Because the baseball field serves public recreational purposes, it also qualifies as a Section 4(f) property.

Issaquah High School Football Field and Track

The Issaquah High School football field and track is located at the south end of the high school campus. The football field is an Astro-Play infill type all-weather field that permits year-round use. The running track has a rubberized surface that also permits year-round use. Nonschool users of this facility include: Eastside FC, Issaquah Lacrosse Club, Issaquah Soccer Club, Issaquah Steelhead Football, Special Olympics, Washington State Soccer Association, Greater Seattle Soccer League, Hibernian & Caledonian Football Club, Washington State Youth Soccer Association and Issaquah Parks and Recreation. The football field and track receives the heaviest nonschool use of the three high school athletic facilities, experiencing over 370 bookings a year.

Rainier Trail

The Rainier Trail is a 14-foot-wide multi-use trail that follows the former Burlington Northern railroad right-of-way west of 2nd Avenue Southeast. Because the city of Issaquah owns and maintains this trail, it qualifies as a 4(f) resource. The developed portion of the trail within the project area ends at 2nd Avenue Southeast. Hikers and cyclists can continue eastward along a dirt path that follows the abandoned railroad right-of-way east of 2nd Avenue Southeast. The path, known locally as Issaquah Trail, can be used to access the more extensive trail system within the West Tiger Mountain NRCA.

Squak Valley Park

Squak Valley Park is a new city-owned park currently being developed on a 10-acre site located just off Front Street South at the south end of the project area. The site currently consists of undeveloped open fields located between Front Street South and Issaquah Creek. When completed, Squak Valley Park will include passive recreation improvements, trails, and parking.

Use of Section 4(f) Properties

Construction and operation of the preferred alternative for the Southeast Issaquah Bypass would result in some degree of "use" of the Section 4(f) properties described in the previous section. "Use" would occur during construction and operation and would range from property acquisition; changes in access; a temporary increase in dust, noise and exhaust emissions; and visual impacts.

White Swan Inn

The White Swan Inn and the property on which it is located would not be used by any of the build alternatives. However, a number of improvements, common to all build alternatives, would be made immediately adjacent to the White Swan Inn building. These improvements include replacing and extending the sidewalk along East Sunset Way on the north side of the existing building and constructing several large stormwater ponds on the abutting parcel just east of the building. Because the historic significance of the White Swan Inn is based to a large degree on the building's proximity to East Sunset Way (formerly the Sunset Highway), it is important not to change the vertical elevation or horizontal alignment of East Sunset Way to avoid creating an adverse effect on the White Swan Inn. The preferred alternative would not alter the current elevation or alignment of East Sunset Way along the street frontage of the White Swan Inn. Construction activities near the White Swan Inn would result in temporary increases in noise, dust and exhaust emissions. However, none of these proximity effects would be severe enough to substantially impair the site's historic function.

Campbell House

The Campbell house and the property on which it is located would not be used by Alternatives 1, 3, or Modified 5. However, with Alternatives 2, 4, and 6, the roadway in front of the Campbell house (2nd Avenue Southeast) would be reconstructed in order to create a smooth transition between the existing two-lane roadway and the new four-way intersection at 2nd Avenue Southeast. The reconstruction work near the Campbell house would occur entirely within the existing road right-of-way and would not use any portion of the historic property. Construction activities near the Campbell house would result in temporary increases in dust, noise, and exhaust emissions in the immediate vicinity. None of these proximity effects are expected to be severe enough to substantially impair the property's historic function.

Issaquah Sportsmen's Clubhouse

All build alternatives were designed to avoid the Sportsmen's Clubhouse structure and property to the maximum extent possible. Given that this facility is adjacent to the alignment of all build alternatives, and the right-of-way width and curvature must meet specific design critieria, unavoidable impacts on the property would occur under Alternatives 3, 4, Modified 5, and 6, as described below. However, none of the build alternatives would affect the clubhouse structure itself.

Alternatives 1 and 2 (both of which include the North A alignment) would not use any portion of the Sportsmen's Clubhouse or the property on which it is located. The centerline of the new roadway would be located approximately 62 meters (203 feet) west of the clubhouse building (**Figure 4-2**). An increase in background noise levels would be expected, and portions of the new road may be visible through the wooded area surrounding the building. Access to the clubhouse and the associated rifle range would continue to be provided by Southeast Evans Street, but with a new connection to the Southeast Issaquah Bypass roadway. Construction activities would temporarily increase dust, erosion, noise, and exhaust emissions in the immediate vicinity of the clubhouse for up to one year. However, none of these proximity effects are expected to be severe enough to substantially impair the site's historic function.

Alternatives 3 and 4 (both of which include the North B alignment) would affect the clubhouse property because approximately 920 square meters (0.22 acres) of property along the eastern edge of the site would be acquired for public right-of-way (**Figure 4-3**). The centerline of the proposed roadway would be located approximately 30 meters (97 feet) east of the clubhouse building and about 2.5 to 4 meters (8 to 13 feet) below the existing grade. Although lowering the road would provide some visual and noise relief, the roadway cut would approach to within 10 meters (33 feet) of the clubhouse building. The northern alignments of Alternatives 3 and 4 would also separate the clubhouse from the rifle range, which would prevent access to the rifle range from Southeast Evans Street thereby eliminating the direct physical connection that currently exists between the rifle range and the clubhouse.

The cultural resources investigation conducted for this project concluded that the close proximity of the new Southeast Issaquah Bypass roadway to the clubhouse would result in an "adverse effect" on the clubhouse based on criteria in Section 106 of the National Historic Preservation Act. An adverse affect would result because the property's existing "park-like" setting would be changed and the direct connection between the clubhouse and the rifle range would be eliminated. Direct access to the clubhouse from Southeast Evans Street would continue to be provided, but access to the rifle range from Southeast Evans Street would be replaced with access from a new road constructed through the proposed Park Pointe development. If alternate access to the rifle range is needed before the Park Pointe development is completed, the city would provide access to the rifle range via an easement from the bypass roadway through the Park Pointe property.

Construction activities associated with Alternatives 3 and 4 would temporarily increase dust, erosion, noise, and exhaust emissions in the immediate vicinity of the clubhouse for up to one year. Because of the clubhouse's closer proximity to the new roadway, these temporary effects would be more severe than described for Alternatives 1 and 2.

Modified Alternative 5 and Alternative 6 (which include the North C alignment) would require approximately 2,490 square meters (0.61 acres) of the Sportsmen's Clubhouse property for public right-of-way, and the centerline of the new road would be located approximately 36 meters (118 feet) west of the clubhouse building (**Figure 4-4**). Although these alternatives require more acquisition of Sportsmen's Clubhouse property compared to the other alternatives, Modified Alternative 5 and Alternative 6 would not impact the

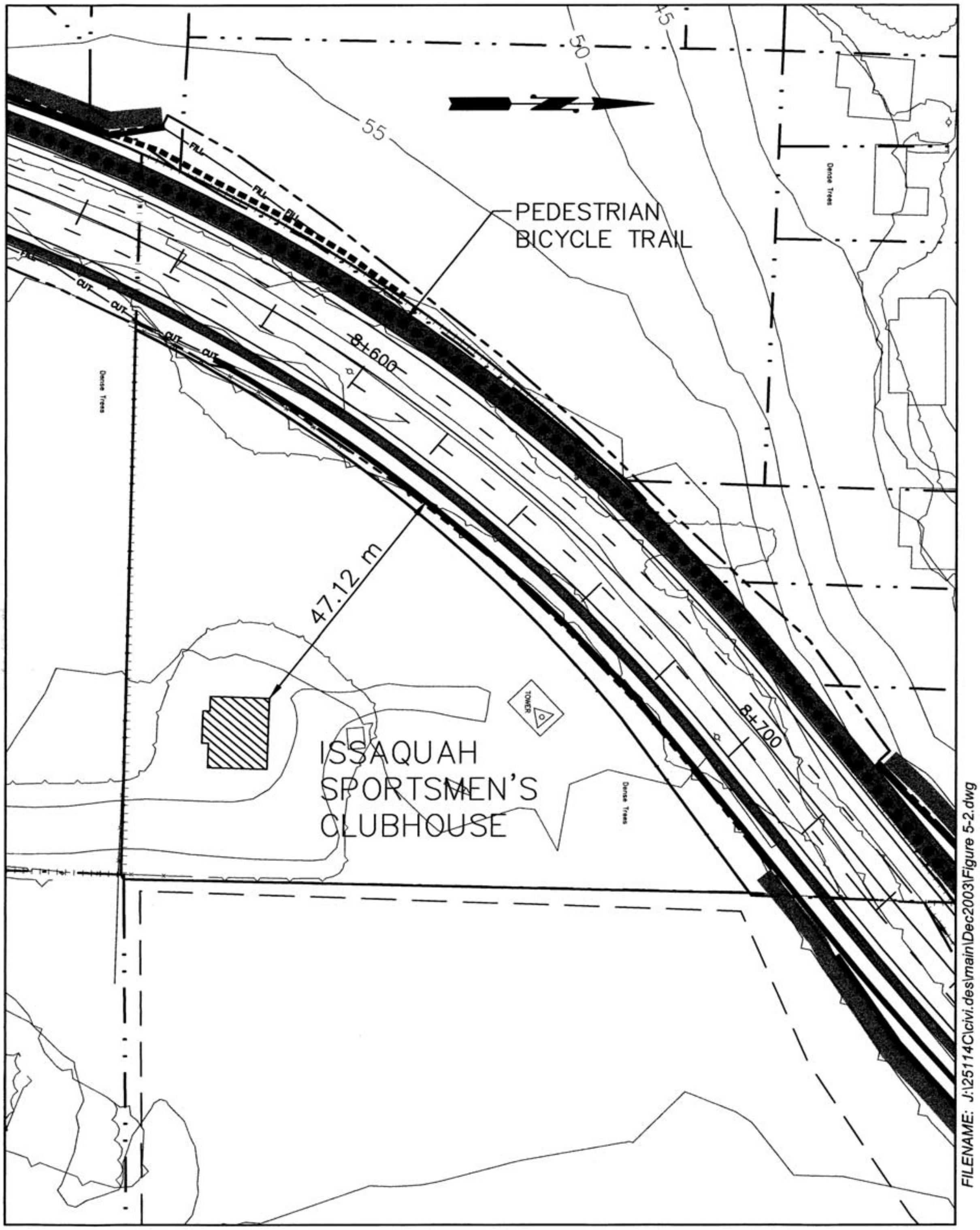

Figure 4-2
Issaquah Sportsmen's Clubhouse (Alternatives 1 and 2)

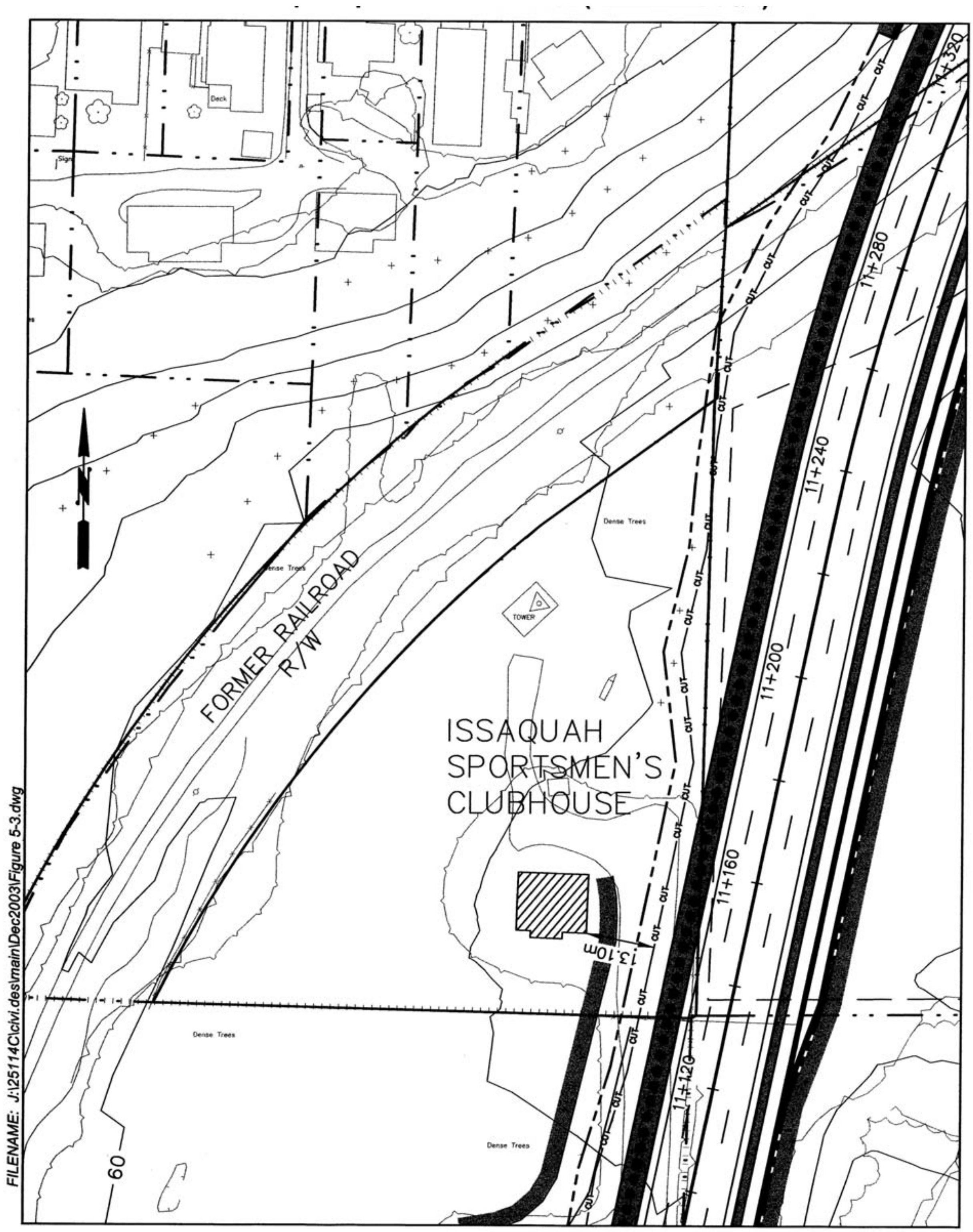

Figure 4-3
Issaquah Sportsmen's Clubhouse (Alternatives 3 and 4)

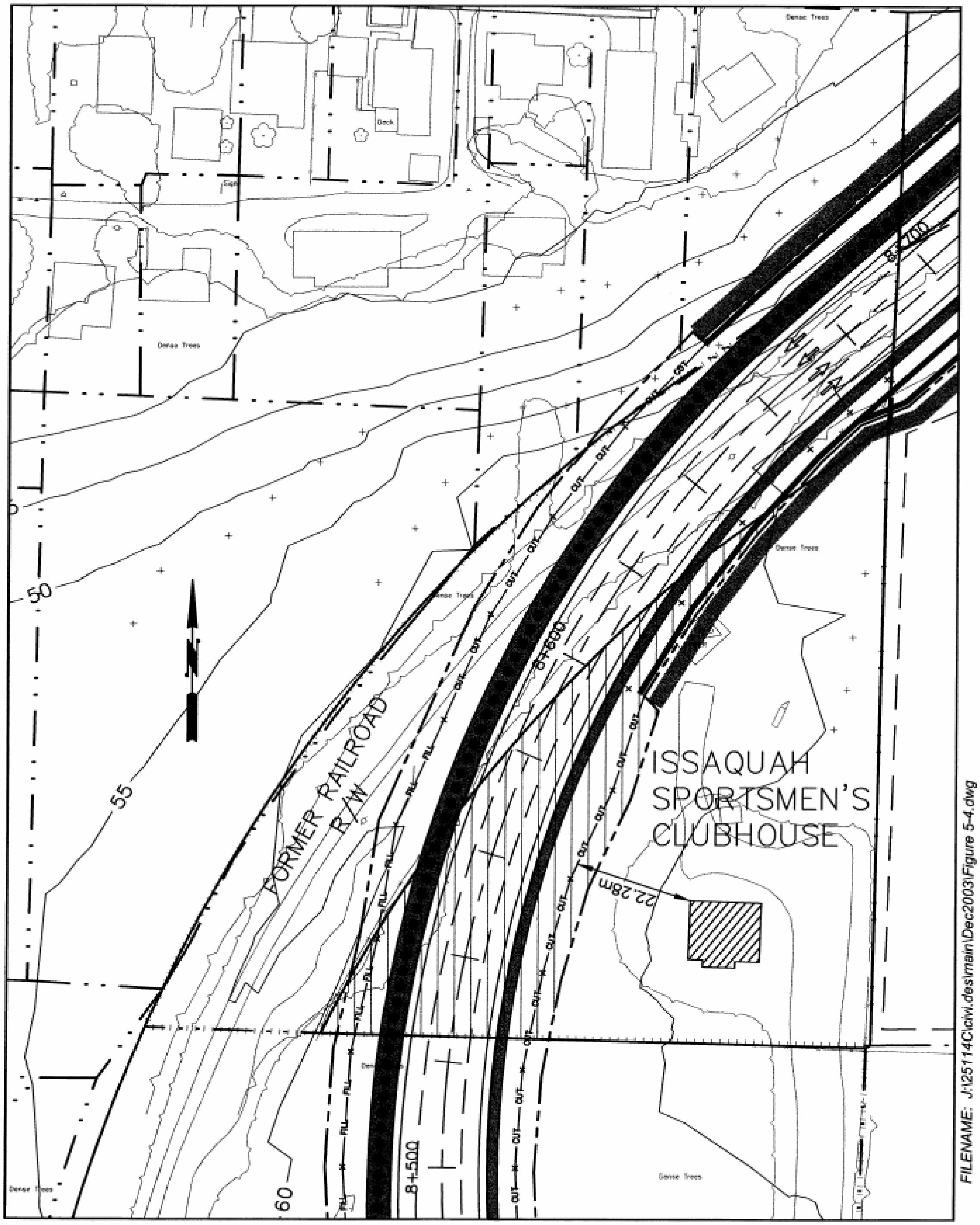

Figure 4-4
Issaquah Sportsmen's Clubhouse (Modified Alternative 5 and Alternative 6)

clubhouse structure and no adverse effect on this resource would result because the historic significance of the setting surrounding the clubhouse would be maintained under these alternatives. These alternatives were designed to avoid the property to the maximum extent possible within the constraints of needed right-of-way width and maximum road curvature as it passes between the school athletic field and the Sportsmen's Clubhouse property. No further alignment shift is possible to lessen the impact to the property. Access to the clubhouse and rifle range from Southeast Evans Street would be eliminated and replaced by access from a new road constructed through the Park Pointe development and connected to the Southeast Issaquah Bypass. If Park Pointe is not constructed, access would be provided off of the Southeast Issaquah Bypass.

Construction activities would increase dust, erosion, noise, and exhaust emissions in the immediate vicinity of the clubhouse for a period of up to one year.

West Tiger Mountain/Tradition Plateau Natural Resource Conservation Area

Alternatives 3 and 4 would use approximately 4,920 square meters (1.21 acres) of land along the western edge of the 1,780-hectare (4,400-acre) West Tiger Mountain/Tradition Plateau NRCA. Land clearing and earthwork would remove approximately 5,705 square meters (1.41 acres) of NRCA forest habitat. Trees along the newly created forest edge would likely be susceptible to damage from high winds, including possible windfall.

Placing a new four-lane roadway along the western edge of the NRCA would increase noise levels and vehicle emissions in the immediate area and reduce the area's visual quality. All of the other build alternatives (Alternatives 1, 2, 5 and 6) completely avoid using land within the NRCA. Modified Alternative 5 (the preferred alternative) would not require land from the NRCA, and no recreational trails or other public facilities within the NRCA would be affected.

Construction activities would temporarily increase dust, erosion, noise, exhaust emissions, and visual impacts at the western edge of the NRCA for up to one year. However, because most construction activity would take place at least 50 to 300 meters (160 to 1,000 feet) away from existing recreational trails within the NRCA, construction activities are not expected to seriously detract from their use and enjoyment.

Issaquah School District Athletic Field

Alternatives 1 and 2 would not require use of the Issaquah School District athletic field. However, a retaining wall and sidewalk would be constructed immediately adjacent to the edge of the field's southwest corner (**Figure 4-5**). The primary concern related to Alternatives 1 and 2 is that they both would physically separate the main high school campus from the athletic field. This would require students to cross a busy roadway, creating a possible safety hazard for both drivers and students. Officials with the Issaquah School District have told the city that they consider Alternatives 1 and 2 to be unacceptable.

Alternatives 1 and 2 would also eliminate the existing vehicle access to the athletic field and parking area via Southeast Evans Street. Southeast Evans

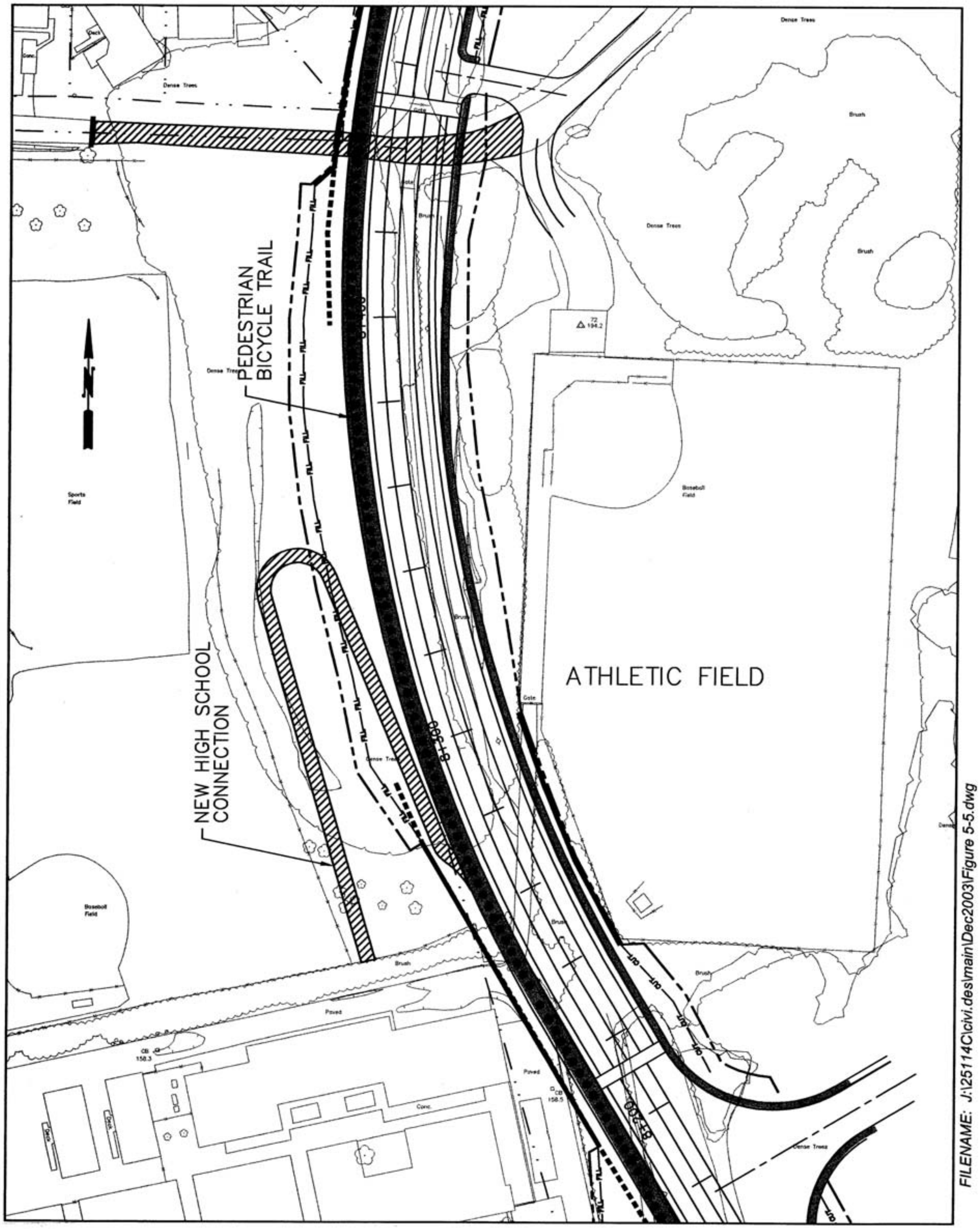

Figure 4-5
Issaquah School District Athletic Field (Alternatives 1 and 2)

Street is currently the only access route to the athletic field available to the public. Alternatives 3 and 4 would also not use any portion of the Issaquah School District athletic field. However, a retaining wall and sidewalk would be constructed at the edge of the field's northeast corner (**Figure 4-6**).

Modified Alternative 5 and Alternative 6 would extend approximately 24 meters (78 feet) into the northeast corner of the athletic field and reduce the size of the field by approximately 715 square meters (0.22 acres) (**Figure 4-7**). The athletic field would be reconfigured and extended to the west to allow continued use of both existing baseball fields.

The close proximity of Alternatives 1, 2, 3, and 4 to the athletic field would result in increased noise levels, vehicle emissions, and reduced visual quality in the immediate vicinity, which could detract from the use and enjoyment of the field. During construction, this alternative would temporarily increase dust, erosion, noise, and exhaust emissions, and decrease visual quality in the immediate vicinity of the athletic field for up to one year. With appropriate mitigation none of these effects would be severe enough to substantially impair the function of the athletic field.

Issaquah High School Baseball Field

None of the build alternatives would use any portion of the Issaquah High School baseball field. The closest alignments (Alternatives 2, 4, and 6) are over 91 meters (300 feet) south of the field's perimeter fence. The paved roadway adjacent to the west side of the baseball field (2nd Avenue Southeast) would be reconfigured to match the new four-way intersection common to Alternatives 2, 4, and 6. The reconfiguration of the roadway would take place entirely within existing right-of-way.

Although construction activities would create temporary increases in dust, noise, and exhaust emissions in the immediate vicinity of the baseball field, none of these effects would be severe enough to substantially interfere with the use of the field.

Issaquah High School Football Field and Track

Alternatives 2, 4 and 6 would approach to within about 30 meters (100 feet) of the south end of the football field and track. Traffic noise levels at the football stadium were modeled for Alternative 2 assuming 2030 traffic conditions. Traffic noise levels were predicted to be 56 dBA at the stadium bleachers and 57 dBA on the field. These predicted noise levels do not exceed the traffic noise threshold of 67 dBA established in 23 CFR 772 to protect Section 4(f) resources.

Adverse noise impacts on Section 4(f) properties are defined in 23 CFR 771.135(p) under the provision of constructive use. Noise constructive use does not occur when projected traffic noise levels do not exceed the traffic noise criteria established in 23 CFR 772. Therefore, there would be no noise constructive use impact on this 4(f) resource as a result of this project. Traffic noise levels in the vicinity of the football stadium would be lower for all other build alternatives, because traffic noise sources would be the same distance or farther away from the football stadium.

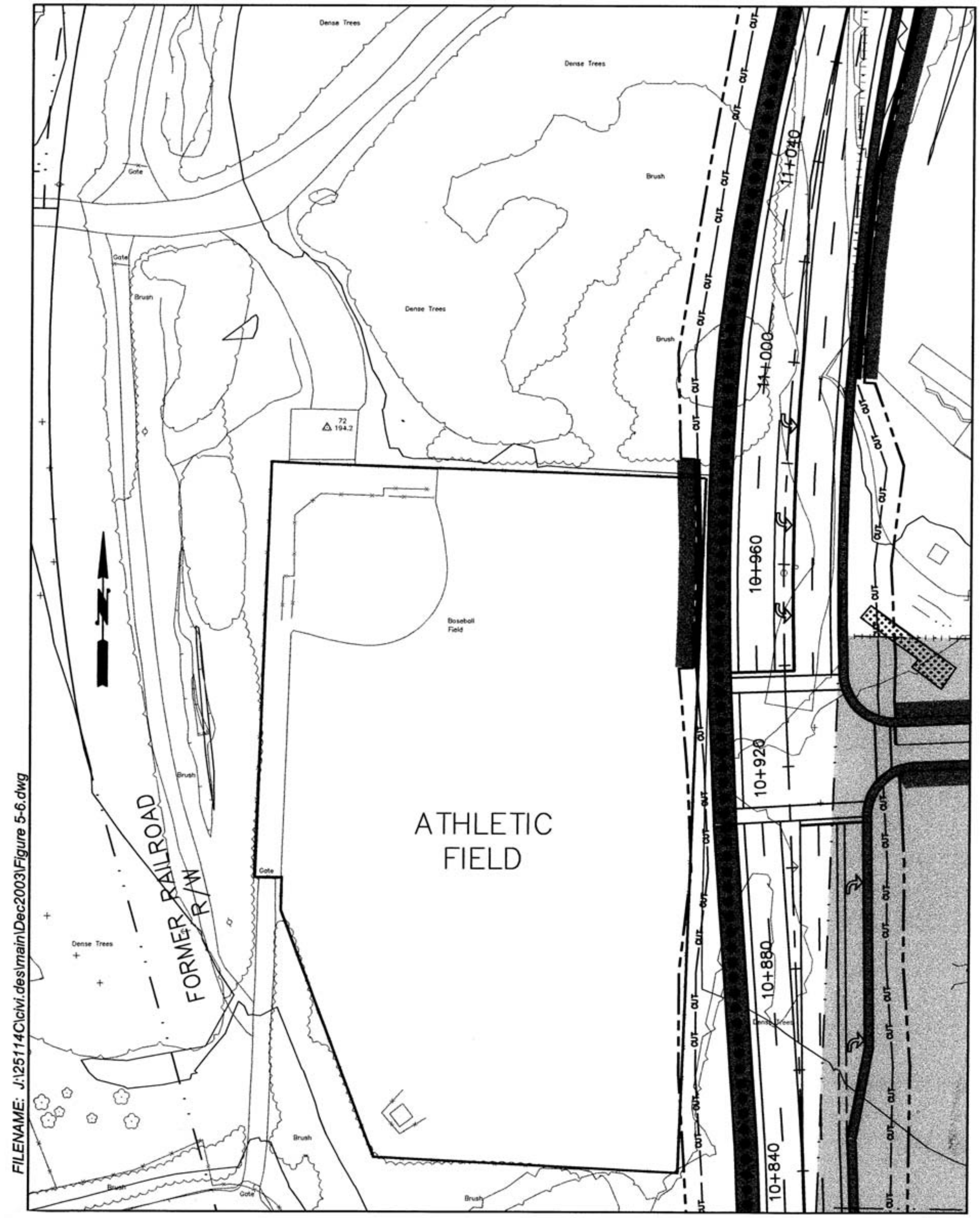

Figure 4-6
Issaquah School District Athletic Field (Alternatives 3 and 4)

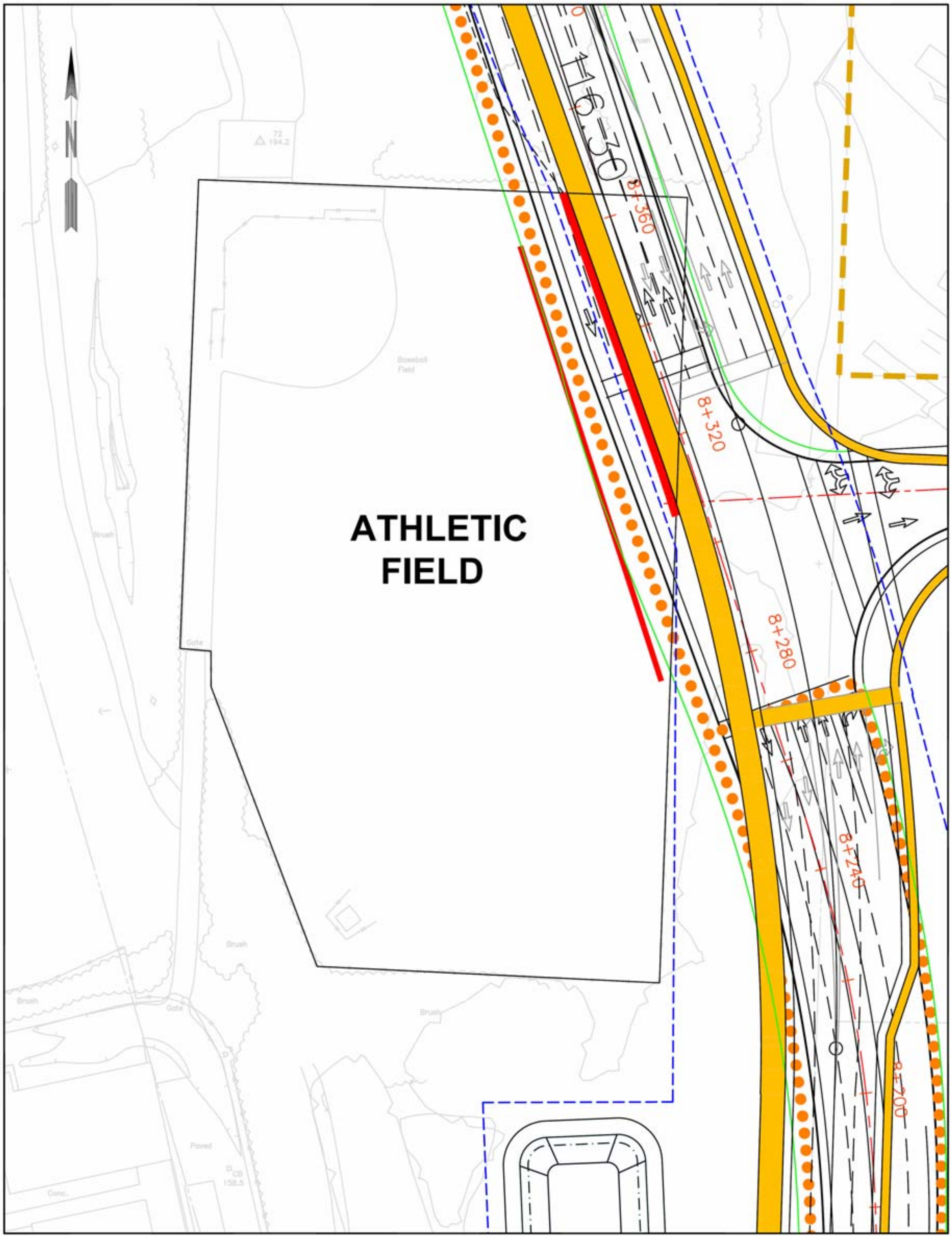

Figure 4-7
Issaquah School District Athletic Field (Modified Alternative 5 and Alternative 6)

Modified Alternative 5 (the preferred alternative) would have no noise constructive use impact on this 4(f) resource.

No air quality constructive use impacts are expected. Predicted worst-case carbon monoxide concentrations for the Front Street South and 2nd Avenue Southeast intersection showed no exceedances of the 1-hour or 8-hour average National Ambient Air Quality Standards.

Visual quality impacts from the Southeast Issaquah Bypass roadway could be noticeable to users and spectators at the football field and track. Moving vehicles would be visible from the stadium bleachers and possibly the field itself. Direct illumination of the field from vehicle headlights is not expected to occur because of the oblique orientation of the travel lanes to the stadium. However, headlights may be visible to some users and spectators sitting in the stadium bleachers.

All build alternatives would create temporary construction impacts in the immediate vicinity of the athletic field for up to one year. These impacts would include increased dust, erosion, noise, exhaust fumes from construction equipment, and decreased visual quality. With appropriate mitigation these proximity impacts would not be severe enough to substantially impair the function of the football field or track .

Rainier Trail

Alternatives 2, 4, and 6 would require reconfiguration of up to 40 meters (131 feet) of the Rainier Trail at its terminus at 2nd Avenue Southeast (**Figure 4-8**). The trail would be reconfigured in this location to accommodate the new Southeast Issaquah Bypass/2nd Avenue Southeast intersection and to more directly align with the 4.2-meter- (14-foot-) wide pedestrian/bicycle trail to be provided along the western side of the proposed Southeast Issaquah Bypass roadway. During reconfiguration, the trail would be temporarily closed and trail users would be directed around areas of construction. Existing signs, benches and brickwork at 2nd Avenue Southeast would be relocated slightly north, but still within the limits of the former railroad right-of-way.

Alternatives 2, 4, and 6 would also displace the existing (unofficial) trailhead parking area located just off of 2nd Avenue Southeast (within the former railroad right-of-way). This loss of parking would be replaced by a new trailhead parking area located just east of the proposed Southeast Issaquah Bypass roadway, adjacent to the high school trail. No impacts on the Rainier Trail would occur with Alternative 1, 3, or 5.

Construction activities near the Rainier Trail under Alternatives 2, 4, and 6 would create temporary increases in noise, dust and exhaust emissions in the immediate vicinity for up to several months.

Squak Valley Park

Alternatives 1, 3, and Modified Alternative 5 would require reconstruction and repaving of Front Street South adjacent to (east of) Squak Valley Park. Reconstruction and repaving work would be necessary to blend the wider roadway at the new Front Street South/Southeast Issaquah Bypass intersection with the existing two-lane road. This work would occur completely within the existing road right-of-way and would not directly affect park property. All build

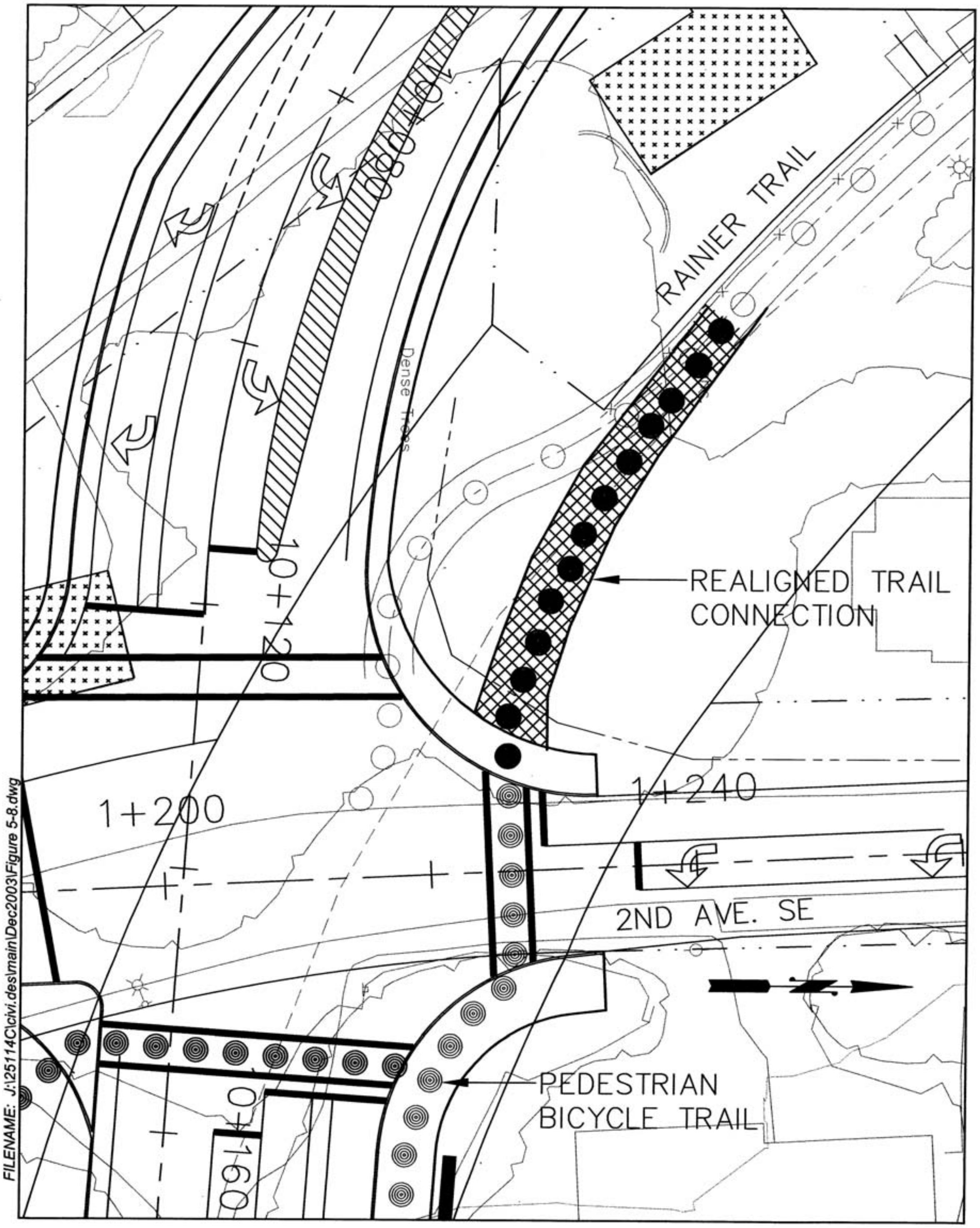

Figure 4-8
Proposed Rainier Trail Connection (Alternatives 2, 4, and 6)

alternatives could result in increased noise levels and vehicle emissions along Front Street South in the vicinity of the Squak Valley Park. However, none of these effects would be expected to seriously detract from the use and enjoyment of the park. Alternatives 2, 4 and 6 would have no direct impacts on Squak Valley Park. Front Street South would be reconstructed and repaved under Alternatives 1, 3 and Alternative 5/Modified 5, and it is possible that dump trucks would use Front Street South as a haul route during construction. This would result in temporary increases in noise levels, dust and exhaust emissions in the immediate vicinity of the Squak Valley Park for several months to one year. However, no Section 4(f) use of the property would result under any of the alternatives.

Mitigation Measures

Use of Section 4(f) properties by the proposed project has been avoided or minimized by incorporating a variety of mitigation measures into its design. These mitigation measures are described below for each 4(f) resource.

White Swan Inn

Potential harm to the White Swan Inn would be minimized by ensuring that the roadway design and design of the new intersection at East Sunset Way does not change the existing roadway elevation or alignment adjacent to the White Swan Inn. This mitigation measure to minimize harm has been incorporated into the design of the preferred alternative. Additional measures to minimize harm include placing vegetative screening between the White Swan Inn and the new stormwater ponds on the east and conducting all work (including new paving and installation of sidewalks) within the existing public right-of-way.

Campbell House

Similar to the measures proposed to minimize potential harm to the White Swan Inn, the new intersection at 2nd Avenue Southeast would be designed so that the existing roadway elevation and alignment adjacent to the Campbell house would not change. This measure to minimize harm has been incorporated into the design of Alternatives 2, 4, and 6. The Campbell house would not be directly affected by Alternative 1, 3, or Modified Alternative 5, which is the preferred build alternative. Additional measures to minimize harm include conducting all work (including new paving and installation of sidewalks) within the existing public right-of-way.

Issaquah Sportsmen's Clubhouse

All build alternatives would include construction of earthen berms between the clubhouse and the Southeast Issaquah Bypass roadway, to create a physical barrier and visual screen between the clubhouse and the new roadway. Dense plantings of native trees, shrubs and groundcovers on the berm and in other disturbed areas would help recreate the existing park-like setting. New light standards along the Southeast Issaquah Bypass roadway would be placed to avoid flooding the clubhouse and grounds with unwanted light. Additional measures to mitigate changes in the setting, feeling and association of the Issaquah Sportsmen's Clubhouse could include:

- Replacing existing parking area displaced by the Southeast Issaquah Bypass
- Moving the clubhouse closer (south or east) to the range so that both facilities are east of the Southeast Issaquah Bypass (this is feasible only if the clubhouse can structurally withstand the move)
- Moving the clubhouse and range to a new location, if the building can be moved
- Creating an oral history of the Issaquah Sportsmen's Clubhouse by interviewing members and their families, users, neighbors, and city and county personnel, and augmenting interviews with photographs of the clubhouse and range
- Supporting an inventory of historical and archaeological resources in Issaquah (create walking tours of historic buildings, markers for historic buildings and sites and brochures available to schools, libraries, the museum, Chamber of Commerce and local businesses)
- Developing Issaquah history documents, which might include topics such as Native American occupation and use of the area, mining, logging and milling, transportation (trails, railroads, and roads), settlement, ethnic groups, and the development of municipal government (such histories, or contexts, are used as the basis for evaluating historical properties, but are also useful tools for teachers and librarians, as well as sources of information for local residents)
- Creating road and trail signs or an exhibit that discuss the sites and buildings along or near the Southeast Issaquah Bypass including the Seattle Lake Shore & Eastern (SLS&E) Railroad, the Gilman Water Company/Old Issaquah Water Works, the Donlan homestead and lumber mill, the Issaquah Lumber Company, the Issaquah Sportsmen's Clubhouse, the Campbell house, and the White Swan Inn.

West Tiger Mountain/Tradition Plateau Natural Resource Conservation Area

To minimize use of property within the NRCA, all build alternatives would include large retaining walls. The maximum height of individual retaining wall would be approximately 30 feet as the walls would be stepped to reduce visual impacts along the eastern edge of the northern alignments. Although construction of the Southeast Issaquah Bypass would not directly affect existing recreation trails within the NRCA, tree clearing and other vegetation removal associated with Alternatives 3 and 4 would reduce the amount of protected recreation land and wildlife habitat within the NRCA.

As mitigation, the city is proposing to acquire an undeveloped privately owned parcel located adjacent to the NRCA to replace recreation land and wildlife habitat lost to construction of the Southeast Issaquah Bypass roadway. The proposed replacement parcel is approximately 1.2 hectares (3 acres), heavily forested, and surrounded on three sides by the NRCA. The Department of

Natural Resources would be compensated at fair market value for any land acquired from the NRCA under Alternatives 3 and 4.

Temporary increases in dust, noise, and exhaust emissions in the immediate vicinity of the NRCA would be mitigated by requiring the contractor to use standard dust control measures, noise suppression equipment, and emission control technologies to ensure that these effects do not substantially interfere with the use of the NRCA.

Issaquah School District Athletic Field

As mitigation for separating the high school campus from the athletic field, Alternatives 1 and 2 would include a new pedestrian walkway connecting the high school campus with the 4.2-meter- (14-foot-) wide bicycle/pedestrian trail to be located along the western edge of the Southeast Issaquah Bypass roadway. Students and faculty would be able to walk to the athletic field using the bicycle/pedestrian trail and the crosswalk at the new signalized intersection at the entrance to the proposed Park Pointe development. Vehicle access to the athletic field would be provided by a new right-in/right-out only roadway connected to the Southeast Issaquah Bypass.

Under Alternatives 3 and 4, the Southeast Issaquah Bypass roadway would be recessed approximately 2 meters (6.6 feet) below existing grades for approximately 600 meters (0.33 miles) adjacent to the high school. This design, which is intended to reduce noise impacts on the main high school campus, would also benefit athletic field users.

The school district would be compensated at fair market value for approximately 715 square meters (0.22 acres) of property acquired from the northeast part of the athletic field under Modified Alternative 5 and Alternative 6. The athletic field would be extended by approximately 24 meters (78 feet) to the northwest. The existing baseball diamonds used by the Issaquah High School varsity girls softball team and the track field facilities (shot put and javelin) would be reconfigured on the athletic field for continued use in the future. Noise barriers placed between the roadway and the athletic field were evaluated for all build alternatives. Because none of the barriers were able to meet WSDOT and FHWA noise abatement criteria (i.e. reduce predicted noise levels by at least 7 dBA), barriers are not included as mitigation for noise impacts on the athletic field. At most, only a 3- to 5-dBA reduction could be expected. Although noise barriers are not required, the city will work with the school district to achieve an acceptable level of noise mitigation. This may include depressing the road and creating a berm along the football field and athletic field and/or a small wall along the athletic field. The actual noise mitigation plan will be developed in coordination with the school district and city designers, if and when the Southeast Bypass enters the design phase.

Temporary increases in dust, noise, and exhaust emissions in the immediate vicinity of the athletic field would be mitigated by requiring the contractor to use standard dust control measures, noise suppression equipment, and emission control technologies to ensure that these impacts do not substantially interfere with the use of the field.

Issaquah High School Baseball Field

As explained in the previous section for the athletic field, noise barriers are not included as mitigation for the baseball field because at most only a 3 to 5 dBA reduction would be possible. Temporary increases in dust, noise, and exhaust emissions in the immediate vicinity of the baseball field during construction would be mitigated by requiring the contractor to use standard dust control measures, noise suppression equipment, and emission control technologies to ensure that these effects do not substantially interfere with the use of the field.

Issaquah High School Football Field and Track

For the same reasons described previously for the athletic and baseball fields, noise barriers are not recommended as mitigation for the football field and track. However, if earthen berms or a solid wall were placed between the Southeast Issaquah Bypass roadway and the football field to reduce visual impacts under Alternatives 2, 4 and 6, there would an added benefit in terms of noise reduction in the range of 3 to 5 dBA. Temporary increases in dust, noise, and exhaust emissions in the football field's immediate vicinity would be mitigated by requiring the contractor to use standard dust control measures, noise suppression equipment, and emission control technologies to ensure that these effects do not substantially interfere with use of the football field and track.

Rainier Trail

Mitigation for temporary closure of the Rainier Trail under Alternatives 2, 4, and 6 would include public notification of construction schedules, and/or providing detour routes that connect to the Tiger Mountain trail network. Existing signs, benches and the brick surface at the trail's terminus with 2nd Avenue Southeast would be moved and reconstructed 10 meters (33 feet) north of its current location. The Rainier Trail would not be impacted with Alternatives 1, 3, or Modified Alternative 5 at its terminus.

Squak Valley Park

The design for Alternatives 1, 3, and Modified Alternative 5 have been carefully developed to avoid use of any portion of Squak Valley Park. The proposed reconstruction and repaving of Front Street South adjacent to the park to allow smooth transition from the four-lane Southeast Issaquah Bypass roadway to the existing two-lane Front Street South roadway would be done completely within the existing road right-of-way. All build alternatives would likely result in increased traffic noise and vehicle emissions in the vicinity of Squak Valley Park. However, none of these effects are expected to seriously detract from the use and/or enjoyment of the park.

Section 4(f) Alternatives Comparision

This section addresses the alternatives considered for the proposed project based on Section 4(f) criteria. As detailed in Chapter 2 of this final EIS, many alternatives were originally considered. Following the screening of alternatives, six alternatives were advanced for environmental review in the draft EIS (June 2000). Modifications and changes in these alternatives resulted in dismissing three of the draft EIS alternatives and adding three others in their place. These were the six alternatives evaluated in the June 2004 supplemental draft EIS. **Table 4-1** summarizes these alternatives' potential impacts on Section 4(f) resources.

Table 4-1
Comparison of Potential Impacts on Section 4(f) Resources

Alternative	Impact
Alternative 1	Would not affect 4(f) resources
Alternative 2	Reconfigures the Rainier Trail at 2nd Avenue SE
Alternative 3	Results in Section 106 adverse effect on the Sportsmen's Clubhouse; displaces 4,920 square meters (1.21 acres) of NRCA land
Alternative 4	Results in Section 106 adverse effect on the Sportsmen's Clubhouse; displaces 4,920 square meters (1.21 acres) of NRCA land; reconfigures the Rainier Trail at 2nd Avenue SE
Modified Alternative 5 (Preferred Alternative)	Requires approximately 715 square meters (0.22 acres) of the Issaquah High School athletic field; requires property from Sportsmen's Clubhouse land, but would not result in adverse effect
Alternative 6	Requires approximately 1,500 square meters (0.37 acres) of the Issaquah High School athletic field; reconfigures the Rainier Trail at 2nd Avenue SE; requires property from Sportsmen's Clubhouse land but would not result in adverse effect

Following issuance of the supplemental draft EIS, and as a result of the 404 Merger Agreement review, Modified Alternative 5 was selected as the preferred alternative. A brief review of the alternatives considered in the supplemental draft EIS follows.

Alternative 1

Alternative 1 was the only build alternative that completely avoided use of Section 4(f) property. Alternative 1 was considered feasible from an engineering point of view, but was not considered prudent because it would have created a number of impacts that would seriously affect wetlands in the project area and would have substantial impacts at Issaquah High School. Although wetland impacts associated with this alternative have been reduced, it would still result in proximity impacts at Issaquah High School.

The North A alignment of Alternative 1 could seriously disrupt Issaquah High School. Construction of Alternative 1 would place the roadway within 10 to 20 meters (32 to 65 feet) of student-occupied portions of the high school. Even though noise barriers (sound walls) would be installed between the roadway and the high school to reduce noise levels, construction noise could be temporarily bothersome to outdoor users of Issaquah High School facilities. Construction noise inside the classrooms would be noticeable at times but is not expected to be substantially disruptive.

Alternative 1 would also separate the high school campus from the athletic field. As mitigation, Alternative 1 includes a new pedestrian walkway connecting the high school campus with the bicycle/pedestrian trail along the western side of the

Southeast Issaquah Bypass roadway to allow students and faculty to walk to the athletic field using crosswalks at a new signalized intersection at the entrance to the proposed Park Pointe development. However, this solution would require students to cross a busy roadway, creating a possible safety hazard for drivers and students. Alternative 1 is considered unacceptable by the Issaquah School District.

Alternative 2

Alternative 2 (which included the North A alignment) was considered feasible from an engineering point of view but was not considered prudent for several environmental reasons. As described for Alternative 1, construction of the North A alignment within 10 to 20 meters (32 to 65 feet) of classrooms at Issaquah High School could seriously compromise the existing learning environment and possibly create safety concerns for up to two years. Even though noise barriers (sound walls) would be installed between the new roadway and the high school to reduce noise levels, construction noise inside the classrooms would be noticeable at times but is not expected to be substantially disruptive.

Alternative 2 would also separate the high school campus from the athletic field. As described for Alternative 1, a new pedestrian walkway connecting the high school campus with the bicycle/pedestrian trail would be included in the design. This would allow students and faculty to walk to the athletic field using crosswalks at a new signalized intersection at the entrance to the proposed Park Pointe development. However, as with Alternative 1, this solution would require students to cross a busy roadway, creating a possible safety hazard for drivers and students. Alternative 2 is considered unacceptable by the Issaquah School District.

Alternative 3

Alternative 3 was considered feasible but not prudent for reasons similar to Alternative 1. The North B alignment would use approximately 920 square meters (0.22 acres) of land from the Sportsmen's Club property and would extend to within 10 meters (33 feet) of the historic clubhouse building. The cultural resources investigation conducted for this project concluded that the new road's proximity to the clubhouse under Alternative 3 would create an adverse effect based on criteria in Section 106 of the National Historic Preservation Act by permanently altering the property's parklike setting and separating the clubhouse from the rifle range. This separation would also diminish the value of the clubhouse for social and educational events currently sponsored by the Sportsmen's Club. Even with mitigation (e.g., earthen berms between the clubhouse and the Southeast Issaquah Bypass roadway to create a physical and visual barrier) the physical separation of the clubhouse from the rifle range would seriously disrupt current ongoing activities at the Sportsmen's Club.

Alternative 3 would also use approximately 4,920 square meters (1.21 acres) of land along the western edge of the West Tiger Mountain/Tradition Plateau NRCA for road right-of-way and remove approximately 5,705 square meters (1.41 acres) of NRCA forest habitat.

Alternative 4

Alternative 4, although feasible from an engineering point of view, is not considered prudent because it would require approximately 920 square meters (0.22 acres) of land from the Sportsmen's Club property and would extend to within 10 meters (33 feet) of the historic clubhouse building. Alternative 4 would create an adverse effect on the clubhouse building based on criteria in Section 106 of the National Historic Preservation Act by permanently altering the property's parklike setting and separating the clubhouse from the rifle range.

Alternative 4 would also use approximately 4,920 square meters (1.21 acres) of land along the western edge of the West Tiger Mountain/Tradition Plateau NRCA for road right-of-way and remove approximately 5,705 square meters (1.41 acres) of NRCA forest habitat.

Modified Alternative 5 (Preferred Alternative)

This alternative would extend approximately 24 meters (78 feet) into the northeast corner of the high school athletic field. This would result in reducing the size of the field by approximately 715 square meters (0.22 acres). The athletic field would be reconfigured and extended to the west, preserving the existing uses there.

Approximately 2,490 square meters (0.61 acres) of land would be acquired from the Sportsmen's Club property. The centerline of the new roadway would be approximately 36 meters (118 feet) west of the clubhouse building. A new access road to the clubhouse and range would be provided through the proposed Park Pointe development, or if that project is not constructed, this access would be from the Southeast Bypass roadway. No land would be acquired from the Tiger Mountain NRCA.

Alternative 6

Alternative 6 would use approximately 2,687 square meters (0.66 acres) of land from the clubhouse site. However, because the new roadway would be as close as 25 meters (82 feet) from the clubhouse, and mitigation measures (e.g., dense plantings of trees and shrubs) would recreate the existing parklike setting, the impact on the historic building would be below the threshold of an adverse effect.

Alternative 6 would use portions of two other 4(f) properties in the project area. As described for Alternative 5, the new road would extend approximately 24 meters (78 feet) into the northeast corner of the athletic field, thereby requiring reconfiguration of the field to preserve existing uses.

Alternative 6 would also require relocation and reconstruction of a small portion of the Rainier Trail at its terminus at 2nd Avenue Southeast. Mitigation measures (e.g., public notification of construction schedules and providing detour routes for connections to the Tiger Mountain trail network) would offset any potential adverse effects on the Rainier Trail.

Alternative 7 (No Action)

The no-action alternative is not considered feasible and prudent because it clearly does not meet the project's stated purpose and need to relieve existing traffic congestion on Front Street South and improve mobility in the city of Issaquah.

Section 4(f) Determination

As concluded in the supplemental draft EIS (June 2004), among the alternatives originally considered for this project only Alternative 1 would completely avoid the use of Section 4(f) property. All other build alternatives under consideration would affect Section 4(f) resources to some degree. Although by engineering standards it would be feasible to construct Alternative 1, this alternative was not selected as the preferred alternative because it does not meet the project purpose and need (see Chapter 2).

The Modified Alternative 5 alignment would require acquisition of property from the Issaquah Sportsmen's Clubhouse site and the Issaquah High School athletic field. Acquisition of land from the Sportsmen's Clubhouse property would not result in an adverse effect on this resource. The athletic field would be reconfigured to preserve its current uses. These measures would provide actions to minimize potential harm to these resources as a result of the proposed roadway.

Alternatives 1, 2, 3, 4, and 6 were considered not feasible due to various impacts. Alternative 7, no action, would not meet the proposed project purpose and need. Modified Alternative 5 is considered feasible. It would result in some impacts on Section 4(f) resources; however, with mitigation these impacts would not adversely affect the use of these faculties. **Table 4-2** summarizes the analysis of project alternatives for impacts on Section 4(f) resources.

Table 4-2
Summary of Impacts on Section 4(f) Resources

	Feasible and Prudent?	Uses Section 4(f) Land?	Relative Net Harm after Mitigation
Alternative 1	No	No (N/A*)	N/A
Alternative 2	No	Yes (N/A*)	N/A
Alternative 3	No	Yes (N/A*)	N/A
Alternative 4	No	Yes (N/A*)	N/A
Modified Alternative 5	Yes	Yes	Lowest
Alternative 6	No	Yes	N/A
Alternative 7 (No Action	No	No (N/A*)	N/A

*N/A – Alternatives not feasible and prudent are eliminated from further consideration.

Coordination with Other Agencies

The Washington Department of Natural Resources (WDNR) was contacted in 1998 regarding the West Tiger Mountain NRCA and its relationship to

Section 4(f) requirements. In response, WDNR indicated that although there was no past documentation of the NRCA as a Section 4(f) resource, the designation seemed appropriate. Regarding potential impacts on the resource, WDNR advised that any proposed conversion or encumbrances on state trust property are required by statute to compensate the trust at fair market value.

Coordination concerning the White Swan Inn and the Issaquah Sportsmen's Clubhouse occurred through Section 106 consultations in connection with historic preservation regulations. The state Office of Archaeology and Historic Preservation (OAHP) and the King County Cultural Resources Division were contacted regarding these resources, and both have indicated a desire to minimize use of these properties. Where use cannot be avoided, the OAHP indicated that a range of mitigation measures should be explored to reduce the overall impact on historic properties. In January 2005, OAHP concluded that the project would have no adverse effects on historic resources (OAHP, 2005). A copy of this letter is included at the end of Chapter 6.

The Issaquah School District was contacted during environmental review of the proposed project to obtain information on school use and nonschool use of the recreation facilities on and near the Issaquah High School campus. The school district is opposed to any alternative that would separate the athletic field from the main campus and has expressed serious concerns about alternatives that would displace existing baseball diamonds at the athletic field. The city will continue to work closely with the school district to identify appropriate mitigation to offset the use of school district owned recreational facilities.

Chapter 5

Comments and Coordination

Chapter 5 Comments and Coordination

Notice of Intent

On November 8, 1996 the Federal Highway Administration (FHWA) issued a notice of intent to prepare an environmental impact statement (EIS) for the proposed Southeast Issaquah Bypass project. The proposed project was identified as a new arterial bypass approximately 2.4 km (1.5 miles) in length, to connect I-90 at the Sunset interchange with Front Street South. Environmental issues of concern were identified, and comments were invited from agencies and interested parties.

Agency and Public Scoping

To ensure that environmental information was available to public officials, agencies, and citizens before decisions were made, open houses were held and newsletters distributed. Scoping meeting notifications were mailed via U.S. mail to a large geographic area (98027 and portions of the 98032 ZIP code), totaling over 11,000 households. Notices were also mailed to local agencies, legislators, and local businesses. Posters were placed throughout the community to encourage attendance at the scoping meeting. Agencies received scoping meeting notices and follow-up phone calls, encouraging their participation at the agency scoping meeting.

The agency scoping meeting was held at the Issaquah City Council chambers on the afternoon of December 9, 1996, and a public scoping meeting was held that evening at Issaquah High School. Representatives of the city of Issaquah, Federal Highway Administration, Washington State Department of Transportation, Washington Department of Natural Resources, U.S. Environmental Protection Agency, Sound Transit, Washington Department of Fish and Wildlife, U.S. Army Corps of Engineers, Washington Natural Gas, Washington Department of Ecology, and the Puget Sound Regional Council attended the agency meeting. A walking tour of the proposed project corridor was conducted in the morning as part of the agency scoping meeting.

Following the conclusion of an extended comment period, scoping comments identified a number of issues of concern related to the proposed project. These issues included alternative route locations, traffic, project design, noise, runoff and flooding, streams and wetlands, impacts on trails, quality of life, growth and development, aquifer protection, safety, transit, air quality, and impacts on schools and neighborhoods.

Public Involvement

A public involvement plan was developed to identify an approach to involving the public, affected jurisdictions, regulatory agencies, and elected public officials in the study and evaluation process. Major elements of the plan include:

- Newsletters distributed to potentially affected residents, businesses, public officials, agencies, and other individuals and groups who expressed interest in the project

- Open houses and neighborhood meetings held to present project progress and findings and facilitate feedback
- News releases distributed to news media, discussions with media reporters, and paid advertising encouraging participation at open houses and other meetings
- Fact sheets, handouts, and comment forms distributed during open houses
- Project displays, newsletters, and comment forms available at community events
- Project information placed on the city of Issaquah's web page.

Public Meetings and Open Houses

Several public open houses for the proposed Southeast Issaquah Bypass project have been held in conjunction with other proposed roadway projects in the Issaquah area, including the Southeast Issaquah Bypass, Sunset interchange, South Sammamish Plateau Access Road (SPAR), and North SPAR projects. Prior to environmental analysis, information on the Southeast Issaquah Bypass project was available at open houses held at Issaquah High School on July 31, 1996, December 12, 1996, and May 19, 1997. Two open houses were held at Issaquah High School during early environmental review: one on December 9, 1998, and one on January 25, 2000.

A community roundtable meeting was also held on June 6, 2000 to provide a public forum on the proposed Southeast Issaquah Bypass. This meeting was held at Issaquah High School and moderated by WSDOT. Citizens were asked to comment on the project and city council members were in attendance.

Media releases to newspapers throughout the region advertised open houses, and paid advertising was placed in the Issaquah Press for each of the two weeks prior to each open house. Posters announcing the open houses were also displayed throughout the community. Project advisory committee members were provided with additional notices for their distribution. A mailing list of over 2,000 interested individuals, organizations, and agencies has been compiled and maintained specifically for this project. All written communications provided ways for people with disabilities to request special accommodations in alternative formats, sign language interpreters, physical accessibility accommodations or other reasonable accommodations.

Information on the project has also been on display at Issaquah Salmon Days (an annual community event that draws over 200,000 people over one weekend). A display has also been showcased at the Issaquah Community Center during recent years.

Small group meetings have also been used for ongoing public involvement activity. Groups representing neighborhoods, schools and recreational interests have been contacted. In September 2002, a meeting with Issaquah Parks and Recreation officials, members of local trails groups, and citizens was held to present new information on the proposed roadway design. Notes from that meeting are provided at the end of this chapter. The Issaquah City Council's regular project briefings are advertised to the general public through paid advertising placed in the Issaquah Press.

A draft EIS for the Southeast Issaquah Bypass was issued in June 2000. The draft EIS was followed by a public and agency comment period, which included a public hearing held on August 1, 2000 to provide an additional opportunity to comment on the document. Federal, state and local agencies and groups and individuals provided written and verbal comments on the draft EIS. Because of significant changes in the proposed project that have made most of these comments irrelevant or obsolete, a formal response to these comments was not prepared. New information on the project was provided in this supplemental draft EIS, and comments will be taken during the formal comment period for this final EIS. Copies of letters and comments received on the 2000 draft EIS are available from the city of Issaquah in a separate document.

The supplemental draft EIS was published in June 2004 and followed by another public comment period, including a public hearing on July 15, 2004. Written and verbal comments provided during the comment period are included in Volume 2 of this final EIS, with responses to those comments.

As part of public input, comments have been received from citizens in the Lewis Lane neighborhood, where home displacements and neighborhood impacts would occur. The primary issues raised in these comments include the following:

- Loss of homes in the Lewis Lane neighborhood
- Neighborhood disruptions
- Impacts on property values
- Traffic noise
- Air quality impacts
- Floodplain disturbance and flooding
- Impacts on wildlife and vegetation
- Visual quality
- Construction impacts.

Each of these issues was addressed in the supplemental draft EIS and is addressed in Chapter 3 of this final EIS. Although the environmental review has acknowledged that impacts on the neighborhood would occur, the city believes that with proposed mitigation measures, substantial adverse impacts on the neighborhood would be avoided. A short summary of these issues follows.

- Although the proposed roadway cannot avoid the displacement of up to seven homes (including one in-home business), the roadway has been designed to minimize potential displacements to the extent possible. All displacements would be provided compensation under the provisions of the Uniform Relocation Act.
- A localized loss of mobility between Lewis Lane and Kramer Place would occur, but this would only affect travel to and from three homes on

Kramer Place and the Latter Day Saints (LDS) church on 6th Avenue Southeast. Access to the homes and the church would be provided from the proposed Southeast Bypass roadway, so the primary change experienced would be the need to use the proposed Southeast Bypass to reach the church and Kramer Place.

- The relationship between property values and the proposed roadway is discussed in the supplemental draft EIS and this final EIS. It has not been demonstrated that the proposed roadway would result in adverse impacts on local property values.
- The roadway would not result in the exceedance of air quality standards. Mitigation for noise impacts would not be feasible in the neighborhood area.
- With proposed stormwater facilities, the project is not expected to have an effect on 100-year flood levels in the project area.
- The proposed bridge in the south project area would provide area for wildlife movement beneath the bridge. The city has agreed to contribute to studies of wildlife movement in the area. Although some loss of vegetation would occur for roadway construction, the project includes a Wetland Mitigation Plan that would replace and enhance buffer and streamside vegetation to preserve wildlife habitat in this area.
- Mitigation for visual impacts would include landscaping to help obscure views of the roadway from nearby residences, and downward-directed lighting or shields to reduce light and glare from roadway lighting.
- Best management practices to be followed during construction are intended to reduce temporary impacts associated with construction activities throughout the project area.

Chapter 3 of this final EIS discusses impacts and mitigation measures for each of these elements in more detail and provides additional information in response to individual questions received on the supplemental draft EIS. As indicated previously, responses to comments and letters received on the supplemental draft EIS are provided in a separate volume.

Newsletters

Several newsletters have been periodically distributed to inform the public of the proposed Southeast Issaquah Bypass project's progress and to provide information on the South SPAR/Sunset interchange and North SPAR projects. An extensive database of local and regional residents interested in these projects has been used for newsletter mailings. A project newsletter was distributed in November 1996, which summarized the input received at the last open house, and announced another meeting in December 1996. This newsletter included information on upcoming environmental review and scoping for the Southeast Issaquah Bypass project.

In April 1997, a second newsletter was sent to provide an update on the Southeast Issaquah Bypass schedule and announce an upcoming open house. A third newsletter was mailed in August 1998 with information on the proposed

Southeast Issaquah Bypass alignments and the latest schedule for environmental review. The project was delayed by interagency review during much of 1999, and a fourth newsletter in December 1999 summarized discussions with resource agencies. This included information on potential alternatives to constructing the Southeast Bypass, reasons for their rejection, and the final alternatives to be considered in environmental review.

Following additional project delays, a fifth newsletter was distributed in March 2002 to advise the public of the resumption of project review, beginning with design of the new South C alignment and followed by preparation of the supplemental draft EIS. In May 2002, a two-page update to the March newsletter was mailed to present preliminary findings from the transportation analysis using the 2030 traffic demand model. This newsletter also included the city council's decision to pursue study of the project through completion of a final EIS.

All newsletter mailed to the public contained the following "Individuals requiring reasonable accommodation may request written materials in alternative formats, sign language interpreters, physical accessibility accommodations or other reasonable accommodations by contacting Pam Fox at (425) 837-3423 or e-mailing *pamf@ci.issaquah.wa.us*.

Interagency Merger Agreement Review

In August 1998, it was determined that the proposed project was subject to review under the terms of the National Environmental Policy Act/State Environmental Policy Act (NEPA/SEPA) Interagency Working Agreement between state and federal transportation and resource agencies. Participating agencies within the Signatory Agency Committee (SAC) under this agreement include FHWA, NOAA Fisheries (NMFS), U.S. EPA, U.S. COE, USFWS, WDFW, WSDOT, and the Department of Ecology.

Meetings were held throughout 1999 to obtain agency input and to discuss progress on the receiving agencies' concurrence on the project's purpose and need and the study of project alternatives. Five primary meetings took place during this review. The initial meeting with the SAC was held in Seattle, Washington on January 13, 1999. At this meeting, the proposed project was presented to the agencies and the project's purpose and need was defined.

On February 10, 1999 a morning field visit to the project site in Issaquah was conducted, followed by a meeting at the city hall council chambers. Project goals were reviewed and alternatives to the proposed project were discussed. As a result of this meeting, concurrence with the project's purpose and need and the alternatives studied was received from three agencies. Three agencies did not concur, and one agency withdrew from the interagency review process.

On April 27, 1999 a meeting was held at the Ecology offices in Bellevue, Washington to provide additional information on proposed project alternatives and further refine the goals identified in the project's purpose and need statement. The participating agencies agreed that more information was required to fully evaluate alternative choices to building the new roadway.

On September 16, 1999 the results of additional analysis were presented to resource agencies in Olympia, Washington. The project's purpose and need statement was agreed to and agencies subsequently provided concurrence with the examination of alternative routes and nonstructural options. However, in providing concurrence, the agencies called for the EIS to include a full discussion of the alternatives evaluation, and assurance that the secondary impacts associated with providing a new roadway would be identified. These issues are discussed in Chapter 2 of this document and secondary impacts are discussed in Chapter 3.

When it was decided to prepare a supplemental EIS in summer of 2002, the 404 Merger Agreement signatory agencies were notified and new information on the project was presented at the SAC meeting on September 12, 2002. Following this meeting, the agencies were requested to provide concurrence on alternatives to be considered in the supplemental EIS. Concurrence was received from all but one agency, including concurrence with advisory comments from three agencies. The U.S. EPA did not concur with the proposed alternatives. A meeting was held on October 24, 2002 to discuss the U.S. EPA concerns, and the city of Issaquah agreed to provide additional information on the proposed project following this meeting. U.S. EPA then provided concurrence on the supplemental EIS alternatives, with the understanding that the supplemental EIS would include additional analysis to address their concerns. Letters from agencies providing advisory comments during the 2002 review and response letters from the city are included at the end of this chapter.

After publication of the supplemental draft EIS, the city coordinated with SAC agencies to initiate consideration of agency concurrence on the preferred alternative. In fall 2005, the city submitted information to the signatory agencies, presenting the selection of Modified Alternative 5 as the preferred alternative to be considered in the final EIS. Comments were received from the signatory agencies and issue resolution meetings were held to determine additional measures to minimize potential impacts on streams, wetlands, and wildlife resources in the project area. A final report identified as the Concurrence Point 3 packet (Issaquah, 2005) was submitted in December 2005, and signatory agencies concurred with the selection of Modified Alternative 5 as the preferred alternative in February 2006. Concurrence letters and advisory comments from the signatory agencies at the end of the Concurrence Point 3 discussion in 2006 are provided at the end of this chapter.

Coordination with Interagency Committee for Outdoor Recreation

The Issaquah Sportsmen’s Clubhouse and the nearby shooting range have made improvements through funding from the Washington Interagency Committee for Outdoor Recreation (IAC). The IAC was contacted in April 2003 to review impacts from the proposed Southeast Bypass on these resources. Subsequently, on June 11, 2003, members of the IAC met with city staff and consultants to discuss the project. A letter identifying the use of IAC funds for improvements to the clubhouse and shooting range and notes from the June 2003 meeting is included at the end of this chapter. Additional coordination with the IAC occurred for this final EIS. In a letter dated April 14, 2006, the IAC indicated that because any impacts on the Sportsmen’s Clubhouse would not occur until after grant conditions for the facility have been removed, April 28, 2008, IAC compensation would not be required and IAC board approval of the project would not be necessary. A copy of this letter is provided at the end of this chapter.

Issaquah School District Correspondence

The Issaquah School District has been consulted regarding potential impacts on school facilities that may result from the proposed project. Coordination with the school district occurred during identification of potential noise impacts on nearby school buildings and potential impacts on the school district athletic field northeast of the high school campus. Impacts and mitigation measures for school facilities are discussed in Chapter 3. A letter from the school district regarding impacts on the athletic field is included at the end of this chapter.

106 Correspondence

Coordination concerning cultural resources has occurred with the Office of Archaeology and Historic Preservation (OAHP) and local Indian tribes, as provided for under Section 106 of the National Historic Preservation Act. Copies of recent letters to OAHP and tribes concerning potential impacts on historic, cultural, and archaeological resources in the project area are provided at the end of this chapter. Additional coordination with OAHP occurred during preparation of the city's Concurrence Point 3 packet for the 404 Merger Agreement meetings.

The city received a letter from OAHP in January 2005 concluding that Modified Alternative 5 "would not have adverse effects on National Register eligible or listed historic and cultural resources." A copy of this letter is provided at the end of this chapter.

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Interagency 404 Merger Agreement Coordination

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 98501

RECEIVED
FEB 24 2006
PUBLIC WORKS ENG

February 23, 2006

Mr. Bob Brock
Public Works Director
P.O. Box 1307
Issaquah, WA 98027-1307

Subject: SE Issaquah Bypass - Concurrence Point 3 - Advisory Comments

Dear Mr. Brock:

The Washington Department of Fish and Wildlife (WDFW) hereby submits concurrence and advisory comments for the SE Issaquah Bypass Project - Concurrence Point 3.

1. The WDFW prefers Mitigation Option 1 over Option 2, primarily because it would be "on-site", rather than "off-site" mitigation.

2. The WDFW prefers level spreaders discharging to wetlands or buffers where feasible. Direct outfalls would have more impact to stream systems and should be avoided.

3. <u>Clarification language for discussion on wildlife connectivity impacts, mitigation, and reasons for eliminating or not pursuing certain wildlife crossings</u> *The WDFW is in agreement with EPA regarding the following edit recommendations which are consistent with the resource agencies white paper.* .

   Page 7 and page 27 of *Concurrence Point 3 Packet*, <u>Wildlife Crossings</u>, and 7.13 Wildlife Connectivity, provides information about wildlife connectivity and wildlife crossing issues associated with the project. We recommend the text in both locations be edited to be consistent with the following text excerpted from the resource agencies white paper prepared during level 3-issue resolution.

   > "The construction of the SE Issaquah Bypass will incrementally impede the natural movement of large animals. However, it is not in the animals' interests or in the citizens' interests to mitigate this impact by facilitating the movement of large animals through an urban area where it brings them into proximity of urban residents. The SDEIS: 1) identified existing wildlife corridors and species that would be impacted; 2) concluded that the road would deter wildlife movement; 3) suggested the proposed bridge might not be high enough to allow large mammal movement; and, 4) identified land preservation and the creation of contiguous habitat as possible mitigation."

In regards to any question about the use of fencing, the resource agencies provided an explanation why it should not be included at this time:

> "Therefore, we recommend that the fencing be implemented only in conjunction with the establishment of adequate crossing structures at some time in the future."

In regards to mitigation for the impacts, we recommend the following:

> "It was agreed mitigation should be proportionate to the adverse effect. The mitigation would be in the form of monetary support and facilitation of the initiation of a study and planning effort that addresses regional wildlife connectivity. The monetary level of participation would be proportionate to the cost difference between a 6' high bridge and an 8' high bridge across the North Tributary. "

4. Include CP 3 commitments in FEIS and ROD discussion; track commitments through to permitting

We want to ensure that all the hard work, commitments, and issue resolution that has been accomplished during the SAC process for the SE Issaquah Bypass project is retained and used. For that reason, we encourage the project proponents to clearly incorporate the commitments, made during CP3, into the discussion of impacts and mitigation/commitments in the main body of the FEIS and the Record of Decision (ROD). Additionally, we encourage you to identify and implement a plan to ensure that the commitments are implemented during later stages.

Thank you for your cooperation and willingness to work with us throughout the project process.

Sincerely,

Gayle Kreitman for

Teresa Eturaspe

Cc: WDFW SEPA/NEPA Coordinator
WDFW SAC Representative

SAC Agreement
Concurrence Form

Project Title:	SE Issaquah Bypass Project				
State Route #:	N/A	**County:**	King	**Date Due:**	February 23, 2006

Concurrence Point # and Description

[ ] **#1a** Project Purpose and Need (non-concurrence limited to transportation issues)	[X] **#3a** Detailed Mitigation Plan
[ ] **#1b** Screening Criteria for Selection of Alternatives	[X] **#3b1** For COE, USFWS, EPA, and NMFS: NEPA/SEPA Preferred Alternative/Apparent Section 404 LEDPA
[ ] **#2** Project Alternatives to be evaluated in the DEIS	[X] **#3b2** For Ecology and WDFW: NEPA/SEPA Preferred Alternative

Project Contact Person: Bob Brock, Public Works Director

Phone: (425) 837-3405 **Fax:** (425) 837-3409 **E-mail:** bobb@ci.issaquah.wa.us

Address: P.O. Box 1307, Issaquah, WA. 98027-1307

Brief Description of Project Status and Issues Relevant to Concurrence Points Checked Above:

The City has modified plans for the Bypass and believes the Alternative 5, as proposed, is the LEDPA solution that has the least possible environmental impact and the most practicable response to the project purpose and need.

Agency Decision:
(see end of form for definitions)

[✓] Concurrence

[ ] Non-concurrence (provide reasons on next page)

[ ] Waived

Summary of Reasons for Non-concurrence

Please include a detailed explanation of the reasons for non-concurrence. Also please identify the statutory or regulatory authority upon which this non-concurrence is based. (Attach detailed comments if needed)

Advisory Comments

Comments are advisory only, and will not trigger the issue resolution process. The project proponent will have 45 calendar days to respond to resource agency comments.

See Attached.

Agency: WDFW

Signer's Name: Gayle Kreitman

Signature: Gayle Kreitman

Title: Regulatory Services Section Manager

Date: 2-23-06

Technical Point of Contact: Teresa Eturaspe

CITY OF ISSAQUAH
Department of Public Works/Engineering
PO Box 1307 / Issaquah, WA 98027
(425) 837-3400 Fax (425) 837-3409

March 30, 2006

Teresa Eturaspe
State of Washington Department of Fish and Wildlife
600 Capitol Way North
Olympia, WA 98501-1091

Re: Concurrence Point 3
Advisory Comments

Dear Ms. Eturaspe:

Thank you for submitting the signed Signatory Agency Committee (SAC) agreement concurrence form for Concurrence Point 3 (3a – Conceptual Mitigation Plan; 3b1 – Alternative/Apparent Section 404 LEDPA; and 3b2 – NEPA.SEPA Preferred Alternative) for the SE Issaquah Bypass Project. In response to the advisory comments included with your letter dated February 23, 2006 included with the Concurrence Form dated February 23, 2006, the City of Issaquah has the following comments:

1. The WDFW prefers Mitigation Option 1 over Option 2, primarily because it would be "on-site", rather than "off-site" mitigation.

   <u>City's response</u>: *The City also prefers Option 1 for mitigation, given the favorable conditions at that location for a successful mitigation project. Option 2 was identified as an alternative should the Option 1 property becomes unavailable. At this point in time the property owner has indicated his support for using it for Bypass mitigation.*

2. The WDFW prefers level spreaders discharging to wetlands or buffers where feasible. Direct outfalls would have more impact to stream systems and should be avoided.

   <u>City's response</u>: *Level spreaders will be used where feasible.*

3. <u>Clarification language for discussion on wildlife connectivity impacts, mitigation, and reasons for eliminating or not pursuing certain wildlife crossings. The WDFW is in agreement with EPA regarding the following edit recommendations which are consistent with the resource agencies white paper…</u>

   Page 7 and page 27 of *Concurrence Point 3 Packet*, <u>Wildlife Crossings</u>, and 7.13 Wildlife Connectivity, provides information about wildlife connectivity and wildlife crossing issues associated with the project. We recommend the text in both locations be edited to be consistent with the following text excerpted from the resource agencies white paper prepared during level 3 issue resolution.

> "The construction of the SE Issaquah Bypass will incrementally impede the natural movement of large animals. However, it is not in the animals' interests nor in the citizens' interests to mitigate this impact by facilitating the movement of large animals through an urban area where it brings them into proximity of urban residents. The SDEIS: 1) identified existing wildlife corridors and species that would be impacted; 2) concluded that the road would deter wildlife movement; 3) suggested the proposed bridge might not be high enough to allow large mammal movement; and, 4) identified land preservation and the creation of contiguous habitat as possible mitigation."

In regards to any question about the use of fencing, the resource agencies explained, in the white paper, why it should not be included at this time:

> "Therefore, we recommend that the fencing be implemented only in conjunction with the establishment of adequate crossing structures at some time in the future."

In regards to mitigation for the impacts, we recommend the following:

> "It was agreed mitigation should be proportionate to the adverse effect. The mitigation would be in the form of monetary support and facilitation of the initiation of a study and planning effort that addresses regional wildlife connectivity. The monetary level of participation would be proportionate to the cost difference between a 6' high bridge and an 8' high bridge across the North Tributary. "

> <u>City's response</u>: *The City of Issaquah will not be resubmitting a new Final CP 3 document, except for replacement pages 29 and 30 that adds a statement on stormwater treatment objectives that was agreed to during a CP3 meeting but inadvertently omitted from the final document. Our recollection of the discussion is slightly different than your proposed statements but they are nonetheless consistent with the approved mitigation approach for wildlife connectivity and will be incorporated in the Final Environmental Impact Statement as appropriate.*

4. <u>Include CP 3 commitments in FEIS and ROD discussion; track commitments through to permitting</u>

   We want to ensure that all the hard work, commitments, and issue resolution that has been accomplished during the SAC process for the SE Issaquah Bypass project is retained and used. For that reason, we encourage the project proponents to clearly incorporate the commitments, made during CP3, into the discussion of impacts and mitigation/commitments in the main body of the FEIS and the Record of Decision

(ROD). Additionally, we encourage you to identify and implement a plan to ensure that the commitments are implemented during later stages.

City's response: The FEIS and ROD will incorporate all commitments made during the SAC process. The City will work closely with the consultant during preparation of the FEIS to ensure that all comments are addressed in the proper context, and mitigation/commitments clearly documented. This information represents crucial agency review of the project, and thus is extremely important for the ROD and subsequent project approval by the City Council, should the project proceed. Even so, it is our understanding that the CP3 documents and letters of concurrence from the SAC agencies will still stand alone as commitments that shall be adhered to by both the project proponent and the permitting agencies when permits are applied for during final design. A project management/quality assurance plan will also be developed to track the progress and implementation of all aspects of project design, permitting, construction and operations to ensure these commitments are incorporated into the project.

Thank you again for your advisory comment. The City remains committed to providing complete environmental review on the proposed SE Issaquah Bypass project. We look forward to your continued direction and participation on this project.

Sincerely,

Bob Brock, P.E.
Public Works Director

Enclosure: Replacement page 29 & 30 of the Concurrence Point 3 document.

Cc: Nancy Brennan-Dubbs/USFWS
John Grettenberger/USFWS
Krista Rave-Perkins/EPA
Christine Reichgott/EPA
Terry Swanson/Dept of Ecology
Patty Betts, EPA c/o Dept of Ecology
Gayle Kreitman/WDFW
Phil Kauzloric/WSDOT
Brian Hasselbach/WSDOT
Sharon Love/FHWA
Jim Leonard/FHWA
Jack Kennedy/COE
Neil Rickard/NMFS
Michael Grey/NMFS

SAC Agreement Concurrence Form

Project Title: SE Issaquah Bypass Project

State Route #: N/A **County:** King **Date Due:** February 23, 2006

Concurrence Point # and Description

[ ] **#1a** Project Purpose and Need (non-concurrence limited to transportation issues)

[X] #3a Conceptual Mitigation Plan

[ ] **#1b** Screening Criteria for Selection of Alternatives

[X] **#3b1** For COE, USFWS, EPA, and NMFS: NEPA/SEPA Preferred Alternative/Apparent Section 404 LEDPA

[ ] **#2** Project Alternatives to be evaluated in the DEIS

[X] **#3b2** For Ecology and WDFW: NEPA/SEPA Preferred Alternative

Project Contact Person: Bob Brock, Public Works Director

Phone: (425) 837-3405 **Fax:** (425) 837-3409 **E-mail:** bobb@ci.issaquah.wa.us

Address: P.O. Box 1307, Issaquah, WA. 98027-1307

Brief Description of Project Status and Issues Relevant to Concurrence Points Checked Above:

The City has modified plans for the Bypass and believes that Alternative 5, as proposed, is the LEDPA solution that has the least possible environmental impact and the most practicable response to the project purpose and need.

Agency Decision:
(see end of form for definitions)

[X] Concurrence

[ ] Non-concurrence (provide reasons on next page)

[ ] Waived

Summary of Reasons for Non-concurrence

Please include a detailed explanation of the reasons for non-concurrence. Also please identify the statutory or regulatory authority upon which this non-concurrence is based. (Attach detailed comments if needed)

Advisory Comments

Comments are advisory only, and will not trigger the issue resolution process. The project proponent will have 45 calendar days to respond to resource agency comments.

NMFS concurrence is contingent upon inclusion of the entire Level 3 Issue Resolution text being added to the final CP3 package.

Agency: National Marine Fisheries Service

Signer's Name: Michael Grady

Signature:

Title: Transportation Team Leader, Washington State Habitat Office

Date: February 23, 2006

Technical Point of Contact: Neil Rickard

Each agency submitting a concurrence response is also responsible for mailing a final signed hard-copy of the form to all SAC agency members (Corps, Ecology, EPA, FHWA, NMFS, USFWS, WDFW, WSDOT).

Concurrence is a written determination that
1. The information is adequate for this stage, and
2. The project may proceed to the next stage without modification, and
3. The agency's concurrence is consistent with its statutes and regulations (given available information).
4. And, if applicable, concerns were adequately addressed by the project proponent following a non-concurrence.

Non-concurrence is written determination that
1. The information is inadequate for this stage, or
2. The concurrence submittal is inconsistent with the agency's statutory or regulatory authority (cite regulation or statute).
3. The issue resolution process will commence and the project will not proceed to the next concurrence point until each issue is resolved.

Waiver
A waiver is written determination by an agency that it voluntarily gives up its opportunity to provide concurrence or non-concurrence. Agencies that decide to waive agree not to revisit that concurrence point. An agency may elect to waive its concurrence opportunity at the beginning of the SAC process for a project or at a specific concurrence point. At a concurrence point, an agency may waive the opportunity to concur or non-concur on the entire concurrence point or an individual element of that point (for instance 1a or 1b).

Advisory Comments
Advisory comments provided in addition to the agency's concurrence or non-concurrence are informational only. Concurrence with conditional comments is not permitted. Advisory comments provided with a concurrence will not trigger the issue resolution process, but the project proponent must respond to these comments in writing within 45 calendar days, or identify when the response to comments will be provided if it is not possible to respond within 45 days.

Revised September 12, 2002

cc Terry Swanson, Department of Ecology
Nancy Brennan-Dubbs, USFWS
Krista Rave-Perkins, EPA
Patty Betts, EPA c/o Department of Ecology
Teresa Eturaspe, WDFW
Phil Kauzloric, WSDOT
Sharon Love, FHWA
Jack Kennedy, COE

bc: WSHO – Chron File
WSHO – Rickard
WSHO – Grady

cc addresses:

Terry Swanson
Department of Ecology
PO Box 47600
Olympia, WA 98504-7600

Nancy Brennan-Dubbs
USFWS
510 Desmond Drive SE
Suite 102
Lacey, WA 98503

Krista Rave-Perkins
EPA
1200 6th Avenue
Seattle WA 98101

Patty Betts
EPA c/o Department of Ecology
PO Box 47600
Olympia, WA 98504-7600

Teresa Eturaspe
WDFW
600 Capitol Way North
Olympia WA 98501

Phil Kauzloric
WSDOT
PO Box 47331
Olympia WA 98504-7331

Sharon Love
FHWA
711 S. Capitol Way Suite 501
Olympia WA 98501

~~Jack Kennedy~~ Rebecca McAndrews
COE
PO Box 3755
Seattle WA 98124-3755

CITY OF ISSAQUAH
Department of Public Works/Engineering
PO Box 1307 / Issaquah, WA 98027
(425) 837-3400 Fax (425) 837-3409

March 30, 2006

Michael Grey
National Marine Fisheries Services
510 Desmond Drive SE, Suite 102
Lacey, WA 98503

Re: Concurrence Point 3
Advisory Comments

Dear Mr. Grey:

Thank you for submitting the signed Signatory Agency Committee (SAC) agreement concurrence form for Concurrence Point 3 (3a – Conceptual Mitigation Plan; 3b1 – Alternative/Apparent Section 404 LEDPA; and 3b2 – NEPA/SEPA Preferred Alternative) for the SE Issaquah Bypass Project. In response to the advisory comment included with the Concurrence Form dated February 23, 2006, the City of Issaquah has the following comment.

> *NMFS concurrence is contingent upon inclusion of the entire Level 3 Issue Resolution text being added to the Final CP3 package.*
>
> *City's response: The City of Issaquah will not be resubmitting a new Final CP 3 document, instead attached are replacement pages for page 29 and 30 to replace the existing pages. This adds the paragraph that was included in the letter mailed to all agencies on February 16, 2006 and has the language from the Level 3 Issue Resolution meeting. We will also be adding this information to the Final Environmental Impact Statement.*

Thank you again for your advisory comment. The City remains committed to providing complete environmental review on the proposed SE Issaquah Bypass project. We look forward to your continued direction and participation on this project.

Sincerely,

Bob Brock, P.E.
Public Works Director

Enclosure: Replacement page 29 & 30 of the Concurrence Point 3 document.

Cc: Neil Rickard/NMFS
Nancy Brennan-Dubbs/USFWS
John Grettenberger/USFWS
Krista Rave-Perkins/EPA
Christine Reichgott/EPA
Terry Swanson/Dept of Ecology
Patty Betts/EPA c/o Dept of Ecology
Teresa Eturaspe/WDFW
Gayle Kreitman/WDFW
Phil Kauzloric/WSDOT
Brian Hasselbach/WSDOT
Sharon Love/FHWA
Jim Leonard/FHWA
Jack Kennedy/COE
Project

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
TTY 711 or 800-833-6388 (for the speech or hearing impaired)

March 17, 2006

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MAR 23 2006
PUBLIC WORKS ENG.

Mr. Bob Brock
Public Works Director
P.O. Box 1307
Issaquah, WA 98027-1307

Dear Mr. Brock:

The following are Ecology's "Advisory comments" offered with our concurrence on Concurrence Point #3. As you know, Advisory comments normally accompany an agency's Concurrence form when an agency concurs with a project. However, given the unusual circumstances Ecology encountered during this last Concurrence Point review, the City of Issaquah not only extended the time for us to submit our Concurrence form, but also agreed to accept Ecology's Advisory comments after the form was submitted. We appreciate your flexibility in this regard and hope that it did not cause too much inconvenience – though we recognize that the delay was somewhat disruptive for you.

With that said, our comments are as follows:

Stormwater:

- North Alignment – stormwater ponds

Ecology has concerns regarding stormwater management around the planning, design, and construction of the operational BMP Pond N-1 in the north basin. Based on site conditions encountered after construction of ponds near the Sunset Interchange, an assumption can be made that the infiltration potential at the proposed site of Pond N-1 will not be favorable. A high groundwater table has also historically been consistently identified in this vicinity. The Revised Concurrence Point 3 package discusses the need for further testing of soils in the area around Pond N-1 to determine the actual infiltration capacity. The documentation of this infiltration data, showing actual infiltration rates of soils in that area, should be submitted to Ecology for review along with any conclusions made on the evidence supporting this type of design for pond N1. If the evidence shows the infiltration rate is not within the acceptable range, further coordination with Ecology is recommended regarding selection of alternative enhanced treatment BMP types. Another option would be to apply appropriate mitigation measures.

Other concerns regarding Pond N-1 are centered on the pond outfall location. Overflow from the pond will be routed through a closed conveyance system that eventually discharges via an outfall pipe in the vicinity of the East Fork Issaquah Creek, where run off from the Issaquah Highlands and the Sunset Interchange ponds currently drains. Design of the conveyance system for pond N-1 should take into account placement of the outfall pipe in relation to other stormwater outfalls for two referenced sources discharging to that section of the Creek.

One other item to consider in the plans for Pond N-1 is the potential for stormwater to contaminate groundwater flows that may be used as drinking water supplies. Adequate design will allow for the required time for aerobic and anaerobic cleansing in the soils, and encountering groundwater could inhibit these processes.

- South Alignment/Roadway Design:

Pages 9 and 20 of the conceptual mitigation plan and page 18 of the Concurrence Point 3 package reference flooding in the area east of Front Street. The flooding is attributed to Issaquah Creek via the North Tributary, and there is discussion regarding roadway design providing potential flood protection. Ecology has noted, through review of information available, that flooding occurring in the 6th Ave/Front Street intersection has the potential to come from more than one source as the south tributary of Issaquah Creek is in the vicinity as well as the North Tributary. As the City continues to develop project design of the roadway, Ecology recommends that the City take into consideration the need for adequate roadway cross drainage in the location of the new intersection, particularly if the roadway is raised 1-2 feet as described in the Concurrence Point 3 package.

Wetlands:

- Ecology supports the recommendations in the Conceptual Mitigation Plan that additional work will be performed at both compensatory mitigation option sites in order to determine which site will prove best for this project. This additional work should include verification of site soils by excavating test pits; monitoring shallow groundwater levels through piezometers or groundwater wells for at least one year prior to final design; and delineation of existing wetlands at each site.

- The Final Mitigation Plan for wetland impacts will need to include specific performance standards, monitoring methods, and a contingency plan, as noted in the Conceptual Mitigation Plan. At the permitting stage, Ecology will likely ask for 10 years of monitoring to ensure the success of the wetland mitigation sites. In addition, Ecology may ask for delineation and a functional assessment of the compensatory wetland mitigation sites by the end of the monitoring period to ensure that the wetland functions that are lost due to the Bypass project will be successfully replaced.

We look forward to the City's response to Ecology's comments. Should you have questions, please do not hesitate to contact me at 360.407.6789 or via email at tswa461@ecy.wa.gov or the project manager for this project, Penny Kelley, at 360.407.7298 or via email at pkel461@ecy.wa.gov. Penny or I can follow up with technical staff as needed.

Sincerely,

Therese M. Swanson
by [illegible] Willis

Therese M. Swanson
Ecology Transportation Liaison Team Lead
Shorelands and Environmental Assistance Program
Department of Ecology.

SAC Agreement
Concurrence Form

Project Title:	SE Issaquah Bypass Project				
State Route #:	N/A	**County:**	King	**Date Due:**	February 23, 2006

Concurrence Point # and Description

- [ ] **#1a** Project Purpose and Need (non-concurrence limited to transportation issues)
- [X] **#3a** Detailed Mitigation Plan
- [ ] **#1b** Screening Criteria for Selection of Alternatives
- [X] **#3b1** For COE, USFWS, EPA, and NMFS: NEPA/SEPA Preferred Alternative/Apparent Section 404 LEDPA
- [ ] **#2** Project Alternatives to be evaluated in the DEIS
- [X] **#3b2** For Ecology and WDFW: NEPA/SEPA Preferred Alternative

Project Contact Person:	Bob Brock, Public Works Director				
Phone:	(425) 837-3405	**Fax:**	(425) 837-3409	**E-mail:**	bobb@ci.issaquah.wa.us
Address:	P.O. Box 1307, Issaquah, WA. 98027-1307				

Brief Description of Project Status and Issues Relevant to Concurrence Points Checked Above:

The City has modified plans for the Bypass and believes the Alternative 5, as proposed, is the LEDPA solution that has the least possible environmental impact and the most practicable response to the project purpose and need.

Agency Decision:
(see end of form for definitions)

- [X] Concurrence
- [ ] Non-concurrence (provide reasons on next page)
- [ ] Waived

Department of Ecology
RECEIVED
JAN 09 2006
Shorelands & Environmental Assistance Program

Summary of Reasons for Non-concurrence

Please include a detailed explanation of the reasons for non-concurrence. Also please identify the statutory or regulatory authority upon which this non-concurrence is based. (Attach detailed comments if needed)

Advisory Comments

Comments are advisory only, and will not trigger the issue resolution process. The project proponent will have 45 calendar days to respond to resource agency comments.

per an agreement w/ the City of Issaquah, Ecology will submit advisory comments by COB 3/17/06

Agency: Ecology

Signer's Name: Therese M Swanson

Signature: Therese M. Swanson

Title: Ecology - Transportation Team Lead

Date: 03-13-06

Technical Point of Contact: Penny Kelley 360 407-~~8~~7298

CITY OF
ISSAQUAH
Department of Public Works/Engineering
PO Box 1307 / Issaquah, WA 98027
(425) 837-3400 Fax (425) 837-3409

March 30, 2006

Theresa Swanson
Department of Ecology
PO Box 47600
Olympia, WA 98504-7600

Re: Concurrence Point 3
Advisory Comments

Dear Ms. Swanson:

Thank you for submitting the signed Signatory Agency Committee (SAC) agreement concurrence form for Concurrence Point 3 (3a – Conceptual Mitigation Plan; 3b1 – Alternative/Apparent Section 404 LEDPA; and 3b2 – NEPA/SEPA Preferred Alternative) for the SE Issaquah Bypass Project. In response to the advisory comments included with your letter dated March 17, 2006 included with the Concurrence Form dated February 23, 2006, the City of Issaquah has the following comments:

1. **Stormwater:** North Alignment – stormwater ponds
   Ecology has concerns regarding stormwater management around the planning, design, and construction of the operational BMP Pond N-1 in the north basin. Based on site conditions encountered after construction of ponds near the Sunset Interchange, an assumption can be made that the infiltration potential at the proposed site of Pond N-1 will not be favorable. A high groundwater table has also historically been consistently identified in this vicinity. The Revised Concurrence Point 3 package discusses the need for further testing of soils in the area around Pond N-1 to determine the actual infiltration capacity. The documentation of this infiltration data, showing actual infiltration rates of soils in that area, should be submitted to Ecology for review along with any conclusions made on the evidence supporting this type of design for pond N1. If the evidence shows the infiltration rate is not within the acceptable range, further coordination with Ecology is recommended regarding selection of alternative enhanced treatment BMP types. Another option would be to apply appropriate mitigation measures.

   City's response: *The CP3 document evaluated scenarios of both good and poor infiltration potential at Pond N-1, and the associated effects on aquatic resources. Ecology's concurrence acknowledges that further soil testing may result in either outcome, and that the proposed mitigation under both scenarios is adequate to addresses potential impacts. However, as stated in the CP3 document, the City is committed to maximizing the potential for infiltrating groundwater at all locations along the proposed roadway. Adequate guidance and factors of safety provided in Ecology's stormwater* *manual, combined with experience gained on infiltration success at nearby facilities, will enable geotechnical and civil engineers to correctly interpret geological data and design an effective infiltration system. The resulting design reports can be provided to Ecology if requested, and Ecology is certainly welcome to provide input on improving the designs.*

Other concerns regarding Pond N-1 are centered on the pond outfall location. Overflow from the pond will be routed through a closed conveyance system that eventually discharges via an outfall pipe in the vicinity of the East Fork Issaquah Creek, where run off from the Issaquah Highlands and the Sunset Interchange ponds currently drains. Design of the conveyance system for pond N-1 should take into account placement of the outfall pipe in relation to other stormwater outfalls for two referenced sources discharging to that section of the Creek.

<u>City's response</u>: *The outfalls will be designed to conform to all regulatory requirements, and will be subject to Department of Fish and Wildlife review as part of the HPA permit. The new outfall will not be in close proximity to other outfalls on the stream, and thus we see no potential conflicts.*

One other item to consider in the plans for Pond N-1 is the potential for stormwater to contaminate groundwater flows that may be used as drinking water supplies. Adequate design will allow for the required time for aerobic and anaerobic cleansing in the soils, and encountering groundwater could inhibit these processes.

<u>City's response</u>: *The potential impact of stormwater infiltration on drinking water supply is obviously a concern to the City because it is our water supply that could be impacted. Many factors weigh into whether stormwater infiltration could potentially impact drinking water supplies, such as travel distance and depth to wells. At a minimum, pre-treatment of stormwater will be done in accordance with the requirements of Ecology's stormwater manual, and design of those facilities will be coordinated with the City's Water Department. However, the City does not see any significant issues because there has never been a contamination problem in the drinking water source, even though I-90 and many other developments are within a few feet of all four City wells and no water quality treatment occurs on stormwater runoff from those surfaces. The main reasons for this are the depth of the City wells: 100-200 feet, the natural ability of both unsaturated and saturated soil zones to attenuate the transport of contaminants, and the tremendous amount of dilution that occurs in the aquifer. Stormwater facilities designed in accordance with current treatment guidelines should be more than adequate to prevent potential contamination of groundwater from SE Bypass stormwater runoff.*

2. **Stormwater:** <u>South Alignment/Roadway Design:</u>
Pages 9 and 20 of the conceptual mitigation plan and page 18 of the Concurrence Point 3 package reference flooding in the area east of Front Street. The flooding is attributed to Issaquah Creek via the North Tributary, and there is discussion regarding roadway design

providing potential flood protection. Ecology has noted, through review of information available, that flooding occurring in the 6th Ave/Front Street intersection has the potential to come from more than one source as the south tributary of Issaquah Creek is in the vicinity as well as the North Tributary. As the City continues to develop project design of the roadway, Ecology recommends that the City take into consideration the need for adequate roadway cross drainage in the location of the new intersection, particularly if the roadway is raised 1-2 feet as described in the Concurrence Point 3 package.

City's response: The City is well aware of flooding that has historically occurred in the vicinity of 6th Avenue and Front Street. In fact, a recent culvert replacement project on the south tributary (Kees Creek) should have corrected the problem of flooding from that source (caused by plugging of a small culvert under Issaquah-Hobart Road). The City has a very strict flood hazard code that would apply to this project. The project design and permits will need to demonstrate that no increased flood hazard would occur to neighboring properties. Simply keeping the new roadways at existing grade would probably meet those requirements, but detailed design work that is beyond the scope of the EIS is needed to verify whether that is possible. If the roadway must be raised, adequate flood mitigation will be provided as required by City code.

3. **Wetlands:** Ecology supports the recommendations in the Conceptual Mitigation Plan that additional work will be performed at both compensatory mitigation option sites in order to determine which site will prove best for this project. This additional work should include verification of site soils by excavating test pits; monitoring shallow groundwater levels through piezometers or groundwater wells for at least one year prior to final design; and delineation of existing wetlands at each site.

   City's response: The purpose of the Conceptual Mitigation Plan is to provide a preliminary analysis of mitigation options. We agree that additional work as you indicated is required to support the final mitigation plan.

4. **Wetlands:** The Final Mitigation Plan for wetland impacts will need to include specific performance standards, monitoring methods, and a contingency plan, as noted in the Conceptual Mitigation Plan. At the permitting stage, Ecology will likely ask for 10 years of monitoring to ensure the success of the wetland mitigation sites. In addition, Ecology may ask for delineation and a functional assessment of the compensatory wetland mitigation sites by the end of the monitoring period to ensure that the wetland functions that are lost due to the Bypass project will be successfully replaced.

   City's response: The City intends to follow through with implementing the Conceptual Mitigation Plan, as refined and conditioned by subsequent regulatory permits that will authorize the wetland fill. Long-term monitoring is an element of all wetland mitigation projects to evaluate mitigation success. The City assumes that permit conditions for the

SE Bypass project will be consistent with agency guidance as well as conditions imposed on other permitted wetland mitigation projects in the region.

Thank you again for your advisory comment. The City remains committed to providing complete environmental review on the proposed SE Issaquah Bypass project. We look forward to your continued direction and participation on this project.

Sincerely,

Bob Brock, P.E.
Public Works Director

Enclosure: Replacement page 29 & 30 of the Concurrence Point 3 document.

Cc: Nancy Brennan-Dubbs/USFWS
John Grettenberger/USFWS
Krista Rave-Perkins/EPA
Christine B. Reichgott/EPA
Patty Betts, EPA c/o Dept of Ecology
Gayle Kreitman/WDFW
Teresa Eturaspe/WDFW
Phil Kauzloric/WSDOT
Brian Hasselbach/WSDOT
Sharon Love/FHWA
Jim Leonard/FHWA
Jack Kennedy/COE
Neil Rickard/NMFS
Michael Grey/NMFS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

February 23, 2006

Reply To
Attn of: ETPA-088 Ref: 96-091-FHA

Mr. Bob Brock
Public Works Director
City of Issaquah
P.O. Box 1307
Issaquah, WA 98027-1307

Dear Mr. Brock:

Thank you for the revised Concurrence Point 3 (CP3) Packet (dated December 31, 2005) for the Southeast Issaquah Bypass Project. The U.S. Environmental Protection Agency (EPA) has reviewed the packet and concurs with the NEPA Preferred Alternative /Apparent Section 404 Least Environmentally Damaging Practicable Alternative (LEDPA) and Conceptual Mitigation Plan. As part of our concurrence we are providing advisory comments.

Our advisory comments can be found in Attachment A and include:

- Clarifying language for the wildlife connectivity discussion;
- Post CP3 tracking of commitments; and
- Clarification question regarding Park Point drainage impacts and mitigation.

Although it is not reiterated in this letter, please continue to consider our previous advisory comment, prepared for the first CP3 packet, regarding regional and subregional effects on travel and growth.

We appreciate the effort that the City of Issaquah (City), Washington State Department of Transportation (WSDOT), and Federal Highway Administration (FHWA) made to provide a complete packet of information. Several sections of the document describing the proposal and impacts to various resources provided much more information. For example, on page 24 there is a good discussion about the Lower Issaquah Valley (LIV) aquifer recharge area and potential impacts to it. The discussion provides information about new impervious surface area associated with the project, the amount of existing impervious surface area in the watershed, and the total aquifer recharge area within the watershed. This provides useful context for assessing the magnitude and significance of this project's effects on the aquifer recharge area.

EPA also appreciates the additional information provided on the Conceptual Mitigation Plan. We encourage the City to pursue the proposed mitigation Option 1. This option would restore a major portion of Wetland GW, which will be directly impacted by the proposed project.

We look forward to receiving your responses to our advisory comments and to reviewing the preliminary final EIS. If you have any questions, please contact Patty Betts in our NEPA Review Unit at 360-407-6925 or Krista Rave-Perkins in our Wetlands Unit at 206-553-6686.

Sincerely,

Christine B. Reichgott

Christine B. Reichgott, Manager
NEPA Review Unit

Attachment

SAC Agreement Concurrence Form

Project Title:	SE Issaquah Bypass Project				
State Route #:	N/A	**County:**	King	**Date Due:**	February 23, 2006

Concurrence Point # and Description

- [ ] **#1a** Project Purpose and Need (non-concurrence limited to transportation issues)
- [X] **#3a** Detailed Mitigation Plan
- [ ] **#1b** Screening Criteria for Selection of Alternatives
- [X] **#3b1** For COE, USFWS, EPA, and NMFS: NEPA/SEPA Preferred Alternative/Apparent Section 404 LEDPA
- [ ] **#2** Project Alternatives to be evaluated in the DEIS
- [X] **#3b2** For Ecology and WDFW: NEPA/SEPA Preferred Alternative

Project Contact Person: Bob Brock, Public Works Director

Phone: (425) 837-3405 **Fax:** (425) 837-3409 **E-mail:** bobb@ci.issaquah.wa.us

Address: P.O. Box 1307, Issaquah, WA. 98027-1307

Brief Description of Project Status and Issues Relevant to Concurrence Points Checked Above:

The City has modified plans for the Bypass and believes the Alternative 5, as proposed, is the LEDPA solution that has the least possible environmental impact and the most practicable response to the project purpose and need.

Agency Decision:
(see end of form for definitions)

- [X] Concurrence
- [ ] Non-concurrence (provide reasons on next page)
- [ ] Waived

Summary of Reasons for Non-concurrence

Please include a detailed explanation of the reasons for non-concurrence. Also please identify the statutory or regulatory authority upon which this non-concurrence is based. (Attach detailed comments if needed)

Advisory Comments

Comments are advisory only, and will not trigger the issue resolution process. The project proponent will have 45 calendar days to respond to resource agency comments.

See Attachment A of EPA Region 10 letter dated February 23, 2006.

Agency: U. S. Environmental Protection Agency

Signer's Name: Christine B. Reichgott

Signature: Christine B. Reichgott

Title: Manager, NEPA Review Unit

Date: February 23, 2006

Technical Point of Contact: Patty Betts (360) 407-6925

Each agency submitting a concurrence response is also responsible for mailing a final signed hard-copy of the form to all SAC agency members (Corps, Ecology, EPA, FHWA, NMFS, USFWS, WDFW, WSDOT).

Concurrence is a written determination that
1. The information is adequate for this stage, and
2. The project may proceed to the next stage without modification, and
3. The agency's concurrence is consistent with its statutes and regulations (given available information).
4. And, if applicable, concerns were adequately addressed by the project proponent following a non-concurrence.

Non-concurrence is written determination that
1. The information is inadequate for this stage, or
2. The concurrence submittal is inconsistent with the agency's statutory or regulatory authority (cite regulation or statute).
3. The issue resolution process will commence and the project will not proceed to the next concurrence point until each issue is resolved.

Waiver

A waiver is written determination by an agency that it voluntarily gives up its opportunity to provide concurrence or non-concurrence. Agencies that decide to waive agree not to revisit that concurrence point. An agency may elect to waive its concurrence opportunity at the beginning of the SAC process for a project or at a specific concurrence point. At a concurrence point, an agency may waive the opportunity to concur or non-concur on the entire concurrence point or an individual element of that point (for instance **1a** or **1b**).

Advisory Comments

Advisory comments provided in addition to the agency's concurrence or non-concurrence are informational only. Concurrence with conditional comments is not permitted. Advisory comments provided with a concurrence will not trigger the issue resolution process, but the project proponent must respond to these comments in writing within 45 calendar days, or identify when the response to comments will be provided if it is not possible to respond within 45 days.

Attachment A

EPA Advisory Comments for SE Issaquah Bypass

Concurrence Point 3

1. Clarification language for discussion on wildlife connectivity impacts, mitigation, and reasons for eliminating or not pursuing certain wildlife crossings

   Page 7 and page 27 of *Concurrence Point 3 Packet*, Wildlife Crossings, and 7.13 Wildlife Connectivity, provides information about wildlife connectivity and wildlife crossing issues associated with the project. We recommend the text in both locations be edited to be consistent with the text in the resource agencies' white paper prepared during level 3 issue resolution. Below are some excerpts that appear to be particularly relevant.

   > "The construction of the SE Issaquah Bypass will incrementally impede the natural movement of large animals. However, it is not in the animals' interests nor in the citizens' interests to mitigate this impact by facilitating the movement of large animals through an urban area where it brings them into proximity of urban residents. The SDEIS: 1) identified existing wildlife corridors and species that would be impacted; 2) concluded that the road would deter wildlife movement; 3) suggested the proposed bridge might not be high enough to allow large mammal movement; and, 4) identified land preservation and the creation of contiguous habitat as possible mitigation."

   In regards to any question about the use of fencing, the resource agencies explained, in the white paper, why it should not be included at this time:

   > "Therefore, we recommend that the fencing be implemented only in conjunction with the establishment of adequate crossing structures at some time in the future."

   In regards to mitigation for the impacts, we recommend the following which is very similar to language in the aforementioned white paper:

   > "It was agreed mitigation should be proportionate to the adverse effect. The mitigation would be in the form of monetary support and facilitation of the initiation of a study and planning effort that addresses regional wildlife connectivity. The monetary level of participation would be proportionate to the cost difference between a 6' high bridge and an 8' high bridge across the North Tributary. "

2. Carry CP3 commitments into FEIS and ROD discussion; track commitments through to permitting

   The SAC process does not appear to address how commitments made during SAC concurrence points will be tracked and implemented in later project development stages including final design, permitting, construction, operation, maintenance, etc. We want to ensure that all the hard work, commitments, and issue resolution that has been accomplished during the SAC process for the SE Issaquah Bypass project is retained and used. For that reason, we encourage the project proponents to clearly incorporate the commitments, made during CP3, into the discussion of impacts and mitigation/commitments in the main body of the FEIS and the Record of Decision (ROD). Additionally, we encourage you to identify and implement a plan to ensure that the commitments are implemented during later stages.

3. Please clarify the statement "...Park Pointe will also be required to mitigate all drainage impacts..." The statement as it is currently worded means all drainage impacts caused by Park Pointe will be mitigated not just those managed by regulations. We support and encourage the City to require mitigation of all drainage impacts. However, if the statement is intended to mean Park Pointe will only be required to comply with stormwater regulations, it should be reworded to state that instead. The two statements do not necessarily commit to the same level of mitigation.

CITY OF ISSAQUAH
Department of Public Works/Engineering
PO Box 1307 / Issaquah, WA 98027
(425) 837-3400 Fax (425) 837-3409

March 30, 2006

Christine B. Reichgott
US Environmental Protection Agency
1200 Sixth Avenue
Seattle, WA 98101

Re: Concurrence Point 3
Advisory Comments

Dear Ms. Reichgott:

Thank you for submitting the signed Signatory Agency Committee (SAC) agreement concurrence form for Concurrence Point 3 (3a – Conceptual Mitigation Plan; 3b1 – Alternative/Apparent Section 404 LEDPA; and 3b2 – NEPA.SEPA Preferred Alternative) for the SE Issaquah Bypass Project. In response to the advisory comments included with your letter dated February 23, 2006 included with the Concurrence Form dated February 23, 2006, the City of Issaquah has the following comments:

1. Clarification language for discussion on wildlife connectivity impacts, mitigation, and reasons for eliminating or not pursuing certain wildlife crossings

Page 7 and page 27 of *Concurrence Point 3 Packet*, Wildlife Crossings, and 7.13 Wildlife Connectivity, provides information about wildlife connectivity and wildlife crossing issues associated with the project. We recommend the text in both locations be edited to be consistent with the text in the resource agencies' white paper prepared during level 3 issue resolution. Below are some excerpts that appear to be particularly relevant.

> "The construction of the SE Issaquah Bypass will incrementally impede the natural movement of large animals. However, it is not in the animals' interests nor in the citizens' interests to mitigate this impact by facilitating the movement of large animals through an urban area where it brings them into proximity of urban residents. The SDEIS: 1) identified existing wildlife corridors and species that would be impacted; 2) concluded that the road would deter wildlife movement; 3) suggested the proposed bridge might not be high enough to allow large mammal movement; and, 4) identified land preservation and the creation of contiguous habitat as possible mitigation."

In regards to any question about the use of fencing, the resource agencies explained, in the white paper, why it should not be included at this time:

> "Therefore, we recommend that the fencing be implemented only in conjunction with the establishment of adequate crossing structures at some time in the future."

In regards to mitigation for the impacts, we recommend the following which is very similar to language in the aforementioned white paper:

> "It was agreed mitigation should be proportionate to the adverse effect. The mitigation would be in the form of monetary support and facilitation of the initiation of a study and planning effort that addresses regional wildlife connectivity. The monetary level of participation would be proportionate to the cost difference between a 6' high bridge and an 8' high bridge across the North Tributary. "

> *<u>City's response</u>: The City of Issaquah will not be resubmitting a new Final CP 3 document, except for replacement pages 29 and 30 that adds a statement on stormwater treatment objectives that was agreed to during a CP3 meeting but inadvertently omitted from the final document. Our recollection of the discussion is slightly different than your proposed statements but they are nonetheless consistent with the approved mitigation approach for wildlife connectivity and will be incorporated in the Final Environmental Impact Statement as appropriate.*

2. <u>Carry CP3 commitments into FEIS and ROD discussion; track commitments through to permitting</u>

The SAC process does not appear to address how commitments made during SAC concurrence points will be tracked and implemented in later project development stages including final design, permitting, construction, operation, maintenance, etc. We want to ensure that all the hard work, commitments, and issue resolution that has been accomplished during the SAC process for the SE Issaquah Bypass project is retained and used. For that reason, we encourage the project proponents to clearly incorporate the commitments, made during CP3, into the discussion of impacts and mitigation/commitments in the main body of the FEIS and the Record of Decision (ROD). Additionally, we encourage you to identify and implement a plan to ensure that the commitments are implemented during later stages.

> *<u>City's response</u>: The FEIS and ROD will incorporate all commitments made during the SAC process. The City will work closely with the consultant during preparation of the FEIS to ensure that all comments are addressed in the proper context, and mitigation/commitments clearly documented. This information represents crucial agency review of the project, and thus is extremely important for the ROD and subsequent project approval by the City Council, should the project proceed. Even so, it is our understanding that the CP3 documents and letters of concurrence from the SAC agencies will still stand alone as commitments that shall be adhered to by both the project proponent and the permitting agencies when permits are applied for during final design. A project management/quality assurance plan will also be developed to track the progress and implementation of all aspects of project design, permitting, construction and operations to ensure these commitments are incorporated into the project.*

3. <u>Please clarify the statement "...Park Pointe will also be required to mitigate all drainage impacts..."</u>
The statement as it is currently worded means all drainage impacts caused by Park Pointe will be

mitigated not just those managed by regulations. We support and encourage the City to require mitigation of all drainage impacts. However, if the statement is intended to mean Park Pointe will only be required to comply with stormwater regulations, it should be reworded to state that instead. The two statements do not necessarily commit to the same level of mitigation.

City's response: To put this statement into the proper context, the entire sentence from Page 28 of the CP3 document is as follows: "Since Park Pointe will also be required to mitigate all drainage impacts, there is no indication that future development activities would significantly affect Wetland GW or the wetland mitigation that is proposed as part of the SE Bypass project". Thus, in the context of the CP3 document, this means that wetland hydrology won't be adversely impacted. It should also be noted that Park Pointe proposed to infiltrate stormwater from the development site, which as mitigation goes beyond current stormwater regulations.

Thank you again for your advisory comment. The City remains committed to providing complete environmental review on the proposed SE Issaquah Bypass project. We look forward to your continued direction and participation on this project.

Sincerely,

Bob Brock, P.E.
Public Works Director

Enclosure: Replacement page 29 & 30 of the Concurrence Point 3 document.

Cc: Nancy Brennan-Dubbs/USFWS
John Grettenberger/USFWS
Krista Rave-Perkins/EPA
Terry Swanson/Dept of Ecology
Patty Betts, EPA c/o Dept of Ecology
Teresa Eturaspe/WDFW
Gayle Kreitman/WDFW
Phil Kauzloric/WSDOT
Brian Hasselbach/WSDOT
Sharon Love/FHWA
Jim Leonard/FHWA
Jack Kennedy/COE
Neil Rickard/NMFS
Michael Grey/NMFS

SAC Agreement
Concurrence Form

Project Title:	SE Issaquah Bypass Project

State Route #:	N/A	**County:**	King	**Date Due:**	February 23, 2006

Concurrence Point # and Description

[ ] **#1a** Project Purpose and Need (non-concurrence limited to transportation issues)	[X] **#3a** Detailed Mitigation Plan
[ ] **#1b** Screening Criteria for Selection of Alternatives	[X] **#3b1** For COE, USFWS, EPA, and NMFS: NEPA/SEPA Preferred Alternative/Apparent Section 404 LEDPA
[ ] **#2** Project Alternatives to be evaluated in the DEIS	[X] **#3b2** For Ecology and WDFW: NEPA/SEPA Preferred Alternative

Project Contact Person: Bob Brock, Public Works Director

Phone: (425) 837-3405 **Fax:** (425) 837-3409 **E-mail:** bobb@ci.issaquah.wa.us

Address: P.O. Box 1307, Issaquah, WA. 98027-1307

Brief Description of Project Status and Issues Relevant to Concurrence Points Checked Above:

The City has modified plans for the Bypass and believes the Alternative 5, as proposed, is the LEDPA solution that has the least possible environmental impact and the most practicable response to the project purpose and need.

Agency Decision:
(see end of form for definitions)

[X] Concurrence

[ ] Non-concurrence (provide reasons on next page)

[ ] Waived

Summary of Reasons for Non-concurrence

Please include a detailed explanation of the reasons for non-concurrence. Also please identify the statutory or regulatory authority upon which this non-concurrence is based. (Attach detailed comments if needed)

Advisory Comments

Comments are advisory only, and will not trigger the issue resolution process. The project proponent will have 45 calendar days to respond to resource agency comments.

Agency: Corps of Engineers

Signer's Name: John Kennedy

Signature: J. Kennedy

Title: Regulatory Project Manager

Date: 2.24.2006

Technical Point of Contact: Jack Kennedy (206) 764-6907

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Western Washington Fish and Wildlife Office
510 Desmond Dr. SE, Suite 102
Lacey, Washington 98503

FEB 2 1 2006

Bob Brock, Public Works Director
City of Issaquah
P.O. Box 1307
Issaquah, Washington 98027
Attn: Pam Fox

RECEIVED
FEB 2 3 2006
PUBLIC WORKS ENG.

Dear Mr. Brock:

This letter is in response to your request on Concurrence Point 3 per the Signatory Agency Committee Agreement on the South East Issaquah Bypass project. You have requested concurrence on the following:

- **Alternative 5** as the National Environmental Policy Act "Preferred Alternative"/ apparent Section 404 least environmentally damaging alternative (LEDPA); and

- **Detailed Mitigation Plan** proposed for the project.

The U.S. Fish and Wildlife Service has determined that the information provided is adequate. We are issuing a "Concurrence" for Concurrence Point 3 and the signed concurrence form is enclosed.

If you have any question about the contents of this document, please contact Jennifer Quan at (360) 753-6047 or Nancy Brennan-Dubbs at (360) 753-5835, of my staff.

Sincerely,

Pamela Bapp

for Ken S. Berg, Manager
Western Washington Fish and Wildlife Office

Enclosure

cc:

COE, Seattle (J. Kennedy)
EPA, Seattle (K. Rave, P. Betts)
FHWA, Olympia (J. Leonard)
NMFS, Lacey (N. Rickard)
WDOE, Lacey (T. Swanson, P. Kelly)
WSDOT - ESO, Olympia (P. Kauzloric)
WSDOT – HLP, Olympia (B. Hasselbach)

SAC Agreement
Concurrence Form

Project Title:	SE Issaquah Bypass Project				
State Route #:	N/A	**County:**	King	**Date Due:**	February 23, 2006

Concurrence Point # and Description

- [ ] **#1a** Project Purpose and Need (non-concurrence limited to transportation issues)
- [X] **#3a** Detailed Mitigation Plan
- [ ] **#1b** Screening Criteria for Selection of Alternatives
- [X] **#3b1** For COE, USFWS, EPA, and NMFS: NEPA/SEPA Preferred Alternative/Apparent Section 404 LEDPA
- [ ] **#2** Project Alternatives to be evaluated in the DEIS
- [X] **#3b2** For Ecology and WDFW: NEPA/SEPA Preferred Alternative

Project Contact Person:	Bob Brock, Public Works Director				
Phone:	(425) 837-3405	**Fax:**	(425) 837-3409	**E-mail:**	bobb@ci.issaquah.wa.us
Address:	P.O. Box 1307, Issaquah, WA. 98027-1307				

Brief Description of Project Status and Issues Relevant to Concurrence Points Checked Above:

The City has modified plans for the Bypass and believes the Alternative 5, as proposed, is the LEDPA solution that has the least possible environmental impact and the most practicable response to the project purpose and need.

Agency Decision:
(see end of form for definitions)

- [X] Concurrence
- [ ] Non-concurrence (provide reasons on next page)
- [ ] Waived

Summary of Reasons for Non-concurrence

Please include a detailed explanation of the reasons for non-concurrence. Also please identify the statutory or regulatory authority upon which this non-concurrence is based. (Attach detailed comments if needed)

Advisory Comments

Comments are advisory only, and will not trigger the issue resolution process. The project proponent will have 45 calendar days to respond to resource agency comments.

Agency: USFWS

Signer's Name: Pam Rupp

Signature: Pamela Rupp

Title: Division Manager

Date: 2/21/06

Technical Point of Contact: Jennifer Quan

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

October 10, 2002

Reply To
Attn Of: ECO-088

Ms. Elizabeth Healy
Federal Highway Administration
711 South Capitol Way, Suite 501
Olympia, WA 98501

Dear Ms. Healy:

The Environmental Protection Agency wishes to respond to Concurrence Point 2, Alternatives, for the Issaquah Bypass project. Our response is issued pursuant to our statutory authority and responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act.

We have elected to non-concur in hopes that the City of Issaquah will incorporate additional public transit as an integral part of the bypass alternatives being proposed, as well as provide more information to the resource agencies and the public regarding the new South C alignment and its use of the railroad right-of-way. In addition, we have concerns about the need to address ecological connectivity.

We appreciate the City of Issaquah's willingness to provide these clarifications during the 45-day review period for this concurrence point. We are required, however, by the newly revised SAC process to non-concur in order to ensure that our concerns are addressed. Nevertheless, we expect that the issues can be quickly and easily resolved, so that they result in no project delay.

Transit. As we discussed with the City's consultant, Jeff Buckland, our concerns involve the need for additional public transportation in concert with the bypass, particularly in view of the fact that (1) "The need for the project is the result of existing traffic volumes on city streets, and the necessity to increase mobility by reducing congestion and improving access to I-90"; (2) there is an existing unmet demand for transit and Park & Ride space for motorists traveling from locations south of I-90, which is not served by an Issaquah Highlands Park & Ride lot north of I-90; (3) the year 2030 traffic analysis indicates that congestion will exist whether or not the bypass is built, with level of service (LOS) F at Front Street and SR 900 intersections; and (4) the alternatives proposed (various alignment adjustments of a new road in a specific corridor) do not address the need to lessen overall traffic volumes, for which public transit is a viable alternative, particularly when combined with strategic, compatible land use planning and a potential bypass.

It is unclear whether or not a 2-lane bypass alternative that incorporates strategic land use and transit is adequate to address year 2030 travel demand. The advantage of a 2-lane bypass with additional transit would be to minimize the roadway footprint and its associated impacts.

We request that it be included in the range of alternatives. If analysis reveals it is not feasible on its own, then a phased approach that uses transit and strategic land use planning to extend the viable life of the 2-lane bypass could be adopted. The project consultant has stated that the bypass would be built in a 2 and 4 lane phased approach, and we would like confirmation from FHWA and the City of Issaquah regarding this statement.) We would also like an explanation as to how a phased approach would be implemented/constructed, and what the process would be to initiate action on the expansion to 4 lanes.

As stated in the DEIS, "Because Issaquah is expected to grow in size with or without local transportation improvements, it is likely that congestion would continue to be experienced whether the Bypass is constructed or not." The 2030 traffic model assumes the same relative level of transit use as currently exists. It is possible that this future scenario could be improved upon, and we invite the project proponents to explore means to do so. We encourage the project proponents, other affected jurisdictions, and transit entities to work toward solutions that move affected communities from a limited range of transportation choices and auto dependence to increased choices, mobility, accessibility, and freedom.

Railroad right-of-way (ROW). The Supplemental Draft EIS (SDEIS) should provide information needed to adequately inform the public and decision makers regarding the extent to which each roadway alignment alternative makes use of the existing Railroad ROW and the implications (pro and con) of doing so. One of the implications that should be disclosed and discussed is how the alignment selection will either positively or negatively affect the ability/opportunity to potentially use the ROW for commuter, passenger, and/or freight rail in the future. The SDEIS should disclose where the Railroad ROW comes from and goes to and what it connects with or has the potential to connect with. Other relevant information, such as ownership, availability of and any encroachments upon the ROW, should be included. This information also needs to be provided to the Signatory Agency Committee (SAC) at this time because of its relevance to the range of alternatives.

Ecological connectivity. Because the project location is adjacent to the Tiger Mountain Resource Conservation Area and lies within the Mountains to Sound Greenway, the alternatives would potentially fragment habitats, create a barrier to wildlife movement, cause wildlife roadkill, and sever other aspects of ecological connectivity in the project area. The SDEIS needs to provide an analysis of the alternatives with respect to ecological connectivity needs and impacts, and include adequate mitigation measures to avoid and minimize the impacts. The project proponents should perform this analysis and develop the mitigation for both terrestrial and aquatic ecosystem processes, habitats, and species in consultation with the resource agencies.

For terrestrial species, this involves identifying habitat linkages (movement corridors) that need to be preserved or re-established, safe wildlife crossings/structures under or over the roadway that accommodate the species residing in the area, and fencing that effectively prevents wildlife entry on the roadway and that funnels them to safe crossing locations/structures. These actions provide for the safety of both wildlife and motorists.

Ecological connectivity is a broader concept, however, than wildlife movement in the landscape. It includes the connections and interactions between land and water, the transfer of water, wood, soil, nutrients, genes, species, and so on. For example, ecological connectivity is impaired when a stream is channelized and separated from its flood plain; when shoreline structures or bank armoring block sediment flows and coastal/shoreline enrichment processes; when dams are built or culvert installation block fish passage; when impervious surface prevents ground water aquifer recharge; when aquatic habitat hydrological alterations and development interfere with riverine hyporheic zones; etc. Efforts to assess environmental impacts need to focus much more on this aspect.

The Issaquah Bypass project affects ecological connectivity in many ways. In addition to wildlife habitat linkages, the environmental analysis should address the effects of cutting into hillslopes where seepage and springs are evident; the effects of continued conversion of native vegetation and forest cover to impervious surface and its consequences with respect to flooding, ground water recharge, aquifer draw down, loss of stream base flows, diminished drinking water supplies, water quality, and impacts to aquatic life, including salmonids; and the opportunities to minimize these effects through low impact development, strategic land use and transportation planning and decision making, as well as use of conventional best management practices.

Thank you for the opportunity to review the proposed alternatives. If you have questions or would like to discuss these comments further, please contact Elaine Somers at 206/553-2966.

Sincerely,

Judith Leckrone Lee

Judith Leckrone Lee, Manager
Geographic Unit

Enclosure

Merger Agreement
Concurrence Form

Project Title	SR#	Region	County
SE Issaquah Bypass	[illegible]	NW	King County

WRIA	Environmental Document Classification	Date Concurrence Due
Issaquah Cr. No. 08-0178	EIS	September 27, 2002

- [ ] Project purpose and 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: Terry Paananen, NW Region

Environmental Summary

The City of Issaquah is preparing a NEPA/SEPA Supplemental Environmental Impact Statement (SEIS) for a new bypass arterial connecting the I-90 Sunset Interchange to the Issaquah-Hobart Road in southeastern Issaquah, Washington. The proposed bypass would be an approximately 2 kilometers (1.25 miles) long multi-lane road with through lanes and turn-lane channelization. The proposed project would reduce congestion on existing streets and improve access to Interstate 90. This is the final concurrence form on alternatives to be evaluated in the SEIS.

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]
- [X] Nonconcurrence[2]
- [ ] Waived[4]

Comments/Reasons for Nonconcurrence: See attached letter.

Additional Information Needed:

Agency:	Title:	Signature:	Date:
EPA	Manager, Geounit	[signature]	10.10.02

[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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[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."

Ecological Connectivity

FHWA agrees that the Supplemental EIS will address the primary topics identified in the EPA letter of October 10, 2002* regarding ecological connectivity, as well as other topics as necessary and appropriate under the several environmental elements/sections in the SEIS to which they pertain. The level of detail for any one element will be defined by the requirements specified in the Washington State Department of Transportation (WSDOT) Environmental Procedures Manual, volumes 1 and 2 (WSDOT, 2001). EPA has agreed to review the WSDOT manual in November 2002 and provide comments on any additional analysis they feel should be provided to address ecological connectivity issues. FHWA, WDOT, and Issaquah have agreed to read and consider comments EPA will provide resulting from their review of the manual. It was also noted that all the participating agencies in the SAC Merger Agreement process, including EPA, will receive copies of the preliminary Supplemental EIS and will have an opportunity to comment on the level of detail provided in that document. EPA may use this opportunity to provide additional comments on how well this detail meets its intent to see that ecological connectivity issues have been adequately addressed for this project.

*** Ecological connectivity (from EPA Letter of October 10, 2002):**

Because the project location is adjacent to the Tiger Mountain Resource Conservation Area and lies within the Mountains to Sound Greenway, the alternatives would potentially fragment habitats, create a barrier to wildlife movement, cause wildlife roadkill, and sever other aspects of ecological connectivity in the project area. The SDEIS needs to provide an analysis of the alternatives with respect to ecological connectivity needs and impacts, and include adequate mitigation measures to avoid and minimize the impacts. The project proponents should perform this analysis and develop the mitigation for both terrestrial and aquatic ecosystem processes, habitats, and species in consultation with the resource agencies.

For terrestrial species, this involves identifying habitat linkages (movement corridors) that need to be preserved or re-established, safe wildlife crossings/structures under or over the roadway that accommodate the species residing in the area, and fencing that effectively prevents wildlife entry on the roadway and that funnels them to safe crossing locations/structures. These actions provide for the safety of both wildlife and motorists.

Ecological connectivity is a broader concept, however, than wildlife movement in the landscape. It includes the connections and interactions between land and water, the transfer of water, wood, soil, nutrients, genes, species, and so on. For example, ecological connectivity is impaired when a stream is channelized and separated from its flood plain; when shoreline structures or bank armoring block sediment flows and coastal/shoreline enrichment processes; when dams are built or culvert installation block fish passage; when impervious surface prevents ground water aquifer recharge; when aquatic habitat hydrological alterations and

SE Issaquah Bypass SAC Process
Issue Resolution Meeting for Concurrence Point 2, Alternatives
October 24, 2002

Attendees:
Ernie Combs, WSDOT
Anjali Bhagat, Parsons Brinckerhoff
Elizabeth Healy, FHWA
Sharon Love, FHWA
Phil KauzLoric, WSDOT
Judith Leckrone Lee, EPA
Elaine Somers, EPA
Terry Paananen, WSDOT
Bob Brock, Issaquah
Pam Fox, Issaquah
Lou Haff, Issaquah
Jeff Buckland, Parsons Brinckerhoff

This meeting was held to discuss issues identified in Environmental Protection Agency's October 10, 2002 letter of nonconcurrence on the SE Issaquah Bypass alternatives. Three primary areas of concern for the Supplemental EIS were discussed: the need for additional information on the former railroad right-of-way in the proposed project area, the need to address issues related to ecological connectivity, and the potential inclusion of a new alternative based on the use of transit and land use measures to maintain a 2 lane facility.

Following is a summary of the points of agreement that resulted from this meeting for each of these topics.

Railroad Right-of-Way

FHWA agrees, via the City of Issaquah, to provide more information on the existing railroad right-of-way. Specifically, the Supplemental EIS will discuss five main topics concerning the right-of-way: (1) its historic use and ownership (i.e. how it was used in the past and the communities/areas it served); (2) its current status in terms of its condition, ownership, and use, including any restrictions on this use; (3) existing or possible links to this route, i.e. where it comes from and where it goes; (4) specific uses and purposes that are or may be planned by other interests in the community, e.g., the trails group and the trolley interests; and (5) examples of other possible uses for the right-of-way, so that readers of the EIS can understand what potential uses could be altered or lost if the SE Bypass uses all, or part of this route. The EIS will include a clear statement that the choice to use the right-of-way for the SE Bypass may prevent its use for these other purposes in the future.

development interfere with riverine hyporheic zones; etc. Efforts to assess environmental impacts need to focus much more on this aspect.

The Issaquah Bypass project affects ecological connectivity in many ways. In addition to wildlife habitat linkages, the environmental analysis should address the effects of cutting into hillslopes where seepage and springs are evident; the effects of continued conversion of native vegetation and forest cover to impervious surface and its consequences with respect to flooding, ground water recharge, aquifer draw down, loss of stream base flows, diminished drinking water supplies, water quality, and impacts to aquatic life, including salmonids; and the opportunities to minimize these effects through low impact development, strategic land use and transportation planning and decision making, as well as use of conventional best management practices.

Construction Phasing, Transit and HOV lanes

The proposed 4-lane SE Bypass may be constructed in phases such that two lanes would be built at first, and two additional lanes could be added at some point in the future when the road capacity is needed. Agreement to build the bypass in a phased approach was not confirmed by City of Issaquah because of the possibility that funding could be obtained that would allow four lanes to be built at the start.

FHWA agreed that the Supplemental EIS will include a statement for all build alternatives that a phased construction approach may be used. The SEIS will state that *if a phased approach is used,* FHWA and City of Issaquah will evaluate and consider dedicating the use of any new lanes to transit service and/or High Occupancy Vehicles. Whether or not a phased approach is adopted, the SEIS will also state the City's intention to collaborate now and in the future with transit agencies to assure that opportunities for additional transit, park & ride facilities, and other TDM/TSM measures are reviewed and considered. If a 4-lane bypass is built at the start, EPA encourages FHWA and City of Issaquah to consider transit and HOV designation from the start as well.

Closure of Issue Resolution Process

Once EPA agrees these are the actions that will be taken to resolve their October 10, 2002 non-concurrence EPA will provide an updated concurrence form indicating concurrence. The project proponent will provide the updated concurrence form and the results of the issue resolution to all SAC agencies. SAC agencies will have 15 calendar days to agree or not agree the changes to resolve the issues are not substantial and the project may move ahead without further modification. It is recommended individual SAC agency responses be provided via e-mail to all SAC agencies.

Merger Agreement
Concurrence Form

Project Title	SR#	Region	County
SE Issaquah	————	NW	King County

WRIA	Environmental Document Classification	Date Concurrence Due
Issaquah Cr. No. 08-0178	EIS	Post-issue resolution

- ☐ Project purpose and 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

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WSDOT Contact Person: Terry Paananen, NW Region

Environmental Summary

The City of Issaquah is preparing a NEPA/SEPA Supplemental Environmental Impact Statement (SEIS) for a new bypass arterial connecting the I-90 Sunset Interchange to the Issaquah-Hobart Road in southeastern Issaquah, Washington. The proposed bypass would be an approximately 2 kilometers (1.25 miles) long multi-lane road with through lanes and turn-lane channelization. The proposed project would reduce congestion on existing streets and improve access to Interstate 90. This is the final concurrence form on alternatives to be evaluated in the SEIS. See attachment for issue resolution results/commitments, which are hereby incorporated into this concurrence.

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 attachment for results of issue resolution.

Additional Information Needed: Results/commitments from issue resolution

Agency:	Title:	Signature:	Date:
U.S. EPA	Manager, Geographic Unit	Judith Leckrone Lee	11-7-02

1Definition 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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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

SEP 26 2002

September 19, 2002

Mr. Robert Brock
Public Works Director
City of Issaquah
1775 12th Ave NE
Issaquah WA 98027

Dear Mr. Brock:

Ecology has reviewed the concurrence package for the range of alternatives to be considered in the supplemental draft environmental impact statement (SDEIS) for the Southeast Issaquah Bypass (FHWA-WA-EIS-00-1D) that we received on August 12, 2002, and the supplemental information that includes the addition of the South A Alternative into consideration that was submitted during the Signatory Agency Meeting (SAC) on September 12th. We would like to thank the City of Issaquah for working with Ecology to address our significant SEPA concerns on wetland impacts that were discussed with you on the old South B alignment. We feel this decision by the City to remove this alternative from the document shows the City's commitment and desire to protect critical resources that are valued by the City and residents of Issaquah.

The remaining range of alternatives will meet the project needs and should result in significantly less resource impacts. We concur with the range of alternatives as presented but have the following comments to provide for your information:

> Ecology has expressed concern about impacts to the Category I wetland adjacent to the LDS Church. Alternatives that include the South A alignment will still result in impacts to that wetland. Although the impacts are significantly less that the Old South B alignment, we still have concerns about impacting this Category I wetland when other alternatives that meet the purpose and need are available.
>
> In addition to impacts to the Category I wetland, the South A alignment will result in greater social impacts, additional flooding impacts, and a stream crossing. We agree that it is important to disclose a full range of available alternatives for evaluation, but based on the information presently available, alternatives with the South A alignment do not appear to be the least environmentally impacting.
>
> Per earlier comments that were provided to the City in November of 2000 on the South A option, the DEIS will need to include details on road width, and

direct fill area associated with this option. We recommend the following information be provided in the final document to address the comments and concerns previously raised by Ecology:

1) Ecology expressed concern about the need to treat Front Street per the agreement between Ecology and DOT that if new impervious surfaces are created, then adjacent old impervious surfaces will be treated during project expansion work.. Please update the stormwater treatment information, or provide to Ecology a response to this issue.
2) Please indicate how flooding problems along the current 6th Avenue will be handled for the South A alignment. The City will also need to investigate this area to determine how they will manage stormwater for this site. As previously expressed, placing a stormwater pond in a frequently flooded area may not provide for adequate storage or treatment.
3) Please update the buffer impacts and information in the DEIS. Ecology's guidance does not support 25-foot buffers as adequate to protect various wetland functions.
4) Ecology provided a detailed comment letter per our SEPA review that addresses remaining concerns on stormwater and mitigation that should be addressed in the Final document.

I hope these comments will help to develop a detailed document that will provide an adequate range of alternatives for public and agency review. Thank you again for the opportunity to comment and for addressing our concerns in bisecting the Category I wetland. If you have any questions, please call me at (360) 407-6912.

Sincerely,

Sandra L. Manning

Sandra Manning, Liaison Manager
Shorelands and Environmental Assistance Program

cc: Anne Robinson, Corps
Mike Grady, NMFS
Sarah Suggs, NWRO – wetlands
Ben Brown, DOT
Jennifer Quan, USFWS
Cynthia Pratt, WDFW
Jeff Bucklund, Parsons Brinckerhoff

Merger Agreement
Concurrence Form

Project Title	SR#	Region	County
SE Issaquah Bypass	--------------	NW	King County

WRIA	Environmental Document Classification	Date Concurrence Due
Issaquah Cr. No. 08-0178	EIS	September 27, 2002

- ☐ **Project purpose and need**
- ☐ **Preferred alternative/Least environmentally damaging alternative**
- ☐ **Criteria for alternatives selection**
- ☐ **Detailed mitigation plan**
- ☐ **Role of all agencies**
- ☐ **Preliminary preferred alternative when known**
- ☒ **Project alternatives to be evaluated in DEIS**

WSDOT Contact Person: Terry Paananen, NW Region

Environmental Summary

The City of Issaquah is preparing a NEPA/SEPA Supplemental Environmental Impact Statement (SEIS) for a new bypass arterial connecting the I-90 Sunset Interchange to the Issaquah-Hobart Road in southeastern Issaquah, Washington. The proposed bypass would be an approximately 2 kilometers (1.25 miles) long multi-lane road with through lanes and turn-lane channelization. The proposed project would reduce congestion on existing streets and improve access to Interstate 90. This is the final concurrence form on alternatives to be evaluated in the SEIS.

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:
Ecology	Liaison Manager	Sandra L Manning	9/11/02

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CITY OF ISSAQUAH
Department of Public Works/Engineering
PO Box 1307 / Issaquah, WA 98027
(425) 837-3400 Fax (425) 837-3409

November 12, 2002

Sandra Manning, Liaison Manager
Shorelands and Environmental Assistance Program
Washington Department of Ecology
P.O. Box 47600
Olympia, Washington 98504-7600

Dear Ms. Manning:

Thank you for submitting the signed SAC Agreement concurrence form for Concurrence Point 2 (Project Alternatives to be evaluated in the Supplemental EIS) for the SE Issaquah Bypass project. In response to the advisory comments in your letter dated September 19, 2002, the City of Issaquah agrees to the following actions:

1. Regarding impacts from build alternatives that include the South A alignment (especially impacts to the Category I wetland adjacent to the LDS church and the crossing of the North Tributary); the Supplemental EIS will clearly describe the details on proposed roadway width and fill areas and will investigate and disclose other potential impacts associated with the build alternatives, including social impacts and flooding impacts.

2. Regarding Ecology's concern about the "need to treat Front Street per the agreement between Ecology and DOT that if new impervious surfaces are created, then adjacent old impervious surfaces will be treated during project expansion work"; the City agrees to coordinate with Ecology staff during preparation of the Supplemental DEIS to determine the applicability and feasibility of this approach on the current project.

3. Flooding conditions along 6th Avenue will be evaluated in the Supplemental EIS, including a description of existing flood problems and potential changes to flood conditions that may result from the proposed project. New information on flooding conditions in the Issaquah Creek basin prepared for the City by the Montgomery Water Group in 2001 will be presented in the Supplemental DEIS. Where storage and treatment of runoff from new impervious surfaces along the 6th Avenue alignment cannot be provided because of problematic flooding conditions, compensatory storage and treatment would be provided at a nearby location within the project area.

4. The Supplemental EIS will update wetland and wetland buffer impacts for each build alternative and will discuss Ecology's position that 25-foot buffers are not considered adequate to protect important wetland functions. The City's EIS consultant will work with Ecology staff to prepare a wetland mitigation plan that replaces lost wetland functions and reflects appropriate compensatory mitigation ratios.

5. The City's EIS consultant will address other specific comments on stormwater and mitigation in Ecology's August 14, 2000 comment letter on the draft EIS.

The City of Issaquah remains committed to providing complete environmental review of the proposed SE Issaquah Bypass project. We look forward to your continued review and direction on this project.

Sincerely,

Bob Brock, P.E.
Director Public Works

cc: Phil KauzLoric, WSDOT
Sharon Love, FHWA
Elizabeth Healy, FHWA
Pam Fox, Issaquah

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

October 7, 2002

City of Issaquah
Attention: Bob Brock, Director
Department of Public Works/Engineering
PO Box 1307
Issaquah, WA 98027

Dear Director Brock:

RE: SE Issaquah Bypass, Concurrence Point 2

Thank you for allowing WDFW to extend our comment period until October 10, 2002. Enclosed is our signed SAC Agreement concurrence form for Concurrence Point 2 (Project Alternatives to be evaluated in the Supplemental EIS {SEIS} for this project). We concur, with the following comments:

COMMENTS

- WDFW concurs that the alignment alternatives being considered at this time offer a full suite of choices, and agree with you that they should be carried forward into the SEIS. (See Additional Comments, also)

- The City of Issaquah needs to look at ways that ecological connectivity (hydrological and upland) will be considered in the preferred alternative (Concurrence Point #3). (WAC 232-12-297 (11.1.3); RCW 77.55.060; Fish and Wildlife Coordination Act.) Because there is a risk to both motorists and wildlife in this area due to potential fragmentation of wildlife corridors, the issue of habitat connectivity is a serious issue that WDFW hopes will be resolved. In addition, using I-90 as an example, there is a potential for traffic delays if wildlife (elk, dear) get on the roadway and are unable to get to habitat they ordinarily would use. Wildlife injuries or road kills are a high potential in this area because of the proximity to Tiger Mountain, the Mountains to Sound Greenway and the Issaquah Bypass Project. Our agency encourages you to work closely with our regional wildlife and PHS staff so that these impacts will be greatly minimized.

- Please note that SEPA/Concurrence Point comments have been supplied previously by WDFW staff on this project, including letters on December 21, 1998, and August 14, 2000. They provide information important to the environmental impacts of this project, and to future permitting.

Northern Alignments:

None of the northern alignments appears to intersect a stream. WDFW has no preference on any of the proposed northern alignments. Immediately southeast of this new interchange, numerous seeps come out of the hill crossed by the old railroad grade. The new SE Issaquah Bypass will build the road somewhat lower on the hill than the old grade. It would be very advisable to have a Geotechnical Engineer examine the slope stability both upslope and downslope of the various proposed alignments. Landslumps/slides can create enormous amounts of fine sediments, which are detrimental for fish and aquatic systems, and for road construction. Construction impacts, and sedimentation impacts of poor erosion control, will likely have a negative impact on the fish resource in East Fork Issaquah Creek. This stream is used for both spawning and rearing of salmonids. The current Sunset Interchange project is upgrading the fish passage structures in this stream.

Southern Alignments:

Streams and deficient culverts

There are two stream systems that will be impacted by the southern section of this roadway. Both streams have salmonid use, and are tributary to Issaquah Creek. Both streams have culvert crossings under Front Street/Issaquah- Hobart Road. Both crossings are past their useful life, and are deficient by today's WDFW fish passage design criteria.

The most southerly stream crosses Issaquah-Hobart diagonally SE to NW, just south of the intersection of SE 96th St., and 6th AVE SE. This creek drains out of wetland RD. If the proposed South A alignment is chosen, the taper back from the 4- lane Bypass to the now 2- lane Issaquah-Hobart must cross this stream. The drawing shows the taper crossing the creek's location. It is not likely, nor is it advised, that the project limits be redesigned to stop a few feet, or inches from this creek crossing. Placing an upstream culvert extension to support the new roadway is not reasonable, and will not be permitted. An appropriate design for the new crossing would be a short span bridge. If the current alignment of the Issaquah-Hobart is still needed after Bypass completion, the existing old culvert should be replaced by the same type structure as in the Bypass. If the Issaquah-Hobart is not needed going north, then the culvert and roadway should be removed, and the stream returned to full functionality. Clearing limits and staging areas must be closely managed to prevent damage to the stream and riparian vegetation outside of the built roadway.

The northerly stream is impacted by any alignment chosen. This stream crosses Issaquah-Hobart, from east to west, immediately south of the intersection with 2nd Ave. SE. There is a small mucky pond immediately upstream of the Issaquah-Hobart guardrail. The existing Issaquah-Hobart culvert is old, and deficient for current fish passage criteria. The culvert has been extended, in the last few years, from the widening of Issaquah-Hobart. The South A alignment (past the LDS church), would cross the mainstem of this creek and associated Wetland GW, on a long bridge. A long bridge is an appropriate way to minimize the impacts to the stream and wetland. However, severe impacts to streams and wetlands are common during the actual construction of the very structure designed to minimize long-term impact to the stream and wetlands. The South A alignment would continue south and cross another very small stream which drains from Wetland GW intoWetland VL through the roadside ditch. This southern fork of the stream crosses 6th Ave. SE just south of the LDS church parking lot entrance. Choosing this South A alignment would require the filling of portions of Wetland GW, and filling the current stream channel and relocating the stream. Permitting this activity will be difficult. Homes along this stream routinely flood when the stream and wetlands overtop during winter storms.

The old railroad grade South C alignment appears to be a way to minimize impacts to the stream, and wetlands. The 4 lane to 2 lane taper south of the proposed intersection at 2nd Ave. SE will require a new crossing of the northerly stream. As in the South A alignment (6th Ave. SE), it is not appropriate to extend the Issaquah-Hobart culvert further. As above, a bridge crossing should be anticipated, as should the removal of the existing Issaquah-Hobart culvert. The South C alignment places the Bypass on the old grade, supported by concrete or Hilfikker-type walls. The creek and wetland are immediately at the base of the old grade fill slope. It is likely that the sub-grade materials must be removed to some depth, and new suitable fill materials imported. Close attention must be paid to new fill slope stability, erosion control, and clearing limits during the re-construction of this grade. Dry season construction only should be considered. Sloppy construction will allow spillage of import fill and materials to spread into the creek and wetland. The fish don't need more dirt.

The existing railroad grade cut off part of wetland GW adjacent to the High School from the stream and the rest of Wetland GW to the south. It does not seem appropriate to place a stormwater pond in this cutoff wetland. An upland location for this water quality facility is preferred. Further site investigation is necessary to determine if fish passage may be required from the stream into the now cutoff wetland piece. This South C alignment does not allow for buffers from the stream and wetland as it already goes right through the wetland. Previous WDFW comments have discussed department policy concerning wetlands, and wetland buffers. It is likely that further wetland mitigation will be required for this project to account for wetland buffers. The site NW of the LDS property on 6th Ave. SE should be investigated. It is contiguous to Wetland GW, and it appears likely that it is a formerly filled piece of this wetland. It may not be appropriate to site stormwater pond A-2 here if it is a filled wetland. It may be best to acquire the site, and remove the fill and restore it to become a functional part of wetland GW.

ADDITIONAL COMMENTS

- We would like to see a copy of your Wetland Report as soon as it is prepared.

- A Hydraulic Project Approval (HPA) will be required by WDFW for elements of this project, including stream crossings, in-stream work, and work in wetlands adjacent to and tributary to the stream systems (RCW 77.55). We expect consultation on the stormwater design, as the discharge of stormwater to streams and wetlands negatively impacts fish and wildlife unless there is a NPDES permit issued.

- Fish Passage - for culvert replacements, WDFW requires that the design meets or exceeds the WDFW fish passage design criteria current at the time of the design. In general, bridges are the preferred crossing structure on fish bearing streams. (WAC 220-110-070.)

- We will require final inspection and implementation of the corrections "punch list" prior to project completion - opening of the roadway. This is to ensure that construction work that has impacted streams and wetlands have been properly installed and construction related damage fully mitigated.

Thank you for considering our comments on your proposal. We appreciate your continued cooperation in our efforts to protect and manage the fish and wildlife resources of the state of Washington. If you have any questions, please contact me at (360) 902-2575, or Kurt Buchanan, the WDFW/DOT Liaison for this project, at (360) 466-4345 x 256.

Sincerely,

Cynthia R. Pratt

Cynthia R. Pratt
SEPA/NEPA Coordinator and
404 Merger Agreement Representative
Regulatory Services Section

cc: Phil KauzLoric, WSDOT
Sharon Love, FHWA
Joan Cabreza, EPA
Elaine Somers, EPA
Jack Kennedy, COE
Terry Swanson, Ecology
Michael Grady, NOAA-Fisheries
Jennifer Quan, USFWS

Tan/LW [illegible]

10/10

RECEIVED

OCT 08 2002

PUBLIC WORKS ENG.

Merger Agreement
Concurrence Form

Project Title	SR#	Region	County
SE Issaquah Bypass	-------------	NW	King County

WRIA	Environmental Document Classification	Date Concurrence Due
Issaquah Cr. No. 08-0178	EIS	September 27, 2002

- ☐ **Project purpose and 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: Terry Paananen, NW Region

Environmental Summary

The City of Issaquah is preparing a NEPA/SEPA Supplemental Environmental Impact Statement (SEIS) for a new bypass arterial connecting the I-90 Sunset Interchange to the Issaquah-Hobart Road in southeastern Issaquah, Washington. The proposed bypass would be an approximately 2 kilometers (1.25 miles) long multi-lane road with through lanes and turn-lane channelization. The proposed project would reduce congestion on existing streets and improve access to Interstate 90. This is the final concurrence form on alternatives to be evaluated in the SEIS.

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:
WDFW	Responsible Official SEPA/NEPA Coordinator	Cynthia K. Hiatt	10/7/02

1Definition 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."

2Definition 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."

3Definition 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."

4Definition 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."

CITY OF ISSAQUAH
Department of Public Works/Engineering
PO Box 1307 / Issaquah, WA 98027
(425) 837-3400 Fax (425) 837-3409

November 12, 2002

Cynthia R. Pratt
SEPA/NEPA Coordinator and
404 Merger Agreement Representative
Washington Department of Fish and Wildlife
500 Capitol Way North
Olympia, WA 98501

Dear Ms. Pratt:

Thank you for submitting the signed SAC Agreement concurrence form for Concurrence Point 2 (Project Alternatives to be evaluated in the Supplemental EIS) for the SE Issaquah Bypass project. In response to the advisory comments in your letter dated October 7, 2002, the City of Issaquah agrees to the following actions:

1. Comment acknowledged. The alignment alternatives presented at the September 12, 2002 SAC meeting will be carried forward into the SEIS.

2. During preparation of the Supplemental DEIS, our EIS consultant will work closely with WDFW staff to evaluate strategies for preserving and improving ecological connectivity in the project area. Special attention will be paid to maintaining existing wildlife corridors and implementing measures to minimize conflicts between wildlife and motorists.

3. We have reviewed WDFW SEPA/Concurrence Point comments in previously submitted letters dated December 21, 1998 and August 14, 2000. Most, if not all, of these previous comments have been addressed through subsequent design changes or new avoidance alternatives.

4. Regarding the Northern Alignments: A professional civil engineer specializing in geotechnical design examined slope stability in the vicinity of the northern alignments in 1998 and 1999. The observations were reported in the June 2000 DEIS and will be represented in the Supplemental DEIS. Potential sedimentation impacts to East Fork Issaquah Creek will be investigated and appropriate BMP's for erosion control will be included as mitigation during construction.

5. Regarding the Southern Alignments: The designs for both the South A alignment (6th Avenue) and South C alignment (abandoned railroad grade) have been changed to avoid crossing or impacting existing stream culverts under Front Street/Issaquah-Hobart Road. With this change, no damage to streams or riparian vegetation from staging or clearing activities is anticipated. The City will also investigate bridge construction techniques that minimize impacts to Wetland GW and the North Tributary and will limit construction activities in that area to the dry period.

6. Your letter also notes the presence of "another very small stream" along the South A alignment south of the LDS church. Preliminary investigation of this feature does not confirm that a stream is located there. This drainage feature has experienced intermittent storm and groundwater flow in the past and it has previously been cleared and maintained by the adjacent church owners to facilitate water conveyance. This drainage feature was not rated as a stream in the City's recent survey, nor is it identified as a stream by the King County Sensitive Areas Folio, which does include the North and South tributaries discussed above. The SEIS will explore the characteristics of this feature further, including its potential usage by fish and/or habitat value. If further investigation suggests that this feature should be identified as a stream, impacts on the stream will be identified by the SEIS. If it does not have characteristics consistent with designation as a stream, impacts of the project design on this feature will still be addressed as part of the analysis of impacts to the wetland area where it is located.

7. As recommended by Ecology and WDFW, the City has agreed to relocate stormwater pond C-2 to an upland location just north of Wetland HS. Unfortunately, relocating the pond to this location will displace up to three single-family homes. Regrettable as this is, we understand our legal obligation to explore all reasonable and practicable alternatives to avoid and minimize wetland impacts. The City will work with resource agencies to develop a wetland mitigation plan that appropriately replaces lost wetland functions and values, including buffer areas. As you pointed out in your letter, one of the best potential wetland mitigation sites in the project area is the undeveloped parcel located adjacent to Wetland GW just across 6th Avenue SE from the LDS church. We will be sending you and other SAC agencies copies of the Draft Wetland Mitigation Plan and Report as soon as it is completed.

8. As requested, the City will consult with WDFW and other resource agencies during design of the stormwater management system. We are currently coordinating with Eric Pentico, WDFW Area Habitat Biologist, Region 4.

Thank you again for your advisory comments. The City remains committed to providing complete environmental review on the proposed SE Issaquah Bypass project. We look forward to your continued direction on this project.

Sincerely,

Bob Brock PE
Director Public Works

cc: Phil KauzLoric, WSDOT
Sharon Love, FHWA
Elizabeth Healy, FHWA
Jan Aarts, Parsons Brinckerhoff Quade and Douglas, Inc.
Day/Project

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Western Washington Fish and Wildlife Office
510 Desmond Drive SE, Suite 102
Lacey, Washington 98503
Phone: (360) 753-9440 Fax: (360) 753-9008

Bob Brock
Public Works Director
1775 12th Ave NW
Issaquah, Washington 98027

Dear Mr. Brock:

This letter is in response to your request on Concurrence Point 2 as per the National Environmental Policy Act (NEPA)/State Environmental Policy Act (SEPA)/404 Merger Agreement (Merger Agreement) on the SE Issaquah Bypass in King County, Washington. In your letter, you have requested concurrence on the following:

- Project alternative to be evaluated in the Supplemental Environmental Impact Statement (SEIS)

The U.S. Fish and Wildlife Service (Service) has determined that the information provided is adequate. We are issuing a "Concurrence with Comments" for Concurrence Point 2. We have the following additional comments and per the Merger Agreement, we understand that our comments our advisory only. We look forward to your response to our comments.

Success: Avoidance and Minimization

The Service would like to express our appreciation of the consideration and steps that the City of Issaquah has taken to produce an alternative (South C) that greatly reduces impacts to the wetlands at the south end of the corridor. The new alternative marks a success in the early coordination process as intended of the Merger Agreement.

Terrestrial and Aquatic Resources

Within the project area, we currently have responsibility under the Endangered Species Act of 1973, as amended (Act) for the bull trout (*Salvelinus confluentus*) and the bald eagle *(Haliaeetus leucocephalus)*, both federally listed as threatened, and the olive-sided fly catcher (*Contopus cooperi)* and the tailed frog (*Ascaphus truei*), both species of federal concern.

Additionally, under the Fish and Wildlife Coordination Act (48 Stat. 401 as amended, 16 U.S.C. et. seq.) (FWCA), the Service is authorized to provide assistance in the development and protection of all fish and wildlife and their habitat. Per the Draft Environmental Impact

Statement (DEIS) for this project, there are potentially 75 bird species and 59 mammal species that use the area. These numbers represents a substantial amount of natural resources. Other aquatic species of specific concern within the project vicinity include the Chinook salmon *(Onchorynchus tshawytsha)*, which is federally listed as threatened and under the responsibility of NOAA Fisheries, and the LakeWashington/Sammamish kokenee *(Onchorynchus nerka)*, one of five remaining native kokenee populations left in the State of Washington.

For the terrestrial and aquatic species listed above as well as all species in the vicinity of the project, it is the Service's overarching goal to maintain or improve these species current use of the area. As this project moves ahead in its design phases we encourage further coordination with the Service regarding needs for listed, candidate and/or species of concern.

Impervious Surface Impacts

The Service is concerned about the impacts of new impervious surfaces that could result from the proposed bypass as well as Issaquah's development related to the bypass. The shallow aquifer underlying the City of Issaquah is likely hydrologically connected to many of the streams and creeks (i.e., Issaquah Creek) in the area. Placement of impervious surface, especially in areas of aquifer recharge, significantly changes the way that water reaches the streams. In turn, the changes generally result in reduced summer base flows, higher and more frequent flood events (peak flow events), and stream channel scour. Fish (as well as all the aquatic organisms in these systems) have not evolve to these stream conditions and thus are negatively impacted.

These impacts can be minimized in a number of different ways. For further minimization of natural resource impacts resulting from new impervious surface, please consider incorporation of the suggested measures outlined in the following advisory comments.

Stormwater Treatment

Traditional stormwater treatment is effective for reducing pollutant loading and managing peak flows but does not usually minimize impacts related to the loss of water recharge (infiltration).

The Service would like to encourage the development and use of "non-engineered" stormwater solutions. We envision that these solutions would apply a "watershed approach[1]", and combine traditional stormwater treatment and habitat restoration/enhancement that meet "quality" and "quantity" treatment requirements as well as minimize effects to other impacted habitat functions (not addressed with the current treatments).

[1]October 18, 2002 (65 FR 202) Unified Federal Policy for a Watershed Approach to Federal Lands and Resource Management

A "watershed approach" would incorporate and focus on hydrologic and stream impacts at the sub-basin level. Current science suggests that in the Pacific Northwest, streams in sub-basins above a five percent impervious level exhibit a decrease in aquatic bio-diversity and a general decrease in stream health (May *et al.* 1998[2]; Booth and Reinelt 1993[3]). This in not to say that below five percent there is not degradation or negative impacts. It is likely that below five percent degradation occurs incrementally, which can be exacerbated by other factors such as reduced riparian habitat and increased pollution (Booth 2000[4]; Karr and Chu 2000[5]). Acknowledgment and analysis of the full spectrum of impacts that result from impervious surface (i.e., reduced infiltration as well as increased peak flows and pollutants) may also reveal more appropriate methods for minimizing and/or offsetting such impacts.

We believe that habitat restoration and/or enhancement could provide detention or "quantity" treatments beyond just minimizing peak flows. Restoration of a variety of habitats (upland, riparian, wetland, floodplain) can minimize more of the impacts of stormwater run-off than a detention pond. Permanent removal of impervious surface and/or other impacted areas, and restoration of soils and vegetation can increase water storage capacity and infiltration, thus recharging aquifers, groundwater and base flows while reducing the amount of water reaching the ground and becoming "stormwater."

Transit/Land-use Alternatives

Upon our receipt of the subject concurrence package and subsequent coordination with the City of Issaquah and the Federal Highway Administration (FHWA), we discussed an additional alternative (two lane) that would potentially reduce the need for four lanes to two lanes thereby minimizing impervious surface impacts to hydrologic resources important for both fish and wildlife in the Issaquah area. FHWA and the City acknowledge the alternative could be included as an alternative "considered and rejected". This alternative and reasons for rejection reads as follows:

---

[2]May, C.W., E.B. Welch, R.R. Horner, J.R. Karr and B.W. Mar. 1998. Quality indices for urbanization effects in Puget Sound Lowlands streams. Final Report for Washington Department of Ecology. Dept. of Ecology, Pub. 98-04. 229 pp.

[3]Booth, D.B., and Reinelt, L.E. 1993 Consequences of urbanization on aquatic systems - degradation thresholds, stormwater detention, and the limits of mitigation: Water Resources Bulletin, v. 33, p. 1077-1090.

[4]Booth, D. B. 2000. Forest Cover, Impervious-Surface area, and the Mitigation of Urbanization Impacts in King County, Washington. University of Washington, Center for Urban Water Resource Management, Seattle, WA. 18pp.

[5]Karr, J. R. and E.W. Chu. 2000. Sustaining Living Rivers. Excerpts from Hydrobiologia 422/423: 1-14, 2000

"Two-Lane SE Bypass Alternative with Future Transit and Land Use Measures

Under this alternative the proposed SE Issaquah Bypass project would be limited to a two-lane facility only, and City and regional jurisdictions would be asked to cooperate to develop a series of transit improvements, and/or land use regulations, intended to reduce the need for increasing the proposed arterial roadway to four lanes. Although the exact combination of transit and land use improvements that might be implemented was not identified, this alternative would include potential measures that could be taken under this approach. This cooperation would be intended to ensure that measures such as increased transit service, new park and ride facilities, and land use controls were achieved and coordinated to reduce travel demands that could lead to the need for an increase in the size of the proposed SE Bypass facility.

In reviewing this alternative, transportation analysis using the recently developed 2030 traffic model for this project, indicated an approximate trip reduction of 25% to 30% along the SE Bypass Road would be needed in order for the SE Bypass to operate as a two-lane facility. This degree of trip reduction is unrealistic for a suburban community, and would be so even for a very densely populated urban setting, and therefore could not meet the proposed project's purpose and need. Additionally, it was noted that potential land use and transit measures mentioned above may be beyond the City's discretion and would require cooperation between the City, King County, and other local jurisdictions before it could be implemented. For these reasons, this alternative would be identified as "considered, but rejected" for evaluation throughout the document. "

The Service believes the rejection of this two-lane alternative without further analysis is premature and encourages the City to carry the alternative on for further analysis. We believe that this alternative is still viable for the following reasons.

- On September 12, 2002, at the last a meeting of the Signatory Agencies Committee, Lou Haff and Pam Fox of the City of Issaquah reported that in Issaquah the main employment centers are on north side of town (new Microsoft campus in progress) and that Issaquah daytime populations are approximately 40,000 verses 12,000-14,000 at night.

  At face value this indicates that a significant number of people are coming to Issaquah to work and that there is a potential to provide transit infrastructure from where their trips begin (the Origin and Destination Summary provided to the Service did not contain a analysis that provided geographical information on actual origin and destinations). While this alone may not meet the 25-30 percent reduction stated to meet the purpose and *need, it provides an example of a potential measures that could be evaluated under the two lane alternative. Other measures are likely to exist, including reverse-use lanes.*

- Table 4, of the supplemental Transportation Supplemental Report, provides a comparison between the 4 lane-build to no build alternatives, measured by the expected Level of Service (LOS) in 2030 of 29 intersections affected by the bypass. A review of this table led the Service to conclude that a new four-lane bypass would have the following outcomes:

  - *The percent of intersections functioning at LOS F between the "No build" and "4-lane build" alternative will be reduced, at best, from 56 percent to 45 percent.*
  - *Nine (9) intersections (31 percent) would experience an increase in LOS.*
  - *Five (5) intersections (17 percent) would experience of a decrease in LOS.*
  - *Fifteen (15) intersections (52 percent) would maintain their LOS .*
  - *Twelve (12) intersections (41 percent) would maintain an LOS F in either or both the AM and PM.*

  By these calculation the projected congestion improvements appear to be relatively low. Therefore the Service questions whether the proposed two lane alterative may have a similar outcome while reducing environmental impacts, including impervious surface impacts.

◎ *Among the City's reasons for the rejection of the twó lane alternative is that it could go beyond the City of Issaquah's discretion. Under NEPA viable alternatives are not limited to jurisdictional boundaries. An alternative that is outside the jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable.*[6]*. For the reasons listed in the two previous bullets, the Service believes that the two lane alternative is reasonable.*

[6]Question and Answer #2 in the: Memorandum for the Federal NEPA Liaisons, Federal, State and Local Official and Other Persons Involved in the NEPA Process. From the Exective Office of the President, Council on Environmental Quality. March 16, 1981

Wildlife/Ecological Connectivity

The proposed bypass and related development will encroach into the Tiger Mountain Resource Conservation Area. The Service is concerned that the proposed project and development related to it have the potential to displace wildlife that uses the area, fragment habitats, truncate wildlife movement, and increase wildlife road kill.
The Service recommends that the City of Issaquah implement a survey of the proposed bypass and development areas that:

- ◎ Geographically identifies habitat that is currently providing movement/migration corridors for all wildlife in the area.

- ◎ Identifies current areas of reoccurring road kill and thus needed improvement in wildlife crossing.

This information will provided a comprehensive understanding of how wildlife are using the existing landscape and can reveal appropriate connectivity measures, thereby increasing the likelihood of the use and success of a wildlife crossing.

The Service recommends the following reports as reference and further guidance on ecological/ habitat connectivity.

Singleton, P.H., Gaines, W. L., and J.F. Lehmkuhl. 2002. Landscape permeability for large carnivores in Washington: A GIS weighted distance and least-cost corridor assessment. Final report to WSDOT, to be submitted as a Research Paper through the USDA Forest Service, Pacific Northwest Research Station, Portland, Oregon. 85 pp.

Singleton, P. H., and J. F. Lehmkuhl. 1998. Wildlife-roadway interactions: A bibliography and review of roadway and wildlife interactions. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Wenatchee Forestry Sciences Laboratory. 164 pp.

Singleton, P. H., and J. F. Lehmkuhl. 2000. I-90 Snoqualmie Pass wildlife habitat linkage assessment. Report WA-RD 489.1. Washington State Department of Transportation, Olympia, Washington. 97 pp.

Thank you for the chance to comment on this project at this early stage. If you have any question or need clarification on items in this document, please contact Jennifer Quan, of my staff, at (360) 753-6047.

Sincerely,
Original signed by Lynn P. Childers

Ken S. Berg, Manager
Western Washington Fish and Wildlife Field Office

cc:
ACOE, Seattle (J. Kennedy)
EPA, Seattle (E. Somers)
FHWA, Olympia (E. Healy)
NOAA Fisheries (M. Grady, B. Leonard)
WSDOT, NW Region, Seattle (B. Brown)
WSDOT, EAO, Olympia (P. Kauzlorik)
WDFW Region 6, Olympia (C. Pratt)
WDOE Lacey, (S. Manning)

Merger Agreement
Concurrence Form

Project Title	SR#	Region	County
SE Issaquah Bypass	————	NW	King County

WRIA	Environmental Document Classification	Date Concurrence Due
Issaquah Cr. No. 08-0178	EIS	September 27, 2002

- ☐ Project purpose and 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: Terry Paananen, NW Region

Environmental Summary

The City of Issaquah is preparing a NEPA/SEPA Supplemental Environmental Impact Statement (SEIS) for a new bypass arterial connecting the I-90 Sunset Interchange to the Issaquah-Hobart Road in southeastern Issaquah, Washington. The proposed bypass would be an approximately 2 kilometers (1.25 miles) long multi-lane road with through lanes and turn-lane channelization. The proposed project would reduce congestion on existing streets and improve access to Interstate 90. This is the final concurrence form on alternatives to be evaluated in the SEIS.

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 comments

Additional Information Needed:

Agency:	Title:	Signature:	Date:
USFWS	Division Manager	Lynn P. Childers	10/10/02

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CITY OF ISSAQUAH
Department of Public Works/Engineering
PO Box 1307 / Issaquah, WA 98027
(425) 837-3400 Fax (425) 837-3409

November 18, 2002

Lynn P. Childers
United States Fish and Wildlife Service
Western Washington Fish and Wildlife Office
510 Desmond Drive SE, Suite 102
Lacey, WA 98503

Dear Ms. Childers:

Thank you for submitting the signed SAC Agreement concurrence form for Concurrence Point 2 (Project Alternatives to be evaluated in the Supplemental EIS) for the SE Issaquah Bypass project. In response to the advisory comments included with the Concurrence Form dated October 10, 2002, the City of Issaquah agrees to the following actions:

1. The City will continue to refine the design of the build alternatives to minimize and avoid impacts to valuable natural resources.
2. The SDEIS will include updated information on federally listed threatened and endangered species, species of concern and other fish, wildlife and their habitat in the project area. The City's EIS consultant will coordinate with USFWS to identify strategies and mitigation measures to maintain or improve these species current use of the area.
3. The SDEIS will assess impacts to hydrologic systems and streams at a sub-basin level as required in the new Stormwater Management Manual for Western Washington (Ecology, 2001).
4. The City will evaluate the potential for using a combination of traditional stormwater treatment methods and "non-engineered" stormwater solutions to meet quality and quantity treatment requirements. Non-engineered solutions might include habitat restoration, removal of invasive/noxious weeds, and/or enhancement of upland, riparian and floodplain habitats. Pervious concrete sidewalks, pervious pavers in parking lots to assist in stormwater infiltration.
5. Abandoned roadway surfaces will be removed and soils and vegetation will be restored to increase water storage capacity and infiltration.
6. The Draft Transportation Study (in progress) will address the operational characteristics of both a two-lane facility and a four-lane facility. The SDEIS will state that if a phased construction approach is used, the City will evaluate and consider dedicating the use of any new lanes to transit service and or High Occupancy Vehicles (HOVs). Whether or not a phased construction approach is adopted, the SDEIS will state the City's intention to collaborate now and in the future with transit agencies to assure that opportunities for additional transit, park and ride facilities, and other TDM/TSM measures are reviewed and considered. If a 4-lane facility is built at the start, the City will consider transit and HOV designation from the start as well.
7. The issue of wildlife and ecological connectivity will be addressed in the SDEIS under the several environmental elements/sections in the SDEIS to which they pertain. The level of detail for any one element will be defined by the requirements specified in the Washington State Department of Transportation (WSDOT) Environmental Procedures Manual, Volumes 1 and 2 (WSDOT, 2001). The City will include information in the SDEIS that geographically identifies habitat that is currently providing movement/migration corridors for wildlife in the area. Areas experiencing, or likely to experience, recurrent road kill will be identified and improvements to wildlife crossing will be investigated.

Thank you again for your advisory comments. The City remains committed to providing complete environmental review on the proposed SE Issaquah Bypass project. We look forward to your continued direction and participation on this project.

Sincerely,

Bob Brock, Public Works Director

cc: Phil KauzLoric, WSDOT
Sharon Love, FHWA
Elizabeth Healy, FHWA
Jan Aarts, Parsons Brinckerhoff, Quade and Douglas, Inc.
Day/Project

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Trail Connectivity Meeting Notes

Proposed SE Bypass – Trail Connectivity Meeting
September 19, 2002
City Hall/Police Station – Eagle Room

Attendees

City of Issaquah Staff:		
Lou Haff	louh@ci.issaquah.wa.us	
Pam Fox	pamf@ci.issaquah.wa.us	(425) 837-3423
Bob Hudson	bobh@ci.issaquah.wa.us	(425) 837-3305
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Jeff Buckland	buckland@pbworld.com	(206) 382-6355
Interested Public/Agency:		
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Mabeline Lapsonsky		(425) 392-3316
Marilyn Batura	mjbatura@attbi.com	(425) 392-5169
Carol Quinsey	tomandcarolq@foxinternet.com	(425) 557-8915
Thomas Quinsey	"	"
Janice Pacific/WDNR	Janice.Pacific@wadnr.gov	(360) 825-1631
Kelly Heintz/WDNR	Kelly.Heintz@wadnr.gov	(360) 825-1631
Ken Konigsmark	kenneth.d.konigsmark@boeing.com	(425) 957-5094
Barbara Shelton	bshelton@seanet.com	(425) 557-5502
Karen Behm	klbehm@nwlink.com	(425) 391-4124
Jerry Bunce	superduper100@attbi.com	(425) 837-9400
Virginia Chong	vchong1206@attbi.com	(425) 313-8951
Dennis Neuzil	dennisneuzil@foxinternet.com	(425) 455-1419
Robert Whitbeck	robert.j.whitbeck@boeing.com	(425) 427-6680
Mark Meredith	artguy@merry.com	(425) 369-9183
John Ardussi	jardussi@eldec.com	(425) 392-1183
Jennifer Lesher		

Notes

Introduction of staff and consultants. Lou Haff, Haff Engineering, provided a brief history of the proposed SE Bypass Project and that this meeting is provide an opportunity for bicyclists and walkers/hikers to review the proposed concepts for the non-motorized transportation elements as included in the SE Bypass proposal.

Randall Roberts, Parsons Brinkerhoff, provided an overview of the proposed SE Bypass alternatives and how the project will connect with the Sunset Interchange Project.

The Sunset Way Trail will be realigned as part of the Sunset Interchange construction. At Sunset Way, pedestrians/hikers will cross the proposed SE Bypass at an at-grade, lighted intersection, then leading to the Sunset Way Trail/Tradition Plateau trail system.

As part of the SE Bypass proposal, a 14-foot wide sidewalk is proposed on the west side of the bypass. Ken Konigsmark made a quick comment that the sidewalk should be called a trail. Haff responded that the 14-foot wide sidewalk is referred to as a sidewalk on the plans due to grant funding opportunities and constraints.

Barbara Shelton also asked about the proposed 5-foot sidewalk located on the east side of the bypass. Why does the sidewalk end at the Park Pointe intersection? Haff replied that during staff review of the project proposal, it did not appear that a sidewalk would be used as much between the Sunset Interchange and the Park Pointe intersection as would be used between Second Avenue and the Park Pointe intersection. At the intersection, people could cross the bypass and utilize the 14-foot wide sidewalk located on the west side of the bypass. Additionally, there will be retaining walls located on the east side of the bypass, which won't provide a pleasant walking experience – it would be noisy with the traffic noise reflecting off the wall back onto the pedestrian.

Konigsmark also suggested that there be a 14-foot wide sidewalk on the east side of the bypass up to the High School Trail, then change the width of the sidewalk down to 5-feet as it continues to the Park Pointe intersection. Jeff Buckland commented that the east side of the proposed bypass is bordered by significant wetlands and other environmental constraints, which may limit the ability to extend the width of the sidewalk. Haff also responded that this issue could be reviewed in the preparation of the supplemental DEIS. Additionally a 14-ft. wide sidewalk may not be suitable but that there may be an opportunity to increase the width of the proposed sidewalk beyond the 5-ft. width.

Konigsmark commented that the supplemental DEIS should focus on the following concern: that the foot-print of the proposed SE Bypass is supplanting a very popular trail, the Issaquah RR Grade Trail, which provides connections to two access points/trails (Sunset Way and High School Trails) to the Tradition Plateau. The RR grade trail is one of the most popular trails in Issaquah.

Questions arose over the possibility of a pedestrian/bicycle crossing across the proposed SE Bypass at the High School Trail. As the current concept shows, people will have to walk/ride down to the Park Pointe lighted intersection and then walk/ride back to the High School Trail. Knowing human nature, people will just run across the street ("jay-walk"). The supplemental DEIS should look at the possibility of a crosswalk with an activated signal; or an under-crossing (tunnel), or an over-crossing (bridge). This would help to ensure public safety and provide safe access to the High School Trail, which leads up to the Tradition Plateau/Tiger Mountain trail system.

A question was raised about the width of the proposed bypass and how many lanes it will have? The bypass is designed to a width equivalent to six lanes. Also, will trailhead parking be provided? Haff responded that the proposed design alternatives connect to all of the existing non-motorized facilities and that the concept design will replace the informal parking area now available at the RR Grade Trail off of Second Avenue.

Another question was raised about providing a parking area/trailhead at the Sunset Way Trail. Haff responded that this is part of the Sunset Interchange Project, but as clarification, parking was planned to replace the informal parking area located at the base of the Sunset Way Trail. However, when the Department of Fish and Wildlife issued their permit, they prohibited public use and the proposed trailhead parking due to potential adverse impacts to salmon, thus the proposed trailhead was eliminated from the project plans.

If Park Pointe doesn't move forward with their project, is a pedestrian crossing still planned at that location? Yes, a signal, whether pedestrian activated or as part of the road intersection, is proposed at that location.

Concern was again raised over pedestrian/bicycle safety in crossing the SE Bypass. The supplemental DEIS needs to focus on an under or over-crossing to ensure public safety. Haff remarked that in the past and during review of the Sunset Interchange, the City Council was opposed to under-passes.

Shelton asked about the possibility of striping the multiple use sidewalk/trail and the installation of "Stay to the Right" signs. Striping down the middle of the trail minimizes conflict between users. She would like to see striping on the existing City multiple-use trails too.

The group again reiterated that the City should focus on the adverse effect the construction of the proposed SE Bypass will have on the very popular Issaquah RR Grade Trail. If the trail is supplanted by the proposed bypass, this will be a huge loss to the City's trail system. Konigsmark commented that this trail provides a key connection between the City's urban trails to the open space trails located on Tiger Mountain. Bob Hudson spoke about the value of open space and the recreational opportunities this open space land provides to the residents of Issaquah. He also commented about the need for either an over or under-pass across the proposed SE Bypass for public safety. Haff responded that the concept of an over or under-pass will be addressed in the supplemental DEIS, but cautioned that an under-pass may not be feasible due to groundwater levels in the area. Additionally, Hudson stated that the Parks Department is holding two public open houses on Oct. 9th and 15th on the planning for the updated Parks, Recreation and Open Space Plan. At the open house, people may wish to provide comments on the City's recreational trail system.

Mary Lou Lewis brought up the issue of landscaped medians, both in the roadway and along the sidewalks. Medians provide a buffer between traffic lanes and between walkers and the roadway. Haff responded that landscaped medians had been discussed as part of the project concept; however when the Parks and Recreation Department reviewed the concept proposal, Parks said that medians were very expensive for the City to maintain. The medians were then eliminated from the plans. A comment was raised that if medians are not going to be included as part of the project, what other traffic calming devices will be used? Haff replied that this is an arterial roadway where the strategy is to move traffic through the City as efficiently as possible. The bypass is designed as a 35-mph road. Studies have shown that 85% of the drivers drive within the required speed limit and that 15% of the drivers exceed the speed limit. Traffic enforcement will be necessary.

A comment was raised that if a median is not included between the sidewalk and roadway, then a railing should be included at the edge of the sidewalk to ensure pedestrian safety, especially since this is going to be highly traveled and will most likely be a higher-speed roadway. Europe and even the state of Oregon have installed such railings along sidewalks. Haff asked that a photo be sent to him showing this sort of railing because he is unfamiliar with this sidewalk design feature.

Marilyn Batura commented that the 12 car parking lot proposed to replace the existing one will probably not accommodate current and future parking needs, especially if the design consideration for the bypass is to meet 2030 standards.

Lewis also remarked that if detention/retention ponds were built as part of the project, it would be appropriate to install interpretive signs in order to inform the public about the importance of groundwater recharge and the types of wildlife that utilizes these ponds.

Haff provided additional brief comments about the project proposal and remarked that he would like to reconvene the group just before or after release of the Supplemental DEIS. The group responded that they would like to reconvene in order to provide additional review and comments to the City. The meeting was adjourned.

MJM/mm
SE Bypass Trail Connectivity 9-19-02

Interagency Committee for Outdoor Recreation (IAC) Coordination

Interagency Committee for Outdoor Recreation

360/902-3000
360/902-3026 (fax)
email: info@iac.wa.gov

Salmon Recovery Funding Board

360/902-2636
360/902-3026 (fax)
email: salmon@iac.wa.gov

STATE OF WASHINGTON

OFFICE OF THE INTERAGENCY COMMITTEE
1111 Washington Street SE
PO Box 40917
Olympia, WA 98504-0917

RECEIVED
MAY 11 2006
PUBLIC WORKS ENG.

April 14, 2006

Pam Fox
City of Issaquah
Department of Public Works/Engineering
PO Box 1307
Issaquah, WA 98027

RE: Issaquah Sportsman's Club IAC Projects #92-040D and #96-333D
SE Issaquah Bypass Project

Dear Ms. Fox

Thank you for the updated information on the City of Issaquah's preferred alignment for the SE Issaquah Bypass project. Our office appreciates the opportunity to provide comment that will be incorporated into the Final Environmental Impact Statement.

According to your letter and from your discussion on the phone with my staff, we understand that construction of the bypass project would not begin at least until 2009. Any impacts to the Issaquah Sportsmen's Club facility and grant-assisted areas would not occur until after the grant conditions are removed - April 28, 2008. IAC requirements for replacement of negatively affected assisted areas would not be required and therefore IAC Board approval would not be necessary.

Thank you again for the opportunity to comment. If you have questions, or need additional assistance, please contact Darrell Jennings of my staff at (360) 902-3020, or by sending email to darrellj@iac.wa.gov.

Sincerely,

Marguerite Austin
Manager, Recreation and Habitat Projects

Cc: Bob Brock, City of Issaquah
Tom Melcher, Issaquah Sportsmen's Club
Eugene Kirchner, Issaquah Sportsmen's Club

Interagency Committee for Outdoor Recreation

360/902-3000
360/902-3026 (fax)
email: info@iac.wa.gov

Salmon Recovery Funding Board

360/902-2636
360/902-3026 (fax)
email: salmon@iac.wa.gov

STATE OF WASHINGTON

OFFICE OF THE INTERAGENCY COMMITTEE
1111 Washington Street SE
PO Box 40917
Olympia, WA 98504-0917

RECEIVED

MAY 21 2003

PARSONS BRINCKERHOFF

May 16, 2003

Doug Mattoon
City of Issaquah
P.O. Box 1307
Issaquah, WA 98027

RE: Southeast Issaquah Bypass Alternatives and Issaquah Sportsman's Club Review
IAC Projects #92-040D and #96-333D

Dear Mr. Mattoon:

Our office was provided a faxed copy of alternatives #1, 4, and 6 from the Southeast Issaquah Bypass Preliminary Supplemental Draft EIS. We were asked to review these alternatives for potential impacts to the Issaquah Sportsman's Club facilities funded with assistance through the Firearms and Archery Range Recreation (FARR) grant program administered by our office.

Since 1964, the Washington State Interagency Committee for Outdoor Recreation (IAC) has provided state and federal grant funds to outdoor recreation and conservation projects throughout the state of Washington. If at any time these recreation lands are used for a purpose other than for which the project agreement provides, a "conversion of use" may be declared. In general, should a conversion be declared, the sponsor would be required to replace the land and elements converted with new lands of equal or greater value, proximity, and recreation utility[1].

IAC has two contractual agreements with the Issaquah Sportsman's Club restricting use of the project properties for outdoor recreation use. Please note that FARR program policies differ slightly from most IAC administered grant programs. The provisions for development grants provided through FARR remain effective for ten years from the date of IAC's last reimbursement to the sponsor. While the conditions of the grant may be released at that point, sponsors are encouraged to keep these recreation facilities in perpetuity. The last payment to the Issaquah Sportsman's Club for the above referenced projects was issued April 28, 1998.

---

[1] IAC Participation Manual #7: *Funded Projects: Policies* §3 - Conversions

It appears that alternative 4 positions the bypass directly between the clubhouse and the range and represents a conversion of use. In project #92-040D, FARR grant funding assisted in several improvements including the relocation of the historic clubhouse building and the construction of a new parking lot and access road to and between these two areas. In our opinion, the range and the clubhouse are considered part of the same facility and directly support one another. The clubhouse provides meeting room space for hunter safety and firearm safety, both which must be allowed at facilities receiving FARR assistance. Often these courses have classroom work in addition to "live" training on the range. One of the reasons this project scored well enough to receive funding is because of the proximity and ease of access between the clubhouse and the range. Alternative 4 eliminates that access and requires patrons to drive rather than walk to the other facility.

The bypass plans submitted were not detailed enough to provide more than a cursory review of the potential impacts to the Club's facility and we are therefore unable to determine the extent that other alternatives will have on range facilities. We welcome you to submit additional, detailed plans for our review.

If you have questions, or need additional assistance, please contact me at (360) 902-3020 or by sending email to darrellj@iac.wa.gov.

Sincerely,

Darrell Jennings
Project Manager

Cc: Jan Aarts, Parsons Brinckerhoff
Tom Mechler, Issaquah Sportsman's Club

SOUTHEAST ISSAQUAH BYPASS PROJECT

COORDINATION MEETING WITH IAC AND ISSAQUAH SPORTSMEN'S CLUB

June 11, 2003

Participants:
Doug Matoon, City of Issaquah
Jan Aarts, Parsons Brinckerhoff
Margurite Austin, IAC
Eric Erickson, Issaquah Sportsmen's Club
Pam Fox, City of Issaquah
Darrell Jennings, IAC
Lorinda Anderson, IAC

NOTES

1. The IAC follows very specific conversion policies to protect recreation lands acquired, developed or improved with IAC grant assistance. IAC grant money was used to relocate the historic Issaquah Sportsmen's Club clubhouse, make safety and noise reduction improvements at the rifle and pistol range, and to realign the gravel road that provides access to and between the clubhouse and the rifle and pistol range.

2. All of the build alternatives would require conversion of Sportsmen's Club recreation land and access road property to non-recreation uses. The access road improvements funded with IAC money extend from the gun club property to the abandoned railroad ROW.

3. Before a conversion request can be approved, IAC policies require the following:

   - All practical alternatives to the conversion must be evaluated and rejected on a sound basis.

   - The land proposed for replacement or substitution must be of equal or greater market value, reasonably equivalent recreation utility, and location.

     (Note: The replacement land need not provide identical recreation experiences or be located at the same site provided it is in a reasonably equivalent location. It must, however, be administered by the same political jurisdiction as the converted land and be identified in the agencies Comprehensive Park and Recreation Plan.)

4. Based on the policies described above, alternatives that include the North B alignment would be less preferable to IAC because North B physically separates the clubhouse from the rifle and pistol range and eliminates access road connection between the two facilities. People taking gun safety courses at the clubhouse would no longer be able to walk from the clubhouse to the rifle and pistol gun range, but would instead have to drive between the two facilities.

5. North B also eliminates on-site parking on the clubhouse property. Eric felt it would be very difficult to replace lost parking on the remainder of the clubhouse site. There are also utilities and drain fields on site that would need to be relocated or reconfigured. Jan will contact Eric to obtain copies of as-built drawings for the clubhouse site.

6. IAC staff will carefully review the City's proposal and EIS alternatives to see if there are ways to mitigate the conversion of recreation land to non-recreation uses. The City can proceed with issuance of the SDEIS at this time if the document thoroughly describes proposed conversion, adds discussion of need for replacement of equal value, location and utility, and discusses and applies the IAC conversion policies.

7. After a preferred alternative is identified by the City Council, the proposed conversion can be taken up with the IAC Board to get final approval. IAC Board approval should be obtained prior to issuing the Final EIS.

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Issaquah School District Coordination

Issaquah School District No. 411
565 NW Holly Street • Issaquah, WA 98027-2899 • Phone (425) 837-7000
Janet N. Barry, Ed. D.
Superintendent

RECEIVED
JUN 13 2006
PUBLIC WORKS ENG.

June 12, 2006

City of Issaquah
Department of Public Works/Engineering
PO Box 1307
Issaquah, WA 98027

Attn: Bob Brock, P.E.
Public Works Director

RE: Southeast Bypass Project
Noise Mitigation

Dear Bob:

I received your letter dated May 24, 2006 including the listed sound mitigation options and assumptions.

The District understands that the City Council must still discuss the proposed bypass after receiving the Record of Decision from Federal Highways and that this approval is a necessary part of the FEIS process.

The District has reviewed the letter and finds the proposed process and options acceptable.

As there are still some design alternatives that may influence potential noise impacts to district facilities, we look forward to working with the City if and when the SE Bypass project enters into the design phase.

Sincerely,

Steve Crawford
Director of Capital Projects

CITY OF ISSAQUAH
Department of Public Works/Engineering
PO Box 1307 / Issaquah, WA 98027
(425) 837-3400 Fax (425) 837-3409

May 24, 2006

Issaquah School District
565 NW Holly Street
Issaquah, WA 98027

ATTN: Steve Crawford

RE: Southeast Bypass Project
Noise Mitigation Options

Dear Mr. Crawford:

Thank you for this opportunity to discuss noise mitigation options with the Issaquah School District (ISD). As you are aware the city is in the process of preparing the Final Environmental Impact Statement for the Southeast (SE) Issaquah Bypass Project and noise mitigation options for impacts to the Issaquah High School needs to be included.

We understand that the ISD received voter approved bonds enabling them to make renovations to Issaquah High School. We understand that the timing for the design of the high school is uncertain at this time and the SE Issaquah Bypass project still must be discussed by our City Council after a Record of Decision is received from Federal Highways.

Attached is our list of options that has been refined based upon your comments and discussed with our Mayor's office. Please review with your School Board and respond back to us in writing. Our deadline for receiving your letter is June 12, 2006 in order to maintain our present schedule for completion of the FEIS.

Should you have any questions or wish to discuss this, please give me a call at (425) 837-3405.

Sincerely,

Bob Brock, P.E.
Public Works Director

BB/pf

Attachment: 1

Cc: Day/Project 440400

C:\Documents and Settings\PamF\Local Settings\Temporary Internet Files\OLK2\Doc18.doc

School District Noise Mitigation Options
5/23/06

1. Work with school district during design process to try to achieve a reasonable noise reduction based upon Department of Health code.

2. Depress road (create berm) along football field and athletic field and/or small wall along athletic field

These options are based on the following assumptions:

A. The Department of Health (DOH) sound control standards in RCW 246-366-030 paragraph 3 address noise at a school site and RCW 246-366-110 address classroom background noise levels are to be used as guidelines for achieving acceptable sound mitigation.
B. Commitments to any particular noise mitigation measure cannot be made at this time because the project needs to go to design phase before feasibility and costs can be determined. Timing of roadway design and school design are uncertain. ISD noise study (BRC) indicates mitigation required for classrooms with open windows. Office of the Superintendent of Public Instruction (OSPI) will require new schools construction to comply with Washington Sustainable Schools Protocol. The district is currently voluntarily meeting this goal. This and other "green" or sustainable strategies strongly encourage natural ventilation. This also represents a way to reduce energy use and costs. Open windows will likely continue or increase.
C. The actual noise mitigation plan will be developed in coordination between ISD and City designers if and when the SE Bypass enters the design phase. Selection of the preferred mitigation action will be based on cost-benefit considerations, recognizing that achieving DOH guidelines at all areas of the school property may not be possible or practicable..

Issaquah School District No. 411
565 NW Holly Street • Issaquah, WA 98027-2899 • Phone (425) 837-7000
Janet N. Barry, Ed. D.
Superintendent

February 7, 2005

Robert Brock, Public Works Director
City of Issaquah
PO Box 1307
Issaquah, WA 98027

RE: Southeast Issaquah Bypass Preferred Alternative # 5

Dear Mr. Brock:

The Issaquah School District appreciates the opportunity to respond with mitigation requirements necessary to maintain the quality of the educational environment at Issaquah High School, Clark Elementary and Tiger Mountain Community High School. These facilities will be impacted by the Preferred Alternative # 5. Our concerns remain consistent with those expressed in the past.

We request that the Final Environmental Impact Statement for the selected design, roadway alignment and configuration specifically address the following:

Noise

Exterior noise levels will increase significantly at the Issaquah High School campus in general but specifically at the easternmost classrooms and the upper and south PE/athletic fields which will be close to the preferred alignment. Clark Elementary School and Tiger Mountain Community High School will also be impacted though they are located further from the proposed alignment. Noise levels must not exceed those permitted by the Washington State Board of Health criteria as defined in the WAC for classrooms, field instructional areas and the campus in general. The only effective mitigation for reducing exterior noise levels appears to be carefully designed barriers at or adjacent to the roadway.

Visual

The high school upper playfield and softball fields will be adjacent the proposed roadway and classrooms will be nearby. Visual screening of the roadway and moving traffic will be necessary to maintain the quality of the instructional environment along the eastern side of the school facilities. As much as possible, existing vegetation buffers should be retained to maintain a visual separation between the roadway and school facilities.

Education

Public land on Tiger Mountain has provided a living lab and a natural learning environment as well as a venue for PE and athletic activities. A safe student access from the three affected schools must be maintained to the Tiger Mountain NRCA resources.

Both upper softball fields are required under Title 9. Two softball fields must be maintained with improvements that at least match existing conditions.

Safety

A barrier must be in place the full length of the roadway adjacent to school facilities to prevent students from entering the roadway except at designated crossing points. The roadway appears to be adjacent to the first base side of the southern, upper softball field. A tall fence or screen will be necessary to prevent foul balls from landing in the roadway. At the north softball field, a left field home run could also enter the roadway unless appropriate fencing or screening is provided.

Construction Activities

Construction will coincide with normal school hours for instruction and activities. Because Issaquah High is in close proximity to the construction zone, special attention will need to be given to maintaining allowable noise limits and controlling particulate matter from construction activities. Noise barriers should be in place early in the construction process to ensure productive learning environments. Safety barriers must be in place at the start of construction.

The quality of life in and around Issaquah depends on both traffic solutions and quality schools. We are confident solutions to these problems can be found and we look forward to continue working with the City to assure a Final EIS and project that is mutually acceptable.

Sincerely,

Steve Crawford
Director of Capital Projects

Issaquah School District No. 411

565 NW Holly Street • Issaquah, WA 98027-2899 • Phone (425) 837-7000

Janet N. Barry, Ed. D.
Superintendent

RECEIVED
MAR 05 2004
PUBLIC WORKS ENG.

March 05, 2004

Pam Fox
Project Coordinator
City of Issaquah
P.O. Box 1307
Issaquah, WA 98027

RE: SE Bypass Alternative Routes

Dear Pam:

I have reviewed the proposed Alternative routes shown on the seven maps you provided. All proposed routes will impact district facilities along 2nd Avenue SE including, Issaquah High School, Clark Elementary School, Tiger Mountain Community High School and the Transportation Center. Issaquah Middle School is a little further away from the proposed routes and would be impacted to a lesser degree.

Routes located further to the east do not divide the high school campus and provide a greater separation distance in which to mitigate impacts. None of the existing fields can be lost without impacting school programs and/or generating Title 9 complaints or lawsuits.

Alternative 1 & 2: Both routes bisect the high school campus, separating the upper playfields from the main campus. North A passes very close to existing classrooms and eliminates the required fire lane which encircles the facility. Acces to the upper playfields would require crossing the heavily travelled roadway. The route would also eliminate an existing parking lot. These two routes would have a severe impact on the high school and are unacceptable.

Alternative 3: The North B portion of the alignment runs close to but does not cut through the high school upper playfields.The South A portion continues directly southward with the distance to the high school increasing as the route proceeds southward. This route does not overlay or conflict with the location of existing high school structures or facilities. While there are concerns regarding potential impacts to district facilities, this alignment is preferred over the other alternatives.

Alternative 4: The North B portion matches Alternative 3 but the South C portion remains closer to the high school than South A as proposed in Alternative 3. The South C alignment is less acceptable than South A.

Alternative 5: The North C route significantly impacts the upper playfield and portions of district property that are currently undeveloped. It would be necessary to relocate both ballfields that the route crosses through to maintain program and Title 9 facility requirements. One ballfield could be relocated within the remaining field area. Unfortunately the alignment crosses through the existing field and undeveloped land area in a way that does not appear to preserve enough undisturbed area to relocate the second ballfield.

Alternative 6: The North C route is the same as Alternative 5 so those comments also apply here. The South C portion of the route is less acceptable than South A as shown in Alternative 5.

Alternative 7: This No Action Alternative would result in increased traffic volumes and higher speeds on 2nd Avenue SE. The increase in traffic creates significant safety concerns for the adjacent district facilities which serve children in all grades from kindergarten through high school. Significant work would be required along 2nd Avenue SE to maintain safe and aceptable access to district facilities for pedestrians, vehicular traffic and busses. The "no action" Alternative 7 would create the need for transportation system improvements and mitigation on 2nd Avenue SE.

All proposed Alternatives, including the No Action Alternative 7, will result in impacts to district facilities. Each will require mitigation of various types and to varying degrees. My ranking of the Alternatives from 1. (severe impact) to 7. (impacting) is as follows;

1. Alternative 2
2. Alternative 1
3. Alternative 6
4. Alternative 5
5. Alternative 7
6. Alternative 4
7. Alternative 3

If you have any additional questions or require additional informmatio, please contact me.

Sincerely

Steve Crawford
Director of Capital Projects

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Section 106 Correspondence

STATE OF WASHINGTON

Office of Archaeology and Historic Preservation

1063 S. Capitol Way, Suite 106 • Olympia, Washington 98501
(Mailing Address) PO Box 48343 • Olympia, Washington 98504-8343
(360) 586-3065 Fax Number (360) 586-3067

January 18, 2005

Mr. Trevin Taylor
Environmental Engineer
Washington Department of Transportation
310 Maple Park Ave. SE
P.O. Box 47300
Olympia, Washington 98504-7300

Highways & Local Programs
RECEIVED
JAN 19 2005
OLYMPIA, WA

In future correspondence please refer to:
Log: 053003-01-FHWA
Property: City of Issaquah Southeast Bypass Cultural Resources Determination
Re: No Adverse Effect

Dear Mr. Taylor:

Thank you for contacting the Washington State Office of Archaeology and Historic Preservation (OAHP). The above referenced project has been reviewed on behalf of the State Historic Preservation Officer under provisions of Section 106 of the National Historic Preservation Act of 1966 (as amended) and 36 CFR Part 800. My review is based upon documentation contained in your communication.

I concur that the current project as proposed will have "NO ADVERSE EFFECT" on National Register eligible or listed historic and cultural resources. If additional information on the project becomes available, or if any archaeological resources are uncovered during construction, please halt work in the area of discovery and contact the appropriate Native American Tribes and OAHP for further consultation.

Thank you for the opportunity to review and comment. Should you have any questions, please contact me.

Sincerely,

Russell Holter

Russell Holter
Project Compliance Reviewer
(360) 586-3533
russellh@cted.wa.gov

Washington State Department of Transportation
Douglas B. MacDonald
Secretary of Transportation

Transportation Building
310 Maple Park Avenue S.E.
P.O. Box 47300
Olympia, WA 98504-7300

360-705-7000
TTY: 1-800-833-6388
www.wsdot.wa.gov

May 8, 2003

RECEIVED
MAY 1 2 2003
LOCAL PROGRAMS

Dr. Allyson Brooks
Office of Archaeology and Historic Preservation
P.O. Box 48343
Olympia, WA 98504-8343

City of Issaquah
Southeast Issaquah Bypass
Cultural Resources Determination
(Fed Aid # Unassigned)
OAHP Log # 061598-12-FHWA
OAHP Log # 031898-01-FHWA

Dear Dr. Brooks:

The City of Issaquah is proposing to construct a new principal arterial in the eastern portion of the City of Issaquah, Washington. Work will include major construction and ground disturbance over a wide geographic area.

Pursuant to compliance with Section 106 of the National Historic Preservation Act and 36 CFR 800, we are continuing consultation for the above referenced project. Our records show that Northwest Archaeological Associates, Inc., on behalf of the city, contacted your office in 1998 and 1999 regarding the Determination of Eligibility for various structures potentially impacted by the proposed project. Your office responded on June 15, 1998 and again on February 12, 1999 on the DOEs. During project development the city had a Cultural Resource Survey prepared for the project by Northwest Archaeological Associates, Inc., dated August 26, 1998. This report was included in the June 2000 Draft Environmental Impact Statement (DEIS) and subsequently amended on January 10, 2003 to reflect changes in project alternatives. Our Cultural Resource Specialist has reviewed the January 2003 report and concurred with its findings.

It has come to our attention that although the Area of Potential Effect (APE) for this undertaking was presented to the Yakama Nation, Muckleshoot, Tulalip, and Snoqualmie tribes on January 15, 1997 for comment, it was not sent to the OAHP. Furthermore, subsequent to the above referenced coordination and in response to public input on the DEIS, the alternatives were changed. The South A alignment was modified and a new South C alignment was proposed. As of this date, we have received no correspondence from these tribes on cultural resources issues. Since the initial consultation outlined a fairly large geographic area there is no change in the APE as presented to the tribes. However, because of the length of time since they were contacted we are sending them the most recent information and inviting them to comment.

At this time we are submitting the January 2003 report for your review and comment. We would also appreciate your evaluation of the project's APE, which we have defined as being the footprint of the six alignments and the adjacent properties as shown in the report. Once the public involvement process has been completed and a Record of Decision (ROD) with the preferred alternative has been issued, WSDOT will submit its determination of effect to the OAHP for concurrence.

We request an expedited review if possible. Please contact me at (360) 705-6975, if you have any questions.

Sincerely,

Candace L. Jochim

Candace L. Jochim
Environmental Engineer
Highways & Local Programs Division

CLJ:ac
Enclosures

cc: Dave Scott, Northwest Region Local Programs, MS NB82-121
Elizabeth Healy, FHWA, MS 40943
Sandie Turner, WSDOT EAO Cultural Affairs, MS 47332

Washington State Department of Transportation
Douglas B. MacDonald
Secretary of Transportation

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TTY: 1-800-833-6388
www.wsdot.wa.gov

May 8, 2003

The Honorable Joseph O. Mullen
Chairman
Snoqualmie Tribe
PO Box 670
Fall City, WA 98024

RECEIVED
MAY 1 2 2003
LOCAL PROGRAMS

City of Issaquah
Southeast Issaquah Bypass
Cultural Resources Determination

Dear Chairman Mullen and Council Members:

The City of Issaquah is proposing to construct a new principal arterial in the eastern portion of the City of Issaquah, Washington. Work will include major construction and ground disturbance over a wide geographic area.

Pursuant to compliance with Section 106 of the National Historic Preservation Act and 36 CFR 800, we are continuing consultation for this project. Our records show that Northwest Archaeological Associates, Inc., on behalf of the City of Issaquah, contacted the Snoqualmie Tribe on January 15, 1997 and again on October 19, 1999 regarding this project. A Cultural Resource Survey was prepared for the project by Northwest Archaeological Associates, Inc. and included in the June 2000 Draft Environmental Impact Statement (DEIS) which was sent to the Tribe for review. The report was amended on January 10, 2003 to reflect subsequent changes in project alternatives.

The Area of Potential Effect (APE) for this undertaking, as presented to the Tribe in 1997, outlined a fairly large geographic area. Although there has been some modification to the alternatives since that time (the South "A" alignment was modified and a new South "C" alignment was proposed) the general APE has not changed. At this time the APE is more specifically defined as being the footprint of the six alignments and the adjacent properties as shown on the maps included in the report. Because of the length of time since the Tribe was last contacted, we are sending you a copy of the most recent cultural resources report and inviting you to comment.

The actual project impacts cannot be determined until the public involvement process has been completed and a Record of Decision (ROD) with the preferred alternative has been issued. At that time WSDOT will submit its determination of effect to the OAHP for concurrence.

Your response to this letter acknowledging your interest in participating in this undertaking as a consulting party would be greatly appreciated. In order to complete the project development process in a timely manner, we request that you provide a response by June 6, 2003 identifying any Traditional Cultural Properties or other issues of concern. A request for review of the January 2003 report was also sent to the Office of Archaeology and Historic Preservation on May 8, 2003.

If you have any questions, please contact me at (360) 705-6975.

Sincerely,

Candace L. Jochim

Candace L. Jochim
Environmental Engineer
Highways & Local Programs Division

CLJ:ac
Enclosure
cc: Dave Scott, NW Region Local Programs, MS NB82-121
Elizabeth Healy, FHWA, MS 40943

Washington State Department of Transportation
Douglas B. MacDonald
Secretary of Transportation

Transportation Building
310 Maple Park Avenue S.E.
P.O. Box 47300
Olympia, WA 98504-7300

360-705-7000
TTY: 1-800-833-6388
www.wsdot.wa.gov

May 8, 2003

RECEIVED
MAY 1 2 2003
LOCAL PROGRAMS

Hank Gobin
Manager Cultural Resources
Tulalip Tribes
6700 Totem Beach Road
Marysville, WA 98270-9694

City of Issaquah
Southeast Issaquah Bypass
Cultural Resources Determination

Dear Mr. Gobin:

The City of Issaquah is proposing to construct a new principal arterial in the eastern portion of the City of Issaquah, Washington. Work will include major construction and ground disturbance over a wide geographic area.

Pursuant to compliance with Section 106 of the National Historic Preservation Act and 36 CFR 800, we are continuing consultation for this project. Our records show that Northwest Archaeological Associates, Inc., on behalf of the City of Issaquah, contacted the Tulalip Tribes on January 15, 1997 and again on October 19, 1999 regarding this project. A Cultural Resource Survey was prepared for the project by Northwest Archaeological Associates, Inc. and included in the June 2000 Draft Environmental Impact Statement (DEIS) which was sent to the Tribe for review. The report was amended on January 10, 2003 to reflect subsequent changes in project alternatives.

The Area of Potential Effect (APE) for this undertaking, as presented to the Tribe in 1997, outlined a fairly large geographic area. Although there has been some modification to the alternatives since that time (the South "A" alignment was modified and a new South "C" alignment was proposed) the general APE has not changed. At this time the APE is more specifically defined as being the footprint of the six alignments and the adjacent properties as shown on the maps included in the report. Because of the length of time since the Tribe was last contacted, we are sending you maps of the current alternatives for your review and comment. Please advise us if you would like a copy of the most recent cultural resources report.

The actual project impacts cannot be determined until the public involvement process has been completed and a Record of Decision (ROD) with the preferred alternative has been issued. At that time WSDOT will submit its determination of effect to the OAHP for concurrence.

Your response to this letter acknowledging your interest in participating in this undertaking as a consulting party would be greatly appreciated. In order to complete the project development process in a timely manner, we request that you provide a response by June 6, 2003 identifying any Traditional Cultural Properties or other issues of concern. A request for review of the January 2003 report was also sent to the Office of Archaeology and Historic Preservation on May 8, 2003.

If you have any questions, please contact me at (360) 705-6975.

Sincerely,

Candace L. Jochim

Candace L. Jochim
Environmental Engineer
Highways & Local Programs Division

CLJ:ac
Enclosure

cc: Dave Scott, NW Region Local Programs, MS NB82-121
Elizabeth Healy, FHWA, MS 40943
Sandie Turner, WSDOT EAO Cultural Affairs, MS 47332

THE TULALIP TRIBES

Cultural Resources Department
x̌alal?tx̌
6410 - 23rd Avenue N.E.
Tulalip, WA 98271-9694
(360) 651-3300
FAX (360) 651-3312

The Tulalip Tribes are the successors in interest to the Snohomish, Snoqualmie, and Skykomish tribes and other tribes and band signatory to the Treaty of Point Elliott

RECEIVED
MAY 2 0 2003
LOCAL PROGRAMS

May 13, 2003

Ms. Candace L Jochim
Environmental Engineer
Highways & Local Program Division
310 Maple Park Avenue S.E.
Olympia, WA 98504-7300

RECEIVED
MAY 1 4 2003
OLYMPIA, WA

Dear Ms. Jochim:

This is in response to your letter dated May 8, 2003 on your proposed constuction of a new principal arterial in the eastern portion of the City of Issaquah, Washington.

You will find our standard SOP's below concerning cultural sights.

Also any reports of cultural accesments that have been done we would like to havew a copy for our files and review.

1. Cultural Resources Office will be the point of contact for this project.

2. We would ask that before any major construction be done at the project site:

   That you do a cultural and archaeological assessment before any work begins no matter how big or small the project.

3. Whatever is being proposed that it does not adversely effect the natural resources in that area such as: timber, floral, faunas, i.e., adjacent to rivers and streams.

4. Ethno botany, i.e., plants indigenous to the Puget Sound (pre-contact). We would like to see more time given to identifying

indigenous plants @ project sites. To begin developing a profile of what types of plants that are still in existence that was indigenous to the environment, and after construction that any replanting is done with indigenous plants of the area.

5. To protect our water resources and fisheries.

6. That you only contact tribal representatives that are federally recognized, and that representatives have tribal jurisdiction in the area of your work project.

These SOP's should serve as our basic concerns when it comes to buildings and development projects in Snohomish, King and Island County.

We appreciate the opportunity of working with you on this project. This office would like to do periodic site visitations as the project progresses. Thank you for contacting our office.

Sincerely yours,

Hank Gobin

Hank Gobin,

Cultural Resources Manager

Washington State
Department of Transportation
Douglas B. MacDonald
Secretary of Transportation

Transportation Building
310 Maple Park Avenue S.E.
P.O. Box 47300
Olympia, WA 98504-7300

360-705-7000
TTY: 1-800-833-6388
www.wsdot.wa.gov

May 19, 2003

RECEIVED
MAY 20 2003
LOCAL PROGRAMS

Hank Gobin
Cultural Resources Manager
The Tulalip Tribes
6410 23rd Ave. NE
Tulalip, WA 98271-9694

City of Issaquah
Southeast Issaquah Bypass
Cultural Resources Report

Dear Mr. Gobin:

Thank you for your response to our May 8th letter requesting the Tulalip Tribe's participation as a consulting party in this undertaking. As requested, we are forwarding a copy of the Cultural Resources Technical Report prepared by Northwest Archaeological Associates, Inc. for your review and files. We look forward to receiving any comments you may have. In order to complete the project development process in a timely manner, we request that you provide a response by June 20, 2003 identifying any Traditional Cultural Properties or other issues of concern.

If you have any questions, please contact me at (360) 705-6975.

Sincerely,

Candace L. Jochim

Candace L. Jochim
Environmental Engineer
Highways & Local Programs Division

CLJ:ac
Enclosure

cc: Dave Scott, NW Region Local Programs, MS NB82-121
Elizabeth Healy, FHWA, MS 40943
Sandie Turner, WSDOT EAO Cultural Affairs, MS 47332

ISQ BYPASS

STATE OF WASHINGTON

OFFICE OF COMMUNITY DEVELOPMENT
OFFICE OF ARCHAEOLOGY & HISTORIC PRESERVATION

1063 S. Capitol Way, Suite 106 • Olympia, Washington 98501
(Mailing Address) PO Box 48343 • Olympia, Washington 98504-8343
Phone (360) 586-3065 FAX (360) 586-3067 Web Site: www.oahp.wa.gov

RECEIVED
JUN 03 2003
LOCAL PROGRAMS

May 30, 2003

Ms. Candace L. Jochim
Highways & Local Programs Division
Washington State Department of Transportation
P.O. Box 47300
Olympia, Washington 98504-7300

RECEIVED
JUN 2 2003
OLYMPIA, WA

In future correspondence please refer to:
Log: 053003-01-FHWA
Property: City of Issaquah Southeast Bypass Cultural Resources Determination
Re: Area of Potential Effect and Determination of Eligibility for the National Register of Historic Places

Dear Ms. Jochim:

Thank you for contacting the Washington State Office of Archaeology and Historic Preservation (OAHP). The above referenced property has been reviewed on behalf of the State Historic Preservation Officer under provisions of Section 106 of the National Historic Preservation Act of 1966 (as amended) and 36 CFR Part 800. My review is based upon documentation contained in your communication.

In response, I concur with your determination of the revised Area of Potential Effect (APE) for this project, recognizing that new alternatives have been evaluated since our last communication on this project. I also concur that the Campbell House at 24410 SE 103rd Street in Issaquah is ELIGIBLE for the National Register of Historic Places under criterion C as a good and intact example of early 20th century vernacular residential architecture. It is also potentially eligible under criterion A for its association with the Campbell family, early inhabitants of the Issaquah area and with close ties to it's resource based industries. As you are aware, the Issaquah Sportsmen's Club is already listed in the National Register (see OAHP Log 061598-12-FHWA) as well as designated a King County Landmark. The White Swan Inn has previously been determined eligible for the National Register (see OAHP Log 031898-01-FHWA).

In view of the presence of National Register listed and eligible resources within the APE, I recommend that the selected Bypass alternative avoid adverse effects to these properties. I am particularly concerned about effects upon the Sportmen's Club, its setting, and the building's spatial relationship with the range. If adverse effects cannot be avoided, I recommend that a memorandum of agreement (MOA) be executed between the SHPO, FHWA, and interested members of the public. The MOA should identify specific measures to help mitigate the adverse effects of the action on National Register listed or eligible resources.

Ms. Candace L. Jochim
May 30, 2003
Page Two

We would also appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36 CFR 800.4(a)(4).

Thank you for the opportunity to review and comment. Should you have any questions please feel free to contact me at 586-3073 or gregg@cted.wa.gov.

Sincerely,

Greg Griffith

Gregory Griffith
Deputy State Historic Preservation Officer

Cc: Eric Erickson
Julie Koler

STATE OF WASHINGTON
DEPARTMENT OF COMMUNITY, TRADE AND ECONOMIC 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, 1999

Ms. Lorelei Hudson
Northwest Archaeological Associates
5416 1/2 20th Avenue NW
Seattle, Washington 98107

In future correspondence please refer to:
Log: 031898-01-FHWA
Re: Southeast Issaquah Bypass, Site 17-66 Determination of Eligibility

Dear Ms. Hudson:

Thank you for contacting the Washington State Office of Archaeology and Historic Preservation (OAHP) regarding the above referenced property in Issaquah. From your letter, I understand that Site 17-66 is within the area of potential effect of the proposed Southeast Issaquah Bypass.

In response, I concur with your determination that this site is not eligible for listing in the National Register of Historic Places. Although over fifty years in age, the site does not exhibit significant associations meeting National Register criteria. As a result of concurrence, further contact with OAHP about the effects of the bypass on this site is not necessary. However, should additional information come to light or should ground disturbance reveal archaeological resources, it is recommended that consultation should be resumed.

Thank you for the opportunity to review and comment. Should you have any questions, please feel free to contact me at 360-407-0766.

Sincerely,

Greg Griffith

Gregory Griffith
Comprehensive Planning Specialist

GAG

Cc: Sandie Turner

RECEIVED
MAR 2 7 1998
Archaeology &
Historic Preservation

Please indicate your concurrence in these determinations by signing and returning one copy of the form to my office.

The last recorded site, **19-51 The White Swan Inn** was determined eligible under Criterion A . (Received your concurrence March 20, 1998).

If you need further information, please call me at 705-7493.

Sincerely,

Sandie Turner

SANDIE TURNER
Cultural Resources / Contracts Manager

Concur: Gregory Griffith for Acting State Historic Preservation Officer 4/2/98 Date

Enclosures
cc: Dean Torkko, NW Region

RECEIVED

MAR 2 7 98

Archaeology & Historic Preservation

Washington State Department of Transportation

Sid Morrison
Secretary of Transportation

Transportation Building
P.O. Box 47300
Olympia, WA 98504-7300

March 26, 1998

Mr. David Hansen
Acting State Historic Preservation Officer
Office of Archaeology and Historic Preservation
MS-8343
Olympia, Washington 98504-8343

RE: King County, SR 90 Sunset I/C
South Sammamish Plateau Access Rd
DETERMINATION OF ELIGIBILITY

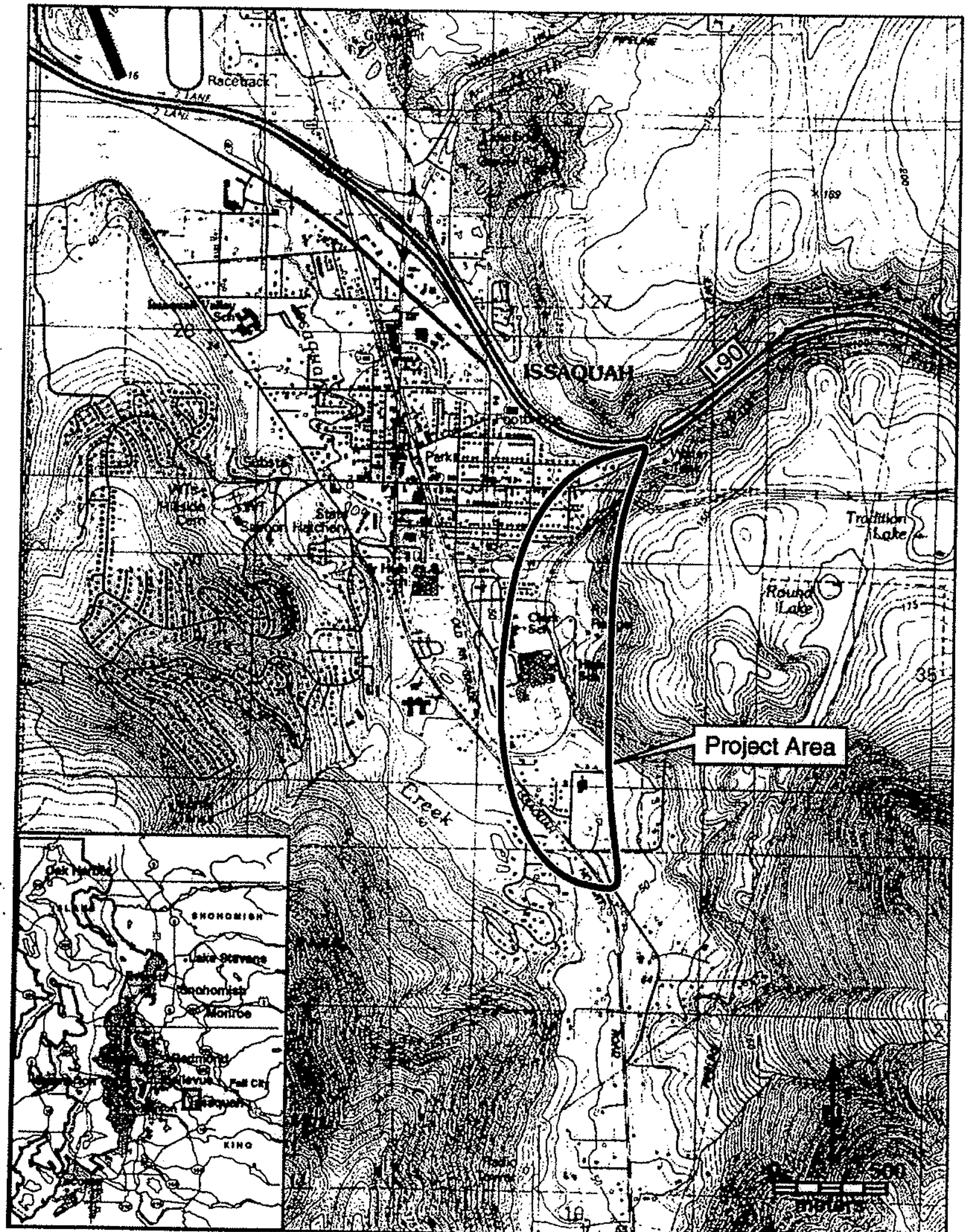
Dear Mr. Hansen:

In accordance with the provisions of 36 CFR 800, we are continuing coordination for the project identified above. Enclosed is the Final Historical, Archaeological and Cultural Resources Technical Report. Based on the enclosed report and previous reports, we are seeking your concurrence that the following sites do not appear eligible for listing on the National Register of Historic Places (NRHP):

Site 45-KI-451 is a segment of railroad grade which is now part of the High Point trail between High Point and Issaquah. It was constructed in 1888. The railroad tracks and ties, as well as the trestle, have been removed. Other segments of the railroad have been recommended as eligible and in some cases nominated to the NRHP in the past, and none have been determined eligible.

Site 45-KI-452 consist of three features located on the lower north slope of Tiger Mountain south of I-90. These structures represent remains of the historic Gilman Water System which began in 1893. Due to incompleteness, the structures remaining are not representative of the entire water system which included a round water tank and other structures now removed. Owing to this incompleteness, it is unlikely that the site would be considered eligible for listing on the NRHP.

Site 45-KI-453 is a foundation located on a bench above the right bank of the East Fork Issaquah Creek and below the railroad grade. It was built in 1955, razed in 1968 during expansion of the freeway. Because the house is less than 50 years old, has no outstanding features or historical significance, and no longer retains integrity, it is not considered eligible for NRHP.



Southeast Issaquah Bypass project area (USGS Bellevue South, WA, 7.5' x15' Quad., 1983, metric.)

Northwest Archaeological Associates, Inc.
Cultural Resources Management Services
5416½ 20th Avenue NW Seattle, WA 98107
Tel: (206) 781-1909 Fax: (206) 781-0154 Email: nwarch@jetcity.com

October 19, 1999

Chairman John Daniels, Jr.
Muckleshoot Tribal Council
39015 172nd Avenue SE
Auburn, WA 98002

Re: Southeast Issaquah Bypass

Dear Chairman Daniels and Councilmembers,

In January 1997, Northwest Archaeological Associates, Inc. (NWAA) contacted the Muckleshoot Tribe about the Southeast Issaquah Bypass project and our task of conducting the cultural resources investigations. At that time we explained that NWAA was retained by Parsons Brinckerhoff, on behalf of the City of Issaquah, to carry out this study, as well as two related projects: the South Sammamish Plateau Access Road and Sunset Interchange Modifications (South SPAR) and the North Sammamish Plateau Access Road (North SPAR). Each of these projects is in a different phase of the National Environmental Policy Act (NEPA) and/or State Environmental Policy Act (SEPA) process. The SE Issaquah Bypass technical reports were completed last fall and are currently being updated, while the draft environmental impact statement is scheduled for completion by the spring of 2000.

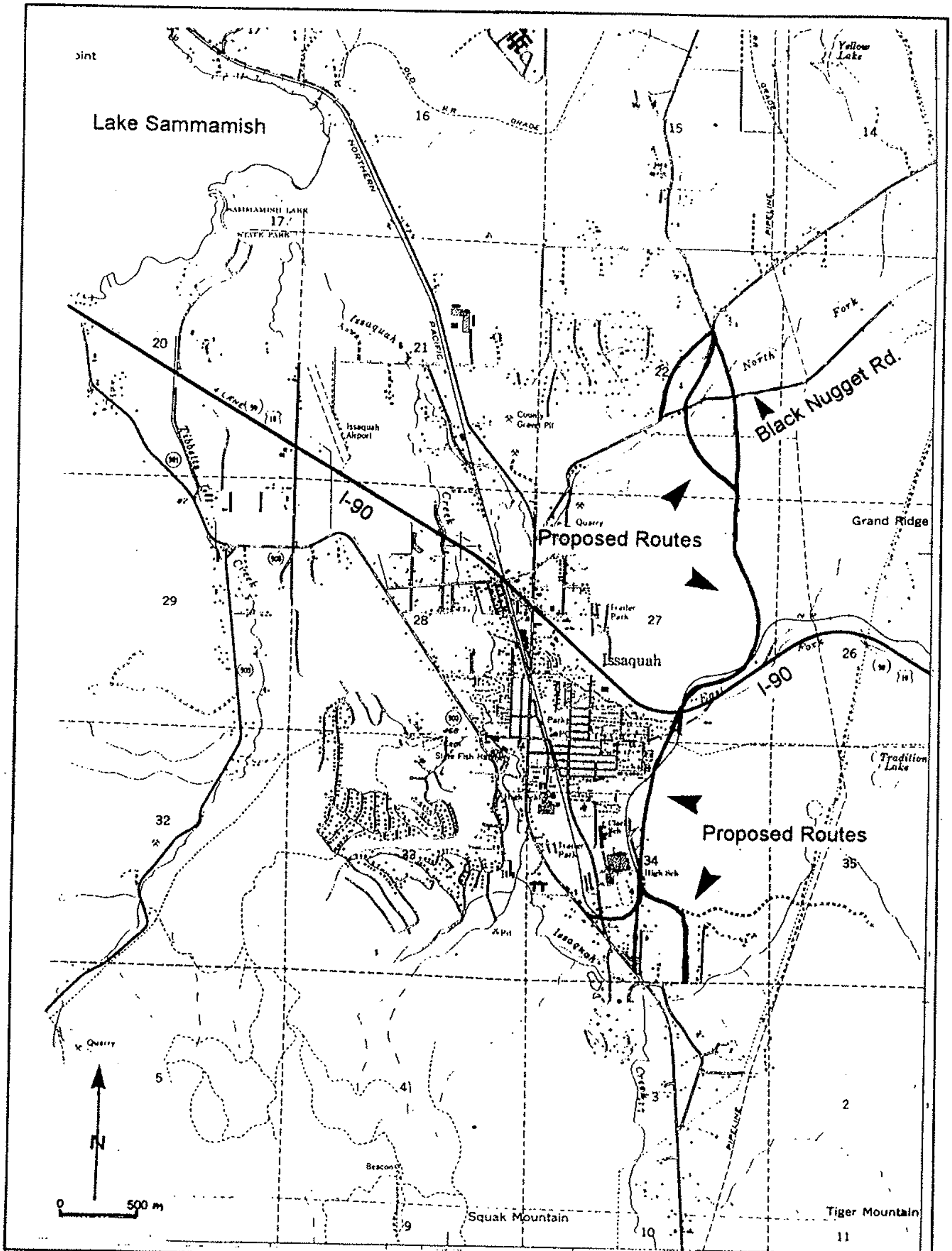
For your information, records at the Washington Office of Archaeology and Historic Preservation (OAHP) showed no archaeological sites for the SE Issaquah Bypass, although two historic properties, the Issaquah Sportsman's Clubhouse and White Swan Inn are within the project area. NWAA recorded two additional historical archaeological sites along the SE Issaquah Bypass; a segment of the Seattle Lake Shore and Eastern Railroad grade 45-KI-41 and two concrete foundations associated with non-Native American settlement, site number 17-66.

NWAA's work on the SE Issaquah Bypass continues as the city council considers the impacts of the proposed alternatives and decides on a preferred route. Please take this time to review the attached map and let me know if there are locations of concerns or importance to the Muckleshoot people that may be affected by this project. If you have questions, please contact me. Thank you for your attention to this matter and I look forward to hearing from you.

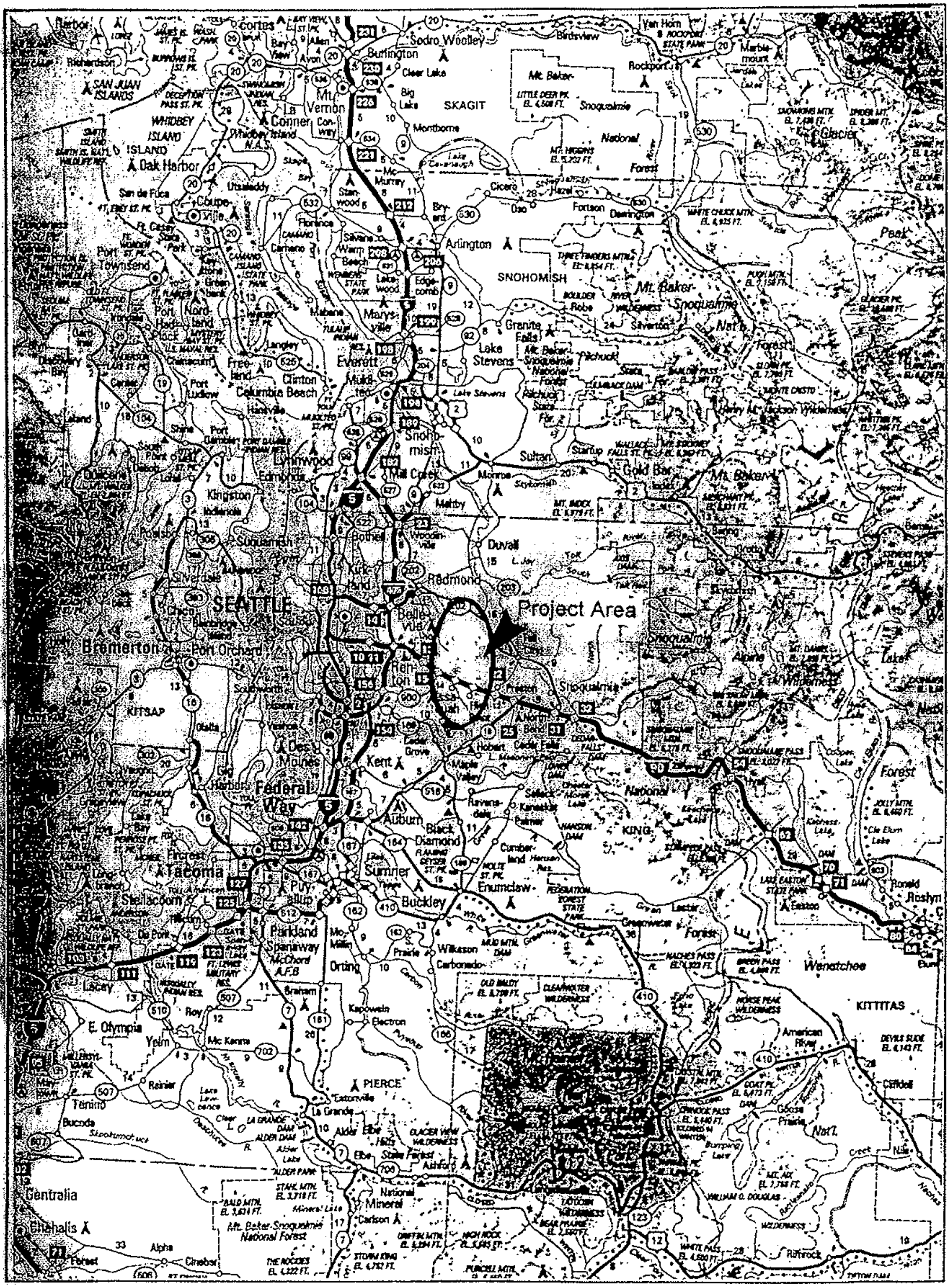
Sincerely,

Lorelea Hudson
Senior Archaeologist

cc: Walter Pacheco



SPAR Project Area (USGS 7.5' Issaquah, WA., 1950)



SPAR Project Vicinity

NORTHWEST ARCHAEOLOGICAL ASSOCIATES, INC.

5416½ 20th Avenue NW
Seattle, WA 98107
Phone: 206 781-1909/FAX: 206 781-0154

Tribal Council
Snoqualmie Tribe
P.O. Box 280
Carnation, WA. 98014-0280

January 15, 1997

Northwest Archaeological Associates has been retained by Parsons Brinckerhoff to perform a cultural resources study as part of an Environmental Impact Statement for the proposed North SPAR (Sammamish Plateau Access Road), South SPAR and I-90 Sunset Interchange, and Southeast Bypass road improvement project near Issaquah (see attached map). The project area is less than one mile from a portion of a cross-Cascades trail over Snoqualmie Pass that was regularly used by the Snoqualmie and other Puget Sound American Indian groups. At a public meeting for the project held last year, Joseph Mullen, a Snoqualmie tribal member, stated that there are or were American Indian burials on Grand Ridge in the vicinity of Black Nugget Road. If you have any information on this or if there are other areas of importance to the Snoqualmie people in or near the project area, please let us know so that they can be considered in the planning of the project. If you have any questions, please contact me or Lorelea Hudson at the number above. Thank you for your attention to this matter.

Meg Nelson

Meg Nelson
Senior Archaeologist

cc: Andy de los Angeles, tribal chairman

Appendices

Appendix A	*Principal Contributors*
Appendix B	*Studies Performed*
Appendix C	*Distribution List*

Appendix A

Principal Contributors

Appendix A: Principal Contributors

Name and Title Participation	Education	Professional Discipline	Professional Experience
FHWA			
Jim Leonard, P.E.	M.P.A.	Public Administration	43 years with FHWA
WSDOT			
Ernie Combs EIS Coordination and Review		Environmental Policy Specialist	25 years with WSDOT
Parsons Brinckerhoff Quade and Douglas, Inc.			
Jan Aarts Senior Quality Control/Assurance, Purpose and Need, Alternatives, Recreation, Section 4 (f)	M.U.P.	Environmental Planning	23 years
Tara Ballentine Cok FEIS Coordination, Response to Comments	M.U.P.	Environmental Planning	3 years
Anjali Bhagat Transportation	M.S.C.E.	Transportation Planning	10 years
Jeff Buckland, AICP EIS Management, Land Use, Social Elements, Displacement and Relocation, Economic Elements, Visual Quality, Regional and Community Growth, Environmental Justice	M.R.P.	Environmental Planning	18 years
Ginette Lalonde Air Quality, Noise, Energy	B.S.C.E.	Environmental Engineering	7 years
Bill Lider, P.E. Floodplains, Preliminary Design	B.S.C.E	Civil Engineering	27 years
Tony Lo, P.E. Traffic Analysis	M.S.C.E.	Transportation Planning	11 years
Nicola Longo Traffic Analysis	M.S.C.E.	Transportation Planning	7 years
Randall Roberts, P.E. Preliminary Design, Alternatives	B.S.C.E.	Civil Engineering	21 years

Name and Title Participation	Education	Professional Discipline	Professional Experience
Patrick Romero Hazardous Materials	M.S.E.P.	Environmental Engineering	9 years
Andrea Rose Technical Editor	B.A.	Linguistics	15 years
Lawrence Spurgeon Air Quality and Noise	M.S.E.	Environmental Engineering	12 years
Herrera Environmental Consultants, Inc.			
Kathleen Adams Vegetation and Wildlife	M.S.	Natural Resources	12 years
Mark Ewbank, P.E. Hydrologic Systems and Water Quality	M.S.	Civil / Environmental Engineering	20 years
Kris Lepine Wetlands	B.S.	Environmental Science	9 years
Darcey Miller Wetlands, Fisheries, Threatened and Endangered Species	B.S.	Environmental Science	6 years
Walter Trial Wetlands, Hydrologic Systems, Threatened and Endangered Species, Water Quality, Fisheries, Vegetation and Wildlife	PhD	Civil Engineering	33 years
Northwest Archaeological Associates, Inc.			
Lorelea Hudson Historic and Cultural Elements	M.A.	Anthropology	33 years
Icicle Creek Engineers, Inc.			
Brian Beaman Geology, Soils, and Hazardous Materials	M.S.	Geological Engineering	22 years
Kathy Killman Geology, Soils, and Hazardous Materials	M.S.	Geology	21 years

Appendix B

Studies Performed

Appendix B: Studies Performed

Studies and technical reports completed during the planning and preliminary design of this project contain additional information that supports the conclusions presented in this Final EIS. These technical studies are available for review at the following location:

City of Issaquah
Department of Public Works
1775 12th Avenue NE
Issaquah, Washington 98027
Telephone (425) 837-3405

Technical Reports

Air Quality Technical Memorandum, Parsons Brinckerhoff, 2000

Air Quality Technical Report, Parsons Brinckerhoff, 1998

Air Quality Technical Report, Parsons Brinckerhoff, 2003

Biological Assessment Technical Report, Herrera Environmental Consultants, 1998

Biological Assessment Technical Report, Mason, Bruce, and Girard, 2003

Biological Resources (Wildlife and Vegetation) Technical Memorandum, Herrera Environmental Consultants, 2000

Biological Resources (Wildlife and Vegetation) Technical Report, Herrera Environmental Consultants, 1998

Displacements and Relocations Technical Memorandum, Parsons Brinckerhoff, 2000

Displacements and Relocations Technical Report, Parsons Brinckerhoff, 1998

Earth Technical Memorandum, Icicle Creek Engineers, 2000

Earth Technical Report, Icicle Creek Engineers, 1998

Economics Technical Memorandum, Parsons Brinckerhoff, 2000

Economics Technical Report, Parsons Brinckerhoff, 1998

Floodplains Technical Memorandum, Parsons Brinckerhoff, 2000

Floodplains Technical Report, Parsons Brinckerhoff, 1998

Hazardous Materials Technical Memorandum, Icicle Creek Engineers, 2000

Hazardous Materials Technical Report, Icicle Creek Engineers, 1998

Historic, Cultural, and Archaeological Resources Technical Memorandum, Northwest Archaeological Associates, 2000

Historic, Cultural, and Archaeological Resources Technical Memorandum, Northwest Archaeological Associates, 2003

Historic, Cultural, and Archaeological Resources Technical Report, Northwest Archaeological Associates, 1998

Initial Wetlands Mitigation Plan, Herrera Environmental Consultants, 2003

Land Use Technical Memorandum, Parsons Brinckerhoff, 2000

Land Use Technical Report, Shapiro and Associates, 1998

Noise Technical Memorandum, Parsons Brinckerhoff, 2000

Noise Technical Report, Shapiro and Associates, 1998

Noise Technical Report, Parsons Brinckerhoff, 2003

Social Elements Technical Memorandum, Parsons Brinckerhoff, 2000

Social Elements Technical Report, Parsons Brinckerhoff, 1998

Streams and Fisheries Technical Memorandum, Herrera Environmental Consultants, 2000

Streams and Fisheries Technical Report, Herrera Environmental Consultants, 1998

Transportation Technical Memorandum, Parsons Brinckerhoff, 2000

Transportation Technical Report, Parsons Brinckerhoff, 1998

Transportation Technical Report, Parsons Brinckerhoff, 2003

Water Quality Supplemental Technical Analysis, Herrera Environmental Consultants, 2003

Water Quality Technical Memorandum, Herrera Environmental Consultants, 2000

Water Quality Technical Report, Herrera Environmental Consultants, 1998

Waterways and Hydrological Systems Technical Memorandum, Herrera Environmental Consultants, 2000

Waterways and Hydrological Systems Technical Report, Herrera Environmental Consultants, 1998

Wetlands Technical Memorandum, Herrera Environmental Consultants, 2000

Wetlands Technical Report, Herrera Environmental Consultants, 1998

Appendix C

Distribution List

Appendix C: Final EIS Distribution List

Federal Agencies

Council on Environmental Quality
U.S. Army Corps of Engineers
U.S. Bureau of Indian Affairs
U.S. Department of Commerce
U.S. Department of Health Services
U.S. Department of Interior
U.S. Environmental Protection Agency
U.S. Federal Emergency Management Agency
U.S. Federal Highway Administration
U.S. Fish and Wildlife Service
U.S. National Marine Fisheries Service
U.S. Natural Resource Conservation Service

State of Washington Agencies

Washington State Department of Agriculture
Washington State Department of Community Trade and Economic Development
Washington State Department of Ecology
Washington State Department of Fish and Wildlife
Washington State Department of Health (Division of Drinking Water)
Washington State Department of Natural Resources
Washington State Department of Transportation
Washington State Energy Office
Washington State Governor's Office of Indian Affairs
Washington State Office of Archaeology and Historic Preservation
Washington State Parks and Recreation Commission
Washington State Interagency Committee for Outdoor Recreation (IAC)
Washington State Patrol
Washington State Utilities and Transportation Commission

Regional Agencies

Central Puget Sound Regional Transit Authority
Northwest Indian Fisheries Commission
Puget Sound Clean Air Agency
Puget Sound Regional Council
Puget Sound Water Quality Authority
Squak, Cougar, and Tiger Mountains Interagency Committee

Local Agencies

King County Department of Transportation
King County Historic Preservation Program
Issaquah School District

Utilities

Eastside Fire and Rescue
Sammamish Plateau Water and Sewer District
Puget Sound Energy
Qwest Communications
AT & T Broadband
TCI Cablevision

Native American Tribes

Duwamish Tribe
Muckleshoot Tribe
Snoqualmie Tribe
Tulalip Tribe

Libraries

Bellevue Regional Library
Issaquah Library
Sammamish Library

News Media

Eastside Journal
Issaquah Press
Seattle Post Intelligencer
The Seattle Times

Organizations

Church of Jesus Christ of Latter-Day Saints
First Church of Christ Scientist
Issaquah Alps Trails Club
Issaquah Chamber of Commerce
Issaquah Rivers and Streams Board
Issaquah Sportsmen's Club
Issaquah Valley Water Association
Main Street Issaquah
Mountains to Sound Greenway
Save Lake Sammamish
Concerned Residents About the Bypass
Issaquah Environmental Council
SE Issaquah Neighborhood Alliance

Businesses

Park Pointe Development Company
Port Blakely Communities

Bibliography

Bibliography

Bagley, Clarence B., 1929. *History of King County, Washington.* S.J. Clarke, Chicago, Illinois and Seattle, Washington.

Beaman, B., October 1, 2003. Personal communication (teleconference with the Southeast Issaquah Bypass Project EIS team). Icicle Creek Engineers, Inc. Issaquah, Washington.

Berge, H.B. and K. Higgins, 2003. *The Current Status of Kokanee in the Greater Lake Washington Watershed*. King County Department of Natural Resources and Parks, Water and Land Resources Division, Seattle, Washington.

Booth, D.B. and Minard, J.P., 1992*. Geologic Map of the Issaquah 7.5' Quadrangle, King County, Washington.* U.S. Geological Survey Miscellaneous Field Studies Map MF-2206.

Booth, D.B., 1990. *Surficial Geology of the Skykomish and Snoqualmie River areas, King and Snohomish Counties, Washington.* U.S. Geological Survey, Map I-1745.

Cooke, S., 2000. Wetland and *Buffer Functions Semi-Quantitative Assessment Methodology*, Final Draft User's Manual. Cooke Scientific Services, Seattle, Washington.

Cooke, S., 1996. *Wetland and Buffer Functions Semi-Quantitative Assessment Methodology*, *Draft User's Manual*. Cooke Scientific Services, Seattle, Washington.

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