Appendix C

Alternative Analysis Reports and Scoping Summary

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June 2013

FEDERAL WAY TRANSIT EXTENSION

Level 1 Alternatives Screening Report

SOUNDTRANSIT

CENTRAL PUGET SOUND
REGIONAL TRANSIT AUTHORITY

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Acronyms

AA	Alternatives Analysis
ACS	American Community Survey
BAT	Business Access Transit
BRT	Bus Rapid Transit
BMPs	Best Management Practices
CFR	Code of Federal Regulations
CTP	Comprehensive Transportation Plan
EDR	Environmental Data Resource
EIS	Environmental Impact Statement
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FWTC	Federal Way Transit Center
FWTE	Federal Way Transit Extension
GMA	Growth Management Act
HCC	Highline Community College
HCT	High Capacity Transit
HOV	High Occupancy Vehicle
KCM	King County Metro
LOS	Level of Service
LRT	Light Rail Transit
LWCF	Land and Water Conservation Fund
MAP-21	Moving Ahead for Progress in the 21st Century
MPH	Miles Per Hour
MPO	Metropolitan Planning Organization
NEPA	National Environmental Policy Act
O&M	Operation and Maintenance
OCS	Overhead Catenary System
P&R	Park and Ride
PSE	Puget Sound Energy
PSRC	Puget Sound Regional Council
RCW	Revised Code of Washington
SCC	Standard Cost Categories
SEPA	State Environmental Policy Act
ST	Sound Transit
ST2	Sound Transit 2 Plan

TOD	Transit Oriented Development
TSP	Transit Signal Priority
TSM	Transit System Management
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation

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1.0 Executive Summary

1.1 Purpose of this Report

Sound Transit (ST) and the Federal Transit Administration (FTA) are conducting an alternatives analysis to start the public planning and environmental processes for the Federal Way Transit Extension (FWTE) in South King County in the metropolitan Puget Sound region. The proposed project is part of the Sound Transit 2 (ST2) Plan approved by voters in 2008. It would start at the regional light rail system at the future Angle Lake Station in the City of SeaTac at S. 200th Street. **Exhibit 1-1** shows where the FWTE is located. The FWTE is an element of the region's Metropolitan Transportation Plan (the Puget Sound Regional Council's (PSRC) Transportation 2040), and Sound Transit's Long-Range Transit Plan. These plans anticipate the eventual extension of high capacity transit (HCT) service south to Tacoma.

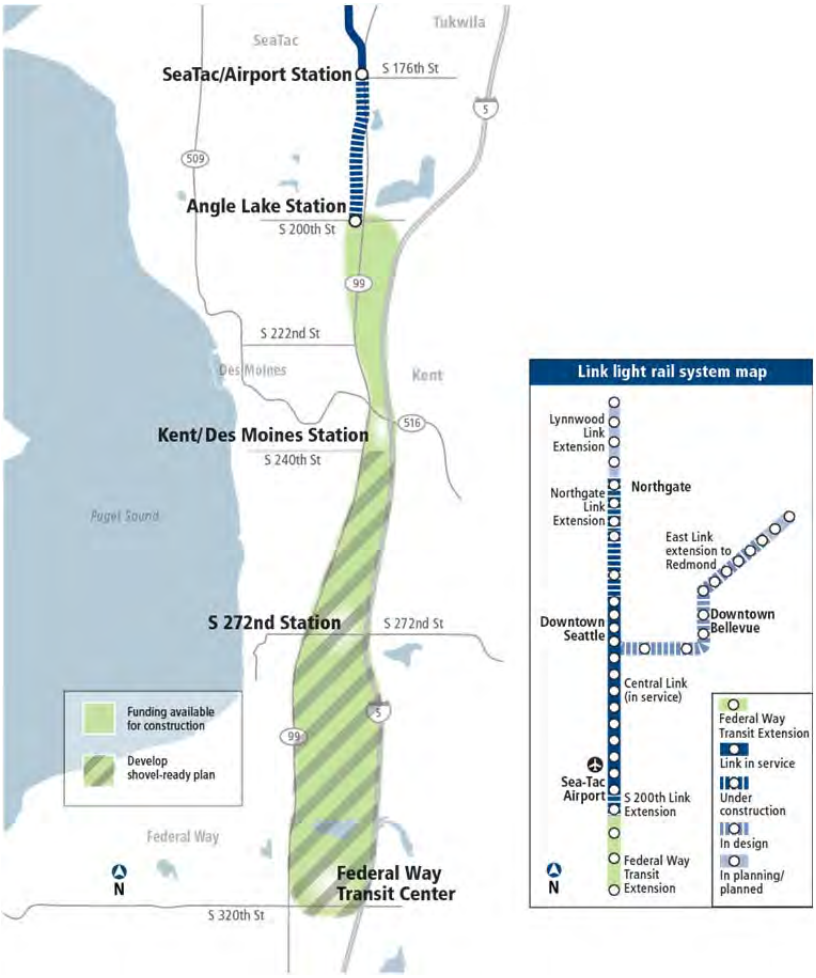

EXHIBIT 1-1
FWTE Project Study Area

This report is organized in six sections:

- Introduction
- Pre-Screening of Alternatives
- Definition of Level 1 Alternatives
- Evaluation Criteria
- Level 1 Data Results
- Findings and Conclusions

1.2 Purpose and Need of the Federal Way Transit Extension Project

The purpose of the Federal Way Transit Extension is to expand the Sound Transit Link light rail system from SeaTac to the cities of Des Moines, Kent, and Federal Way in King County in order to meet the following objectives:

- Provide a rapid, reliable, accessible, and efficient alternative for travel to and from the corridor and other urban growth and activity centers in the region with sufficient capacity to meet projected demand.
- Expand mobility alternatives to traveling on congested roadways and improve connections to the regional multimodal transportation system with peak and off-peak service.
- Provide the high-capacity transit (HCT) infrastructure to support adopted regional and local land use, transportation, and economic development plans.
- Advance the long-range vision, goals, and objectives for transit service established by the Sound Transit Long-Range Plan for high-quality regional transit service connecting major activity centers in King, Pierce, and Snohomish counties.
- Implement a financially feasible system that seeks to preserve and promote a healthy environment.

The following conditions within the project corridor demonstrate the need for the project:

- North-south transit demand is expected to grow by 30 to 40 percent by 2035 as a result of residential and employment growth in the FWTE corridor and regionally.
- The FWTE corridor population is a highly transit-dependent population with needs for efficient, reliable regional connectivity.

- Congestion on I-5 and on the key corridor arterials leading in and out of the study area will increase and further degrade existing transit performance and reliability.
- There is a lack of reliable and efficient peak and off-peak transit service connecting persons in the FWTE corridor with the region's growth centers.
- Regional and local plans call for HCT in the corridor consistent with PSRC's *VISION 2040* and the *Regional Transit Long-Range Plan*.
- Implementing the project will help meet environmental and sustainability goals of the state and region, including reduced vehicle miles traveled and greenhouse gas emissions.

Any alternative evaluated for the FWTE must demonstrate the ability to address these needs and achieve the project purpose.

1.3 Pre-Screening of Alternatives

Development of alternatives for the project was informed by FTA guidelines on project development and alternatives analyses. Potential alternatives for the FWTE came from two sources: previous regional and local planning studies (see Section 2.2.2) and input from the public and agencies during a 30-day early scoping period between October 18 and November 19, 2012. The early scoping period included two public open houses (one in Des Moines and one in Federal Way), an online survey, and opportunities for the public to provide comments on comment forms at the meeting, online, or via postal mail. The public open houses provided several interactive opportunities for attendees to provide input, including a large map of the project corridor where attendees could draw alignment suggestions. An online agency meeting and public meeting were also conducted and provided opportunities to ask questions and provide comments.

Feedback received during the early scoping period was positive and indicated a desire for improved transit service in the project area. Comments provided by agencies, local jurisdictions, institutions, and members of the general public indicated a strong preference for light rail transit. Stakeholders expressed concerns about parking, travel time, connections to future light rail expansion in Tacoma and to other transit facilities in the study area, and multimodal connections. Comments received on alignment, profile preference, and station locations were mixed.

Alternatives considered include different modes, profiles and alignments. Mode refers to the method of transportation, such as bus or light rail. Profile refers to a vertical location, such as above grade (elevated), at-grade, below-grade (retained cut or tunnel), or mixture of one or

more profile. Alignment refers to the horizontal location within a corridor. **Table 1-1** and **Exhibit 1-2** below show the initial range of alternative types considered.

Table 1-1
Initial Alternative Types Considered

Mode	Transportation System Management (TSM) Bus Rapid Transit (BRT) Light Rail Transit (LRT)	
Profile	At-grade Elevated Mixed at-grade/elevated Tunnel	
Alignment	SR 99	West Side
		Median
		East Side
	I-5	West Side
		Median
		East Side
	30th Avenue S.	West Side
		Median
		East Side
	24th Avenue S.	West Side
		Median
		East Side

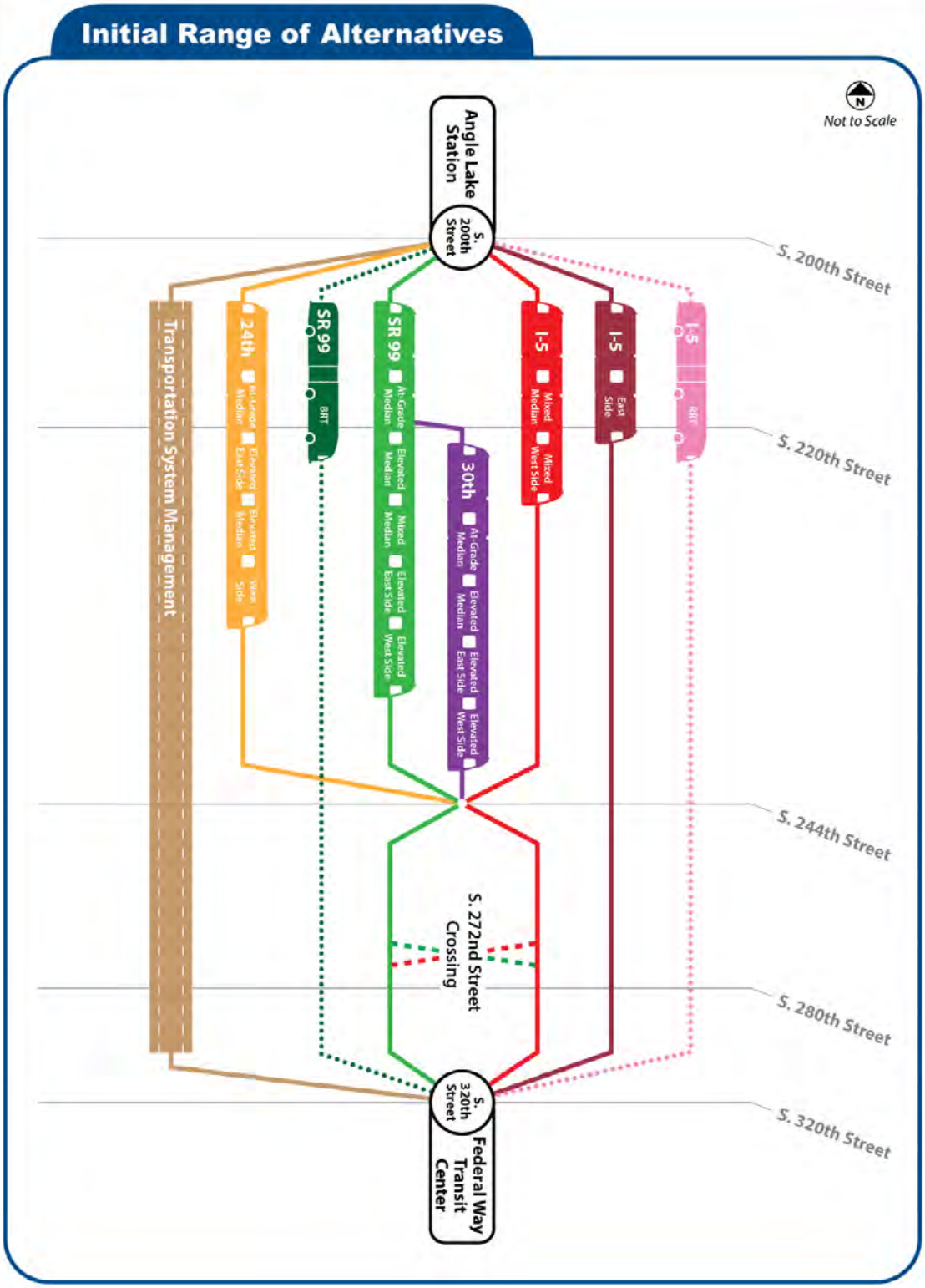

EXHIBIT 1-2
Initial Range of Alternatives

Some of the modes, profiles and alignment alternatives were not evaluated in the Level 1 process because they would not meet the stated purpose and need for the project, they had substantial impacts to environmental resources that must be avoided, or they had design features that would substantially increase the project cost compared to other alternatives that make them infeasible to keep under consideration. **Table 1-2** and **Exhibit 1-3** show the alternatives that were not evaluated as part of Level 1. On Exhibit 1-3, the alternatives not carried forward to Level 1 are shown in gray. Section 3.3.3 of this report explains in detail why these alternatives were not evaluated in the Level 1 screening process.

Table 1-2
Alternatives Not Evaluated in Level 1

Alternative Type	Alternative	Corridor
Mode	TSM	I-5 or SR 99
	BRT	I-5 or SR 99
Profile	Tunnel	SR 99
Alignment	East Side	I-5
	Crossing at S. 272nd Street	I-5 / SR 99 Hybrid
	Behind Businesses	SR 99
	West Side	24th Avenue S.

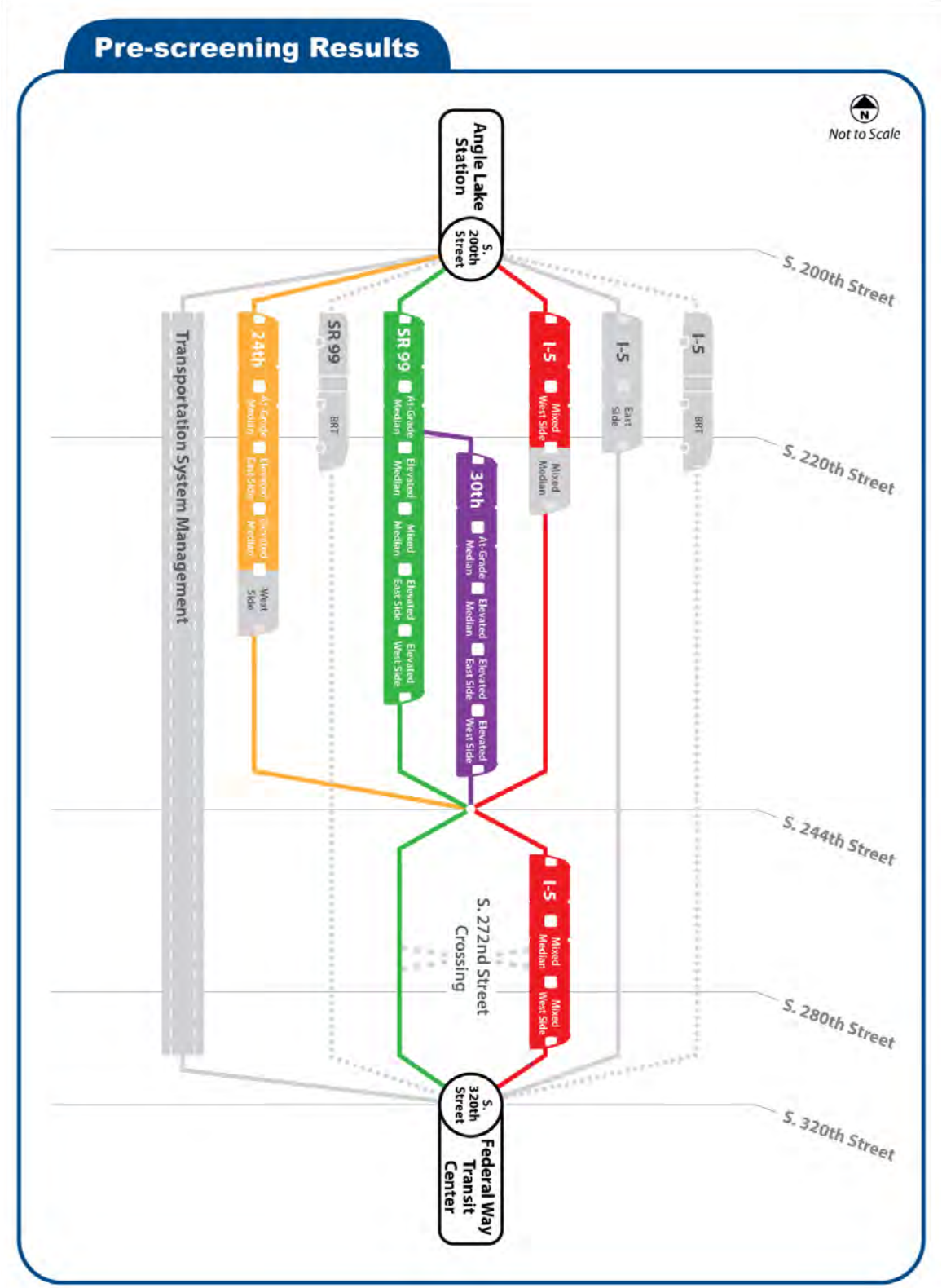

EXHIBIT1-3
Pre-Screening Results

1.4 Definition of Alternatives Evaluated in Level 1

The following alternatives were evaluated in Level 1, as shown in **Table 1-3** and **Exhibit 1-4**.

Table 1-3
Level 1 Alternatives

Corridor	Profile
SR 99	At-grade Median
	Mixed Median
	Elevated Median
	Elevated West Side
	Elevated East Side
I-5	Mixed West Side
	Mixed Median
30th Avenue S.	At-grade Median
	Elevated Median
	Elevated West Side
	Elevated East Side
24th Avenue S.	At-grade Median
	Elevated Median
	Elevated East Side

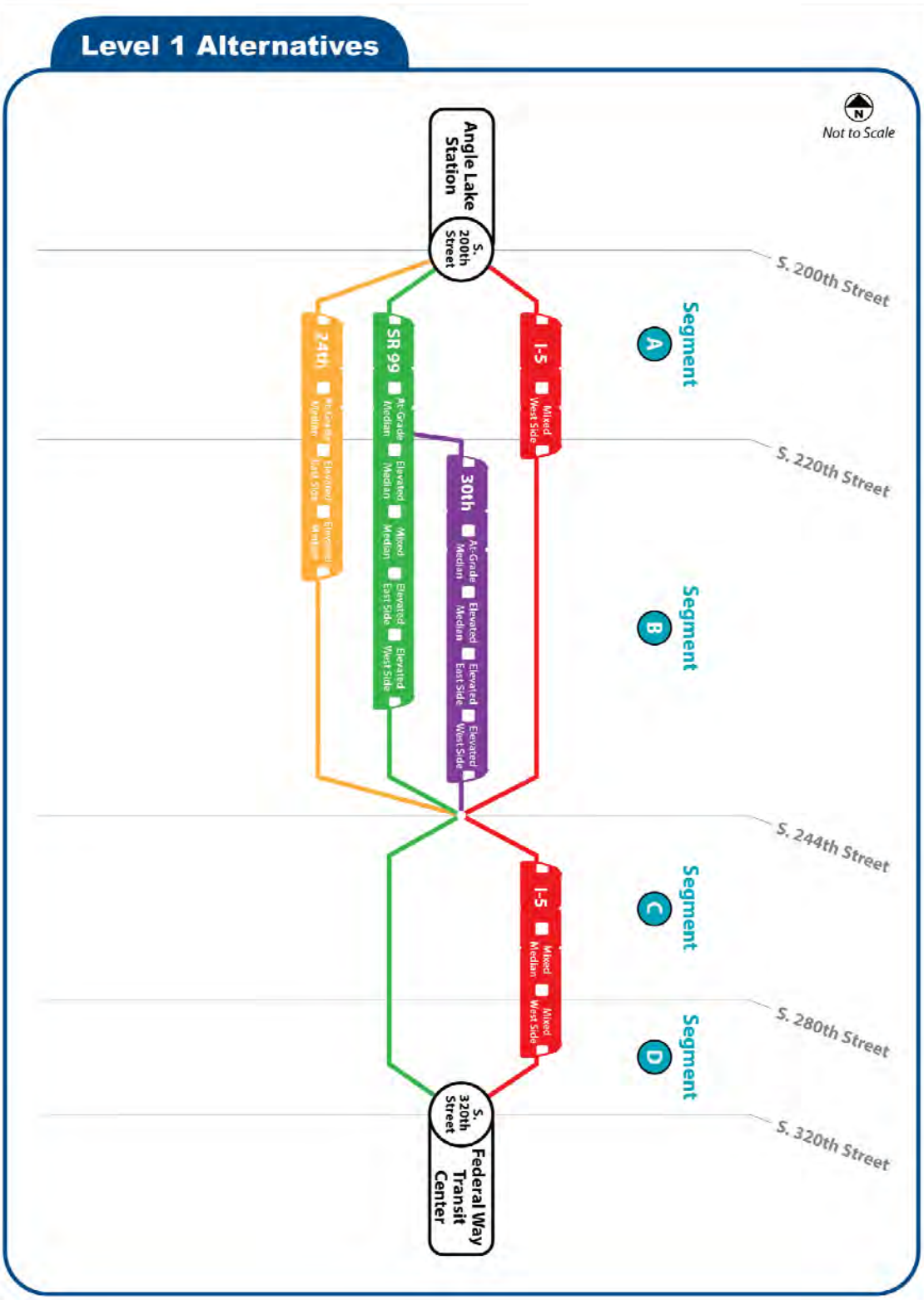

EXHIBIT 1-4
Level 1 Alternatives

For the Level 1 evaluation, the entire corridor was broken into four segments to allow for easier comparison within areas where major differences would occur. The SR 99 and I-5 alternatives would continue through the full corridor length, from the Angle Lake Station at S. 200th Street to the Federal Way Transit Center (FWTC). The 30th Avenue S. alternatives and 24th Avenue S. alternatives would only occur in the northern half of the corridor, and could connect with either a SR 99 or an I-5 alternative after the proposed station near S. 240th Street.

- Segment A: S. 200th Street to S. 220th Street. Within Segment A, there are distinct alignments along SR 99, I-5, and 24th Avenue S.
- Segment B: S. 220th Street to S. 244th Street. This segment would include a station at approximately S. 240th Street for all alternatives. Within Segment B, there are distinct alignments along SR 99, I-5, 30th Avenue S. and 24th Avenue S.
- Segment C: S. 244th Street to S. 280th Street. This segment would have a station at approximately S. 272nd Street. Within Segment C, there are distinct alignments along SR 9 and I-5 only.
- Segment D: S. 280th Street to S. 320th Street. This segment would have a station in the approximate vicinity of the Federal Way Transit Center. Within Segment D, there are distinct alignments along SR 99 and I-5 only.

1.5 Level 1 Evaluation Criteria

The evaluation criteria for this study originated from goals and objectives established in the Purpose and Need. **Table 1-4** presents the complete set of evaluation criteria that were used to review the alternative concepts in Level 1. Details on the specific measures and methodologies for each criterion can be found in Section 5 of this report.

Table 1-4
Evaluation Criteria for Level 1 Screening

Evaluation Criteria	Measures
Objective: Provide Effective Transportation Solution to Meet Mobility Need	
Ridership potential	• 2035 daily project riders (projected) • Travel time in study area
Connections to regional multimodal transportation systems	• Transit integration with Link system • Transit integration with facilities in the study area
Objective: Support Equitable Mobility	
Transit-dependent population	• Low-income population within ½ mile of stations • Elderly population (age 65 or older) within ½ mile of stations • Youth population (age 16 or younger) within ½ mile of stations • 0-car households within ½ mile of stations
Objective: Support Land Use Plans and Economic Development	
Transit-supportive land use and economic development policies	• How well an alternative provides enhanced mobility to existing high-density land use centers
Objective: Preserve a Healthy Environment	
Effect on natural environment	• Impacts on wetlands • Potential to affect stream crossings
Effect on built environment	• Visual aesthetic impacts of alternative • Potential property acquisition • Impacts to known parks • Number of community facilities affected • Impacts on known or eligible historic or other sensitive properties • Number of potentially impacted noise receptors • Level of Service (LOS) at intersections; evaluation of capacity/flow (existing conditions) • Traffic circulation and access; number of mid-block opportunities
Objective: Design an Affordable and Constructible Project	
Design Considerations	• Potential utility effects • High-risk hazardous materials • Geologic hazards • Park and Ride lot locations
System Costs	• Estimated capital cost ($2013) • Estimated annual operations and maintenance cost ($2013) **Not evaluated in Level 1. Will be included in Level 2.*

1.6 Level 1 Analysis Summary

Chapter 6 of this report documents the data that was developed for the Level 1 evaluation. The sections below summarize the data that most differentiates the alternatives and supports conclusions to either carry an alternative forward to the Level 2 evaluation or to not study the alternative further. The data is summarized by alternative in **Exhibit 1-5,** Level 1 Alternatives Analysis Summary Table, on the following pages.

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Executive Summary

Sheet 1

	At-Grade Median	Mixed Median	Elevated Median	Elevated East	Elevated West
Provide an effective transportation solution to meet mobility needs					
Daily project riders (2035)	19,000 to 19,500	21,500	23,500 to 24,000	23,500 to 24,000	23,500 to 24,000
Travel time in study area	20 to 21 minutes	18 minutes	14 to 15 minutes	14 to 15 minutes	14 to 15 minutes
Potential to affect Link system-wide operations and reliability	High	Moderate	Low	Low	Low
Transit integration with other transit services and facilities	Likely effects to RapidRide; near existing transit hub (HCC)	Some effects to RapidRide; near existing transit hub (HCC)	Minimal effects to RapidRide; near existing transit hub (HCC)	Minimal effects to RapidRide; near existing transit hub (HCC)	Minimal effects to RapidRide; near existing transit hub (HCC)
Support equitable mobility					
Low-income population within access area	2,100 people (20%)	2,100 people (20%)	2,100 people (20%)	2,100 people (20%)	2,100 people (20%)
Elderly population (age 65 or older) within access area	2,500 people (23%)	2,500 people (23%)	2,500 people (23%)	2,500 people (23%)	2,500 people (23%)
Youth population (age 16 or younger) within access area	1,000 people (9%)	1,000 people (9%)	1,000 people (9%)	1,000 people (9%)	1,000 people (9%)
Zero-car households within access area	310 households (2%)	310 households (2%)	310 households (2%)	310 households (2%)	310 households (2%)
Support land use plans and economic development					
Total acreage of high density/mixed use zoning within 1/4 mile of alternative's centerline	614 acres (26%)	614 acres (26%)	614 acres (26%)	622 acres (27%)	605 acres (26%)
Total acreage of TOD/high density/mixed use zoning within station access areas	534 acres (27%)	534 acres (27%)	534 acres (27%)	537 acres (27%)	531 acres (26%)
Preserve a healthy environment					
Acres of wetlands potentially affected	0 acres	0 acres	0 acres	0 acres	0 acres
Number of stream crossings potentially affected	2 streams	2 streams	2 streams	1 streams	2 streams
Potential visual effects	Moderate	Moderate	Moderate	Moderate	Moderate
Number of residential properties within 100 ft. of the alternative's centerline	17 properties	17 properties	17 properties	26 properties	12 properties

Key to Ranking: Higher Performing / Lower Performing

EXHIBIT 1-5

Level 1 Alternatives Analysis Summary Table

Sheet 1 (Cont.)

Executive Summary

Mixed West (I-5)	Mixed West/ Median (I-5)	At-Grade Median (30th)	Elevated Median (30th)	Elevated East (30th)	Elevated West (30th)	At-Grade Median (24th)	Elevated Median (24th)	Elevated East (24th)
		Coupled with SR 99 Elevated Median						
23,500	23,500	19,000 to 19,500	23,500	23,500	23,500	19,000 to 19,500	23,500 to 24,000	23,500 to 24,000
14 minutes	14 minutes	21 minutes	15 minutes	15 minutes	15 minutes	22 minutes	15 minutes	15 minutes
Low	Low	Moderate	Low	Low	Low	Moderate	Low	Low
Minimal effects to RapidRide; near existing regional transit facility (Star Lake P&R)	Minimal effects to RapidRide; near existing regional transit facility (Star Lake P&R), potential for I-5 flyer stops)	With transition to SR 99 at-grade likely effects to RapidRide; near existing transit hub (HCC)	Minimal effects to RapidRide; if transition to SR 99 near existing transit hub (HCC), if transition to I-5 near Star Lake P&R	Minimal effects to RapidRide; if transition to SR 99 near existing transit hub (HCC), if transition to I-5 near Star Lake P&R	Minimal effects to RapidRide; if transition to SR 99 near existing transit hub (HCC), if transition to I-5 near Star Lake P&R	Likely effects to RapidRide; along SR 99; near existing transit hub (HCC)	Minimal effects to RapidRide; near existing transit hub (HCC)	Minimal effects to RapidRide; near existing transit hub (HCC)
2,000 people (20%)	2,000 people (20%)	2,100 people (20%)	2,100 people (20%)	2,100 people (20%)	2,100 people (20%)	2,100 people (20%)	2,100 people (20%)	2,100 people (20%)
2,500 people (25%)	2,500 people (25%)	2,500 people (23%)	2,500 people (23%)	2,500 people (23%)	2,500 people (23%)	2,500 people (23%)	2,500 people (23%)	2,500 people (23%)
1,000 people (10%)	1,000 people (10%)	1,000 people (9%)	1,000 people (9%)	1,000 people (9%)	1,000 people (9%)	1,000 people (9%)	1,000 people (9%)	1,000 people (9%)
600 households (6%)	600 households (6%)	250 households (2%)	250 households (2%)	250 households (2%)	250 households (2%)	250 households (2%)	250 households (2%)	250 households (2%)
380 acres (16%)	358 acres (13%)	634 acres (29%)	635 acres (29%)	635 acres (29%)	636 acres (29%)	368 acres (16%)	368 acres (16%)	368 acres (16%)
488 acres (24%)	483 acres (24%)	534 acres (27%)	534 acres (27%)	534 acres (27%)	534 acres (27%)	534 acres (27%)	534 acres (27%)	534 acres (27%)
0.4 acres	2.1 acres	0 acres	0 acres	0 acres	0 acres	0 acres	0 acres	0 acres
1 stream	1 stream	2 streams	2 streams	2 streams	2 streams	2 streams	2 streams	2 streams
Low to Moderate	Low	Moderate	Moderate to High	Moderate to High	Moderate to High	Moderate to High	Moderate to High	Moderate to High
130 properties	52 properties	43 properties	43 properties	43 properties	43 properties	98 properties	98 properties	98 properties

Key to Ranking: Higher Performing / Lower Performing

EXHIBIT 1-5

Level 1 Alternatives Analysis Summary Table

Executive Summary

Sheet 2

	At-Grade Median	Mixed Median	Elevated Median	Elevated East	Elevated West
Preserve a healthy environment (cont'd)					
Number of commercial properties within 100 ft. of the alternative's centerline	359 properties	359 properties	359 properties	196 properties	193 properties
Impacts to park within 50 ft. of an alternative's centerline (acres)	0 acres	0 acres	0 acres	0 acres	0 acres
Impacts to park within 200 ft. of an alternative's centerline (acres)	0 acres	0 acres	0 acres	0 acres	0 acres
Number of community facilities adjacent to an alternative	4 facilities	4 facilities	4 facilities	1 facility	3 facilities
Number of community facilities within 200 ft. of the alternative's centerline	1 facility	1 facility	1 facility	3 facilities	2 facilities
Number of potentially impacted noise receptors within 350 ft. of unobstructed exposure to noise and 175 ft. with intervening obstruction to noise	389 properties	609 properties	827 properties	885 properties	865 properties
Number of affected Level of Service "F" intersections	3 intersections	0 intersections	0 intersections	0 intersections	0 intersections
Number of un-signalized intersections or side-streets with restricted turns	12 intersections or streets	12 intersections or streets	12 intersections or streets	0 intersections or streets	0 intersections or streets
Number of properties affected by restricted turns at midblock U-turns and/or median two-way left turn lanes	83 properties	83 properties	83 properties	0 properties	0 properties
Design an affordable and constructible project					
Potential utility effects	High	High	Moderate	High	High
Number of hazardous materials sites in study area	75 sites	75 sites	75 sites	75 sites	75 sites
Location of hazardous material sites in study area	Highest number of sites located in Segment B	Highest number of sites located in Segment B	Highest number of sites located in Segment B	Highest number of sites located in Segment B	Highest number of sites located in Segment B
Geologic hazards	Low risk	Low risk	Low risk	Low risk	Low risk
Park-and-Ride access	4 lots 3,864 spaces	4 lots 3,864 spaces	4 lots 3,864 spaces	4 lots 3,864 spaces	4 lots 3,864 spaces
Estimated capital cost ($2013) in billions of dollars	$1.1 to $1.3	$1.2 to $1.3	$1.5 to $1.7	$1.6 to $1.9	$1.6 to $1.8
Estimated annual operations and maintenance cost	Not evaluated in Level 1. Will be evaluated in Level 2.				

Key to Ranking: Higher Performing / Lower Performing

EXHIBIT 1-5

Level 1 Alternatives Analysis Summary Table

Sheet 2 (Cont.)

Executive Summary

Mixed West (I-5)	Mixed West/ Median (I-5)	At-Grade Median (30th)	Elevated Median (30th)	Elevated East (30th)	Elevated West (30th)	At-Grade Median (24th)	Elevated Median (24th)	Elevated East (24th)
		Coupled with SR 99 Elevated Median						
71 properties	53 properties	334 properties	336 properties	336 properties	336 properties	264 properties	264 properties	264 properties
0 acres	0 acres	0 acres	0 acres	0 acres	0 acres	<0.1 acres	0 acres	<0.1 acres
0.4 acres	0.1 acres	0 acres	0 acres	0 acres	0 acres	1 acre	1 acre	1 acre
3 facilities	1 facility	4 facilities	4 facilities	4 facilities	4 facilities	9 facilities	9 facilities	9 facilities
1 facilities	0 facilities	0 facilities	0 facilities	0 facilities	0 facilities	0 facilities	0 facilities	0 facilities
967 properties	811 properties	1,186 properties	1,348 properties	1,348 properties	1,348 properties	918 properties	918 properties	1,005 properties
0 intersections	0 intersections	0 intersections	0 intersections	0 intersections	0 intersections	0 intersections	0 intersections	0 intersections
0 intersections or streets	0 intersections or streets	16 intersections or streets	16 intersections or streets	12 intersections or streets	12 intersections or streets	19 intersections or streets	19 intersections or streets	19 intersections or streets
0 properties	0 properties	144 properties	144 properties	83 properties	83 properties	150 properties	150 properties	83 properties
High	High	High	High	High	Moderate	High	High	High
23 sites	23 sites	77 sites	77 sites	77 sites	77 sites	70 sites	70 sites	70 sites
Highest number of sites located in Segment B	Highest number of sites located in Segment B	Highest number of sites located in Segment B	Highest number of sites located in Segment B	Highest number of sites located in Segment B	Highest number of sites located in Segment B	Highest number of sites located in Segment B	Highest number of sites located in Segment B	Highest number of sites located in Segment B
High risk	Moderate risk	Moderate risk	Moderate risk	Moderate risk	Moderate risk	Moderate risk	Moderate risk	Moderate risk
7 lots 4,167 spaces	7 lots 4,167 spaces	4 lots 3,864 spaces	4 lots 3,864 spaces	4 lots 3,864 spaces	4 lots 3,864 spaces	4 lots 3,864 spaces	4 lots 3,864 spaces	4 lots 3,864 spaces
$1.3 to $1.5	$1.5 to $1.7	$1.4 to $1.6	$1.5 to $1.7	$1.5 to $1.7	$1.5 to $1.7	$1.5 to $1.7	$1.5 to $1.7	$1.4 to $1.7

Key to Ranking: Higher Performing / Lower Performing

EXHIBIT 1-5

Level 1 Alternatives Analysis Summary Table

1.6.1 SR 99 At-Grade Median Alternative

The SR 99 At-Grade Median alternative is one of the lowest cost alternatives. It would have the lowest ridership and longest travel time of all SR 99 alternatives. It would require extensive reconstruction of the recently reconstructed SR 99 roadway, as well as extensive utility relocation, resulting in the greatest disruption to adjacent properties and the surrounding communities and presenting substantial engineering challenges associated with widening. Traffic and other transit operations would be adversely affected, and the potential delays associated with at-grade operation would adversely affect system-wide operations.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the SR 99 At-Grade Median alternative is not proposed for further evaluation.

1.6.2 SR 99 Mixed Median Alternative

The SR 99 Mixed Median alternative would have lower ridership and longer travel time than the elevated SR 99 alternatives. Like the SR 99 At-Grade Median alternative, it would require extensive reconstruction of the recently-reconstructed SR 99 roadway, as well as extensive utility relocation, resulting in disruption to adjacent properties and the surrounding communities. This alternative would avoid some traffic, transit, and system-wide impacts associated with the SR 99 At-Grade Median alternative because it would cross major intersections on an elevated structure.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the SR 99 Mixed Median alternative is not proposed for further evaluation.

1.6.3 SR 99 Elevated Median Alternative

The SR 99 Elevated Median alternative would be more expensive than the at-grade or mixed median alternatives, but would have higher ridership and faster travel times. It has the potential to limit reconstruction of SR 99 to intersections and station locations, reducing potential for utility relocations and disruption to adjacent properties.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the SR 99 Elevated Median alternative is proposed for further evaluation.

1.6.4 SR 99 Elevated East Side Alternative

The SR 99 Elevated East Side alternative would be more expensive than the at-grade or mixed median alternatives, but would have higher ridership and faster travel times. High-voltage electrical transmission lines on the east side of SR 99 would need to be relocated. Acquisition of properties on the east side of the road could result in business and residential displacements, and could limit the potential for redevelopment of these properties following construction. Topographical constraints on the east side of SR 99 in some places would present engineering challenges.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the SR 99 Elevated East Side alternative is not proposed for further evaluation.

1.6.5 SR 99 Elevated West Side Alternative

The SR 99 Elevated West Side alternative would be more expensive than the at-grade or mixed median alternatives, but would have higher ridership and faster travel times. Acquisition of properties on the west side of the road would likely result in business and residential displacements, and could limit the potential for redevelopment of these properties following construction. Topographical constraints on the west side of SR 99 in some places would present engineering challenges.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the SR 99 Elevated West Side alternative is not proposed for further evaluation.

1.6.6 I-5 Mixed West Side Alternative

The I-5 Mixed West Side alternative would be less expensive than elevated alternatives along SR 99. Based on current information from WSDOT, it appears this alternative could be constructed largely within WSDOT right-of-way, limiting residential or business displacements, and avoiding impacts to local roadway operations. Ridership and travel time would be similar to the SR 99 elevated alternatives. Potential risks include proximity to Highline Water District water tanks, a Puget Sound Energy substation, and the Midway Landfill, which also presents a potential hazardous materials concern and geologic hazard.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the I-5 Mixed West Side alternative is proposed for further evaluation.

1.6.7 I-5 Mixed West Side/Median Alternative

The I-5 Mixed West Side/Median alternative would be less expensive than elevated alternatives along SR 99. Based on current information from WSDOT, it appears this alternative could be constructed largely within WSDOT right-of-way, limiting residential or business displacements and avoiding impacts to local roadway operations. Ridership and travel time would be the same as SR 99 elevated alternatives. Potential risks include proximity to Highline Water District water tanks and a Puget Sound Energy substation. This alternative would avoid the Midway Landfill and the engineering challenges that this crossing presents, and would also have the lowest potential for visual impacts.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the I-5 Mixed West Side/Median alternative is proposed for further evaluation.

1.6.8 30th Avenue S. At-Grade Median Alternative

The 30th Avenue S. At-Grade Median alternative would avoid the disruption of SR 99 associated with construction activities and widening of the roadway between S. 220th Street and S. 240th Street. It would have a longer travel time and lower ridership than elevated alternatives, and would require reconstruction of 30th Avenue S., a two-lane primarily residential road. This reconstruction would involve utility relocations and result in impacts to local traffic by eliminating left turns from side streets and adjacent properties. This alternative would cross Kent-Des Moines Road at-grade directly adjacent to on and off-ramps to I-5. This alternative would have high potential for noise and visual impacts and would bifurcate the Pacific Ridge neighborhood between S. 220th Street and Kent-Des Moines Road.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the 30th Avenue S. At-Grade Median alternative is not proposed for further evaluation.

1.6.9 30th Avenue S. Elevated Median Alternative

The 30th Avenue S. Elevated Median alternative would have a similar travel time and ridership as other elevated alternatives on SR 99 and I-5. It would require reconstruction of 30th Avenue S., a two-lane primarily residential road. This reconstruction would involve utility relocations and would result in impacts to local traffic by eliminating left turns from side streets and adjacent properties. This alternative would have high potential for noise and visual impacts and would bifurcate the Pacific Ridge neighborhood between S. 220th Street and Kent-Des Moines Road.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the 30th Avenue S. Elevated Median alternative is not proposed for further evaluation.

1.6.10 30th Avenue S. Elevated East Side Alternative

The 30th Avenue S. Elevated East Side alternative would have a similar travel time and ridership as other elevated alternatives on SR 99 and I-5. It would require reconstruction of 30th Avenue S., a two-lane primarily residential road. This reconstruction would involve utility relocations and property acquisition on the east side of the road, likely resulting in residential displacements. This alternative would have high potential for noise and visual impacts and would bifurcate the Pacific Ridge neighborhood between S. 220th Street and Kent-Des Moines Road.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the 30th Avenue S. Elevated East Side alternative is not proposed for further evaluation.

1.6.11 30th Avenue S. Elevated West Side Alternative

The 30th Avenue S. Elevated West Side alternative would have similar travel time and ridership to other elevated alternatives on SR 99 and I-5 and is likely to require only partial reconstruction of 30th Avenue S., a two-lane primarily residential road. This alternative would have high potential for noise and visual impacts and would bifurcate the Pacific Ridge neighborhood between S. 220th Street and Kent-Des Moines Road. This reconstruction would avoid major utility relocations associated with median and east side alternatives on 30th Avenue S.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the 30th Avenue S. Elevated West Side alternative is proposed for further evaluation.

1.6.12 24th Avenue S. At-Grade Median Alternative

The 24th Avenue S. At-Grade Median alternative would avoid the disruption of SR 99 associated with construction activities and widening of the roadway between S. 200th Street and S. 240th Street. It would have a longer travel time and lower ridership than elevated alternatives, and would require reconstruction of 24th Avenue S., a two-lane collector road in a residential area. This reconstruction would involve utility relocations and would result in effects to local traffic by eliminating left turns from side streets and adjacent properties. This alternative would have high potential for noise and visual effects and could have indirect effects to parks and

neighborhood cohesion between S. 216th Street and Kent-Des Moines Road. Additional costs would be associated with structures for crossing the proposed SR 509 right-of-way and S. 208th Street.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the 24th Avenue S. At-Grade Median alternative is not proposed for further evaluation.

1.6.13 24th Avenue S. Elevated Median Alternative

The 24th Avenue S. Elevated Median alternative would avoid the disruption of SR 99 associated with construction activities and widening of the roadway between S. 200th Street and S. 240th Street. This alternative would require reconstruction of 24th Avenue S., a two-lane collector road in a residential area. This reconstruction would involve utility relocations and would result in effects to local traffic by eliminating left turns from side streets and adjacent properties. This alternative would have high potential for noise and visual effects and could have indirect effects to parks and neighborhood cohesion between S. 216th Street and Kent-Des Moines Road. Additional costs would be associated with structures for crossing the proposed SR 509 right-of-way and S. 208th Street.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the 24th Avenue S. Elevated Median alternative is not proposed for further evaluation.

1.6.14 24th Avenue S. Elevated East Side Alternative

The 24th Avenue S. Elevated East Side alternative would avoid the disruption of SR 99 associated with construction activities and widening of the roadway between S. 200th Street and S. 240th Street. This alternative would result in acquiring properties on the east side of 24th Avenue S. for right-of-way, possibly displacing residences and/or churches. This alternative would have high potential for noise and visual effects and could have indirect effects to parks and neighborhood cohesion between S. 216th Street and Kent-Des Moines Road. Additional costs would be associated with structures for crossing the proposed SR 509 right-of-way and S. 208th Street.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the 24th Avenue S. Elevated East Side alternative is not proposed for further evaluation.

1.6.15 Developing a New Alternative (Hybrid)

The results of the Level 1 analysis showed that different segments of each of the SR 99 alternatives could work, but each one of them as a “stand alone” alternative has substantial flaws. A combination of conceptual design elements (a mix of east side, west side, and median alignment; at-grade and elevated profile) could result in an alternative that operates better with less adverse effects than the “stand alone” SR 99 alignment alternatives studied in Level 1. For the Level 2 evaluation, this new alternative will be called the “hybrid” alternative.

Conclusion: A new SR 99 Hybrid alternative should be developed for study in the Level 2 evaluation. It should be made up of segments of the SR 99 alignment and grade alternatives (at-grade, median elevated, east elevated and west elevated) that have been developed and examined in the Level 1 evaluation.

Exhibit 1-6 summarizes the Level 1 evaluation, showing which alternatives will not be studied further (shown in gray) and which alternatives will be studied further in Level 2 (shown in color).

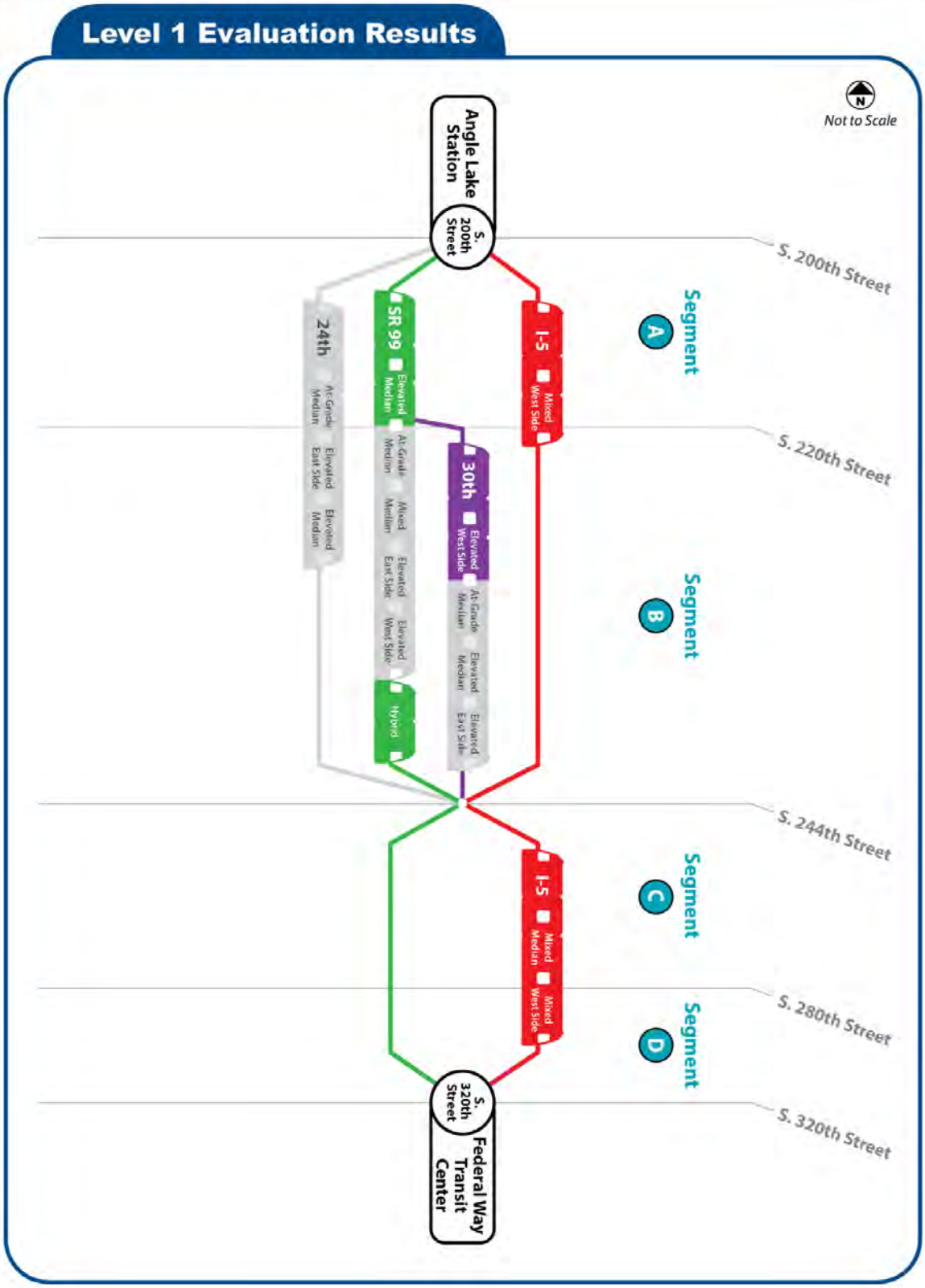

EXHIBIT 1-6
Level 1 Evaluation Results

2.0 Introduction

This chapter provides an introduction to the Alternatives Analysis (AA) phase of the Federal Way Transit Extension (FWTE), the background on the corridor, and an explanation of the AA process.

The Central Puget Sound Regional Transit Authority (Sound Transit) intends to extend regional high capacity transit (HCT) between the cities of SeaTac and Federal Way. The Sound Transit 2 (ST2) Plan, approved by voters in 2008, included environmental study and design of this extension. This approximately 7.6 mile extension would extend HCT south from the future Angle Lake Station terminus of the Sound Transit Link light rail system at S. 200th Street in SeaTac (scheduled to open in 2016) to the Federal Way Transit Center at S. 320th Street. The voter-approved extensions to the Link light rail system will bring 36 new miles of service to the north, south, and east over the next few years, creating a 55-mile light rail system serving the Puget Sound region.

The FWTE will help fulfill regional plans developed by the Puget Sound Regional Council (PSRC) and Sound Transit. PSRC's Vision 2040 (PSRC 2009) and Sound Transit's 2005 Regional Transit Long-Range Plan (Sound Transit, 2005) both call for future HCT in the FWTE corridor. **Exhibit 2-1** shows the Regional Transit System Plan map

EXHIBIT 2-1

Sound Transit Current Service and Future Projects

2.1 Relationship of this Study to Project Development

This report summarizes the portion of the AA process that has been completed to date to identify and evaluate alternatives. The alternatives performing best against evaluation criteria may be analyzed in an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) and under the Washington State Environmental Policy Act (SEPA). The study identified an initial range of potential alternatives based on previous plans and studies and input from the public and agencies. This study evaluated those potential alternatives to determine which should undergo further study and design during the AA and EIS processes. At the end of the project development and environmental review process, the Sound Transit Board is expected to select the project to build and operate.

Sound Transit intends to maintain eligibility for future New Starts or other federal funding from the Federal Transit Administration (FTA). To be eligible for federal funding the planning process for the project must be done in compliance with FTA planning and project development guidance. The new transportation funding bill, Moving Ahead for Progress in the 21st Century (MAP-21), eliminates the formal AA requirement from the New Starts Program and instead relies on the review of alternatives performed during the metropolitan planning and environmental processes. The following chapters document this local planning process both prior to initiation of the FWTE project and as part of this alternatives analysis.

Throughout the AA and NEPA/SEPA processes, Sound Transit is committed to engaging the public, agencies, and key stakeholders. Agencies involved in the Interagency Working Group include each city in the corridor (SeaTac, Des Moines, Kent and Federal Way), PSRC, Highline Community College, WSDOT, and King County Metro. Key stakeholders include local community and business organizations and community service providers. Input from each of these groups (public, agencies, and stakeholders) is important throughout the process to ensure that the community concerns and issues are considered during the evaluation and design process.

2.2 FWTE Corridor Background

This section provides context on the FWTE corridor within the greater regional transit system and an overview of previous planning efforts within the corridor.

Sound Move, the first phase of regional transit investments, was approved and funded by voters in 1996. Sound Transit is now completing its implementation. It includes light rail, commuter rail and regional express bus infrastructure and service. As a result of the *Sound Move* initiative, in 2009, Sound Transit began light rail operations between downtown Seattle and Sea-Tac International Airport, and an extension to the University of Washington is under construction and scheduled to open in 2016.

The S. 200th Link Extension is currently under construction, extending light rail from the Sea-Tac Airport to S. 200th Street, terminating at the Angle Lake Station. The FWTE will extend this system south to Federal Way in order to expand regional service as well as make progress toward reaching Tacoma, the long-term southern terminus of the Link light rail system planned for in Sound Transit's 2005 Regional Transit Long-Range Plan.

In 2004, Sound Transit began planning for the next phase of investment to follow *Sound Move*. This included updating the long-range plan and associated environmental review. Following several years of system planning work to define, evaluate and prioritize the next round of regional transit system expansion, voters in 2008 authorized funding to extend the regional light rail system south to Federal Way as part of the Sound Transit 2 (ST2) Plan. The ST2 Plan would also extend light rail from downtown Seattle to Bellevue and Redmond to the east and to Northgate and Lynnwood to the north.

Regional and local efforts have studied and identified, through a rigorous planning and outreach process, alternatives for further study and evaluation to bring high-capacity transit to the FWTE corridor. Related regional planning documents include:

- Regional Multi-Corridor Summary Report (Puget Sound Council of Governments, 1986)
- Regional Transit System Plan Final EIS (Joint Regional Policy Committee, 1993)
- 1995 Regional Transit Service Proposal (Sound Transit, 1995)
- The Regional Transit Long-Range Vision and Sound Move-the Ten-Year Regional Transit System Plan (Sound Transit, 1996)
- Destination 2030 (PSRC 2001)
- Regional Transit Long-Range Plan and associated EIS (Sound Transit, 2005)
- Sound Transit 2 (ST2) Plan (Sound Transit, 2008)
- Transportation 2040 (PSRC 2011)

These plans all support an investment in high-capacity transit serving the FWTE study area. In addition, the plans of the cities in the FWTE study area (SeaTac, Kent, Des Moines, and Federal Way), as well as other regional transportation agencies also support a high capacity transit investment in the FWTE corridor. These plans include:

- SR 99 Route Development Plan (Federal Way to Tukwila) (Washington State Department of Transportation (WSDOT), 2006)
- Looking to the Future: Six-Year Transit Development Plan for 2002 to 2007 (King County Metro, 2002)
- Strategic Plan for Public Transportation, 2007 to 2016 (King County Metro, 2007)
- King County Metro Transit Strategic Plan for Public Transportation 2011 to 2021 (King County Metro, 2011)

- City of SeaTac Comprehensive Plan (Updated, 2011)
- City of Des Moines Comprehensive Plan (2009) and Comprehensive Transportation Plan (CTP) (2009)
- City of Kent Comprehensive Plan (2008) and Transportation Master Plan (2008)
- City of Federal Way Comprehensive Plan (Updated, 2010)
- Puget Sound Regional Council Growing Transit Communities Program (2012)

Sound Transit documented these planning and outreach efforts in a November 2012 memo to the FTA titled "Federal Way Transit Extension – Linking Planning and NEPA." The findings of the memo indicate that the planning processes for high capacity transit in the FWTE project area have addressed questions of 'general travel corridor' and 'general mode.'

2.3 Overview of the Alternatives Analysis Process

The purpose of this alternatives analysis is to define the transportation needs in the corridor and identify reasonable alternatives that would address those needs. While this alternatives analysis is a local process, because the resulting project may use federal funding, and FTA is the steward of federal transit funding, FTA's general guidelines for how to conduct alternatives analysis are incorporated into the study. These include four major steps:

- Study initiation
- Development and refinement of alternatives and technical methodologies
- Analysis and evaluation
- Identification of a preferred alternative

Exhibit 2-2 illustrates the steps in the Alternatives Analysis process.

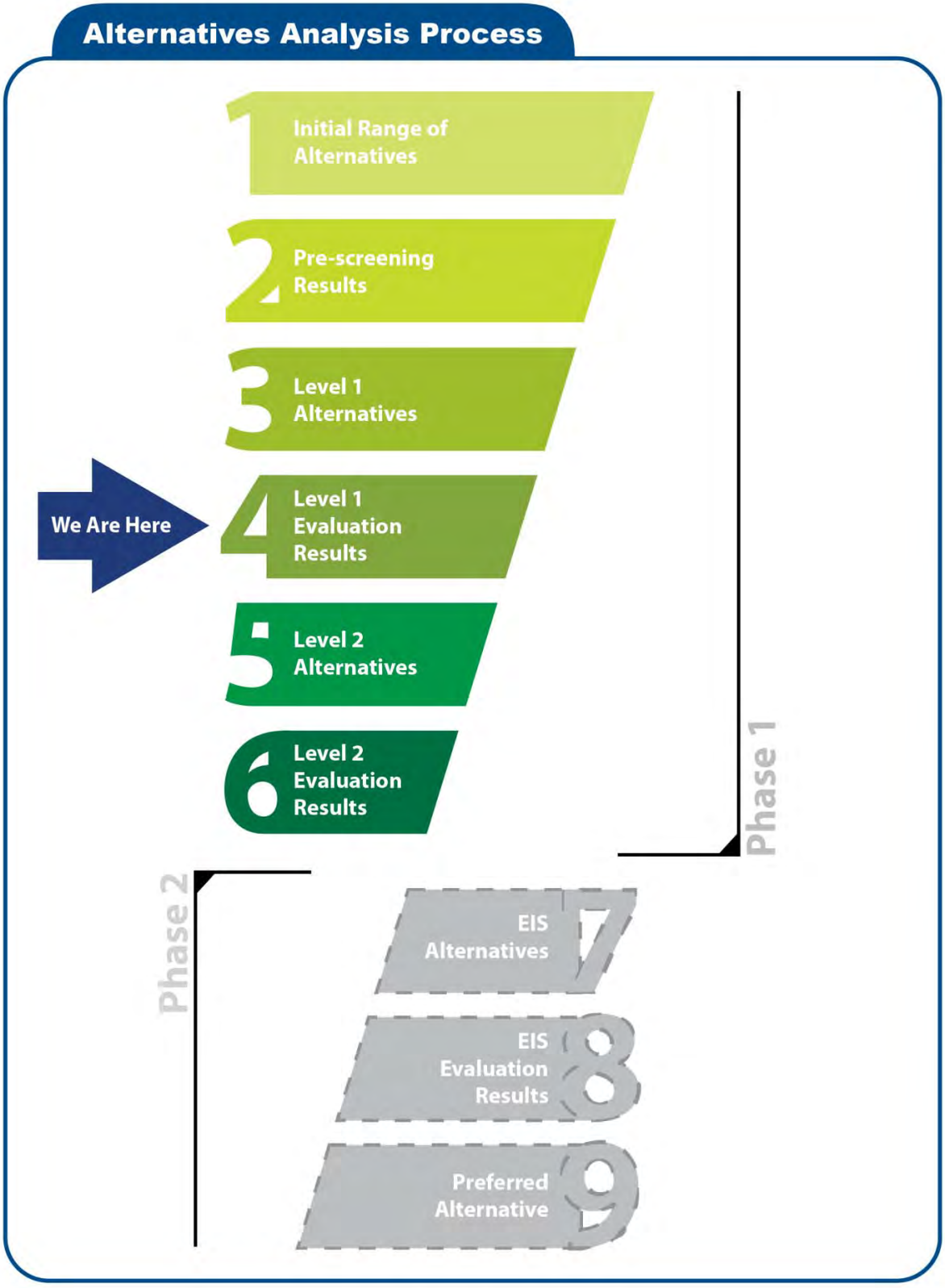

EXHIBIT 2-2
Alternatives Analysis Process

During the study initiation phase, the roles and responsibilities of participating agencies are established, issues to be addressed in the study are defined, and the availability of data and models for addressing these issues is determined. The study initiation phase also includes development of a detailed work plan, a problem statement and purpose and need, evaluation measures to guide the subsequent analysis, and a conceptual definition of alternatives to be included in the study. Chapter 3 of this report summarizes the project purpose and need.

Once the alternatives analysis study has been initiated, the next step is to further refine the study alternatives and analysis methods. This step is designed to ensure that all participants in the process are in general agreement with the alternatives and analysis methods before the alternatives are further developed and evaluated in greater detail. This step often includes a preliminary analysis to screen out those alternatives that clearly cannot satisfy the project purpose and need or that show the least amount of promise. The third step includes the more detailed development of the most promising alternatives followed by the analysis and evaluation of these alternatives. This step constitutes the main work of the alternatives analysis, and includes applying the methodologies developed for each of the study's evaluation measures to assess the transportation, environmental and financial impacts of each alternative. This step has two levels for the FWTE, and this report documents Level 1 of this evaluation. Chapter 4 defines the alternatives studied in Level 1; Chapter 5 describes the criteria used to evaluate the alternatives and the methodologies for applying these criteria; Chapter 6 presents the results of each evaluation measure; and Chapter 7 provides a comparative analysis of alternatives based on these criteria and identifies alternatives to be evaluated further in Level 2.

The Level 1 evaluation applies both qualitative and quantitative criteria to measure the benefits, impacts, and costs of the alternatives. The best performing alternatives will then be studied further in the Level 2 evaluation. Given the expanded information available at this stage of the process, alternatives that will be further studied have a refined design and definition prior to evaluation in Level 2.

The Level 2 evaluation will apply more quantitative criteria and analyses to the remaining, smaller set of alternatives. These alternatives are again compared against one another. This evaluation will compare each alternative's merits and weaknesses relative to the other alternatives. The results of this screening will be presented to Sound Transit Board and will inform alternatives to present during the NEPA/SEPA environmental scoping period. Following scoping, the Sound Transit Board is expected to identify the alternative or alternatives that should be studied in the Draft EIS.

2.4 Organization of this Report

This report is organized by the following chapters:

Chapter 1 – Executive Summary: This chapter provides an overview of the alternatives evaluated in this study and the key findings and conclusions.

Chapter 2 – Introduction: This chapter provides an introduction to the alternatives analysis phase of the FWTE, some background on the corridor, and an explanation of the alternatives analysis process.

Chapter 3 – Pre-Screening of Alternatives: This chapter discusses alternatives identified in previous studies or submitted during the early scoping process that were pre-screened from further evaluation because they do not meet the project purpose and need, they have engineering or environmental constraints that make them infeasible, or they are inconsistent with adopted local and regional plans for public transportation infrastructure. This chapter also provides a summary of the project purpose and need.

Chapter 4 – Definition of Level 1 Alternatives: This chapter describes the Level 1 alternatives. Maps and cross-sections of each alternative are provided here.

Chapter 5 – Level 1 Evaluation Criteria: This chapter presents the evaluation criteria used to examine and compare the alternatives defined in Chapter 4. These criteria relate directly to the purpose and need and goals and objectives of the project.

Chapter 6 – Level 1 Data Results: This chapter provides the results of how each Level 1 alternative described in Chapter 4 performs under each criterion described in Chapter 5. Results are organized by criteria and provide a comparison between alternatives for each criterion.

Chapter 7 – Level 1 Key Findings and Conclusions: This chapter summarizes the key findings of each alternative as they relate to the evaluation criteria, and draws conclusions about the alternative's relative performance. This chapter identifies the alternatives that are to be evaluated further in the Level 2 evaluation.

3.0 Pre-Screening of Alternatives

This chapter summarizes the process used to develop the initial range of potential alternatives, the project purpose and need, the process used to pre-screen alternatives, and analysis and conclusions regarding alternatives that were considered but not evaluated further in the Level 1 evaluation.

3.1 Development of Alternatives

Potential alternatives for the Federal Way Transit Extension (FWTE) came from two sources: previous regional and local planning studies (see Section 2.2.2) and input from the public and agencies during a 30-day early scoping period held from October 18 to November 19, 2012. The purpose of early scoping is to start the public planning and environmental processes for the FWTE project. The early scoping period included two public open houses (one in Des Moines and one in Federal Way), an online survey, and opportunities for the public to provide comments on comment forms at the meeting, online, or via postal mail. The public open houses provided several interactive opportunities for attendees to provide input, including a large map of the project corridor where attendees could draw alignment suggestions. An online meeting for agencies and tribal governments was also conducted and provided opportunities to ask questions and provide comments.

Overall feedback received during the early scoping period was positive and indicated a desire for improved transit service in the project area. Comments provided by agencies, local jurisdictions, institutions, and members of the general public indicate a strong preference and expectation for light rail transit as planned for in the Regional Transit Long-Range and Sound Transit 2 (ST2) Plans. Stakeholders expressed concerns about parking, travel time, connections to Tacoma and to other transit facilities in the study area, and multimodal connections. Comments received on alignment, profile preference, and station locations were varied.

Exhibit 3-1 shows the study area within which alternatives were identified and considered. The study area is generally bounded by SR 99 to the west, I-5 to the east, S. 200th Street to the north and S. 320th Street to the south. Alternatives outside this general area or with different origins or destinations were not considered as part of this evaluation because they would not meet the purpose and need for the project, as described in Section 3.2. Alternatives generally followed two corridors, SR 99 and I-5, between SeaTac and Federal Way, a distance of approximately 7.6 miles. Between S. 200th Street and Kent-Des Moines

Road, alternatives along 30th Avenue S. and 24th Avenue S. were suggested during the early scoping period and were also considered.

Alternatives considered include different modes, profiles and alignments. Mode refers to the method of transportation, such as bus or light rail. Alignment refers to the horizontal location within a corridor, such as east side, west side, or in the median. Profile refers to a vertical location, such as above grade (elevated on columns), at-grade, below-grade (retained cut or tunnel), or mixture of one or more profile. Section 3.3 contains brief descriptions of alternatives not carried forward for further evaluation in Level 1. The alternatives evaluated in Level 1 are more fully described in Chapter 4.

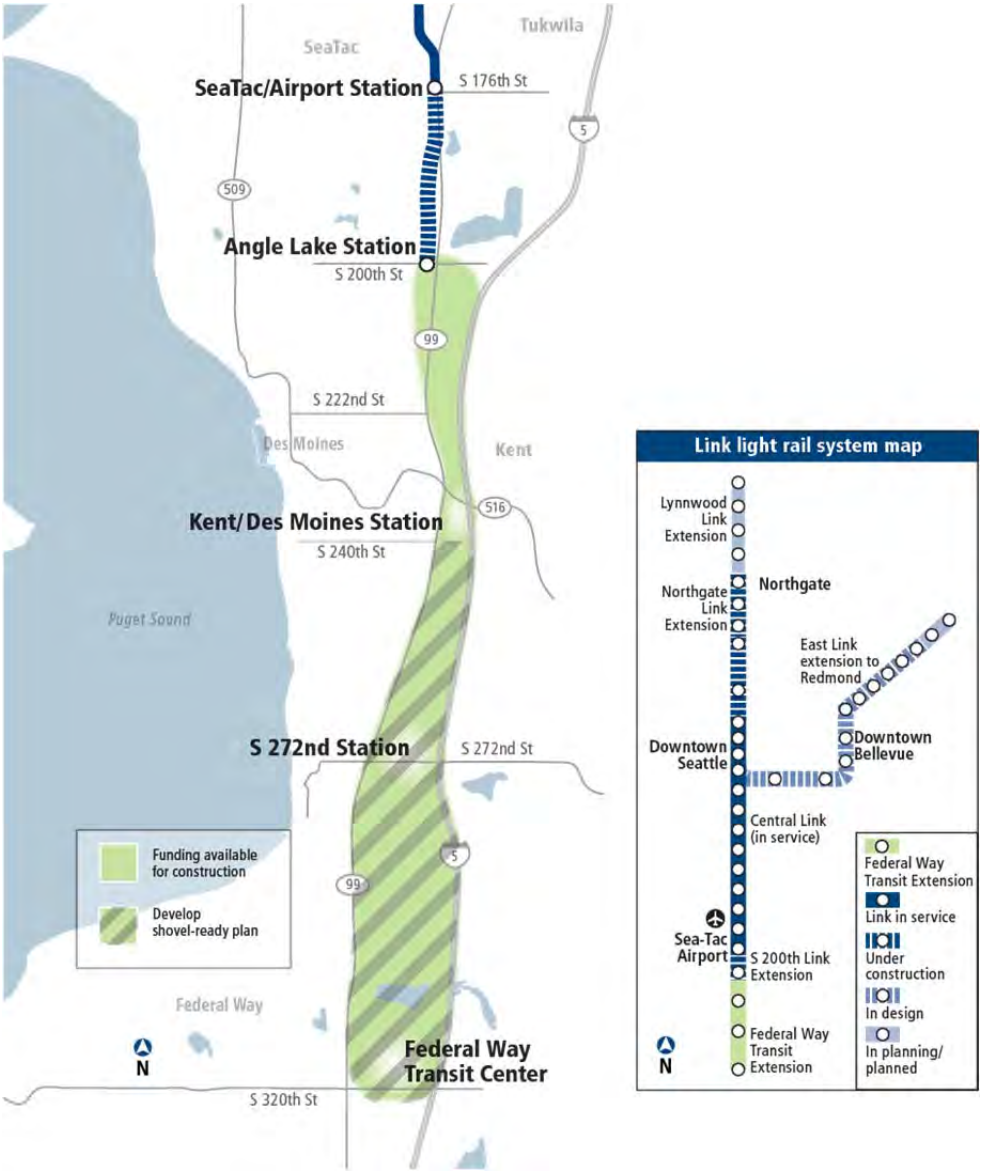

EXHIBIT 3-1
Project Area Map

Exhibit 3-2 illustrates the initial range of alternatives that were identified for the FWTE, which can generally be grouped as shown in **Table 3-1.**

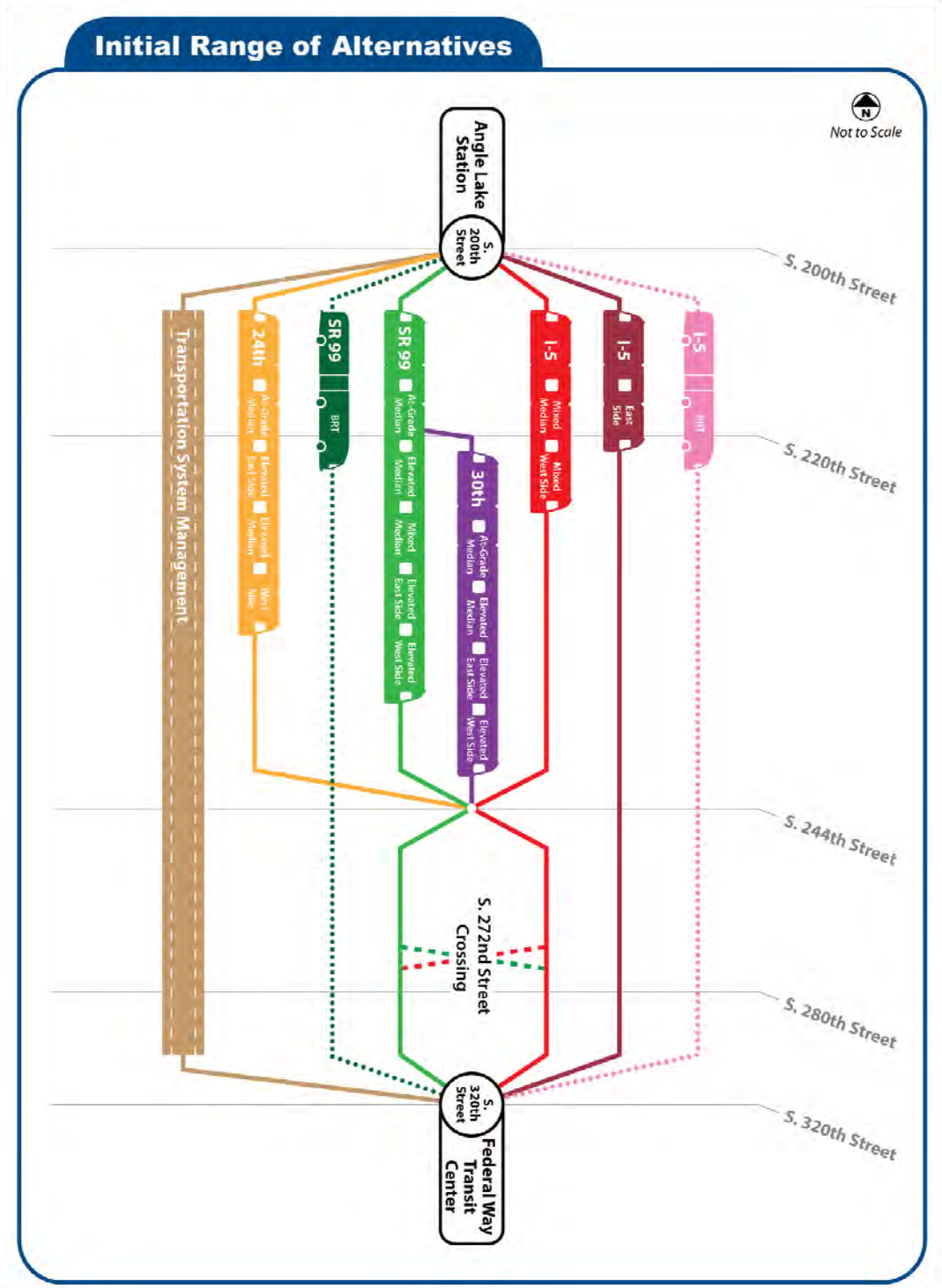

EXHIBIT 3-2
Initial Range of Alternatives

TABLE 3-1
Alternatives Initially Identified or Suggested During Early Scoping

Initial Alternative Types Considered		
Mode	Transportation System Management (TSM) Bus Rapid Transit (BRT) Light Rail Transit (LRT)	
Profile	At-grade Elevated Mixed at-grade/elevated Tunnel	
Alignment	SR 99	West Side
		Median
		East Side
	I-5	West Side
		Median
		East Side
	30th Avenue S.	West Side
		Median
		East Side
	24th Avenue S.	West Side
		Median
		East Side

3.2 Purpose and Need

The purpose of the Federal Way Transit Extension is to expand the Sound Transit Link light rail system from SeaTac to the cities of Des Moines, Kent, and Federal Way in King County in order to meet the following objectives:

- Provide a rapid, reliable, accessible, and efficient alternative for travel to and from the corridor and other urban growth and activity centers in the region with sufficient capacity to meet projected demand.
- Expand mobility alternatives to traveling on congested roadways and improve connections to the regional multimodal transportation system with peak and off-peak service.
- Provide the high-capacity transit (HCT) infrastructure to support adopted regional and local land use, transportation, and economic development plans.
- Advance the long-range vision, goals, and objectives for transit service established by the Sound Transit Long-Range Plan for high-quality regional transit service connecting major activity centers in King, Pierce, and Snohomish counties.
- Implement a financially feasible system that seeks to preserve and promote a healthy environment.

The following conditions within the project corridor demonstrate the need for the project:

- North-south transit demand is expected to grow by 30 to 40 percent by 2035 as a result of residential and employment growth in the FWTE corridor and regionally.
- The FWTE corridor population is a highly transit-dependent population with needs for efficient, reliable regional connectivity.
- Congestion on I-5 and on the key corridor arterials leading in and out of the study area will increase and further degrade existing transit performance and reliability.
- There is a lack of reliable and efficient peak and off-peak transit service connecting persons in the FWTE corridor with the region's growth centers.
- Regional and local plans call for HCT in the corridor consistent with Puget Sound Regional Council's (PSRC) *VISION 2040* and the *Regional Transit Long-Range Plan*.
- Implementing the project will help meet environmental and sustainability goals of the state and region, including reduced vehicle miles traveled and greenhouse gas emissions.

3.3 Alternatives Not Evaluated in Level 1

Mode refers to the type of transit service or transit investment. Previous transportation planning, including Sound Transit's regional long-range transit system planning, PSRC's metropolitan transportation planning, and voter-approved transit investment measures (i.e., the ST2 Plan) have prioritized the extension of light rail transit in the FWTE corridor. Local jurisdictions in the corridor have updated land use and transportation comprehensive plans in anticipation of the extension of light rail from the City of SeaTac to points south. These plans and studies are documented in the FWTE report titled, *Plan Review for High-Capacity Transit in the Project Corridor: S. 200th Street to Federal Way City Center* (Sound Transit, 2012).

Since initiating development and consideration of FWTE alternatives, FTA requirements for alternatives analyses have been in flux. Nonetheless, existing FTA guidance encourages consideration of a range of mode alternatives in the project development process, including lower-cost transit investments. In addition to light rail, other modes initially evaluated for the FWTE include transportation system management (TSM) and bus rapid transit (BRT). These modes were considered in light of existing FTA guidance and/or because they were suggested by members of the public during the early scoping period. Both TSM and BRT were determined not to meet the project purpose and need and were not evaluated in Level 1, as discussed in the following subsections, 3.3.1.1 and 3.3.1.2.

TABLE 3-2
Alternatives Not Evaluated in Level 1

Alternative Type	Alternative	Corridor
Mode	TSM	I-5 or SR 99
	BRT	I-5 or SR 99
Profile	Tunnel	SR 99
Alignment	East Side	I-5
	Crossing at S. 272nd Street	I-5/SR 99 Hybrid
	Behind Businesses	SR 99
	West Side	24th Avenue S.

3.3.1 Modes Evaluated in Pre-Screening, Not Evaluated in Level 1

Modes initially considered for the FWTE include bus, Transit System Management (TSM), and light rail. Alternatives utilizing bus transit include transportation system management, or TSM, and bus rapid transit (BRT). Both TSM and BRT were determined not to meet the project purpose and need and were not evaluated in Level 1, as discussed in the following subsections, 3.3.1.1 and 3.3.1.2.

Consistency with Local Plans

As described below, for several decades multiple regional and local land use and transportation plans have been anticipating high-capacity transit (HCT) in the FWTE corridor. Sound Transit intends to seek FTA New Starts funding which requires compliance with FTA guidance on planning. The most recent transportation funding bill, Moving Ahead for Progress in the 21st Century (MAP-21) eliminates the formal AA requirement from the New Starts Program and instead relies on the review of alternatives performed during the metropolitan planning and environmental processes.

The studies described below demonstrate that the regional planning and decision-making process have met the criteria and led appropriately and logically to the narrowing of mode alternatives in this corridor to light rail transit.

PSRC HCT Corridor Assessment (2004)

In 2004, PSRC conducted the HCT Corridor Assessment (PSRC, 2004), which applied regional travel demand forecasts to determine the relative potential of the corridor to support HCT. The study examined a range of HCT technologies including enhanced bus, bus rapid transit (BRT), light rail, monorail, sky train, and diesel multiple units. It considered the capacity, speed, and performance reliability of each mode. The study concluded that an HCT extension within the FWTE corridor would be a worthwhile investment for the region and local communities. “Corridor-wide land use characteristics and projected growth indicate that this corridor has sufficient land use activity and densities to support HCT in the future” (PSRC,

2004). The report suggests that as urban development continues in the FWTE study corridor, enhanced bus services are unlikely to keep pace with transit demand and that transit reliability will become increasingly difficult to maintain. The report notes that fixed-guideway exclusive rail technologies would have the greatest capability to maintain consistent transit service in the corridor, and to connect with other areas of the metropolitan region.

Sound Transit Regional Transit Long-Range Plan (2005)

The *Regional Transit Long-Range Plan*, adopted by Sound Transit in July 2005, modifies the region's earlier long-range transit plan adopted in 1996, *Sound Move*. The plan represents Sound Transit's goals, policies, and strategies to guide the long-term development of the HCT system through the year 2030 and beyond.

Before adopting the plan, Sound Transit conducted an extensive public outreach program and environmental review of specific plan elements in compliance with the State of Washington's State Environmental Policy Act (SEPA), culminating with the publication of the *Final Regional Transit Long-Range Plan Supplemental Environmental Impact Statement* (Final SEIS) in June 2005 (Sound Transit, 2005). The Long-Range Plan provided the basis for the current ST2 Plan and defined the vision for developing HCT throughout the region, including the FWTE project (identified in the ST2 Plan as the South Corridor).

The Final SEIS contains a series of recommendations for HCT corridors extending throughout the greater Seattle metropolitan region. The FWTE corridor is highlighted specifically among these corridors as a candidate corridor for LRT. The document expressly states that "Under the plan alternative, light rail would (be) include[d among] the following segments… a light rail extension south from SeaTac at S. 200th Street to downtown Tacoma, generally along the I-5 corridor, but also encompassing parallel arterial corridors such as SR 99" (Sound Transit, 2005).

Sound Transit 2 (2008)

In July 2008, the Sound Transit Board adopted Sound Transit 2: A Mass Transit Guide, the Regional Transit System Plan for Central Puget Sound (ST2). ST2 is a package of HCT investments in the regional transit system. Financing for the ST2 package was approved by the voters in November 2008 and includes Link light rail extensions, including:

> "Extension from SeaTac/Airport Station to Redondo/Star Lake with stations at South 200th, Highline Community College, and Redondo/Star Lake (page A-13, in Appendix A: Detailed Description of Facilities and Estimated Costs)."

Municipal Plans

The plans for the cities within the FWTE corridor (SeaTac, Des Moines, Kent, and Federal Way) each address improvements in the overall transit network, and mention extending Sound Transit HCT to the south. Plans that specify light rail as the mode of HCT in this corridor include the City of Des Moines Comprehensive Transportation Plan (2009) and the City of Kent Transportation Master Plan (2008).

3.3.1.1 Transportation System Management (SR 99 and I-5)

TSM was considered during the development of alternatives because it could be a lower-cost solution in the corridor, compared to other alternatives that require construction of new capital infrastructure, and because expansion of regional express service was suggested during the early scoping period by members of the public. A TSM alternative would include enhancements to the existing transportation system, including transit service such as improvements to existing RapidRide A Line service, bus priority treatments, expanded use of Business Access Transit (BAT) lanes, and expanded local and/or express service. The current services provided by King County Metro and Sound Transit have incorporated many of these features, such as use of BAT lanes on SR 99 from S. 320th Street in Federal Way to S. 200th Street in SeaTac, signal prioritization for the RapidRide A line along SR 99, and express service by both Metro and Sound Transit on I-5 beginning in Federal Way and with stops along the FWTE corridor.

Inability to Provide Efficient and Reliable Service

As described below, increased congestion and expected population and employment growth make it difficult for the TSM alternative to meet the growing needs for transit.

Increased Congestion

The TSM alternative would not meet the corridor purpose and need because of the projected increased congestion that will occur on both I-5 and SR 99 that would result in increased travel times and reduced reliability. I-5 and SR 99 are the only major north-south travel options in the FWTE corridor, and travel times are unreliable for many hours of the day as consistent congestion that occurs in the peak-periods is expected to extend the congestion outside of the typical commuting hours. I-5 between Federal Way and Seattle is currently congested for eight hours a day. With expected growth in the future congestion on I-5, by year 2035 congestion is expected to occur for as many as 11 hours out of the day between Federal Way and Seattle without programmed major investments along I-5 (PSRC Travel Demand Model, 2012). Along SR 99, Des Moines, Kent, and Federal Way long-range plans predict traffic congestion on SR 99 and key arterials will increase and up to 19

intersections would operate at Level of Service (LOS) F by the year 2035 without major investments in the area.

Population and Employment Growth

By 2035, north-south transit demand from Seattle south to the city of Tacoma and including the FWTE corridor is expected to grow by 30 to 40 percent as a result of residential and employment growth in the South King County and Pierce County areas (Sound Transit Ridership Model, 2012). PSRC's *VISION 2040* (PSRC, 2009), the regional growth strategy and land use plan, has called upon the two north and south transportation destinations at opposite ends of the FWTE corridor—Seattle and Tacoma—to accommodate 32 percent of the projected regional population growth and 42 percent of the regional employment growth. Similarly, the regional growth strategy calls for Kent and Federal Way to be two of the 14 core cities called upon to accommodate 22 percent of the region's population growth and 29 percent of its employment growth by the year 2040 (PSRC, 2009, Part II, page 8-9). Accommodating this expected growth with a TSM alternative is not realistic due to the limited potential for improvements to the existing transportation system and transit options. Additionally, the TSM alternative would require transfers to connect to existing light rail service and the regional connections that LRT provides, increasing travel times in the corridor.

Conclusion

The TSM alternative was dropped in the pre-screening step and not evaluated further in Level 1 because it would not be able to provide reliable and efficient two-way, peak and off-peak service within the FWTE corridor due to the increased transit demand expected in the corridor accompanied by the increased congestion on both I-5 and SR 99, which is associated with this growth. The existing transportation system and existing transit options already incorporate many TSM features, and transit options in this corridor cannot be improved substantially without at least a semi-exclusive right-of-way to eliminate the effect of increased congestion. It also would not provide a HCT solution that meets the needs of the corridor as planned for at the regional and local level.

3.3.1.2 Bus Rapid Transit (SR 99 and I-5)

Consideration of BRT on SR 99 and I-5 between S. 200th Street and Federal Way was suggested during the FWTE early scoping process by members of the public, and may be considered a lower cost alternative to light rail. BRT scenarios were considered for I-5 and SR 99. BRT would be an enhanced form of bus transit that includes a selection of features to improve travel time, such as exclusive right-of-way, signal prioritization and paying before

boarding, as well as specially designed stations and branded vehicles so that service would be easily identified and easy to use.

BRT already exists in the SR 99 corridor in the form of the King County Metro RapidRide A Line, which travels from the Federal Way Transit Center (FWTC) to the Tukwila International Blvd. Station with 25 stops and a travel time of approximately 40 minutes during peak hours. RapidRide A Line does not include some BRT features, such as exclusive right-of-way, and still uses on-board fare payment. For the BRT alternative on SR 99, exclusive right-of-way would need to be created for the buses to improve reliability and travel times. Grade separation at major intersections would be needed to improve travel times.

BRT on I-5 would use existing high-occupancy vehicle (HOV) lanes and the direct access ramps at S. 317th Street that provide access to the FWTC. Direct access ramps would be added at S. 200th Street, Kent-Des Moines Road and S. 272nd Street to access stations at these locations.

Inability to provide efficient and reliable regional transit connections

Providing BRT service in an exclusive or semi-exclusive right-of-way on SR 99 or I-5 would improve reliability and travel times compared to doing nothing or the TSM alternative. However, the BRT alternatives would still require a transfer to the regional light-rail system and lower vehicle capacity would reduce the ability of the buses to accommodate future transit demand. The BRT alternatives considered in the pre-screening step would result in a poor linkage to the regional transit system and would not provide an efficient connection between the FWTE study area and the region's activity centers because they would force riders to transfer at the Angle Lake Station at S. 200th Street. This forced transfer would add additional wait time (up to 8 minutes inbound based on future projected light rail transit (LRT) headways, plus the time to travel between the bus station and the elevated light rail station) to a person's travel time between the project study area and major destinations accessible via the existing Link system. An eight minute transfer (maximum that could occur) is equivalent to a maximum of 57% of the total LRT travel time (14 to 21 minutes depending on the alternative) projected between Federal Way and the Angle Lake Station.

Limited Capacity

The BRT alternatives would have less capacity than LRT even with the same planned headways. The person-capacity of the BRT system was calculated based upon the bus's seated capacity (with a factor for some standing passengers) and the planned headways during the peak period. This capacity would be 1,050 persons per hour (north and south directions combined). Light rail, however, can accommodate 8,000 (combined) persons per hour with four-car trains (as planned for by Sound Transit in 2035), even with the same

planned headways. BRT, therefore, would be more limited in its ability to meet future transit demand, even with similar operational characteristics.

Consistency with Local Plans

As discussed under Section 3.3.1, regional plans specifically identify a light rail extension south of S. 200th Street. The BRT alternatives would therefore not be consistent with these adopted local plans.

Conclusion

The BRT alternatives were identified for the pre-screening step but not carried forward for further evaluation in the Level 1 evaluation because of the greater travel time (compared to LRT) to regional destinations north of the Angle Lake Station (up 8 minutes additional travel time with transfer), lower passenger carrying capacity than LRT (over 8,000 persons per hour, combined), and incompatibility with existing local plans.

3.3.2 Profiles Evaluated in Pre-screening, Not Evaluated in Level 1

The light rail profile could be at-grade, elevated, or below grade in a retained cut or a tunnel. Light rail alternatives may consist of one or more profile types along the length of the alignment. The only profile suggested in the initial range of alternatives that was not carried forward to be evaluated in Level 1 was the tunnel profile, as discussed in Section 3.3.2.1.

3.3.2.1 Tunnel Profile

A tunnel profile was suggested by the City of Des Moines during early scoping as a way to minimize visual and noise impacts of the light rail alternatives as well as impacts to low-income neighborhoods.

Tunnel profiles are considered by Sound Transit only in specific situations due to the high cost and risk associated with tunnel construction. Generally, tunnel alignments are only considered to be a viable option under certain circumstances, which include:

- To avoid slopes over 3 to 4 percent
- Areas where right-of-way is inadequate for at-grade or elevated profiles
- Areas where surface land uses are sensitive for density (or other) reasons
- Areas where at-grade alternatives would severely impact traffic operations due to high traffic, ridership and frequency of trains
- Locating stations in high ridership areas that cannot be served in any other way

Conclusion

A tunnel alternative was evaluated in the pre-screening step but not carried forward for further evaluation in the Level 1 analysis. The FWTE project team has identified a number of alternatives to a tunnel that that meet the project purpose and need and that could be implemented in the FWTE corridor with less cost, risk, and potential impacts.

3.3.3 Light Rail Alignments Evaluated in Pre-Screening, Not Evaluated in Level 1

The light rail alignments identified during the alternatives identification process included alternatives along four different general routes: SR 99, I-5, 30th Avenue S., and 24th Avenue S. (see Exhibit 3-1). The following light rail alignments within these corridors were considered in the pre-screening but were not carried forward for further evaluation in Level 1:

- *I-5 Elevated East Side*: This alternative was suggested during early scoping by a member of the public. It would travel on the east side of I-5 from the proposed SR 509 right-of-way to either the station at S. 272nd Street or the FWTC.
- *I-5/SR 99 Alignments with a crossing at S. 272nd Street*: This combination of alternatives was suggested during early scoping by a member of the public. This light rail alignment would allow for a crossing between I-5 and SR 99, or vice versa, at approximately S. 272nd Street. One variation on the alignment would cross diagonally between these corridors between S. 260th Street and S. 272nd Street, while another variation would follow the S. 272nd roadway between these corridors.
- *SR 99 Elevated West Side (behind businesses*): This alternative was suggested during early scoping by a member of the public. The alignment would travel behind businesses on the west side of SR 99 to preserve street frontage commercial development.
- *24th Avenue S. West Side (all profiles):* The 24th Avenue S. alternatives were suggested during early scoping by a member of the public as a way to avoid impacts on SR 99. Alignments on the west side, median, and east side of 24th Avenue S. were considered. A west side alignment could be either at-grade or elevated.

A more detailed description of each of these alignments and a discussion of why they were not carried forward for evaluation in the Level 1 analysis is provided in the following subsections.

3.3.3.1 East Side of I-5

This light rail alignment alternative would travel in the proposed SR 509 right-of-way from the Angle Lake Light Rail Station to I-5, then cross to the east side of I-5 and follow I-5 south

to a station on the east side of I-5 at Kent-Des Moines Road. From this station, it would stay on the east side of I-5 until crossing back to the west side of I-5 to access a station at either the Star Lake Park-and-Ride at S. 272nd Street or the FWTC. This alternative was suggested during the early scoping period by a member of the public as a way to avoid utility conflicts on the west side of I-5, including the Highline Water District water towers, a Puget Sound Energy substation and the Midway Landfill.

Design/Construction Considerations

To cross I-5 this alignment would require a clear span structure in excess of 700 feet, requiring cast in place balanced segmental bridge construction. This structure type is typically five to six times the cost of the precast segmental 130 foot span maximum preferred by Sound Transit. It would substantially increase the cost of this alternative compared with other alignments along I-5. Construction would also require at least periodic closures of I-5 while crossings were being constructed, which would be avoidable with other I-5 alternatives.

Accessibility

This alternative would also affect the ability of communities, Highline Community College (HCC), and transit dependent populations in the SR 99 corridor to connect to the regional transportation system efficiently because of the greater distance to stations located on the east side of I-5 near Kent–Des Moines Road and S. 272nd Street. These stations would not serve the corridor populations as well as alignments on the west side of I-5 or those along SR 99. Most routes on SR 99 are north-south and would require a transfer to another route that travels east-west on Kent Des Moines Road or would require up to a half mile walk from stops on SR 99, adding to their travel time and reducing the attractiveness and convenience of LRT service to riders.

Consistency with Local Plans

This alternative would not be consistent with the Midway Subarea Plan (City of Kent, 2012), which identifies a future light rail station between SR 99 and I-5 south of Kent-Des Moines Road. A station on the east side of I-5 would not support the development of transit oriented development (TOD) in this part of the Midway Subarea. The area east of I-5 is within the Midway Subarea, but is not planned for TOD, and I-5 would be a barrier between this station and the area planned for TOD on the west side of I-5.

Conclusion

The I-5 east side light rail alternative would have extra cost and engineering challenges of crossing all lanes of I-5 twice, reduced accessibility for riders (especially transit dependent populations) compared to other alignments along I-5 or SR 99, and would not be consistent with local plans. For these reasons, it was not carried forward for evaluation in Level 1.

3.3.3.2 I-5/SR 99 Hybrid with crossing at S. 272nd Street

This alternative was suggested at early scoping meetings and was intended to allow for a possible connection between alignments on SR 99 and I-5 along S. 272nd Street.

This alternative would have two right angle curves that would require speeds be reduced to ten mph or less. It would add approximately one half mile of east-west travel that would increase the overall travel time. Both of these factors would likely have a negative effect on ridership. Additionally, the alignment would cross a valley and require an elevated structure. Columns of 50 feet or taller would be needed to maintain the maximum Sound Transit LRT grade of four percent. Columns of this height, along with the longer length of the alternative, would increase the cost of this alternative relative to other alternatives without similar structures. Lastly, S. 272nd Street currently exceeds its traffic operational capacity. Taking traffic lanes for LRT is unlikely to be considered acceptable by local jurisdictions because it would worsen traffic. Locating the LRT on either side of the road would result in displacing approximately ten multi-family buildings, and an alignment on the north side of S. 272nd Street could have wetland and Section 6(f) impacts.

Conclusion

Due to the increased travel time, potential to reduce ridership, expected higher costs, and potential impacts to residences, wetlands and Section 6(f) resources, this option was not carried forward for further evaluation in Level 1.

3.3.3.3 SR 99 Light Rail West Side (Behind Businesses on West Side of SR 99)

Identified by a member of the public at an early scoping meeting, this alternative alignment was proposed as a way to minimize right-of-way acquisition from existing businesses fronting SR 99, to maintain access for existing businesses along the west side of SR 99, and to minimize possible limitations on future development that could occur from placement of columns adjacent to SR 99. Between the Angle Lake Station and Kent-Des Moines Road, this alternative would not be directly within the SR 99 right-of-way but would run on an elevated guideway in front of or behind businesses set back some distance to the west of SR 99.

This alignment would include multiple relatively sharp curves in order to minimize the number of property acquisitions, displacements, and potential impacts to properties (such as access, noise, and vibration), which would increase the project cost and would reduce travel speeds from the target of 55 mph to as low as 10 mph in some places. The slower speed and longer travel time would likely decrease ridership. To avoid the businesses along SR 99, there would be displacements of approximately five businesses behind these properties as well as ten or more multi-family residential buildings and 15 or more single family residences, which is a greater impact than if the alignment was directly adjacent to the west side of SR 99.

Conclusion

This alternative was not carried forward for further evaluation in Level 1 because the cost would be higher than similar alternatives that travel along SR 99, travel times would be slower, ridership would be lower, and it would result in more business and residential displacements.

3.3.3.4 Light Rail 24th Avenue S. West Side (all profiles)

This light rail alignment would be elevated on the west side along the two-lane 24th Avenue S. between approximately S. 204th Street and Kent-Des Moines Road. This road currently only exists between S. 208th Street and Kent-Des Moines Road, and adjacent land uses are primarily residential with three churches, three schools, a fire station and a park. The road is expected to be upgraded to four lanes between S. 208th Street and S. 216th Street to accommodate the future Des Moines Creek Business Park proposed on the west side of the road on vacant land. There are no plans to change the configuration of 24th Avenue S. between S. 216th Street and Kent-Des Moines Road and it is expected to remain a local collector road serving the existing residential neighborhood.

An alignment on the west side of the road would be the only alternative to have direct impacts to Steven J. Underwood Memorial Park, a resource protected under Section 4(f) of the Department of Transportation Act that must be avoided if there are other feasible and prudent alternatives. In addition, the alignment would pass directly in front of Midway Elementary and Pacific Middle School, also potential Section 4(f) resources. Lastly, this alignment would likely require reconstruction or relocation of South King Fire Station #26, which is within 20 feet of the western curb line of 24th Avenue S.

Conclusion

This alternative was not carried forward for further evaluation in Level 1 because it would have direct park impacts, it would impact community facilities and would require the displacement of a fire station.

3.4 Summary

This chapter describes the alternatives identified and considered during the pre-screening but not carried forward for further study in the Level 1 evaluation. The alternatives remaining for the Level 1 evaluation are shown on Exhibit 3-3 in color, while those not evaluated further are shown in gray. Chapter 4 provides a definition of the alternatives evaluated in Level 1 and the Level 1 analysis is described in Chapters 5 through 7.

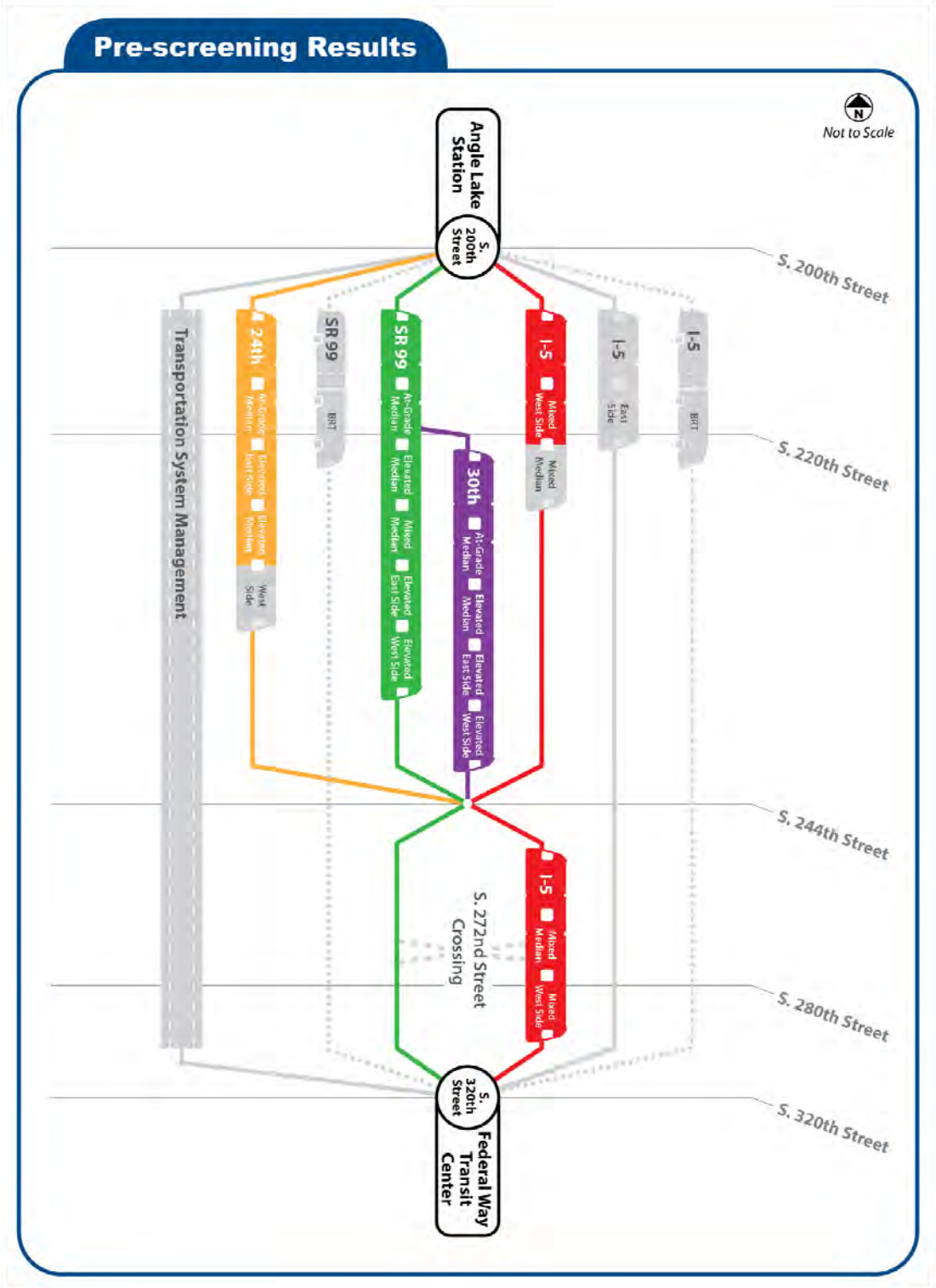

EXHIBIT 3-3
Pre-Screening Results

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4.0 Definition of Level 1 Alternatives

The purpose of this chapter is to define the alternatives evaluated during Level 1. As discussed in Chapter 3, Pre-Screening of Alternatives, non-light rail alternatives were considered but are not evaluated in Level 1. Therefore, all alternatives discussed in this chapter are light-rail alternatives. **Exhibit 4-1** shows the alternatives remaining after pre-screening.

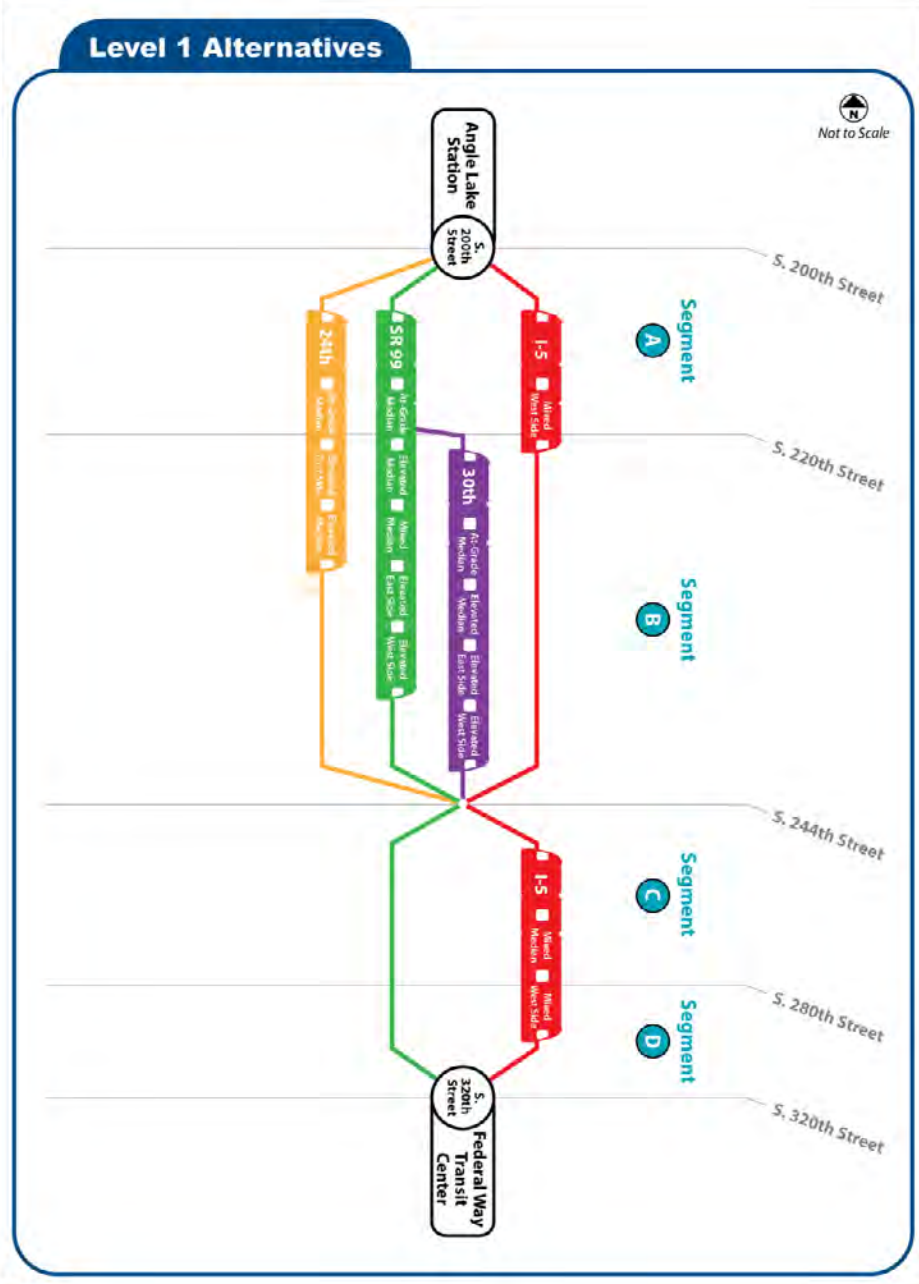


Exhibit 4-1
Level 1 Alternatives

4.1 Overview of Alternatives

For each alternative, there are multiple profile and alignment options included in the Level 1 alternatives evaluation. Alternative profiles (vertical location) include at-grade, elevated, and a combination of both at-grade and elevated, referred to as a "mixed" profile. Alignments (horizontal location) include the light rail within the roadway median, the east side of the roadway, or the west side of the roadway within each corridor.

The alternatives evaluated in Level 1 include those in 4 corridors, as listed in **Table 4-1**. This table also identifies the origin of each alternative.

Table 4-1
Level 1 Alternatives

Corridor	Alternative	Source
SR 99	At-grade Median	Identified in previous planning studies, suggested by public and agencies during early scoping.
	Mixed Median	
	Elevated Median	
	Elevated West Side	
	Elevated East Side	
I-5	Mixed West Side	Identified in previous planning studies, suggested by public and agencies during early scoping.
	Mixed Median	
30th Avenue S.	At-grade Median	Suggested by the City of Des Moines during early scoping.
	Elevated Median	
	Elevated West Side	
	Elevated East Side	
24th Avenue S.	At-grade Median	Suggested by members of the public during early scoping.
	Elevated Median	
	Elevated East Side	

For the Level 1 evaluation, the entire corridor was divided in segments to allow for easier comparison within areas where major differences occur. The SR 99 and I-5 alternatives would be for the full corridor length, from the Angle Lake Station to the Federal Way Transit Center (FWTC). The 30th Avenue S. and 24th Avenue S. alternatives would only occur in the northern half of the corridor, and could connect with either a SR 99 or an I-5 alternative south of the proposed station at S. 240th Street. For the purposes of data collection and comparison in the Level 1 analysis, it was assumed 30th Avenue S. and 24th Avenue S. alternatives would connect to the SR 99 Elevated Median alternative.

These segments are:

- Segment A: S. 200th Street to S. 220th Street. Within Segment A, there are distinct alignments along SR 99, I-5 and 24th Avenue S.

- Segment B: S. 220th Street to S. 244th Street. This segment would include a station at approximately S. 240th Street for all alternatives. Within Segment B, there are distinct alignments along SR 99, I-5, 30th Avenue S. and 24th Avenue S.
- Segment C: S. 244th Street to S. 280th Street. This segment would have a station at approximately S. 272nd Street. Within Segment C, there are distinct alignments along SR 99 and I-5 only.
- Segment D: S. 280th Street to S. 320th Street. This segment would have a station in the approximate vicinity of the Federal Way Transit Center. Within Segment D, there are distinct alignments along SR 99 and I-5 only.

Breaking down each alternative within these segments not only allows for a better understanding of where differences occur between alternatives and along the corridor, but can also allow for combinations of alternative components in order to avoid impacts in one segment while taking advantage of benefits in another segment. This also keeps poor performance or impacts in one segment from precluding higher-performing segments of the alternative from being evaluated in Level 2.

Some criteria used in the Level 1 evaluation focuses on areas where the light rail alternatives would be accessed (potential station areas). These access areas are listed in **Table 4-2** for the SR 99 and I-5 alternatives. Access areas for the 30th Avenue S. and 24th Avenue S. alternatives would be the same as the alternatives they would connect to (either SR 99 or I-5).

Table 4-2
Level 1 Access Areas

Corridor	Access Areas	Segment
SR 99	S. 240th St.	B
	S. 272nd St.	C
	S. 320th St.	D
I-5	S. 240th St.	B
	S. 272nd St.	C
	S. 320th St.	D

4.2 Description of Alternatives

This section includes a one-page summary for each alternative that includes a brief description of the alternative, a plan view of the alignment, and a typical cross-section.

SR 99 At-Grade Median

The SR 99 At-Grade Median Alternative would be **At-Grade in the median of SR 99 from Angle Lake Station to FWTC**. SR 99 is a six-lane state route with four general purpose lanes, two Business Access and Transit (BAT) lanes, and a landscaped median that limits left turns and U-turns except at signalized intersections or designated locations. The alternative would depart Angle Lake Station on an elevated guideway, cross into the SR 99 median in the vicinity of the proposed SR 509 extension near S. 208th Street, and transition to an at-grade profile between the northbound and southbound lanes of SR 99. The guideway would pass through cross-street intersections at-grade, including S. 216th Street, S. 224th Street, Kent-Des Moines Road (SR 516), S. 240th Street, S. 272nd Street, S. 288th Street, Dash Point Road, and S. 312th Street, before ending at FWTC. This alternative would have stations at approximately S. 240th Street, S. 272nd Street and FWTC.

This alternative would require:

- Widening the roadway to one or both sides, as well as extra widening at the S. 240th Street and S. 272nd Street station locations
- Utility relocations
- Signalized intersections at all locations where vehicular and pedestrian traffic crosses
- Passing through the busy Kent-Des Moines Road and S. 272nd Street intersections at-grade

At-grade LRT in the median of a street operates at speeds restricted by safety considerations.

The maximum speed for semi-exclusive right-of-way with at-grade crossings is 35mph unless full railroad crossing gates are used, in which case the speed can exceed 35 mph.

Proposed condition looking north (Not to Scale)

EXHIBIT 4-2
SR 99 At-Grade Median

SR 99 Mixed Median

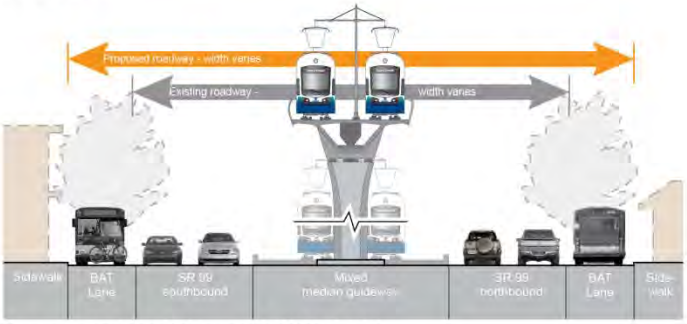
The SR 99 Mixed Median Alternative would be **mixed-profile in the middle of SR 99 from Angle Lake Station to FWTC**. SR 99 is a six-lane state route with four general purpose lanes, two Business Access and Transit (BAT) lanes, and a landscaped median that limits left turns and U-turns except at signalized intersections or designated locations. The alternative would depart Angle Lake Station on an elevated guideway, cross into the SR 99 median in the vicinity of the proposed SR 509 extension near S. 208th Street, and transition to an at-grade profile between the northbound and southbound lanes of SR 99, except at Kent-Des Moines Road (SR 516) and S. 272nd Street, which would each be crossed with short lengths of elevated, grade-separated guideway. This alternative would have stations at approximately S. 240th Street, S. 272nd Street and FWTC.

This alternative would require:

- Widening the roadway to one or both sides, as well as extra widening at the S. 240th Street and S. 272nd Street station locations
- Utility relocations (including high-voltage transmission lines and possibly a high-pressure gas main)
- Signalized intersections at all locations where vehicular and pedestrian traffic crosses
- Grade-separated crossings of the busy Kent-Des Moines Road and S. 272nd Street intersections

At-grade LRT in the median of a street operates at speeds restricted by safety considerations.

The maximum speed for semi-exclusive right-of-way with at-grade crossings is 35mph unless full railroad crossing gates are used, in which case the speed can exceed 35 mph.



Proposed condition looking north (Not to Scale)

EXHIBIT 4-3
SR 99 Mixed Median

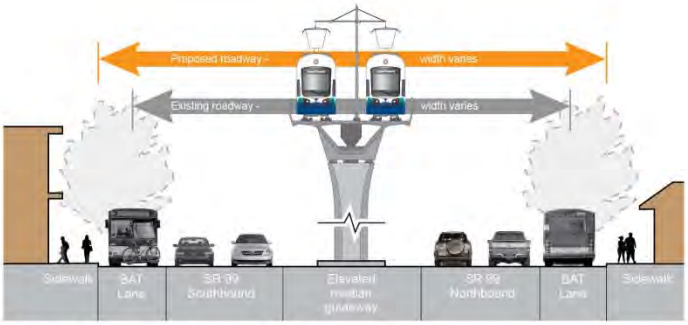
SR 99 Elevated Median

The SR 99 Elevated Median Alternative would be **an elevated light rail guideway in the middle of SR 99 from Angle Lake Station to FWTC**. SR 99 is a six-lane state route with four general purpose lanes, two Business Access and Transit (BAT) lanes, and a landscaped median that limits left turns and U-turns except at signalized intersection or designated locations. The alternative would depart Angle Lake Station on an elevated guideway, cross into the SR 99 median in the vicinity of the proposed SR 509 extension near S. 208th Street, and remain elevated between the northbound and southbound lanes of SR 99. Crossings of all streets would be grade-separated. This alternative would have stations at approximately S. 240th Street, S. 272nd Street and FWTC.

This alternative would require:

- Some roadway widening on one or both sides
- Extra widening at the S. 240th Street and S. 272nd Street station locations
- Utility relocations (including high-voltage transmission lines and possibly a high-pressure gas main)
- Prohibiting left turns under the guideway
- Long spans at most intersections which result in roadway widening at those intersections to accommodate left-turn lane capacity displaced by the guideway
- Cause minimal to no degradation of service at existing intersections

Because this alternative would operate in an exclusive, grade-separated right-of-way, trains could travel at speeds up to **55 mph**.



Proposed condition looking north (not to scale)

EXHIBIT 4-4
SR 99 Elevated Median

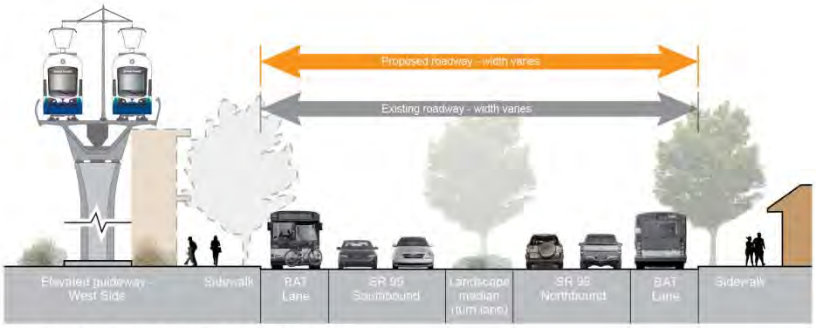
SR 99 Elevated West Side

The SR 99 Elevated West Side Alternative would construct **an elevated light rail guideway on the west side of SR 99 from Angle Lake Station to FWTC**. SR 99 is a six-lane state route with four general purpose lanes, two Business Access and Transit (BAT) lanes, and a landscaped median that limits left turns and U-turns except at signalized intersections or designated locations. The alternative would depart Angle Lake Station on an elevated guideway and continue to the west side of SR 99 in the vicinity of the proposed SR 509 extension near S. 208th Street, and remain elevated through to FWTC. This alternative would have stations at approximately S. 240th Street, S. 272nd Street and FWTC. Crossings of all streets would be grade-separated.

This alternative would:

- Avoid most potential reconstruction of SR 99
- Require utility relocations (including high-voltage transmission lines and possibly a high-pressure gas main)
- Permit turning movements under the guideway
- Require right-of-way acquisition on the west side of the roadway
- Require a setback from SR 99 to permit sight distance for drivers
- Cause minimal to no degradation of service at existing intersections

Because this alternative would operate in an exclusive, grade-separated right-of-way, trains could travel at speeds up to **55 mph**.



Proposed condition looking north (not to scale)

EXHIBIT 4-5
SR 99 Elevated West Side

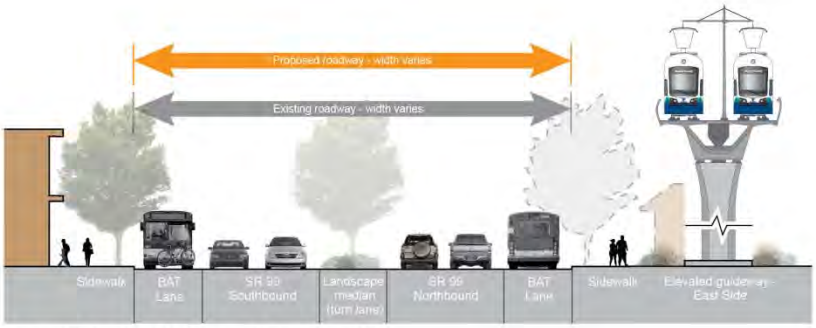
SR 99 Elevated East Side

The SR 99 Elevated East Side Alternative would be **elevated on the east side of SR 99 from Angle Lake Station to FWTC**. SR 99 is a six-lane state route with four general purpose lanes, two Business Access and Transit (BAT) lanes, and a landscaped median that limits left turns and U-turns except at signalized intersections or designated locations. The alternative would depart Angle Lake Station on an elevated guideway, cross SR 99 in the vicinity of the proposed SR 509 extension near S. 208th Street, and remain elevated on the east side of SR 99. This alternative would have stations at approximately S. 240th Street, S. 272nd Street and FWTC. Crossings of all streets would be grade-separated.

This alternative would:

- Avoid most potential reconstruction of SR 99
- Require utility relocations (including high-voltage transmission lines and possibly a high-pressure gas main)
- Permit turning movements under the guideway
- Require right-of-way acquisition on the east side of the roadway
- Require a setback from SR 99 to permit sight distance for drivers
- Cause minimal to no degradation of service at existing intersections

Because this alternative would operate in an exclusive, grade-separated right-of-way, trains could travel at speeds up to **55 mph**.



Proposed condition looking north (not to scale)

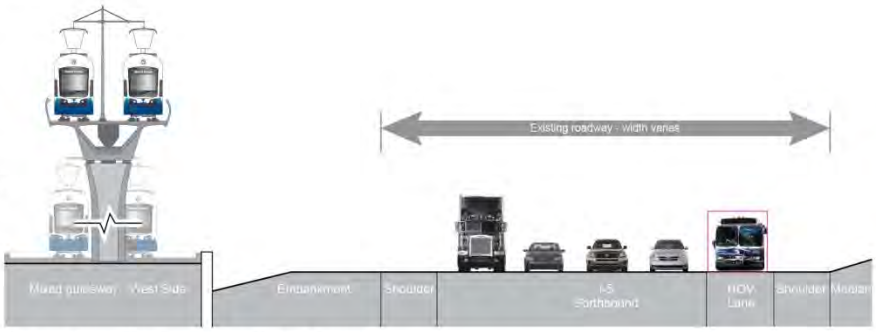
EXHIBIT 4-6
SR 99 Elevated East Side

I-5 Mixed West

The I-5 Mixed West Alternative would be **a mixed-profile alignment on the west side of I-5 from Angle Lake Station to FWTC**. The alternative would depart Angle Lake Station on an elevated guideway, cross SR 99 and the proposed SR 509 on long-span structures, run along the south side of the proposed SR 509 right-of-way to I-5, and then turn south into the west side of the I-5 right-of-way. The guideway would primarily remain in the I-5 right-of-way and pass over S. 216th Street, Kent-Des Moines Road (SR 516), S. 259th Place, S. 272nd Street, Military Road S., S. 288th Street, and Military Road S. once again before turning west at S. 317th Street to access FWTC. This alignment would run in close proximity to the Highline Water District storage tanks, Puget Sound Energy's Midway Switch Station, Midway Landfill, Mark Twain Elementary School and Truman High School. This alternative would have stations at approximately S. 240th Street, S. 272nd Street and FWTC. The alternative would utilize either at-grade or elevated guideway construction depending on requirements related to track profile, roadway crossings, cost, and other notable obstacles.

Crossing Midway Landfill would require extensive investigation into waste mitigation and construction solutions. Right-of-way acquisition outside the WSDOT corridor would be minimal and there would be few utility relocations, although some high-voltage transmission line crossings would need to be raised. There would be minimal to no degradation of service on parallel or crossing roadways.

Because this alternative would operate in an exclusive, grade-separated right-of-way, trains could travel at speeds up to **55 mph**.



Proposed condition looking north (not to scale)

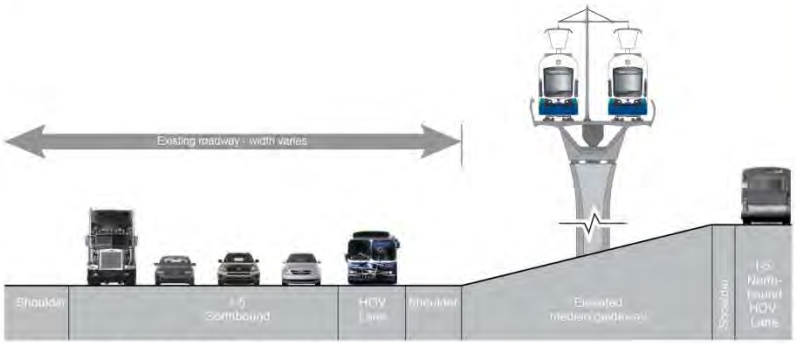
EXHIBIT 4-7
I-5 Mixed West Side

I-5 Mixed West/Median

The I-5 Mixed West/Median Alternative would be **a mixed-profile alignment along I-5 from Angle Lake Station to FWTC**. The alternative would depart Angle Lake Station on an elevated guideway, cross SR 99 and the proposed SR 509 on long-span structures, run along the south side of the proposed SR 509 right-of-way to I-5, and then turn south into the west side of the I-5 right-of-way. At approximately S. 240th Street, the alignment would transition into the median between the northbound and southbound lanes of I-5. This alignment would run in close proximity to the Highline Water District storage tanks and Puget Sound Energy's Midway Switch Station. The primary purpose of this alternative is to avoid the complex issues associated with crossing Midway Landfill. For the purpose of the Level 1 evaluation, the alternative is assumed to continue in the I-5 median to S. 317th Street, though it would return to a west-side alignment at any point south of the landfill. The median alignment would cross S. 259th Place, S. 272nd Street, Military Road S., S. 288th Street, and Military Road S. once again before turning west at S. 317th Street to re-cross the I-5 southbound lanes and access FWTC. This alternative would have stations at approximately S. 240th Street, S. 272nd Street and FWTC.

Right-of-way acquisition outside the WSDOT corridor would be minimal and there would be few utility relocations, although some high-voltage transmission line crossings would need to be raised. There would be minimal to no degradation of service on parallel or crossing roadways.

Because this alternative would operate in an exclusive, grade-separated right-of-way, trains could travel at speeds up to **55 mph**.



Proposed condition looking north (not to scale)

EXHIBIT 4-8
I-5 Mixed West Median

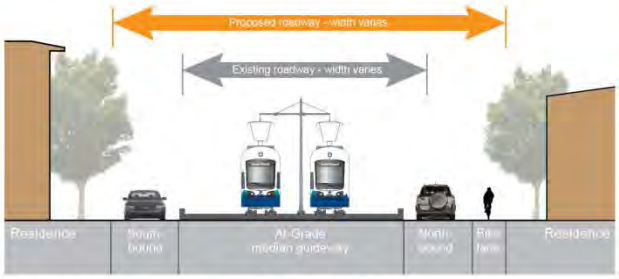
30th Avenue S. At-Grade Median

The 30th Avenue S. At-Grade Median Alternative would be **at-grade in the middle of 30th Avenue S. between S. 224th Street and S. 240th Street.** It would connect to the SR 99 Elevated Median Alternative to the north, and near the intersection of SR 99 and S. 220th Street the guideway would transition east to intersect the 30th Avenue S. corridor at-grade, which would be at a higher elevation than SR 99. 30th Avenue S. is currently a two-lane residential street with a shoulder on the southbound side, a bike lane on the northbound side and minimal sidewalks. From S. 224th Street, the guideway would run south along 30th Avenue S. across Kent-Des Moines Road to S. 240th Street. Near S. 240th Street the guideway would transition to an elevated alignment and could connect to any alternative in the SR 99 or I-5 corridors; for purposes of this analysis, it was assumed to connect to the SR 99 Elevated Median Alternative.

An at-grade guideway would require:

- Complete reconstruction of the roadway, which would include utility relocations
- Prohibiting left turns except at signalized intersections
- Signalized intersections at all locations where vehicular and pedestrian traffic crosses
- Crossing Kent-Des Moines Road at-grade adjacent to the I-5 interchange

At-grade LRT in the median of a street operates at speeds restricted by safety considerations. In the configuration proposed here, the speed limit of **25 mph** on 30th Avenue S. would govern trains as well.



Proposed condition looking north (not to scale)

EXHIBIT 4-9
30th Avenue S. At-Grade Median

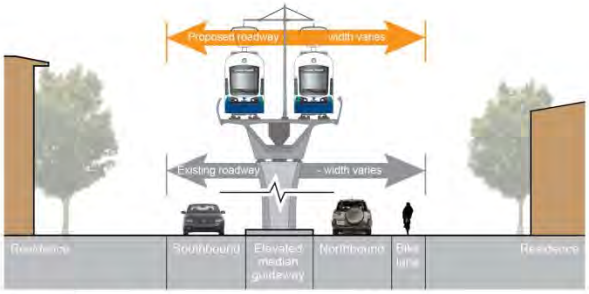
30th Avenue S. Elevated Median

The 30th Avenue S. Elevated Median Alternative would be **elevated in the middle of 30th Avenue S. between S. 224th Street and S. 240th Street.** It would connect to the SR 99 Elevated Median Alternative to the north, and near the intersection of SR 99 and S. 220th Street the guideway would transition east to intersect the 30th Avenue S. corridor, which would be at a higher elevation than SR 99. 30th Avenue S. is currently a two-lane residential street with a shoulder on the southbound side, a bike lane on the northbound side and minimal sidewalks. From S. 224th Street, the guideway would run south in the center of 30th Avenue S. across Kent-Des Moines Road to S. 240th Street, where it could connect to any alternative in the SR 99 or I-5 corridors; for purposes of this analysis, it was assumed to connect to the SR 99 Elevated Median Alternative. Crossings of all streets would be grade-separated.

This alternative would require:

- Complete reconstruction of the roadway
- Continuous barrier in the median, except at signalized intersections, which would prohibit left turns under the guideway
- Long spans at the Kent-Des Moines Road crossing
- Utility relocations (including high-voltage transmission lines)

Because this alternative would operate in an exclusive, grade-separated right-of-way, trains could travel at speeds up to **55 mph.**



Proposed condition looking north (not to scale)

EXHIBIT 4-10
30th Avenue S. Elevated Median

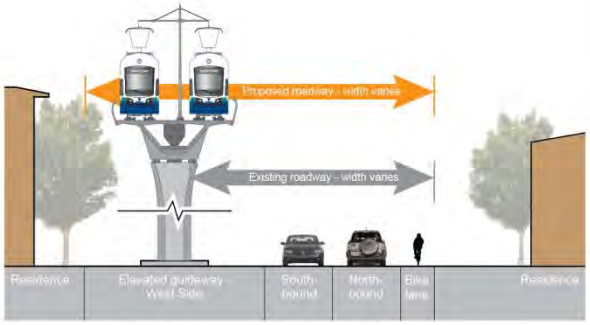
30th Avenue S. Elevated West Side

The 30th Avenue S. Elevated West Side Alternative would be **elevated along the west side of 30th Avenue S. between S. 224th Street and S. 240th Street.** It would connect to the SR 99 Elevated Median Alternative to the north, and near the intersection of SR 99 and S. 220th Street the guideway would transition east to intersect the 30th Avenue S. corridor, which would be at a higher elevation than SR 99. 30th Avenue S. is currently a two-lane residential street with a shoulder on the southbound side, a bike lane on the northbound side and minimal sidewalks. From S. 224th Street, the guideway would run south along the west side of 30th Avenue S. across Kent-Des Moines Road to S. 240th Street, where it could connect to any alternative in the SR 99 or I-5 corridors; for purposes of this analysis, it was assumed to connect to the SR 99 Elevated Median Alternative. Crossings of all streets would be grade-separated.

This alternative would:

- Require complete reconstruction of the roadway
- Require a setback from 30th Avenue S. to permit sight distance for drivers
- Permit turning movements under the guideway
- Require right-of-way acquisition of the west side of the road
- Require long spans at the Kent-Des Moines Road crossing
- Avoid conflict with the east-side high-voltage transmission line

Because this alternative would operate in an exclusive, grade-separated right-of-way, trains could travel at speeds up to **55 mph.**



Proposed condition looking north (not to scale)

EXHIBIT 4-11
30th Avenue S. Elevated West Side

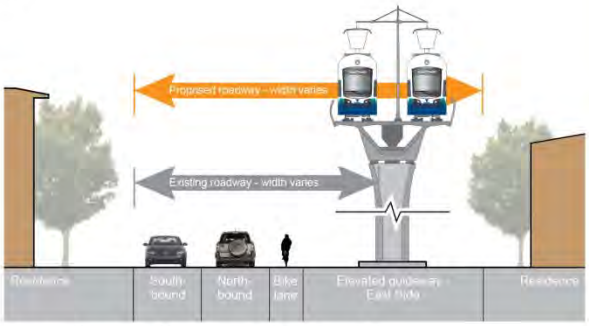
30th Avenue S. Elevated East Side

The 30th Avenue S. Elevated East Side Alternative would be **elevated along the east side of 30th Avenue S. between S. 224th Street and S. 240th Street.** It would connect to the SR 99 Elevated Median Alternative to the north, and near the intersection of SR 99 and S. 220th Street the guideway would transition east to intersect the 30th Avenue S. corridor, which would be at a higher elevation than SR 99. 30th Avenue S. is currently a two-lane residential street with a shoulder on the southbound side, a bike lane on the northbound side and minimal sidewalks. From S. 224th Street, the guideway would run south along the east side of 30th Avenue S. across Kent-Des Moines Road to S. 240th Street, where it could connect to any alternative in the SR 99 or I-5 corridors; for purposes of this analysis, it was assumed to connect to the SR 99 Elevated Median Alternative. Crossings of all streets would be grade-separated.

This alternative would:

- Require complete reconstruction of the roadway
- Permit turning movements under guideway
- Require a setback from 30th Avenue S. to permit sight distance for drivers
- Require long spans at the Kent-Des Moines Road crossing
- Require right-of-way acquisition and utility relocations (including high-voltage transmission lines)

Because this alternative would operate in an exclusive, grade-separated right-of-way, trains could travel at speeds up to **55 mph.**



Proposed condition looking north (not to scale)

EXHIBIT 4-12
30th Avenue S. Elevated East Side

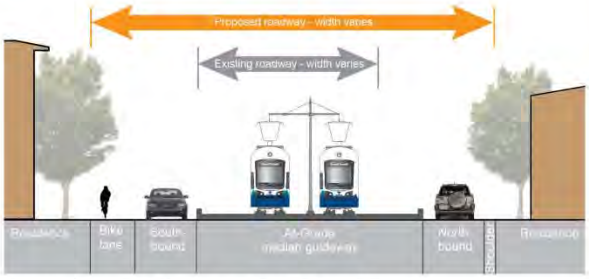
24th Avenue S. At-Grade Median

The 24th Avenue S. At-Grade Median Alternative would be **at-grade in the middle of 24th Avenue S. between approximately S. 208th Street and Kent-Des Moines Road.** 24th Avenue S. is a two-lane minor collector road with a south-bound bike lane between S. 216th Street and Kent-Des Moines Road, and minimal sidewalks. After departing Angle Lake Station, the guideway would continue elevated over S. 204th Street, then turn southwest and begin descending to cross the proposed SR 509 right-of-way and a topographic valley. The guideway would transition to at-grade in the center of 24th Avenue S. near S. 208th Street. Due to the presence of schools, a fire station, and a park west of 24th Avenue S., an at-grade median configuration would require leaving the southbound lane in place and shifting the northbound lane east to accommodate the guideway. Near S. 226th Street, the guideway would transition to elevated and head southeast along Kent-Des Moines Road to return to the SR 99 corridor and connect to the proposed station at S. 240th Street. After this station, the guideway could connect to any alternatives in the SR 99 or I-5 corridors; for purposes of this analysis, it was assumed to connect to the SR 99 Elevated Median Alternative.

This alternative would require:

- Roadway widening on the east side of 24th Avenue S.
- Prohibiting left turns except at signalized intersections
- Utility relocation (including high-voltage transmission lines and possibly a high-pressure gas main)
- Signalized intersections at all locations where vehicular and pedestrian traffic crosses
- Right-of-way acquisition on the east side of the road

At-grade LRT in the median of a street operates at speeds restricted by safety considerations. In the configuration proposed here, the speed limit of **25 mph** on 24th Avenue S. would govern trains as well.



Proposed condition looking north (not to scale)

EXHIBIT 4-13
24th Avenue S. At-Grade Median

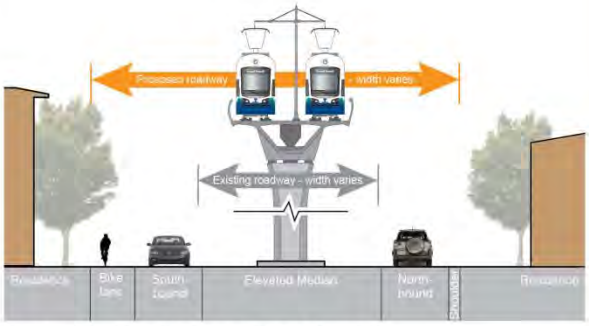
24th Avenue S. Elevated Median

The 24th Avenue S. Elevated Median Alternative would be **elevated in the middle of 24th Avenue S. between approximately S. 208th Street and Kent-Des Moines Road.** 24th Avenue S. is a two-lane minor collector road with a south-bound bike lane between S. 216th Street and Kent-Des Moines Road, and minimal sidewalks. After departing Angle Lake Station, the guideway would continue elevated over S. 204th Street, then turn southwest and begin descending to cross the proposed SR 509 right-of-way and a topographic valley. The guideway would remain elevated and run in the center of 24th Avenue S. beginning near S. 208th Street. Due to the presence of schools, a fire station, and a park west of 24th Avenue S., an elevated median configuration would require leaving the southbound lane in place and shifting the northbound lane east to accommodate the guideway. The guideway would then head southeast along Kent-Des Moines Road to return to the SR 99 corridor and connect to the proposed station at S. 240th Street. After this station, the guideway could connect to any alternatives in the SR 99 or I-5 corridors; for purposes of this analysis, it was assumed to connect to the SR 99 Elevated Median Alternative.

This alternative would require:

- Roadway widening on the east side of 24th Avenue S.
- A continuous barrier in the median, except at signalized intersections
- Prohibiting left turns except at signalized intersections
- Utility relocation (including high-voltage transmission lines and possibly a high-pressure gas main)
- Signalized intersections at all locations where vehicular and pedestrian traffic crosses
- Right-of-way acquisition on the east side of the road

Because this alternative would operate in an exclusive, grade-separated right-of-way, trains could travel at speeds up to **55 mph.**



Proposed condition looking north (not to scale)

EXHIBIT 4-14
24th Avenue S. Elevated Median

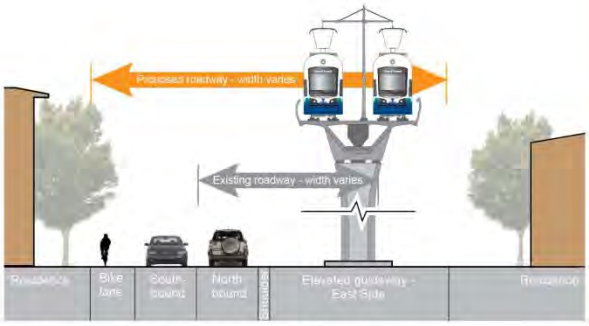
24th Avenue S. Elevated East Side

The 24th Avenue S. Elevated East Side Alternative would be **elevated along the east side of 24th Avenue S. between approximately S. 208th Street and Kent-Des Moines Road.** 24th Avenue S. is a two-lane minor collector road with a south-bound bike lane between S. 216th Street and Kent-Des Moines Road, and minimal sidewalks. After departing Angle Lake Station, the guideway would continue elevated over S. 204th Street, then turn southwest and begin descending to cross the proposed SR 509 right-of-way and a topographic valley. The guideway would remain elevated and run on the east side of 24th Avenue S. beginning near S. 208th Street. Near S. 226th Street, the guideway would transition to elevated and head southeast along Kent-Des Moines Road to return to the SR 99 corridor and connect to the proposed station at S. 240th Street. After this station, the guideway could connect to any alternatives in the SR 99 or I-5 corridors; for purposes of this analysis, it was assumed to connect to the SR 99 Elevated Median Alternative.

This alternative would likely not change the existing 24th Avenue S. roadway configuration, but would require:

- Utility relocation (including high-voltage transmission lines and possibly a high-pressure gas main)
- Right-of-way acquisition on the east side of the road
- A setback from 24th Avenue S. to permit sight distance for drivers
- Long spans at most intersections

Because this alternative would operate in an exclusive, grade-separated right-of-way, trains could travel at speeds up to **55 mph.**



Proposed condition looking north (not to scale)

EXHIBIT 4-15
24th Avenue S. Elevated East Side

5.0 Evaluation Criteria

The criteria used to evaluate the Level 1 alternatives originated from objectives derived from the project's Purpose and Need, described in Section 3.2. These objectives are:

- Objective 1: Provide an effective transportation solution to meet mobility needs
- Objective 2: Support equitable mobility
- Objective 3: Serve supportive land use plans and economic development objectives
- Objective 4: Preserve a healthy environment
- Objective 5: Design an affordable and constructible project

Table 5-1 shows the evaluation criteria established for Level 1 and the objectives with which they correspond. Each criterion has one or more quantitative or qualitative measures that are described in this chapter. These criteria and measures are intended to provide meaningful measures that differentiate between alternatives in terms of project performance and potential impacts.

TABLE 5-1
Evaluation Criteria

Purpose and Need Objective	Evaluation Criteria
Provide an Effective Transportation Solution to Meet Mobility Needs	Ridership potential
	Connections to regional multimodal transportation systems
Support Equitable Mobility	Transit dependent population
Support Land Use Plans and Economic Development	Transit supportive land use and economic development policies
Preserve a Healthy Environment	Effect on natural environment
	Effect on built environment
Design an Affordable and Constructible Project	Design Considerations
	System costs

Table 5-2 presents the complete set of evaluation criteria that were used to review the Level 1 alternatives.

TABLE 5-2
Level 1 Evaluation Criteria and Measures

Evaluation Criteria	Measures
Objective: Provide Effective Transportation Solution to Meet Mobility Need	
Ridership potential	• 2035 daily project riders • Travel time in study area
Connections to regional multimodal transportation systems	• Transit integration with Link system • Transit integration with facilities in the study area
Objective: Support Equitable Mobility	
Transit-dependent population	• Low-income population within ½ mile of station • Elderly population (age 65 or older) within ½ mile of station • Youth population (age 16 or younger) within ½ mile of station • 0-car households within ½ mile of stations
Objective: Support Land Use Plans and Economic Development	
Transit-supportive land use and economic development policies	• How well an alternative provides enhanced mobility to existing or planned high-density land use centers
Objective: Preserve a Healthy Environment	
Effect on natural environment	• Impacts on wetlands • Potential to affect stream crossings
Effect on built environment	• Visual aesthetic impacts of alternative • Potential property acquisition • Impacts to known parks • Number of community facilities affected • Impacts on known or eligible historic or other sensitive properties • Number of potentially impacted noise receptors • Level of Service (LOS) at intersections; evaluation of capacity/flow (existing conditions) • Traffic circulation and access; number of mid-block opportunities
Objective: Design an Affordable and Constructible Project	
Design Considerations	• Potential utility effects • High-risk hazardous materials • Geologic hazards • Park-and-Ride lot locations
System Costs	• Estimated capital cost ($2013) • *Estimated annual operations and maintenance cost ($2013) not included for Level 1. Will be in Level 2.*

5.1 Provide Transportation Solution to Meet Mobility Need

This objective has two criteria: the ridership potential of an alternative and how an alternative improves connections to regional multimodal transportation systems.

Ridership Potential

This criterion is intended to illustrate the projected ridership potential based on two measures: forecasted daily ridership in 2035 and travel time within the corridor for each alternative.

TABLE 5-3
Ridership Potential Measures

Concept Evaluation Measure	Methodology
2035 daily project riders	Using ST forecasting model and general station area assumptions, 2035 forecasted daily ridership was produced. This criterion also qualitatively addresses how well each alternative serves forecasted ridership. Unit of measure: Average daily riders.
Travel time in study area	Travel time in the study area was calculated based on the alternative distance and speed. Speeds were selected based on the alternative profile and intersection delay and station dwell times were factored in, where appropriate. Unit of measure: One way travel time between S. 320th Street and S. 200th Street.

Connections to Regional Multimodal Transportation Systems

This criterion addresses the connectivity of each alternative to the rest of the regional transit system and to facilities within the study area.

TABLE 5-4
Connections to Regional Multimodal Transportation Systems Measures

Concept Evaluation Measure	Methodology
Transit integration with Link system	How the FWTE project affects the current and planned Link system was assessed qualitatively as well as by the potential for delays related to traffic signals. Key considerations were schedule adherence, fleet management and potential extensions beyond the FWTE project. Unit of measure: Number of traffic signals traversed.
Transit integration with facilities in study area	How the FWTE alternatives would affect existing transit services (such as RapidRide) and facilities (such as park and ride lots), as well as the connection between bus and rail was assessed qualitatively. Unit of measure: Qualitative assessment.

5.2 Support Equitable Mobility

This objective has one criterion, which is how well an alternative improves transit access to transit dependent populations.

Transit Dependent Population

This criterion assesses whether or not a corridor improves accessibility to regional destinations for transit-dependent residents, such as low-income, elderly, youth, and households without access to a vehicle.

TABLE 5-5
Transit Dependent Population Measures

Concept Evaluation Measure	Methodology
Low-income population within 1/2 mile of station	2010 Census data was used to create maps of low-income populations with block level Census data. General station areas were assumed; will be refined to specific locations in Level 2. Unit of measure: 2010 Census population estimate of low-income population within ½ mile of station access areas.
Elderly population (age 65 or older) within ½ mile of station	2010 Census data was used to create maps of elderly populations with block level Census data. General station areas were assumed; refined to specific locations in Level 2 Unit of measure: 2010 Census population estimate of elderly population within ½ mile of station access areas.
Youth population (age 16 or younger) within ½ mile of station	2010 Census data was used to create maps of youth populations with block level Census data. General station areas were assumed; refined to specific locations in Level 2. Unit of measure: 2010 Census population estimate of youth population within ½ mile of station access areas.
0-car households within ½ mile of stations	2010 Census data was used to create maps of zero-car households with block level Census data. General station areas were assumed; refined to specific locations in Level 2. Unit of measure: 2010 Census population estimate of 0-car households within ½ mile of station access areas.

5.3 Support Land Use Plans and Economic Development

This objective has one criterion, which is the extent to which an alternative would be consistent with local transit supportive plans.

Transit Supportive Land Use and Economic Development Policies

The intent of this measure is to evaluate the extent to which the alternatives are consistent with and support local plans to create more compact, livable, and sustainable communities with transit in mind. Local comprehensive, transportation, and sub-area plans for the cities of SeaTac, Des Moines, Kent, and Federal Way were reviewed to identify where cities have

identified potential light rail or high capacity transit alignments and have designated areas for transit-oriented development opportunities.

TABLE 5-6
Transit Supportive Land Use and Economic Development Measures

Concept Evaluation Measure	Methodology
How well an alternative provides enhanced mobility to existing or planned high-densityhigh-density land use centers	This criterion evaluated existing zoning that was either high-density residential, transit oriented development, or allowed mixed use. Zoning data was obtained from the cities of SeaTac, Des Moines, Kent and Federal Way. Units of measure: • Total acreage of high-density/mixed use zoning within ¼ mile of alignment • Total percent of available land that is zoned high-density/mixed use within ¼ mile of alignment • Total acreage of high-density/mixed use zoning within ½ mile of station area • Total percent of available land that is zoned high-density/mixed use within ½ mile of station area

5.4 Preserve a Healthy Environment

This objective has two criteria: (1) the extent to which an alternative affects the natural environment, and (2) the extent to which it affects the built environment.

Effect on Natural Environment

This criterion addresses the potential to minimize and mitigate impacts to the natural environment. The FWTE corridor is highly developed, so natural resources are generally limited to wetlands and stream crossings. Due to the regulatory permitting requirements associated with impacts to wetlands and stream crossings, any impacts to these resources would need to be minimized or avoided to the extent possible.

TABLE 5-7
Effect on Natural Environment Measures

Concept Evaluation Measure	Methodology
Impacts on wetlands	Wetlands or waters of the U.S. within 100 feet of the alternative centerline were identified; because there is potential these could be permanently affected. Wetland data was obtained from King County and the U.S. Fish and Wildlife Service National Wetlands Inventory (NWI). Unit of measure: Acreage of wetlands within 100 feet of alternative centerline.
Potential to affect stream crossings	The number of streams that an alternative would cross was identified using available mapping of streams. It is likely that any alternative that reconstructs a roadway would affect these crossings. Data on streams was obtained from King County. Unit of measure: Number of stream crossings for each alternative.

Effect on Built Environment

Level 1 evaluates the effects on the built environment by the alternatives' potential to affect the cohesion of the neighborhood and/or community resources. Division of communities through building a transportation improvement through a neighborhood has the potential to sever residential areas and negatively affect the quality of life for residents in that neighborhood. Other measures include potential impacts to residential and commercial property, parks, visual aesthetics, community facilities, eligible historic properties, noise receptors, traffic flow, intersection capacity, and level of service.

TABLE 5-8
Effect on Built Environment Measures

Concept Evaluation Measure	Methodology
Visual/aesthetic impacts of alternative	An analysis was conducted based on the linear length of elevated guideway where residential properties front the guideway. Unit of measure: Linear length of elevated guideway where residential properties front the guideway for each alternative.
Potential property acquisition	Analysis of residential and commercial properties within 100 feet of the alternative's centerline. It is assumed that property within this distance could have property acquired and would potentially have residences or businesses displaced. Displacements, however, are not estimated at this level of screening. Unit of measure: Number of residential and commercial properties within 100 feet of the centerline.
Impacts to known parks	Direct impacts to parks, which would include acquisition of park property, were measured by determining the area of parkland within 50 feet of the centerline. Indirect impacts, such as noise and visual impacts could occur to parks within 200 feet of the centerline of each alternative. Unit of measure: *Direct impacts*: Acreage of park within 50 feet of an alternative's centerline; *Indirect impacts*: Acreage of park within 200 feet of an alternative's centerline.
Number of community facilities affected	An analysis of potentially affected community facilities located within 200 feet of the centerline of each alternative. For Level 1, community facilities included schools, libraries and churches. Data for these facilities was obtained by the King County Assessor property use information. Unit of measure: *Direct*: Number of community facilities within 100 feet of an alternative; *Indirect:* Number of community facilities within 200 feet of an alternative's centerline.
Impacts on known or eligible historic or other sensitive properties	A record search of property listed on the National Register of Historic Places (NRHP) and those eligible for listing on the NRHP was completed. Unit of measure: Number of NRHP eligible properties within 100 feet of the alternative's centerline.
Number of potentially impacted noise receptors	Using Federal Transit Administration screening guidance, Category II (residential properties and hotels) and Category III (schools and churches) noise receivers within 350 feet of each alternative were identified. The number of receivers within 350 feet of the alternative centerline was determined for buildings with an unobstructed view of the alternative and up to 175 feet for buildings with shielding from the study area. Potential noise sensitive receivers were identified using aerial base maps, with information verified using King County Assessor data and Google Earth. Unit of measure: Category II and III noise sensitive receivers potentially affected by the project.

Level of Service (LOS) at intersections; evaluation of capacity/flow (existing conditions)	Intersections within each alignment (at-grade only) that are currently operating at LOS F were identified. These intersections could worsen if affected by light rail operations. Local jurisdiction (SeaTac, Des Moines, Kent, and Federal Way) documents were used as the data source for this information. Unit of measure: Number of intersections within alignment currently operating at LOS E or F.
Traffic circulation and access; number of mid-block opportunities	Identify the number of locations where turns would be restricted. This would be at un-signalized intersections, mid-block u-turns or median two-way left-turn lane areas that would be removed. It is assumed that these turn movements across the track would not remain unless protected (gates or signal). Unit of measure: Number of restricted turns at un-signalized intersections; number of restricted turns at mid-block u-turns; number of restricted turns at median two-way left turn areas.

5.5 Design an Affordable and Constructible Project

This objective measures the degree to which physical and engineering constraints and system costs would affect the ability to design an affordable and constructible project.

Design Considerations

Similar to the consideration of wetlands and water bodies, there are a number of important engineering considerations during Level 1 that help inform the alternatives' future design to be carried into Level 2, including potential for utility relocations, encountering hazardous materials and geologic hazards, and park-and-ride lot locations that would provide access to future access areas.

TABLE 5-9
Design Consideration Measures

Concept Evaluation Measure	Methodology
Potential utility effects	Readily available major utility lines were reviewed (water, sanitary sewer, and gas and oil main lines) to determine the potential risk and level of impact within the vicinity of the alignments. Data was obtained from local jurisdictions and utility companies. Unit of measure: qualitative assessment of potential for utility relocations and conflicts.
High-risk hazardous materials	Data from Environmental Data Resource (EDR), a database research company, was reviewed for potential high-risk hazardous materials sites that could affect construction. Unit of measure: Location and number of high-risk hazardous materials site within a ¼ mile of alternative centerline.
Geologic hazards	A qualitative geologic risks assessment included reviewing steep slopes, seismic ground shaking, liquefiable soils, fault crossings, and erosion potential from King County Geologic Hazards maps, U.S. Department of Agriculture soils maps, and surface geology. Unit of measure: qualitative assessment.
Park-and-Ride Lot Locations	An assessment of existing park-and-ride lot locations and the existing number of parking spaces at each location. Unit of measure: number of existing lots and parking spaces

System Costs

These evaluation measures capture the estimated capital costs to build, operate, and maintain the project alternatives.

TABLE 5-10
System Cost Measures

Concept Evaluation Measure	Methodology
Estimated capital cost ($2013)	Using unit cost data from recent projects including Lynnwood Link, a range of capital cost estimates was determined for alternatives in current year dollars. Unit of measure: Range of capital costs for alternatives as well as on a per mile basis ($2013).
Estimated annual operations and maintenance cost ($2013)	Not included in Level 1 Alternatives Screening. Will be evaluated in Level 2 Alternatives Screening.

6.0 Level 1 Data Results

The Level 1 alternatives were evaluated based on the project objectives outlined in Chapter 5. All criteria and associated measures that were used to evaluate alternatives were derived from the project objectives and have a basis in the project's purpose and need, as discussed in Section 5.1. Data collected for each evaluation criteria and measure respond to a need to understand both the alternative as whole as well as smaller segments within an alternative. Alternatives were defined in Chapter 4. Some data for some evaluation criteria are presented at the segment level and others are presented at the alternative level, depending on the type of measure and appropriate evaluation logic. **Table 6-1** provides a summary of the level of data collection and analysis associated with each evaluation criteria and measure.

TABLE 6-1
Level of Data Collection by Evaluation Criteria and Measure

Criteria	Measure	Level of Data Collection / Analysis	
		Segment	Alternative
Ridership Potential	2035 Daily Project Riders		✓
	Travel Time in Study Area		✓
Connections to Regional Multimodal Transportation System	Transit Integration with Link LRT System	✓	✓
	Transit Integration with Other Transit Facilities	✓	✓
Transit Dependent Population	Low-Income Population	✓	✓
	Elderly Population	✓	✓
	Youth Population	✓	✓
	0-Car Households	✓	✓
Transit Supportive Land Use and Economic Development Policies	Acres of TOD/high-density zoned land within ¼ mile of alignment		✓
	Acres of TOD/high-density zoned land within ½ mile of access areas	✓	
	% available land zoned TOD/high-density within ¼ mile of alignment		✓
	% available land zoned TOD/high-density within ½ mile of access areas	✓	
Effect on Natural Environment	Effects on Wetlands	✓	✓
	Potential to Affect Stream Crossings	✓	✓
Effect on Built Environment	Visual / Aesthetic Effects	✓	✓
	Potential Property Acquisition	✓	✓
	Effects to Known Parks	✓	✓
	Number of Community Facilities Affected	✓	✓
	Effects to Historic or Sensitive Properties	✓	
	Number of Potentially Affected Noise Receptors	✓	
	LOS at Intersections	✓	
	Traffic Circulation	✓	
Physical and Engineering	Utility Relocation		✓
	High Risk Hazardous Materials	✓	✓
	Geologic Hazards	✓	
	Park-and-Ride Lot Locations		✓
System Costs	Estimated Capital Costs		✓
	Estimated Annual O&M Costs		✓

6.1. Ridership Potential

6.1.1 2035 Daily Projected Riders

Methodology

Year 2035 daily project-wide riders were forecasted for the project alternatives. Ridership estimates were only prepared for the full-length alternatives to understand the potential project-wide benefits. All of the full-length alternatives included three light rail transit (LRT) stations: Kent-Des Moines Road/S. 240th Street, S. 272nd Street corridor, and FWTC. Ridership at a segment (i.e., station) level will be prepared in Level 2 screening. Key considerations for the Level 1 ridership forecasts are station and profile assumptions. Alternatives that have a similar profile (e.g., elevated) and are located on the same roadway (whether side or median) are assumed to produce a similar ridership forecast for the Level 1 screening. Therefore, separate ridership numbers are not provided for each individual alternative described in Chapter 4.

The 24th Avenue S. and 30th Avenue S. alternatives were connected to another alternative (SR 99 Elevated Median) so a project-wide ridership forecast for these alternatives could be produced. The Level 1 ridership forecasts are based on interim year 2035 land use forecast and a conceptual bus network that would support LRT to the FWTC.

Key Results

- The travel demand forecasts indicate a year 2035 project-wide ridership range from 19,000 to 24,000 daily riders. The highest potential daily project-wide ridership is approximately 24,000 for the elevated alternatives, primarily due to faster LRT speeds and shorter travel times.

Discussion of Results

By profile, the daily ridership ranges from 19,000 for an at-grade profile to 24,000 for an elevated profile within the same alignment. This is as much as a 5,000 increase in daily riders (about 25 percent) with an elevated profile compared to an at-grade profile. An alternative with a mixed profile (both at-grade and elevated) would be likely to have a ridership forecast between these two estimates.

These ridership effects due to the alignment profile also apply to the 30th Avenue S. and 24th Avenue S. alternatives. Both of the I-5 alternatives would produce a similar forecast of up to 23,000 to 24,000 daily riders. A summary of the daily ridership estimates for Level 1 alternatives is provided **Exhibit 6-1** and in **Table 6-2** following the discussion of travel time. The table also contains annualized ridership estimates.

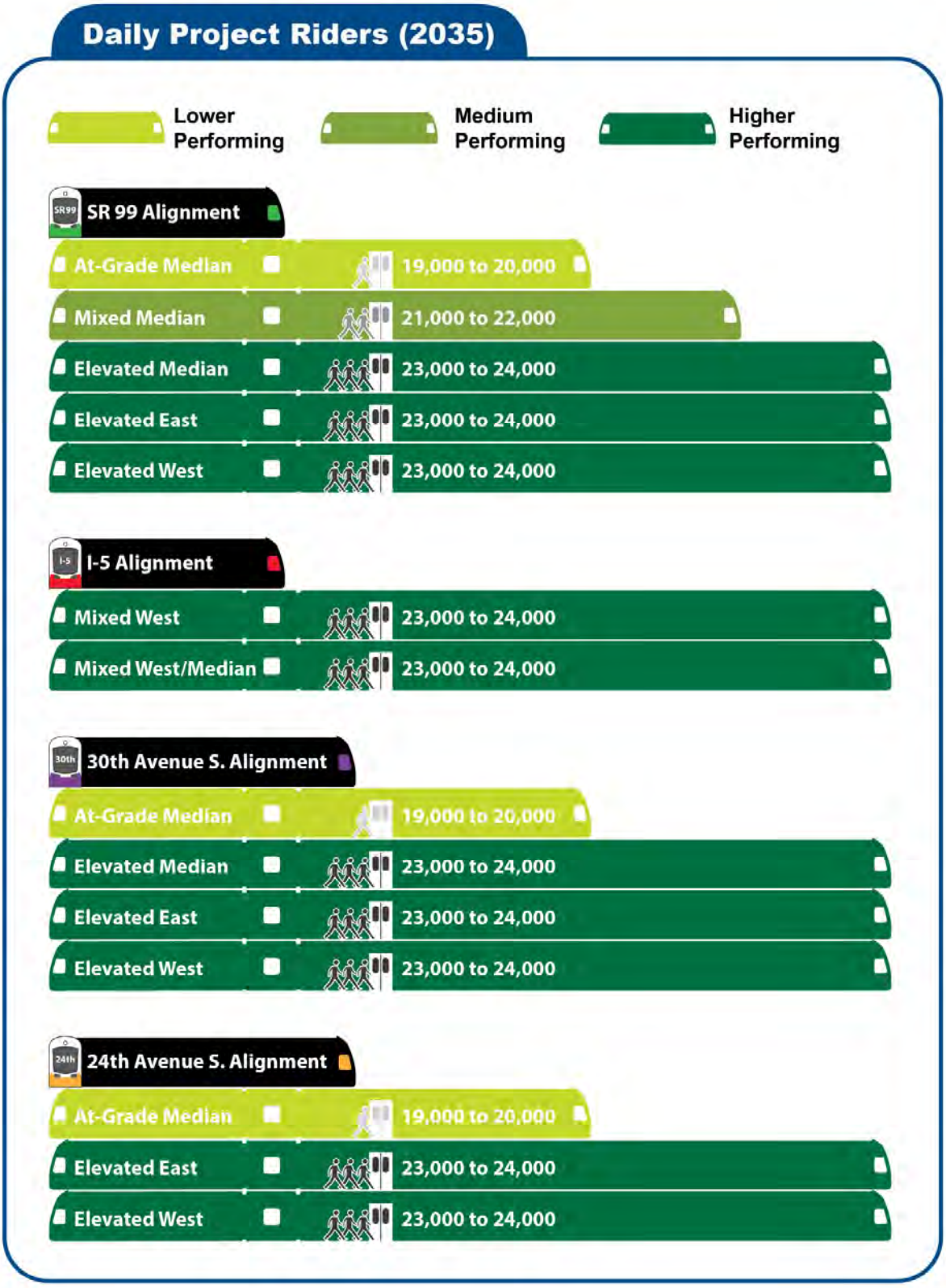


EXHIBIT 6-1
2035 Daily Projected Transit Riders by Alternative

6.1.2 Travel Time in Study Area

Methodology

Estimated travel times represent the time for a light rail vehicle to travel the full length of the FWTE study area between the Angle Lake Station and the Federal Way Transit Center. Travel times for any given segment can be affected by multiple variables including the alignment curvature, transitions between adjacent segments, station locations, and the effects of traffic signals, if applicable, in the case of at-grade operation. Therefore, travel times were estimated for full-length alternatives rather than individual alternative segment.

Key Results

- Travel times in the corridor range from 14 to 22 minutes.
- All of the faster alternatives have fully exclusive guideway.

Discussion of Results

The estimated travel times presented in **Table 6-2** and **Exhibit 6-2** indicate that at-grade alternatives that operate within the roadway right-of-way would result in longer travel times than grade-separated alternatives (elevated or mixed profile). The alternatives that would be fully grade separated from the roadway (i.e., elevated or along I-5) are the fastest alternatives with an estimated end-to-end travel time of between 14 to 15 minutes. This includes the SR 99 Elevated, I-5 Mixed, 30th Avenue S. and 24th Avenue S. alternatives. With a 20 to 22 minute travel time, the three at-grade alternatives (24th Avenue S., SR 99, and the 30th Avenue S.) would be 50 percent slower than the faster alternatives. The SR 99 Mixed alternative would have a travel time of approximately 18 minutes.

TABLE 6-2
Alternative Travel Times and Ridership Projections

Light Rail Alternative	Travel Time (minutes)	2035 Daily Riders	2035 Annual Riders
SR 99			
At-Grade Median	20-21	19,000 – 20,000	6.1 million to 6.4 million
Mixed Median	18	21,000 – 22,000	6.7 million to 7.0 million
Elevated (Any)	14-15	23,000 – 24,000	7.4 million to 7.7 million
I-5			
Mixed West (Either)	14	23,000 – 24,000	7.4 million to 7.7 million
30th Avenue S.			
At-Grade Median	21	19,000 – 20,000	6.1 million to 6.4 million
Elevated (Either)	15	23,000 – 24,000	7.4 million to 7.7 million
24th Avenue S.			
At-Grade Median	22	19,000 – 20,000	6.1 million to 6.4 million
Elevated (Either)	15	23,000 – 24,000	7.4 million to 7.7 million

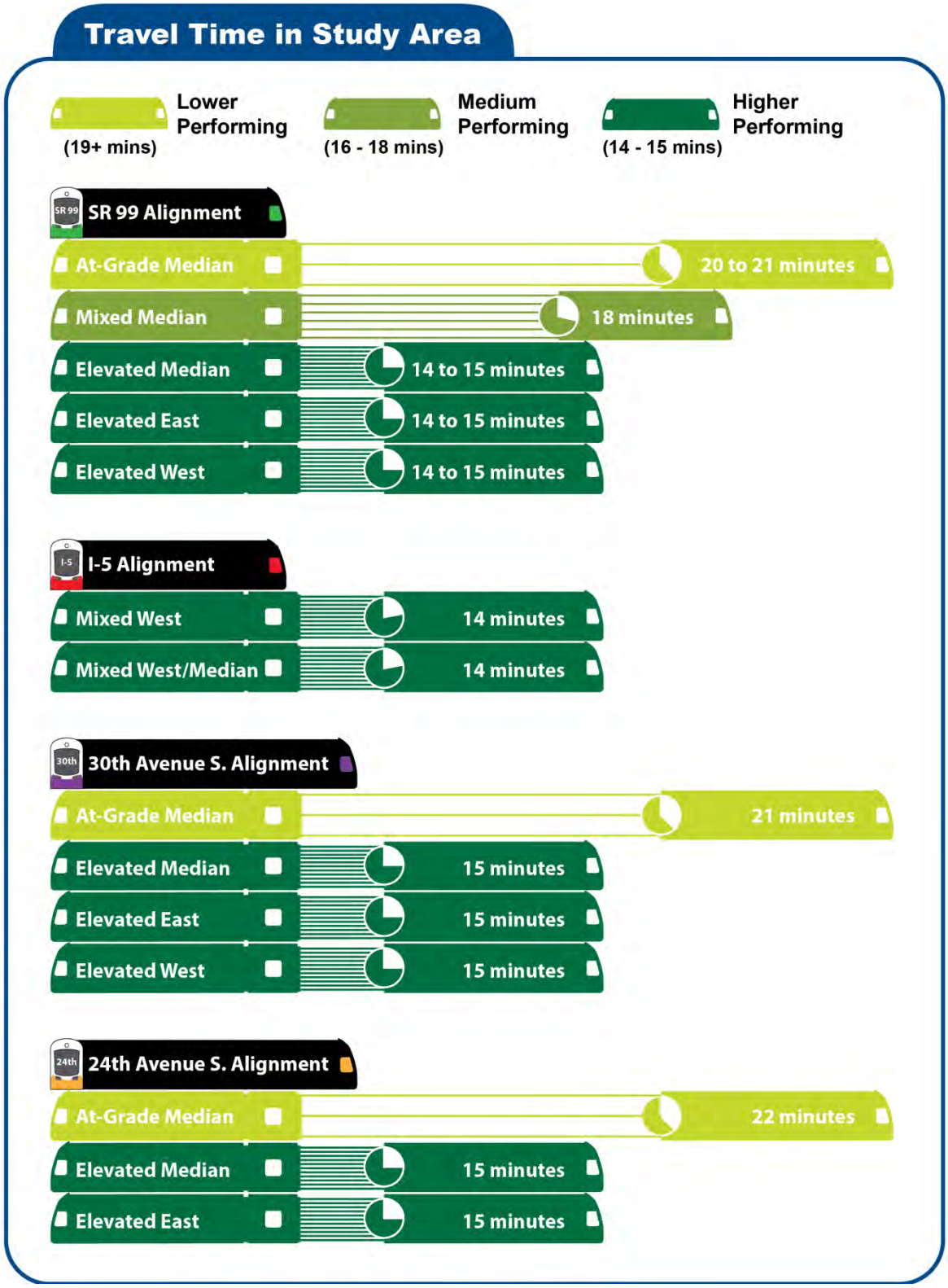


EXHIBIT 6-2

2035 Transit Peak-Period, Peak Direction Travel Times (minutes) from Angle Lake Station to Federal Way Transit Center

6.2. Transit Integration

6.2.1 Transit Integration with Link System

Methodology

Transit integration with the ST Link light rail system was evaluated based on the potential for delays that the Level 1 alternatives could experience due to the alignment interfacing with roadway traffic at signals. While the Level 1 alternatives are expected to have some form of transit priority treatment at the signalized intersections, its effectiveness in improving reliability could vary due to uncertainties in signal phasing, coordination, and traffic congestion. Therefore, the number of signalized intersections that each alternative would traverse through provides an indication of the likelihood for potential system-wide effects to Link operations and reliability.

Key Results

- By avoiding at-grade operations, elevated alternatives are expected to maintain schedule headways; therefore, they are not expected to affect system-wide Link operations and reliability.
- At-grade and mixed alternatives would traverse at-grade through traffic signals, introducing potential delays to scheduled headways and therefore affecting system-wide Link operations and reliability.

Discussion of Results

All of the elevated alternatives do not interface with roadway operations and avoid existing traffic signals. These alternatives are expected to have the greatest ability to maintain scheduled service headways and would therefore have the lowest potential to affect system-wide Link operations compared to the other Level 1 alternatives. In contrast, all at-grade alternatives could experience unpredictable delays within the corridor as each would traverse through multiple traffic signals. Therefore, it could be difficult to maintain vehicle progression through the corridor, which would affect scheduled headways and potentially affect system-wide Link operations and reliability, especially at the International District Station merge with East Link.

Among Level 1 alternatives, the SR 99 At-Grade Median and SR 99 Mixed Median alternatives have the highest number of existing traffic signals that the alignment would traverse through at-grade. With any segment, the highest number of traffic signals (ten) that an alternative traverses through at-grade is associated with the SR 99 At-Grade Median alternative between S. 280th Street and S. 320th Street (Segment C). **Table 6-3** summarizes by alternative the number of traffic signals traversed. **Table 6-4** summarizes the number of traffic signals traversed by segment.

TABLE 6-3
Existing Traffic Signals Traversed by Alternative

Alternative	Traffic Signals Traversed
SR 99	
At-Grade Median	27
Mixed Median	23
Elevated Median	0
Elevated East Side	0
Elevated West Side	0
I-5	
Elevated Mixed West Side	0
Elevated Mixed West Side/Median	0
30th Avenue – SR 99	
At-Grade Median	23
Elevated Median	0
Elevated East Side	0
Elevated West Side	0
24th Avenue	
At-Grade Median	23
Elevated Median	0
Elevated East Side	0

TABLE 6-4
Existing Traffic Signals Traversed by Alternative/Segment

Segment	Description	Alternative	Traffic Signals Traversed
A	Angle Lake Station to S. 220th Street	SR 99 At-Grade Median	3
		SR 99 Mixed Median	2
		SR 99 Elevated Median	0
		SR 99 Elevated East Side	0
		SR 99 Elevated West Side	0
		I-5 Mixed West Side	0
		I-5 Mixed West Side/Median	0
		24th Avenue S. At-Grade Median	2
		24th Avenue S. Elevated Median	0
		24th Avenue S. Elevated East Side	0
B	S. 220th Street to S. 244th Street	SR 99 At-Grade Median	7
		SR 99 Mixed Median	6
		SR 99 Elevated Median	0
		SR 99 Elevated East Side	0
		SR 99 Elevated West Side	0
		I-5 Mixed West Side	0
		I-5 Mixed West Side/Median	0
		30th Avenue S. At-Grade Median	2
		30th Avenue S. Elevated Median	0
		30th Avenue S. Elevated East Side	0
		30th Avenue S. Elevated West Side	0
		24th Avenue S. At-Grade Median	3
		24th Avenue S. Elevated Median	0
		24th Avenue S. Elevated East Side	0
C	S. 244th Street to S. 280th Street	SR 99 At-Grade Median	7
		SR 99 Mixed Median	6
		SR 99 Elevated Median	0
		SR 99 Elevated East Side	0
		SR 99 Elevated West Side	0
		I-5 Mixed West Side	0
		I-5 Mixed West Side/Median	0
D	S. 280th Street to S. 320th Street	SR 99 At-Grade Median	10
		SR 99 Mixed Median	9
		SR 99 Elevated Median	0
		SR 99 Elevated East Side	0
		SR 99 Elevated West Side	0
		I-5 Mixed West Side	0
		I-5 Mixed West Side/Median	0

6.2.2 Transit Integration with Facilities in Study Area

Methodology

Transit integration with facilities in the study area is a qualitative assessment of the interface between the FWTE Level 1 alternatives to existing transit services, such as King County's RapidRide A Line and Sound Transit's express routes, and transit facilities such as park-and-ride (P&R) lots. Potential effects to existing transit services and opportunities to connect to existing transit facilities by segment are documented in this section. **Exhibit 6-3** illustrates the existing transit services and transit passenger facilities in the study area.

Key Results

- Elevated alternatives and the I-5 alternatives would not likely affect the operations of other transit services.
- At-grade and mixed alternatives on SR 99 would receive transit signal priority that could affect existing RapidRide A Line performance.
- SR 99 would likely be better integrated to the transit hubs along SR 99, such as Highline Community College (HCC), but would not connect as well as the I-5 alternatives would to the regional transit facilities, such as Star Lake P&R, along I-5.

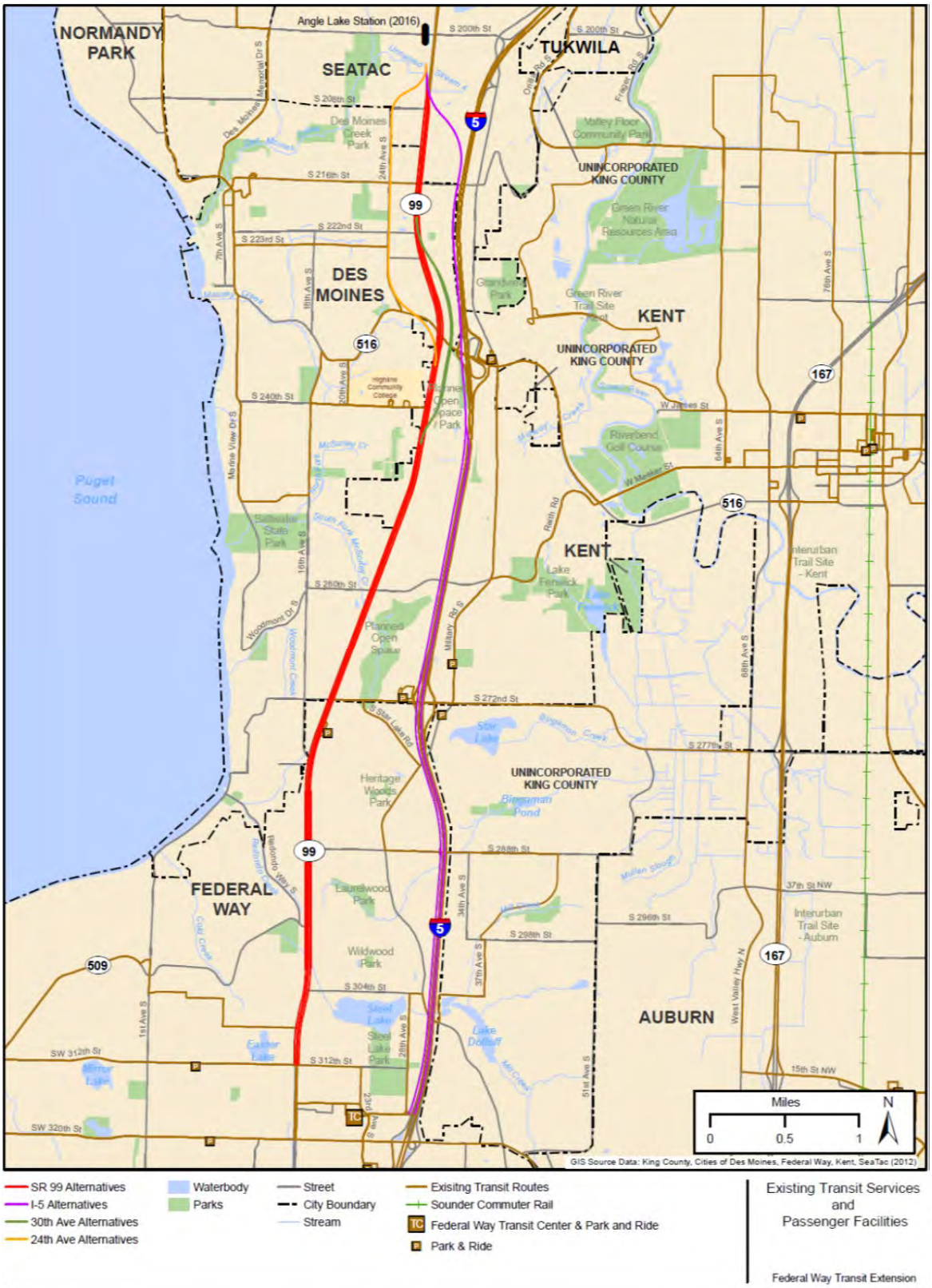


EXHIBIT 6-3
Existing Transit Services and Transit Passenger Facilities in the Study Area

Discussion of Results

One of the considerations for the Level 1 alternatives is how they interface with other transit services in the study area and specifically the potential to interrupt or conflict with the existing RapidRide A Line transit signal priority (TSP). Similar to the "Transit Integration with Link System" evaluation measure, the number of traffic signals traversed provides an indication of the potential level of conflict that may exist between Level 1 alternatives and King County Metro's (KCM) TSP system. Alternatives that traverse along SR 99 in either an at-grade or mixed profile would potentially affect RapidRide A Line's TSP system. This includes the SR 99 At-Grade Median and SR 99 Mixed Median alternatives, but also potentially the at-grade alternatives along 24th Avenue S. and 10th Avenue S. if they transition with SR 99. This potential conflict may affect the overall net travel speed and schedule adherence of the RapidRide A Line. None of the elevated alternatives along SR 99, I-5, 30th Avenue S., and 24th Avenue S. would be likely to affect the operations of other transit services.

Integration opportunities with other transit services in the study area are summarized by segment as follows:

Segment A (Angle Lake Station-S. 220th Street)

All alternatives along SR 99 would have minimal integration with current transit service, as there is no planned station in this segment. Both of the I-5 alternatives in this segment would be separated from the roadway system as they generally follow the planned SR 509 right-of-way; therefore, integration with current transit services for these two alternatives would be minimal.

There is only one local bus route (KCM 156) along 24th Avenue S. in this segment; therefore minimal affects to transit service are expected with any of the three 24th Avenue S. alternatives. There would also be limited integration of the 24th Avenue S. alternatives to other transit facilities as there is no station associated with these alternatives. There are no existing P&Rs in this segment that would be affected by any of the alternatives in Segment A.

Segment B (S. 220th Street-S. 244th Street)

All alternatives along SR 99 provide an opportunity to construct an LRT station near HCC that would be directly connected to existing regional and local multi-directional bus services. HCC is currently served by five KCM routes, including RapidRide A Line.

It is not likely that the operations of other transit services would be affected by either of the I-5 alternatives. These alternatives are farther from existing transit service along SR 99 (and at HCC) than the other alternatives in this segment; however, these alternatives are closer to the Kent/Des Moines P&R. Currently, seven KCM routes and one Sound Transit express route serve the Kent/Des Moines P&R lot, but the I-5/SR 516 interchange is a substantial barrier, making this potential connection difficult for transit riders.

Transit service is not currently provided along 30th Avenue S.; therefore, none of the 30th Avenue S. alternatives would affect other transit services. An LRT station is being considered near 30th Avenue S., south of SR 516. This would require existing transit routes to be restructured to serve this street.

There are only two bus routes (KCM 156 and KCM 122) along 24th Avenue S., therefore minimal effects to transit service are expected. As with the SR 99 alternatives there would be an opportunity to construct a LRT station near HCC with any of the SR 99 and 24th Avenue S. alternatives. A station at or near HCC could provide direct connections to existing regional and local multi-directional bus services.

Segment C (S. 244th Street-S. 280th Street)

The opportunity to integrate with the majority of existing transit services in this segment is associated with the I-5 alternatives. The I-5 alternatives could connect with Star Lake P&R, which is currently served by seven KCM routes and one ST express route. SR 99 alternatives could connect with the Redondo Heights P&R; however this facility is only served by two KCM routes and RapidRide A Line. The relative difference in transit service at these two park-and-ride lots is also one of the likely indicators of the lots' usage. Redondo Heights P&R has a noticeably lower utilization rate (less than 10% full) than Star Lake P&R (close to 60% full).

Segment D (S. 280th Street-S. 320th Street)

Both the SR 99 and I-5 alternatives would terminate at or near the FWTC, providing a connection to a regional transit center. Although the two I-5 alternatives have the potential to be located closer to the Federal Way P&R (south of S. 320th Street) than the SR 99 alternatives in this segment.

Table 6-5 summarizes the transit integration opportunities with other transit services and facilities within the study area.

TABLE 6-5
Transit Integration with Other Transit Services and Facilities

Alternative	Transit Integration Summary
SR 99 At-Grade	Likely to affect RapidRide A Line and other transit service's performance; alignment near existing transit hub (HCC)
SR 99 Mixed Median	Some effects to RapidRide A Line and other transit service's performance; alignment near existing transit hub (HCC)
SR 99 Elevated Median	Elevated profile would have minimal effects on other transit services; alignment near existing transit hub (HCC)
SR 99 Elevated East Side	Elevated profile would have minimal effects on other transit services; alignment near existing transit hub (HCC)
SR 99 Elevated West Side	Elevated profile would have minimal effects on other transit services; alignment near existing transit hub (HCC)
I-5 Elevated Mixed West Side	Grade separated profile would have minimal effects on other transit services; near existing regional transit facility (Star Lake P&R)
I-5 Elevated Mixed West Side/Median	Grade separated profile would have minimal effects on other transit services; near existing regional transit facility (Star Lake P&R), potential for I-5 flyer stops
30th Avenue S. At-Grade Median	With a transition to SR 99 at-grade, there would likely be effects to RapidRide A Line and other transit service's performance; alignment is near existing transit hub (HCC)
30th Avenue S. Elevated Median	Elevated profile would have minimal effects on other transit services; if transition to SR 99 the alignment is near an existing transit hub (HCC), if transition to I-5 the alignment is near a regional transit facility (Star Lake P&R)
30th Avenue S. Elevated East Side	Elevated profile would have minimal effects on other transit services; if transition to SR 99 the alignment is near an existing transit hub (HCC), if transition to I-5 the alignment is near a regional transit facility (Star Lake P&R)
30th Avenue S. Elevated West Side	Elevated profile would have minimal effects on other transit services; if transition to SR 99 the alignment is near an existing transit hub (HCC), if transition to I-5 the alignment is near a regional transit facility (Star Lake P&R)
24th Avenue S. At-Grade Median	With a transition to SR 99 at-grade, there would likely be effects to RapidRide A Line and other transit service's performance; alignment is near existing transit hub (HCC)
24th Avenue S. Elevated Median	Elevated profile would have minimal effects on other transit services; with a transition to SR 99 the alignment is near an existing transit hub (HCC).
24th Avenue S. Elevated East Side	Likely to affect RapidRide and other transit service's performance; alignment near existing transit hub (HCC)

6.3. Transit Dependent Populations

6.3.1 Low-Income Population within ½ Mile of Station, Elderly Population (age 65 or older) within ½ Mile of Station, Youth Population (age 16 or younger) within ½ Mile of Station, and 0-Car Households within ½ Mile of Station

Methodology

A number of measures were used to evaluate each alternative's ability to provide equitable service to transit dependent populations. Data and estimates were extracted from the 2010 Census as well as the 2011 American Community Survey (ACS) on specific measures within ½ mile of access areas along each alternative. Access areas are defined as places along each alternative where there are significant activity and/or population centers. The available census unit of measure includes data for areas outside of the ½ mile access area; therefore, actual results may be higher or lower than reported.

Key Results

- Due to the close geographic proximity of the alternatives, the US Census data do not indicate a strong differentiation among the alternatives. However, the SR 99 alternatives do have approximately 900 more people (estimated total population, not just transit-dependent population) within the access area than the I-5 alternatives.

Discussion of Results

These data are compared to the same statistics for the total of the surrounding four-city area comprised of SeaTac, Kent, Des Moines, and Federal Way. The alternatives exhibit similar values for each measure. Due to their proximity to one another, the alternatives show only modest differences. However, due to the greater number of activity centers and residential areas directly adjacent to the alternative, SR 99 serves the greatest overall population as well as slightly higher numbers for low-income populations. The 24th Avenue S. alternatives include areas with less density of both residential and commercial development and are therefore the lowest in terms of both overall and transit dependent populations served. However, these alternatives are still higher than the overall four-city study area. The 30th Avenue S. alternatives, situated between SR 99 and I-5, include the greatest number of transit dependents for the area between S. 200th Street and S. 240th Street.

All alternatives would serve a higher percentage of low-income and elderly people than are generally found in the larger four-city area. However, the results are not as consistent when comparing the size of the youth population and those households without access to an automobile. Only near the Federal Way Transit Center access area do the alternatives include a higher percentage of youth and households without an access to an automobile than the percentage found in the larger four-city area. **Table 6-6** and **Exhibits 6-4 through 6-7** illustrate the concentrations of low-income population, elderly population (age 65 or older), youth population (age 16 or younger), and 0-car households within ½ mile of access areas.

TABLE 6-6

Year 2010 Low-Income, Elderly, Youth, and 0-Car Households within ½ Mile of Access Areas

Light Rail Alignment Alternatives	Estimated Total Population of Access Area	Estimated Low-Income Population/ %*	Estimated Population 65 Years or Older/%**	Estimated Population 16 Years or Younger**	Estimated 0-Car Households*
Four-City Area					
SeaTac, Des Moines, Kent, and Federal Way	243,000	37,100 / 15%	24,400 / 10%	59,900 / 25%	7,000 / 8%
SR 99					
S. 240th Street	3,900	700 / 19%	700 / 19%	200 / 5%	0 / 0%
S. 276th Street (Redondo Heights P&R)	3,800	700 / 20%	1,300 / 35%	300 / 8%	100 / 6%
Federal Way Transit Center	3,000	700 / 22%	500 / 15%	500 / 17%	150 / 11%
TOTAL	**10,700**	**2,100 / 20%**	**2,500 / 23%**	**1,000 / 9%**	**250 / 2%**
I-5					
S. 240th Street	3,400	600 / 18%	700 / 21%	200 / 6%	100 / 7%
S. 272nd Street (Star Lake P&R)	3,600	700 / 19%	1,300 / 36%	300 / 8%	100 / 7%
Federal Way Transit Center	3,000	700 / 22%	500 / 15%	500 / 17%	400 / 30%
TOTAL	**10,000**	**2,000 / 20%**	**2,500 / 25%**	**1,000 / 10%**	**600 / 6%**
30th Avenue S. (with SR 99)					
S. 240th Street	3,900	700 / 19%	200 / 8%	700 / 26%	100 / 7%
S. 276th Street (Redondo Heights P&R)	3,800	N/A	N/A	N/A	N/A
Federal Way Transit Center	3,000	N/A	N/A	N/A	N/A
TOTAL	**0**	**700 / 19%**	**200 / 8%**	**700 / 26%**	**100 / 7%**
24th Avenue S. (with SR 99)					
Kent Des Moines Road (SR 516)	3,900	700 / 21%	200 / 6%	1,000 / 30%	100 / 11%
S. 276th Street (Redondo Heights P&R)	3,800	N/A	N/A	N/A	N/A
Federal Way Transit Center	3,000	N/A	N/A	N/A	N/A
TOTAL	**0**	**700 / 21%**	**200 / 6%**	**1,000 / 30%**	**100 / 11%**

* - Source: 2011 American Community Survey

** - Source: 2010 Census

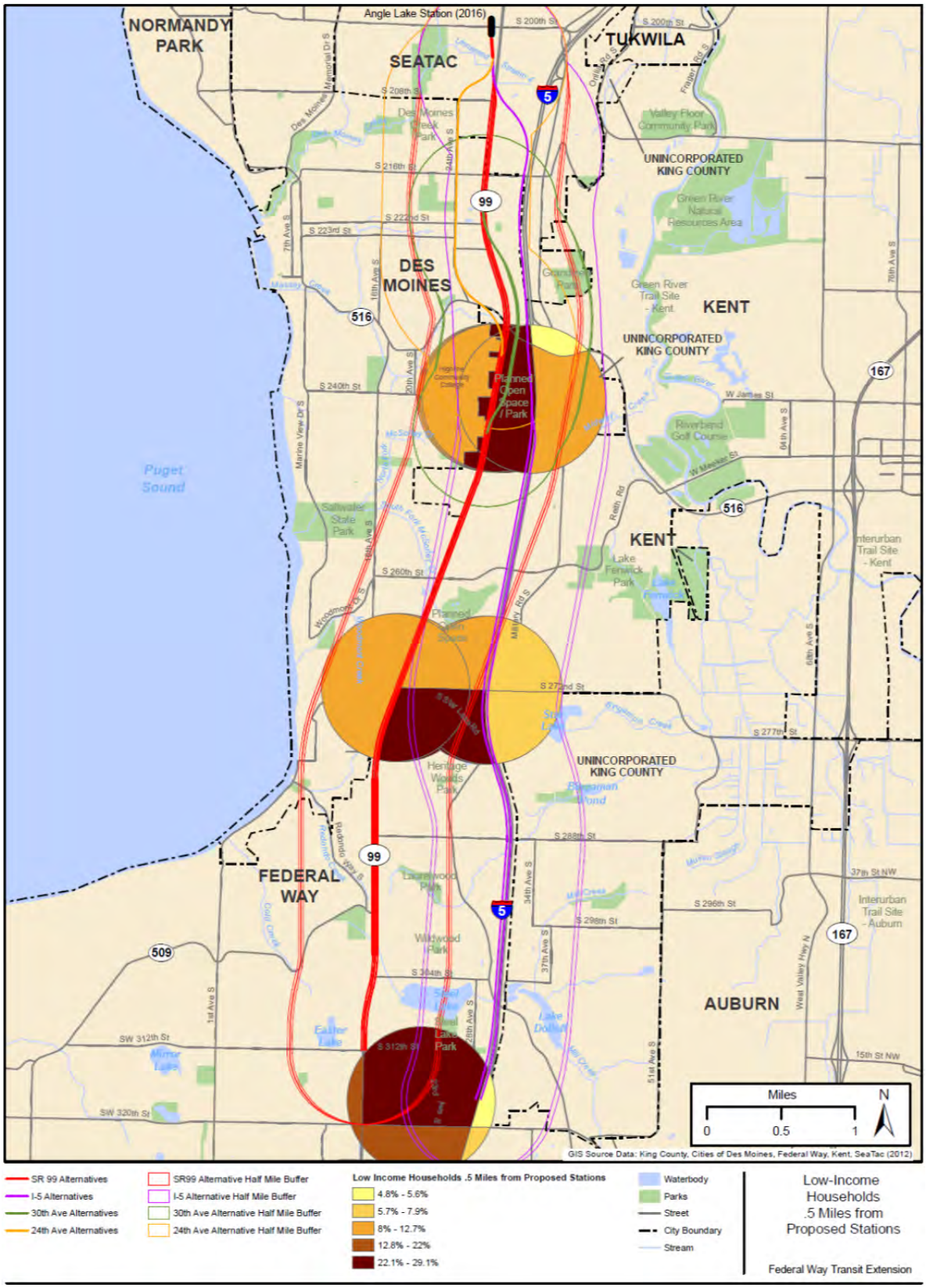


EXHIBIT 6-4
Low-Income Households within ½ Mile of Access Area

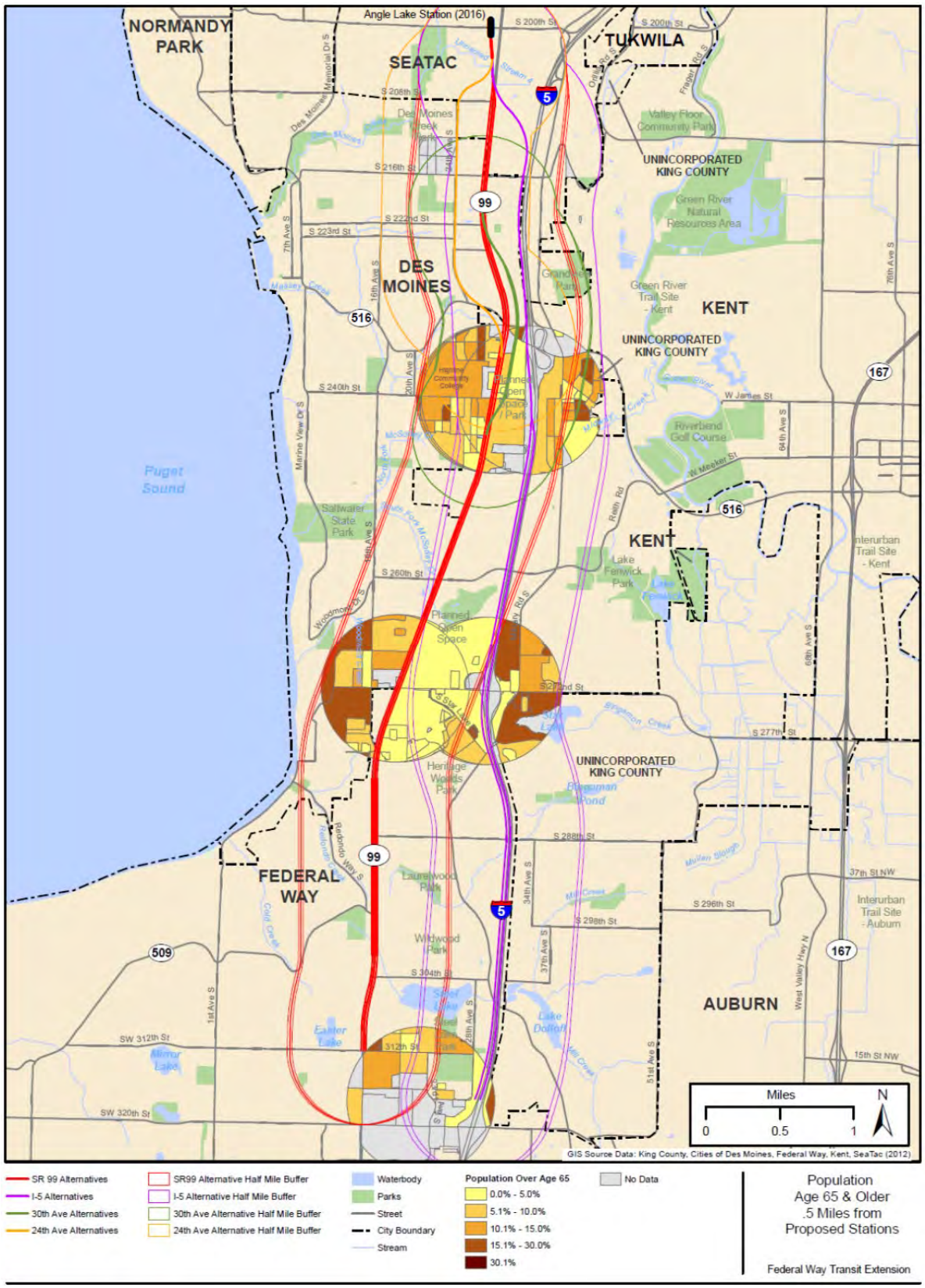


EXHIBIT 6-5
Elderly Population (age 65 and over) within ½ Mile of Access Area

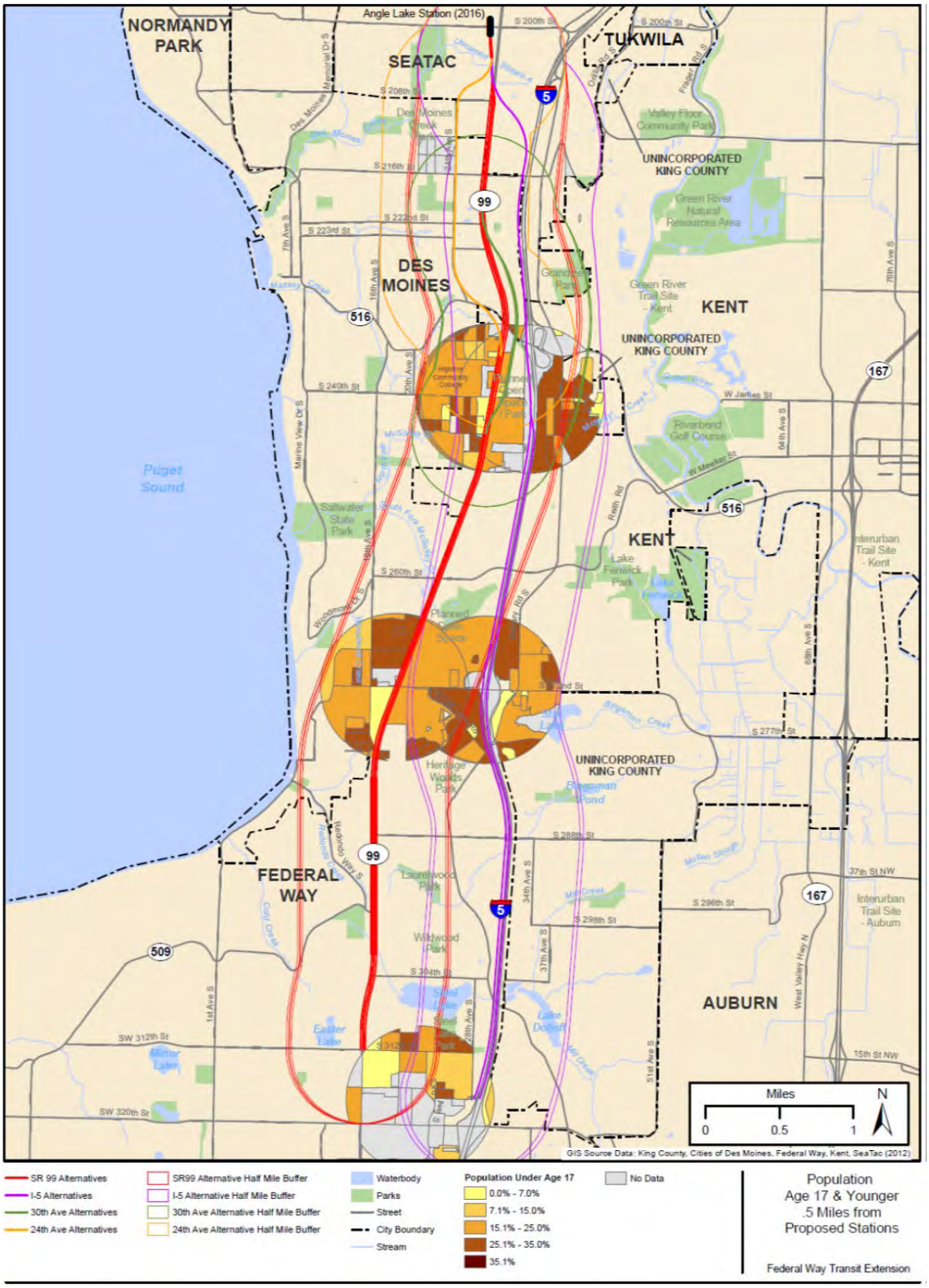


EXHIBIT 6-6
Youth Population (age 17 and younger) within ½ Mile of Access Area

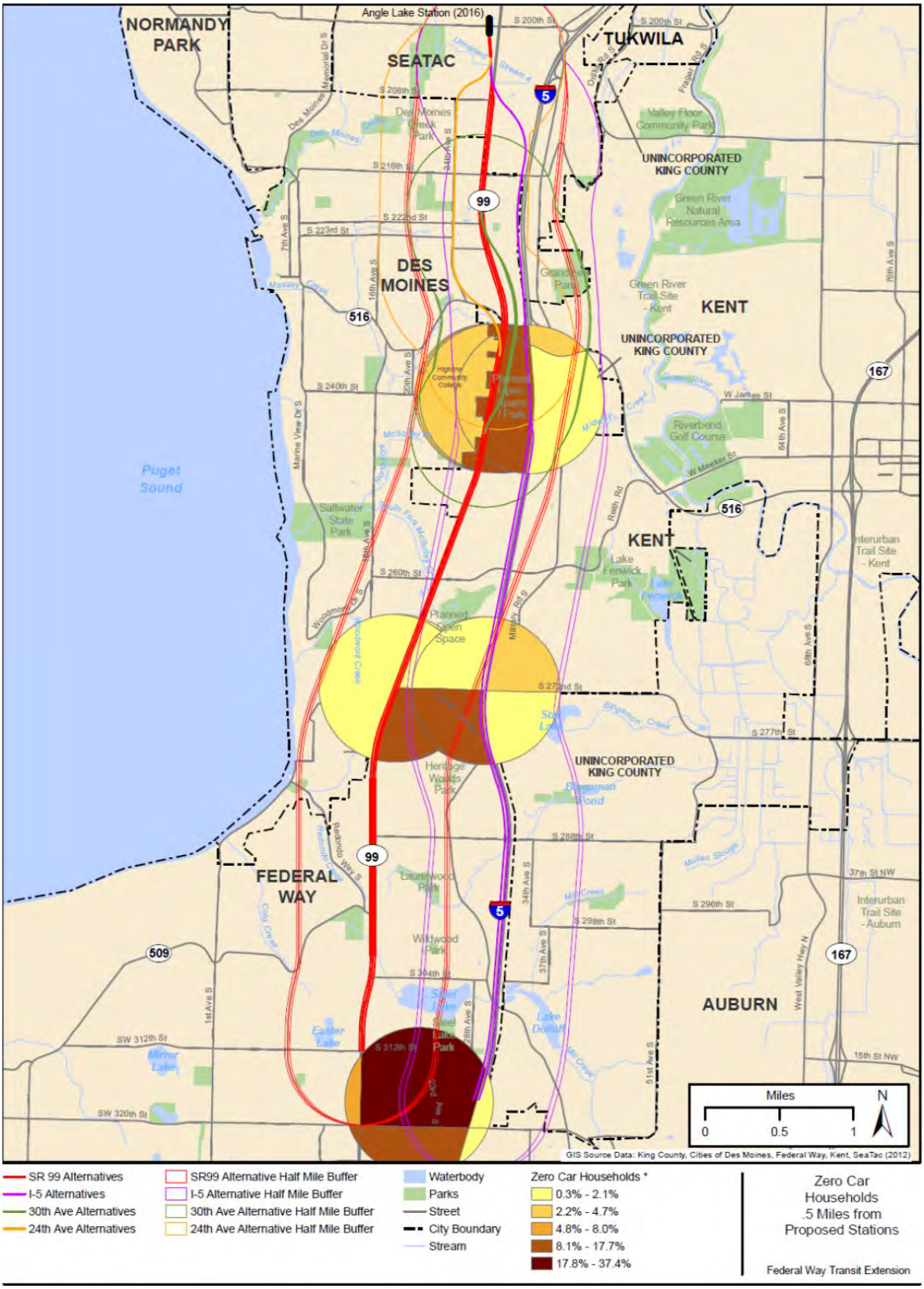


EXHIBIT 6-7
0-Car Households within ½ Mile of Access Area

6.4. Transit Supportive Land Use and Economic Development

6.4.1 How Well an Alternative Provides Enhanced Mobility to Existing High-Density Land Use Centers

Sound Transit's Transit-Oriented Development (TOD) Policy establishes a framework to evaluate, facilitate, and implement TOD strategies in the project planning process. TOD is a land development pattern that integrates transit and land use by promoting transit ridership while supporting community land use and development visions. Sound Transit's primary responsibility is to complete and expand the high-capacity transit system to deliver transit service that connects the region's urban centers, which is a key step toward meeting local and regional land use goals.

During the project development phase, Sound Transit has committed to:

- Identify and document agency and community TOD opportunities and strategies based on information available at the time of plan development, including input from stakeholders.
- Assess the extent to which development of alignments, station locations, and transit support facilities affect and support implementation of agency and community TOD strategies.
- Ensure that evaluation criteria for project alternatives include TOD measures.

Methodology

The ability of each alternative to provide access to high-density land use centers was evaluated based on the following factors:

- Area (in acres) of zoning that supports high-density land uses within ¼ mile of the centerline of each alternative
- The percent of the total acreage within ¼ mile that is zoned for high-density land uses
- Area (in acres) of zoning that supports high-density land uses within ½ mile of potential station access areas
- The percent of the total acreage within ½ mile of potential station access areas that is zoned for high-density land uses

Exhibit 6-8 identifies the location of areas along the study corridor with transit supportive density (TOD, mixed use and high-density land use patterns).

Key Results

- Alternatives along SR 99 and 30th Avenue S. provide greater zoning potential for high-density development at the alignment level. Results are more similar at the station access area level.

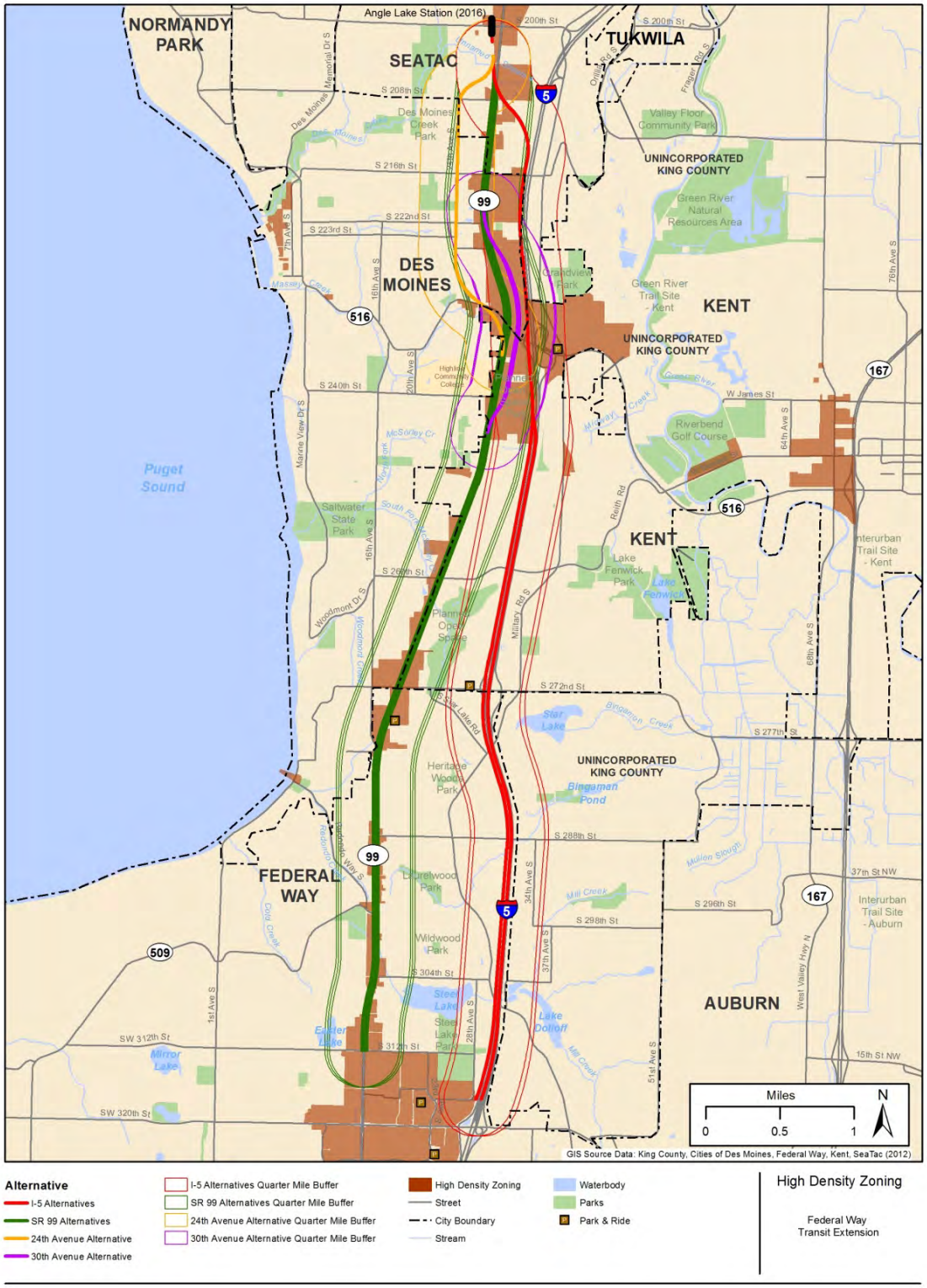


EXHIBIT 6-8
TOD/High-Density Zoning

Discussion of Results

Alternatives along SR 99 and 30th Avenue S. provide greater zoning potential for high-density development than those along I-5 or 24th Avenue S. The SR 99 Elevated East Side alternative has a slightly higher area than the other SR 99 alternatives, and SR 99 Elevated West Side alternative has slightly lower area of high-density zoning. **Table 6-7** summarizes the total land area of TOD/high-density zoning within ¼ mile of an alternative. **Table 6-8** summarizes the total land area of TOD/high-density zoning within ¼ mile of an alternative by segment.

TABLE 6-7
TOD/High-Density Zoning within ¼ Mile of an Alternative – Effects by Alternative

Alternative	Acres of TOD/High-Density Zoning within ¼ mile of the Alternative	Percent of TOD/High-Density Zoning within ¼ mile of the Alternative
SR 99 At-Grade Median	632	27%
SR 99 Mixed Median	632	27%
SR 99 Elevated Median	632	27%
SR 99 Elevated East Side	644	28%
SR 99 Elevated West Side	617	27%
I-5 Mixed West Side	454	19%
I-5 Mixed West Side/Median	449	19%
24th Avenue S. At-Grade Median	472	21%
24th Avenue S. Elevated Median	472	21%
24th Avenue S. Elevated East	471	21%
30th Avenue S. At-Grade Median	660	30%
30th Avenue S. Elevated Median	660	30%
30th Avenue S. Elevated East Side	664	31%
30th Avenue S. Elevated West Side	658	30%

The greatest TOD potential is within Segment B, with most alternatives having over 50 percent land designated for high-density zoning, except those alternatives along 24th Avenue S. Segments A has the next greatest area, with between 24 and 39 percent, with the highest area along SR 99. Segments C and D have similar levels along SR 99, at 17 percent, while areas along I-5 range from 1 to 5 percent.

In Segment A, the SR 99 alternatives have over ten percent more acres zoned as high-density (38 to 40 percent) as the I-5 alternatives (27 percent). In Segment B, the 30th Avenue S. alternatives have the highest percentage of its area zoned for high-density uses, with 87 to 88 percent. The I-5 alternatives have 74 percent of the area zoned for high-density uses, while SR 99 alternatives have between 54 and 57 percent. Between the SR 99 alternatives and the 30th Avenue S. alternatives, the east side running alternatives have slightly more acreage than the west side running alternatives. In Segment C, the SR 99 alternatives have 17 percent zoned for high-density uses, while the I-5 alternative have one to two percent. In Segment D, the SR 99 alternatives again have 17 percent zoned for high density uses, while the I-5 alternatives have 4 to 5 percent.

TABLE 6-8
TOD/High-Density Zoning within ¼ Mile of an Alternative – Effects by Segment

Segment	Description	Alternative	Acres of TOD/High-Density Zoning within ¼ mile of the Alternative	Percent of TOD/High Density Zoning within ¼ mile of the Alternative
A	Angle Lake Station to S. 220th Street	SR 99 At-Grade Median	154	39%
		SR 99 Mixed Median	154	39%
		SR 99 Elevated Median	154	39%
		SR 99 Elevated East Side	156	40%
		SR 99 Elevated West Side	150	38%
		I-5 Mixed West Side	110	27%
		I-5 Mixed West Side/Median	110	27%
		24th Avenue S. At-Grade Median	103	24%
		24th Avenue S. Elevated Median	103	24%
		24th Avenue S. Elevated East	103	24%
B	S. 220th Street to S. 244th Street	SR 99 At-Grade Median	272	55%
		SR 99 Mixed Median	272	55%
		SR 99 Elevated Median	272	55%
		SR 99 Elevated East Side	280	57%
		SR 99 Elevated West Side	263	54%
		I-5 Mixed West Side	303	74%
		I-5 Mixed West Side/Median	302	74%
		30th Avenue S. At-Grade Median	299	87%
		30th Avenue S. Elevated Median	299	87%
		30th Avenue S. Elevated East Side	304	88%
		30th Avenue S. Elevated West Side	298	88%
		24th Avenue S. At-Grade Median	162	24%
		24th Avenue S. Elevated Median	162	24%
		24th Avenue S. Elevated East Side	162	24%
C	S. 244th Street to S. 280th Street	SR 99 At-Grade Median	127	17%
		SR 99 Mixed Median	127	17%
		SR 99 Elevated Median	127	17%
		SR 99 Elevated East Side	127	17%
		SR 99 Elevated West Side	126	17%
		I-5 Mixed West Side	6	1%
		I-5 Mixed West Side/Median	9	2%
D	S. 280th Street to S. 320th Street	SR 99 At-Grade Median	116	17%
		SR 99 Mixed Median	116	17%
		SR 99 Elevated Median	116	17%
		SR 99 Elevated East Side	118	17%
		SR 99 Elevated West Side	114	17%
		I-5 Mixed West Side	35	5%
		I-5 Mixed West Side/Median	28	4%

Additional analysis was done to identify the total zoned TOD/high-density area at station access area locations. At the alternative level, SR 99 access areas demonstrate greater potential at approximately 26 to 27 percent—slightly greater than the I-5 alternatives, which have 24 percent. Between the SR 99 alternatives, the SR 99 Elevated East Side alternative has a slightly higher area than the other SR 99 alternatives. Between the I-5 alternatives, the I-5 Mixed West Side alternative has slightly more area than the I-5 Mixed West Side/Median. **Table 6-9** summarizes the total land area of TOD/high-density zoning within station access areas, while **Table 6-10** summarizes the data by segment.

TABLE 6-9
TOD/High Density Zoning within ½ mile of Station Access Area – Effects by Alternative

Alternative	Acres of TOD/High-Density Zoning within Station Access Areas	Percent of TOD/High-Density Zoning within Station Access Areas
SR 99 At-Grade Median	534	27%
SR 99 Mixed Median	534	27%
SR 99 Elevated Median *	534	27%
SR 99 Elevated East Side	537	27%
SR 99 Elevated West Side	530	26%
I-5 Mixed West Side	487	24%
I-5 Mixed West Side/Median	482	24%

* Results for all 30th Avenue S. and 24th Avenue S. alternatives are assumed to be the same as the SR 99 Elevated Median alternative, as there are no station access areas identified along 30th Avenue S. or 24th Avenue S.

No stations are located in Segment A, so there are no access areas to analyze in this segment. Analysis at this level indicates access areas in Segment D have the highest percentage of high-density zoning, with 57 percent for all alternatives.

In Segment B, the I-5 alternatives have 38 percent high-density zoning in the access area, while the SR 99 alternatives have 31 to 33 percent. Between the SR 99 alternatives, the SR 99 Elevated East Side alternative has a slightly higher area than the other SR 99 alternatives and the SR 99 Elevated West Side alternative has slightly less high-density zoning.

In Segment C, the SR 99 alternatives have 17 percent high-density zoning within the access areas, while the I-5 alternatives have high-density zoning in less than 2 percent within the access areas.

TABLE 6-10
TOD/High-Density Zoning within ½ mile of Station Access Area – Effects by Segment

Segment	Description	Alternative	Acres of TOD/High-Density Zoning within Station Access Areas	Percent of TOD/High-Density Zoning within Station Access Areas
A	Angle Lake Station to S. 220th Street	SR 99 At-Grade Median	0	0%
		SR 99 Mixed Median	0	0%
		SR 99 Elevated Median	0	0%
		SR 99 Elevated East Side	0	0%
		SR 99 Elevated West Side	0	0%
		I-5 Mixed West Side	0	0%
		I-5 Mixed West Side/Median	0	0%
B	S. 220th Street to S. 244th Street	SR 99 At-Grade Median	161	31%
		SR 99 Mixed Median	161	31%
		SR 99 Elevated Median	161	31%
		SR 99 Elevated East Side	164	33%
		SR 99 Elevated West Side	157	31%
		I-5 Mixed West Side	192	38%
		I-5 Mixed West Side/Median	192	38%
C	S. 244th Street to S. 280th Street	SR 99 At-Grade Median	86	17%
		SR 99 Mixed Median	86	17%
		SR 99 Elevated Median	86	17%
		SR 99 Elevated East Side	86	17%
		SR 99 Elevated West Side	86	17%
		I-5 Mixed West Side	8	2%
		I-5 Mixed West Side/Median	3	<1%
D	S. 280th Street to S. 320th Street	SR 99 At-Grade Median	287	57%
		SR 99 Mixed Median	287	57%
		SR 99 Elevated Median	287	57%
		SR 99 Elevated East Side	287	57%
		SR 99 Elevated West Side	287	57%
		I-5 Mixed West Side	287	57%
		I-5 Mixed West Side/Median	287	57%

6.5. Effect on Natural Environment

6.5.1 Effects on Wetlands/Potential to Affect Stream Crossings

Wetlands are important ecosystem areas that provide habitat, contribute to hydrologic function, and water quality function in a given area. Streams are important aquatic habitats for salmonids and other fish. **Exhibit 6-9** indicates the location of potential stream and wetland crossings in the study area. **Table 6-11** shows the total number of resources that could be directly affected for each alternative. **Table 6-12** shows the effects by segment.

Methodology

Wetlands are considered "directly affected" if they are located within 100 feet of the centerline of an alternative. Stream effects are determined by the number of times an alternative crosses a stream. As the alternatives are refined, many potential effects may be avoided or mitigated; therefore, in Level 1 screening this measure is only used to show relative differences among the alternatives.

TABLE 6-11
Ecosystems – Effects by Alternative

Alternative	Wetlands Directly Affected (acres)	Number of Stream Crossings
SR 99 At-Grade Median	0	2
SR 99 Mixed Median	0	2
SR 99 Elevated Median	0	2
SR 99 Elevated East Side	0	2
SR 99 Elevated West Side	0	2
I-5 Mixed West Side	0.4	1
I-5 Mixed West Side/Median	2.1	1
30th Avenue S. At-Grade Median	0	2
30th Avenue S. Elevated Median	0	2
30th Avenue S. Elevated East Side	0	2
30th Avenue S. Elevated West Side	0	2
24th Avenue S. At-Grade Median	0	2
24th Avenue S. Elevated Median	0	2
24th Avenue S. Elevated East Side	0	2

Key Results

- Potential for wetland effects would occur only with the I-5 alternatives.
- Potential for stream effects would be greater with the SR 99 alternatives.

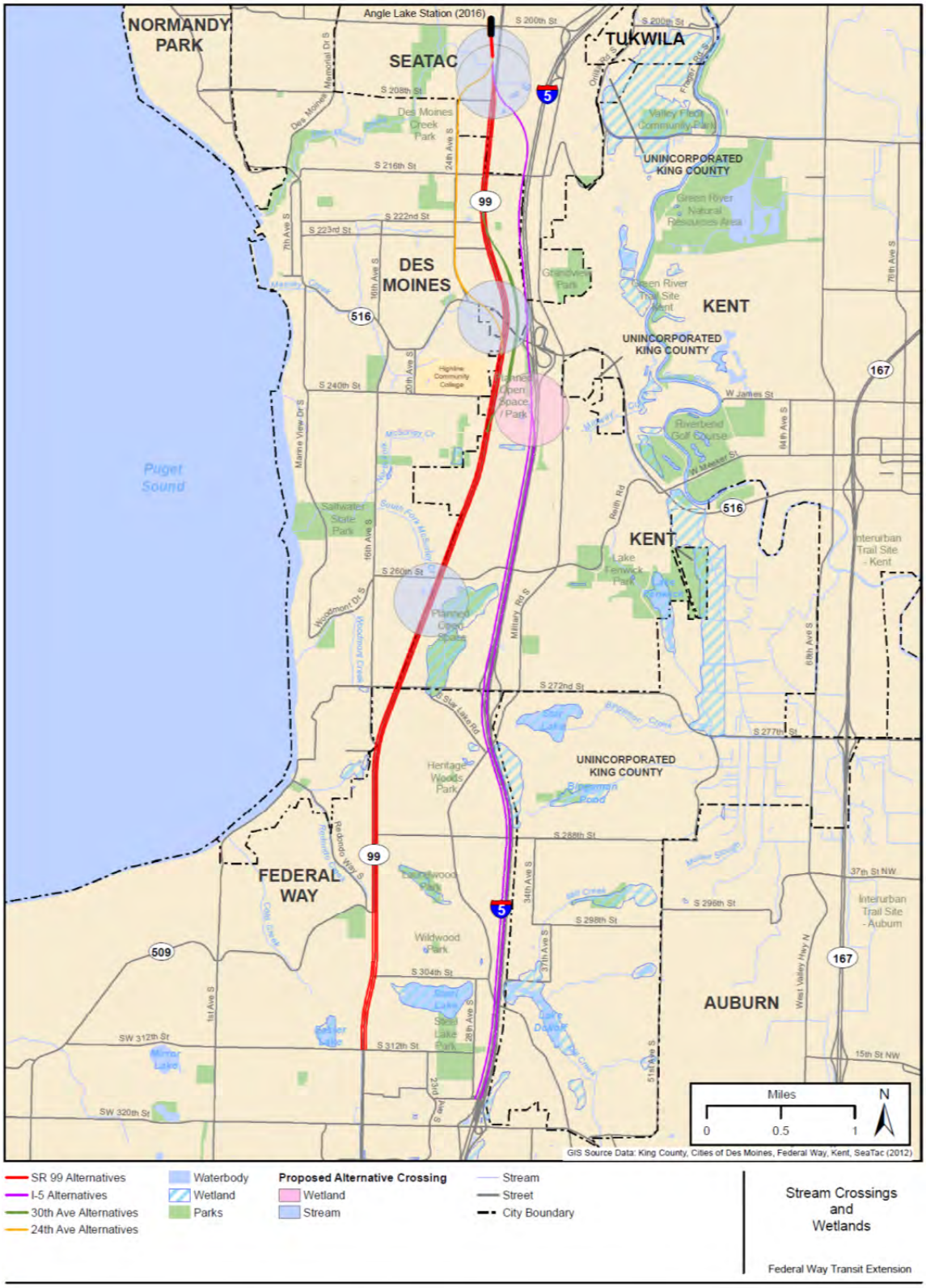


EXHIBIT 6-9
Stream Crossings and Wetlands

TABLE 6-12
Ecosystems – Effects by Segment

Segment	Description	Alternative	Wetlands Directly Affected (acres)	Number of Stream Crossings
A	Angle Lake Station to S. 220th Street	SR 99 At-Grade Median	0	1
		SR 99 Mixed Median	0	1
		SR 99 Elevated Median	0	1
		SR 99 Elevated East Side	0	1
		SR 99 Elevated West Side	0	1
		I-5 Mixed West Side	0	1
		I-5 Mixed West Side/Median	0	1
		24th Avenue S. At-Grade Median	0	1
		24th Avenue S. Elevated Median	0	1
		24th Avenue S. Elevated East Side	0	1
B	S. 220th Street to S. 244th Street	SR 99 At-Grade Median	0	0
		SR 99 Mixed Median	0	0
		SR 99 Elevated Median	0	0
		SR 99 Elevated East Side	0	0
		SR 99 Elevated West Side	0	0
		I-5 Mixed West Side	0.4	0
		I-5 Mixed West Side/Median	0.4	0
		30th Avenue S. At-Grade Median	0	0
		30th Avenue S. Elevated Median	0	0
		30th Avenue S. Elevated East Side	0	0
		30th Avenue S. Elevated West Side	0	0
		24th Avenue S. At-Grade Median	0	0
		24th Avenue S. Elevated Median	0	0
		24th Avenue S. Elevated East Side	0	0
C	S. 244th Street to S. 280th Street	SR 99 At-Grade Median	0	1
		SR 99 Mixed Median	0	1
		SR 99 Elevated Median	0	1
		SR 99 Elevated East Side	0	1
		SR 99 Elevated West Side	0	1
		I-5 Mixed West Side	<0.1	0
		I-5 Mixed West Side/Median	0.5	0
D	S. 280th Street to S. 320th Street	SR 99 At-Grade Median	0	0
		SR 99 Mixed Median	0	0
		SR 99 Elevated Median	0	0
		SR 99 Elevated East Side	0	0
		SR 99 Elevated West Side	0	0
		I-5 Mixed West Side	0	0
		I-5 Mixed West Side/Median	1.6	0

Discussion of Results

Only the I-5 alternatives would potentially affect wetlands. The I-5 Mixed West Side/Median alternative would have the most potential to affect wetlands, with most potential effects occurring in Segments C and D. The I-5 Mixed West Side alternative has fewer potential effects, with most occurring in Segment B. No potential wetland effects were identified for the SR 99 alternatives.

The SR 99 alternatives would affect more streams than I-5 alternatives. All SR 99 alternatives would potentially affect two stream crossings: an unnamed stream in Segment A, which appears to be tributary to Des Moines Creek, and the south fork of McSorley Creek in Segment C. The I-5 alternatives would only cross the same unnamed creek in Segment A. No other affected streams were identified for the I-5 alternatives.

6.6. Effect on Built Environment

6.6.1 Visual Aesthetic Effects

The visual environment is made up of both built and natural elements and provides the cultural and natural features that contribute to the public's appreciation and enjoyment of the area. Visual effects can occur if a project negatively affects the visual character and quality of the environment.

Methodology

In this preliminary assessment, the evaluation does not determine the existing visual quality other than if there are views, existing visual disturbances, and some high-level context along the project corridor. As the alternatives are refined, many potential effects may be minimized through design and landscape features; therefore, this discussion is intended at this time to show relative differences among the alternatives.

Residents are the most sensitive viewers in the study area along any of the proposed alternatives. The method for comparing potential visual effects was measured by determining the length of the alternative next to residential properties. Although the distance of sensitive viewers that may be affected is an important tool to determine effects, the visual context and alternative profile must also be considered in the analysis.

Key Results

- Elevated profiles would affect visual aesthetics more than at-grade profiles, as they often block views and stand out more in the existing environment.
- The I-5 alternatives have low to moderate potential for visual effects.
- The SR 99 alternatives have moderate potential for visual effects.
- Segments C and D have the highest existing visual quality because of views towards Puget Sound and Mt. Rainier in this area.

Discussion of Results

Table 6-13 shows the estimated total length of the alternative that may be visible by residential properties in the study area for each alternative. **Table 6-14** shows the estimated total length in each segment. The results are generalized and do not take into consideration potential mitigation measures or the potential for future development to integrate with the proposed infrastructure. **Exhibit 6-10** (north of S. 260th Street) and **Exhibit 6-11** (south of S. 260th Street) indicate the areas along each alternative that may be visible by residential properties.

TABLE 6-13
Lengths of Visually Sensitive Lands – Effects by Alternative

Alternative	Total Length of Visual Sensitivity (linear ft)	Predominant Profile	Potential Visual Effects
SR 99 At-Grade Median	5,950	At-grade	Moderate
SR 99 Mixed Median	5,950	Mixed	Moderate
SR 99 Elevated Median	5,950	Elevated	Moderate
SR 99 Elevated East Side	5,950	Elevated	Moderate
SR 99 Elevated West Side	5,950	Elevated	Moderate
I-5 Mixed West Side	23,900	Mixed	Low to moderate
I-5 Mixed West Side/Median	8,300	Mixed	Low
30th Avenue S. At-Grade Median	9,750	At-grade	Moderate
30th Avenue S. Elevated Median	9,750	Elevated	Moderate
30th Avenue S. Elevated East Side	9,750	Elevated	Moderate
30th Avenue S. Elevated West Side	9,750	Elevated	Moderate
24th Avenue S. At-Grade Median	9,750	At-grade	Moderate
24th Avenue S. Elevated Median	9,750	Elevated	Moderate
24th Avenue S. Elevated East Side	9,750	Elevated	Moderate

The I-5 alternatives have the least overall potential to affect sensitive views, as the residents along I-5 are either positioned to avoid views of the freeway or already have blocked views. The elevated alternatives along SR 99 may be able to reduce traffic effects on the roadway but may have a visual effect on adjacent residents. The 24th Avenue S. and 30th Avenue S. alternatives are likely to have the greatest effect on viewers in Segment B.

For the SR 99 alternatives, an elevated guideway would have more visual disruption than an at-grade profile. The overall potential visual effect of the elevated SR 99 alternatives is moderate, whereas the at-grade is potentially low to moderate. The elevated guideways have the potential for moderate to high effects on views to the water in the southern segments and changes to the character of the urban arterial. At-grade transit is within the character of the major arterial; while this design profile might have other effects on the built environment, it would not compromise views.

EXHIBIT 6-10
Areas Potentially Visible by Residential Properties (north of S. 260th Street)

SR 99 Alternatives
I-5 Alternatives
30th Ave Alternatives
24th Ave Alternatives
Street
City Boundary
Stream
Areas Potentially Visible by Residential Properties
Waterbody
Parks
Park & Ride

Areas Potentially Visible by Residential Properties – South

Federal Way Transit Extension

EXHIBIT 6-11
Areas Potentially Visible by Residential Properties (south of S. 260th Street)

TABLE 6-14
Lengths of Visually Sensitive Lands – Effects by Segment

Segment	Description	Alternative	Length of Visual Sensitivity (linear ft)	Potential Visual Effects
A	Angle Lake Station to S. 220th Street	SR 99 At-Grade Median	1,300	Low to moderate
		SR 99 Mixed Median	1,300	Low to moderate
		SR 99 Elevated Median	1,300	Low to moderate
		SR 99 Elevated East Side	1,300	Low to moderate
		SR 99 Elevated West Side	1,300	Low to moderate
		I-5 Mixed West Side	5,200	Low to moderate
		I-5 Mixed West Side/Median	5,200	Low to moderate
		24th Avenue S. At-Grade Median	1,800	Moderate to high
		24th Avenue S. Elevated Median	1,800	Moderate to high
		24th Avenue S. Elevated East Side	1,800	Moderate to high
B	S. 220th Street to S. 240th Street	SR 99 At-Grade Median	0	Low
		SR 99 Mixed Median	0	Low
		SR 99 Elevated Median	0	Low
		SR 99 Elevated East Side	0	Low
		SR 99 Elevated West Side	0	Low
		I-5 Mixed West Side	3,100	Low to moderate
		I-5 Mixed West Side/Median	3,100	Low to moderate
		30th Avenue S. At-Grade Median	3,800	Moderate to high
		30th Avenue S. Elevated Median	3,800	Moderate to high
		30th Avenue S. Elevated East Side	3,800	Moderate to high
		30th Avenue S. Elevated West Side	3,800	Moderate to high
		24th Avenue S. At-Grade Median	3,300	Moderate to high
		24th Avenue S. Elevated Median	3,300	Moderate to high
		24th Avenue S. Elevated East Side	3,300	Moderate to high
C	S. 244th Street to S. 280th Street	SR 99 At-Grade Median	0	Low
		SR 99 Mixed Median	0	Low
		SR 99 Elevated Median	0	Low
		SR 99 Elevated East Side	0	Low
		SR 99 Elevated West Side	0	Low
		I-5 Mixed West Side	4,600	Low to Moderate
		I-5 Mixed West Side/Median	0	Low
D	S. 280th Street to S. 320th Street	SR 99 At-Grade Median	4,650	Low to Moderate
		SR 99 Mixed Median	4,650	Low to moderate
		SR 99 Elevated Median	4,650	Moderate to high
		SR 99 Elevated East Side	4,650	Moderate to high
		SR 99 Elevated West Side	4,650	Moderate to high
		I-5 Mixed West Side	11,000	Moderate
		I-5 Mixed West Side/Median	0	Low

In Segment A, the I-5 alternatives would have the longest elevated profile near residential viewers in this segment, but the visual effect would be low to moderate. There would be no

particular viewsheds affected by these alternatives along the SR 509 right-of-way. It is likely that the FWTE would be built prior to SR 509, resulting in a change of the existing condition and affecting the visual aesthetic of the area. Residences along the proposed SR 509 corridor may be affected by the I-5 alternatives, but the effect would be minimal as the residences are oriented away from the potential alignment. For the SR 99 alternatives, the residential units do not face the highway; however, the at-grade alternatives may remove land uses, thereby exposing more residential units to the SR 99 corridor than exists today. Depending on the property acquisition required, an elevated profile may be buffered by existing commercial units from the residences. The 24th Avenue S. alternatives would have the next greatest effect and would pass in front of homes that currently look out onto undeveloped land. 24th Avenue S., however, is planned for widening and improvements in the next few years and the undeveloped land is the location of the planned Des Moines Creek Business Park, which would alter the visual feel of this area. The 24th Avenue S. At-Grade Median alternative could be designed to feel integrated with the design elements of the roadway and would have less potential for visual effects than the 24th Avenue S. Elevated East Side alternative.

In Segment B, the I-5 alternatives would affect the same linear length of residential areas; however, the homes are oriented away from I-5 resulting in minimal affect on the viewers' experience. Views of Mt Rainier would not be affected. There are no residential uses along Segment B for alternatives along SR 99 and there are no immediate views that would be blocked from SR 99 in this segment. The 24th Avenue S. and 30th Avenue S. alternatives would all be visible from the same linear length of residences. The difference in the level of effect would result from the profile and location of the alternative. Elevated structures have the largest visual effect as they often block views and stand out more in the existing environment than at-grade alternatives. The 30th Avenue S. Elevated East Side and 30th Avenue S. Elevated West Side alternatives would have the greatest visual effect of the 30th Avenue S. alternatives, as they would be elevated and would be adjacent to sensitive residential areas (although the most immediate residences would likely be removed, those that remain would be affected). The 30th Avenue S. Elevated Median alternative would have the next largest visual effect because it would be highly visible. It would not be immediately adjacent to homes, but would visually affect both sides of the roadway. The 30th Avenue S. At-Grade Median alternative would have the least visual effect because it would be at-grade and in the median of the roadway. Similarly, the 24th Avenue S. At-Grade Median alternative would have less visual effect on this road because it would be at-grade and in the median; although expanding the roadway would change the character of the road it would likely not diminish the visual environment. The 24th Avenue S. Elevated East Side alternative may result in moderate to high effect on the visual environment because an overhead infrastructure is not consistent with the neighborhood environment and park activities along 24th Avenue S.

In Segment C, the I-5 Mixed West Side alternative would be adjacent to the west side of I-5 while the I-5 Mixed West Side/Median alternative would be located in the I-5 median. The area to the west of I-5 includes open areas, landfill, wetlands, and about 25 percent residential uses. These residential uses appear to be heavily buffered by vegetation to reduce the views toward the freeway; therefore, the visual effects are low to moderate. The I-5 Mixed West Side/Median alternative would be more integrated with the freeway and slightly less noticeable from a visual perspective. There are very few residential uses along SR 99 in Segment C, so the effects of an elevated profile over the at-grade profile would be a tradeoff with the visual improvements along SR 99 that would be removed by an at-grade profile. The elevated alternatives on the east and west sides of SR 99 would affect the roadway less. The at-grade would have the highest effect due to the low presence of sensitive viewers; however, the overall effect is low for all SR 99 alternatives.

In general, Segments C and D would have the highest existing visual quality because of views towards Puget Sound in this area. The SR 99 Elevated Median alternative, SR 99 Elevated East Side alternative, and the SR 99 Elevated West Side alternative all have elevated portions of their alignment in Segments C and D and could affect sensitive water views. The SR 99 Elevated East Side alternative would have a greater visual effect, as it is elevated throughout and blocks sensitive views towards the water from adjacent residential areas. Elevated median alternatives, such as the SR 99 Elevated Median alternative, and mixed elevated and at-grade median alternatives, such as I-5 Mixed West Side/Median and SR 99 Mixed Median alternatives, would disrupt some views but would be in the middle of an existing transportation corridor and would therefore have less of a visual effect than side running elevated alternatives. These elevated and mixed median alternatives are projected to have moderate to high visual effects. The elevated alternatives on SR 99 may provide passengers intermittent views of Puget Sound. The SR 99 At-Grade Median alternative and SR 99 Mixed Median alternative may widen the roadways to open views of Puget Sound without blocking views of remaining land uses, but removal of vegetation in the process would result in visual changes to SR 99. Overall, these alternatives are rated as having low to moderate effects.

There are some views of Mt. Rainier looking east that may be affected by an elevated profile along I-5 at the southern end of the I-5 alternatives. Of these alternatives, the SR 99 Elevated East Side and I-5 Mixed West Side would have the greatest visual effect. I-5 Mixed West Side would cross the greatest area of visual sensitivity in Segment D. However, this alternative would be only partially elevated and would be adjacent to homes on the west side of I-5. The I-5 Mixed West Side alternative, depending on the elevation of the guideway, may affect views of Mt. Rainier and would result in a moderate effect. I-5 Mixed West Side/Median alternative would have a low visual effect, unless the alternative has to cross over I-5 to access the Federal Way Transit Center, which could block views accordingly.

6.6.2 Potential Property Acquisition

Properties would need to be purchased for right-of-way and other project-related facilities and could involve the displacement and relocation of residential and commercial properties. Projects receiving federal funding are required to comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1070 (Code of Federal Regulations [CFR] Title 49, Part 24), as amended. This Act provides guidance on how property owners would be compensated and relocated as necessary. Sound Transit adopted the *Real Property Acquisition and Relocation Policy, Procedures, and Guidelines* to guide its compliance with Chapter 8.26 Revised Code of Washington (RCW) and Chapter 468-100 Washington Administration Code (WAC).

Methodology

The number of potential displacements would be estimated in the Level 2 Screening. Because the design of the alternatives is still in the preliminary stages, it is unknown exactly which properties would be acquired for the alternatives; however, in order to compare potential effects of the alternatives being considered, a threshold is used to determine potential acquisition effects. Properties were determined to have the potential to be acquired if they are located within 100 feet of the centerline of the alternative.

Table 6-15 shows the total number of residential and commercial properties that could potentially be required for acquisition for each alternative. **Table 6-16** shows the number of properties that could potentially be acquired in each segment. Individual properties could have one or multiple residential units or businesses. Not all property acquisitions may result in displacements.

Key Results

- Property acquisition would be required for all alternatives.
- SR 99 alternatives (including 24th Avenue S. alternatives) would require more commercial property acquisitions.
- I-5 and 30th Avenue S. alternatives would require residential property acquisitions.

Discussion of Results

The SR 99 At-Grade Median alternative, SR 99 Mixed Median alternative, and SR 99 Elevated Median alternative would result in the greatest number of potential commercial properties acquired, with up to 322 commercial properties affected. The I-5 Mixed West Side alternative would result in the greatest number of potential residential property acquisitions from any alternative with up to 169 residential properties affected. The I-5 Mixed West Side/Median alternative would result in the lowest total amount of potential commercial property acquisitions with 20 potentially affected. The SR 99 Elevated West Side alternative would result in the lowest number of residential acquisitions with 34 residential properties potentially affected.

TABLE 6-15
Potential Property Acquisitions – Effects by Alternative

Alternative	Potential Acquisitions (Residential)	Potential Acquisitions (Commercial)
SR 99 At-Grade Median	58	322
SR 99 Mixed Median	58	322
SR 99 Elevated Median	58	322
SR 99 Elevated East Side	57	167
SR 99 Elevated West Side	34	175
I-5 Mixed West Side	169	33
I-5 Mixed West Side/Median	86	20
30th Avenue S. At-Grade Median	53	47
30th Avenue S. Elevated Median	55	47
30th Avenue S. Elevated East Side	55	47
30th Avenue S. Elevated West Side	55	47
24th Avenue S. At-Grade Median	94	41
24th Avenue S. Elevated Median	94	41
24th Avenue S. Elevated East Side	95	40

Segment A has the fewest potential property acquisitions for the SR 99 alternatives. In Segment B, the SR 99 At-Grade Median alternative, SR 99 Mixed Median alternative, and the SR 99 Elevated Median alternative would result in the greatest number of commercial property acquisitions. The 30th Avenue S. alternatives would have at least 53 residential property acquisitions, whereas the SR 99 alternatives would have three, except for SR 99 Elevated East Side, which would have five.

The SR 99 Elevated East Side alternative would result in the greatest total number of commercial and residential property acquisitions in Segment C. The I-5 Mixed West Side/Median alternative would have the fewest potential acquisitions in Segments C and D because of its location in the I-5 median. In Segment D, the I-5 Mixed West Side alternative would result in the greatest number of residential property acquisitions, while the SR 99 At-Grade Median alternative, SR 99 Mixed Median alternative, and the SR 99 Elevated Median alternative would result in the greatest number of commercial property acquisitions.

TABLE 6-16
Potential Property Acquisitions – Effects by Segment

Segment	Description	Alternative	Potential Acquisitions (Residential)	Potential Acquisitions (Commercial)
A	Angle Lake Station to S. 220th Street	SR 99 At-Grade Median	8	44
		SR 99 Mixed Median	8	44
		SR 99 Elevated Median	8	44
		SR 99 Elevated East Side	9	26
		SR 99 Elevated West Side	4	23
		I-5 Mixed West Side	62	9
		I-5 Mixed West Side/Median	62	9
		24th Avenue S. At-Grade Median	50	13
		24th Avenue S. Elevated Median	50	13
		24th Avenue S. Elevated East Side	51	12
B	S. 220th Street to S. 244th Street	SR 99 At-Grade Median	3	91
		SR 99 Mixed Median	3	91
		SR 99 Elevated Median	3	91
		SR 99 Elevated East Side	5	43
		SR 99 Elevated West Side	4	52
		I-5 Mixed West Side	24	11
		I-5 Mixed West Side/Median	24	11
		30th Avenue S. At-Grade Median	53	47
		30th Avenue S. Elevated Median	55	47
		30th Avenue S. Elevated East Side	55	47
		30th Avenue S. Elevated West Side	55	47
		24th Avenue S. At-Grade Median	44	28
		24th Avenue S. Elevated Median	44	28
		24th Avenue S. Elevated East Side	44	28
C	S. 244th Street to S. 280th Street	SR 99 At-Grade Median	26	105
		SR 99 Mixed Median	26	105
		SR 99 Elevated Median	26	105
		SR 99 Elevated East Side	19	55
		SR 99 Elevated West Side	14	56
		I-5 Mixed West Side	42	5
		I-5 Mixed West Side/Median	42	5
D	S. 280th Street to S. 320th Street	SR 99 At-Grade Median	21	82
		SR 99 Mixed Median	21	82
		SR 99 Elevated Median	21	82
		SR 99 Elevated East Side	24	43
		SR 99 Elevated West Side	12	44
		I-5 Mixed West Side	41	8
		I-5 Mixed West Side/Median	41	8

6.6.3 Effects to Known Parks

Direct effects to parks could include, but are not limited to, the acquisition of public parks, greenbelts, and other undeveloped open spaces, trails, and playfields. Indirect effects include noise, dust, and temporary construction period access restrictions. **Table 6-17** shows the total number of resources that could be directly and/or indirectly affected. **Table 6-18** shows the effects by segment.

Methodology

Direct effects to a park could occur if the park is located within 50 feet of the alternative's centerline, while indirect effects would occur if the park is within 200 feet of the alternative's centerline. As the alternatives are refined, many potential effects may be avoided or mitigated; therefore, this measure is intended to show relative differences among the alternative alignment options and segments.

Key Results

- No potential park effects would occur with the SR 99 or 30th Avenue S. alternatives.
- The 24th Avenue S. At-Grade Median alternative has the greatest potential to affect parks.
- The I-5 alternatives have the greatest potential to indirectly affect parks.

Discussion of Results

The alternative with the highest potential to affect parks is the 24th Avenue S. At-Grade Median alternative. This would be the only alternative with potential direct effects to parks, with less than 0.1 affected acres (Steven J. Underwood Park). All three of the 24th Avenue S. alternatives would have approximately 1 acre of potential indirect effects to the same park. The only other alternatives that would affect parks would be the I-5 alternatives. The only park effects in Segments C and D would occur with the I-5 Mixed West Side/Median alternative in Segment C, which would have 0.1 acre of indirect effects at Old Fire Station Park, and the I-5 Mixed West Side alternative in Segment D, which would have 0.4 acre of indirect park effects at Steel Lake Park.

The I-5 and 30th Avenue S. alternatives have potential to affect a planned open space area in Segment B, if it becomes publicly owned and is opened to the public. The open space is not developed or publicly owned at this time, but there is a potential for an open space effect depending on the timeline of the proposed FWTE project. If so, this would trigger a Department of Transportation Act 'Section 4(f) analysis', which states a "feasible and reasonable alternative" would have to be considered before an alternative that affects a park can be considered.

TABLE 6-17
Parks Effects for the I-5 Alternatives

Alternative	Parks Directly Affected (acres)	Parks Indirectly Affected (acres)
I-5 Mixed West	0	0.4
I-5 Mixed West/Median	0	0.1

No park effects for SR 99 alternatives and 30th Avenue S. alternatives.

TABLE 6-18
Parks Effects by Segment

Segment	Description	Alternative	Parks Directly Affected (acres)	Parks Indirectly Affected (acres)
A	Angle Lake Station to S. 220th Street	SR 99 At-Grade Median	0	0
		SR 99 Mixed Median	0	0
		SR 99 Elevated Median	0	0
		SR 99 Elevated East Side	0	0
		SR 99 Elevated West Side	0	0
		I-5 Mixed West Side	0	0
		I-5 Mixed West Side/Median	0	0
		24th Avenue S. At-Grade Median	Less than 0.1	1
		24th Avenue S. Elevated Median	Less than 0.1	1
		24th Avenue S. Elevated East Side	0	1
B	S. 220th Street to S. 244th Street	SR 99 At-Grade Median	0	0
		SR 99 Mixed Median	0	0
		SR 99 Elevated Median	0	0
		SR 99 Elevated East Side	0	0
		SR 99 Elevated West Side	0	0
		I-5 Mixed West Side	0	0
		I-5 Mixed West Side/Median	0	0
		30th Avenue S. At-Grade Median	0	0
		30th Avenue S. Elevated Median	0	0
		30th Avenue S. Elevated East Side	0	0
		30th Avenue S. Elevated West Side	0	0
		24th Avenue S. At-Grade Median	0	0
		24th Avenue S. Elevated Median	0	0
		24th Avenue S. Elevated East Side	0	0
C	S. 244th Street to S. 280th Street	SR 99 At-Grade Median	0	0
		SR 99 Mixed Median	0	0
		SR 99 Elevated Median	0	0
		SR 99 Elevated East Side	0	0
		SR 99 Elevated West Side	0	0
		I-5 Mixed West Side	0	0
		I-5 Mixed West Side/Median	0	0.1
D	S. 280th Street to S. 320th Street	SR 99 At-Grade Median	0	0
		SR 99 Mixed Median	0	0

Segment	Description	Alternative	Parks Directly Affected (acres)	Parks Indirectly Affected (acres)
		SR 99 Elevated Median	0	0
		SR 99 Elevated East Side	0	0
		SR 99 Elevated West Side	0	0
		I-5 Mixed West Side	0	0.4
		I-5 Mixed West Side/Median	0	0

6.6.4 Number of Community Facilities Affected

For Level 1, community facilities have been defined as schools, libraries, and religious institutions, based on available information from the King County Assessor. These social centers and important meeting areas unify the community as well as provide vital services to communities. **Table 6-19** shows the total number of these resources that could be directly and indirectly affected for each alternative, while **Table 6-20** shows the effects by segment. **Exhibit 6-12** identifies school, church, and government parcels within 100 to 200 feet of each alternative.

Methodology

Community facilities are directly affected if located within 100 feet of the centerline of the alternative. They are indirectly affected if located between 100 to 200 feet from the centerline. As the alternatives are refined, many potential effects may be avoided or mitigated; therefore, this measure is intended to show relative differences among the alternatives.

Key Results

- SR 99 median alternatives and the 24th Avenue S. alternatives have the highest potential to affect community facilities, followed by the SR 99 Elevated West Side alternative.
- The 30th Avenue S. alternatives have no affected community facilities.
- Segment A has the most affected community facilities.

Discussion of Results

In Segment B, the 24th Avenue S. alternatives have at least two more facilities directly affected than the other alternatives. Community facilities are more prevalent in the area of Segment C. The I-5 alternatives have the least potential effects within this segment. In Segment D, the SR 99 At-Grade Median alternative, the SR 99 Mixed Median alternative, the SR 99 Elevated Median alternative, and the I-5 Mixed West Side alternative all have one effect each, while all other alternatives have zero.

TABLE 6-19
Community Facilities – Effects by Alternative

Alternative	Number of Facilities Directly Affected	Number of Facilities Indirectly Affected
SR 99 At-Grade Median	4	1
SR 99 Mixed Median	4	1
SR 99 Elevated Median	4	1
SR 99 Elevated East Side	1	3
SR 99 Elevated West Side	3	2
I-5 Mixed West Side	3	1
I-5 Mixed West Side/Median	1	0
30th Avenue S. At-Grade Median	4	0
30th Avenue S. Elevated Median	4	0
30th Avenue S. Elevated East Side	1	3
30th Avenue S. Elevated West Side	3	1
24th Avenue S. At-Grade Median	9	0
24th Avenue S. Elevated Median	9	0
24th Avenue S. Elevated East Side	6	3

TABLE 6-20
Community Facilities – Effects by Segment

Segment	Description	Alternative	Number of Facilities Directly Affected	Number of Facilities Indirectly Affected
A	Angle Lake Station to S. 220th Street	SR 99 At-Grade Median	0	0
		SR 99 Mixed Median	0	0
		SR 99 Elevated Median	0	0
		SR 99 Elevated East Side	0	0
		SR 99 Elevated West Side	0	0
		I-5 Mixed West Side	0	0
		I-5 Mixed West Side/Median	0	0
		24th Avenue S. At-Grade Median	2	0
		24th Avenue S. Elevated Median	2	0
		24th Avenue S. Elevated East Side	2	0
B	S. 220th Street to S. 244th Street	SR 99 At-Grade Median	0	1
		SR 99 Mixed Median	0	1
		SR 99 Elevated Median	0	1
		SR 99 Elevated East Side	0	0
		SR 99 Elevated West Side	0	1
		I-5 Mixed West Side	1	0
		I-5 Mixed West Side/Median	1	0
		30th Avenue S. At-Grade Median	0	0
		30th Avenue S. Elevated Median	0	0
		30th Avenue S. Elevated East Side	0	0
		30th Avenue S. Elevated West Side	0	0
		24th Avenue S. At-Grade Median	3	0
		24th Avenue S. Elevated Median	3	0
		24th Avenue S. Elevated East Side	3	0
C	S. 244th Street to S. 280th Street	SR 99 At-Grade Median	3	0
		SR 99 Mixed Median	3	0
		SR 99 Elevated Median	3	0
		SR 99 Elevated East Side	1	2
		SR 99 Elevated West Side	2	1
		I-5 Mixed West Side	1	0
		I-5 Mixed West Side/Median	0	0
D	S. 280th Street to S. 320th Street	SR 99 At-Grade Median	1	0
		SR 99 Mixed Median	1	0
		SR 99 Elevated Median	1	0
		SR 99 Elevated East Side	0	1
		SR 99 Elevated West Side	1	0
		I-5 Mixed West Side	1	1
		I-5 Mixed West Side/Median	0	0

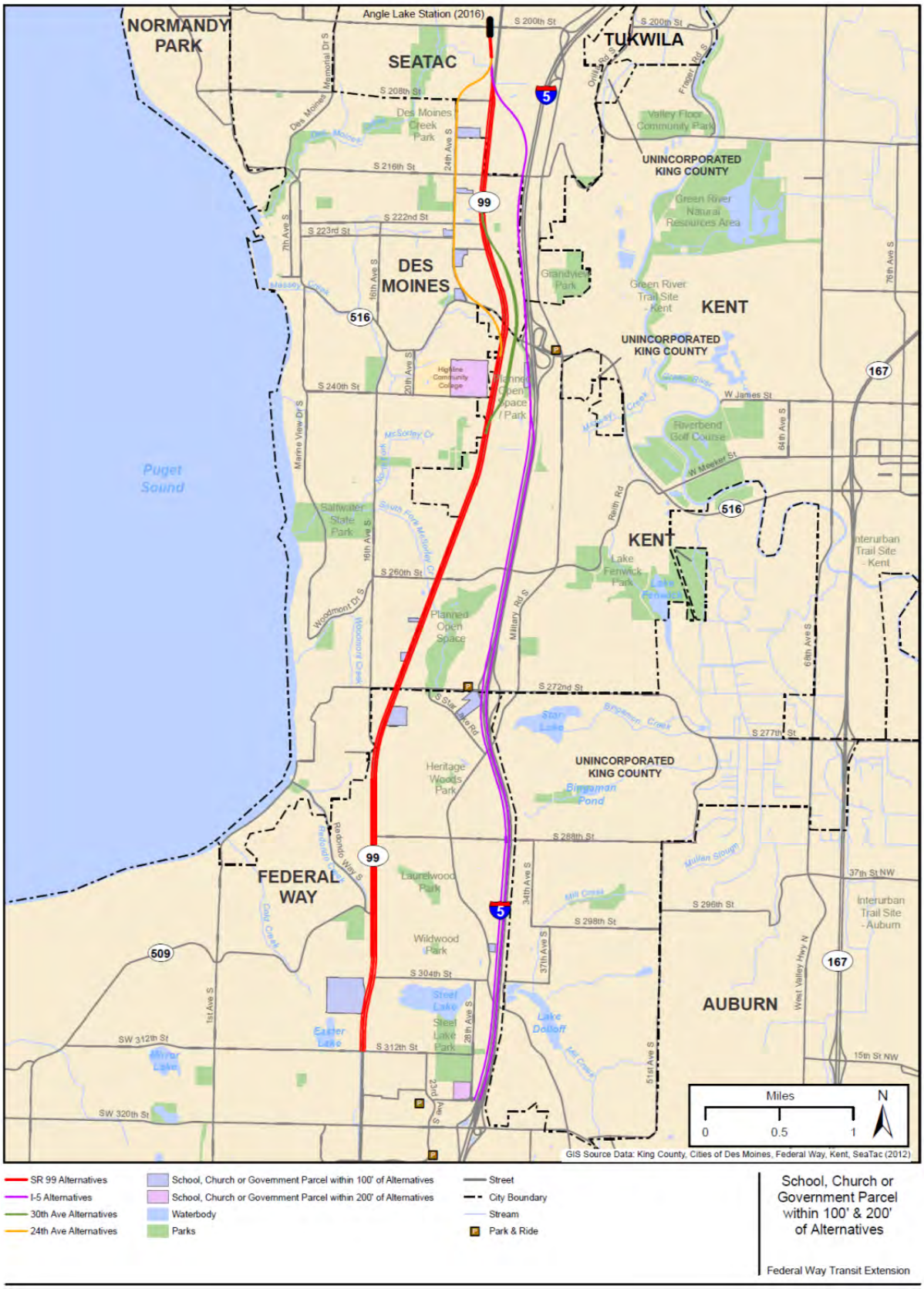


EXHIBIT 6-12

School, Church, or Government Parcel 100' and 200' of Alternatives

6.6.5 Effects on Known or Eligible Historic or Other Sensitive Properties

A preliminary visual review of properties along each alternative and research of historic property databases has not resulted in the identification of any properties eligible for listing on the National Register of Historic Places that would be potentially affected by the Level 1 alternatives.

6.6.6 Number of Potentially Affected Noise Receptors

Noise sensitive receivers were evaluated for Level 1 based on FTA criteria in the *Transit Noise and Vibration Impact Assessment* (FTA 2006), which groups noise sensitive land uses into the following categories:

- Category 1: Buildings or parks where "quiet" is an essential element of their purpose.
- Category 2: Residences and buildings where people normally sleep, including residences, hospitals, and hotels where nighttime sensitivity is assumed to be important.
- Category 3: Institutional land uses with primarily daytime and evening use, including schools, libraries, churches and certain parks used for passive recreation.

Methodology

Within the FWTE study area, potential noise sensitive receivers evaluated for Level 1 include residences and hotels (Category 2 receivers) and schools and churches (Category 3 receivers). All Category 2 receivers would be assumed to have a high potential for noise effects at distances of up to 175 feet from the track. Category 2 receivers along elevated alternatives or in areas with little or no shielding from at-grade alternatives would be considered to have a high potential for noise effects out to 350 feet from the alignment. Schools and churches were considered if within 175 feet of the alternative with no obstructions, based on King County Assessor property data. Additional Category 3 receivers could be identified (and effects on them considered during Level 2 screening) once field verification is completed. Only minimal physical and topographical shielding was considered and used to reduce effects.

Key Results

- The I-5 alternatives have the highest number of potential noise effects.
- 30th Avenue S. and 24th Avenue S. alternatives also have a high number of potential noise effects.
- 24th Avenue S. alternatives have the highest number of schools and churches that could be affected.

Discussion of Results

Table 6-21 summarizes the effects for the entire I-5 and SR 99 alternatives, while **Table 6-22** summarizes these effects by segments and includes effects for the 24th Avenue S. and 30th Avenue S. alternatives. The I-5 Mixed West Side alternative has the greatest potential for noise

effects, while the I-5 Mixed West/Median and SR 99 Elevated alternatives (median, east, and west) would all have similar effects. The SR 99 At-Grade Median alternative would have the least potential for effects overall.

TABLE 6-21
Potential for Noise Effects by Alternative

Alternative	Category 2 Noise Sensitive Receivers (Residences)	Category 3 Noise Sensitive Receivers (Schools, Churches)
SR 99 At-Grade Median	380	9
SR 99 Mixed Median	600	9
SR 99 Elevated Median	818	9
SR 99 Elevated East Side	874	11
SR 99 Elevated West Side	856	9
I-5 Mixed West Side	963	4
I-5 Mixed West Side/Median	808	3
30th Avenue S. At-Grade Median	715	9
30th Avenue S. Elevated Median	1,114	9
30th Avenue S. Elevated East Side	1,196	11
30th Avenue S. Elevated West Side	1,190	9
24th Avenue S. At-Grade Median	446	10
24th Avenue S. Elevated Median	692	11
24th Avenue S. Elevated East Side	861	13

As shown in **Table 6-22**, the SR 99 At-Grade Median alternative would have the lowest potential for noise effects in Segment A, with 41 Category 2 receivers. The I-5 alternatives would have the greatest potential effect, with over 230 Category 2 receivers. At this level of evaluation, only one Category 3 receiver was identified in Segment A. This Category 3 receiver is present along all SR 99 alternatives.

In Segment B, the elevated 30th Avenue S. alternatives would have the greatest potential for effects, with over 500 Category 2 receivers; while the 30th Avenue S. At-Grade Median alternative has 357. The SR 99 Median At-Grade alternative would have the least, with 22. The remaining SR 99 alternatives and the 24th Avenue S. alternatives would all have between 88 and 214 Category 2 receivers. The I-5 alternatives have 335 Category 2 receivers. The 24th Avenue S. alternatives have the greatest number of Category 3 receivers, with four, while the SR 99, I-5, and 30th Avenue S. alternatives have two.

In Segment C, the SR 99 At-Grade Median alternative would have the lowest number of Category 2 receivers, with 44, while the remaining SR 99 alternatives and the I-5 alternatives have a similar number, with between 109 and 193 Category 2 receivers. The SR 99 alternatives have two Category 3 receivers identified, while the I-5 alternatives have one.

TABLE 6-22
Potential for Noise Effects by Segment

Segment	Description	Alternative	Category 2 Noise Sensitive Receivers (Residences)	Category 3 Noise Sensitive Receivers (Schools, Churches)
A	Angle Lake Station to S. 220th Street	SR 99 At-Grade Median	41	1
		SR 99 Mixed Median	70	1
		SR 99 Elevated Median	97	1
		SR 99 Elevated East Side	106	1
		SR 99 Elevated West Side	87	1
		I-5 Mixed West Side	233	0
		I-5 Mixed West Side/Median	233	0
B	S. 220th Street to S. 244th Street	SR 99 At-Grade Median	22	2
		SR 99 Mixed Median	118	2
		SR 99 Elevated Median	214	2
		SR 99 Elevated East Side	188	2
		SR 99 Elevated West Side	176	2
		I-5 Mixed West Side	335	2
		I-5 Mixed West Side/Median	335	2
		30th Avenue S. At-Grade Median	357	2
		30th Avenue S. Elevated Median	510-537[a]	2
		30th Avenue S. Elevated East Side	510-537 [a]	2
		30th Avenue S. Elevated West Side	510-537 [a]	2
		24th Avenue S. At-Grade Median	88	3
		24th Avenue S. Elevated Median	88	4
		24th Avenue S. Elevated East Side	175	4
C	S. 244th Street to S. 280th Street	SR 99 At-Grade Median	44	2
		SR 99 Mixed Median	100	2
		SR 99 Elevated Median	155	2
		SR 99 Elevated East Side	180	2
		SR 99 Elevated West Side	193	2
		I-5 Mixed West Side	148	1
		I-5 Mixed West Side/Median	109	1
D	S. 280th Street to S. 320th Street	SR 99 At-Grade Median	273	4
		SR 99 Mixed Median	312	4
		SR 99 Elevated Median	352	4
		SR 99 Elevated East Side	400	6
		SR 99 Elevated West Side	400	4
		I-5 Mixed West Side	247	1
		I-5 Mixed West Side/Median	131	0

[a] Range is based on connection to SR 99 or I-5 in Segment C. The lower value is for the connection to SR 99 and the higher value is for the connection to I-5.

In Segment D, the I-5 Mixed West Side/Median alternative has the lowest number of Category 2 receivers with 131, while the SR 99 side running elevated alternatives (east and west) has 400. All SR 99 alternatives except the SR 99 Elevated East Side alternative have four Category 3 receivers identified. The SR 99 Elevated East Side alternative has the most Category 3 receivers (six). The I-5 Mixed West Side alternative has one Category 3 receiver, while the I-5 Mixed West Side/Median alternative has no Category 3 receivers.

6.6.7 LOS at Intersections; Evaluation of Capacity/Flow (existing conditions) and Traffic Circulation and Access Number of Mid-block Opportunities

Potential traffic effects include (1) increased waiting time at intersections, which affects an intersection's Level of Service (LOS) and (2) access restriction effect. **Table 6-23** shows the total number of effects from each alternative under each category. **Table 6-24** shows the effects by segment.

Methodology

To determine potential LOS effects, local agencies' transportation plans were reviewed to identify intersections within each at-grade only alternative alignment area that are currently operating at LOS F.

Potential access effects could occur when an alternative restricts access at un-signalized intersections/side streets or when they restrict access to existing U-turns or left-turn lanes that provide indirect access to properties across busy roadways. SR 99 has a number of these points because the roadway has a landscaped median that restricts left turns. As a result, the number of locations where turns would be restricted was identified at un-signalized intersections, mid-block U-turns, or median left-turn lane areas. It was assumed that these turn movements across the track would not remain under project conditions unless they would be protected by gates or signals.

Key Results

- Only the SR 99 At-Grade Median alternative would likely have LOS effects.
- Only the SR 99 Median and 30th Avenue S. Median alternatives are expected to result in restricted access effects at properties and side streets.

Discussion of Results

In general, alternatives located in the median of roadways would have the greatest traffic effects, unless they are along I-5. The I-5 alternatives, the SR 99 Elevated East Side alternative, and the SR 99 Elevated West Side alternative are not expected to have any access restriction effects or LOS effects. The SR 99 At-Grade Median and Elevated Median alternatives are the only alternatives to have potential LOS effects. The most substantial traffic impacts of these

alternatives would occur at three intersections: SR 99 and S. 216th Street, SR 99 and SR 516/Kent Des Moines Road S., and SR 99 and S. 272nd Street. All three SR 99 alternatives in the median would have the same number of potential access effects at side streets (12) and to properties indirectly affected by restricted U-turn and two-way left-turn lane movements (83).

TABLE 6-23
Traffic – Effects by Alternative

Alternative	Number of Affected LOS F Intersections	Number of Unsignalized Intersections/Side Streets Affected	Number of Properties Affected (U-turn or left turn access)
SR 99 At-Grade Median	3	12	83
SR 99 Mixed Median	0	12	83
SR 99 Elevated Median	0	12	83
SR 99 Elevated East Side	0	0	0
SR 99 Elevated West Side	0	0	0
I-5 Mixed West Side	0	0	0
I-5 Mixed West Side/Median	0	0	0
30th Avenue S. At-Grade Median	2	15	115
30th Avenue S. Elevated Median	0	15	115
30th Avenue S. Elevated East Side	0	0	0
30th Avenue S. Elevated West Side	0	0	0
24th Avenue S. At-Grade Median	1	17	110
24th Avenue S. Elevated Median	0	17	110
24th Avenue S. Elevated East Side	0	0	0

The greatest number of potential LOS effects would occur in Segments A, B, and C where one intersection in each segment could be affected by the SR 99 At-Grade Median alternative. These are the only potential LOS effects identified.

Within Segment A, the two 24th Avenue S. alternatives in the median would have access effects that could potentially affect 28 properties, which is the highest in this segment. These alternatives would also affect access at two side streets, which is the greatest within this segment. The 30th Avenue S. Elevated East Side and 30th Avenue S. Elevated West Side alternatives would not result in any traffic effects in Segment B. The 24th Avenue S. Elevated East Side alternative would not have traffic effects in Segments A or B.

TABLE 6-24
Traffic– Effects by Segment

Segment	Description	Alternative	Affected LOS F Intersections	Un-signalized Intersections/ Side Streets Affected	Properties Affected (U-turn or left-turn access)
A	S. 200th to S. 220th Street	SR 99 At-Grade Median	1	1	11
		SR 99 Mixed Median	0	1	11
		SR 99 Elevated Median	0	1	11
		SR 99 Elevated East Side	0	0	0
		SR 99 Elevated West Side	0	0	0
		I-5 Mixed West Side	0	0	0
		I-5 Mixed West Side/Median	0	0	0
		24th Avenue S. At-Grade Median	0	2	28
		24th Avenue S. Elevated Median	0	2	28
		24th Avenue S. Elevated East Side	0	0	0
B	S. 220th to S.244th Street	SR 99 At-Grade Median	1	1	29
		SR 99 Mixed Median	0	1	29
		SR 99 Elevated Median	0	1	29
		SR 99 Elevated East Side	0	0	0
		SR 99 Elevated West Side	0	0	0
		I-5 Mixed West Side	0	0	0
		I-5 Mixed West Side/Median	0	0	0
		30th Avenue S. At-Grade Median	0	4	61
		30th Avenue S. Elevated Median	0	4	61
		30th Avenue S. Elevated East Side	0	0	0
		30th Avenue S. Elevated West Side	0	0	0
		24th Avenue S. At-Grade Median	0	5	39
		24th Avenue S. Elevated Median	0	5	39
		24th Avenue S. Elevated East Side	0	0	0
C	S. 244th to S. 280th Street	SR 99 At-Grade Median	1	8	36
		SR 99 Mixed Median	0	8	36
		SR 99 Elevated Median	0	8	36
		SR 99 Elevated East Side	0	0	0
		SR 99 Elevated West Side	0	0	0
		I-5 Mixed West Side	0	0	0
		I-5 Mixed West Side/Median	0	0	0
D	S. 280th to S. 320th Street	SR 99 At-Grade Median	0	2	7
		SR 99 Mixed Median	0	2	7
		SR 99 Elevated Median	0	2	7
		SR 99 Elevated East Side	0	0	0
		SR 99 Elevated West Side	0	0	0
		I-5 Mixed West Side	0	0	0
		I-5 Mixed West Side/Median	0	0	0

Segment B would have the most potential properties affected by restricted U-turn and two-way left turn lane movements. This effect would occur with the 30th Avenue S. alternatives in the median and could affect 61 properties. Within Segment B, the greatest number of effects to side streets (5) would occur with the 24th Avenue S. median alternatives.

Overall, the greatest effect to side street access would occur in Segment C. This effect is associated with the three SR 99 alternatives in the median, which could affect access at eight intersections or side streets. In Segment C, all three SR 99 alternatives in the median could also affect access at 36 properties.

Although there would be no LOS effects in Segment D, the SR 99 median alternatives could affect access to two side streets and seven properties in this segment. These effects are relatively low when compared to effects identified in other segments.

6.7. Design Considerations

6.7.1 Potential Utility Relocation

Methodology

Existing utility location information for major power transmission lines and gas lines within Segment A (Angle Lake Station to S. 220th Street) were collected to identify potential relocation needs by Level 1 alternative. A more detailed evaluation of utility relocation requirements will be conducted as part of Level 2 after the engineering design process has advanced.

Key Results

The following two major utilities, both owned by Puget Sound Energy (PSE), have been identified for their potential to affect the suitability of Level 1 alternatives:

- High-level power transmission lines in all segments
- A high-pressure gas main in Segment A.

Discussion of Results

Sound Transit requires a minimum of 20 feet of clearance between its Overhead Catenary System (OCS) wires and any power lines. In multiple locations, existing power transmission lines would need to be relocated to accommodate a rail guideway. PSE has indicated that the steel lattice towers on either side of I-5 near S. 224th Street would have to be replaced given their age and structure type related to raising these transmission lines.

A high pressure gas main is currently located within Segment A. The alternatives on SR 99 and 24th Avenue S. would have a potential conflict with it; however, the I-5 alternatives would avoid it. Initial potential major utility conflicts are shown for each alternative in **Table 6-25**.

TABLE 6-25
Potential Major Utility Conflicts Identified

Alternative	Potential Conflict Identified	
	Major Power Transmission Line	Gas Line in Segment A
SR 99 At-Grade Median	Yes	Yes
SR 99 Mixed Median	Yes	Yes
SR 99 Elevated Median	Yes	Yes
SR 99 Elevated East Side	Yes	Yes
SR 99 Elevated West Side	Yes	Yes
I-5 Mixed West Side	Yes	No
I-5 Mixed West Side/Median	Yes	No
30th Avenue S. At-Grade Median	Yes	No
30th Avenue S. Elevated Median	Yes	No
30th Avenue S. Elevated East Side	Yes	No
30th Avenue S. Elevated West Side	No	No
24th Avenue S. At-Grade Median	Yes	Yes
24th Avenue S. Elevated East Side	Yes	Yes
24th Avenue S. Elevated Median	Yes	Yes

6.7.2 High Risk Hazardous Materials

Methodology

Information on reported contaminated sites within ¼ mile of the alternative centerline was collected using a database research company and evaluated to determine which ones should be considered high risk for purposes of the project. The ¼ mile distance was used to identify sites that could be directly within the project footprint or could have contaminated groundwater that has spread within the project footprint.

The presence of contaminated sites in the project area can affect a project in several ways:

- Investigation may be required to determine the potential construction cost impacts of the contaminated site
- Property acquisition cost could be lowered to account for the cost of mitigation during construction
- Contaminated properties that are acquired may require remediation in order to serve their intended purpose on the project (such as a station, maintenance facility, etc.). Engineering controls (such as vapor intrusion mitigation) may also be required.

Key Results

The 30th Avenue S. alternatives had the greatest number of high-risk sites, with a total of 77 for the entire length. The I-5 alternatives had the least, with 23 for the entire length.

High risk sites are defined as sites that might be substantially contaminated and might create liability for Sound Transit either due to construction activities or by virtue of acquiring all or a portion of the site, such as for a maintenance facility. The ¼ mile distance was used to identify

sites that could be directly within the project footprint, or could have contaminated groundwater that has spread within the project footprint.

Discussion of Results

Table 6-26 shows total high risk sites by alternative. **Table 6-27** shows total high risk sites by segment. **Exhibit 6-13** maps the location of the identified high risk hazardous material sites.

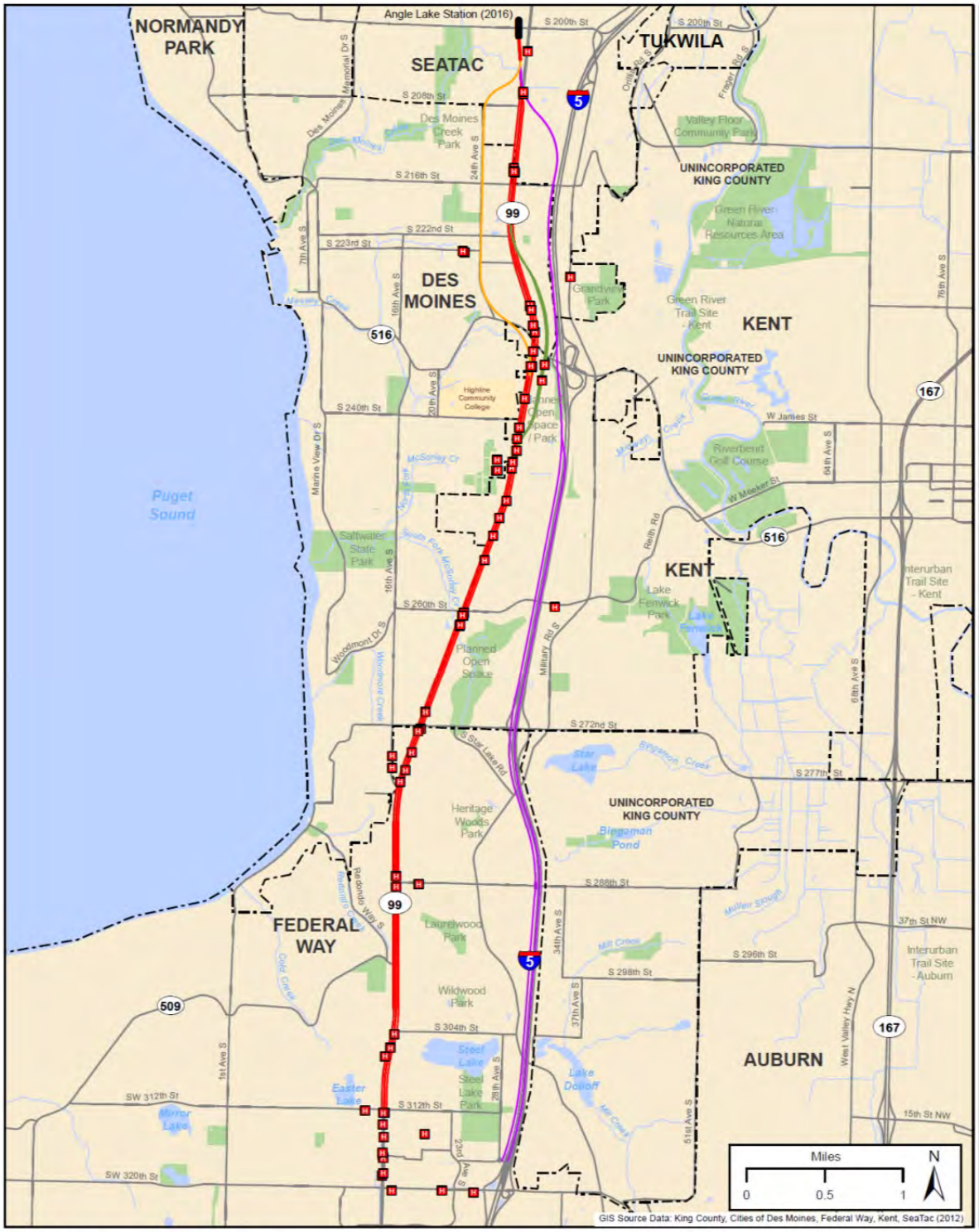
TABLE 6-26
Total High Risk Sites within Study Area by Alternative

Alternative	High Risk Sites within ¼ mile
SR 99 At-Grade Median	75
SR 99 Mixed Median	75
SR 99 Elevated Median	75
SR 99 Elevated East Side	75
SR 99 Elevated West Side	75
I-5 Mixed West Side	23
I-5 Mixed West Side/Median	23
30th Avenue S. At-Grade Median	77
30th Avenue S. Elevated Median	77
30th Avenue S. Elevated East Side	77
30th Avenue S. Elevated West Side	77
24th Avenue S. At-Grade Median	70
24th Avenue S. Elevated Median	70
24th Avenue S. Elevated East Side	70

Within Segment A, the SR 99 alternatives would have nine sites within ¼ mile, compared with three for the I-5 alternatives. Within Segment B, the number of sites is more similar between corridors, with 19 sites for the I-5 alternatives, 25 sites for the SR 99 alternatives, and 27 sites for the 30th Avenue S. alternatives. Within Segment C, the SR 99 alternatives would have substantially more sites within ¼ mile than the other corridor, with 24 sites compared to one in for the I-5 alternatives. However, in Segment C, the I-5 alternatives must address the closed Midway Landfill. Disturbance of the landfill cap for placement of structures presents issues related to engineering design as well as construction, such as movement of waste, potential presence of leachate, cover and liner repair, potential presence of landfill gas, and potential presence of contaminated groundwater. Because the landfill is a Superfund site, regulatory issues will need to be addressed as well. The City of Seattle has recorded an environmental lien (restrictive covenant) on the property. Its provisions have not been determined at this time. In Segment D, there are no sites within ¼ mile of the I-5 alternatives, while there are 17 within ¼ mile of the SR 99 alternatives.

TABLE 6-27
High Risk Sites by Segment for Each Alternative

Segment	Description	Alternative	High Risk Sites within ¼ mile
A	Angle Lake Station to S. 220th Street	SR 99 At-Grade Median	9
		SR 99 Mixed Median	9
		SR 99 Elevated Median	9
		SR 99 Elevated East Side	9
		SR 99 Elevated West Side	9
		I-5 Mixed West Side	3
		I-5 Mixed West Side/Median	3
		24th Avenue S. At-Grade Median	9
		24th Avenue S. Elevated East Side	9
		24th Avenue S. Elevated Median	9
B	S. 220th Street to S. 244th Street	SR 99 At-Grade Median	25
		SR 99 Mixed Median	25
		SR 99 Elevated Median	25
		SR 99 Elevated East Side	25
		SR 99 Elevated West Side	25
		I-5 Mixed West Side	19
		I-5 Mixed West Side/Median	19
		30thAvenue S. At-Grade Median	27
		30thAvenue S. Elevated Median	27
		30thAvenue S. Elevated East Side	27
		30thAvenue S. Elevated West Side	27
		24th Avenue S. At-Grade Median	20
		24th Avenue S. Elevated East Side	20
		24th Avenue S. Elevated Median	20
C	S. 244th Street to S. 280th Street	SR 99 At-Grade Median	24
		SR 99 Mixed Median	24
		SR 99 Elevated Median	24
		SR 99 Elevated East Side	24
		SR 99 Elevated West Side	24
		I-5 Mixed West Side	1
		I-5 Mixed West Side/Median	1
D	S. 280th Street to S. 320th Street	SR 99 At-Grade Median	17
		SR 99 Mixed Median	17
		SR 99 Elevated Median	17
		SR 99 Elevated East Side	17
		SR 99 Elevated West Side	17
		I-5 Mixed West Side	0
		I-5 Mixed West Side/Median	0



SR 99 Alternatives
I-5 Alternatives
30th Ave Alternatives
24th Ave Alternatives
Waterbody
Parks
Street
City Boundary
Stream
Hazardous Materials

High Risk Hazardous Materials Locations

Federal Way Transit Extension

EXHIBIT 6-13
High Risk Hazardous Materials Locations

6.7.3 Geologic Hazards

The Washington State Growth Management Act (GMA) (Revised Code of Washington Chapter 36.70A) requires all cities and counties to identify critical areas within their jurisdictions and to formulate development regulations for their protection. The GMA defines critical areas, including geologically hazardous areas, as areas that are susceptible to erosion, sliding, earthquake, or other geological events; therefore, they are not suited to the siting of commercial, residential, or industrial development consistent with public health or safety concerns.

Methodology

The FWTE passes through four cities (SeaTac, Des Moines, Kent, and Federal Way) and King County, all of which have defined geologically hazardous areas in their respective codes. These definitions and maps were reviewed to evaluate geologic hazards. Mapped geologic hazards are shown on **Exhibit 6-14**. Erosion hazard areas are not shown, although most of the project area would be subject to erosion during construction without the use of best management practices (BMPs).

Key Results

- Portions of the alternatives cross or extend onto areas mapped as erosion and steep slope hazards. These hazard areas are not likely to affect alternative selection because they appear to be relatively minor and can be addressed by typical BMPs and construction practices.
- Seismic and settlement hazard areas are present in limited areas in Segment C and could be a factor in determining the final location of the station near S. 272nd Street.
- Issues related to crossing the Midway Landfill could markedly affect cost of alternatives along I-5 in Segment C.

Discussion of Results

Segment A (Angle Lake Station to S. 220th Street)

Geologic hazards in this segment include erosion and steep slope hazards, both of which can be addressed by typical BMPs and construction practices.

Segment B (S. 220th Street to S. 244th Street)

Mapped geologic hazards in this segment include erosion and steep slope hazards, both of which can be addressed by typical BMPs and construction practices.

Segment C (S. 244th Street to S. 280th Street)

Mapped geologic hazards in this segment include erosion and steep slope hazards, both of which can be addressed by typical BMPs and construction practices.

The Midway Landfill is a 60-acre former gravel quarry that was used as an unlined landfill from 1966 to 1983, ultimately taking approximately 3,000,000 cubic yards of waste, including demolition debris and municipal waste. The landfill was originally capped in 1983. Beginning in 1985, combustible gas was detected in nearby houses. The site has since been cleaned up by the City of Seattle with oversight from Washington Department of Ecology. The current landfill is capped and there are numerous wells in place to capture gases from below the cap.

Alternatives along the west side of I-5 will cross the Midway Landfill and the mitigation and construction costs associated with this crossing would affect the alternative selection for Segment C. These costs include increased effort for design and permitting as well as increased construction costs due to the unknown quantity but likely contaminated character of the undocumented landfill debris.

There is a large area of wetland soils (identified as a seismic and settlement hazard area) bounded by S. 260th Street to the north, SR 99 to the west, S. 272nd Street to the south, and I-5 to the east. The selection of the location for the station at S. 272nd Street could be influenced by the presence of seismic and settlement hazards. Decisions on preferred foundation types would be affected by the presence of these hazards, as would the performance of surface parking facilities.

Segment D (S. 280th Street to S. 320th Street)

Mapped geologic hazards in this segment include erosion and steep slope hazards, both of which can be addressed by typical BMPs and construction practices.

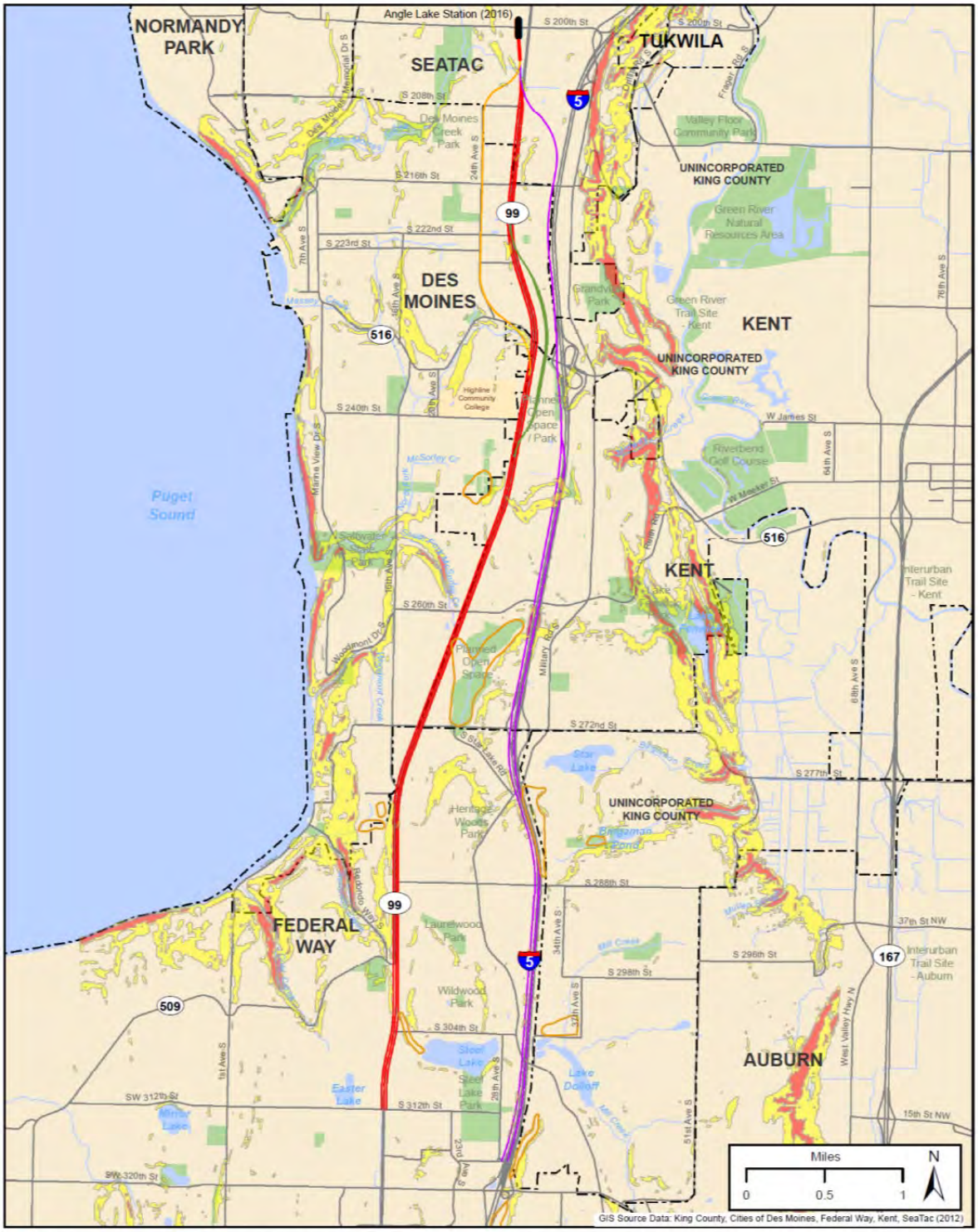


EXHIBIT 6-14
Geologic Hazards

6.7.4 Park-and-Ride Lot Locations

Park-and-Ride (P&R) facilities expand the effective service area of individual transit routes and the transit system as a whole. These facilities would be critical for attracting passengers who either prefer to access the FWTE by automobile or who have no other efficient/viable means of access.

Methodology

Eight P&R locations have been initially identified in the study area, as listed in **Table 6-28**. Based on the proximity of these facilities to each alternative, the number of parking stalls and observed utilization rates were summed to identify the total parking availability for each alternative. For purposes of calculating total parking availability, the minimum number of parking spaces (700) is assumed for the Angle Lake Station P&R. The location of the eight P&R facilities, along with three additional existing P&R facilities near the study area, are shown in **Exhibit 6-15**.

TABLE 6-28
Park-and-Ride Options

P&R Lot	Parking Capacity (spaces)	Utilization	Utilization Rate
Angle Lake Station *	700-1,100	N/A	N/A
Kent/Des Moines P&R Lot	370	345	93%
Redondo Heights P&R Lot	697	56	8%
Star Lake P&R Lot	540	292	54%
All Saints Lutheran Church**	75	63	84%
St. Columba's Episcopal Church **	15	1	7%
Federal Way P&R Lot (south of S. 320th St.)	877	349	40%
Federal Way Transit Center	1,190	1,177	99%

Note: Parking Utilization from KCM Park-and-Ride Lot Utilization – 4th Qtr 2011
* 1,100 parking spaces when station is an interim terminus; 700 spaces when the LRT line is extended to the south.
** leased lots

Key Results

- I-5 alternatives are closer to more parking spaces than the SR 99 alternatives; however, based on current utilization there are more potential parking available spaces in close proximity to SR 99.

Discussion of Results

Three P&R facilities are assumed to be relevant to all alternatives (Angle Lake Station, Federal Way P&R Lot, and Federal Way Transit Center). These three stations account for a majority of the parking available (2,767 total spaces and 1,241 net parking spaces available based on current utilization). The I-5 alternatives are near or adjacent to four additional P&R facilities (Kent/Des Moines P&R Lot, Star Lake P&R Lot, All Saints Lutheran Church, and St. Columbia's Episcopal Church). SR 99 is adjacent to one additional P&R lot (Redondo Heights P&R Lot).

Based on existing capacity and availability, the SR 99 alternatives have 303 fewer total parking spaces than the I-5 alternatives; however, the SR 99 alternatives have 342 more available parking spaces than the I-5 alternatives. This is primarily because the Redondo Heights P&R Lot has limited commuter-oriented transit service to downtown Seattle and is currently only eight percent utilized. Based on the location of the eight P&Rs considered, the 30th Avenue S. and 24th Avenue S. alternatives would have the same capacity as the SR 99 alternatives if coupled with SR 99. **Table 6-29** provides the total P&R parking capacity and net available parking by alternative.

TABLE 6-29
Park-and-Ride Capacity

Alternative	P&R Total Parking Capacity	Net Parking Capacity Available Based on Current Utilization
SR 99 At-Grade Median	3,864	1,882
SR 99 Mixed Median	3,864	1,882
SR 99 Elevated Median	3,864	1,882
SR 99 Elevated East	3,864	1,882
SR 99 Elevated West	3,864	1,882
I-5 Elevated Mixed West	4,167	1,540
I-5 Elevated Mixed/Median	4,167	1,540
30th Avenue S. At-Grade Median	3,864	1,882
30th Avenue S. Elevated Median	3,864	1,882
30th Avenue S. Elevated East	3,864	1,882
30th Avenue S. Elevated West	3,864	1,882
24th Avenue S. At-Grade Median	3,864	1,882
24th Avenue S. Elevated Median	3,864	1,882
24th Avenue S. Elevated East	3,864	1,882

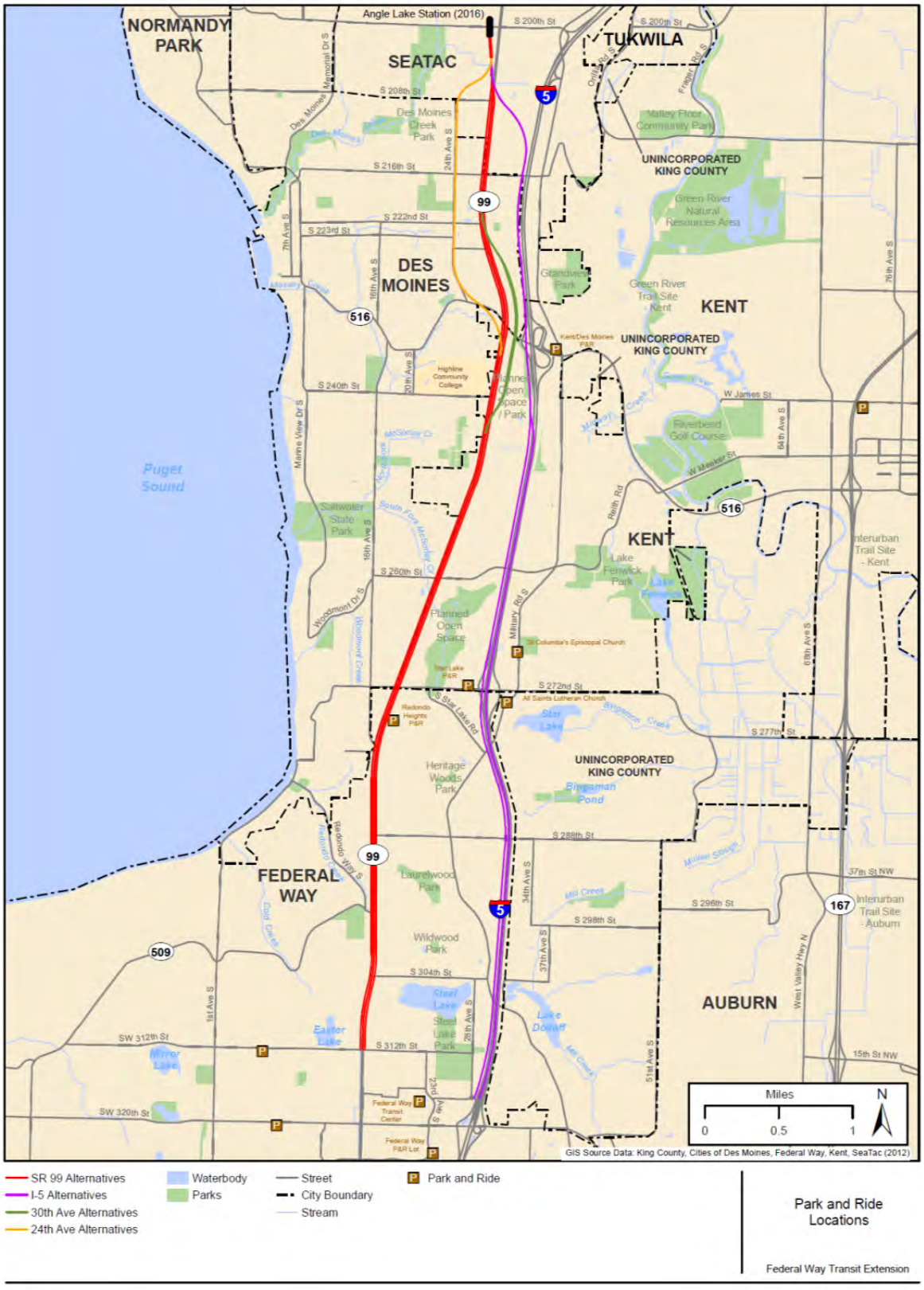


EXHIBIT 6-15
Existing Park-and- Ride Locations

6.8. System Costs

6.8.1 Estimated Capital Cost (2013$)

Methodology

Preliminary capital cost estimates have been prepared for all Level 1 alternatives. For each alternative, a low and high end cost value was estimated to accommodate unforeseen variables not identified during Level 1 conceptual design. The Lynnwood Link Extension Project's Unit Cost Library was used to inform base unit costs for all estimates. Additional unit cost information was sourced from the ST2 Unit Cost Library and other relevant regional projects, including SR 509.

A summary of the capital cost estimates by alternative are presented in **Table 6-30**.

TABLE 6-30
Estimated Capital Costs (2013 $billion)

Alternative	Low End of Range Capital Cost Estimate	High End of Range Capital Cost Estimate
SR 99 At-Grade Median	$1.1	$1.3
SR 99 Mixed Median	$1.2	$1.3
SR 99 Elevated Median	$1.5	$1.7
SR 99 Elevated East	$1.6	$1.9
SR 99 Elevated West	$1.6	$1.8
I-5 Elevated Mixed West	$1.3	$1.5
I-5 Elevated Mixed/Median	$1.5	$1.7
30th Avenue S. At-Grade Median	$1.4	$1.6
30th Avenue S. Elevated Median	$1.5	$1.7
30th Avenue S. Elevated East	$1.5	$1.7
30th Avenue S. Elevated West	$1.5	$1.7
24th Avenue S. Elevated Median	$1.5	$1.7
24th Avenue S. Elevated East	$1.5	$1.7
24th Avenue S. At-Grade Median	$1.4	$1.7

Detailed estimates were produced according to FTA Standard Cost Categories (SCC), which are:

10. Guideway and Track Elements
20. Stations, Stops, Terminals, Intermodals
30. Yards, Shop, Administration/Support Facilities (Note: this cost category is not included in the Level 1 capital cost estimates but will be developed by Sound Transit and provided in later phases)
40. Sitework and Special Conditions
50. Systems
60. Right-of-Way, Land, Existing Improvements
70. Vehicles
80. Soft Costs
90. Unallocated Contingency
100. Finance Charges (Note: This cost category is not included in the Level 1 capital cost estimates but is incorporated in the Sound Transit Financial Model)

Costs for categories 10, 20, 40, and 50 were derived from the alternatives, while costs for categories 60, 70, and 80 were derived from ST guidance. Allocated contingencies applied to the different cost code categories vary from 15 percent to 33 percent depending on the category.

Several key design considerations have been identified at the conceptual design level that help inform this Level 1 capital cost estimate:

- At-grade alternatives are more likely to feature constraints to train speed and reliability in the form of curves, crossings, and potential trackway intrusions. Elevated guideway alternatives feature a higher degree of exclusivity, which leads to faster and more reliable train operations.
- All of the Level 1 alternatives have the design challenge of crossing the SR 509 alignment, which is likely to require multiple long spans.
- Matching the existing roadway profile could be disadvantageous if grades are in excess of LRT vehicle capabilities or if vertical curves do not meet design criteria; these issues could result in reduced operating speeds.

In addition to the Level 1 evaluation general design considerations, several key alternative-specific design considerations have also been identified that help drive the Level 1 cost estimates.

The SR 99 Mixed Median alternative features potential track geometry constraints in the vicinity of Redondo Heights P&R. These constraints could require construction of an elevated station, which would cost more than an at-grade station.

The I-5 Mixed West Side alternative would run along the eastern edge of Midway Landfill for approximately one-third of a mile. Extensive investigation into waste mitigation and construction solutions would be required to prevent potential groundwater pollution and guideway settlement, among other issues. The I-5 Mixed West Side and I-5 Mixed West Side/Median alternatives both have the challenge of constrained space between a WSDOT retaining wall and Highline Water District water tank support infrastructure near S. 216th Street.

The median of I-5 presents a potential conflict with WSDOT's proposed express toll lane component of the SR 509 extension, where a new lane would be constructed in each direction inside of the existing HOV lane. These lanes would reduce the median width to as little as four feet and inserting an elevated guideway column between them would reduce the planned 10-foot shoulder width to six feet. Narrowed shoulders would require a design exception (or "deviation"), which WSDOT may be unwilling to approve for a long stretch of an important highway facility because this design exception would result in only one shoulder on a six- or seven-lane facility available for breakdowns or emergency vehicle bypasses. In addition to these issues, extensive coordination would be required during design to ensure that construction of

the guideway would not inhibit future construction of the express toll lanes nor their related support infrastructure (e.g., signs, gantries, communication, and power lines).

Given the preliminary nature of quantity estimates at this level of screening, cost estimates are rounded to the nearest $100 million (or $0.1 billion) in this Level 1 report. Unit costs have been escalated to represent Year 2013 dollars. Additional details on the cost estimating methodology, assumptions, and results can be found in the project technical memorandum "*Level 1 Alternatives Capital and Operations Cost Estimating Methodology and Results" (March 2013).*

Key Result

- With additional investment in structures, alternatives with elevated profiles generally have the highest estimated capital costs, while at-grade alternatives have the lowest estimated capital costs.

Discussion of Results

SR 99 has the lowest estimated capital cost of any alternative evaluated. With an estimated high end capital cost of $1.35 billion, the SR 99 At-Grade Median alternative is about $200 million less than the lowest capital cost (high end of range) estimated for the I-5 Elevated Mixed West Side alternative. Considering the high end of the capital cost estimate range, the alternative with the highest estimated capital cost is the SR 99 Elevated East Side alternative. The difference between the lowest estimated capital cost alternative and the highest is about $600 million, using high end estimates.

The 24th Avenue S. alternatives range in cost from as low as $1.4 billion (low end of range) to $1.7 billion (high end of range). Both of these are coupled with SR 99, but the primary differential in estimated capital cost is profile. In comparing just the high end of the range, the 24th Avenue S. Elevated East Side alternative is $100 million more than the 24th Avenue S. At-Grade Median alternative.

The 30th Avenue S. alternatives differ from the SR 99 alternatives in that the estimated capital costs for some of the at-grade alternatives are closer to those of the elevated alternatives, reflecting the potentially greater need for property acquisition along 30th Avenue S. The highest cost (high end of range) at-grade alternative on 30th Avenue S. is $1.7 billion.

6.8.2 Estimated Operating Costs

Estimated net operations and maintenance costs (O&M) reflect the potential annual funding requirements necessary to sustain appropriate service levels. Net operating costs capture the labor, energy consumption (fuel), operations and maintenance related administration, planned maintenance, and other variables associated with operating the FWTE. O&M costs will be calculated using Sound Transit's O&M Cost model during the Level 2 evaluation process.

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7.0 Findings and Conclusions

This section summarizes the key data and analysis that were presented in the earlier chapters of this report, and presents the relevant findings and conclusions related to each of the Level 1 alternatives. Each of the following sections provides a summary table of the relative strengths and weaknesses of each alternative. These strengths and weaknesses have been developed based on the evaluation criteria and measures described in Chapter 5, and the data and analysis results presented in Chapter 6. Following the summary table for each alternative, there is a brief narrative that provides the summary conclusions about each alternative, and the concluding assessment of whether the alternative should be carried forward for further study in the Level 2 evaluation.

7.1 SR 99 At-Grade Median Alternative

TABLE 7-1
SR 99 At-Grade Median Alternative Summary Findings

Strengths	Weaknesses
• More high density/TOD zoning than I-5 alternatives • No wetland effects • Would not affect any parks • Fewer sensitive noise receptors • Lower geologic risks than other alternatives (true of all SR 99 alternatives) • Lowest cost of any alternative considered in Level 1	• Lower estimated daily ridership (19,000 – 20,000) • Longest travel time among all SR 99 alternatives (21 minutes), due to slower than desired travel speeds • Likely to affect system-wide Link operations and reliability • Likely to affect RapidRide A Line • Very high potential to displace businesses • Highest number of affected failing (LOS F) intersections of any alternative considered in Level 1 • High utility conflicts based on preliminary analysis • Higher potential for hazardous materials effects due to large footprint

The SR 99 At-Grade Median alternative is one of the lowest cost alternatives. It would have the lowest ridership and longest travel time of all SR 99 alternatives. It would require extensive reconstruction of the recently reconstructed SR 99 roadway, as well as extensive utility relocation, resulting in the greatest disruption to adjacent properties and the surrounding communities and presenting substantial engineering challenges associated with widening. Traffic and other transit operations would be adversely affected, and the potential delays associated with at-grade operation would adversely affect system-wide operations.

Key findings:

1) The operating speeds would not meet the agency's target of 55 mph because the LRT speed would be limited to 35 mph by the safety-driven rules that govern operating in a semi-exclusive environment (in the same fashion as the Sound Transit Link light rail segment along Martin Luther King Way in Seattle). This would contribute to longer

travel times and lower ridership than the grade separated options on SR 99. The at-grade operating configuration would affect reliability due to the LRT having to cross street traffic, which would adversely affect the reliability of the larger ST Link light rail system.

2) The SR 99 Median At-Grade alternative would require a very high number of changes to the SR 99 roadway environment and disrupt both business access and through traffic. For example, left turns would be limited to a few key signalized intersections, effectively reducing access to many businesses along the route. Construction of this alternative would require reconstruction of the entire roadway, and could result in a higher number of displacements than all other SR 99 alternatives.
3) There would be a high potential for encountering hazardous materials sites with all SR 99 alternatives, and this potential would be highest for the at-grade option because it would have the most property acquisition and largest project footprint. Several current and former gas station sites and other auto-related businesses are located along the portion of SR 99 that would be affected by widening.
4) Sloping terrain and existing retaining walls at the southern part of the corridor (generally between S. 272nd Street and Dash Point Road) would present substantial design challenges for this alternative.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the SR 99 At-Grade Median alternative is not proposed for further evaluation.

7.2 SR 99 Mixed Median Alternative

TABLE 7-2
SR 99 Mixed Median Alternative Summary Findings

Strengths	Weaknesses
• More high-density/TOD zoning than I-5 alternatives • No wetland effects • Would not affect any parks • No LOS F intersections affected • Lower geologic risks than other alternatives (true of all SR 99 alternatives) • Second-lowest cost of the 14 alternatives considered	• Lower ridership levels than the SR 99 elevated alternatives (21,000 – 22,000) • Longer travel times than SR 99 fully elevated alternatives (18 minutes) • Moderate to substantial effects on left turns at un-signalized intersections and midblock U-turns • High potential for business displacements • High utility conflicts based on preliminary analysis • Higher potential for hazardous materials effects due to large footprint of at-grade portions of the proposed alignment

The SR 99 Mixed Median alternative would have lower ridership and longer travel time than the elevated SR 99 alternatives. Like the SR 99 At-Grade Median alternative, it would require extensive reconstruction of the recently-reconstructed SR 99 roadway, as well as extensive

utility relocation, resulting in disruption to adjacent properties and the surrounding communities. This alternative would avoid some traffic, transit, and system-wide effects associated with the SR 99 At-Grade Median alternative because it would cross major intersections on an elevated structure.

Key findings:

1) The operating speeds would not meet the agency's target of 55 mph because the LRT speed would be limited to 35 mph by the safety-driven rules that govern operating in a semi-exclusive environment (in the same fashion as the Sound Transit Link light rail segment along Martin Luther King Way in Seattle). This would contribute to longer travel times and lower ridership than the grade separated options on SR 99.
2) This alternative would require a very high number of changes to the SR 99 roadway environment and disrupt both business access and through traffic. For example, left turns would be limited to a few key signalized intersections, effectively reducing access to many businesses along the route. Construction of this alternative would require reconstruction of the entire roadway, and could result in a higher number of displacements than most other SR 99 alternatives.
3) Operating at-grade in some sections would affect reliability due to traffic interaction. Potential delays at intersections would cause transit unreliability within the corridor and would adversely affect the reliability of the larger ST Link light rail system.
4) Construction of this alternative would require reconstruction of the entire roadway in the at-grade segments, and would result in a greater amount of property acquisition than most other SR 99 alternatives.
5) There is a high risk of encountering hazardous materials sites with all SR 99 alternatives, and the risk would be highest for the at-grade portion of this option because this is where the project would have the most property acquisition and widest project footprint.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the SR 99 Mixed Median alternative is not proposed for further evaluation.

7.3 SR 99 Elevated Median Alternative

TABLE 7-3
SR 99 Elevated Median Alternative Summary Findings

Strengths	Weaknesses
• All elevated SR 99 alternatives have the highest projected daily ridership levels among the Level 1 alternatives (23,000 – 24,000) • Elevated SR 99 alternatives would have the lowest travel time among SR 99 alternatives (15 minutes) • No effects on system-wide Link operations and reliability due to fully elevated operation • Minimal effects to RapidRide A Line • More high-density and transit-oriented development zoning than I-5 alternatives • No wetland effects • Would not affect any parks • No LOS F intersections affected • Lowest potential conflict with utilities of any of the SR 99 alternatives • Lower geologic risks than other alternatives (true of all SR 99 alternatives)	• All SR 99 alternatives have high potential for hazardous materials conflicts • Long spans to cross intersections, increased footprint for potential straddle bent design • Higher cost than SR 99 at-grade or mixed alternatives

The SR 99 Elevated Median alternative would be more expensive than the at-grade or mixed median alternatives, but would have higher ridership and faster travel times. It has the potential to limit major reconstruction of SR 99 to intersections and station locations, reducing potential for utility relocations and disruption to adjacent properties. SR 99 has more high-density and transit oriented development zoning than alternatives along I-5.

Key findings:

1) The operating speeds for the median elevated option would meet the agency's target of 55 mph, which contributes to lower travel times and higher ridership than the at-grade and mixed grade alternatives on SR 99.
2) The SR 99 Elevated Median alternative would require fewer changes to the SR 99 roadway environment than the other SR 99 alternatives. For example, more existing left turns and accesses can be maintained than with the at-grade and mixed grade options.
3) This alternative would be more reliable because transit operations would not be affected by street traffic. Reliability would be higher in the corridor and within the larger ST Link light rail system.
4) The median position of the guideway would not require the high-voltage electrical transmission lines that run along SR 99 to be relocated.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the SR 99 Elevated Median alternative is proposed for further evaluation.

7.4 SR 99 Elevated East Side Alternative

TABLE 7-4
SR 99 Elevated East Side Alternative Summary Findings

Strengths	Weaknesses
• Highest daily ridership (23,000 – 24,000) • Lowest travel time among SR 99 alternatives (15 minutes) • No effects to system-wide Link operations and reliability • More high-density/TOD zoning than I-5 alternatives • Minimal reconstruction of SR 99 • No wetland effects • Would not affect any parks • Lower geologic risks than other alternatives (true of all SR 99 alternatives)	• All SR 99 alternatives have high potential for hazardous materials conflicts • Engineering challenges with existing retaining walls and adjacent structures • Usability of remnant parcels after acquisition for guideway would be limited • The terrain on the east side of SR 99 is much higher than the roadway at some locations • Highest potential for effects to community facilities of any alternative considered • Would conflict with existing side-running high voltage transmission lines for much of the corridor • Higher cost than at-grade, mixed-grade, and elevated median alternatives for SR 99

The SR 99 Elevated East Side alternative would be more expensive than the at-grade or mixed median alternatives, but would have higher ridership and faster travel times. High-voltage electrical transmission lines on the east side of SR 99 would need to be relocated. Acquisition of right-of-way on the east side of the road could result in business and residential displacements, and could limit the potential for redevelopment of these properties following construction. Topographical constraints on the east side of SR 99 in some places would present engineering challenges.

Key findings:

1) There are large future redevelopment impacts associated with right-of-way acquisition along the east side of SR 99 that other SR 99 alternatives would not have.
2) The alternative would conflict with existing high-voltage power lines for a significant portion of the length of the project (S. 212th Street to S. 220th Street and S. 240th Street to the terminus at approximately S. 316th Street). Relocation of these power lines would represent a substantial project cost due to the need for pole reconstruction and replacement.
3) There are a number of locations along the east side of SR 99 where the terrain is higher than the roadway. In some places there are tall retaining walls that could conflict with the alignment, requiring realigning the roadway and/or rebuilding the retaining walls.
4) There is a high risk of encountering hazardous materials sites with all SR 99 alternatives, and it would be higher for this alternative than for the median elevated alternative because property acquisition would be required for the full length of SR 99 along the east side, where the guideway would be located.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the SR 99 East Side alternative is not proposed for further evaluation.

7.5 SR 99 Elevated West Side Alternative

TABLE 7-5
SR 99 Elevated West Side Alternative Summary Findings

Strengths	Weaknesses
• Highest daily ridership (23,000 – 24,000) • Lowest travel time among SR 99 alternatives (15 minutes) • No effects to system-wide Link operations and reliability • More high-density/TOD zoning than I-5 alternatives • Minimal reconstruction of SR 99 • No wetland effects • Lowest potential residential property acquisition • Would not affect any parks • Lower geologic risks than other alternatives (true of all SR 99 alternatives)	• All SR 99 alternatives have high potential for hazardous materials conflicts • Engineering challenges with existing retaining walls and adjacent structures • Usability of remnant parcels after acquisition for guideway would be limited • The terrain on the west side of SR 99 is much lower than the roadway at some locations • Highest potential for effects on community facilities of any alternative considered • Would conflict with existing side-running high voltage transmission lines for much of the corridor • Higher cost than at-grade, mixed-grade, and elevated median alternatives for SR 99

The SR 99 Elevated West Side alternative would be more expensive than the at-grade or mixed median alternatives, but would have higher ridership and faster travel times. Acquisition of properties on the west side of the road would likely result in business and residential displacements, and could limit the potential for redevelopment of these properties following construction. Topographical constraints on the west side of SR 99 in some places would present engineering challenges.

Key findings:

1) There would be large future redevelopment effects associated with right-of-way acquisition along the west side of SR 99 that other SR 99 alternatives would not have.
2) The alternative would conflict with the existing high voltage power lines for a portion of the length of the alternative (S. 204th Street to S. 212th Street) and there is a potential conflict with a high pressure gas line between S. 204th Street and S. 208th Street.
3) There are a number of locations along the west side of SR 99 where the terrain is lower than the roadway. In some places there are tall retaining walls that would conflict with the alignment that would need to be reconstructed or would require a shift in the roadway to accommodate light rail between the retaining walls and the roadway.
4) There is a high risk of encountering hazardous materials sites with all SR 99 alternatives. It would be higher for this alternative than for the median elevated because it would

require acquisition of properties the full length of SR 99 along the west side, where the guideway would have a new right-of-way footprint.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the SR 99 West Side alternative is not proposed for further evaluation.

7.6 I-5 Mixed West Side Alternative

TABLE 7-6
I-5 Mixed West Side Alternative Summary Findings

Strengths	Weaknesses
• High ridership levels, on par with SR 99 elevated alternatives (23,000-24,000) • I-5 alternatives have the lowest travel time (14 minutes) of any of the Level 1 alternatives • No effects to system wide Link operations and reliability due to fully-separated alignment; minimal effects to RapidRide A Line • Lower potential for visual effects • No parks within 50 feet of the alternative's centerline • Minimal effects to street traffic operations; no LOS F intersections affected • I-5 alternatives would have lower number of hazardous materials sites • Lower cost than all but two alternatives (SR 99 At-grade Median and SR 99 Mixed Median)	• Some wetland effects • Most adjacent residential properties within 100 feet of centerline of any alternative • Potential utility conflicts with Highline Water District water tank, Midway Landfill, power lines, and PSE sub-station • Higher potential risk of geologic hazards • Limited mixed use/high-density zoning

The I-5 Mixed West Side alternative would be less expensive than elevated alternatives along SR 99 and, based on current design information, could be constructed largely within Washington State Department of Transportation (WSDOT) right-of-way, limiting residential or business displacements and avoiding impacts to local roadway operations. Ridership and travel time would be similar to the SR 99 elevated alternatives. Potential risks include proximity to Highline Water District water tanks, a Puget Sound Energy substation, and the Midway Landfill, which also presents a potential hazardous materials concern and geologic hazard.

Key findings:

1) The operating speeds for this alternative would meet the agency's target of 55 mph, which contributes to faster travel times and higher ridership than at-grade.
2) Based on the conceptual level of design, it appears that this alternative could fit largely within existing WSDOT right-of-way, thereby requiring limited displacements.
3) The I-5 alternatives generally have a lower risk of encountering hazardous materials than the SR 99 alternatives. However, the Midway Landfill site is a Superfund site that could present hazardous materials risk for this alternative, because disturbing the capped landfill material could require expensive construction methods and mitigation.

4) The I-5 Mixed West Side alternative would have the greatest number of residential properties affected of any alternative.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the I-5 Mixed West Side alternative is proposed for further evaluation.

7.7 I-5 Mixed West Side/Median Alternative

TABLE 7-7
I-5 Mixed West Side/Median Alternative Summary Findings

Strengths	Weaknesses
• High ridership levels, on par with SR 99 elevated alternatives (23,000-24,000) • I-5 alternatives have the lowest travel time (14 minutes) of any of the Level 1 alternatives • No effects to system wide Link operations and reliability due to fully-separated alignment; minimal effects to RapidRide A Line • Lowest potential for visual effects of any Level 1 alternative • Lowest number of commercial properties within 100 feet of the alternative's centerline • No parks within 50 feet of the alternative's centerline • Minimal effects on street traffic operations; no LOS F intersections affected • Would not directly impact Midway Landfill • I-5 alternatives would have lower number of hazardous materials sites	• Lowest mixed use/high-density zoning of any alternative • Highest potential wetland impacts of any alternative • Potential future WSDOT express toll lane design conflicts • Potential utility risk with Highline Water District water tanks and PSE substation • Higher costs associated with design considerations for crossing I-5

The I-5 Mixed West Side/Median alternative would be less expensive than elevated alternatives along SR 99 and could be constructed largely within WSDOT right-of-way, limiting residential or business displacements and avoiding impacts to local roadway operations. Ridership and travel time would be the same as SR 99 elevated alternatives. Potential risks include proximity to Highline Water District water tanks and a Puget Sound Energy (PSE) substation. This alternative would avoid the Midway Landfill and the engineering challenges that this crossing presents, and would also have the lowest potential for visual impacts.

Key findings:

1) The operating speeds for this alternative would meet the agency's target of 55 mph, which contributes to faster travel times and higher ridership than at-grade and mixed alternatives.
2) Based on the conceptual level of design, it appears that this alternative could fit largely within existing WSDOT right-of-way, thereby requiring few displacements. However, this alternative would occupy some of the land area potentially needed for future express toll lanes under consideration by WSDOT.

3) The I-5 Mixed West Side/Median alternative would have the lowest risk of encountering hazardous materials of all Level 1 alternatives because it would avoid the Midway Landfill site and because the I-5 alternatives generally would have a lower risk than the SR 99 alternatives.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the I-5 Mixed West Side/Median alternative is proposed for further evaluation.

7.8 30th Avenue S. At-Grade Median Alternative

TABLE 7-8
30th Avenue S. At-Grade Alternative Summary Findings

Strengths	Weaknesses
• No wetland effects • No impacts to parks • No LOS F intersections affected; does not affect complex SR 99/Kent Des Moines Road intersection • More high-density/TOD zoning • Less disruption to businesses along SR 99	• Lower ridership levels than elevated alternatives (19,000 to 20,000 per day) • Longest travel time among all 30th Avenue S. alternatives (21 minutes) due to slower than desired travel speeds • Potential delays in system-wide Link operations and reliability due to at-grade operation • High potential for effects to environmental justice populations related to noise, visual, displacements, traffic and construction • Would cross Kent-Des Moines Road/I-5 interchange at-grade in Level 1 configuration • Restricts left turn access at un-signalized intersections or driveways • High number of sensitive noise receptors • Higher potential utility effects, including high-voltage electrical power lines • At-grade alignment would bifurcate the neighborhood, as pedestrians and vehicles must go to signalized crossings.

The 30th Avenue S. At-Grade Median alternative would avoid the disruption of SR 99 associated with construction activities and widening of the roadway between S. 220th Street and S. 240th Street. It would have a longer travel time and lower ridership than elevated alternatives, and would require reconstruction of 30th Avenue S., a two-lane primarily residential road. This reconstruction would involve utility relocations and result in impacts to local traffic by eliminating left turns from side streets and adjacent properties. This alternative would cross Kent-Des Moines Road at-grade directly adjacent to on and off-ramps to I-5. This alternative would have high potential for noise and visual impacts and would bifurcate the Pacific Ridge neighborhood between S. 220th Street and Kent-Des Moines Road.

Key findings:

1) The operating speeds for the at-grade alternative would not meet the agency's target of 55 mph because it would need to match the adjacent traffic speed limit of 25 mph on

30th Avenue S. This contributes to much slower travel times and lower ridership than grade-separated options.

2) The at-grade operating configuration is less reliable due to it being in the surface traffic environment. Potential traffic delay at Kent-Des Moines Road would cause transit unreliability within the corridor and would adversely affect the reliability of the larger ST Link light rail system.
3) There would be a high degree of change required to the 30th Avenue S. roadway (which is currently a two-lane residential road) and to the adjacent multi-family neighborhood environment. For example, extensive new right-of-way would be required for widening the roadway and adding a median for light rail operation. The at-grade option would have the largest footprint of the 30th Avenue S. alternatives. In addition, there would be high potential for utility relocation impacts.
4) The at-grade alternative would create a barrier in the neighborhood, causing noise and visual effects. The residential nature and demographics of the adjacent neighborhood increase the potential for effects to environmental justice populations because they would be the populations experiencing the noise, visual and construction effects, and could potentially be displaced.
5) The 30th Avenue S. alternatives would avoid temporary and permanent effects to SR 99 between S. 220th Street and S. 244th Street, including the highly congested Kent-Des Moines Road (SR 516) intersection.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the 30th Avenue S. At-Grade Median alternative is not proposed for further evaluation.

7.9 30th Avenue S. Elevated Median Alternative

TABLE 7-9
30th Avenue S. Elevated Median Alternative Summary Findings

Strengths	Weaknesses
• Higher ridership than at-grade alternatives (23,000-24,000) • Lower travel time than most alternatives considered • No effects to system-wide Link operations and reliability • More high density/TOD zoning • No wetland effects • Would not affect any parks • Avoids Kent-Des Moines Road effects	• High potential for effects to environmental justice populations related to noise, visual, displacements, and traffic • Higher visual sensitivity • High number of noise sensitive receptors such as residences, schools, and churches • Substantial effects to unsignalized left turns and u-turns throughout the corridor • All 30th Avenue S. alternatives have high potential for hazardous materials conflicts

The 30th Avenue S. Elevated Median alternative would have a similar travel time and ridership as other elevated alternatives on SR 99 and I-5. It would require reconstruction of 30th Avenue

S., a two-lane primarily residential road. This reconstruction would involve utility relocations and results in impacts to local traffic by eliminating left turns from side streets and adjacent properties. This alternative would have high potential for noise and visual impacts and would bifurcate the Pacific Ridge neighborhood between S. 220th Street and Kent-Des Moines Road.

Key findings:

1) There would be a high degree of change required to the 30th Avenue S. roadway (which is currently a two-lane residential road) and to the adjacent multi-family neighborhood environment.
2) The elevated median alternative would create a barrier in the neighborhood and introduce noise and visual effects. The residential nature and demographics of the adjacent neighborhood increase the potential for effects to environmental justice populations because they would be the populations experiencing the noise, visual and construction effects, and could potentially be displaced.
3) The 30th Avenue S. alternatives would avoid temporary and permanent effects to SR 99 between S. 220th Street and S. 244th Street, including the highly congested Kent-Des Moines Road (SR 516) intersection.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the 30th Avenue S. Elevated Median alternative is not proposed for further evaluation.

7.10 30th Avenue S. Elevated East Side Alternative

TABLE 7-10
30th Avenue S. Elevated East Side Alternative Summary Findings

Strengths	Weaknesses
• Higher ridership than at-grade alternatives (23,000-24,000) • Lower travel time than most alternatives considered • No effects to system-wide Link operations and reliability • More high density/TOD zoning • No wetland effects • Would not affect any parks • Avoids Kent-Des Moines Road effects	• High potential for effects to environmental justice populations related to noise, visual, displacements, and traffic • Higher visual sensitivity • High number of noise sensitive receptors such as residences, schools, and churches • High potential for utility relocations due to power lines on east side of roadway • All 30th Avenue S. alternatives have high potential for hazardous materials conflicts

The 30th Avenue S. Elevated East Side alternative would have a similar travel time and ridership as other elevated alternatives on SR 99 and I-5. It would require reconstruction of 30th Avenue S., a two-lane primarily residential road. This reconstruction would involve utility relocations and property acquisition on the east side of the road, likely resulting in residential

displacements. This alternative would have high potential for noise and visual impacts and would bifurcate the Pacific Ridge neighborhood between S. 220th Street and Kent-Des Moines Road.

Key findings:

1) There would be a high degree of change required to the 30th Avenue S. roadway (which is currently a two-lane residential road) and to the adjacent multi-family neighborhood environment.
2) Required new right-of-way would displace many multi-family structures located adjacent to the existing right-of-way
3) There would be high utility impacts due to elevated high-voltage power lines along the east side of the right-of-way.
4) The elevated median alternative would create a barrier in the neighborhood and introduce noise and visual effects. The residential nature and demographics of the adjacent neighborhood increase the potential for effects to environmental justice populations because they would be the populations experiencing the noise, visual and construction effects, and could potentially be displaced.
5) The 30th Avenue S. alternatives would avoid temporary and permanent effects to SR 99 between S. 220th Street and S. 244th Street, including the highly congested Kent-Des Moines Road (SR 516) intersection.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the 30th Avenue S. Elevated East Side alternative is not proposed for further evaluation.

7.11 30th Avenue S. Elevated West Side Alternative

TABLE 7-11
30th Avenue S. Elevated West Side Alternative Summary Findings

Strengths	Weaknesses
• Higher ridership than at-grade alternatives (23,000 to 24,000) • Lower travel time than most alternatives considered (15 minutes) • No effects to system-wide Link operations and reliability • More high density/TOD zoning • Avoids major property acquisition impacts of other 30th Avenue S. alternatives • No wetland effects • Would not affect any parks • Avoids Kent-Des Moines Road effects	• High potential effects to environmental justice populations related to noise, visual, displacements, and traffic • High number of noise sensitive receptors • All 30th Avenue S. alternatives have high potential for hazardous materials conflicts

The 30th Avenue S. Elevated West Side alternative would have similar travel time and ridership to other elevated alternatives on SR 99 and I-5, is likely to require only partial reconstruction of 30th Avenue S., a two-lane primarily residential road. This alternative would have high potential for noise and visual impacts and could create a barrier through the middle of the Pacific Ridge neighborhood between S. 220th Street and Kent-Des Moines Road. This reconstruction would avoid major utility relocations associated with median and east side alternatives on 30th Avenue S.

Key findings:

1) The operating speeds for the grade separated alternative would meet the agency's target of 55 mph, resulting in travel time and ridership that would be competitive with the elevated SR 99 and I-5 alternatives.
2) Of all of the 30th Avenue S. alternatives, this alternative would cause the least disruption and impacts. Displacements with the 30th Avenue S. West Side Elevated alternative would be lower than with the other 30th Avenue S. alternatives because the buildings are typically set further from the roadway back on the west side of the street than on the east side.
3) The 30th Avenue S. alternatives would avoid temporary and permanent effects to SR 99 between S. 220th Street and S. 244th Street, including the highly congested Kent-Des Moines Road (SR 516) intersection.
4) Construction of the project improvements would not require complete reconstruction of the 30th Avenue S. roadway. Project improvements would be adjacent to the roadway, to the west, but there would still be substantial construction related impacts.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the 30th Avenue S. Elevated West Side alternative is proposed for further evaluation.

7.12 24th Avenue S. At-Grade Median Alternative

TABLE 7-12
24th Avenue S. At-Grade Median Alternative Summary Findings

Strengths	Weaknesses
• Avoids disruption, property displacement, and construction effects along SR 99 between S 200th Street and Kent-Des Moines Road • No wetland effects • Does not affect any community facilities	• Longer travel time than all alternatives considered • Lower ridership than elevated alternatives • Likely to affect system wide Link operations and reliability due to at-grade operation • Less high density/TOD zoning • Moderate to high visual sensitivity • 24th Avenue S. alternatives have potential effects to about 1 acre of parks, higher than other alternatives • Possible indirect effects to Underwood Memorial Park • Restricts left turns at un-signalized intersections and midblock U-turns • 24th Avenue S. alternatives have the worst potential traffic effects of any of the alignments • Higher structural costs for the tall columns required to bridge SR 509 and S. 208th Street

The 24th Avenue S. At-Grade Median alternative would avoid the disruption of SR 99 associated with construction activities and widening of the roadway between S. 200th Street and S. 240th Street. It would have a longer travel time and lower ridership than elevated alternatives, and would require reconstruction of 24th Avenue S., a two-lane collector road in a residential area. This reconstruction would involve utility relocations and results in effects to local traffic by eliminating left turns from side streets and adjacent properties. This alternative would have high potential for noise and visual effects and could have indirect effects to parks and neighborhood cohesion between S. 216th Street and Kent-Des Moines Road. Additional costs would be associated with structures for crossing the proposed SR 509 right-of-way and S. 208th Street.

Key findings:

1) The operating speeds would not meet the agency's target of 55 mph because the LRT speed would be limited to 35 mph by the safety-driven rules that govern operating in a semi-exclusive environment (in the same fashion as the Sound Transit Link light rail segment along Martin Luther King Way in Seattle). This would contribute to longer travel times and lower ridership than the grade separated options on SR 99. The at-grade operating configuration would affect reliability due to the LRT having to cross street traffic, which would adversely affect the reliability of the larger ST Link light rail system.
2) The at-grade operating configuration is less reliable due to surface traffic operations and the risk for conflict of operations. Potential traffic delay at intersections would cause unreliability within the corridor and would ripple through and cause unreliability within the larger ST Link light rail System.

3) Construction of the project improvements would generally include leaving the southbound lane alone and widening to the east for construction of the project and reconstruction of the northbound lane.
4) There would be a high degree of change required to the 24th Avenue S. roadway (which is currently a two-lane residential road) and adjacent neighborhood environment. For example, right-of-way would have to be acquired from the east side of 24th Avenue S. because of a park and other public facility uses on the west side, but could result in displacement of residences and churches.
5) Because this alternative is located in a primarily residential area, it would likely cause property access, visual and noise effects.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the 24th Avenue S. At-Grade Median alternative is not proposed for further evaluation.

7.13 24th Avenue S. Elevated Median Alternative

TABLE 7-13
24th Avenue S. Elevated Median Alternative Summary Findings

Strengths	Weaknesses
• Avoids disruption, property displacement, and construction effects along SR 99 between S 200th Street and Kent-Des Moines Road • No effects to system-wide Link operations and reliability • No wetland effects	• Right-of-way could be required for elevated guideway to cross most intersections • Less high density/TOD zoning • 24th Avenue S. alternatives have potential effects to about 1 acre of parks, higher than other alternatives • Possible indirect effects to Underwood Memorial Park • 24th Avenue S. alternatives have more community facilities adjacent to the proposed alignment than other alternatives • Moderate to high visual sensitivity • Restricts left turns at un-signalized intersections and midblock U-turns • 24th Avenue S. alternatives have the worst potential traffic effects of any of the alignments • Higher structural costs for the tall columns required to bridge SR 509 and S. 208th Street

The 24th Avenue S. Elevated Median alternative would avoid the disruption of SR 99 associated with construction activities and widening of the roadway between S. 200th Street and S. 240th Street. This alternative would require reconstruction of 24th Avenue S., a two-lane collector road in a residential area. This reconstruction would involve utility relocations and results in effects to local traffic by eliminating left turns from side streets and adjacent properties. This alternative would have high potential for noise and visual effects and could have indirect effects to parks and neighborhood cohesion between S. 216th Street and Kent-Des Moines Road. Additional costs would be associated with structures for crossing the proposed SR 509 right-of-way and S. 208th Street.

Key findings:

1) The project would be constructed so that reconstruction of the southbound lane of 24th Avenue S. would be avoided, and 24th would be widened only to the east to accommodate the median guideway and the northbound lane.
2) There would be a high degree of change required to the 24th Avenue S. roadway (which is currently a two-lane residential road) and adjacent neighborhood environment. For example, right-of-way would have to be acquired from the east side of 24th Avenue S. because of a park and other public facility uses on the west side, but could result in displacement of residences and churches.
3) Because this alternative is located in a primarily residential area, it would cause potential property access, visual, and noise effects.
4) The potential permanent effects to neighborhoods and community facilities along 24th Avenue S. outweigh the temporary benefits of avoiding construction along SR 99.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the 24th Avenue S. Elevated Median alternative is not proposed for further evaluation.

7.14 24th Avenue S. Elevated East Side Alternative

TABLE 7-14
24th Avenue S. Elevated East Side Alternative Summary Findings

Strengths	Weaknesses
• Does not require any roadway reconstruction • Avoids disruption and construction along SR 99 between S 200th Street and Kent-Des Moines Road • No operating speed restrictions • Minimal effects to system-wide Link operations and reliability, and RapidRide A Line	• Higher structural costs for the tall columns required to bridge SR 509 and S. 208th Street • Less high density/TOD zoning • Moderate to high visual sensitivity • High number of category 3 noise sensitive receptors (schools and churches) • Would effect neighborhood cohesion • Possible indirect effects to Stephen J. Underwood Memorial Park

The 24th Avenue S. Elevated East Side alternative would avoid the disruption of SR 99 associated with construction activities and widening of the roadway between S. 200th Street and S. 240th Street. This alternative would result in acquiring properties on the east side of 24th Avenue S. for right-of-way, possibly displacing residences and/or churches. This alternative would have high potential for noise and visual effects and could have indirect effects to parks and neighborhood cohesion between S. 216th Street and Kent-Des Moines Road. Additional costs would be associated with structures for crossing the proposed SR 509 right-of-way and S. 208th Street.

Key findings:

1) The project would be constructed so that reconstruction of the southbound lane of 24th Avenue S. would be avoided, and 24th would be widened only to the east to accommodate the median guideway and the northbound lane.
2) This alternative would require a very high number of changes to the 24th Avenue S. roadway and adjacent neighborhood environment. For example, right-of-way would need to be acquired from the east side of the 24th Avenue S. because of a park and other public facility uses on the west side, but could result in displacement of residences and churches.
3) Because this alternative is located in a primarily residential area, it would have potential visual and noise effects.
4) The potential permanent effects to neighborhoods and community facilities along 24th Avenue S. outweigh the temporary benefits of avoiding construction along SR 99.

Conclusion: Based on the key findings above, the project purpose and need, and the analysis completed to date using the evaluation criteria, the 24th Avenue S. Elevated East Side alternative is not proposed for further evaluation.

7.15 Summary of Findings and Conclusions Related to Level 1 Alternatives

Based on the results of the Level 1 evaluation, the following alternatives will be evaluated further in the Level 2 evaluation:

- SR 99 Elevated Median
- I-5 Mixed West
- I-5 Mixed West/Median
- 30th Avenue S. Elevated West

The results of the Level 1 analysis showed that different segments of each of the SR 99 alternatives could work, but each one of them as a “stand alone” alternative has substantial flaws. A combination of conceptual design elements (a mix of east side, west side, and median alignment; at-grade and elevated profile) could results in an alternative that operates better with less adverse effects than the “stand alone” SR 99 alignment alternatives studied in Level 1. For the Level 2 evaluation, this new alternative will be called the “hybrid” alternative.

Conclusion: A new SR 99 Hybrid alternative should be developed for study in the Level 2 evaluation. It should be made up of elements of the SR 99 alignment and grade alternatives (at-grade, median elevated, east elevated and west elevated) that have demonstrated potential feasibility in the Level 1 evaluation.

The alternatives to be evaluated further in the Level 2 evaluation are shown in **Exhibit 7-1** below in color, with the alternatives that will not be carried forward for Level 2 evaluation shown in gray.

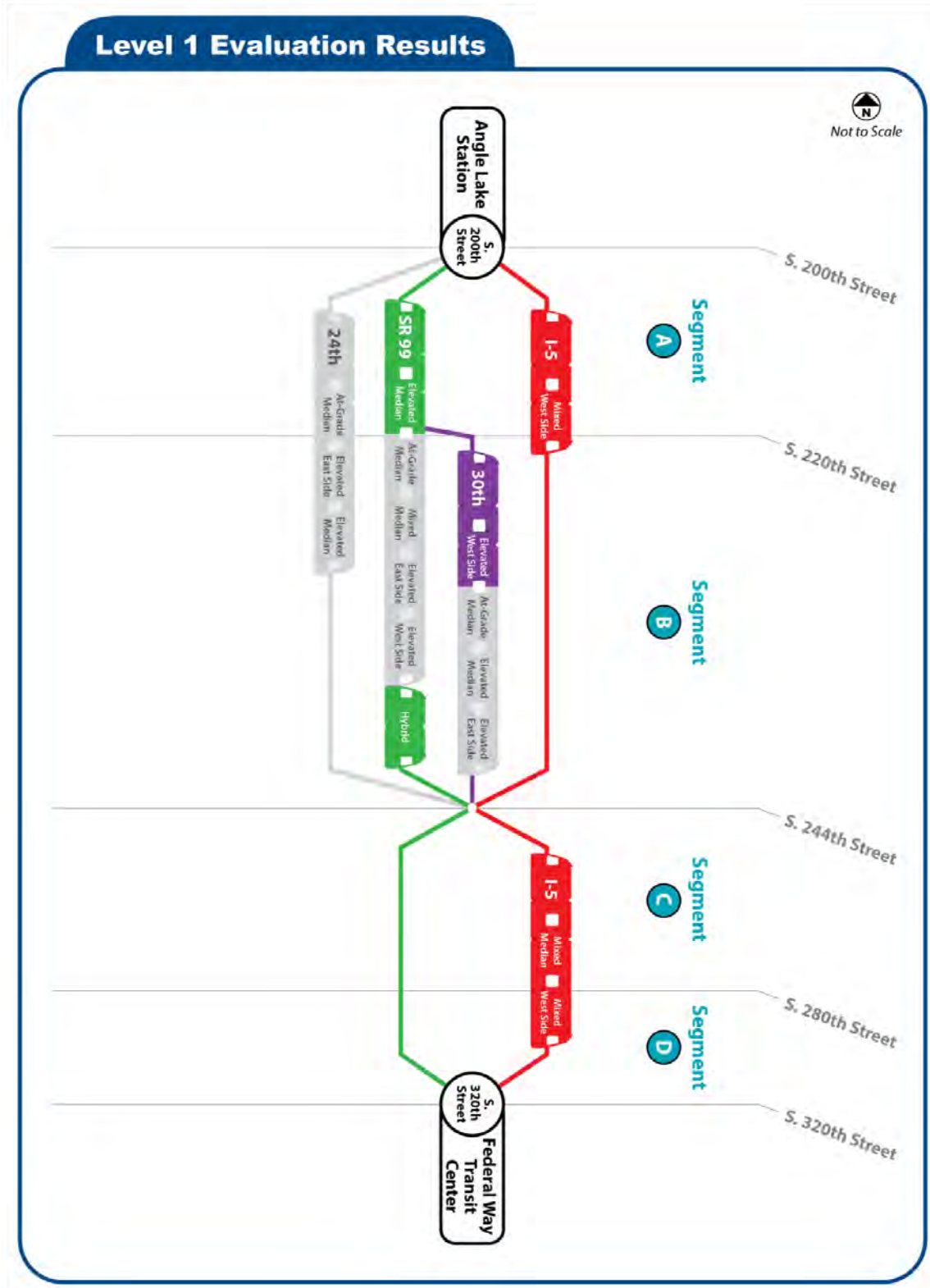

EXHIBIT 7-1
Level 1 Evaluation Results

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June 2013

FEDERAL WAY TRANSIT EXTENSION

Level 2 Alternatives Screening Report

SOUNDTRANSIT

CENTRAL PUGET SOUND
REGIONAL TRANSIT AUTHORITY

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Acronyms

AA	Alternatives Analysis
ACS	American Community Survey
BAT	Business Access Transit
BRT	Bus Rapid Transit
BMPs	Best Management Practices
CFR	Code of Federal Regulations
CTP	Comprehensive Transportation Plan
EDR	Environmental Data Resource
EIS	Environmental Impact Statement
ESD	Employment Securities Division
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FWTC	Federal Way Transit Center
FWTE	Federal Way Transit Extension
GIS	Geographic Information System
GMA	Growth Management Act
HCC	Highline Community College
HCT	High Capacity Transit
HOV	High Occupancy Vehicle
HUD	Department of Housing and Urban Development
KCM	King County Metro
LOS	Level of Service
LRT	Light Rail Transit
LWCF	Land and Water Conservation Fund
MAP-21	Moving Ahead for Progress in the 21st Century
MPH	Miles Per Hour
MPO	Metropolitan Planning Organization
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O&M	Operation and Maintenance
OCS	Overhead Catenary System
P&R	Park-and-Ride
PSE	Puget Sound Energy
PSRC	Puget Sound Regional Council

RCW	Revised Code of Washington
SCC	Standard Cost Categories
SEPA	State Environmental Policy Act
ST	Sound Transit
ST2	Sound Transit 2 Plan
TAZ	Traffic Analysis Zone
TOD	Transit Oriented Development
TSP	Transit Signal Priority
TSM	Transit System Management
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation

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1.0 Executive Summary

1.1 Purpose of This Report

Sound Transit and the Federal Transit Administration (FTA) have conducted an Alternatives Analysis to start the public planning and environmental processes for the Federal Way Transit Extension (FWTE) in South King County in the metropolitan Puget Sound region. The proposed project is part of the Sound Transit 2 (ST2) Plan approved by voters in 2008 and would start at the regional light rail system at the future Angle Lake Station in the City of SeaTac at S. 200th Street. **Exhibit 1-1** shows where the FWTE is located. The FWTE is an element of the region's Metropolitan Transportation Plan (the Puget Sound Regional Council's [PSRC's] *Transportation 2040*), and Sound Transit's Long-Range Transit Plan. These plans anticipate the eventual extension of high capacity transit (HCT) service south to Tacoma.

This report is organized in six key sections, as follows:

- Introduction
- Level 2 Definition of Alternatives
- Level 2 Evaluation Criteria
- Level 2 Data Results - Alignment Alternatives
- Level 2 Findings and Conclusions – Alignment Alternatives
- Station Location Evaluation

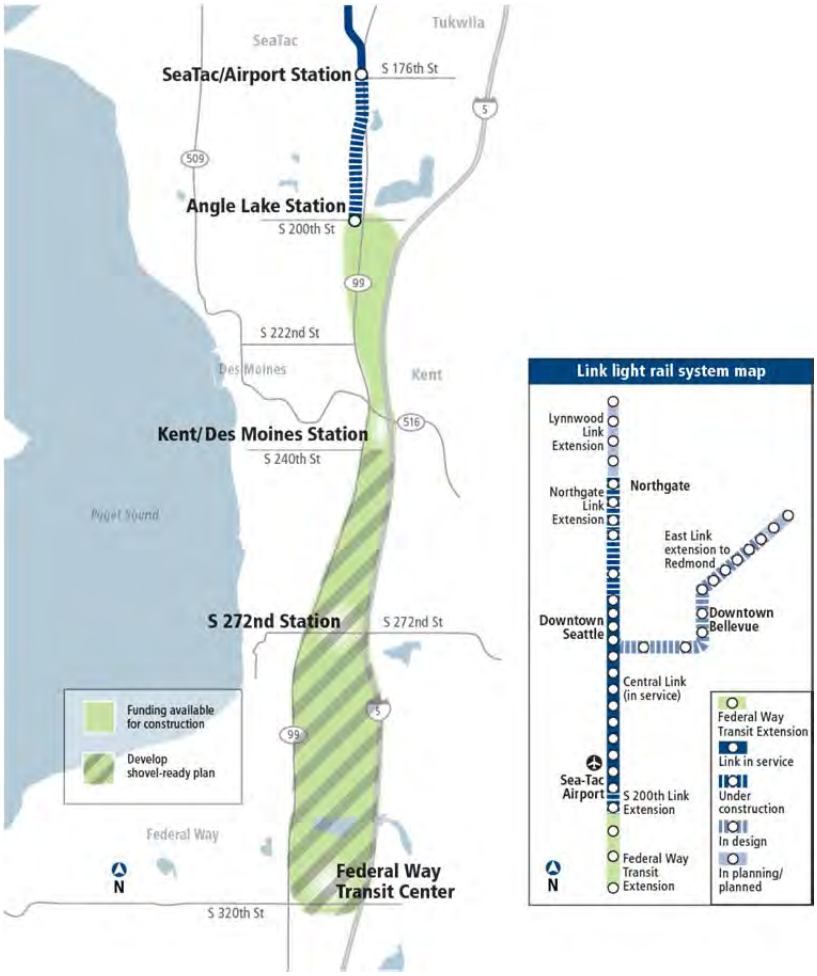


EXHIBIT 1-1
FWTE Project Study Area

1.2 Purpose and Need of the Federal Way Transit Extension Project

The purpose of the Federal Way Transit Extension is to expand the Sound Transit Link light rail system from SeaTac to the cities of Des Moines, Kent, and Federal Way in King County in order to meet the following objectives:

- Provide a rapid, reliable, accessible, and efficient alternative for travel to and from the corridor and other urban growth and activity centers in the region with sufficient capacity to meet projected demand.
- Expand mobility alternatives to traveling on congested roadways and improve connections to the regional multimodal transportation system with peak and off-peak service.
- Provide the high-capacity transit (HCT) infrastructure to support adopted regional and local land use, transportation, and economic development plans.
- Advance the long-range vision, goals, and objectives for transit service established by the Sound Transit Long-Range Plan for high-quality regional transit service connecting major activity centers in King, Pierce, and Snohomish counties.
- Implement a financially feasible system that seeks to preserve and promote a healthy environment.

The following conditions within the project corridor demonstrate the need for the project:

- North-south transit demand is expected to grow by 30 to 40 percent by 2035 as a result of residential and employment growth in the FWTE corridor and regionally.
- The FWTE corridor population is a highly transit-dependent population with needs for efficient, reliable regional connectivity.
- Congestion on I-5 and on the key corridor arterials leading in and out of the study area will increase and further degrade existing transit performance and reliability.
- There is a lack of reliable and efficient peak and off-peak transit service connecting persons in the FWTE corridor with the region's growth centers.
- Regional and local plans call for HCT in the corridor consistent with PSRC's VISION 2040 and the Regional Transit Long-Range Plan.

Implementing the project will help meet environmental and sustainability goals of the state and region, including reduced vehicle miles traveled and greenhouse gas emissions. Any alternative evaluated for the FWTE must demonstrate the ability to address these needs and achieve the project purpose.

1.3 Summary of Level 1 Evaluation

The development of alternatives for the FWTE was informed by FTA guidelines on project development and alternatives analyses. Potential alternatives for the FWTE came from two sources: previous regional and local planning studies and input from the public and agencies during a 30-day early scoping period between October 18 and November 19, 2012. The early scoping period included two public open houses (one in Des Moines and one in Federal Way), an online survey, and opportunities for the public to provide comments on comment forms at the meeting, online, or via postal mail. The public open houses provided several interactive opportunities for attendees to provide input, including a large map of the project corridor where attendees could draw alignment and/or station suggestions. An online agency meeting was also conducted and provided opportunities to ask questions and provide comments.

Feedback received during the early scoping period was positive and indicated a desire for improved transit service in the project area. Comments provided by agencies, local jurisdictions, institutions, and members of the general public indicate a strong preference for light rail transit. Stakeholders expressed concerns about parking, travel time, multimodal connections, and connections to Tacoma and other transit facilities . Comments received on alignment, profile preference, and station locations were varied; strong preferences for one specific alignment, profile, or station location did not emerge.

The alternatives considered included different modes, profiles and alignments. Mode refers to the method of transportation, such as bus or light rail. Profile refers to a vertical location, such as above grade (elevated), at-grade, below-grade (retained cut or tunnel), or mixture of one or more profile. Alignment refers to the horizontal location within a corridor.

The mode evaluated in Level 1 is light rail transit (LRT) only. Bus rapid transit (BRT) was screened out prior to the Level 1 analysis. This screening is documented in Chapter 3, Pre-Screening of the FWTE Level 1 Alternatives Screening Report.

The following alternatives were evaluated in Level 1:

- SR 99 At-Grade Median
- SR 99 Mixed Median
- SR 99 Elevated Median
- SR 99 Elevated East Side
- SR 99 Elevated West Side
- I-5 Mixed West Side
- I-5 Mixed West Side/Median
- 30th Avenue S. At-Grade Median

- 30th Avenue S. Elevated Median
- 30th Avenue S. Elevated East Side
- 30th Avenue S. Elevated West Side
- 24th Avenue S. At-Grade Median
- 24th Avenue S. Elevated Median
- 24th Avenue S. Elevated East Side
- 24th Avenue S. Elevated West Side

Based on the results of the Level 1 Evaluation, the following alternatives were studied further in Level 2:

- SR 99 Elevated Median
- 30th Avenue S. Elevated West Side (with SR 99 Elevated Median)
- I-5 Mixed West Side
- I-5 Mixed West Side/Median
- SR 99 Hybrid (new-see below)

The results of the Level 1 analysis showed that different segments of each of the SR 99 alternatives could work, but each one of them as a "stand alone" alternative had substantial flaws. A combination of conceptual design elements (a mix of east side, west side, and median alignment; at-grade and elevated profile) could result in an alternative that operates better with less adverse effects than the "stand alone" SR 99 alignment alternatives studied in Level 1. For the Level 2 evaluation, this new alternative became the "hybrid" alternative.

For more details on this analysis, refer to the FWTE Level 1 Alternatives Screening Report.

1.4 Definition of Level 2 Alternatives

Exhibit 1-2 displays the alternatives under evaluation in Level 2.

1.4.1 SR 99 Elevated Median Alternative

The SR 99 Elevated Median alternative would extend south from Angle Lake Station at S. 200th Street along the west side of 28th Avenue S. Where 28th Avenue S. ends and the proposed SR 509 extension would cross under SR 99, the LRT guideway would be elevated west of SR 99 to cross SR 509, then transition to the SR 99 median. The guideway would be supported by columns located generally between the northbound and southbound travel lanes in most locations. Where a planted (or otherwise un-traversable) median 12 or more feet wide exists today, the support columns would be assumed to be located there. This column placement could make it possible to avoid re-building SR 99 travel lanes in conjunction with this proposed LRT project at such locations. At intersections or where the median space is occupied by a left

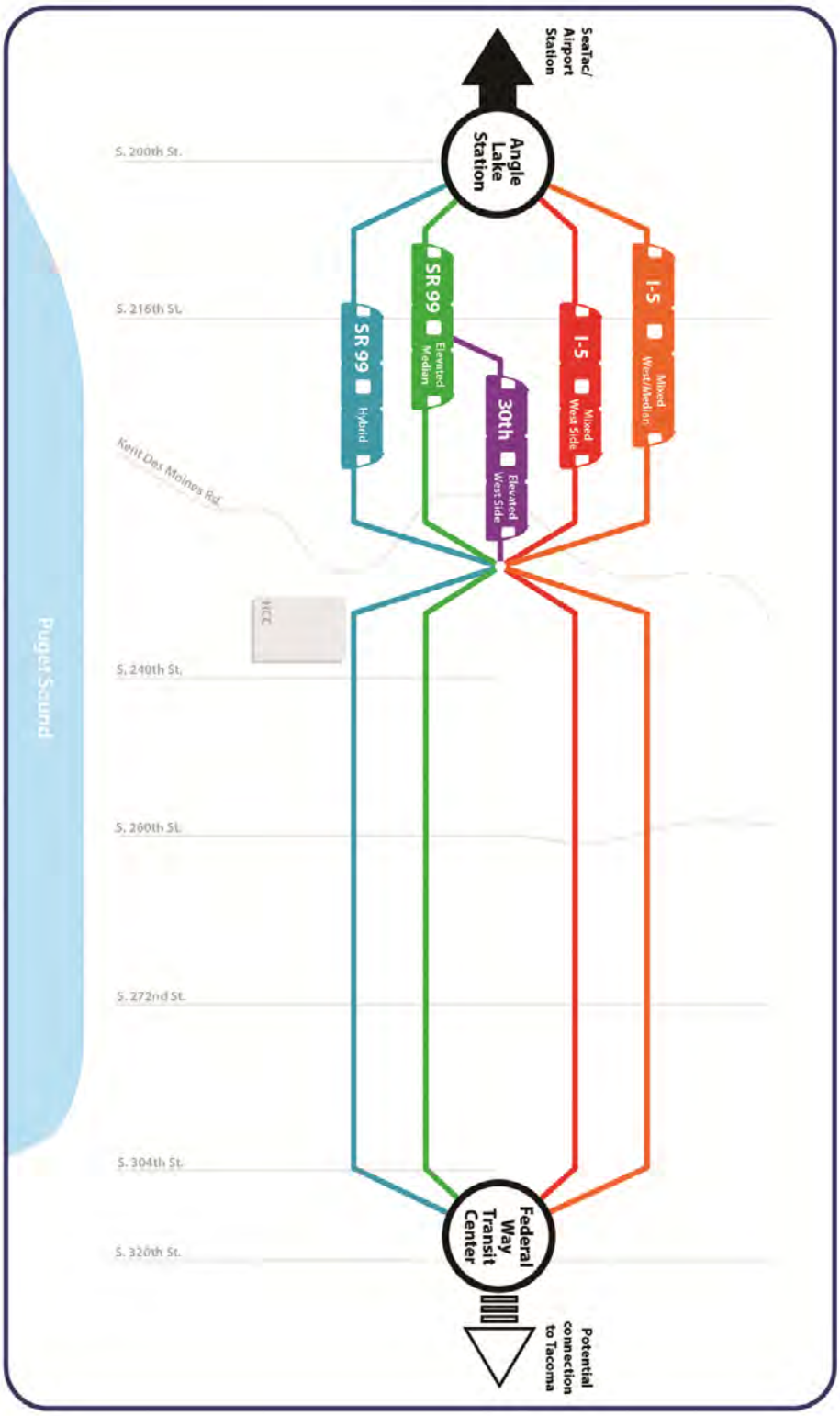


EXHIBIT 1-2

Level 2 Alternatives

turn or U-turn lane, either SR 99 would be widened (in order to create space for columns) by relocating turn lanes, or an alternate method of supporting the elevated guideway (such as straddle bents or more sophisticated bridge structures) would be used.

1.4.2 30th Avenue S. Elevated West Side Alternative

For the purposes of Level 2 evaluation, the 30th Avenue S. Elevated West Side alternative would transition to and from the SR 99 Median Elevated alternative. At the north end of this alternative, the alignment would transition out of the SR 99 median at around S. 220th Street and head east to 30th Avenue S. The elevated guideway would continue south along the west side of 30th Avenue S. between the traveled way and existing buildings, which are primarily multi-family residential buildings to the north of Kent-Des Moines Road and industrial commercial buildings to the south. The elevated guideway would cross Kent-Des Moines Road with a single span (approximately 150 to 250 feet long) to avoid the potential negative effects that could be associated with placing a column in the center of the roadway. South of the Kent-Des Moines station, the 30th Avenue S. alignment would transition on an elevated guideway west to an elevated SR 99 elevated median alignment. From there south to the end of the project corridor, it would be identical to the SR 99 Median Elevated alternative described previously.

1.4.3 SR 99 Hybrid Alternative

During the Level 1 evaluation, it became apparent that the SR 99 Elevated East Side and SR 99 Elevated West Side alternatives would each have too many substantial flaws to be considered on their own. However, these flaws were not consistent throughout the corridor. Each of these alternatives was defined for Level 1 as having the guideway only on one side of SR 99, but a closer look revealed that a viable alternative could be designed with the elevated guideway on one side of SR 99 in certain locations and on the other side (or in the median) in other locations, or even be at grade for certain side-running segments to reduce costs. The alternative resulting from this combination approach was carried forward to be studied in Level 2, as the SR 99 Hybrid. The approximate alignment variations of the SR 99 Hybrid alternative are shown in **Table 1-1.**

TABLE 1-1
SR 99 Hybrid Alternative Alignment Variations

From	To	Orientation Relative to SR 99
Angle Lake Station	S. 208th Street	Along 28th Avenue S. and West of SR 99
S. 208th Street	North of Kent-Des Moines Road	Median of SR 99
North of Kent-Des Moines Road	S. 260th Street	West of SR 99
S. 260th Street	16th Avenue S.	East of SR 99
16th Avenue S.	S. 304th Street	West of SR 99
S. 304th Street	S. 312th Street	East of SR 99

Exhibit 1-3 shows the conceptual alignment variations for the SR 99 Hybrid alternative.

EXHIBIT 1-3
SR 99 Hybrid Alternative Conceptual Alignment

1.4.4 I-5 Mixed West Side Alternative

At the north end of the corridor (just south of the Angle Lake Station), the I-5 Mixed West Side alternative would be identical to the other alternatives, extending the elevated guideway to the south along the west side of 28th Avenue S. After crossing over SR 99 and the proposed SR 509 extension, the guideway would turn east to run along the south side of the proposed SR 509 extension to I-5, then south along the west side of the I-5 right of way. Near S. 316th Street the alignment would turn west toward the FWTC.

"Mixed" refers to the alternative's profile and indicates a combination of elevated and at-grade profiles. This alternative would be at-grade for the most part, but would be grade-separated from all cross-streets (S. 211th Street, S. 216th Street, Kent-Des Moines Road [SR 516], S. 259th Place, S. 272nd Street, Military Road S. [twice], and S. 288th Street) as well as other potential obstacles. The I-5 Mixed West Side alternative's proposed location places it close to several facilities that could affect the alignment and/or profile, including Highline Water District storage tanks, Puget Sound Energy's Midway Switch Station, the Midway Landfill, Mark Twain Elementary School, and the Truman High School complex.

1.4.5 I-5 Mixed West Side/Median Alternative

The I-5 Mixed Median/West Side alternative would be identical to the I-5 Mixed West Side alternative from the north end of the project area to S. 240th Street. At that point, the guideway would transition from the west side of the I-5 right of way, via elevated structure, to the freeway median. It would remain in the I-5 median to the Star Lake Park-and-Ride area, where it would transition back to the west side so that the S. 272nd Street station could be placed close to the Park-and-Ride and avoid issues involved with fitting the station footprint in the median. South of the station, the guideway would transition back to the freeway median via elevated structure. Near S. 316th Street the alignment would turn west toward the FWTC.

1.5 Evaluation Criteria

The criteria used to evaluate the Level 2 alternatives originated from objectives derived from the project's Purpose and Need, described in Section 1.2. These objectives are:

- Objective 1: Provide an effective transportation solution to meet mobility needs
- Objective 2: Support equitable mobility
- Objective 3: Serve supportive land use plans and economic development objectives
- Objective 4: Preserve a healthy environment
- Objective 5: Design an affordable and constructible project

Table 1-2 shows the evaluation criteria established for the Level 2 evaluation for alignments and stations. Each criterion has one or more quantitative or qualitative measures that are described in Chapter 4. These criteria and measures are intended to differentiate between alternatives in terms of project performance and potential impacts.

Table 1-2
Level 2 Evaluation Criteria and Measures

Evaluation Criteria	Level 2 Measures
Ridership potential	Daily and annual project riders
	Station boardings
	Travel time
Connections to regional multimodal transportation systems	Transit integration with Link system
	Integration with bus facilities and services
Transit-dependent and Environmental Justice populations	Student poverty
	Subsidized housing
	Cost of commuting
	Access to express transit
	Minority Populations
Transit-supportive land use and economic development policies	Existing land use
	Planned land use
	High Density/TOD Zoning
	Underutilized parcels
	Population
	Employment
	Households
	Parking opportunities
	Non-motorized access
Effect on natural environment	Wetlands
	Streams
Effect on built environment	Visual effects
	Potential displacements
	Community facilities
	Noise
	Vibration
	Traffic
	Construction effects
Design considerations	Utilities
	Hazardous materials
	Geologic risks

Table 1-2 continued

System costs	Estimated capital costs
	Estimated operations and maintenance costs
Station access	Daily project ridership and station boardings
	Travel time
	Existing land use
	Planned land use
	High Density/TOD Zoning
	Underutilized parcels
	Population
	Employment
	Households
	Access to regional activity centers
	Parking opportunities
	Motorized access
	Non-motorized access
	Estimated cost

1.6 Level 2 Findings and Conclusions – Alignment Alternatives

This section presents the results of the Level 2 analysis. **Exhibits 1-4a and 1-4b** contain a summary of the data results from the analysis of the alignment alternatives, organized by the evaluation criteria used to collect and analyze data. For a more detailed look at these results, refer to Chapter 5 of this report. The text that follows Exhibits 1-4a and 1-4b outlines the key findings and conclusions for each alternative studied in Level 2.

1.6.1 SR 99 Corridor

The SR 99 corridor generally features robust land use variety and corridor access, with areas of opportunity for targeted transit-oriented land use improvements along the proposed Light Rail Transit (LRT) alternatives. The SR 99 alternatives have been designed to connect these areas and optimize ridership by balancing the need for LRT system access with the need to serve regional destinations. The following subsections compare the SR 99 alternatives to each other.

1.6.1.1 SR 99 Elevated Median Alternative

The SR 99 Elevated Median alternative would include a light rail guideway on vertical columns in the median of SR 99. It would require construction of guideway support columns in the median of SR 99, which currently has a planted strip or intersection turning lanes for nearly all of the length of the study corridor.

Executive Summary – Alignments

	Elevated Median	30th Ave Elevated West Side with SR 99 Elevated Median	Hybrid	Mixed West Side	Mixed West Side/ Median
Ridership potential (2035)					
Daily and annual project ridership	23,500 (daily riders) 7.4 million (annual riders)				
Station boardings	HCC Station 3,000 riders S. 272nd St Station 2,000 riders FWTC Station 8,000 riders			HCC Station 2,500 riders S. 272nd St Station 2,000 riders FWTC Station 8,500 riders	
Travel time	14.5 minutes	15 minutes	14.5 minutes	14 minutes	14 minutes
Connections to regional multimodal transportation systems					
Integration with Link system	Good integration - 0 traffic signals traversed				
Integration with bus facilities and services	175 peak / 146 off-peak bus trips			194 peak / 102 off-peak bus trips	
Transit-dependent population					
Student poverty	All schools within the study area have above 47% students eligible for free or reduced lunch				
Subsidized housing	9 properties / 1,113 units			8 properties / 679 units	
Cost of commuting	Slightly lower cost			Slightly higher cost	
Access to express transit	All alternatives performed relatively the same for access to express transit within 1/4 mile of the alternative				
Transit-supportive land use and economic development policies					
Existing land use					
Planned land use					
High-density zoning	797 acres (32%)	823 acres (33%)	792 acres (32%)	580 acres (23%)	579 acres (22%)
Underutilized parcels	1,606 acres (31%)	1,599 acres (30%)	1,598 acres (31%)	1,595 acres (30%)	1,606 acres (30%)
Population	35,800 people	35,900 people	35,700 people	35,100 people	34,900 people
Employment	14,000 jobs	14,000 jobs	14,000 jobs	11,400 jobs	11,400 jobs
Households	14,000 households	14,000 households	14,000 households	13,300 households	13,200 households
Parking opportunities	3,134 existing spaces 64% utilized 4 potential new locations			3,067 existing spaces 75% utilized 1 potential new location	
Non-motorized access	Higher road density (30.5 miles roadway)			Lower road density (26.5 miles roadway)	

Existing land use: Single family Residential, Multi-family Residential, Commercial, Industrial, Institutional, Parks/Open Space, Vacant, ROW/Other

Planned land use: Single Family Residential, Multi-family Residential, Mixed Use, Commercial, Industrial, Institutional, Parks, Urban Separator, ROW/Other

EXHIBIT 1-4a
Alternatives Data Summary – Part 1

Executive Summary – Alignments (cont.)

	SR 99 Elevated Median	30th Ave Elevated West Side with SR 99 Elevated Median	SR 99 Hybrid	I-5 Mixed West Side	I-5 Mixed West Side/ Median
Effect on natural environment					
Wetlands	0 acres	0 acres	0.7 acres	0 acres	0 acres
Streams	120 feet of stream length affected	60 feet of stream length affected	120 feet of stream length affected	220 feet of stream length affected	220 feet of stream length affected
Effect on built environment					
Visual effects	Moderate effects	High effects	Moderate effects	Moderate effects	Low effects
Potential displacements	31 residential, 49 commercial	102 residential, 41 commercial	52 residential, 108 commercial	131 residential, 3 commercial	5 residential, 0 commercial
Community facilities	0 direct, 16 indirect	0 direct, 15 indirect	3 direct, 13 indirect	0 direct, 6 indirect	0 direct, 6 indirect
Noise	1,700 residences 11 schools/ churches	2,500 residences 14 schools/ churches	1,600 residences 9 schools/ churches	2,000 residences 5 schools/ churches	1,700 residences 3 schools/ churches
Vibration	No highly sensitive receptors				
Traffic	14 intersections affected	14 intersections affected	11 intersections affected	11 intersections affected	11 intersections affected
Construction effects	High effects	High effects	Medium effects	Low effects	High effects
Design Considerations					
Utilities	Moderate risk	High risk	High risk	High risk	High risk
Hazardous materials	68 High risk sites	68 High risk sites	68 High risk sites	6 High risk sites	7 High risk sites
Geologic issues	Low risk	Low risk	Low risk	High risk	Moderate risk
System costs					
Estimated capital cost	$1.5 - 1.8b	$1.6 - 1.8b	$1.5 - 1.8b	$1.3 - 1.5b	$1.4 - 1.6b
Estimated operations and maintenance cost ($2013)	$6.5m per year				

For detailed descriptions of methodology and results, see Chapters 4 and 5.

EXHIBIT 1-4b
Alternatives Data Summary – Part Two

The location of the columns for the proposed transit guideway in the existing median of SR 99 would be positive for this alternative because it would, in many locations, minimize or eliminate the need to widen the SR 99 roadway. Where the proposed columns would be placed in an existing planted strip, it has been assumed that the columns would fit within the available space. As a result, the SR 99 Elevated Median alternative would have fewer business displacements than the SR 99 Hybrid. With the SR 99 Elevated Median alternative, residential displacements would be less than with each of the other SR 99 alternatives. Lane closures during construction activities would affect mobility within the SR 99 corridor. The elevated guideway would cross over major intersections such as the Kent-Des Moines Road intersection on a long elevated structure in the median of SR 99, which would increase cost and complexity.

With the elevated alignment in the median of SR 99, the number and locations of mid-block left turns and U-turns could be reduced and the revised median configuration could require additional roadway improvements to facilitate local circulation. This could result in additional traffic impacts at nearby signalized intersections.

The SR 99 Elevated Median alternative would be somewhat close to noise-sensitive receivers on both sides of the roadway, resulting in more potential noise effects than the SR 99 Hybrid alternative, as well as more potential indirect effects on community facilities.

1.6.1.2 30th Avenue S. Elevated West Side Alternative

The 30th Avenue S. Elevated West Side alternative would include a light rail guideway on vertical columns on the west side of 30th Avenue S. between S. 220th Street and S. 240th Street. North and south of these points it would have the same alignment as the SR 99 Elevated Median alternative, and effects in these areas would be the same as the SR 99 Elevated Median alternative. North of Kent-Des Moines Road, 30th Avenue S. is a primarily residential street with several large multi-family complexes as well as some single family homes. Locating the alignment on 30th Avenue S. in this area would avoid the traffic, design and cost issues associated with putting the light rail guideway through the complex SR 99/Kent-Des Moines Road intersection. It has greater potential for residential displacements and visual, noise and vibration effects than the other SR 99 alternatives, but would have fewer effects on businesses along SR 99 in this area.

Some of the negative effects could be reduced by moving the transition from SR 99 to 30th Avenue S. farther south than S. 220th Street. Also, although this alternative was evaluated as if it was connected to the SR 99 Elevated Median alternative, it could be combined with the SR 99 Hybrid alternative to the north or the south, or it could be connected to an I-5 alternative to the south.

1.6.1.3 SR 99 Hybrid Alternative

The SR 99 Hybrid alternative light rail guideway would be constructed primarily (although not entirely) on either the east or the west side of SR 99, minimizing reconstruction of SR 99 and potential traffic effects associated with occupying the median. It would also avoid crossing the SR 99/Kent-Des Moines Road intersection in the median by crossing Kent-Des Moines Road on the west side of SR 99. This alternative would have the least potential for noise and vibration effects on residences among the SR 99 alternatives, as well as less potential for effects on traffic during construction and operation.

This alternative would be located on the east side of SR 99 near the McSorley Creek wetland complex, resulting in potential effects to this wetland. These effects would be further defined in the EIS and would require additional information on the wetland boundary and the extent to which the wetland could be avoided. Being located on the side of the predominantly commercial SR 99 corridor, however would result in the greatest number of business displacements of any alternative, and could displace up to three commercial buildings where space is leased for religious facilities. The design of this alternative could be further refined to further avoid or minimize many of the identified adverse effects.

1.6.2 I-5 Corridor

The I-5 corridor studied is primarily within the I-5 right-of-way, which is adjacent to primarily single family land uses, except at the interchanges at Kent-Des Moines Road and S. 317th/320th streets, which have commercial land uses. The alternatives within this corridor are designed to connect access points at freeway interchanges to optimize ridership by balancing the need for LRT system access with the need to serve regional destinations.

The I-5 alternatives are subject to ongoing review and coordination with WSDOT. The “SR 167, SR 509, and I-5 Puget Sound Gateway Project” (“the Gateway Project”) is a long-term effort to improve roadway access to the ports of Seattle and Tacoma, in the interest of maintaining and enhancing Washington’s global economic competitiveness. The Gateway Project features three projects that, when combined, could add substantial width to I-5 in the FWTE project study area. In some parts of the study area, this additional roadway width would occupy all or most of the available WSDOT right-of-way.

The two I-5 alternatives being considered in this Level 2 screening process are subject to substantial change as new information becomes available about the right-of-way needs of the Gateway Project. Although these widening projects are not currently funded, discussions continue regarding the appropriate placement of the proposed LRT guideway along I-5. The assumptions contained in this report about LRT guideway placement represent the best

information available at the time regarding right-of-way availability and WSDOT design coordination.

1.6.2.1 I-5 Mixed West Side Alternative

The I-5 Mixed West Side alternative would be located along the west side of I-5, primarily within or adjacent to the WSDOT right-of-way. It would be at-grade in some locations and grade-separated in others. Construction within WSDOT right-of-way on the west side of I-5 would minimize the need for lane closures on local roads as well as on I-5. The land uses adjacent to I-5 are primarily residential. Consequently, this alignment has more potential for effects on residences, including displacements, noise, vibration and visual effects. This alternative would cross the Midway Landfill, which presents engineering challenges and additional costs. Both I-5 alternatives would also need to avoid or relocate the Highline Water District tanks and a major Puget Sound Energy substation. Coordination with WSDOT during the Level 2 process indicated that the availability of their right-of-way may be limited north of Kent-Des Moines Road, due to potential conflicts with the planned SR 509 extension (as part of the Gateway Project).

1.6.2.2 I-5 Mixed West Side/Median Alternative

The I-5 Mixed West Side/Median alternative would be along the west side of I-5 primarily within or adjacent to the WSDOT right-of-way and within the median between the north and south bound lanes of I-5. This alternative would transition from west of I-5 to the I-5 median near S. 240th Street, primarily to avoid crossing the Midway Landfill, and would cross back to the west side of I-5 for stations at S. 272nd Street and the Federal Way Transit Center. Construction in the I-5 right-of-way would minimize disruption to the community, but could have effects on I-5 traffic. Construction in the median and to cross into and out of the median would result in lane closures and some traffic disruption on I-5, which would not occur with the I-5 Mixed West Side alternative.

Land use adjacent to I-5 is primarily residential, and therefore the alignment would have less potential for effect on businesses. The potential for noise, vibration and visual effects on residences would be similar to the I-5 Mixed West Side alternative where the alignment is on the west side of I-5, but would be avoided when in the median. Coordination with WSDOT during the Level 2 process indicated that the availability of their right-of-way may be limited north of Kent-Des Moines Road, due to potential conflicts with the planned SR 509 extension (as part of the Gateway Project). Other components of the Gateway Project may require use of the median south of Kent-Des Moines Road.

1.7 Station Location Evaluation

1.7.1 Identifying Station Locations

The Level 2 alignment alternatives were evaluated with three proposed station locations as defined by previous planning documents. These three station locations, Kent Des/Moines, S. 272nd, and Federal Way Transit Center (FWTC), are considered part of the baseline project definition and are referred to as "baseline" stations in this analysis. As part of the Level 2 Evaluation a comprehensive look at potential additional station locations was undertaken.

The station evaluation began with identification of an initial list of potential station locations. The initial list was based in part on input received from the public during early scoping and agencies through agency coordination, and staff assessment of possible station locations. The initial list included 22 potential locations that were subjected to a pre-screening process. Seven proposed locations were in very close proximity to baseline stations and were combined with these stations for purposes of this evaluation and are noted in **Table 1-3.** The initial list of potential station locations are listed in **Table 1-3** and shown on **Exhibit 1-5**.

Table 1-3
Initial List of Potential Stations

Station Location	Corridor (SR 99, I-5 or other)	In Vicinity of Baseline Station?
S. 216th St	SR 99, I-5	No
Kent/Des Moines Park-and-Ride	I-5	No
Highline Community College (HCC) parking lot	SR 99	Yes, in vicinity of Kent/Des Moines Station
Lowes parking lot along SR 99 (near HCC)	SR 99	Yes, in vicinity of Kent/Des Moines Station
S. 252nd Street Near Fred Meyer	SR 99	No
S. 260th Street	SR 99, I-5	No
Woodmont Library	SR 99	Yes, in vicinity of S. 272nd Station
LA Fitness parking lot (near Redondo Heights Park-and-Ride lot)	SR 99	Yes, in vicinity of S. 272nd Station
S. 288th Street	SR 99, I-5, Military Road	No
S. Dash Point Road	SR 99	No
Easter Lake (approximately S. 312th Street)	SR 99	No
S. 320th Street	SR 99	Yes, in vicinity of FWTC Station
The Commons at Federal Way	SR 99, I-5	Yes, in vicinity of FWTC Station
S. 320th Park-and-Ride at I-5	I-5	Yes, in vicinity of FWTC Station
21st Avenue S. near S. 336th Street	Beyond limits of study area	No
S. 348th Street Park-and-Ride	Beyond limits of study area	No
Kent Sounder Station	Beyond limits of study area	No

The list of pre-screened locations and the reasons for not evaluating them further are summarized below in **Table 1-4**.

Table 1-4
Pre-Screening of Initial List of Potential Stations

Station Location	Pre-Screening Results
Kent/Des Moines Park-and-Ride (with an east side I-5 alignment)	This station location would only work with an east of I-5 alignment. An east of I-5 alignment is not under consideration. Existing land uses and planned land uses would not be very supportive of a light rail station in this location.
S. 252nd St. near Fred Meyer	This location is not well connected to cross streets that would provide good access to a station and additional transit transfer opportunities.
S. 288th St. between Military Road and I-5	This location is approximately 0.5 miles east of the SR 99 alternatives and 0.4 miles west of the I-5 alternatives.
Easter Lake	This location is approximately 0.2 miles west of the SR 99 alternatives, is farther away from the FWTC, and in a predominantly single-family neighborhood.
21st Ave/S. 336th Street (beyond the FWTE study area)	There is no proposed light rail alignment in this area. This location is over 1 mile south of the southern terminus at the FWTC and outside the study area.
S. 348th Park-and-Ride (outside the FWTE study area)	There is no proposed light rail alignment in this area. This location is approximately 3 miles southwest of the southern terminus at the FWTC and outside the study area.
Kent Sounder Station (outside the FWTE study area)	There is no proposed light rail alignment near the Sounder alignment through Kent. This location is approximately 3 miles east of I-5 in downtown Kent and is outside the FWTE study area.

After the pre-screening, a smaller list of 11 potential station locations remained and were evaluated in the Level 2 evaluation. These included the 4 baseline stations (Kent/Des Moines Road, two at S. 272nd Street, and one at the FWTC) and 7 potential additional station locations. Four of the potential additional station locations are associated with the SR 99 alternatives and three are associated with the I-5 alternatives. The Level 2 stations are listed in **Table 1-5** and shown in **Exhibit 1-6**.

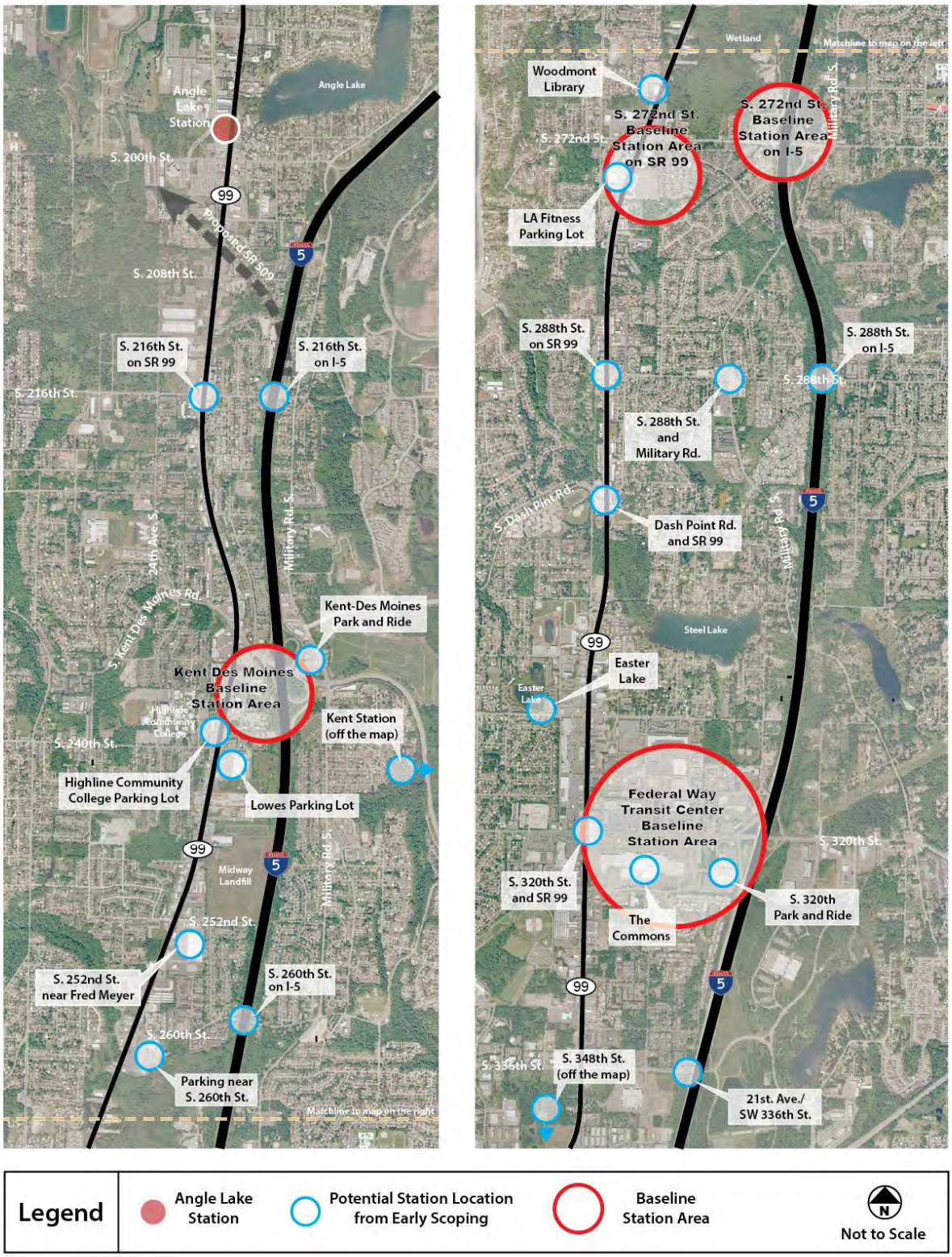


EXHIBIT 1-5
Initial List of Potential Station Locations

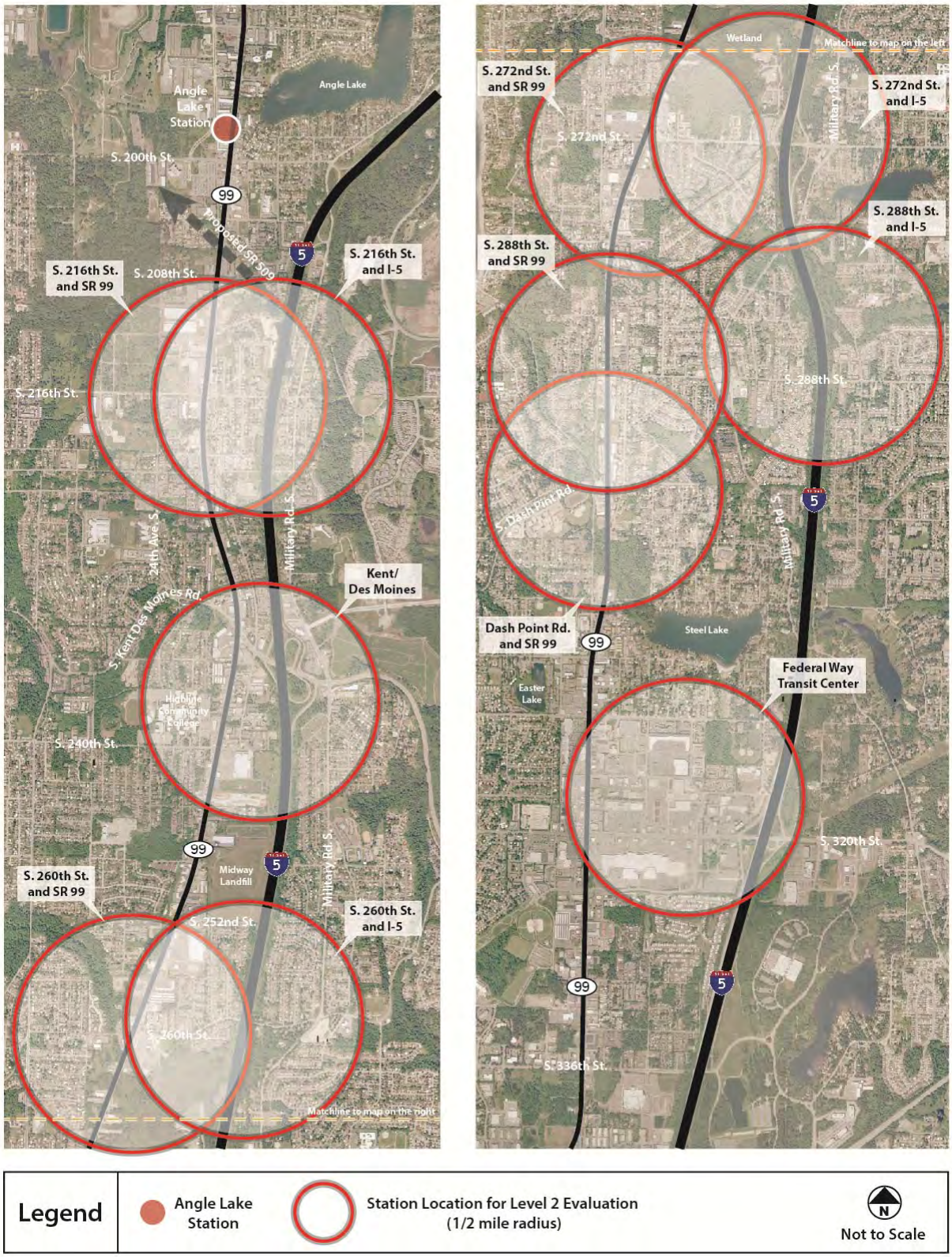


EXHIBIT 1-6
Level 2 Station Locations

Table 1-5
Level 2 Station Locations

Baseline Stations	Potential Additional Stations-SR 99	Potential Additional Stations-I-5
Kent/Des Moines	S. 216th Street	S. 216th Street
S. 272nd Street (Redondo Heights Park-and-Ride)	S. 260th Street	S. 260th Street
S. 272nd Street (Star Lake Park-and-Ride)	S. 288th Street	S. 288th Street
FWTC	S. Dash Point Road	

1.7.2 Evaluating Station Locations

Eleven station locations (four baseline stations, four potential additional stations on SR 99, and three potential additional stations on I-5) were evaluated using primarily the same evaluation measures as described for evaluation of the Level 2 alignment alternatives, Objective 3: Serve Supportive Land Use Plans and Economic Development Objectives. These measures were applied to a half-mile radius around each potential station location in order to provide a more direct comparison between potential station locations. Additional measures for station boardings, access to activity centers and motorized access were also included. For more details on the specific measures, see Chapter 7 of this report.

- Daily project ridership and station boardings
- Travel time
- Existing land use
- Planned land use
- High Density/TOD Zoning
- Underutilized parcels
- Population
- Employment
- Households
- Access to regional activity centers
- Parking opportunities
- Motorized access
- Non-motorized access
- Estimated costs

1.7.3 Station Location Evaluation Results

Exhibit 1-7 contains a summary of the station location evaluation. The summary graphic is organized by the evaluation criteria used to collect and analyze data. For a more detailed look at the station results by measure, refer to Chapter 7 of this report.

Executive Summary – Stations

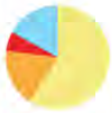
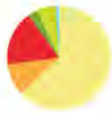
* Low end of range is boardings with 6 stations, high end is boardings with 3 baseline stations only	Baseline Stations				Potential Additional Stations						
	Kent/ Des Moines	S. 272nd Street (SR 99)	S. 272nd Street (I-5)	FWTC (SR 99 and I-5)	S. 216th Street (SR 99)	S. 260th Street (SR 99)	S. 288th Street (SR 99)	S. Dash Point Rd. (SR 99)	S. 216th Street (I-5)	S. 260th Street (I-5)	S. 288th Street (I-5)
Ridership	23,500	23,500	23,500	23,500	24,500	24,500	24,500	24,500	24,500	24,500	24,500
Station boardings	1,500 - 3,000 *	1,000 - 2,000 *	1,000 - 2,000 *	8,000 - 8,500 *	1,000	1,000	500	500	1,000	500	500
Existing land use Single family Residential Multi-family Residential Commercial Industrial Institutional Parks/Open Space Vacant ROW/Other											
Planned land use Single Family Residential Multi-family Residential Mixed Use Commercial Industrial Institutional Parks Urban Separator ROW/Other											
High-density zoning	51%	16%	5%	58%	21%	7%	4%	7%	21%	3%	0%
Underutilized parcels	26%	37%	30%	23%	32%	40%	22%	23%	33%	39%	24%
Population	4,300 people	3,000 people	2,400 people	3,900 people	3,300 people	3,000 people	3,200 people	3,400 people	3,100 people	3,200 people	3,100 people
Employment	1,866 jobs	580 jobs	274 jobs	4,670 jobs	1,052 jobs	587 jobs	568 jobs	410 jobs	856 jobs	599 jobs	249 jobs
Households	1,400 households	1,700 households	1,400 households	1,200 households	1,300 households	1,200 households	1,600 households	1,400 households	1,200 households	1,100 households	1,600 households
Access to **Regional Activity Centers**	Yes	No	No	Yes	No	No	No	No	No	No	No
Parking opportunities	370 P&R stalls, 100% utilized	697 P&R stalls, 8% utilized	630 P&R stalls, 59% utilized	2,067 P&R stalls, 76% utilized	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Motorized Access-roads	N, S, E, W	N, S, E, W	N, S, E, W	N, S, E, W	N, S, E, W	N, S, E, W	N, S, E	N, S, W	E, W	E, W	E, W
Motorized Access-transit	2 routes	One route RapidRide A	6 routes	12 routes	One route RapidRide A	One route RapidRide A	One route RapidRide A	One route RapidRide A	None	None	1 route
Non-motorized Access miles roadway within 1/2 mile of station	6.7	8.4	5.0	4.6	7.7	7.2	12.9	13.3	8.4	8	9.8
Estimated Station Cost ($2013)	Station $40m, O+M $0.2m					Station $40m, O+M $0.2m					

Exhibit 1-7
Station Data Summary

1.7.4 Station Location Findings and Conclusions

The purpose of this section is to summarize the station evaluation findings and conclusions in a more comparative way to understand and document which station locations could be expected to be stronger performing stations and which would be weaker performing stations.

The data compiled for the station location evaluation has been grouped into some general categories that put related characteristics together, as follows.

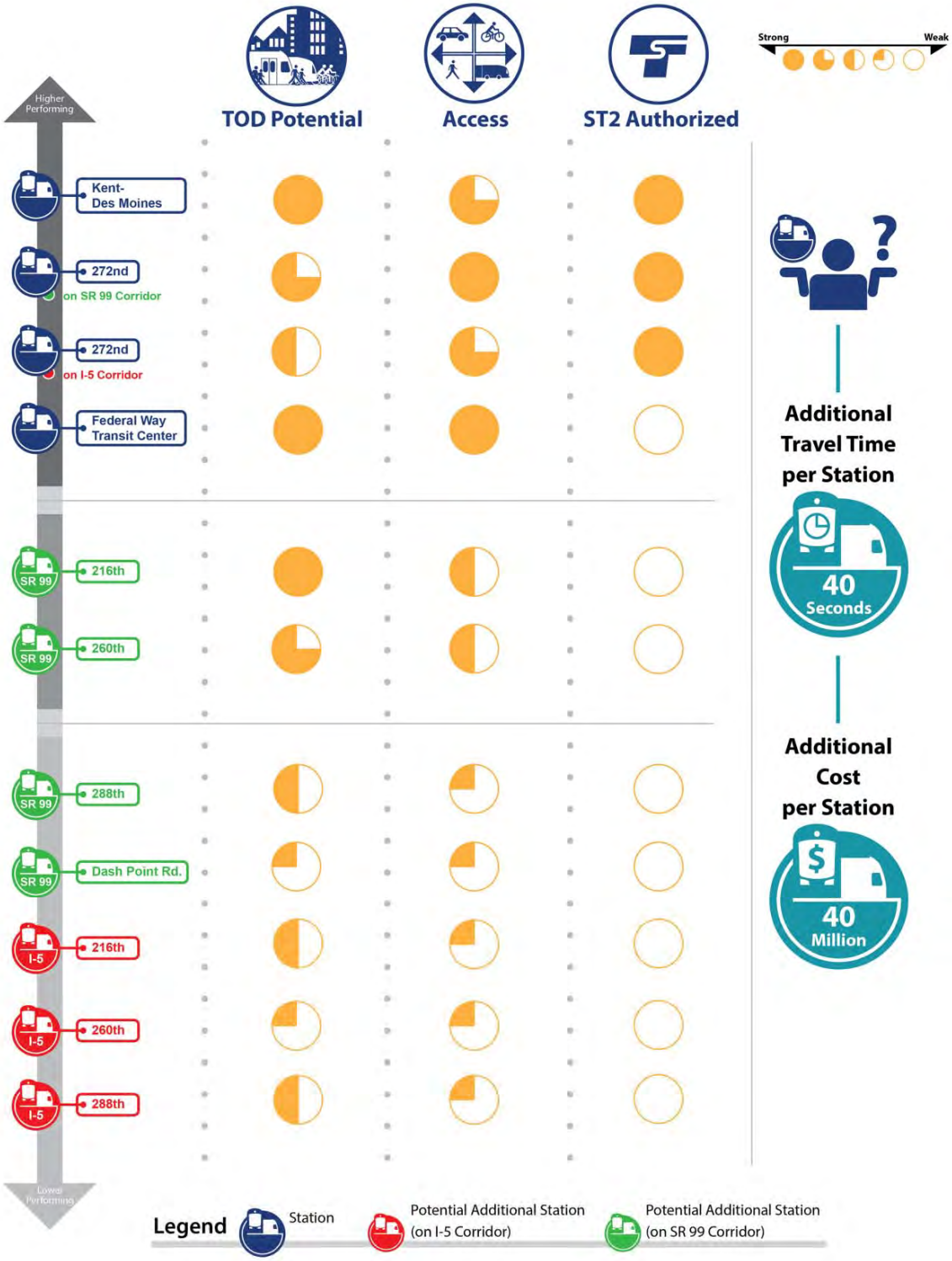
1. **Transit characteristics:** Includes ridership, increase in travel time, capital costs, and operations costs.
2. **Existing conditions:** Includes existing land use, proximity to activity centers, existing population and employment.
3. **Potential for TOD:** Includes planned land uses, TOD and high-density zoning and vacant and underutilized parcels.
4. **Access:** Includes motorized and non-motorized access such as roadway access, park-and-ride access, bus access, pedestrian and bike access.
5. **Included and authorized in the ST2 Plan** or not.

Table 1-6 summarizes the evaluation of each station by these generalized categories, with the exception of transit characteristics, which were found to be similar for all alternatives. It includes a generalized brief discussion about each of the above categories for each of the station locations. The results are also shown on **Exhibit 1-8**, with the strongest stations at the top of the results and the weaker stations lower in the results.

The results of the station evaluation indicate that all baseline stations (Kent/Des Moines, S. 272nd, FWTC) would be expected to perform strongly because they have transit supportive existing and planned land use and/or good multi-modal access. In addition, two of the potential additional station locations, located at S. 216th Street and S. 260th Street at SR 99, show promise as potential future light rail stations. The remaining five station locations do not appear to be as strong candidates for future light rail stations because they do not have supportive existing or planned land use and/or good multimodal access.

TABLE 1-6
Summary of Station Findings

Station	Existing Conditions	Potential for TOD	Access	ST2 Authorized
Baseline				
Kent Des/Moines	High diversity, includes single-family, multi-family, commercial and institutional; highest population and HCC as employment base	Higher, mix of commercial, mixed use, and residential planned	Good vehicle and transit access, improvements planned for bikes and pedestrians	Yes
S. 272nd Street (Redondo Heights Park-and-Ride)	Moderate diversity, includes single-family, multi-family, and commercial; moderate population and employment base	Higher, mix of commercial, mixed use, and residential	Good vehicle and transit access, improvements planned for bikes and pedestrians	Yes
S. 272nd Street (Star Lake Park-and-Ride)	Primarily single family and multi-family residential; moderate population and low employment base	Lower, primarily residential	Good vehicle and transit access, improvements planned for bikes and pedestrians	Yes
FWTC	Primarily commercial with some residential and park; high population and highest employment base	Higher, over 50% mixed use	Good vehicle and transit access, improvements planned for bikes and pedestrians	No
SR 99				
S. 216th Street	High diversity, includes single-family, multi-family, commercial and institutional; moderate population and high employment base	Planned mixed use and commercial in Pacific Ridge area	Good vehicle and transit access, bike lanes and sidewalks present on S. 216th	No
S. 260th Street	Mix of single family residential, multi-family residential and commercial; moderate population and employment base	Moderate, planned increase in single family residential, multi-family residential and commercial; highest amount of underutilized parcels	Good vehicle and transit access, improvements planned for bikes and pedestrians	No
S. 288th Street	Primarily single family and multi-family residential; moderate population and employment base	Lower, predominantly single family residential	Moderate vehicle and good transit access, improvements planned for bikes and pedestrians	No
S. Dash Point Road	Primarily single family residential; moderate population and lower employment base	Lower, predominantly single family residential	Moderate vehicle and good transit access, improvements planned for bikes and pedestrians	No
I-5				
S. 216th Street	High diversity, includes single-family, multi-family, commercial and institutional; moderate population and high employment base	Planned mixed use in Pacific Ridge area	No north/south access or transit service, bike lanes and sidewalks on S. 216th Street west of I-5	No
S. 260th Street	Mix of single family residential, multi-family residential and commercial; moderate population and employment base	Lower, predominantly single family residential	No north/south access or transit service, improvements planned for bikes and pedestrians	No
S. 288th Street	Primarily single family and multi-family residential; moderate population and low employment base	Lower, predominantly single family residential	No north/south access, one transit route, improvements planned for bikes and pedestrians	No
Note: Ridership, increase in travel time, capital costs and operations costs would be similar for all station locations.				



Additional stations were evaluated as part of the alternatives analysis process; these stations were not included in the voter-approved ST2 Plan and, if approved, would require additional taxing authority and funding.

P.10

Exhibit 1-8
Level 2 Station Results

1.8 Summary Conclusions and Next Steps

All of the alignment alternative evaluated in Level 2 will be presented to the public during the Environmental Impact Statement (EIS) scoping period including:

- SR 99 Elevated Median
- 30th Avenue S. Elevated West Side (with SR 99 Elevated Median)
- I-5 Mixed West Side
- I-5 Mixed West Side/Median
- SR 99 Hybrid

In addition, the results of the station location evaluation will be presented. This evaluation indicated that all of the baseline station locations performed strongly and two potential additional stations show good promise.

Based on input received during the EIS scoping period, these alignment and station alternatives may be further refined. Subsequently, the Sound Transit Board will identify which alternatives to carry forward for further development, analysis, and environmental review under the National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA).

The potential effects of the FWTE Project would be such that a NEPA/SEPA EIS is expected to be prepared to document the impacts of the project alternatives, and inform the decision making process. Work on the Draft EIS will start at the end of 2013 and take approximately 12 to 18 months to complete. A No Build Alternative will be identified to provide the basis for comparison of the impacts and benefits of the build alternatives.

Multiple build alternatives are expected to be studied in the Draft EIS. Following public review and comment on the Draft EIS, the Sound Transit Board of Directors is expected to identify a preferred alternative for study in the Final EIS. Once a preferred alternative has been identified, Sound Transit will begin preliminary engineering on the preferred alternative and develop a Final EIS. Following publication of the Final EIS, the Sound Transit Board is expected to select the project to build and operate. Sound Transit anticipates FTA will issue a Record of Decision (ROD) in 2016 and the project will then move into final design, followed by construction, start-up and testing, and ultimately operation. Service is planned to begin in 2023.

2.0 Introduction

This chapter provides an introduction to the Alternatives Analysis (AA) phase of the Federal Way Transit Extension (FWTE) project, some background on the study corridor, and an overview of the AA process.

The Central Puget Sound Regional Transit Authority (Sound Transit) intends to extend regional high capacity transit (HCT) between the cities of SeaTac and Federal Way. The Sound Transit 2 (ST2) Plan, approved by voters in 2008, included environmental study and design of this extension. This 7.6 mile extension would extend HCT south from the future Angle Lake Station terminus of the Sound Transit Link light rail system at S. 200th Street in SeaTac (scheduled to open in 2016) to the Federal Way Transit Center at S. 317th Street. The voter-approved additions to the ST Central Link light rail system over the next few years will bring 36 new miles of service to the north, south, and east, creating a 55-mile light rail system serving the Puget Sound region.

The FWTE will help fulfill regional plans developed by the Puget Sound Regional Council (PSRC) and Sound Transit. PSRC's Vision 2040 (PSRC 2009) and Sound Transit's 2005 Regional Transit Long-Range Plan (Sound Transit 2005) both call for future HCT in the FWTE corridor. **Exhibit 2-1** shows the Regional Transit System Plan map. **Exhibit 2-2** shows the project study area.

EXHIBIT 2-1
Sound Transit Current Service and Future Projects

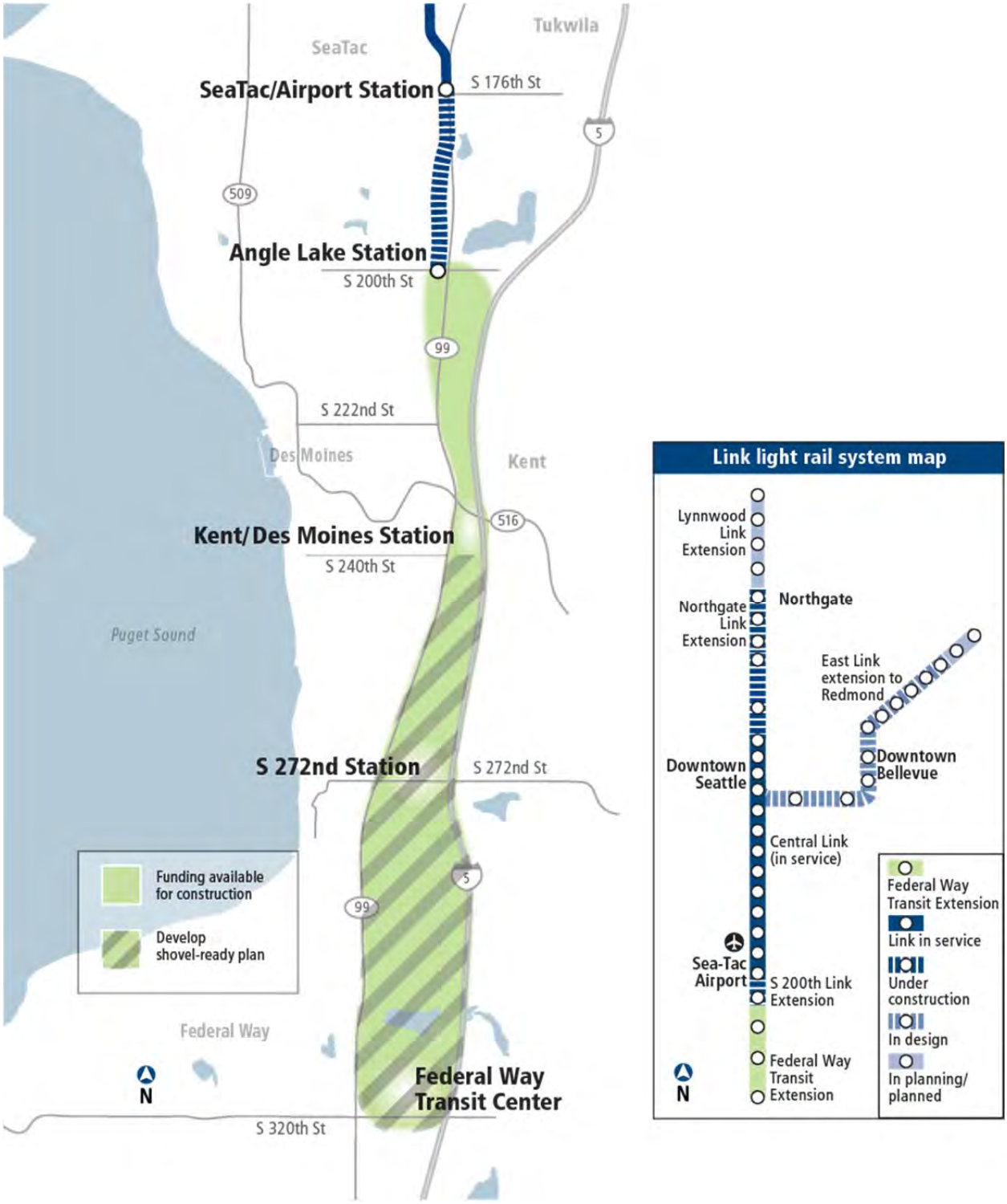


EXHIBIT 2-2
FWTE Project Study Area

2.1 Relationship of this Study to Project Development

This report summarizes the portion of the AA process that has been completed to identify and evaluate viable alternatives. The purpose of this is to define the transportation needs in the corridor and identify alternatives to study in the EIS. While this AA is a local process, because the resulting project would potentially use some federal funding, and the Federal Transit Administration (FTA) is the steward of federal transit funding, the FTA's general guidelines for how to conduct AA have been incorporated into the study.

The alternatives that best meet the project Purpose and Need would later be analyzed in a draft Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) and under the Washington State Environmental Policy Act (SEPA). The study has identified an initial range of potential alternatives (based on previous plans and studies and input from the public and agencies) and evaluated the alternatives to determine which of the alternatives have the most promise and should undergo further study and design during the EIS process. At the end of the project development process, the preferred project will be selected by the Sound Transit Board and moved forward into further design, construction and eventual operations.

The Level 1 evaluation applied both qualitative and quantitative criteria to measure the benefits, effects, and costs of the Level 1 alternatives. The best-performing alternatives from Level 1 were carried forward for further study in Level 2.

The Level 2 evaluation further developed the alternatives that were carried forward and then applied more rigorous criteria and analyses to that remaining, smaller set of alternatives. This evaluation compares each alternative's strengths and weaknesses relative to the other Level 2 alternatives. The technical analysis results of this Level 2 screening, along with the results of the scoping process, will be presented to the Sound Transit Board for identification of the alternatives that should be carried forward for more detailed analysis in the Draft Environmental Impact Statement (EIS).

Exhibit 2-3 illustrates the steps in the AA process.

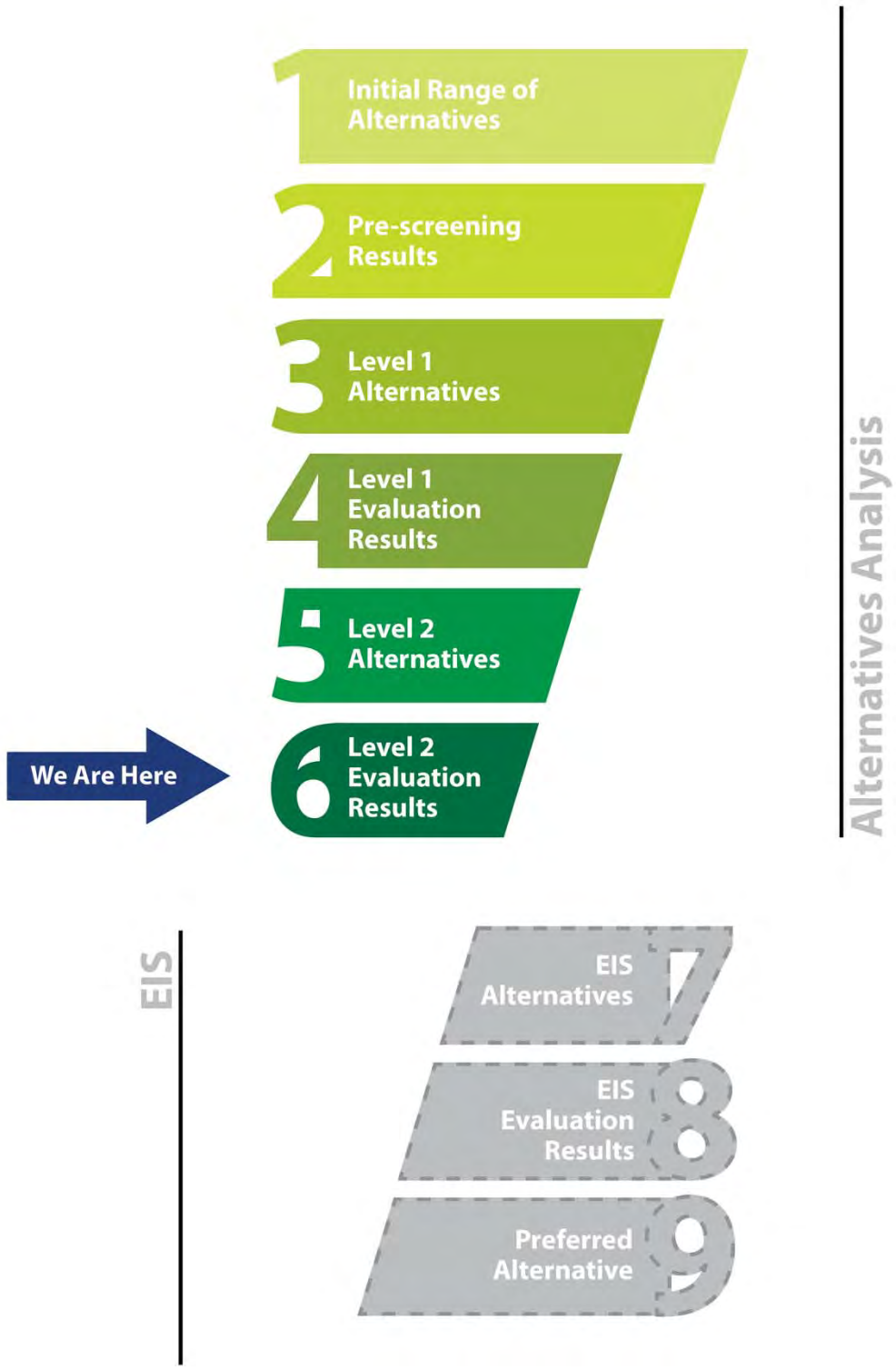


EXHIBIT 2-3
Alternatives Analysis Process

For the FWTE Sound Transit plans to maintain eligibility for future federal New Starts funding from the FTA. To be eligible for federal funding the planning process for the project must be done in compliance with FTA planning and project development guidance.

The new transportation funding bill, Moving Ahead for Progress in the 21st Century (MAP-21), eliminates the formal AA requirement from the New Starts Program and instead relies on the review of alternatives performed during the metropolitan planning and environmental processes. However, in the FWTE corridor the AA process is continuing to evaluate a range of alternatives in order to complete a thorough corridor-focused planning process. The following chapters document this local planning process both prior to initiation of the FWTE project and as part of this alternatives analysis.

Throughout the AA and NEPA/SEPA processes, Sound Transit is committed to engaging the public, agencies, and key stakeholders. Agencies involved in the Interagency Working Group include each city in the corridor (SeaTac, Des Moines, Kent and Federal Way), Washington State Department of Transportation (WSDOT), PSRC, Highline Community College, and King County Metro. Key stakeholders include local community and business organizations and community service providers. Input from each of these groups (public, agencies, and stakeholders) is important throughout the process to ensure that community concerns and issues are considered during the evaluation and design process.

2.2 Purpose and Need of the Federal Way Transit Extension Project

The purpose of the FWTE is to expand the Sound Transit Link light rail system from SeaTac to the cities of Des Moines, Kent, and Federal Way in King County in order to meet the following objectives:

- Provide a rapid, reliable, accessible, and efficient alternative for travel to and from the corridor and other urban growth and activity centers in the region with sufficient capacity to meet projected demand.
- Expand mobility alternatives to traveling on congested roadways and improve connections to the regional multimodal transportation system with peak and off-peak service.
- Provide the HCT infrastructure to support adopted regional and local land use, transportation, and economic development plans.
- Advance the long-range vision, goals, and objectives for transit service established by the Sound Transit Long-Range Plan for high-quality regional transit service connecting major activity centers in King, Pierce, and Snohomish counties.
- Implement a financially feasible system that seeks to preserve and promote a healthy environment.

The following conditions within the project corridor demonstrate the need for the project:

- North-south transit demand is expected to grow by 30 to 40 percent by 2035 as a result of residential and employment growth in the FWTE corridor and regionally.
- The FWTE corridor population is a highly transit-dependent population with needs for efficient, reliable regional connectivity.
- Congestion on I-5 and on the key corridor arterials leading in and out of the study area will increase and further degrade existing transit performance and reliability.
- There is a lack of reliable and efficient peak and off-peak transit service connecting people in the FWTE corridor with the region's growth centers.
- Regional and local plans call for HCT in the corridor consistent with PSRC's *VISION 2040* and the *Regional Transit Long-Range Plan*.
- Implementing the project will help meet environmental and sustainability goals of the state and region, including reducing vehicle miles traveled and greenhouse gas emissions.

Any alternative evaluated for the FWTE must demonstrate the ability to address these needs and achieve the project purpose.

2.3 Summary of Level 1 Evaluation

The Level 1 evaluation consisted of several steps, including: an analysis of comments received during the early scoping period, development of an initial list of mode and alignment alternatives, a pre-screening of alternatives that did not meet the objectives identified in the Purpose and Need for the FWTE project, and an analysis of the Level 1 alternatives based on evaluation criteria established for the Level 1 evaluation. For more details, refer to the FWTE Level 1 Alternatives Screening Report.

2.3.1 Summary of Early Scoping Process

Feedback received during the early scoping period was positive and indicated a desire for improved transit service in the project area. Alternatives considered include different modes, profiles, and alignments. Mode refers to the method of transportation, such as bus or light rail. Profile refers to a vertical orientation, such as above grade (elevated), at-grade, below-grade (retained cut or tunnel), or mixture these. Alignment refers to the horizontal location within a corridor. Comments provided by agencies, local jurisdictions, institutions, and members of the general public indicate a strong preference for light rail transit. Stakeholders expressed concerns about parking, travel time, multimodal connections, and connections to Tacoma and to other transit facilities. Comments received on alignment, profile preference, and station locations were varied; strong preferences for one specific alignment, profile, or station location did not emerge.

For a more detailed explanation of the Early Scoping results, see the FWTE Early Scoping Summary Report.

2.3.2 Summary of Pre-Screening Process

Some of the modes, profiles and alignment alternatives were not evaluated in the Level 1 process because they would not meet the stated purpose and need for the project or they had design features that would substantially increase the project cost compared to other alternatives without providing substantial benefits. **Table 2-1** lists the results of the pre-screening process, identifying the alternatives that were not further evaluated in Level 1.

Table 2-1
Results of Pre-Screening: Alternatives Not Evaluated in Level 1

Alternative Type	Alternative	Corridor	Reason for Not Evaluating in Level 1
Mode	Transportation System Management (TSM)	I-5 or SR 99	Would not meet Purpose & Need
	Bus Rapid Transit (BRT)	I-5 or SR 99	Greater travel time, lower capacity, and inconsistency with existing local plans
Profile	Tunnel	SR 99	Unnecessary risk and cost
Alignment	East Side	I-5	Higher cost, reduced accessibility, and inconsistency with local plans
	Crossing at S. 272nd Street	I-5 and SR 99 combination	Increased travel time and avoidable environmental impacts
	Behind Businesses- West Side	SR 99	Higher cost and lower ridership than other similar alternatives
	West Side	24th Avenue S.	Extensive impacts to parks and other community facilities

2.3.3 Alternatives Evaluated in Level 1

Table 2-2 lists the light rail alternatives that were considered in the Level 1 evaluation.

Table 2-2
Level 1 Alternatives

Corridor	Profile
SR 99	At-grade Median
	Mixed Median
	Elevated Median
	Elevated West Side
	Elevated East Side
I-5	Mixed West Side
	Mixed Median
30th Avenue S.	At-grade Median
	Elevated Median
	Elevated West Side
	Elevated East Side
24th Avenue S.	At-grade Median
	Elevated Median
	Elevated East Side

A detailed explanation of the evaluation criteria used to analyze the Level 1 alternatives can be found in the FWTE Level 1 Alternatives Screening Report, Chapter 5.

2.3.4 Summary of Level 1 Results

Based on the results of the Level 1 evaluation, the following alternatives are evaluated in the Level 2 Alternatives Screening Report:

- SR 99 Elevated Median
- 30th Avenue S. Elevated West Side (with SR 99 Elevated Median)
- I-5 Mixed West Side
- I-5 Mixed West Side/Median
- SR 99 Hybrid (see below)

The results of the Level 1 analysis showed that different segments of each of the SR 99 alternatives could work, but each one of them as a “stand alone” alternative had substantial flaws. A combination of conceptual design elements (a mix of east side, west side, and median alignment; at-grade and elevated profile) could result in an alternative that operates better with less adverse effects than the “stand alone” SR 99 alignment alternatives studied in Level 1. For the Level 2 evaluation, this new alternative became the “hybrid” alternative.

2.4 Organization of this Report

This report is organized by the following chapters:

Chapter 1 – Executive Summary: This chapter provides an overview of the alternatives evaluated in this study and the key findings and conclusions.

Chapter 2 – Introduction: This chapter provides an introduction to the alternatives analysis phase of the FWTE, some background on the corridor and an explanation of the alternatives analysis process.

Chapter 3 – Definition of Alternatives: This chapter describes the Level 2 alternatives. Maps and cross-sections of each alternative are provided here.

Chapter 4 – Evaluation Criteria: This chapter presents the evaluation criteria used to examine and compare the alternatives defined in Chapter 3. These criteria relate directly to the Purpose and Need goals and objectives for the project.

Chapter 5 – Alignment Alternatives Data Results: This chapter provides the results of how each Level 2 alternative, described in Chapter 3, performs under each criterion described in Chapter 4. Results are organized by criteria and provide a comparison between alternatives for each criterion.

Chapter 6 – Level 2 Findings and Conclusions – Alignment Alternatives: This chapter summarizes the key findings of each alternative as they relate to the evaluation criteria, and draws conclusions about the relative performance of each alternative.

Chapter 7 – Station Evaluation: This chapter identifies the station locations that are evaluated in Level 2 and provides the results of this evaluation.

Chapter 8 – Next Steps: This chapter indicates what steps will be taken next to advance the project, and how those steps fit in to the overall project development timeline.

3.0 Definition of Alternatives

The purpose of this chapter is to document the definition of the five alternatives evaluated in Level 2 of the Federal Way Transit Extension (FWTE) Alternatives Analysis (AA). Four of these alternatives were identified as exhibiting strong performance during the Level 1 evaluation and carried forward for further analysis in Level 2. The fifth is a "hybrid" made up of parts of multiple SR 99 alignment alternatives, that has been designed to capture the best-performing parts of the elevated alignments on the east, west, and in the median of SR 99. The SR 99 Hybrid alternative was not evaluated in Level 1 in the configuration it has in Level 2, but nearly all of its components came from elements that were previously evaluated in Level 1.

3.1 Overview of Level 2 Alternatives

Entering the Level 2 evaluation, there were two alternatives on I-5, two alternatives on SR 99, and one that uses both SR 99 and 30th Avenue S. The Level 2 alternatives are listed below and shown schematically in **Exhibit 3-1**.

- SR 99 Elevated Median
- 30th Avenue S. Elevated West Side (with SR 99 Elevated Median)
- SR 99 Hybrid
- I-5 Mixed West Side
- I-5 Mixed West Side/Median

The use of "mixed" in the names of the I-5 alternatives refers to their vertical profile. It is intended to indicate that the tracks would be at-grade in some locations and on an elevated structure in others. While it is possible that the proposed guideway could go under some roadways along I-5, those segments would be at-grade for this analysis. Tunnel segments were suggested during early scoping, but the pre-screening process, documented in the Level 1 Alternatives Screening Report, removed tunnels from further consideration for any alignment.

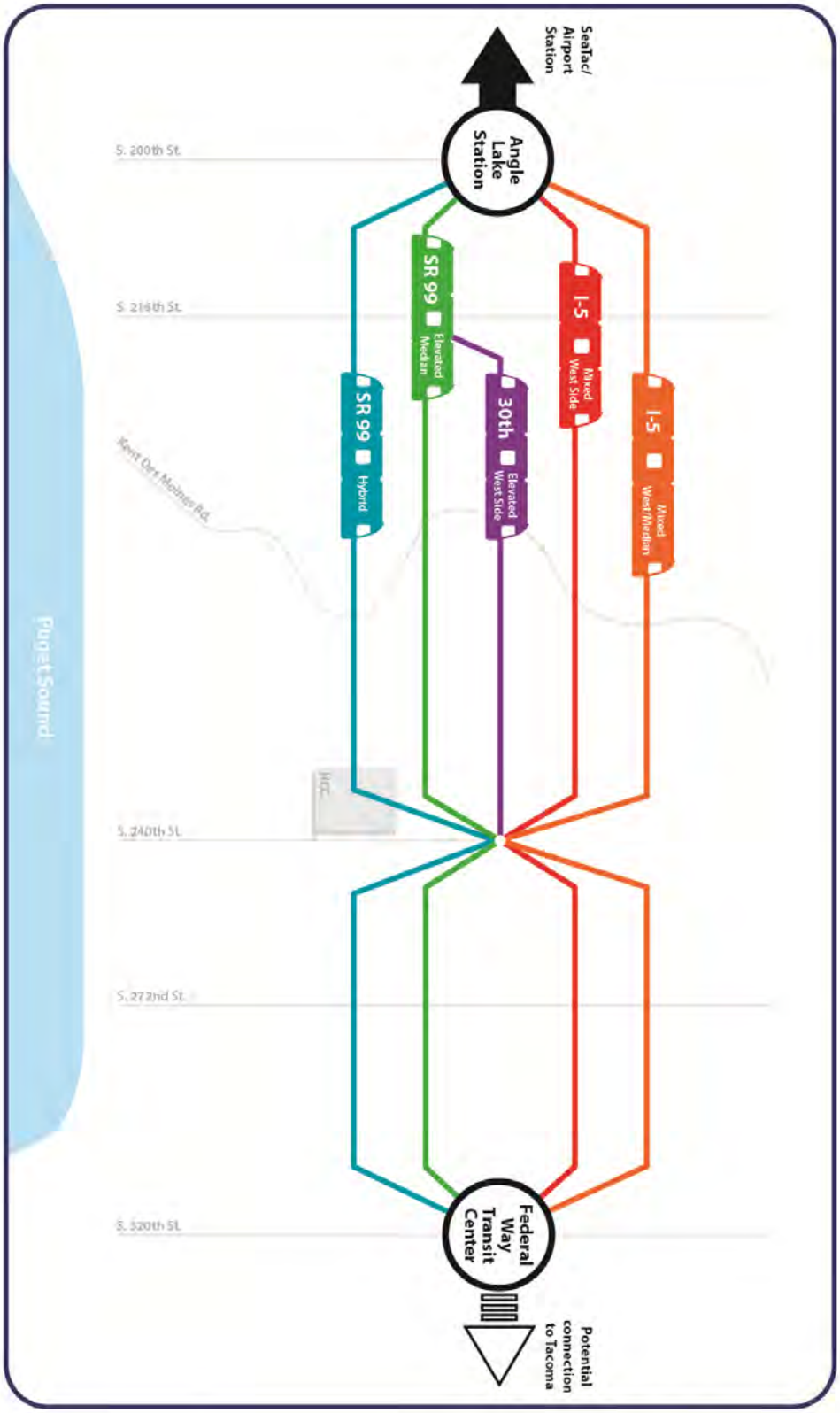


EXHIBIT 3-1
Level 2 Alternatives

3.1.1 Stations

Each of the five Level 2 alignment alternatives has been evaluated with three proposed stations locations as defined by previous planning documents, including:

- Kent/Des Moines station (near S. 240th Street)
- S. 272nd Street station
- Federal Way Transit Center (FWTC)/S. 317th Street station

The specific location of the S. 272nd Street station would vary depending on the alignment alternative. For example, a stop at "S. 272nd Street" along I-5 would be at or near the existing Star Lake Park-and-Ride, while along SR 99 it would be at or near the existing Redondo Heights Park-and-Ride. Although Chapter 7 documents the analysis of some additional potential station locations in the project study area, only these three general station locations were assumed for the Level 2 comparison of alignment alternatives.

Because the timing of funding for construction of the entire project is uncertain, each of these three stations could represent an interim southern terminus of the Link Light Rail system when it is built. Although the FWTC represents the southern limit of the Federal Way Transit Extension study, a further extension of the system south to Tacoma is in Sound Transit's Regional Transit Long Range Plan.

3.1.2 Alignment Design

The alignment alternatives have been developed with attention to the design speed of the tracks. A key design objective for the project has been to optimize the time it takes for a light rail train to travel through the corridor, which in most cases means to design assuming that the vehicles can travel their maximum speed for the type of guideway, power, and control systems in place elsewhere on the Link system, which is 55 mph. Design speed was considered along with other issues including property impacts, utility impacts, and traffic operations constraints to define the Level 2 alternative alignments.

3.1.3 Operations Plan

The light rail operations plan describes how frequently and in what hours of the day trains would run, in addition to which stations would be served and what the train lengths would be. This operations plan is the same for each of the five alternatives considered in the Level 2 evaluation. The light rail service would be provided at headways (distance or time between vehicles in a transit system) based on the service levels needed to meet the projected demand in the study area and the overall operations plan for the Link system. Peak headways are planned to be 8 minutes, and off-peak headways are planned be 10 to 15 minutes, with service

provided between 5 a.m. and 1 a.m. (20 hours) daily. The system is designed to accommodate four-car trains.

3.1.4 Transit Integration

Transit integration for the Level 2 alternatives was not defined specifically for each individual alternative, but it could vary based on whether the light rail alignment would be primarily along SR 99 or along I-5. Below in the discussion of transit service integration, the integration with existing and other planned Link light rail service is discussed separately from integration with existing bus service.

3.1.4.1 Light Rail

The proposed LRT service would be an extension of the existing Seattle-oriented Link light rail service, including its extension from Sea-Tac Airport south to the Angle Lake station at S. 200th Street, which is currently under construction. The proposed Federal Way extension would extend the trackway by approximately 7.5 miles to the south, such that route and schedule information would be modified to reflect a longer system than prior to the extension. Light rail riders who would board at the new stations would not be required to transfer to reach the light rail stations north of the Federal Way extension. The same headways, train lengths, and schedules would be maintained throughout the extended line. Light rail vehicles serving the new stations would likely be stored and maintained at the existing operations and maintenance facility at S. Forest Street in Seattle.

3.1.4.2 Bus

A preliminary concept of bus service has been developed for the study area for the purpose of providing information needed to generate preliminary ridership estimates in support of the alternatives screening process. Bus routes and headways in the corridor will be reviewed in greater detail during the EIS process, for potential optimization related to each EIS alternative. These changes could include the modification, combination, or elimination of routes, as well as increases or decreases in headway and/or service times (such as having routes that serve proposed LRT stations run more frequently). Potential changes to existing regional bus routes that travel in or through the study area could include:

- Elimination of some routes that would be duplicated by the proposed project
- Truncation of some routes that overlap with all or part of the proposed project
- Increasing frequency on some routes that would provide feeder service to proposed LRT stations

The following bus routes serving the study area were assumed to remain the same with the FWTE project, as described below:

- Inter-county Pierce Transit routes serving the FWTC
- RapidRide service
- Some peak commuter routes that use I-5 in the study area

3.2 Detailed Descriptions of SR 99 Alternatives

The detailed descriptions presented below for each alternative include an alignment map on an aerial photo background, typical cross-section sketches and a narrative description highlighting key defining principles. General station locations have been identified for each alternative, but their specific locations and guideway alignments in the immediate vicinity of stations would be subject to additional design refinement in subsequent phases of the project.

3.2.1 SR 99 Elevated Median Alternative

The SR 99 Elevated Median alternative would extend south from the future Angle Lake Station at S. 200th Street along the west side of 28th Avenue S. Where 28th Avenue S. ends and the proposed SR 509 extension would cross under SR 99, the LRT guideway would be elevated west of SR 99 to cross SR 509, then transition to the SR 99 median. The guideway would be supported by columns located generally between the SR 99 northbound and southbound travel lanes in most locations. Where a planted (or otherwise un-traversable) median 12 or more feet wide exists today, the support columns would be assumed to be located there. This column placement could make it possible to avoid re-building the SR 99 travel lanes at such locations. At intersections or where the median space is occupied by a left turn or U-turn lane, either SR 99 would be widened (in order to create space for columns) by relocating turn lanes, or an alternate method of supporting the elevated guideway (such as straddle bents or more sophisticated bridge structures) would be used. The alignment and a typical cross-section for the SR 99 Elevated Median alternative are shown in **Exhibits 3-2** and **3-3**, respectively.

3.2.1.1 Stations

Stations for the SR 99 Elevated Median alternative are anticipated to be located along the trackway and would feature center platforms (passengers waiting for northbound and southbound trains would wait on the same platform) with vertical circulation elements at or near each end. Parking, bus transfers, auto pick-up/drop-off, and most other station-related facilities would be located at ground level.

The Kent/Des Moines station would be located at or near S. 240th Street. The exact location and configuration would be worked out as the alignment design and station planning processes move forward.

The S. 272nd Street station would be located at or near the Redondo Heights Park-and-Ride. As with all other signalized intersections along SR 99 in the study corridor, crossing the Redondo Heights Park-and-Ride signal (S. 276th Street) with a median elevated guideway would require widening SR 99 and/or longer spans for the elevated structure.

The SR 99 Elevated Median alternative alignment would leave the SR 99 median between approximately S. 312th Street and S. 316th Street and turn east to connect with a proposed end-of-line station near the FWTC. The specific guideway alignment in the FWTC station area, the station location, and the station platform orientation would depend on several factors and their relationships, including ST's operating speed goals, existing and planned development, access features in the immediate area, utility conflicts, the LRT station platform's proximity to the existing bus transfer facility, and the preferred alignment for a potential future extension south toward Tacoma.

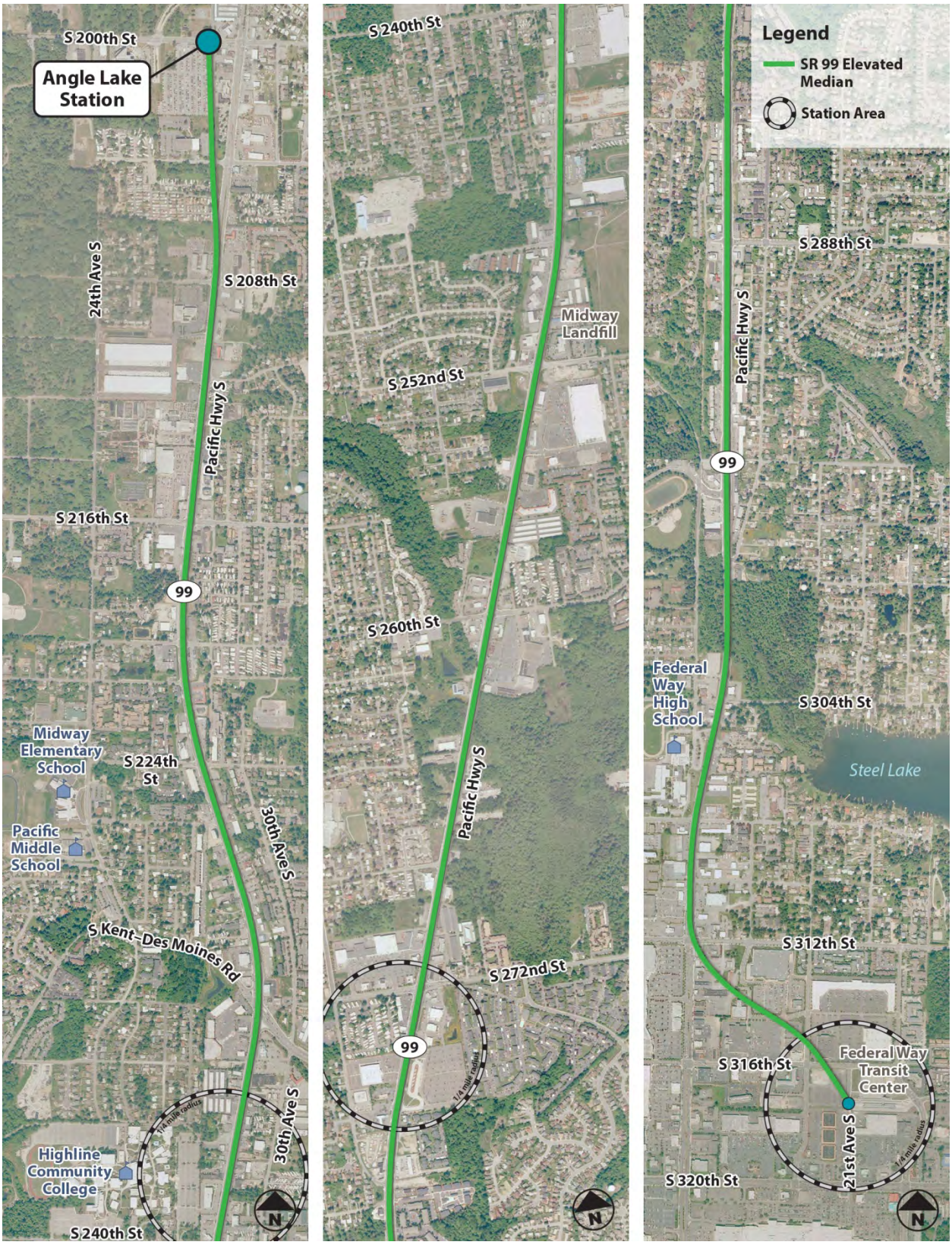
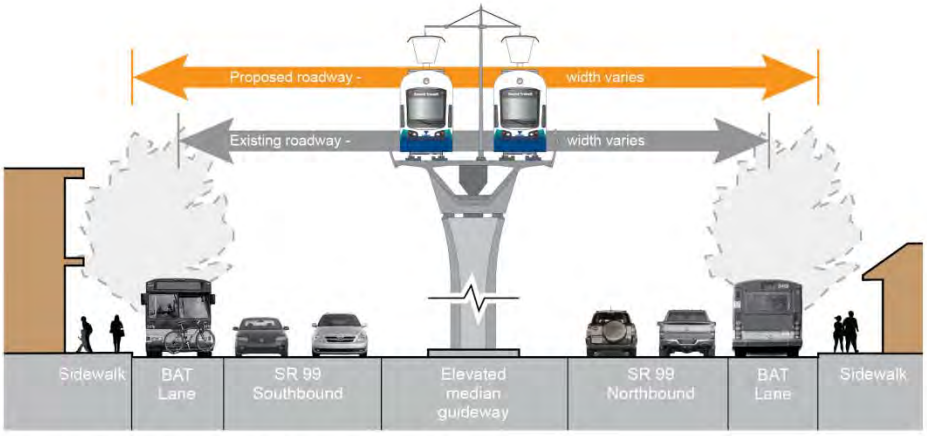


EXHIBIT 3-2
SR 99 Elevated Median Alternative Alignment



Proposed condition looking north (not to scale)

EXHIBIT 3-3
SR 99 Elevated Median Alternative Typical Cross Section

3.2.1.2 Construction

Construction in the SR 99 median would likely require the closure of the two center lanes of the roadway to provide adequate separation between the construction activities and adjacent vehicle travel. It could also require utility relocations associated with widening SR 99 in some locations.

3.2.2 30th Avenue S. Elevated West Side Alternative

For the purposes of the Level 2 evaluation, the 30th Avenue S. Elevated West Side alternative would be combined with the SR 99 Median Elevated alternative. At the north end the alignment would transition from the SR 99 median at around S. 220th Street and head east to 30th Avenue S. The elevated guideway would then continue south along the west side of 30th Avenue S. between the roadway and existing buildings, which are primarily multi-family residential buildings, to the north of Kent-Des Moines Road and industrial buildings to the south. The elevated guideway would cross Kent-Des Moines Road with a single span (approximately 150 to 250 feet long) to avoid the potential negative effects that could be associated with placing a column in the center of the roadway.

South of the Kent/Des Moines station, the 30th Avenue S. alignment would transition on an elevated guideway west to an elevated SR 99 median alignment. From there south to the end of the project corridor, it would be identical to the SR 99 Median Elevated alternative described previously. The alignment and a typical cross-section for the 30th Avenue S. alternative are shown in **Exhibits 3-4** and **3-5**, respectively.

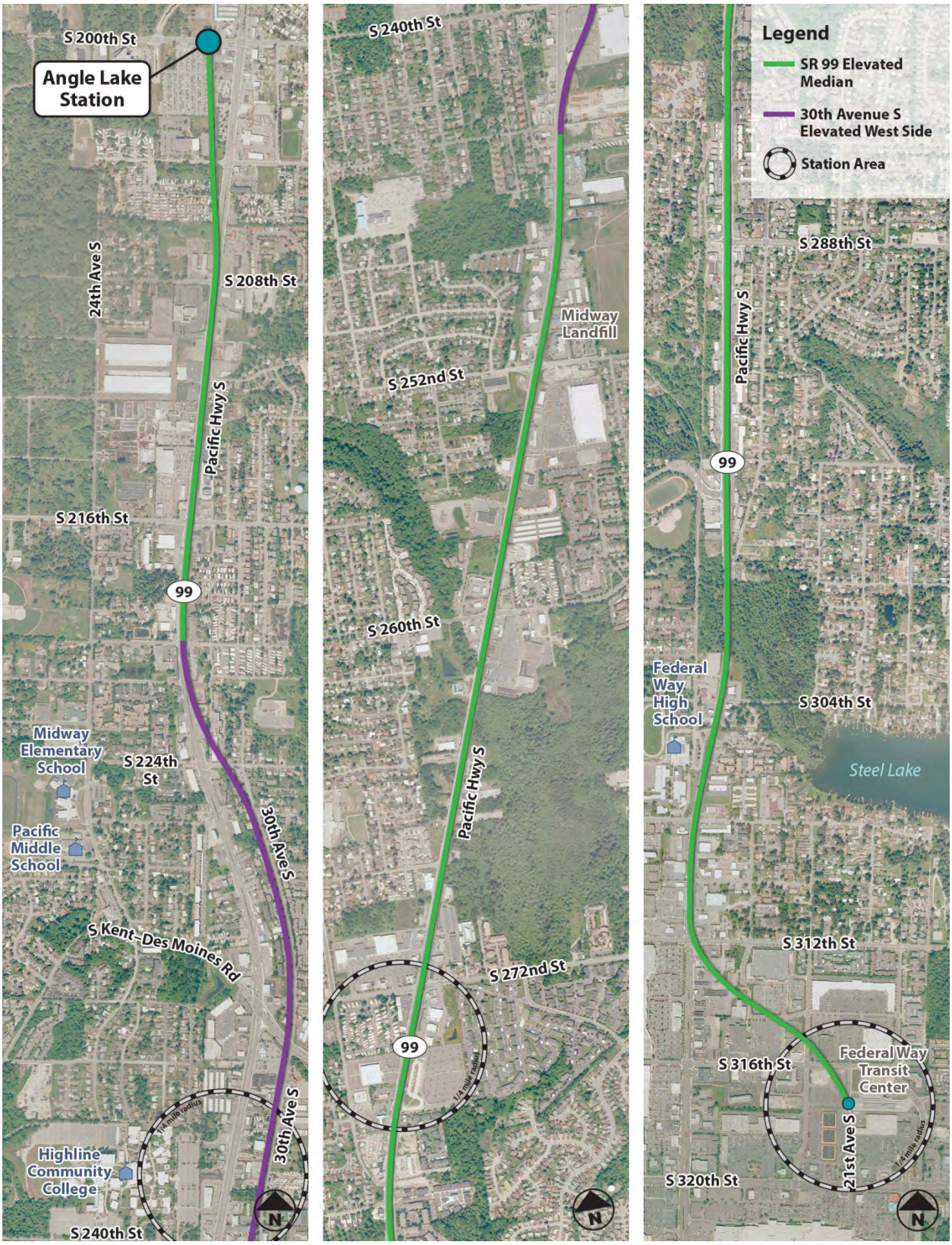
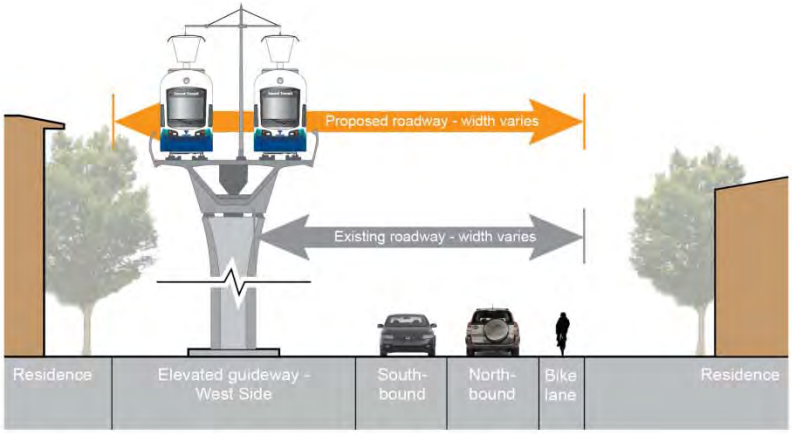


EXHIBIT 3-4
30th Avenue S. West Side Alternative Alignment



Proposed condition looking north (not to scale)

EXHIBIT 3-5
30th Avenue S. West Side Alternative Typical Cross Section

3.2.2.1 Stations

Because the 30th Avenue S. Elevated West Side alternative is identical to the SR 99 Elevated Median alternative at the S. 272nd Street and FWTC station areas, only the Kent/Des Moines station would differ in its potential location. As such, it is the only station with a location that is unique to the 30th Avenue S. Elevated West Side Alternative.

With the 30th Avenue S. Elevated West Side alternative, the Kent/Des Moines station would be located along 30th Avenue S. The exact location and configuration would be worked out as the alignment development and station planning processes move forward.

3.2.2.2 Construction

Construction along 30th Avenue S. would likely require closure of one lane of the roadway to provide adequate separation between the construction activities and adjacent vehicle travel. Because 30th Avenue S. is a two-lane street, only one lane would remain open during construction. Some driveways might need to be consolidated during construction but signage regarding business or residential access would be provided. Where this alternative would be on SR 99, construction in the SR 99 median would likely require the closure of two lanes of the roadway (one lane in each direction) to provide adequate separation between the construction activities and adjacent vehicle travel.

3.2.3 SR 99 Hybrid Alternative

During the Level 1 evaluation, it was concluded that the SR 99 Elevated East Side and SR 99 Elevated West Side alternatives would each have too many substantial flaws to be considered

further on their own. Each of these alternatives was defined for the Level 1 analysis as having the guideway only on one side of SR 99, however it was determined that a viable alternative could be designed using a combination of elements from each, with the elevated guideway on one side of SR 99 in certain locations and on the other side (or in the median) in other areas. In addition, there were areas where it appeared that the guideway could be at-grade for certain side-running segments.

Because of the recognition that different SR 99 Level 1 alignments could work better in different segments of the corridor (and would not work well in others) a hybrid alignment was suggested for development and evaluation in Level 2. The "hybrid" alternative has been designed to optimize the SR 99 alignment opportunities based on knowledge gained in the Level 1 analysis. The hybrid alignment was designed to include the least disruptive parts of each previous alignment and avoid the more difficult alignment segments. The approximate locations where the SR 99 Hybrid alternative's alignment would shift relative to SR 99 are shown in **Table 3-1**. The alignment for the Hybrid alternative is shown in **Exhibit 3-6**. The typical sections for the various segments of the alignment oriented to the west, in the median, and to the east of SR 99 are shown in **Exhibits 3-7**, **3-8**, and **3-9**, respectively.

Table 3-1
SR 99 Hybrid Alternative Alignment: Segments and Descriptions Relative to SR 99

From	To	Orientation Relative to SR 99
Angle Lake Station	S. 208th Street	Along 28th Avenue S. and West of SR 99
S. 208th Street	North of Kent-Des Moines Road	Median of SR 99
North of Kent-Des Moines Road	S. 260th Street	West of SR 99
S. 260th Street	16th Avenue S.	East of SR 99
16th Avenue S.	S. 304th Street	West of SR 99
S. 304th Street	S. 312th Street	East of SR 99

In addition to alignment variations there are some segments along the SR 99 Hybrid alternative where at-grade trackway could be considered. These are all located west of SR 99 and are based on the surrounding land profile. There could be both potential impacts and cost savings resulting from at-grade segments. These segments are identified for general interest, but are not reflected in cost estimates.

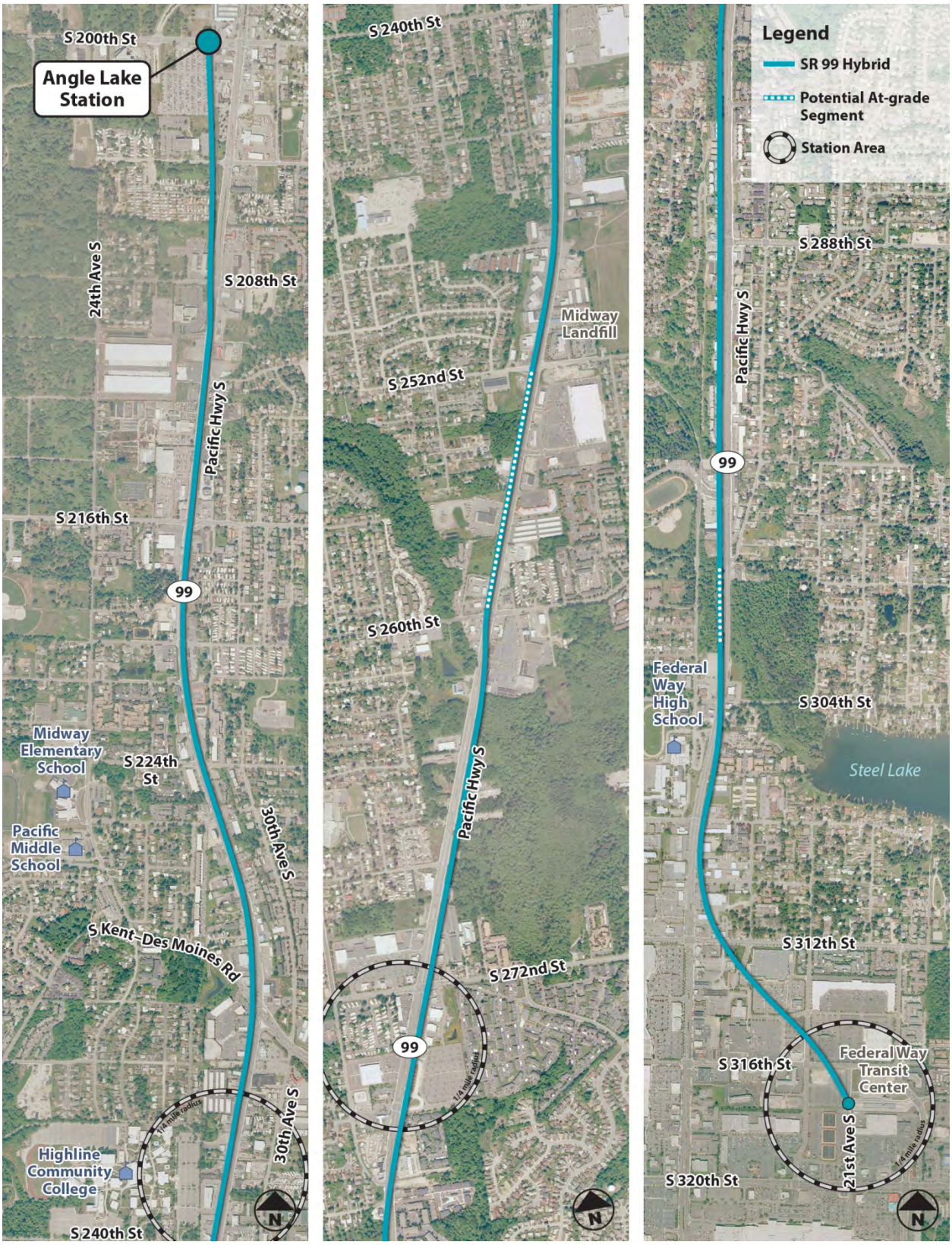
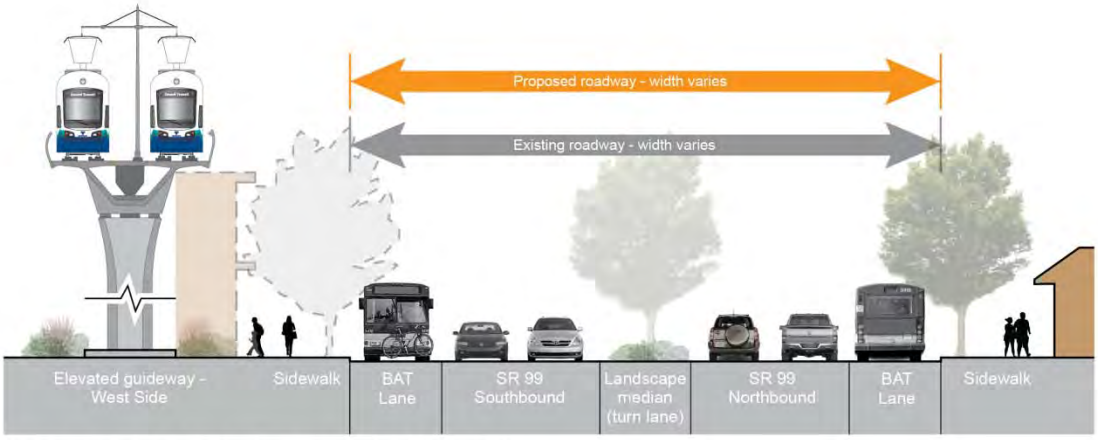
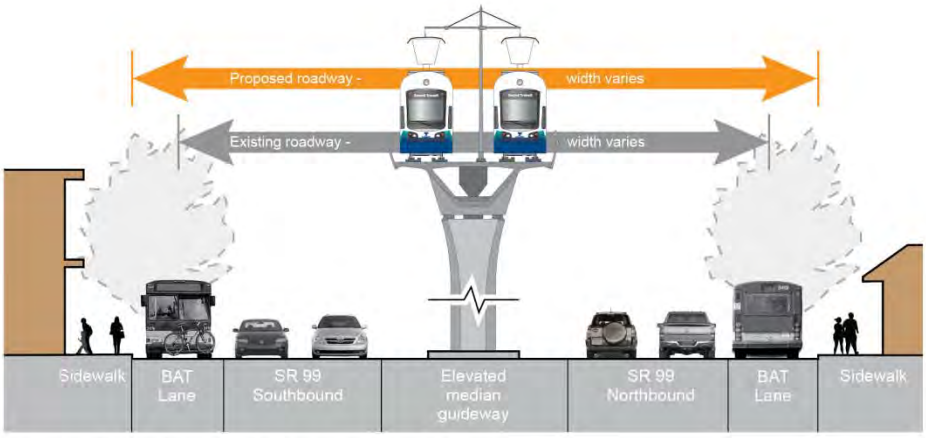


EXHIBIT 3-6
Alignment of SR 99 Hybrid Alternative



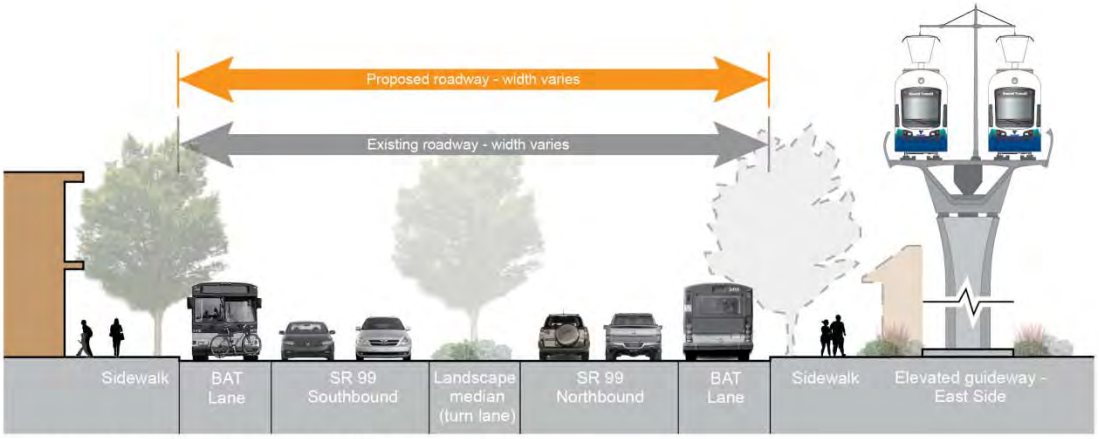
Proposed condition looking north (not to scale)

EXHIBIT 3-7
SR 99 Hybrid Alternative Typical Cross Section (West)



Proposed condition looking north (not to scale)

EXHIBIT 3-8
SR 99 Hybrid Alternative Typical Cross Section (Median)



Proposed condition looking north (not to scale)

EXHIBIT 3-9
SR 99 Hybrid Alternative Typical Cross Section (East)

3.2.3.1 SR 99 Hybrid Alignment Description, by Segment

Below is a brief description, by segment, of the reasons for locating the SR 99 Hybrid alternative as proposed in **Table 3-1** above.

Angle Lake Station to S. 208th Street

In this segment the guideway would be located along 28th Avenue S. because this location is consistent with the planned alignment of the tail tracks south of Angle Lake Station. The alignment was located to minimize conflict with the proposed SR 509 extension.

S. 208th Street to North of Kent-Des Moines Road

The guideway would be located in the median in this segment to avoid disruption to commercial properties on both sides of SR 99 and to avoid high-voltage power lines on the east side.

North of Kent-Des Moines Road to S. 260th Street

The alignment would be located west of SR 99 to optimize commercial redevelopment opportunities and because crossing the Kent-Des Moines Road intersection in the median would require substantial widening and reconstruction of SR 99. The alignment would remain on the west side of SR 99 to provide a station location close to Highline Community College and to avoid high-voltage power lines on the east side. A west side alignment would also have fewer direct property impacts than an east side alignment in this segment.

S. 260th Street to 16th Avenue S.

In this segment, the guideway would transition to east of SR 99 at S. 260th to avoid impacts to a health clinic and to minimize the traffic impacts of a median alignment. The east-side alignment would avoid impacts to the SR 99/S. 272nd Street intersection and would allow the S. 272nd Street station to be located at the Redondo Heights Park-and-Ride.

16th Avenue S. to S. 304th Street

The SR 99 Hybrid alignment would transition to the west side of SR 99 near 16th Avenue S. to take advantage of natural terrain variation (lower terrain on the west side helps to avoid visual impacts) and to avoid impacts to the S. 288th Street and S. Dash Point Road intersections. South of S. Dash Point road, the west-side alignment would meet a hillside and provide an opportunity for the guideway to be located at-grade, which could reduce project cost.

S. 304th Street to S. 312th Street

The guideway would return to the east side of SR 99 at S. 304th to avoid impacts to Federal Way High School and to position the guideway for connecting to the FWTC.

3.2.3.2 Stations

Stations associated with the SR 99 Hybrid alignment would be located in the same basic areas as for the SR 99 Elevated Median alternative (Kent/Des Moines, S. 272nd Street, and FWTC). The Kent-Des Moines station would likely be located between Kent-Des Moines Road and the vicinity of S. 240th Street. The alignment would be just east of SR 99 at S. 272nd Street, and the S. 272nd Street station would be located east of SR 99 between SR 99 and the bus turnaround area at the Redondo Heights Park-and-Ride. The exact location and configuration of each station would be worked out as the alignment design and station planning processes move forward.

3.2.3.3 Construction

Where the SR 99 Hybrid would be aligned to the east or west of SR 99, up to one lane of traffic would be likely to close during construction, which could affect the business access and transit (BAT) lane. Driveways might need to be consolidated during construction but signage regarding business access would be provided. Portions of the SR 99 Hybrid alternative that would be in the median would have construction effects to traffic that would be similar to the SR 99 Elevated Median alternative.

3.3 Detailed Descriptions of I-5 Alternatives

The I-5 corridor studied is generally along west side of the I-5 right-of-way, which is adjacent to primarily single family land uses, except at the interchanges at Kent-Des Moines Road and S. 317th/320th streets. The two alternatives within this corridor are designed to connect access points at freeway interchanges to optimize ridership by balancing the need for LRT system access with the need to serve regional destinations.

The I-5 alternatives are subject to ongoing review and coordination with WSDOT. The SR 167, SR 509, and I-5 Puget Sound Gateway Project ("the Gateway Project") is a long-term effort to improve roadway access to the ports of Seattle and Tacoma, in the interest of maintaining and enhancing Washington's global economic competitiveness. The Gateway Project features three projects that, when combined, could add substantial width to I-5 in the FWTE project study area. In some parts of the study area, this additional roadway width would occupy all or most of the available WSDOT right of way.

The two I-5 alternatives being considered in this Level 2 screening process are subject to substantial change as new information becomes available about the spatial needs of the Gateway Project. Although these widening projects are not currently funded, discussions continue regarding the appropriate placement of the proposed LRT guideway along I-5. The assumptions contained in this report about LRT guideway placement represent the best information available at the time regarding ROW availability and WSDOT design coordination.

3.3.1 I-5 Mixed West Side Alternative

At the north end of the corridor (just south of the future Angle Lake Station), the I-5 Mixed West Side alternative would be identical to the other alternatives, extending the elevated guideway from the Angle Lake Station to the south along 28th Avenue S. After crossing over SR 99 and the proposed SR 509, the guideway would turn southeast to run along the south side of the proposed SR 509 to I-5, then it would turn south along the west side of the I-5 right-of-way. Near S. 316th Street the alignment would turn west toward the FWTC. The specific alignment of the guideway and FWTC station in this area has not been determined. The alignment and typical cross-section for the I-5 Mixed West Side alternative are shown in **Exhibits 3-10** and **3-11**, respectively.

"Mixed" refers to the profile, and it would include a combination of elevated and at-grade segments. This alternative would be elevated for the most part, and would be grade-separated from all east-west cross-streets south of the SR 509/I-5 interchange (S. 216th Street, Kent-Des Moines Road [SR 516], S. 259th Place, S. 272nd Street, Military Road S. [twice], and S. 288th Street) as well as other potential obstacles. The I-5 Mixed West Side alternative's proposed

location places it close to several facilities that could affect both the alignment and profile, including Highline Water District storage tanks, Puget Sound Energy's Midway Switch Station/Freeway Substation, Midway Landfill, Mark Twain Elementary School, and the Truman High School complex.

This alternative is subject to ongoing review and coordination with WSDOT. The "Gateway Project" is a long-term effort to improve roadway access to the ports of Seattle and Tacoma, in the interest of maintaining and enhancing Washington's global economic competitiveness. The Gateway Project features projects that, when combined, could add substantial width to I-5 in the FWTE project study area. In some parts of the study area, this additional roadway width would occupy all or most of the available WSDOT right-of-way.

3.3.1.1 Stations

The stations associated with the I-5 Mixed West Side Alternative would serve the same general transit markets as the three SR 99-based alternatives: Kent/Des Moines, S. 272nd Street, and FWTC. At S. 272nd Street the station platform would be located at the Star Lake Park-and-Ride. The Kent/Des Moines and FWTC station locations would be driven more by local factors and by the alignment of a potential future extension further south to Tacoma than by the choice of FWTE alignment alternatives. The exact station locations and configurations would be worked out as the alignment development and station planning processes move forward.

3.3.1.2 Construction

The I-5 Mixed West Side alternative would be along the west side of I-5 and would likely have some effects at or near the I-5 southbound on- and off-ramps but would not likely affect any I-5 mainline operations or require lane closures on I-5 in the study area.

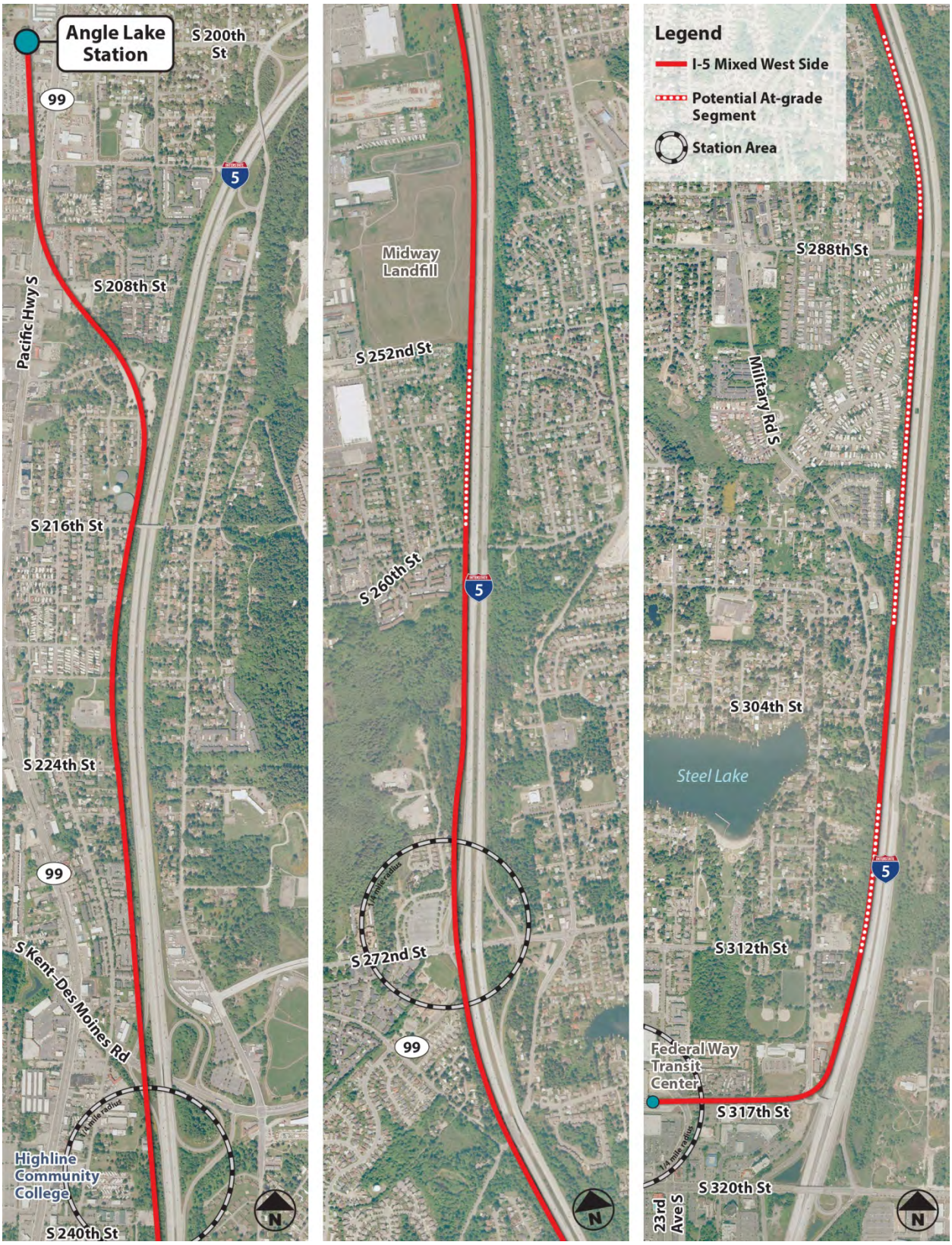
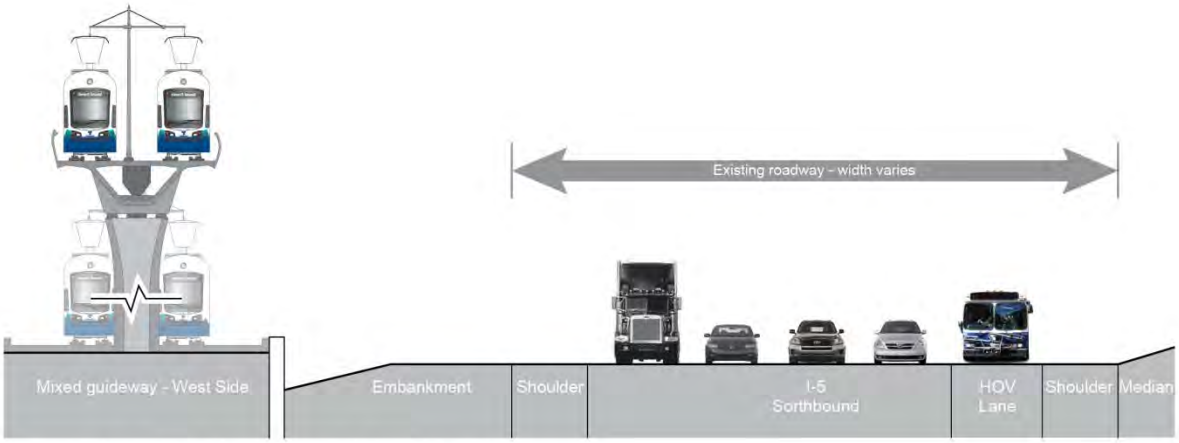


EXHIBIT 3-10
Alignment of I-5 Mixed West Side Alternative



Proposed condition looking north (not to scale)

EXHIBIT 3-11
I-5 Mixed West Side Alternative Typical Cross Section

3.3.2 I-5 Mixed West Side/Median Alternative

The I-5 Mixed West Side/Median alternative would be similar to the I-5 Mixed West Side alternative from the north end of the project area to the S. 240th Street area. At that point, the guideway would transition from the west side of I-5 to the I-5 median via elevated structure. It would remain in the I-5 median to the Star Lake Park-and-Ride area, where it would transition back to the west side so that the S. 272nd Street station could be located close to the Park-and-Ride and avoid issues involved with fitting the station footprint in the median. South of the station, the guideway would transition back to the freeway median via elevated structure. Near S. 316th Street, the alignment would turn west toward the FWTC. The alignment for the guideway and station in this area has not been fully developed, but for the purposes of this study, it has been assumed to follow S. 317th Street and terminate at 21st Avenue S. The alignment and typical cross-sections for the I-5 Mixed West Side/Median alternative are shown in **Exhibits 3-12**, **3-13,** and **3-14**, respectively.

3.3.2.1 Stations

The stations for the I-5 Mixed West Side/Median alternative would be in similar locations as the stations for the I-5 Mixed West Side alternative. The two I-5 alternatives would serve a Kent/Des Moines station, and both would have a station located near the east edge of the Star Lake Park-and-Ride. The FWTC station would be configured the same whether the LRT guideway along I-5 is located in the median or along the west side of the right of way.

3.3.2.2 Construction

Where the I-5 Mixed West/Median alternative would be in the median of I-5, it would likely require full lane closures of the northbound and southbound HOV lanes on I-5 due to the proximity of construction activities to the travel lanes and the high operating speed on I-5. Where this alternative would be along the west side, it would likely have some effects at or near the I-5 southbound on- and off-ramps at S. 272nd Street but would not likely affect any I-5 mainline operations or require lane closures on I-5 in these sections.

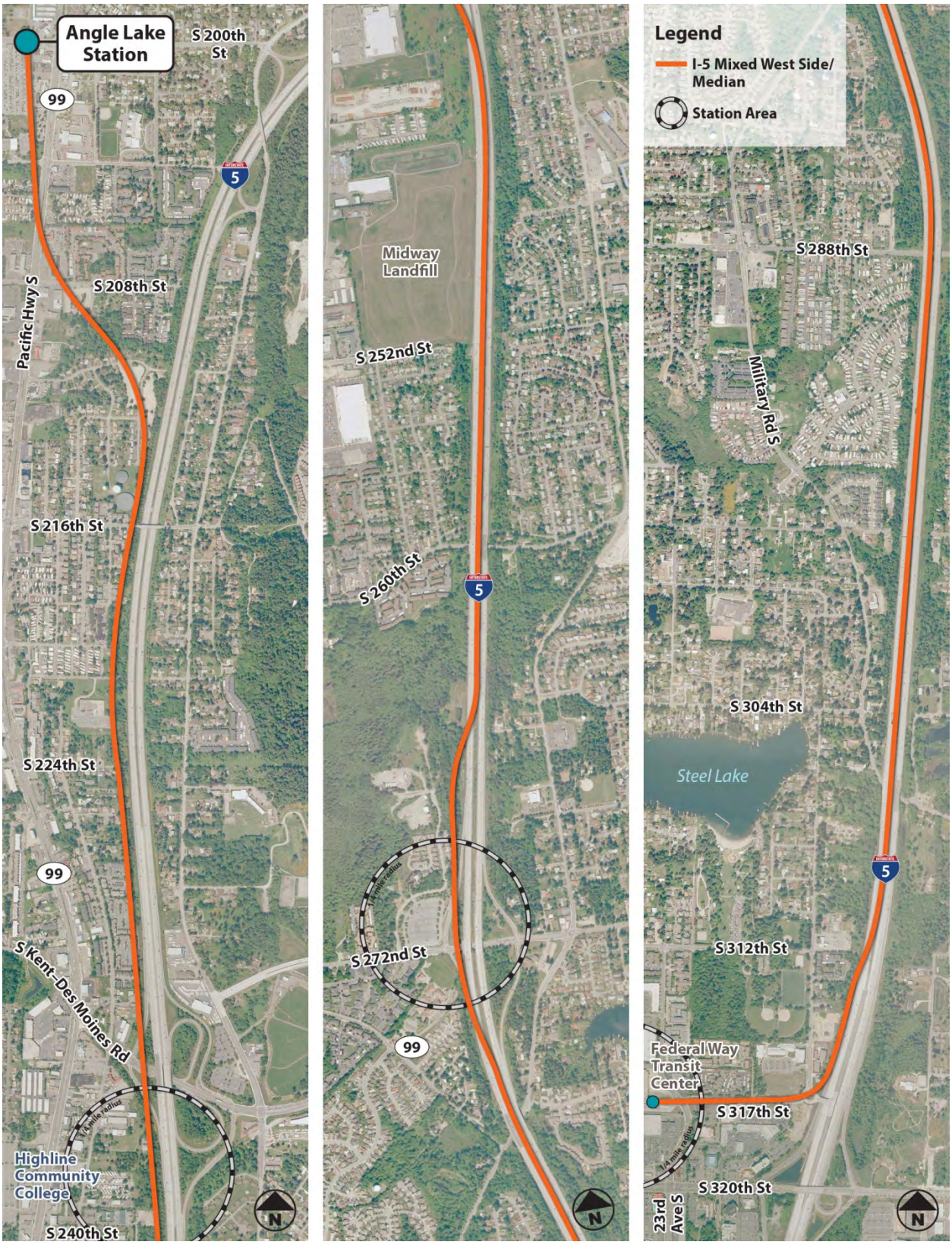
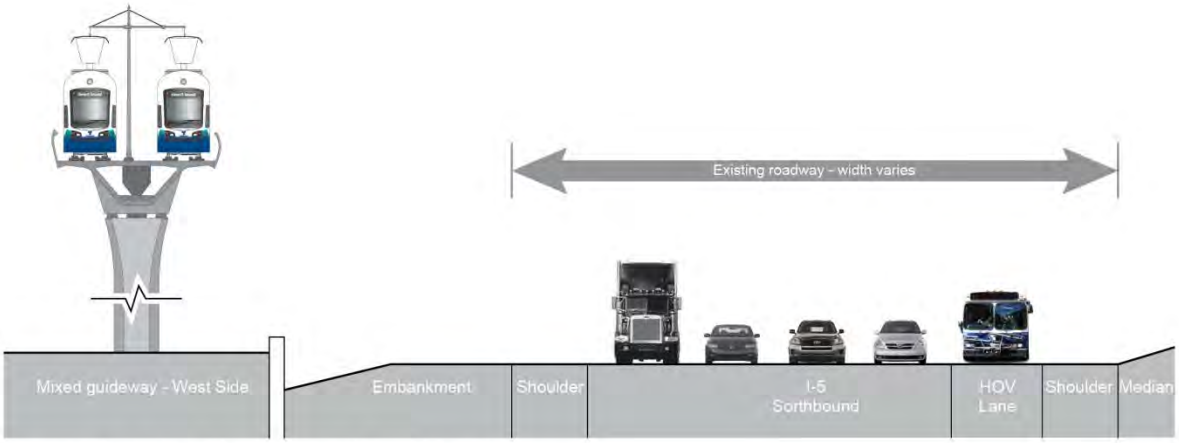
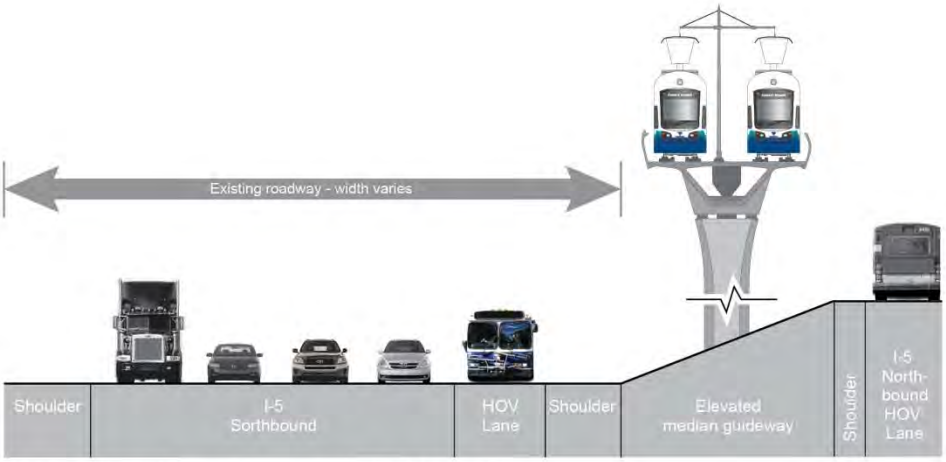


EXHIBIT 3-12
I-5 Mixed West Side/Median Alternative Alignment



Proposed condition looking north (not to scale)

EXHIBIT 3-13
I-5 Mixed Median/West Side Alternative Typical Cross Section for West Side Segments



Proposed condition looking north (not to scale)

EXHIBIT 3-14
I-5 Mixed Median/West Side Alternative Typical Cross Section for Median Segments

4.0 Evaluation Criteria

The criteria used to evaluate the Level 2 alternatives originated from objectives derived from the project's Purpose and Need, described in Chapter 2. These objectives are:

- Objective 1: Provide an effective transportation solution to meet mobility needs
- Objective 2: Support equitable mobility
- Objective 3: Serve supportive land use plans and economic development objectives
- Objective 4: Preserve a healthy environment
- Objective 5: Design an affordable and constructible project

Table 4-1 presents the evaluation criteria established for the Level 2 evaluation. It shows how each relates to Level 1 measures and the objectives with which they correspond. Each criterion has one or more quantitative or qualitative measures that are listed below and further described later in this chapter. They are intended to differentiate between alternatives in terms of project performance and potential effects. Some measures from the Level 1 evaluation were found to not provide meaningful differentiation between alternatives, or they do not differentiate between the alternatives that are being evaluated in Level 2. These measures are identified in the table below, and when possible, new measures were identified to attempt to better differentiate between the Level 2 alternatives.

Table 4-1
Level 2 Evaluation Criteria and Measures

Purpose and Need Objective	***Evaluation Criterion***	***Level 1 Measures***	***Level 2 Measures***
Provide Effective Transportation Solution to Meet Mobility Need	*Ridership potential (2035)*	M1: 2035 daily project riders and 2035 annual project riders	Daily and annual project ridership
			Station boardings
		M2: Travel time in study area	Travel time
	Connections to regional multimodal transportation systems	M3: Transit integration with Link system	Integration with Link system
		M4: Transit integration with facilities in the study area	Integration with bus facilities and services
Support Equitable Mobility	*Transit-dependent and Environmental Justice populations*	EM5: Low-income population within ½ mile of station	*Does not differentiate between alternatives; not considered in Level 2*
		EM6: Elderly population (age 65 or older) within ½ mile of station	*Does not differentiate between alternatives; not considered in Level 2*
		EM7: Youth population (age 16 or younger) within ½ mile of station	*Does not differentiate between alternatives; not considered in Level 2*
		EM8: 0-car households within ½ mile of stations	*Does not differentiate between alternatives; not considered in Level 2*
			Student poverty
			Subsidized housing
			Cost of commuting

Purpose and Need Objective	***Evaluation Criterion***	***Level 1 Measures***	***Level 2 Measures***
			Access to express transit
			Minority populations
Support Land Use Plans and Economic Development	*Transit-supportive land use and economic development policies*	LU9: How well an alternative provides enhanced mobility to existing high density land use centers	Existing land use
			Planned land use
			High Density/TOD zoning
			Underutilized parcels
			Population
			Employment
			Households
			Parking opportunities
			Non-motorized access
Preserve a Healthy Environment	*Effect on natural environment*	EN10: Impacts on wetlands	Wetlands
		EN11: Potential to affect streams crossings	Streams
	Effect on built environment	EN12: Visual aesthetic impacts of alternative	Visual effects
		EN13: Potential property acquisition	Potential displacements
		EN14: Impacts to known parks	*Does not differentiate between alternatives; not considered in Level 2*
		EN15: Number of community facilities affected	Community facilities
		EN16: Impacts on known or eligible historic or other sensitive properties access; number	*Does not differentiate between alternatives; not considered in Level 2*
		EN17: Number of potentially impacted noise receptors	Noise
			Vibration
		EN18: Level of Service (LOS) at intersections; evaluation of capacity/flow (existing conditions)	Traffic
		EN19: Traffic circulation and access; number of mid-block opportunities	
			Construction effects
Design an Affordable and Constructible Project	*Design considerations*	DC20: Potential utility effects	Utilities
		DC21: High-risk hazardous materials within ¼ mile of alternative	Hazardous materials
		DC22: Geologic hazards	Geologic issues
		DC23: Park-and-Ride lot locations	*Combined with parking measure under "Transit-supportive land use and economic development policies"*
	System costs	DC24: Estimated capital cost ($2013)	Estimated capital cost
		DC25: Estimated annual operations and maintenance cost ($2013)	Estimated operations and maintenance cost

Criteria used to evaluate stations are discussed in Section 7.1.4.

4.1 Level 1 Measures Not Evaluated in Level 2

The Level 1 evaluation showed that some measures that did not effectively differentiate between alternatives. The measures also would not differentiate between the alternatives in Level 2 because there are either no resources present for these categories in the corridor or the available data is collected at too large a study area.

These measures included evaluation of effects to parks and historic resources. Although a park was adjacent to the 24th Avenue S. alternatives in Level 1, the S. 24th Avenue alternatives are not being evaluated further in Level 2, and none of the Level 2 alternatives is adjacent to an existing park. Only one property known to have buildings listed on, or known to be eligible for, the National Register of Historic Places (NRHP) is present within the vicinity of any of the alternatives evaluated in Level 1 or Level 2. This property is the Highline Community College (HCC) campus, where three buildings have been determined eligible and the campus may be considered eligible as a historic district. The buildings are over 500 feet from any of the alternatives, and therefore unlikely to be directly or indirectly affected by any of the other alternatives. A preliminary assessment of the project area did not identify any other structures potentially eligible for listing on the NHRP.

These resources are therefore not being evaluated as part of Level 2, but are expected to be evaluated later in the Draft Environmental Impact Statement (EIS).

4.2 Objective 1: Provide Effective Transportation Solution to Meet Mobility Needs

This objective has two criteria: the ridership potential of an alternative and how an alternative improves connections to regional multimodal transportation systems.

Criterion: Ridership Potential (2035) - This criterion is intended to illustrate the ridership potential based on three measures: forecasted daily and annual ridership in 2035, station boardings, and travel time within the corridor for each alternative.

TABLE 4-2
Ridership Potential Measures

Evaluation Measure	Methodology
Daily and annual project ridership	Using Sound Transit forecasting model and general station area assumptions, produced 2035 estimated daily and annual ridership. This criterion also qualitatively addressed how well each alternative would serve forecasted ridership. Unit of measure: Average 2035 daily and annual riders.
Station boardings	Using Sound Transit forecasting model and general station area assumptions, 2035 station boardings were estimated. Unit of measure: Average 2035 daily station boardings.
Travel time	Travel times were developed for alternatives using a simple distance/speed estimate with time added for each station, and all Level 1 travel times were affirmed by Sound Transit operations staff. Unit of measure: One way travel time between S. 200th Street and S. 320th Street.

Criterion: Connections to Regional Multimodal Transportation Systems - This criterion addresses the connectivity of each alternative to the rest of the regional transit system and to existing transit routes and facilities within the study area.

TABLE 4-3
Connections to Regional Multimodal Transportation Systems Measures

Evaluation Measure	Methodology
Integration with Link system	Qualitative assessment of project effect on current and planned Link light rail system. Key considerations were schedule adherence, fleet management and potential extensions beyond the FWTE project. Unit of measure: Number of traffic signals traversed at-grade by alternative.
Integration with bus facilities and services	Using existing transit service data, assessed the number of transit vehicle trips by time of day at stops within ½ mile of stations, the geographic coverage of these routes, connections to employment centers around the region, and the ability to reassign or re-route routes to stations (both local and regional bus routes). Unit of measure: Transit vehicle trips by alignment, trips to regional centers, and a qualitative assessment of the integration with the transit system.

4.3 Objective 2: Support Equitable Mobility

This objective has one criterion, which is how well an alternative improves transit access to transit dependent and environmental justice populations.

Criterion: Transit Dependent and Environmental Justice Populations – In Level 1, this criterion evaluated transit-dependent populations using available U.S. Census data for low-income, elderly, youth, and zero-car household populations, which did not show a substantial difference between alternatives due to the large size of census tracts and block groups that include much of the study area for both SR 99 and I-5 corridors. In lieu of more specific census data, four new

measures were identified that provide additional information on low-income populations in the study area that may be transit dependent and how difficult commuting to work may be in this area. These measures are based on the number of elementary school students in local public schools that qualify for free or reduced lunches due to income, the number of subsidized housing facilities, the average cost of a commute to work, and the area within ¼ mile of an express bus stop. In addition, the minority population within a ½ mile of each alternative was evaluated to consider the potential for improved transit service to benefit this population, as well as the potential for adverse effects on this population, which must be considered under Executive Order 12898, Federal Actions to Address Environmental Justice Impacts in Minority Population and Low-Income Populations.

TABLE 4-4
Transit Dependent and Environmental Justice Population Measures

Evaluation Measure	Methodology
Student poverty	Identified percentage of elementary school population that qualifies for free or reduced lunch within school service areas adjacent to or intersecting an alternative centerline using data from Washington Office of Superintendent of Public Instruction. Unit of measure: Qualitative discussion of percentage of children receiving free or reduced lunch.
Subsidized housing	Using PSRC data, calculated the number of U.S. Department of Housing and Urban Development (HUD) subsidized housing complexes and units within ½ mile of the alternative centerline. Unit of measure: Number of subsidized housing complexes and units.
Cost of commuting	Using PSRC data for average cost of commute of a one-way commute to work within each PSRC traffic analysis zone (TAZ), discussed the costs of the average commute along each alternative. Unit of measure: Qualitative discussion.
Access to express transit	Using PSRC data for areas within ¼ mile of an express bus stop, discussed the degree of access to express buses along each alternative. Unit of measure: Qualitative discussion.
Minority Populations	Using U.S. Census data for minority population, identified areas within the alternative study areas that include high minority population. Unit of measure: Qualitative discussion.

4.4 Objective 3: Serve Supportive Land Use Plans and Economic Development Objectives

This objective has one criterion, which is the extent to which an alternative would be consistent with local transit supportive plans.

Criterion: Transit Supportive Land Use and Economic Development Policies

The intent of this measure is to evaluate the extent to which the alternatives are consistent with and support local plans to create more compact, livable, and sustainable communities with transit in mind, and the degree to which an alternative could help facilitate implementation of

these plans. In Level 1, the measure for this criterion was the acreage and percentage of high-density zoning within each station access area. For Level 2, additional measures were identified to try to get better differentiation between alternatives and to allow for a clearer understanding of what the long-term plans for each corridor are and the potential for transit supportive land use to develop adjacent to each alternative. Existing land use, planned land use (based on comprehensive plans), high density zoning, and an assessment of parcels that could be developed or redeveloped were measured, along with existing population, employment, households, parking opportunities, and existing and planned non-motorized infrastructure.

TABLE 4-5
Transit Supportive Land Use and Economic Development Measures

Evaluation Measure	Methodology
Existing land use	Determined acres and percentage of single family residential, multi-family residential, commercial, industrial, public and vacant land uses within ½ mile of each alternative's centerline, using King County Assessor data. Land uses were generalized between jurisdictions as necessary. Unit of measure: Acres (and percent) of each existing land use.
Planned land use	Determined acres and percentage of planned land uses based on local comprehensive plans within ½ mile of each alternative's centerline. Land uses were generalized between jurisdictions as necessary. Unit of measure: Acres (and percent) of each planned land use.
High Density/TOD Zoning	Determined acres and percentage of existing zoning that is either high-density residential, transit oriented development, or allows mixed use within a ¼ mile of the alternative centerline. Zoning data was obtained from the cities of SeaTac, Des Moines, Kent and Federal Way. Unit of measure: Acres (and percent) of high density/TOD zoning.
Underutilized parcels	Determined number of acres considered underutilized based on ratio of building to land value within ½ mile of the alternative centerline. Underutilized parcels are those with a ratio of improvement value to land value of 1:1 or less. Unit of measure: Acres (and percent) of underutilized land.
Population	Determined total population within ½ mile of the alternative centerline based on U.S. Census data. Population was estimated based on percentage of each census block within study area. Unit of measure: Total population (rounded to nearest 1,000).
Employment	Determined total employment within ½ mile of the alternative centerline based on data supplied by the Employment Securities Department (ESD) through PSRC. Employment data exists as points that were be aggregated for a ½ mile buffer around the centerline of the alternative. Unit of measure: Total employment (rounded to the nearest 1,000).
Households	Determined total number of households within ½ mile of the alternative centerline based on U.S. Census data. Households were estimated based on percentage of each census blocks within study area. Unit of measure: Total households (rounded to the nearest 1,000).
Parking opportunities	This measure included the current number of park & ride parking spaces (publicly owned or leased facilities) and the number of potential park & ride facilities (such as church parking lots) within ½ mile of each alternative. Utilization of existing park and ride lots was reported. The measure also qualitatively discussed areas where overflow parking from park & rides could be a problem. Unit of measure: Number and utilization of existing park-and-ride spaces, number of potential park and ride locations, and qualitative discussion.
Non-motorized access	This measure qualitatively discussed existing and planned bike and pedestrian facilities and options within each alternative corridor. Density of roadways that are arterials or smaller were calculated within ½ mile of the alternative centerline. Unit of measure: Linear feet of roadway within ½ mile of each alternative.

4.5 Objective 4: Preserve a Healthy Environment

This objective has two criteria, which are to assess the degree to which each alternative would have effects on the natural environment and the built environment.

Criterion: Effect on Natural Environment

This criterion addresses the potential to minimize and mitigate adverse effects to the natural environment. The FWTE corridor is highly developed, so natural resources are generally limited to stream crossings and wetlands. Due to the regulatory permitting requirements associated with adverse effects to these resources, any adverse effects to these resources would need to be minimized or avoided to the extent possible. Level 1 used measures to assess the presence of wetlands and streams within 100 feet of each alternative. For Level 2, direct effects to wetland and streams were more clearly defined by identifying the potential effects to these resources within the project construction footprint, based on a conceptual design.

TABLE 4-6
Effect on Natural Environment Measures

Evaluation Measure	Methodology
Wetlands	Wetlands or waters of the U.S. within the alternative construction footprint were identified; because there is potential these could be permanently or temporarily affected. Wetland data was obtained from King County and the U.S. Fish and Wildlife Service National Wetlands Inventory (NWI). Unit of measure: Acreage of wetlands within the alternative construction footprint.
Streams	The length of streams within the alternative construction footprint was identified using available mapping of streams. It is likely any alternative that reconstructs a roadway would affect these crossings. Data on streams were obtained from King County. Unit of measure: Length of stream crossings within alternative construction footprint.

Criterion: Effect on Built Environment

The Level 1 screening evaluated the effects on the built environment based on the alternatives' potential to affect the cohesion of the neighborhood and/or community resources as well as potential effects to residential and commercial property, parks, visual aesthetics, community facilities, eligible historic properties, noise receptors, traffic flow, and intersection capacity and level of service. Many of these measures were evaluated in Level 2 as well, with some refinement. As discussed earlier, parks and historic resources were not used as evaluation measures in Level 2 because of the lack of potential effects to these resources within the study area for the alternatives that are evaluated in Level 2. New measures were also added to evaluate potential effects to properties considered highly sensitive to vibration and to evaluate potential construction effects on traffic, businesses and residents.

TABLE 4-7
Effect on Built Environment Measures

Evaluation Measure	Methodology
Visual effects	The rating considered whether important views would be blocked or if the bulk and mass of the light rail are not congruent with the surrounding landscape (built or natural). Unit of measure: Qualitative discussion.
Potential displacements	Residential and business displacements were determined based on buildings assumed to be removed for capital cost estimate. Number of residences or businesses within each building was verified using King County Assessor data and field visits. Unit of measure: Number of potential residential and business displacements.
Community facilities	Direct effects to community facilities were assessed by determining the number of facilities that would be displaced. Indirect effects were assessed by determining the number of community facilities within 200 feet of the alternative right-of-way. Level 1 community facility information was used and was supplemented with field data collected to identify facilities not listed in King County Assessor data. Unit of measure: *Direct*: Number of displaced community facilities; *Indirect:* Number of community facilities within 200 feet
Noise	Using Federal Transit Administration screening guidance, Category II (residential properties and hotels) and Category III (schools and churches) noise receivers within 350 feet of each alternative were identified. The number of receivers within 350 feet of the alternative centerline was determined for buildings with an unobstructed view of the alternative and up to 175 feet for buildings with shielding from the study area. Potential noise sensitive receivers were identified using aerial base maps, with information verified using King County Assessor data and Google Earth. Updated information on Category III receivers collected during field visits was used. Unit of measure: Category II and III noise sensitive receivers potentially affected by the project.
Vibration	Identified number of highly sensitive locations within 100 feet of the alternative right-of-way based on site visit. Unit of measure: Number of highly sensitive locations.
Traffic	Using Level 1 results that documented where congested intersections are, evaluated the station and alignment characteristics by identifying level of traffic that would travel through those congested intersections. This included either through traffic re-circulation caused by turn restrictions, mid-block u-turns or midblock access control as well as additional vehicles forecasted at the stations based on changes to parking supply. The parking allocation by station was based on the best available information to date and would be an assumption. Unit of measure: Qualitative assessment of traffic effects at each station.
Construction effects	A qualitative assessment of construction effects to the existing transportation system and businesses and residences along each alternative was developed (based on the construction description provided in Chapter 3, Definition of Alternatives).

4.6 Objective 5: Design an Affordable and Constructible Project

This objective has two criteria: the degree to which physical and engineering constraints and system costs would affect the ability to design an affordable and constructible project.

Design Considerations

Similar to the consideration of wetlands and water bodies, there are a number of important engineering considerations during Level 1 that help to inform the alternative's future design to be carried into Level 2, including potential for utility relocations, encountering hazardous

materials and geologic hazards, and park-and-ride lot locations that would provide access to station areas. The measures used in Level 2 generally remain the same as in Level 1, although alternatives were looked at in greater detail relative to these measures. The Level 1 parking measure was consolidated with the parking evaluation for station locations in Chapter 7.

TABLE 4-8
Design Consideration Measures

Evaluation Measures	Methodology
Utilities	Easily available major utility lines were reviewed (water, sanitary sewer, and gas and oil main lines) to determine the potential risk and level of effect within the vicinity of the alignments. Data were obtained from local jurisdictions and utility companies. Unit of measure: Qualitative assessment of potential for utility relocations and conflicts.
Hazardous materials	Data from Environmental Data Resource (EDR), a database research company, was reviewed for potential high-risk hazardous materials sites that could affect construction. High risk sites within 1/8 mile were identified. Unit of measure: Location and number of high-risk hazardous materials site within project footprint and 1/8 mile of alternative right-of-way.
Geologic issues	A qualitative geologic risks assessment was completed, including review of steep slopes, seismic ground shaking, liquefiable soils, fault crossings, and erosion potential from King County Geologic Hazards maps, U.S. Department of Agriculture soils maps, and surface geology. Unit of measure: Qualitative assessment.

System Costs

These screening measures capture the estimated capital costs to build, operate, and maintain the project alternatives.

TABLE 4-9
System Cost Measures

Evaluation Measure	Methodology
Estimated capital cost	Using Sound Transit's database of recent capital costs, a range of capital cost estimates was determined for alternatives in current year dollars. Unit of measure: Range of capital costs for alternatives ($2013).
Estimated operations and maintenance cost	Sound Transit modeled annual operations and maintenance (O&M) costs. Unit of measure: Annual O&M cost ($2013).

5.0 Level 2 Data Results - Alignment Alternatives

The Level 2 light rail transit (LRT) alignment alternatives defined in Chapter 3 were evaluated using the criteria presented in Chapter 4. These criteria and the associated measures were driven by the project's objectives, which in turn were based on the project's purpose and need statements. Data collected for each Level 2 evaluation measure help to improve understanding of each alternative, which in turn facilitates the comparisons that will determine which alternative (or alternatives) move(s) forward for full consideration in the Environmental Impact Statement (EIS) process. The data collected are presented in this chapter by criterion and measure, ordered the way the evaluation measures were presented in Chapter 4.

5.1 Ridership Potential (2035)

The ridership potential of the alternatives is a reflection of surrounding land uses and population, access to the station, and the travel time of the alternative. This ridership criterion provides a comparison of how attractive each alternative would be to potential riders in the greater project area.

5.1.1 Daily and Annual Project Ridership

The daily project ridership indicates the estimated number of riders each day within the project area. The annual project ridership indicates the estimated number of riders within the project area on an annual basis.

Methodology

Year 2035 daily project-wide ridership was forecasted for the five project alternatives using Sound Transit's Ridership Model. Ridership estimates were prepared for the full-length alternatives to understand the potential project-wide benefits. All of the full-length alternatives included three LRT stations – Kent/Des Moines (KDM) (near S. 240th Street), S. 272nd Street, and Federal Way Transit Center (FWTC).

Key considerations for the ridership forecasts are station and profile assumptions and travel time estimates. All I-5 and SR 99 alternatives in the Level 2 screening are either elevated or otherwise grade-separated from vehicle travel and therefore have similar travel time characteristics. The Level 2 ridership forecasts are based on year 2035 land use forecast and a

conceptual bus network that would support LRT to FWTC. A summary of the daily and annual ridership forecasts for the Level 2 alternatives is provided in **Table 5-1**.

Discussion of Results

The year 2035 project-wide ridership for all five project alternatives is forecasted to be approximately 23,500 riders per day. The similarity in the ridership forecasts between alternatives is due to the fact that two of the three station areas (Kent/Des Moines and FWTC) have a similar geographic location to one another and therefore serve similar markets and the travel times for the alternatives vary by less than one minute.

TABLE 5-1
Year 2035 Daily and Annual Ridership Forecasts by Alternative

Alternative	2035 Daily Riders	2035 Annual Riders
SR 99 Alternatives		
SR 99 Elevated Median	23,500	7.4 million
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	23,500	7.4 million
SR 99 Hybrid	23,500	7.4 million
I-5 Alternatives		
I-5 Mixed West Side	23,500	7.4 million
I-5 Mixed West Side/Median	23,500	7.4 million

Estimates of 2035 daily riders are rounded to the nearest 500.
Estimates of 2035 annual riders are rounded to the nearest 0.1 million.

Due to the I-5 and SR 99 project alternatives having similar travel times and, for the most part, station areas, the alternatives show similar ridership potential.

Key Result

- System-wide ridership projections are the same for all five Level 2 alternatives.

5.1.2 Station Boardings

Station boardings are a criterion that shows the differences in potential ridership between specific station locations, and indicate potential differences in attractiveness of station locations to riders.

Methodology

Year 2035 daily station boardings for the five project alternatives were calculated using Sound Transit's Ridership Model. Station boarding forecasts were prepared for three project station areas – Kent/Des Moines, S. 272nd Street corridor, and FWTC. Key considerations for the Level 2

station boarding forecasts are station access and transit integration assumptions. A summary of the estimated daily boardings for the alternatives is provided in **Table 5-2**.

TABLE 5-2
Year 2035 Station Boardings by Alternative

Alternative	Station Area Boardings		
	KDM	S. 272nd St.	FWTC
SR 99 Alternatives			
SR 99 Elevated Median	3,000	2,000	8,000
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	3,000	2,000	8,000
SR 99 Hybrid	3,000	2,000	8,000
I-5 Alternatives			
I-5 Mixed West Side	2,500	2,000	8,500
I-5 Mixed West Side/Median	2,500	2,000	8,500

Daily boardings are rounded to the nearest 500.

Discussion of Results

The year 2035 daily station boardings show similarities between the I-5 and SR 99 alternatives. The station with the highest daily boardings (8,000 or more) is the FWTC. The results at the station areas vary by approximately 500 boardings per day at the north and south ends of the corridor with similar boardings at the S. 272nd Street station locations for either corridor (SR 99 versus I-5). With boardings estimates rounded to the nearest 500, these variations are the smallest possible. Such variations could result from small differences in travel times and/or transit access to the proposed station.

Due to the similarity in travel times and station areas between the alternatives, the station boardings estimates are similar at all of the three station areas within the Federal Way Transit Extension (FWTE) study area.

Key Results

- Station boardings would be the same for a S. 272nd Street station in either corridor.
- The SR 99 alternatives would have approximately 500 more boardings at Kent/Des Moines, but 500 fewer boardings at the FWTC than the I-5 alternatives.

5.1.3 Travel Time

Travel time is generally a reflection of the alignment length, profile, and design speed, and is a factor in determining the ridership potential of an alignment alternative.

Methodology

Estimated travel times represent the time for light rail to travel the full length of the FWTE study area between the Angle Lake Station (near S. 200th Street) and the FWTC (near S. 317th Street). Travel times for any given segment can be affected by multiple variables including the alignment curvature and profile, station locations, and the effects of traffic signals, if applicable, in the case of at-grade operation. A summary of the project alternative travel time is provided in **Table 5-3**.

TABLE 5-3
Alternative Travel Times and Ridership Projections

Light Rail Alternative	Travel Time (minutes)
SR 99 Alternatives	
SR 99 Elevated Median	14.5
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	15.0
SR 99 Hybrid	14.5
I-5 Alternatives	
I-5 Mixed West Side	14.0
I-5 Mixed West Side/Median	14.0
Note: Travel Times are rounded to the nearest half minute.	

Discussion of Results

Because all Level 2 alternatives are similar in length and the alignment profile is either elevated or grade-separated from the roadway right-of-way, the travel times for each of the project alternatives are similar, ranging between 14 and 15 minutes. As noted in the discussion of the ridership measures, this results in similar ridership potential for all the Level 2 alternatives.

Because all of the Level 2 project alternatives are either elevated or grade-separated from the roadway right-of-way, all alignments have similar travel times. Minor differences in alignment length and curvature result in slight travel time differences of one minute or less. In particular, the 30th Avenue alignment is longer than the other SR 99 alternatives, and the I-5 alignments are slightly shorter and have fewer curves.

Key Results

- The I-5 alternatives would have a slightly faster travel time than the SR 99 alternatives.
- The 30th Avenue S. Elevated West Side alternative would have the longest travel time, one minute longer than the I-5 alternatives.

5.2 Connections to Regional Multimodal Transportation Systems

The potential connections with the larger Link system and other transit systems in the area are important to understanding how the project would integrate with the regional and local transit systems and the quality of connections that would be provided to potential riders.

5.2.1 Integration with Link System

The ability of the project to integrate with the existing Link system is important because system-wide integration can affect travel times and on-time performance for the entire system.

Methodology

Transit integration with the Link Light Rail system was evaluated based on the potential for delays that the Level 2 alternatives could experience due to the alignment interfacing with roadway traffic, especially at traffic signals. Because all Level 2 alternatives are either fully elevated or grade-separated from the roadway right-of-way, there are minimal opportunities for the light rail operations to be affected by roadway operations. The only alternative that could have segments with at-grade profile is the SR 99 Hybrid alternative. Even so, the at-grade sections of this alternative would occur between intersection signals and operate with full priority for the train and include crossing gates and other rail protection at driveways. **Table 5-4** summarizes the number of traffic signals that each alternative would traverse at-grade.

TABLE 5-4
Existing Traffic Signals Traversed by Alternative

Alternative	Traffic Signals Traversed
SR 99 Alternatives	
SR 99 Elevated Median	0
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	0
SR 99 Hybrid	0
I-5 Alternatives	
I-5 Mixed West Side	0
I-5 Mixed West Side/Median	0

Discussion of Results

By avoiding at-grade operations, elevated alternatives are expected to be more effective at maintaining scheduled headways; therefore, they are not expected to affect system-wide Link operations and reliability.

Because all of the Level 2 alternatives would not interface with roadway operations and would avoid existing traffic signals, all alternatives are expected to have the ability to maintain scheduled service headways and would therefore have a low potential to affect system-wide Link operations.

Key Result

- Level 2 alternatives would not affect operations of the greater Link system.

5.2.2 Integration with Bus Facilities and Services

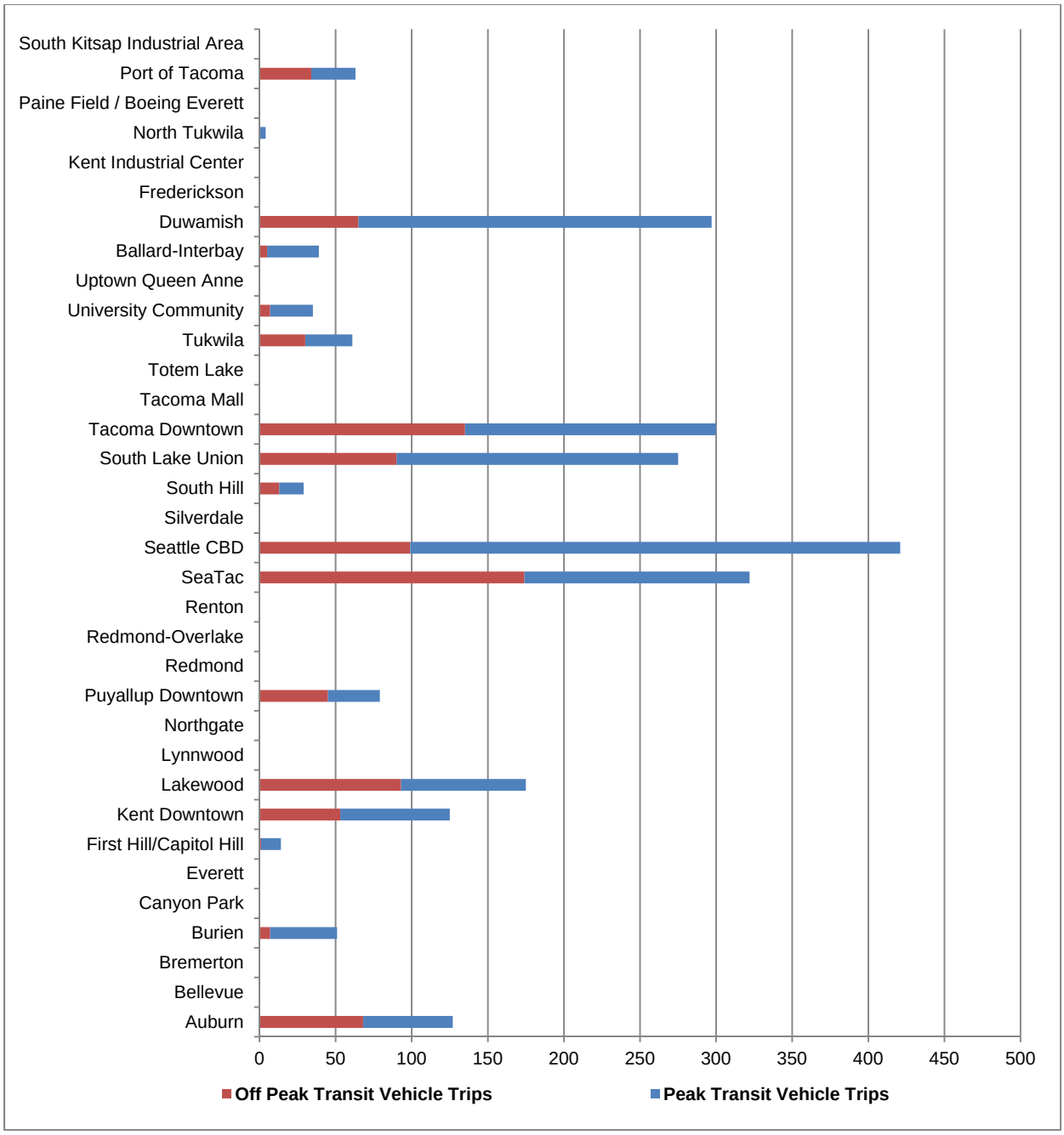
Transit integration with facilities in the study area is a qualitative assessment of the interface between the FWTE Level 2 alternatives to existing transit services (such as King County's RapidRide A Line and Sound Transit Express bus routes) and transit facilities (such as Park-and-Ride lots). The way in which each alternative would integrate with existing bus facilities and services is reflective of the type and degree of transit access to potential FWTE stations. A half-mile radius was used because routes within that area could be re-routed slightly, if necessary, to serve proposed LRT stations.

Methodology

To assess integration with existing bus service and facilities, the number of peak and off-peak transit vehicle trips that would provide access to stations on an alignment was identified. The regional activity centers that could be accessed with these existing routes were also considered. A qualitative discussion of the potential effects to existing transit services and opportunities to connect to existing transit facilities by station area are documented in this section. **Table 5-5** illustrates the total transit vehicle trips that serve each alternative and **Exhibit 5-1** shows how those transit routes/vehicle-trips serve the greater Puget Sound regional centers (designated by the Puget Sound Regional Council).

TABLE 5-5
Total Daily Transit Vehicle Trips within ½ Mile of the Proposed Alternative

Alternative	Peak Period	Off-Peak	Total
SR 99 Alternatives			
SR 99 Elevated Median	175	146	321
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	175	146	321
SR 99 Hybrid	175	146	321
I-5 Alternatives			
I-5 Mixed West Side	194	102	296
I-5 Mixed West Side/Median	194	102	296



Notes: Based on Spring 2012 service from King County Metro, Pierce Transit and Sound Transit.
Information on Regional Growth and Manufacturing and Industrial Centers can be found at http://www.psrc.org/growth/centers

Exhibit 5-1
Total Daily Transit Vehicle Trips from the FWTE Study Area to Regional Growth and Manufacturing and Industrial Centers

Discussion of Results

All alternatives along SR 99 and I-5 would connect with existing transit service that provides access to about a quarter of all the jobs in the region. This service includes access to cities north, south and east of the FWTE study area. Results are discussed by station below.

Transit Routes near the Kent/Des Moines Station Area

There are currently five King County Metro routes that serve this station area: 121, 122, 156, 166 and RapidRide A Line. These routes connect the station area with Seattle, Burien, Tukwila, and Kent, as well as Sea-Tac Airport. Of the five routes, only Route 166 serves the Kent-Des Moines Park and Ride on the way to Kent. The other routes travel north on either SR 99 or roadways west of it through Des Moines. RapidRide A Line is the only route that serves the HCC area that also travels south on SR 99. In general, transit routes that serve HCC are easier to integrate with a station located closer to SR 99; however, the I-5 alternatives could also be integrated to existing transit service along SR 99 as the SR 99 and I-5 alignments are within close proximity of each other.

Near the Kent/Des Moines station area is the Kent-Des Moines Park-and-Ride. The Kent-Des Moines Park-and-Ride is located on the east side of I-5, north of Kent-Des Moines Road. Seven King County Metro (KCM) routes and one Sound Transit Express route serve the Kent-Des Moines Park-and-Ride lot: 158, 159, 166, 173, 192, 193, 197 and 574. These routes serve Lakewood, Tacoma, Federal Way, Kent, Seattle and the University District. A majority of the routes that serve the Kent-Des Moines Park-and-Ride also serve the Federal Way Transit Center and Star Lake Park-and-Ride in the FWTE study area but do not serve areas west of I-5 near HCC.

Due to substantial congestion at the I-5/Kent-Des Moines Road interchange and a challenging pedestrian environment, the I-5/Kent-Des Moines Road interchange could be a substantial barrier for accessing any station area west of I-5 from the Kent-Des Moines Park-and-Ride and therefore re-routing any of the transit routes that currently serve this park and ride to the Kent/Des Moines station area would likely affect that route's operating performance.

Transit Routes serving the Redondo Heights Park-and-Ride

Three KCM routes serve Redondo Heights Park-and-Ride lot: 173, 190 and RapidRide A Line. These routes serve Federal Way and Downtown Seattle as well as Sea-Tac Airport. Routes 173 and 190 proceed to I-5 along S. 272nd Street and heads north to Downtown Seattle. The lack of transit service at the Redondo Heights Park-and-Ride and more convenient bus service at other park and rides in the FWTE is one reason that its occupancy rate is less than ten percent.

Two (173 and 190) of the three existing transit routes at the Redondo Heights Park-and-Ride also serve the Star Lake Park-and-Ride and as such would serve a station area associated with either the SR 99 or I-5 alternatives without requiring any re-routing. Re-routing of other transit service to serve the Redondo Heights Park-and-Ride, for example, I-5 bus routes that stop at

Star Lake Park-and-Ride, would be unlikely as it would create out-of-direction travel that would add travel time to the route and likely affect reliability.

Transit Routes serving the Star Lake Park-and-Ride

Eight King County Metro routes and one Sound Transit Express route serve the Star Lake Park-and-Ride lot: 152, 173, 177, 178, 190, 192, 193, 197 and 574. These routes serve Auburn, Lakewood, Tacoma, Federal Way, Kent, Seattle and the University District. Most of these routes are destined for Downtown Seattle and/or serve the FWTC and Kent/Des-Moines Park-and-Ride within the FWTE study area.

The Star Lake Park-and-Ride is located on the west side of I-5 at the S. 272nd Street interchange. Connecting RapidRide A Line with the Star Lake Park-and-Ride would be unlikely, as it would require re-routing and out of direction travel for RapidRide A Line, and this route would already be connected, or close to, all of the five project alternatives at the Kent/Des Moines and FWTC station areas.

Transit Routes serving the Federal Way Transit Center (FWTC)

The FWTC is a major regional transit hub with nine KCM, three Pierce Transit, and three Sound Transit routes, for a total of 15 routes that serve the FWTC. The nine KCM routes are: 173, 179, 181, 182, 183, 187, 193, 197, and RapidRide A Line. The three Pierce Transit routes are 402, 500, and 501, and all terminate at FWTC. The three ST routes are 574, 577, and 578. In addition to these, KCM routes 177 and 178 stop adjacent to the FWTC. With all the SR 99 and I-5 alternatives terminating at or near the FWTC, no re-routing of the transit routes that serve FWTC is expected.

Overall Bus Transit Integration for the FWTE Project

Although some routes could be restructured or truncated, the I-5 alternatives would provide access to, and in some cases duplicate, the existing regional express transit service that already serves the Kent-Des Moines, Star Lake and FWTC Park-and-Ride facilities. Both the SR 99 and I-5 alternatives would likely have a connection to RapidRide A Line at the Kent/Des Moines and FWTC station areas. Due to peak period congestion at the I-5 interchanges with Kent-Des Moines Road and S. 272nd Street, rerouting of current peak-only express bus service in the I-5 corridor to serve SR 99 alternatives could result in increased travel time and less reliable service for those routes. .

The SR 99 alternatives would integrate better overall with existing service, in large part because RapidRide provides all-day service with frequent stops between light rail stations. While the proposed I-5 stations would connect to a large number of existing transit routes, they are more

predominantly peak-period ones. The RapidRide A Line functions as a frequent, all-day extension of the proposed service throughout the corridor. The proposed LRT service is more of a complement to existing transit service if it's on 99, and somewhat more of a duplication of existing transit service if it's on I-5.

As shown previously in Exhibit 5-1, transit service in the study area connects to about half of the areas designated by the PSRC as Regional Growth Centers or as Regional Manufacturing and Industrial Centers. This connectivity is important because it indicates that those who live in the corridor are connected by transit to about 25% of the jobs in the region. To further this connection between housing and jobs, more than half of this transit service is peak period service, which addresses traditional commuter demand, rather than all-day service, which is more oriented toward transit-dependent populations and those who commute outside the normal "rush" hours.

Key Results

- SR 99 alternatives would connect to about 8 percent more daily transit vehicle trips than the I-5 alternatives. This is mainly due to the all-day frequency of service for King County Metro's RapidRide A Line that accounts for close to 60 percent of the total transit vehicle trips associated with the SR 99 alternatives.
- Transit routes that serve the I-5 alternatives are more peak-oriented, while SR 99 service features more all-day service.
- Overall, transit service within the FWTE study area connects to 18 of 35 Regional Growth and Regional Manufacturing and Industrial Centers in the region. These centers have 25 percent of the total employment in the region.

5.3 Transit-Dependent and Environmental Justice Populations

A goal of the FWTE project is to support equitable mobility, which means providing similar options for getting around, such as transit, for all populations. The criterion for this objective is how well the alternative could be accessed by transit dependent populations. Measures for this criterion evaluated in Level 1 included U.S. Census data for low-income, elderly, youth and zero-car household populations, but they did not differentiate noticeably between alternatives, and therefore alternate measures were identified for Level 2 to better understand the potential differences in transit dependent populations along each alternative alignment.

5.3.1 Student Poverty

The number of children in a given area eligible for the free or reduced lunch program can serve as an indicator of the overall income level of that area. To qualify for this program, the family income must be 130% or less of the poverty level figures on the U.S. Department of Health and Human Services Poverty Level Table.

Methodology

The percentage of students at each elementary school whose service area intersects with or is adjacent to an alternative alignment was identified and mapped. Elementary school data was used because they have the smallest service areas when compared to middle schools, junior highs, or high schools. Data for each school was obtained from the Washington State Office of Superintendent of Public Instruction website "Washington State Report Card" (http://reportcard.ospi.k12.wa.us/summary.aspx?year=2011-12) and the data for students receiving free or reduced lunches was current as of May 2012. To illustrate student poverty, **Exhibit 5-2** shows the elementary schools within or adjacent to each alternative and the percentage of each school's students that qualify for free or reduced lunch programs.

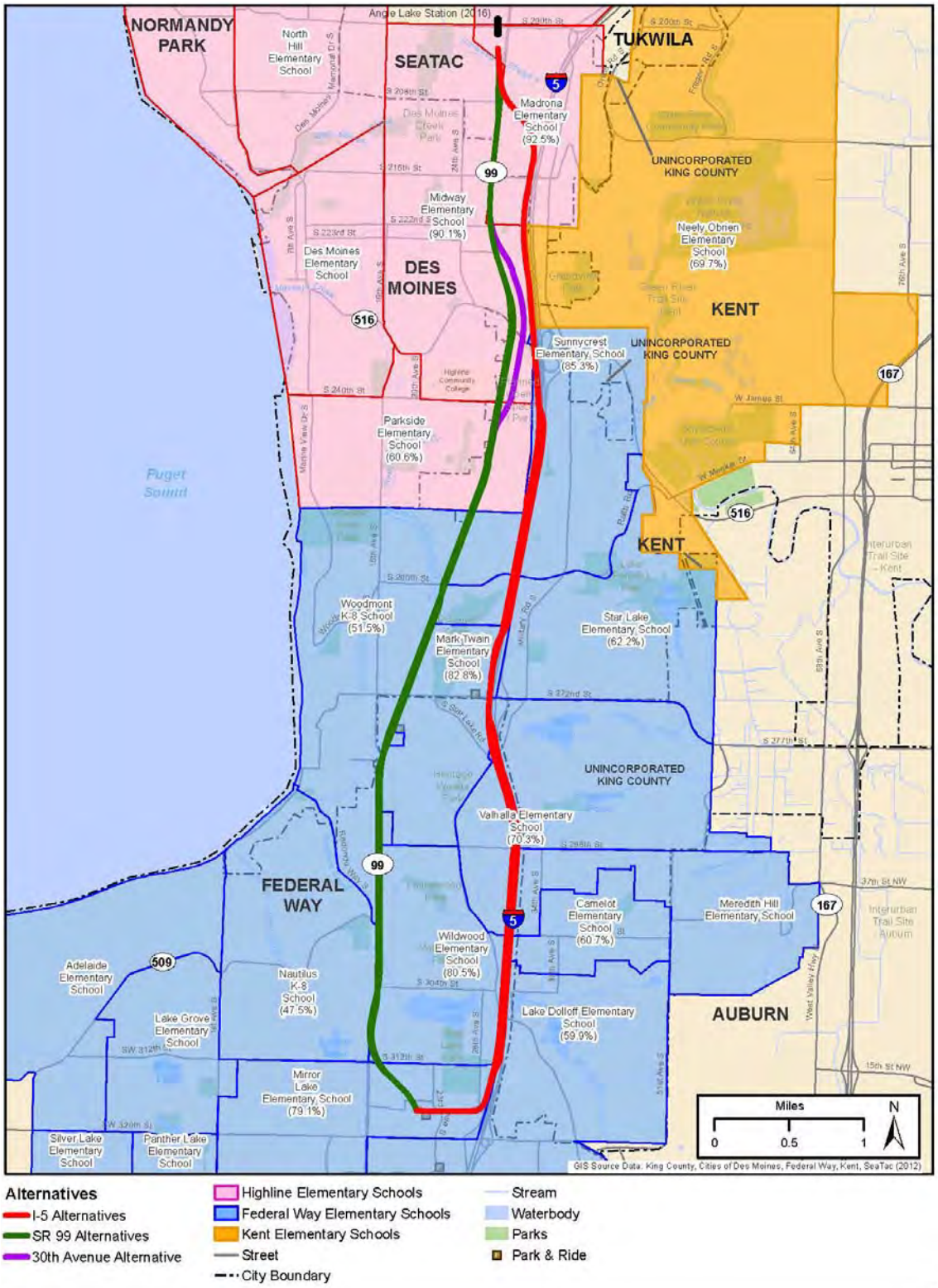


Exhibit 5-2
Percentage of Children Eligible for Free or Reduced Lunch

Discussion of Results

Schools near the northern edge of the study have the highest share of students who qualify for free or reduced lunches, with over 90% of the elementary school population. All schools whose service area includes the area between SR 99 and I-5 have at least 60% qualifying, with most above 80%. The lowest percentage for any school adjacent to or intersecting an alternative alignment is Nautilus K-8 School in Federal Way, on the west side of SR 99, which has a qualifying percentage of 47.5%. All other schools have qualifying populations of over 50%.

Key Results

- Student poverty rates are similar between alternatives.
- Student poverty rates are highest at the north end of the project area and lowest west of SR 99 near S. 260th Street and near S. Dash Point Road.

5.3.2 Subsidized Housing

Subsidized housing can be an indicator of the general income levels in a greater area and shows where lower-income populations may be concentrated. For this measure, the locations of subsidized housing developments administered by the U.S. Department of Housing and Urban Development (HUD) were identified along each alternative alignment.

Methodology

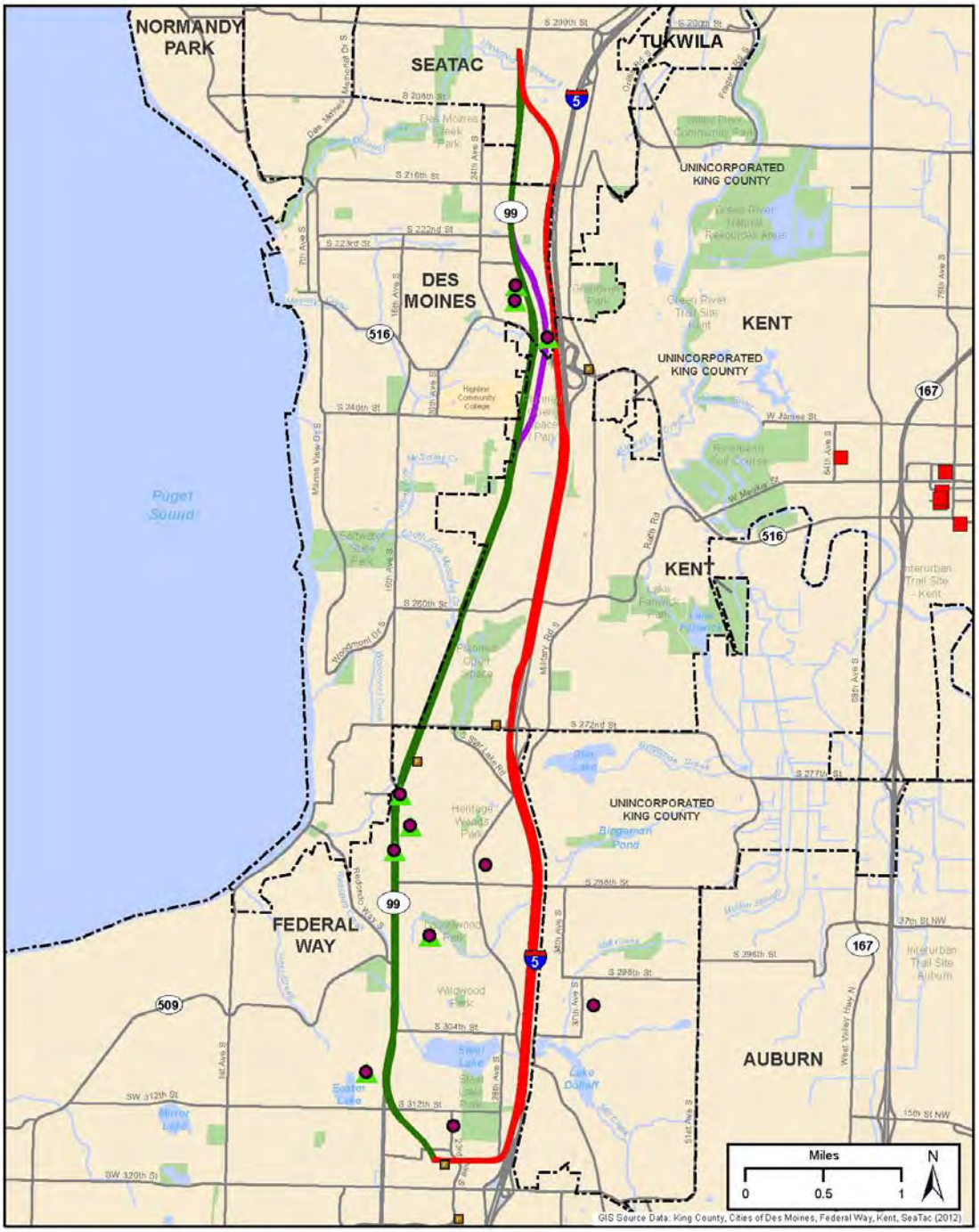
Data on HUD housing in the study area was obtained from PSRC and mapped to show the HUD housing developments within ¼ mile and a ½ mile of each alternative. The number of HUD developments and units within a ½ mile of each alternative is summarized in **Table 5-6** and **Exhibit 5-3**. This dataset, however, represents only these HUD housing locations and does not include other subsidized housing programs, such as the Section 8 voucher program administered by the King County Housing Authority, which could increase the number of subsidized housing units in either corridor.

TABLE 5-6
Subsidized Housing within ½ Mile of Alternatives

Alternative	HUD Properties within ½ Mile	Number of Units within ½ Mile
SR 99 Alternatives		
SR 99 Elevated Median	9	1,113
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	9	1,113
SR 99 Hybrid	9	1,113
I-5 Alternatives		
I-5 Mixed West Side	8	679
I-5 Mixed West Side/Median	8	679

Discussion of Results

The SR 99 alternatives have a greater number of subsidized housing developments within a ½ mile than the I-5 alternatives do. Property sizes range from approximately 50 to 200 units, and although SR 99 alternatives have only one more HUD property within a ½ mile, the properties located along SR 99 tend to be larger complexes, resulting in over 400 more units along SR 99.



Alternatives
- I-5 Alternatives
- SR 99 Alternatives
- 30th Avenue Alternative

- Street
- City Boundary
- Stream

- Waterbody
- Parks
- Park & Ride

- Subsidized Housing Within 1/2 Mile
- Subsidized Housing Within 1/4 Mile
- Subsidized Housing More Than 1/2 Mile

Exhibit 5-3
Subsidized Housing

Key Results

- Alternatives along SR 99 have slightly more HUD housing developments within a ¼ and a ½ mile than alternatives along I-5.
- SR 99 alternatives have over 400 more HUD housing units than alternatives along I-5.

5.3.3 Cost of Commuting

The cost of getting to work can be a hardship for low-income populations if it accounts for a substantial percentage of their income and it reduces the amount of income available for other necessities, such as housing and food. While measuring the average commute cost within the study area is not an indicator of transit-dependent populations, when compared with data on income it can provide insight into where commute costs may be a financial burden on residents and where more affordable options, such as transit, may reduce this burden.

Methodology

Data for this measure was provided by PSRC, which calculated the average one-way morning commute cost by Traffic Analysis Zone (TAZ) for vehicles and actual transit fare for transit riders. This calculation included estimated parking and gas costs for those that commute by car. **Exhibit 5-4** shows the average commute cost by TAZ for the zones on each side of the SR 99 and I-5 alignments in the study area.

Discussion of Results

The average commute cost did not vary greatly within the study area, and the highest commute costs were found to occur on the east side of I-5. These areas are generally low-density areas, however, and much of this area is used for agriculture or warehousing. Along the more populated SR 99 and west of I-5 corridors, the data at this level does not differentiate between these corridors, and it appears that commute costs are generally the same throughout the project area.

Key Results

- Commute costs are highest east of I-5.
- Commute costs along SR 99 and between SR 99 and I-5 are generally the same.
- The lowest commute costs in the corridor are at the very north and very south ends of the corridor.

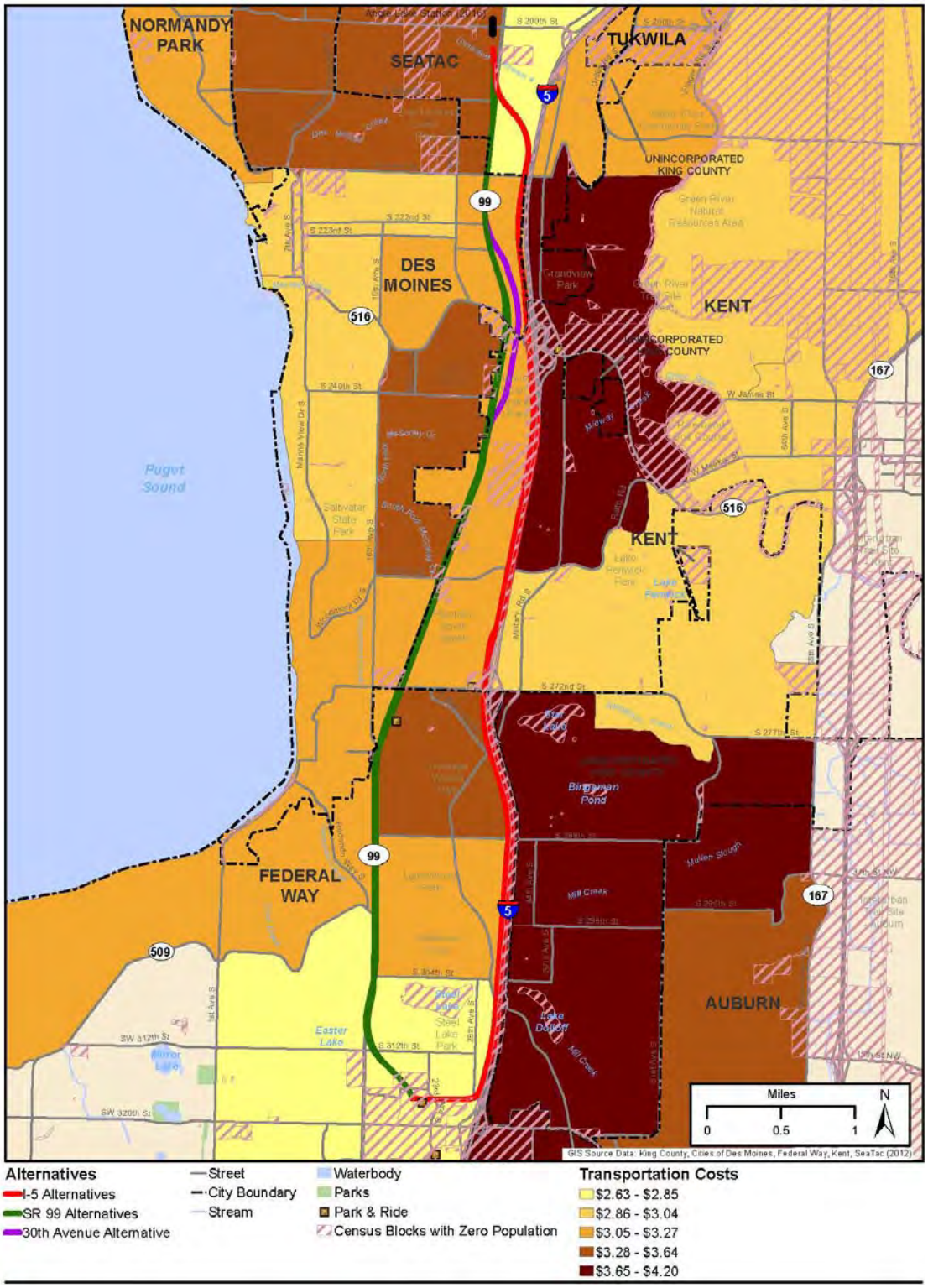


Exhibit 5-4
Commute Cost by Traffic Analysis Zone

5.3.4 Access to Express Transit

For transit dependent populations, the walking distance to transit is important, and access to express buses can be important for minimizing the time to get to work, school, or other destinations on a daily basis.

Methodology

Data from PSRC shows the percentage of total population within ¼ mile of an express transit stop. A distance of ¼ mile is considered a walkable distance. Express transit routes included in the dataset from PSRC included KCM Express routes and Rapid Ride routes and express routes operated by Sound Transit and Pierce Transit. Information on access to express transit by TAZ is presented in **Exhibit 5-5**.

Discussion of Results

The percentage of population within ¼ mile of an express bus stop is fairly low, with only TAZs at the very north and south ends of the corridors and the area between Kent-Des Moines Road and S. 260th Street having percentages over 10 percent. Populations west of SR 99 and east of I-5 appear equally likely to have limited access to express bus stops. These results are due to the majority of express bus stops occurring on either SR 99 or I-5.

Key Results

- The highest percentage of population within ¼ mile of an express bus stop is around the Federal Way Transit Center.
- The percentage of the population within ¼ mile of an express bus stop is below 10 percent for much of both the SR 99 and I-5 corridors.

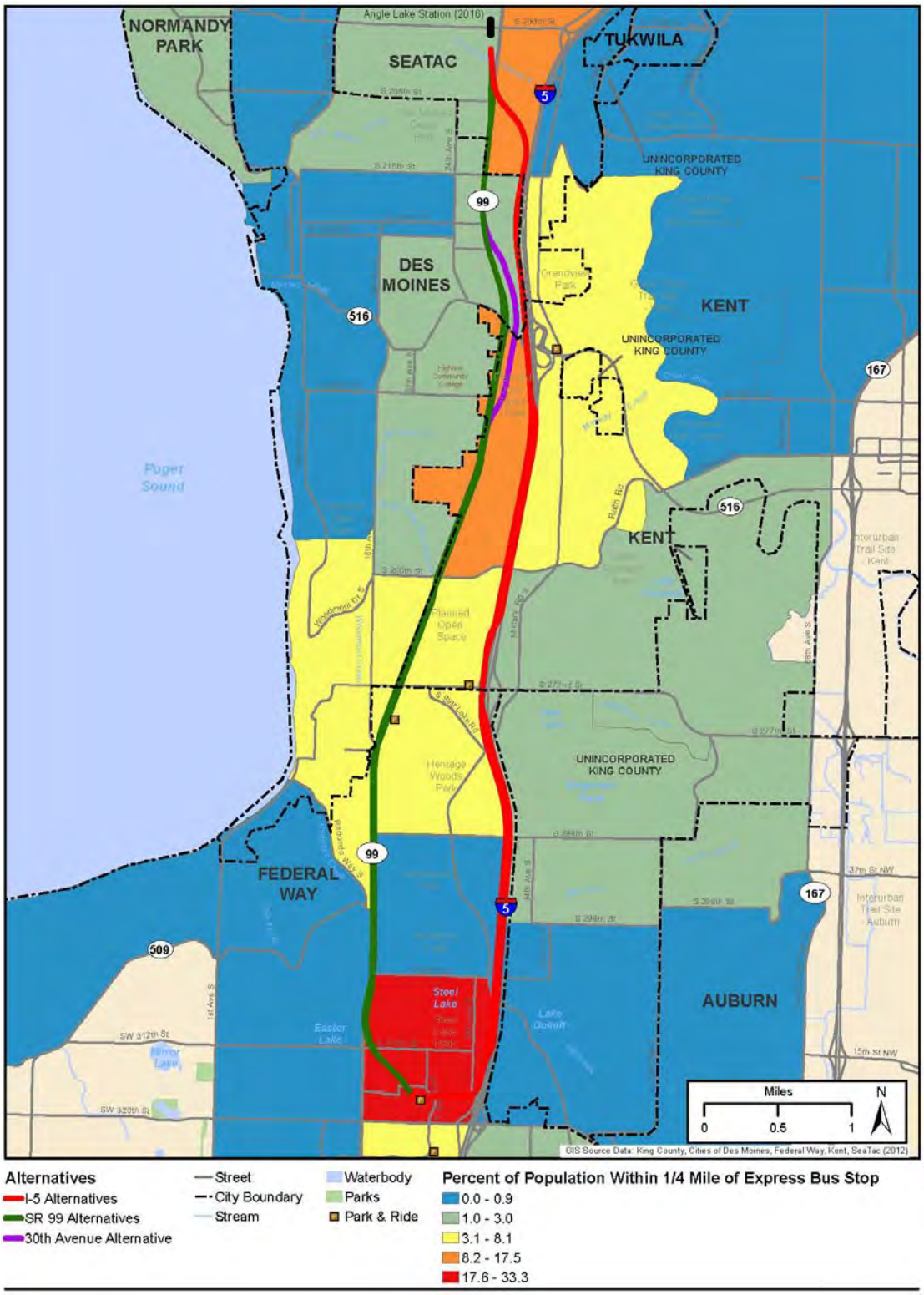


Exhibit 5-5
Access to Express Transit

5.3.5 Minority Populations

Disproportionately high and adverse effects to minority populations, along with low-income populations, must be considered during the NEPA process under Executive Order 12898. Low-income population were evaluated in the Level 1 evaluation and found not to differentiate between alternative due to the scale at which income data is collected by the U.S. Census. For the Level 2 Evaluation, minority population data was evaluated to determine if one alternative would be more likely to have a disproportionately high and adverse effect on environmental justice populations.

Methodology

To evaluate the presence of minority populations for potential effects on environmental justice populations, 2010 U.S. Census data on minorities was mapped within the greater project area, as shown in **Exhibit 5-6.**

Discussion of Results

As shown in **Exhibit 5-6**, the majority of the project area, including all of the area between SR 99 and I-5 within the project limits, is at least 51 percent minority. There are also census block groups within this area that are over 75 percent minority. Due to the shape and size of the census tracts at which these data are collected, these data do not differentiate between Level 2 alternatives, and all alternatives are equally likely to provide benefits to minority communities through improved transit service as well as have potential for adverse effects, such as noise, property acquisition and visual effects.

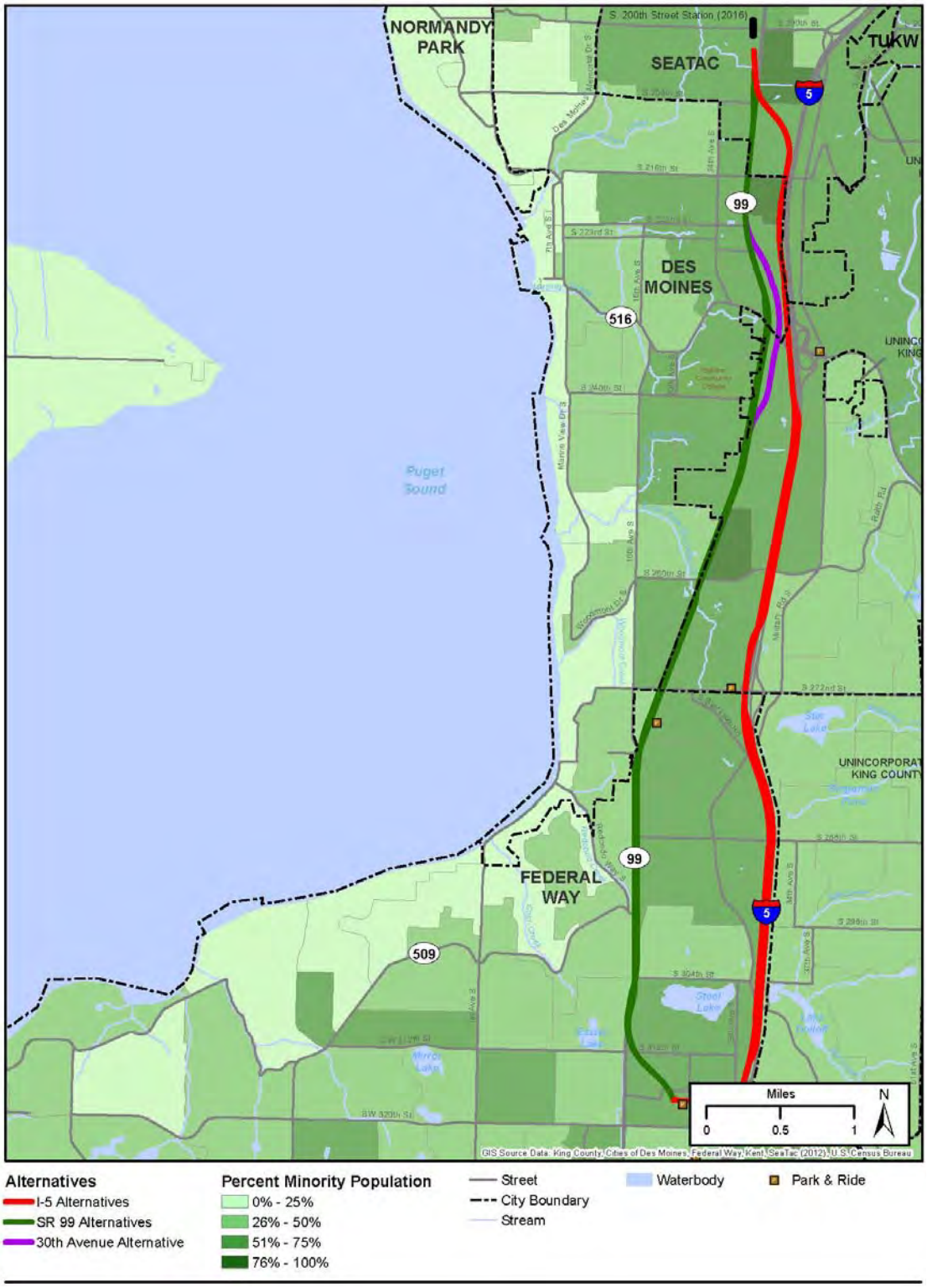


Exhibit 5-6
Minority Population

5.4 Transit-Supportive Land Use and Economic Development Policies

The potential for transit supportive land uses and economic development along each alternative was evaluated by comparing the existing land use, the planned land use, and the area of underutilized parcels within a half mile, as well as considering demographic information including the population, employment, and households within a half mile. Mobility along each alternative is also important in understanding the potential for development, and therefore parking opportunities and challenges along each alternative were evaluated along with the degree of non-motorized access.

This purpose of these measures is to understand the level of potential development that could occur along each corridor. This potential development could result in economic development desired by the cities, as well as increase the potential ridership base for each alternative. For purposes of data presentation and discussion in this chapter, some measures were grouped together for ease of discussion, as follows:

- Land Use
- Population, Employment, and Households
- Parking Opportunities
- Non-motorized Access

5.4.1 Land Use

Land use related measures included existing land use, planned land use, and underutilized parcels within a ½ mile of each alternative. High-density zoning, included transit-oriented development and mixed-use zoning, were evaluated within a ¼ mile of each alternative. Existing land uses along each alignment were evaluated in order to better understand the dominant existing land uses in the corridor and how well they align with each city's vision for that corridor which are reflected in the planned land uses. Planned land uses in the project area are determined by each city through their comprehensive planning process. The amount of underutilized land along each alternative was evaluated in order to better understand the area of land that could be available for redevelopment in the future. High density zoning indicates where the highest density development is likely to occur, and was focused on a smaller area adjacent to the alternatives because this area within an easy walking distance of the corridors and existing transit routes on these corridors. The planned land use data was compared with the existing land use data, underutilized parcel data and high-density zoning to understand the level of potential development that could occur along each corridor. This potential development could result in economic development desired by the cities, as well as increase the potential ridership base for each alternative. The presence of underutilized land, however,

does not guarantee that it will be redeveloped, but when evaluated in comparison to existing land use and planned land use, it can provide a picture of the degree of development potential along a corridor.

Methodology

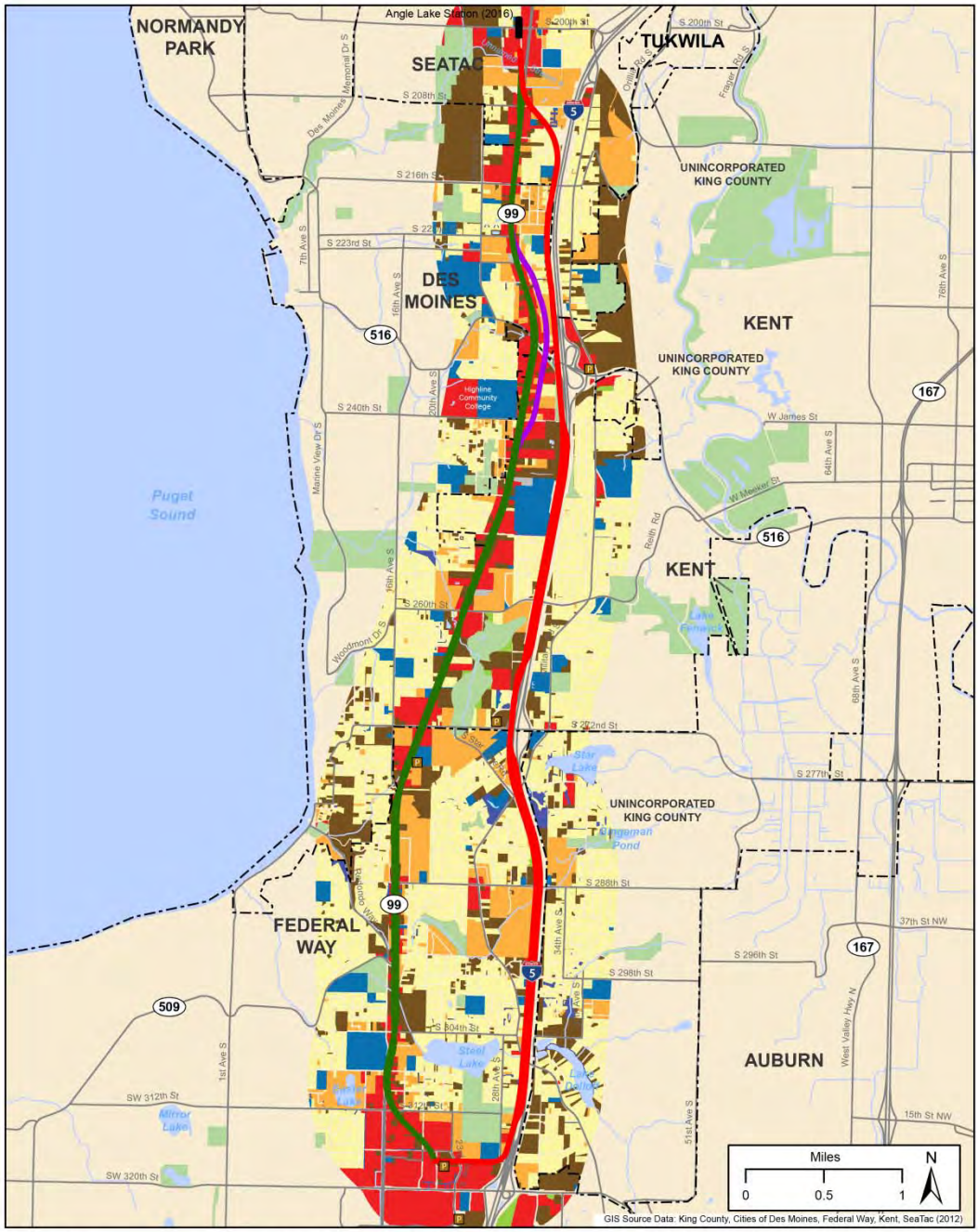
Existing land use data was obtained from the King County Assessor database and was grouped into the following categories:

- Single family residential
- Multi-family residential
- Commercial
- Industrial
- Institutional
- Parks/Open Space
- Vacant

Existing land use data does not account for public right-of-ways. The total acres of each existing land use and the percent of the total area within a half mile of the centerline of each alternative was calculated and reported below in **Table 5-7**. Existing land uses are also shown on **Exhibit 5-7**.

TABLE 5-7
Existing Land Uses Within ½ Mile of Alternative [Acres (%)]

Alternative	Single family Residential	Multi-family Residential	Com-mercial	Industrial	Insti-tutional	Parks/Open Space	Vacant
SR 99 Alternatives							
SR 99 Elevated Median	1,533 (29%)	615 (12%)	710 (14%)	10 (< 1%)	375 (7%)	78 (1%)	892 (17%)
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	1,540 (29%)	612 (12%)	704 (13%)	10 (< 1%)	367 (7%)	79 (2%)	929 (18%)
SR 99 Hybrid	1,524 (29%)	614 (12%)	710 (14%)	10 (< 1%)	378 (7%)	79 (2%)	887 (17%)
I-5 Alternatives							
I-5 Mixed West Side	1,560 (29%)	597 (11%)	633 (10%)	8 (< 1%)	293 (5%)	83 (2%)	989 (18%)
I-5 Mixed West Side/Median	1,570 (29%)	595 (11%)	630 (12%)	8 (< 1%)	295 (5%)	83 (2%)	992 (18%)
Note: Percentages do not add to 100 because total land use acreage includes public and other unusable rights of way.							



Alternatives
- I-5 Alternatives
- SR 99 Alternatives
- 30th Avenue Alternative

Present Land Use - 1/2 Mile From Alternatives
- Commercial
- Industrial
- Institution
- Parks/Open Space
- Single Family Residential
- Multi-Family Residential
- Vacant
- Other
- Street
- City Boundary
- Stream
- Park & Ride
- Waterbody
- Parks

Exhibit 5-7
Existing Land Use

Planned land use data from each city were grouped into the following categories:

- Single family residential
- Multi-family residential
- Mixed Use
- Commercial
- Industrial
- Institutional
- Parks
- Urban Separator (City of Kent only)

The current Comprehensive Plan data for the City of Kent does not incorporate the land uses proposed in the 2012 Midway Subarea Plan. The data set used for this Level 2 study has been updated to include the Midway Subarea Plan land uses. The Urban Separator land use category within the City of Kent is a special designation for areas that are intended to protect environmentally sensitive areas, including lakes, streams, wetlands, and geologically unstable areas. These areas allow no more than one dwelling unit per acre, and within the project study area are primarily located on the steep hillside between I-5 and the Green River valley, with the exception of the McSorley Creek area, which also carries this designation. The total acres of each planned land use and the percent of the total area within a half mile of the footprint of each alternative was calculated and reported below in **Table 5-8**. Planned land uses are also shown on **Exhibit 5-8**.

TABLE 5-8
Comprehensive Plan Land Uses Within ½ Mile of Alternative [Acres (%)]

Alternative	Single Family Residential	Multi-family Residential	Mixed Use	Com-mercial	Indus-trial	Insti-tutional	Parks	Urban Separator
SR 99 Alternatives								
SR 99 Elevated Median	2,113 (40%)	604 (12%)	623 (12%)	857 (17%)	3 (<1%)	175 (3%)	260 (5%)	77 (1%)
30th Avenue S. Elevated West Side w/SR 99 Elevated Median	2,118 (40%)	600 (11%)	640 (12%)	860 (17%)	5 (<1%)	161 (3%)	276 (6%)	83 (2%)
SR 99 Hybrid	2,107 (40%)	603 (12%)	620 (12%)	855 (16%)	3 (<1%)	177 (3%)	263 (5%)	77 (1%)
I-5 Alternatives								
I-5 Mixed West Side	2,318 (43%)	493 (9%)	636 (12%)	763 (15%)	5 (<1%)	64 (1%)	277 (5%)	116 (2%)
I-5 Mixed West Side /Median	2,335 (43%)	491 (9%)	636 (12%)	760 (14%)	5 (<1%)	63 (1%)	280 (5%)	116 (2%)
Note: Percentages do not total 100 because total land use acreage includes public and other unusable rights of way.								

Underutilized parcels were identified using the improvement value and land value for each parcel within a half mile based on 2012 King County Assessor data. If the ratio of improvement to land value is 1:1 or less, the land is considered underutilized and could have greater value if redeveloped. The acres and percentage of underutilized land within a ½ mile of each alternative are provided in **Table 5-9** and in **Exhibit 5-9**.

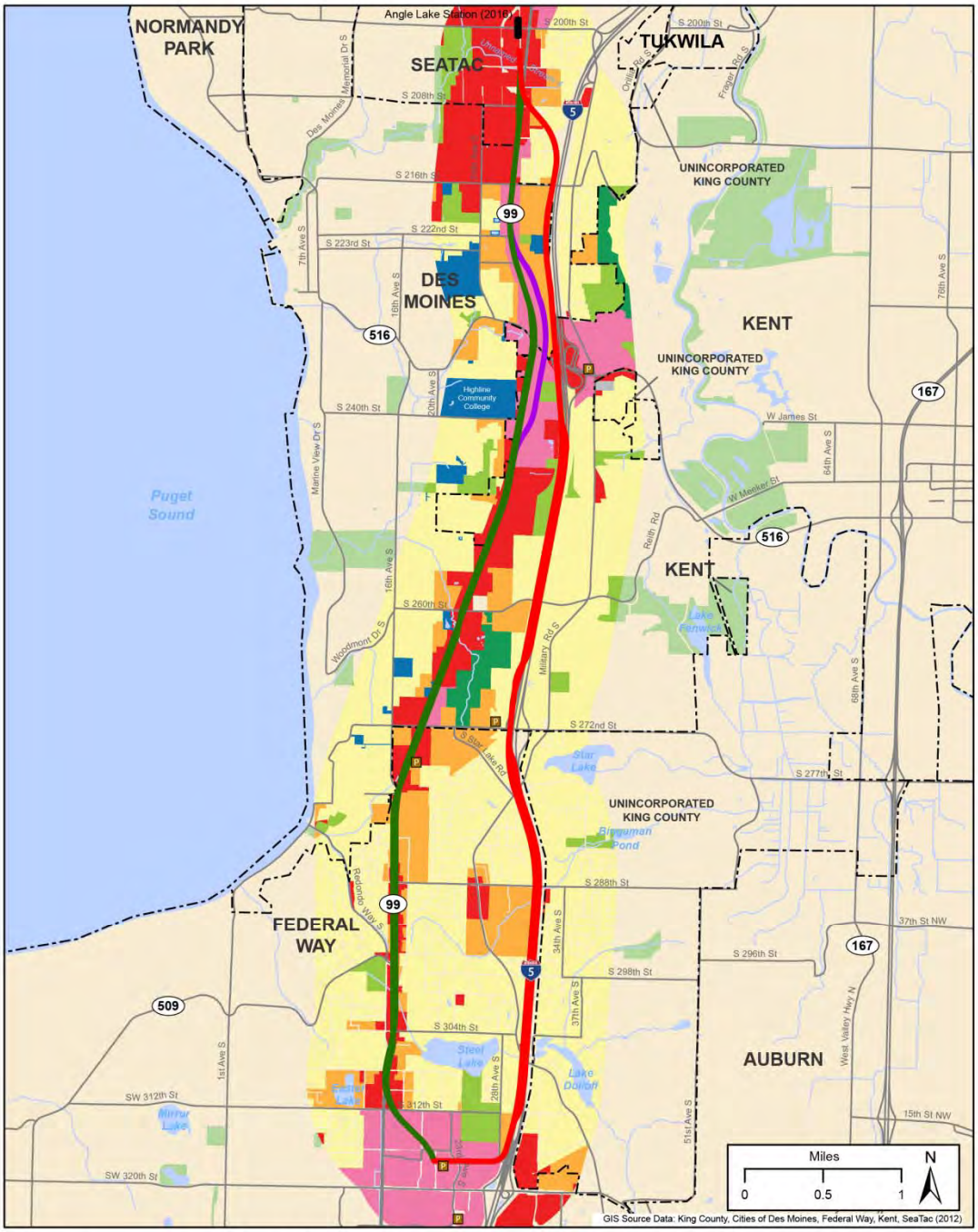


Exhibit 5-8
Planned Land Use

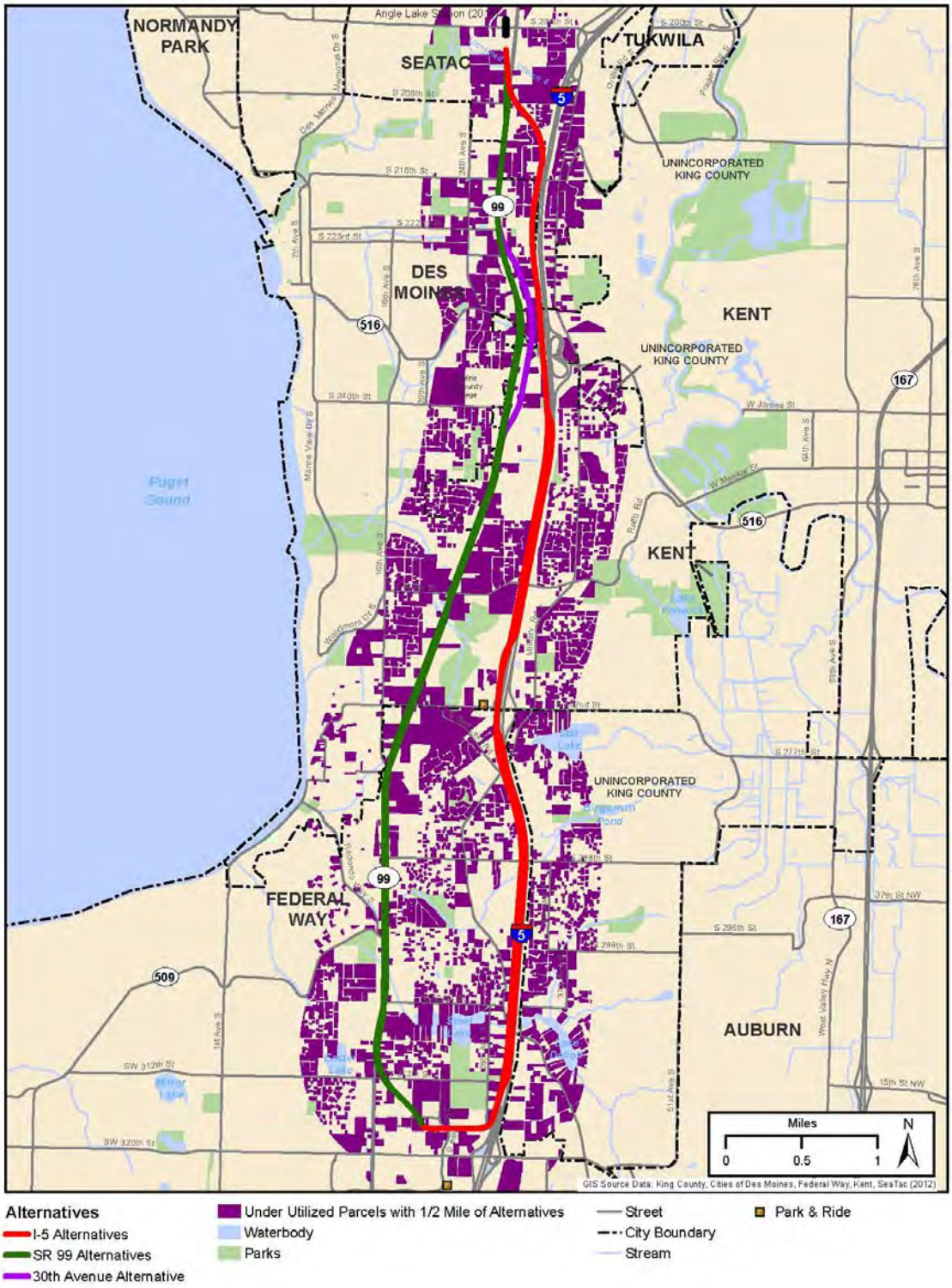


Exhibit 5-9
Underutilized Parcels

TABLE 5-9
Underutilized Parcels within ½ Mile of Alignment

Alternative	Underutilized Parcels [Acres (%)]
SR 99 Alternatives	
SR 99 Elevated Median	1,606 (31%)
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	1,599 (30%)
SR 99 Hybrid	1,598 (31%)
I-5 Alternatives	
I-5 Mixed West Side	1,595 (30%)
I-5 Mixed West Side/Median	1,606 (30%)

High density zoning within each city was identified, and included areas zoned as high-density, mixed use or transit oriented development, as well as commercial and multi-family residential areas that allowed mixed use. The acres and percentage of high density zoning within a 1/4 mile of each alternative are provided in **Table 5-10** and in **Exhibit 5-10.**

TABLE 5-10
High Density Zoning Within 1/4 Mile of Alignment

Alternative	High-Density Zoning [Acres (%)]
SR 99 Alternatives	
SR 99 Elevated Median	797 (32%)
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	823 (33%)
SR 99 Hybrid	792 (32%)
I-5 Alternatives	
I-5 Mixed West Side	580 (23%)
I-5 Mixed West Side/Median	579 (22%)

Discussion of Results

Existing land uses within a ½ mile of each alternative are similar between all alternatives, with approximately one third of the land used for single family residential, which is the dominant use. Public and private right-of-way (not included in Table 5-7) generally accounts for 20 percent of each study area, and all other land uses account for less than 20 percent of the study area. Almost all land uses are within one to two percent of each other between alternatives, with the largest difference between alternatives being 4% for commercial land between the SR 99 Hybrid and SR 99 Elevated Median alternative when compared with the I-5 Mixed West Side alternative.

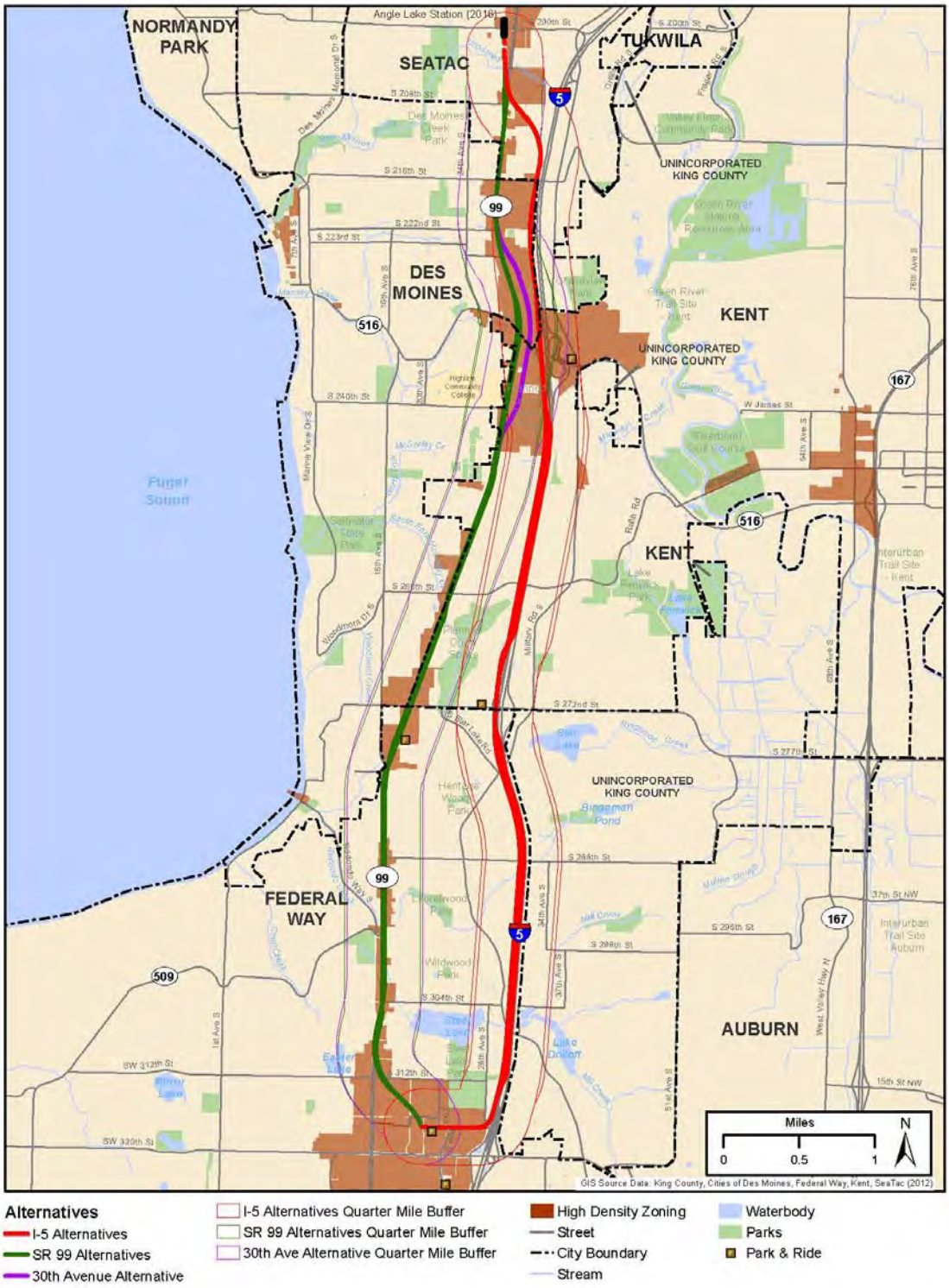


Exhibit 5-10
High-Density Zoning

Over the full length of each alternative, planned land uses do not vary noticeably between alternatives. The predominant planned land use for all alternatives is single family residential, followed by commercial. Multi-family and mixed use categories are the next largest categories, and have similar planned areas of approximately 10 percent of the study area. Compared with the percentages of existing land uses, the greatest areas of planned growth appear to be for single-family, mixed use and commercial land uses.

The area of underutilized land within the study area for each alternative is very similar for all alternatives. As shown in Table 5-7 (Existing Land Uses), all alternatives have 17 to 18% vacant land within a half-mile. This would suggest that approximately 20 to 30% of land within a ½ mile of each alternative could be developed or redeveloped. As described under the discussion of planned land uses, it is most likely that this land would be developed as single family residential, commercial, or mixed-use.

The greatest amount of high density zoning is along the 30th Avenue S. alternative, with 823 acres and 33 percent of all land within a ¼ mile of the alternative. The SR 99 alternatives had slightly less area, with 32 percent of the area within a ¼ zoned as high density. The I-5 alternatives had between 22 and 23 percent of the area zoned as high density, with the I-5 Mixed West Side having slightly greater area (one acre) than the I-5 Mixed West/Median alternative.

Key Results

- Existing and planned land uses are similar within a ½ mile between all alternatives.
- The predominant existing use in each study area is single family residential, followed by vacant land.
- Commercial development and multi-family residential are both about 10% to 15% of existing land use.
- Most planned land uses are within 1-3 percent of other alternatives.
- The largest difference in planned land uses occurs between the SR 99 Hybrid and the I-5 alternatives for single family residential, with a difference of 3%.
- All alternatives have approximately 30% underutilized parcels.
- The alternatives predominantly along SR 99 had approximately 10 percent more land zoned for high density within ¼ mile.

5.4.2 Population, Households, and Employment

The existing population, households, and employment within a half-mile of each alternative was evaluated to understand the density of existing development and how this relates to planned land uses.

Methodology

2010 U.S. Census data was used for population and households, and the total population and households within a half-mile of each alternative was determined using GIS. This methodology assumes that the populations and households are distributed evenly within each census block, so these numbers are estimates only for blocks that are not entirely within the half-mile study area. The alternative centerlines were provided to PSRC, who provided data on employment within a half mile of each alternative based on 2011 data from the Washington State Employment Security Department. Employment data are tied to specific locations and therefore are an accurate representation of employment in this study area. **Table 5-11** shows current population, household, and employment data with ½ mile of each alternative.

TABLE 5-11
Population, Households and Employment Within ½ Mile of Alternative

Alternative	Population	Households	Employment
SR 99 Alternatives			
SR 99 Elevated Median	35,800	14,000	14,000
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	35,900	14,000	14,000
SR 99 Hybrid	35,700	14,000	14,000
I-5 Alternatives			
I-5 Mixed West Side	35,100	13,300	11,400
I-5 Mixed West Side/Median	34,900	13,200	11,400

Key Results

- Households numbers are the same for all SR 99 alternatives, while population differs by 100 to 200 between these alternatives.
- The I-5 Mixed West Side alternative has slightly more population and households than the I-5 Mixed West Side/Median alternative.
- SR 99 has slightly higher populations and households than the I-5 alternatives.
- Employment is the same for all SR 99 alternatives and for both I-5 alternatives.
- SR 99 alternatives have approximately 2,600 additional jobs within a ½ mile.

Discussion of Results

Within a half mile of each alternative, the current population and number of households do not differ substantially. Between the SR 99 alternatives, the 30th Avenue S. Elevated West Side alternative has the highest population, but the number of households is the same as the other SR 99 alternatives. The maximum difference between alternatives is 1,000 people and 800 households. Employment along SR 99 is approximately 14,000, which is 20% higher than along

I-5. Total employment is the same between all SR 99 alternatives and between both I-5 alternatives.

5.4.3 Parking Opportunities

Park-and-Ride facilities expand the effective service area of individual transit routes and the transit system as a whole. These facilities attract passengers who either prefer to access transit by automobile or who have no other efficient or viable means of access.

Methodology

Based on the proximity of existing Park-and-Ride facilities to each alternative, the number of parking stalls and observed utilization rates are summarized to identify the total parking available within a ½ mile by FWTE alternative. Beyond the current active Park-and-Ride locations, an assessment of future potential Park-and-Ride locations was conducted by identifying existing church properties that are located within a ½ mile of a station area or accessible to RapidRide A Line. Although Sound Transit has not done so, other transit agencies commonly lease church parking lots for use as park and rides because they often have excess capacity during weekday commute hours. Lastly, a qualitative assessment of the potential for on-street transit parking and/or "hide-and-ride" activity was performed within a ½ mile of a station area. This was conducted by examining the relative convenient access from existing on-street non-restricted public parking to station areas in relationship to the existing Park-and-Ride utilization rates. Data for the existing park-and-ride lots in the study area are provided in **Table 5-12**.

TABLE 5-12
Park-and-Ride Lots in FWTE Study Area

Park-and-Ride Lot	Number of Existing Park-and-Ride spaces	Utilization of Existing Park-and-Ride spaces	Alternative Alignments Served
Kent-Des Moines	370	100%	I-5
St Columba's Episcopal Church*	15	33%	I-5
Star Lake	540	58%	I-5
Redondo Heights	697	8%	SR 99
All Saints Lutheran Church*	75	75%	I-5
Federal Way Transit Center	1,190	99%	I-5 and SR 99
Federal Way/S 320th St.	877	45%	I-5 and SR 99

** leased lots*
Note: Parking Utilization data from King County Metro as of 4th Qtr 2012

Discussion of Results

Seven Park-and-Ride locations have been identified in the FWTE study area. Three Park-and-Ride facilities, Federal Way Transit Center, the Federal Way/S. 320th Park-and-Ride and the Kent/Des-Moines Park-and-Ride, are assumed to be within a ½ mile of a potential station area for all five FWTE project alternatives. These lots account for over 2,400 total spaces but two out of three of these lots are currently at capacity. The only lot of these three with available capacity is the Federal Way/S. 320th Street lot.

In addition to the three Park-and-Ride lots that serve both the SR 99 and I-5 alternatives, the two I-5 alternatives are also near or adjacent to three Park-and-Ride facilities: Star Lake Park-and-Ride Lot, All Saints Lutheran Church, and St. Columbia's Episcopal Church. The two church lots are leased lots with less than 100 total spaces between them. The Star Lake Park-and-Ride currently operates at 58% utilization with approximately 225 spaces still available for use.

The SR 99 alternatives are adjacent to one additional Park-and-Ride lot, the Redondo Heights Park-and-Ride Lot. Based on existing capacity and availability, the SR 99 alternatives have about 70 additional total parking spaces than the I-5 alternatives. This is primarily because the Redondo Heights Park-and-Ride has limited commuter-oriented transit service to Downtown Seattle and other regional centers and therefore is currently only eight percent utilized. **Table 5-13** provides the total Park-and-Ride parking capacity and utilization of current parking by alternative.

TABLE 5-13
Parking Potential within 1/2-Mile of Alternative

Land Use	Number of Existing Park and Ride spaces	Utilization of Existing Park and Ride spaces	Number of Potential New Park and Ride locations
SR 99 Alternatives			
SR 99 Elevated Median	3,134	64%	4
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	3,134	64%	4
SR 99 Hybrid	3,134	64%	4
I-5 Alternatives			
I-5 Mixed West Side	3,067	75%	1
I-5 Mixed West Side/Median	3,067	75%	1

In terms of potential additional Park-and-Ride lot areas, there are only a handful of churches within reasonable proximity (1/2 mile) to either the station areas or a RapidRide A Line stop. Four of these churches are along SR 99. Only one additional church location was identified east of I-5 near the S. 272nd Street interchange.

The three possible station areas have various levels of available on-street parking supply and degree of ease between the station area and that on-street parking that influence their potential for hide and ride activity. In general, the stations along the S. 272nd Street corridor have the likeliest probability of hide and ride activity while the Federal Way Transit Center has the lowest potential.

Kent/Des Moines Station Area

The neighborhoods surrounding the Kent/Des Moines station area have a high degree of restricted parking with over 70 percent of the on-street parking restricted for residential use only. The high level of restricted parking makes the likelihood of station users parking in the neighborhood low.

S. 272nd Street Station Areas (Star Lake and Redondo Park-and-Rides)

The majority of residential development south of the Star Lake Park-and-Ride is multi-family with private resident-only parking. The residential neighborhood north of the Park–and-Ride lot off of 28th Avenue S. is relatively small with unrestricted on-street parking that is less than 10% utilized. The neighborhood south of S. 272nd Street and west of Star Lake Road has on-street parking that is about 10% utilized during the day. The distance from this neighborhood is about ½ mile from both the Star Lake Park-and-Ride and the Redondo Heights Park-and-Ride lots; however due to a combination of vegetation barriers and street connectivity, access to either the Star Lake or Redondo Heights station areas would require walking along S. 272nd Street. This would likely require a 15- to 20-minute walk to these station areas.

FWTC

The nearest neighborhood to the FWTC area with on-street parking is located north of S. 312th Street. Access to the station area would require walking along 28th Avenue S. past Truman High School. This is approximately a ½-mile walk that would take about 10 minutes. Therefore there is a low potential of riders parking in the neighborhood and walking to the transit center.

Key Results

- All five project alternatives (along both I-5 and SR 99) have similar parking availability.
- The Redondo Heights Park-and-Ride has the lowest utilization rate of all Park-and-Ride lots in the FWTE study area.
- Only a few existing locations could likely provide future leased Park-and-Ride space.
- The stations in the S. 272nd Street area (Star Lake and Redondo Heights) have some potential for “hide-and-ride” parking to occur. The on-street parking near the Kent/Des Moines and FWTC station areas are either restricted or are not easily accessible.

5.4.4 Non-Motorized Access

Existing and planned pedestrian facilities around the light rail station areas provide an opportunity to connect the adjacent land uses and the stations. A higher concentration of a street system is generally reflective of higher intersection density and improved non-motorized accessibility.

Methodology

The density of the existing street system within a ½ mile buffer of the station areas was calculated using GIS. The roadways are classified into two types:

- Local and Collectors
- Minor and Principal Arterials

Freeways were not included in this calculation as non-motorized access is not provided on freeways. Local Bicycle and Pedestrian Master Plans from the cities of SeaTac, Kent, Des Moines, and Federal Way as well as King County were also reviewed to understand any non-motorized deficiencies in and around the planned station areas as well as plans for future non-motorized investments. The number of miles of roadway in station areas is shown for each alternative in **Table 5-14**.

TABLE 5-14
Miles of Roadway within Station Areas

Alternative	Roadway Classification (in miles)		
	Local and Collector	Arterial	Total
SR 99 Alternatives			
SR 99 Elevated Median	20.5	10.0	30.5
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	20.5	10.0	30.5
SR 99 Hybrid	20.5	10.0	30.5
I-5 Alternatives			
I-5 Mixed West Side	16.0	10.5	26.5
I-5 Mixed West Side/Median	16.0	10.5	26.5
Note: a ½-mile buffer around the station area was used to calculate the roadway miles and values were round to the nearest ½ mile.			

Discussion of Results

The roadway system density (in miles) is similar for all of the alignment alternatives, although pedestrian and bicycle access for the station areas associated with the I-5 alternatives would be limited at the Kent-Des Moines Road and S. 272nd Street interchanges. Access between the station areas and areas east of I-5 would require crossing under I-5 at these interchanges. The combination of high roadway volume and congestion at these interchanges along with minimal

bicycle and pedestrian facilities create a non-motorized access barrier. These interchange areas are both shown as priority pedestrian and bicycle areas in the City of Kent's Non-Motorized Plan, but currently lack bicycle facilities and sidewalks around the interchanges are sporadic.

In general, SR 99 has sidewalks on both sides of the roadway and could provide access for non-motorized users to the light rail stations. Most other streets surrounding the station areas do not have continuous sidewalks. There are limited bicycle facilities along SR 99, however all potential station areas have been indicated as locations for future investments in both bicycle and pedestrian improvements by the local agencies. The City of Des Moines has future plans for a bike lane along S. 240th Street as well as S. 272nd Street, which would connect with the City of Federal Way's future bicycles plans along S. 272nd Street.

Key Results

- Many of the streets within the station areas lack sidewalks and have limited bicycle facilities.
- The SR 99 alternatives have a larger local street network than the I-5 alternatives which could provide greater non-motorized access.

5.5 Effect on Natural Environment

5.5.1 Wetlands and Streams

Wetlands are important ecosystem areas that provide habitat, contribute to hydrologic function, and water quality function in a given area. Streams are important aquatic habitats for salmonids and other fish. This criterion had two measures: direct effect on wetlands direct effect on streams.

Methodology

Existing wetland and stream data was obtained from King County and wetland data was provided by the City of Kent. These datasets were used to identify potential direct effects to wetlands and streams for each alternative as follows:

- Acreage of wetlands within the project construction footprint
- Length of streams within the project construction footprint

Wetlands and streams in the project area are shown on **Exhibit 5-11**. Quantified direct effects to wetlands and streams are shown in **Table 5-15**.

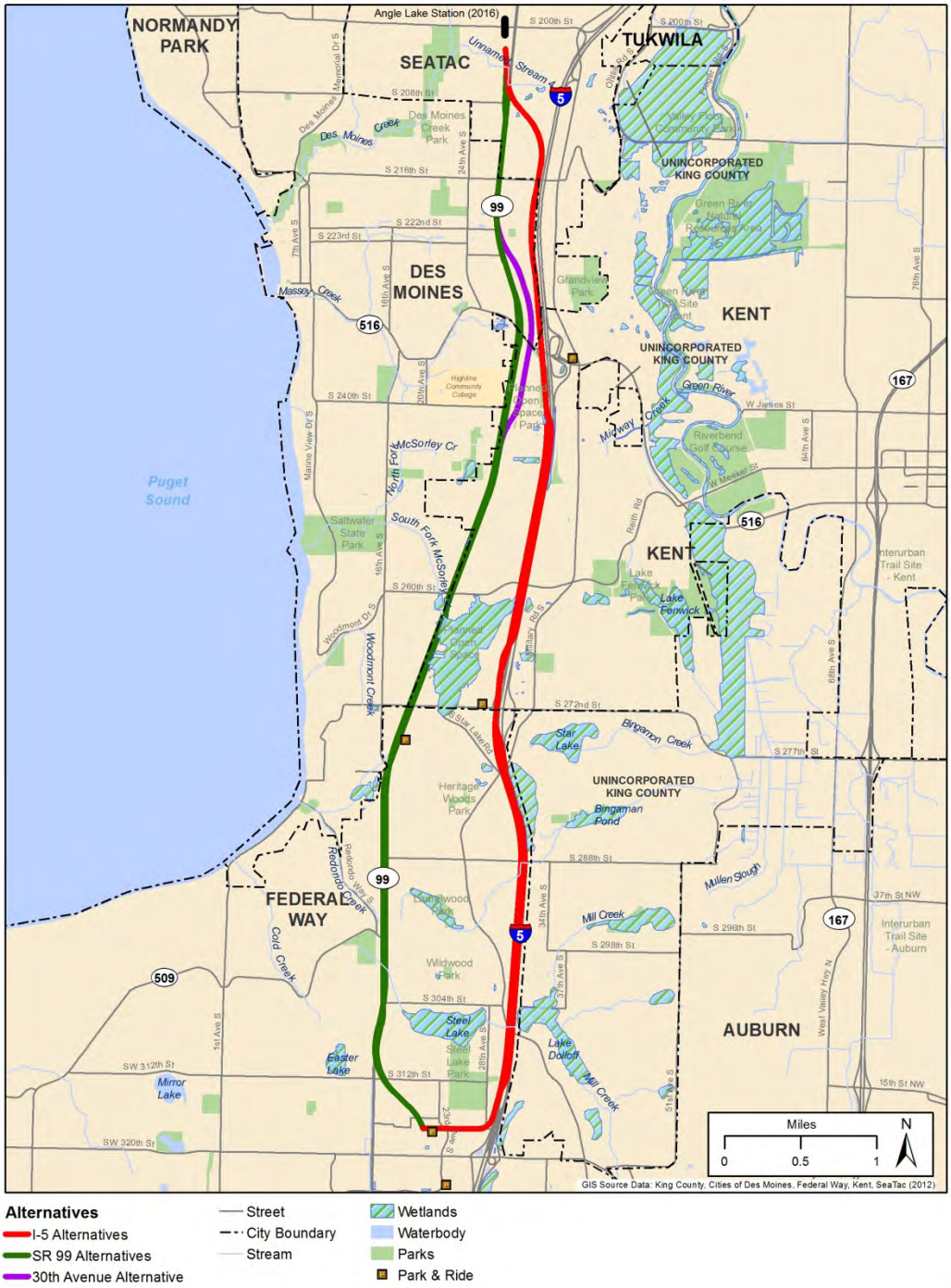


Exhibit 5-11
Wetlands and Stream Crossings

TABLE 5-15
Wetland and Stream Effects by Alternative

Alternative	Acres of Wetlands Directly Affected	Length of Streams Potentially Affected (feet)	Number of Stream Crossings
SR 99 Alternatives			
SR 99 Elevated Median	0	120	2
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	0	120	2
SR 99 Hybrid	0.7	60	2
I-5 Alternatives			
I-5 Mixed West Side	0	220	1
I-5 Mixed West Side/Median	0	220	1

Discussion of Results

Based on available wetland and stream data and the current level of design, the only alternative with potential direct effects on wetlands would be the SR 99 Hybrid. This impact would occur on the west side of the McSorley Creek wetland complex between S. 260th Street and S. 272nd Street. A total of 0.7 acres would be within the permanent right-of-way for this alternative, however the actual permanent impact may be less since the guideway would be elevated in this location. Field verification of wetlands in both corridors during the EIS process may identify new wetlands or revise the boundaries of known wetlands and when combined with further refined design of alternatives, additional direct effects to wetlands may still occur for all alternatives.

All Level 2 alternatives have streams within their construction footprints, with the shortest length of stream associated with the SR 99 Hybrid alternative, which crosses short distances of an unnamed stream near S. 204th Street and McSorley Creek. The SR 99 Elevated Median alternative would cross these streams as well, but has a larger footprint at these crossing because of greater roadway reconstruction at intersections. The I-5 alternatives would only affect the unnamed stream near S. 204th Street, but would parallel it for much of its length between SR 99 and I-5, resulting in the greatest length of stream within the construction footprint.

It is important to note that these streams are likely in culverts for much if not all of the length where they occur in the project footprint, so it is likely there would be no permanent impacts to these streams and that temporary impacts may only occur if the culvert needs to be disturbed or extended during construction.

Key Results

- There would be no wetland effects for either of the I-5 alternatives.
- The SR 99 Hybrid alternative would have the greatest amount of wetland directly affected.
- The SR 99 alternatives would have the most potential for effects to streams, while the I-5 alternatives would have the least.

5.6 Effect on Built Environment

The evaluation of effects on the built environment includes measures to identify potential effects to residences, neighborhoods, businesses, and the greater community. Individual measures are discussed below.

5.6.1 Visual Effects

Visual and aesthetic environments are the landscape's natural and cultural features that can be seen and that contribute to the public's appreciation and enjoyment of the landscape. Effects on the visual environment are defined in terms of the extent to which the project's presence would change the perceived visual character and quality of the environment.

Methodology

Three measures were used to evaluate potential visual effects. The first is the total length of the alternative adjacent to visually sensitive areas. Visually sensitive areas contain viewers such as residents or park users that have high visual sensitivity to changes in the viewed landscape because of their familiarity with an area, and/or, their frequent and long viewing duration of it. Areas containing single family residential neighborhoods, multifamily complexes, community centers (such as the Woodmont Library) and parks are considered to be sensitive viewing areas. These areas were initially identified using aerial photographs and online aerial imagery resources and were confirmed during site visits. In some locations there are sensitive viewers on both sides of an alignment. In these situations both sides were measured.

The second factor is the total length of the visual quality categories of areas the alternatives would pass by or through. This assessment was based upon Federal Highway Administration (FHWA) visual quality assessment methodology and guidance. Visual quality categorized by considering a viewed landscape's vividness (sense of drama, memorability, or distinctiveness), intactness (the visual integrity of a landscape and its freedom from visually encroaching and unattractive elements), and unity (the degree of visual coherence and compositional harmony). Vividness, intactness and unity are considered in establishing visual quality categories. In this assessment visual quality is categorized as high, average, or low. The visual quality of most landscapes is average. For the visual quality of a landscape to be considered high, it must be

exceptional in terms of vividness, intactness and unity. To be considered low, a landscape must be lacking in vividness, intactness and unity. Landscapes that are utilitarian in use and appearance, such as automobile-oriented businesses frequently found along transportation corridors, are often considered to have low visual quality. The visual quality of an area can indicate how responsive an area's most sensitive viewers would likely be to changes in the visual environment. For example, viewers such as residents with high viewer sensitivity in areas that are categorized as having medium visual quality would be expected to react more to changes in the visual environment than would viewers with low visual sensitivity in areas that have low visual quality. Visual quality was established by visual analysts as they drove through the project area to become familiar with it and by taking representative photographs of various parts of the project area to confirm the categories. The project area for visual assessment primarily follows the SR 99 and I-5 corridors. Most of the areas along the corridors are considered to be of average or low visual quality. There are a number of residential areas outside of the two corridors that were considered in this evaluation that have high visual quality. However, because views from these areas would likely not be affected by the alternatives being considered, they were not included in this evaluation.

The third factor is views of distant features such as Puget Sound and the Olympic Mountains. Several areas along the SR 99 corridor have these views, as identified during a site visit to the study area. The presence of the alternatives in these areas could interrupt or block views. Additional field investigations will be conducted during the EIS to determine specific areas with views (particularly if there are specific views identified in local plans or ordinances), the nature of the views (panoramic, narrow, only from elevated areas east of SR 99, etc.) and how specific alternatives might affect views. Information on visual effects is presented in **Table 5-16** and in **Exhibit 5-12** (in three parts).

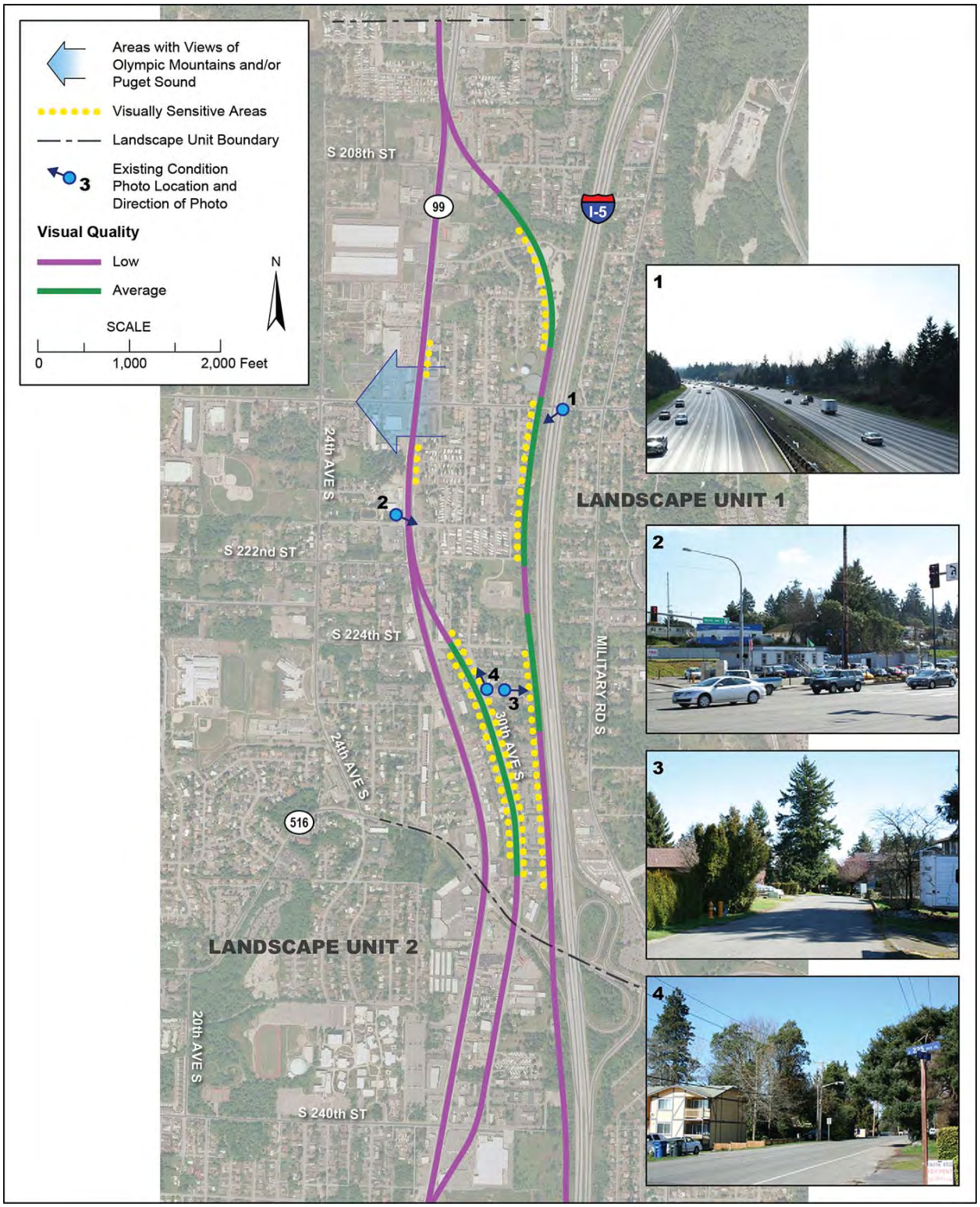


Exhibit 5-12a
Visual Conditions in Landscape Unit 1

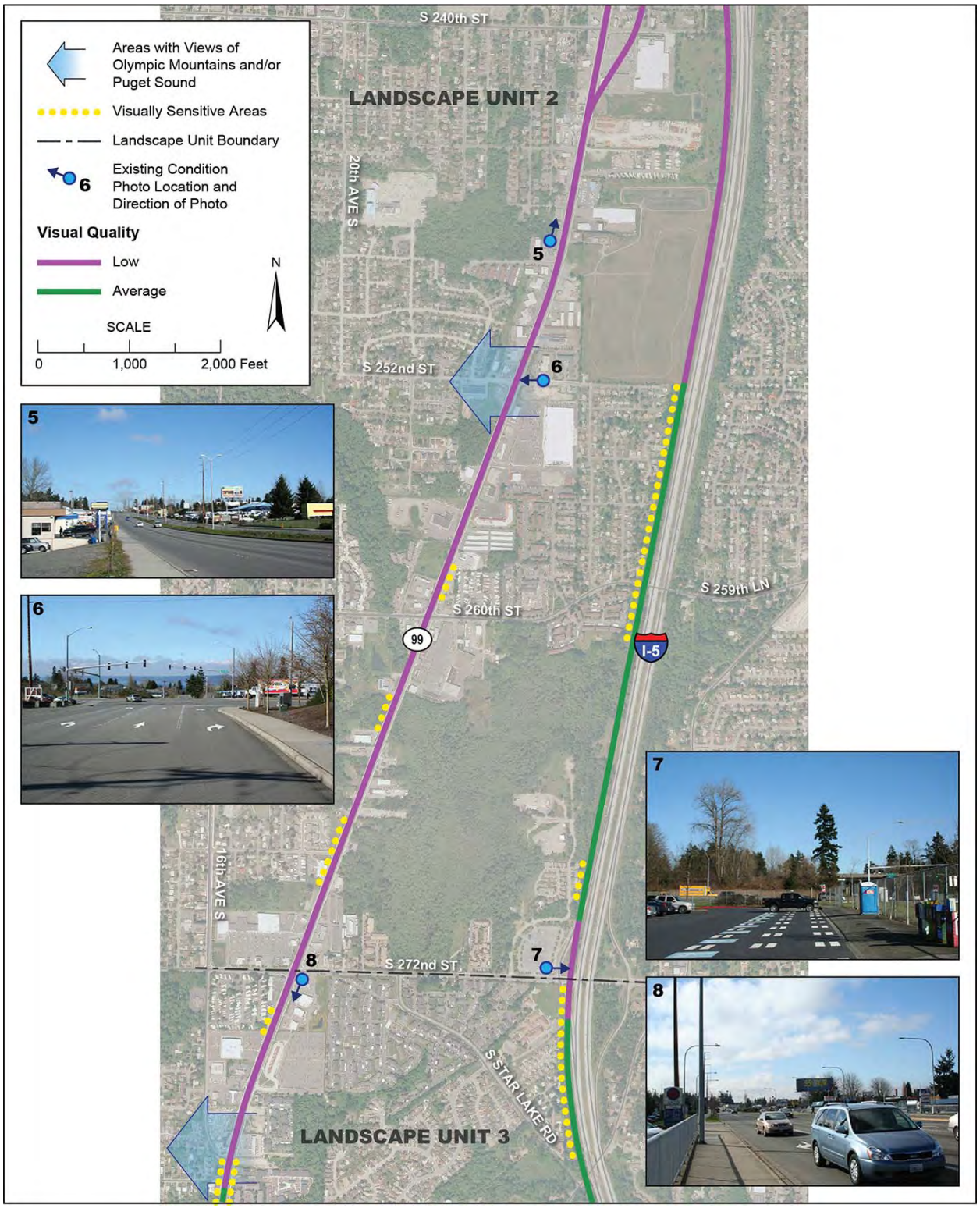


Exhibit 5-12b
Visual Conditions in Landscape Unit 2

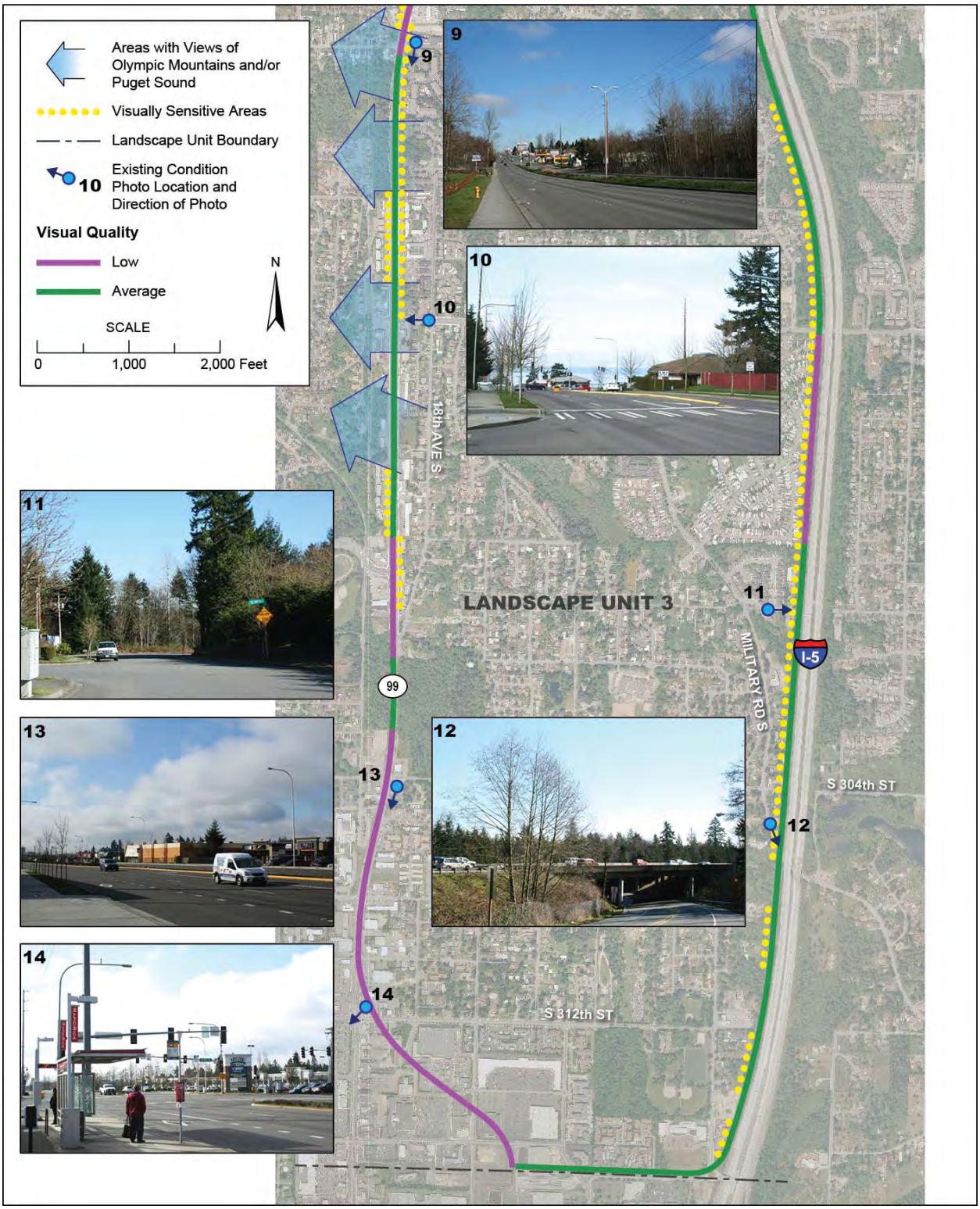


Exhibit 5-11c
Visual Conditions in Landscape Unit 3

TABLE 5-16
Visual Effects by Alternative

Alternative	Route Length Adjacent to Visually Sensitive Areas (feet)	Visual Quality (VQ) of Areas Adjacent to Visually Sensitive Areas (feet)		Number of Areas Near Alternative with Water and/or Mountain Views to West	Notes
		Average VQ	Low VQ		
SR 99 Alternatives					
SR 99 Elevated Median	7,275	5,050	2,225	6	
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	10,050	9,900	150	6	
SR 99 Hybrid	7,275	5,050	2,225	6	Potential at-grade parts of alignment not near sensitive viewing areas
I-5 Alternatives					
I-5 Mixed West Side	21,025	16,650	4,375	0	
I-5 Mixed West Side/Median	6,050	4,450	1,600	0	Most of route in I-5 median
Notes: All alternatives have a profile that is predominantly elevated. No areas of high visual quality were identified in the study area.					

Discussion of Results

Changes related to alternatives that would be routed along the west side of I-5 have the potential to have visual impacts along greater lengths of sensitive viewing areas than the alternatives along SR 99. This is due to the number of residential areas adjacent to the west side of I-5 and because vegetation along the west side of I-5 (within the I-5 right-of-way and next to it on private lands) has formed a backdrop to these residential areas that lines much of I-5 and blocks views of it from nearby areas. Although many residences that back up to I-5 “face” away from it, removing vegetation (mainly tall trees) and potentially seeing project components could change the character and visual quality of eastern views from these neighborhoods. This could be important if changes associated with removing vegetation along I-5 and building the elevated structure would lower average visual quality to low.

Alternatives that would be routed along SR 99 would pass by fewer sensitive viewing areas than the I-5 alternatives. In some locations the alternatives could impinge upon, or block, views to the west of Puget Sound and the Olympic Mountains from sensitive viewing areas. These areas can include locations at street level and higher areas to the east, which include multistory residential buildings and single family residences on the slopes east of SR 99. The City of Federal Way may have some protected views within the project area that will need to be identified and evaluated in the EIS.

Although this measure identifies the areas where visual effects may occur along each alternative, there are ways in which the alternatives can be designed to reduce or minimize this potential for impacts, and these will be evaluated further in the EIS.

Key Results

- The SR 99 Elevated Median and SR 99 Hybrid alternatives would pass next to the second shortest length (7, 275 feet) of visually sensitive areas of all the alternatives and the second least amount of areas with average visual quality (5,050 feet).
- The 30th Avenue S. Elevated West Side alternative would pass through a residential area, and therefore would pass by more visually sensitive areas (a total of 10,050 feet) than the SR 99 Elevated Median and the SR 99 Hybrid alternatives. It would also pass near more areas with average visual quality (9,900 feet total) than the other SR 99 alternatives.
- The I-5 Mixed West alternative would pass by the longest length of visually sensitive areas (21,025 feet) of all of the alternatives. The alternative would also pass next to the most sensitive areas that are adjacent to areas with average visual quality (16,650 feet).
- The I-5 Mixed West/Median alternative would pass by the least amount of visually sensitive areas (6,050 lineal feet) of all the alternatives and the least (4,450 lineal feet) amount of areas with average visual quality.

5.6.2 Potential Displacements

Properties would need to be purchased for right-of-way and other project-related facilities and would involve the displacement and relocation of residences and businesses. Projects receiving federal funding are required to comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Code of Federal Regulations [CFR] Title 49, Part 24), as amended. This Act provides guidance on how property owners will be compensated and relocated as necessary. Sound Transit adopted the *Real Property Acquisition and Relocation Policy, Procedures, and Guidelines* to guide its compliance with Chapter 8.26 Revised Code of Washington (RCW) and Chapter 468-100 Washington Administration Code (WAC).

Methodology

Individual properties and buildings may have one or multiple residential units or businesses, so potentially displaced buildings were field-checked to confirm the number of residences or businesses that would potentially be displaced. **Table 5-17** provides the total number of residences and businesses that could potentially be displaced for each alternative.

Discussion of Results

The SR 99 Hybrid alternative would result in the greatest number of potential business displacements, with up to 108, which is more than twice the number of businesses displaced by any other alternative. Both the I-5 Mixed West and I-5 Mixed West/Median alternatives would result in the greatest number of potential residential displacements, with up to 131, but would only displace three businesses.

TABLE 5-17
Potential Displacements by Alternative

Alternative	Potential Residence Displacements	Potential Business Displacements
SR 99 Alternatives		
SR 99 Elevated Median	31	49
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	102	41
SR 99 Hybrid	52	108
I-5 Alternatives		
I-5 Mixed West Side	131	3
I-5 Mixed West Side/Median	131	3

Key Results

- Displacements would be required for all alternatives.
- SR 99 alternatives would require more business displacements than alternatives along I-5.
- I-5 alternatives would require more residential displacements than alternatives along SR 99.

5.6.3 Community Facilities

For Level 2, community facilities are defined as schools, libraries, and religious institutions, based on available information from the King County Assessor as well as data collected in the field, which identified additional facilities than were identified in Level 1. These social centers and important meetings areas unify the community as well as provide vital services to communities.

Methodology

Community facilities have potential to be directly affected if they are within the project footprint and would be displaced. They may be indirectly affected by noise, visual, traffic, or construction effects if located up to 200 feet from the centerline of the alternative. As the alternatives are refined, many potential effects may be avoided or mitigated; therefore, this measure is intended to show relative differences among the alternatives. **Exhibit 5-13** identifies school, church, and government parcels within 200 feet of each alternative. **Table 5-18** shows the total number of these resources that could be directly and indirectly affected for each alternative.

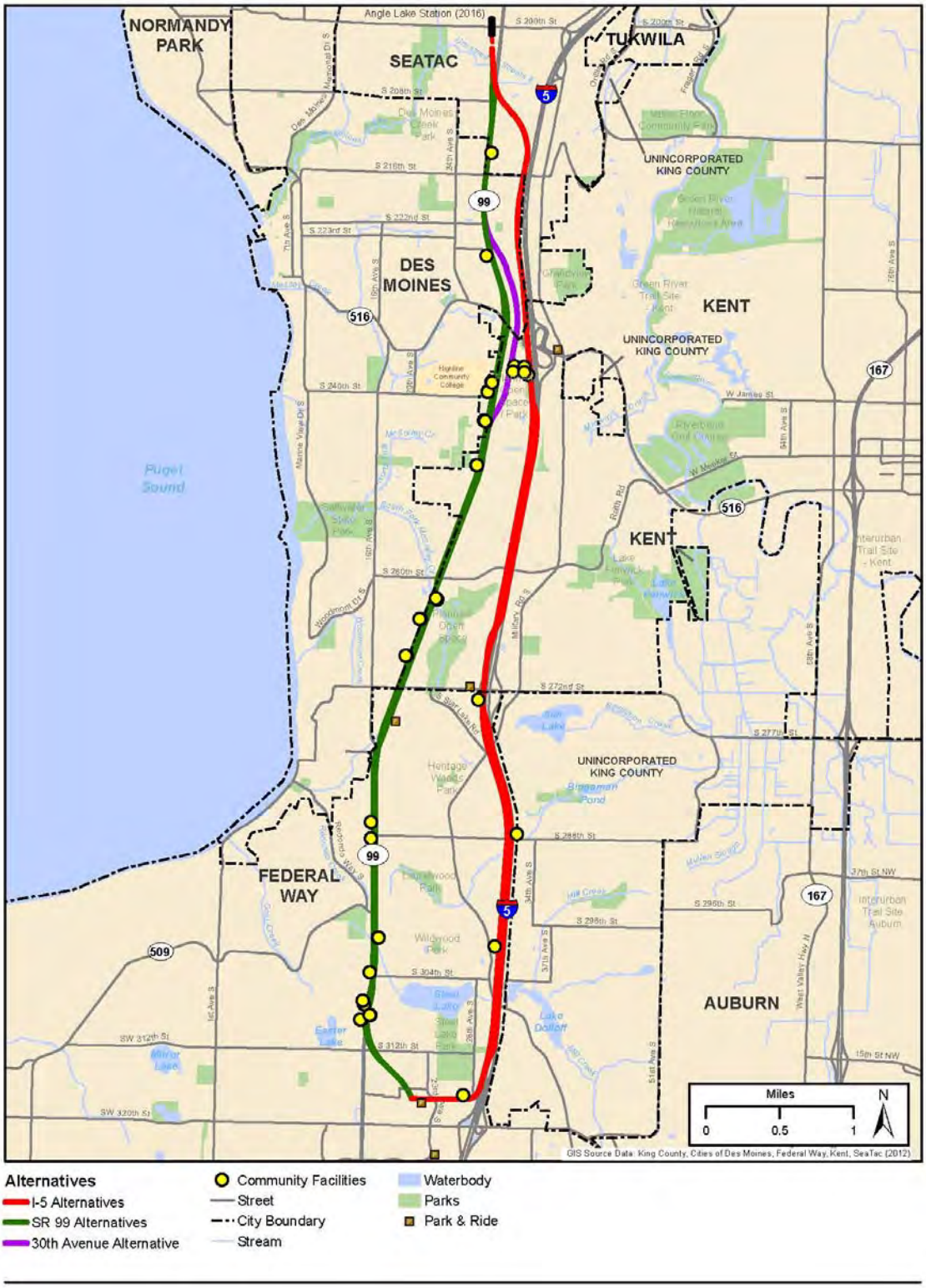


EXHIBIT 5-13
Community Facilities within 200 Feet of Alternatives

TABLE 5-18
Community Facilities – Effects by Alternative

Alternative	Number of Resources Directly Affected	Number of Resources Potentially Indirectly Affected
SR 99 Alternatives		
SR 99 Elevated Median	0	16
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	0	15
SR 99 Hybrid	3	13
I-5 Alternatives		
I-5 Mixed West Side	0	6
I-5 Mixed West Side/Median	0	6

Discussion of Results

The SR 99 Hybrid alternative would displace three churches and would be the only alternative with direct effects on community facilities. These churches are leased facilities within existing strip malls. The SR 99 Elevated Median alternative would have the greatest potential for indirect effects, with 16 community facilities within 200 feet, while the I-5 alternatives would have the least potential for indirect effects. Community facilities near stations, however, could experiences a benefit from improved access.

Key Results

- The SR 99 Hybrid alternative is the only alternative that would have direct effects on community facilities, displacing three churches.
- The I-5 alternatives would have less potential for indirect effects to community facilities than alternatives along SR 99.

5.6.4 Noise

Noise sensitive receivers were evaluated for Level 2 based on Federal Transit Administration's (FTA) criteria in the *Transit Noise and Vibration Impact Assessment* (FTA 2006), which groups noise sensitive land uses into the following categories:

- Category 1: Certain buildings or outdoor spaces, where quiet is an essential element of their purpose.
- Category 2: Residences and buildings where people normally sleep, including residences, hospitals, and hotels where nighttime sensitivity is assumed to be important.
- Category 3: Institutional land uses with primarily daytime and evening use, including schools, libraries, churches, and certain parks.

Methodology

Within the FWTE study area, potential noise sensitive receivers evaluated for Level 2 include residences and hotels (Category 2 receivers) and schools and churches (Category 3 receivers). No Category 1 receivers were identified in the alternative corridors. All Category 2 receivers would be assumed to have a high potential for noise effects at distances of up to 175 feet from the track. Category 2 receivers along elevated alternatives or in areas with little or no shielding from at-grade alternatives would be considered to have a high potential for noise effects out to 350 feet from the alignment. Schools and churches were considered if within 175 feet of the alternative with no obstructions. Only minimal physical and topographical shielding was considered and used to reduce effects. Existing background noises were not taken into account for the purposes of the Level 2 evaluation (i.e., noise from I-5). **Table 5-19** summarizes the effects along the entire length of each alternative.

Discussion of Results

The 30th Avenue S. Elevated West Side alternative would result in the greatest potential for noise effects at both Category 2 and Category 3 receivers, with almost 2,500 Category 2 and 12 Category 3. The I-5 Mixed West alternative would have the next highest number of Category 2 receivers, with just over 2,000, but only five Category 3 receivers. The remaining alternatives would have fairly similar effects on Category 2 receivers, with approximately 1,600 to 1,700 affected; but there is a wider range of potential Category 3 receivers affected.

TABLE 5-19
Potential for Noise Effects by Alternative

Alternative	Category 2 Noise-Sensitive Receivers (Residences, Hotels)	Category 3 Noise-Sensitive Receivers (Schools, Churches)
SR 99 Alternatives		
SR 99 Elevated Median	1,700	11
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	2,500	12
SR 99 Hybrid	1,600	9
I-5 Alternatives		
I-5 Mixed West Side	2,000	5
I-5 Mixed West Side/Median	1,700	3

Key Results

- The 30th Avenue S. Elevated West Side alternative would result in the highest number of potential noise effects.
- The SR 99 Hybrid alternative would result in the lowest number of potential noise effects.

- The I-5 Mixed West Side/Median alternative would have the fewest Category 3 noise-sensitive receivers.

5.6.5 Vibration

The FTA criteria in the *Transit Noise and Vibration Impact Assessment* (FTA 2006) identifies three types of land use for vibration: Category 1-High Sensitivity, Category 2-Residential and Category 3-Institutional. The criteria for determining impacts to these land uses are based on the frequency of events, with Category 1 having the most sensitive criteria for vibration and ground-borne noise impacts and Category 3 having the least sensitive criteria. The potential for vibration and ground-borne noise impacts also depends on the soils in the area and how vibration travels through these soils, requiring vibratory testing along the corridor to determine the properties of the soils in the project area, although residences within 150 feet will generally be considered vibration sensitive for purposes of the impact analysis. This testing and analysis will be completed for the EIS, but was not completed for screening, however the number of Category 2 receivers is expected to similar to but less than the number of Category 2 noise sensitive receivers. For this reason, the Level 2 evaluation prioritized the most sensitive land uses (Category 1) along each alternative, because assessing the sensitivity of other land use categories appropriately would require field vibratory testing.

Methodology

A field survey of properties along all alternative alignments was completed to identify buildings that would be potentially high sensitivity land uses, known as Category 1. Category 1 land uses are described as “buildings where vibration would interfere with operations within the building, including levels that may be well below those associated with human annoyance” (FTA 2006). Typical land uses covered by Category 1 include:

- Vibration sensitive research and manufacturing
- Hospitals with vibration-sensitive equipment
- University research operations

The FTA guidance also identifies “special buildings” that can be very sensitive to vibration but do not fit into Categories 1 through 3. These include concert halls, TV studios, recording studios, auditoriums, and theaters. The FTA screening manual treats concert halls and TV studios as Category 1 and auditoriums and theaters as Category 2.

Discussion of Results

No highly sensitive receptors were identified along any of the alternative alignments; therefore none of the alternatives have potential to affect highly sensitive receptors.

Key Result

- No Category 1 vibration-sensitive land uses or special buildings were identified along any alternative alignment.

5.6.6 Traffic

Potential traffic effects include increased waiting time at intersections, which can affect an intersection's Level of Service (LOS). This increase in delay is generally attributable to higher volumes of traffic traversing an intersection, but can be caused by changes in the distribution of traffic as well.

Methodology

This evaluation used local agency transportation plans to identify intersections that are currently operating near, at, or worse than a jurisdiction's LOS threshold. LOS describes traffic operations service quality and ranges from A (best) to F (worst). A LOS of "D" was chosen to identify intersections that are currently congested. Intersections that are currently congested (i.e. LOS D or worse) and would likely have additional project-related traffic travel through it are identified. Project-related traffic is defined as:

- Vehicles to or from a proposed station (with a park-and-ride), or
- Traffic re-circulation caused by a project-related restriction of current acceptable traffic movements.

Roadway access changes due to an alternative could restrict access at existing un-signalized intersections and mid-block U-turns and/or left-turn lanes. To evaluate these potential effects, traffic occurring at these locations was re-circulated to identify congested intersections that would likely see an increase in traffic. **Table 5-20** documents the number of congested intersections that would experience a noticeable increase in traffic due to station-related traffic and/or traffic re-circulated because of roadway access changes caused by the alignment. The locations of these congested intersections are indicated in **Exhibit 5-14**.

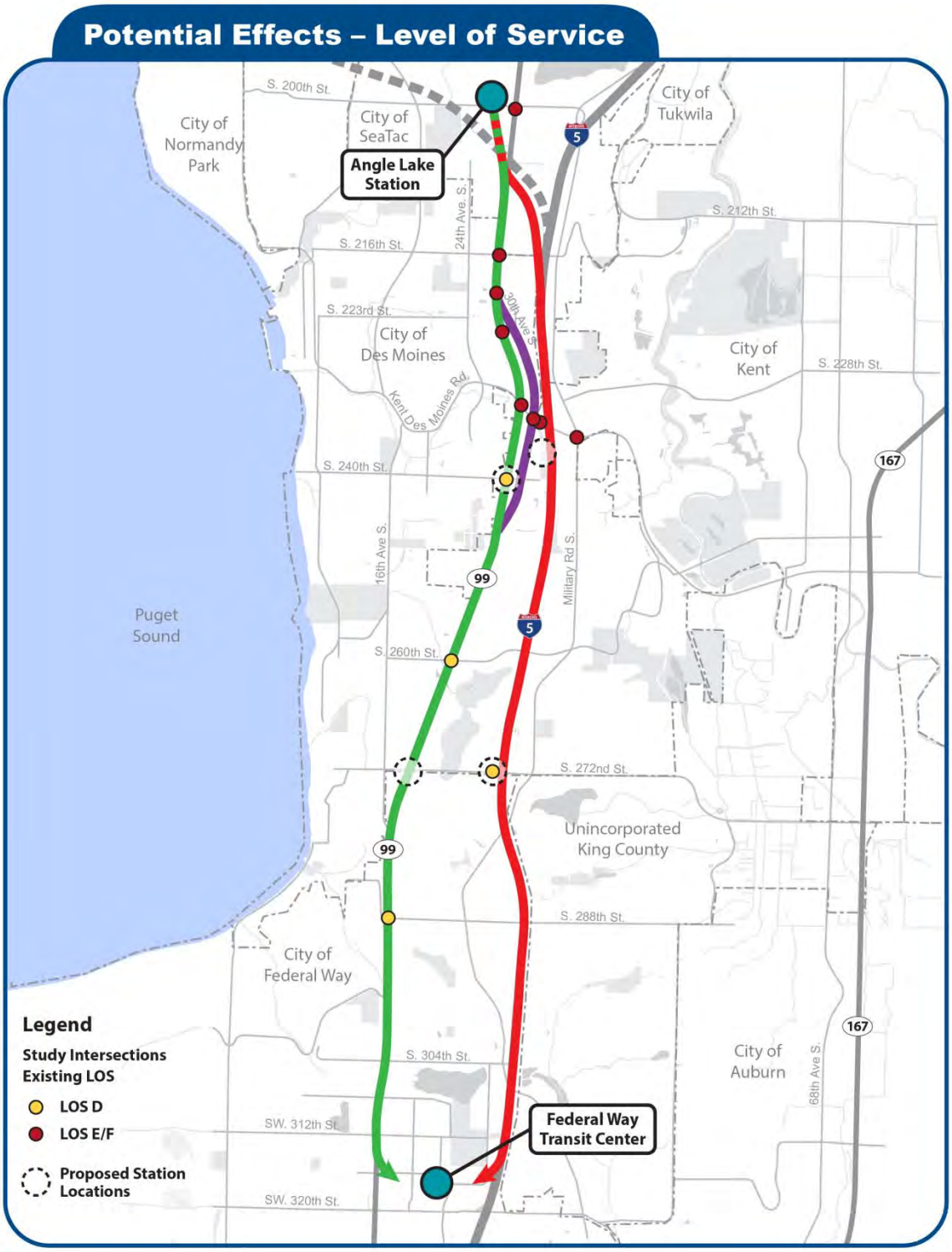


EXHIBIT 5-14
Potential Intersection Effects - Level of Service

TABLE 5-20
Number of Congested Intersections Affected

		Number of Congested Intersections with Potential Traffic Effects		
Alternative	**Total Number of Signalized Intersections**	**Alignments**	**Station Areas**	**Total: Alignments and Station Areas**
SR 99 Alternatives				
SR 99 Elevated Median	34	8	6	14
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	34	8	6	14
SR 99 Hybrid	34	2	9	11
I-5 Alternatives				
I-5 Mixed West Side	22	0	11	11
I-5 Mixed West Side/Median	22	0	11	11

Discussion of Results

The I-5 alternatives are not expected to create any turn restrictions that would cause additional traffic to re-circulate and impact congested intersections along the alignment. There are 11 intersections at possible I-5 station areas that are at or worse than LOS D that could see an increase in traffic. Five intersections are near the Kent-Des Moines interchange with I-5, one is at Star Lake Park-and-Ride, and five of these are near the FWTC.

The most substantial alignment related traffic impacts occur with the alternatives that have a median alignment. With the SR 99 Elevated Median alternative up to 8 intersections would see a noticeable increase in volume due to turn restrictions caused by the alignment. Six congested intersections are within the station areas for a total of 14 congested intersections that would potentially have project-related traffic through them. In contrast, the SR 99 Hybrid Alternative would only have two congested intersections impacted by re-circulating traffic caused by the alignment along with nine station area congested intersections, for a total of 11 congested intersections that would potentially have project-related traffic through them. This is because there are substantial sections of the SR 99 Hybrid Alternative that are side-aligned and not in the SR 99 median. The I-5 Alternatives have a total of 11 congested intersections within the station areas and no congested intersections that are affected by the alignment.

Key Results

- The SR 99 Elevated Median alternative is expected to have the greatest traffic effects at congested intersections because this alternative has the highest business traffic re-circulation effect.
- The SR 99 Hybrid alternative would have the fewest congested intersections.

- The I-5 alternatives would not restrict any traffic movements and have the fewest number of congested intersections that would have potential traffic effects.

5.6.7 Construction Effects

Identifying the potential effects on traffic and the subsequent effect this has on businesses and residents due to construction activities of the project alternatives is an important aspect to understand with the FWTE project. Construction impacts for the Level 2 screening are estimated based on a high-level understanding of the design and construction requirements of the Level 2 alternatives.

Methodology

A qualitative assessment of potential construction related effects was performed based on a high-level understanding of how the alternatives might be constructed. This assessment was based on the need for lane closures during the major construction period(s) required for those closures. **Table 5-21** summarizes the anticipated construction effects on traffic. The potential effects of these construction activities on the local communities, including residents and businesses, are discussed qualitatively.

TABLE 5-21
Summary of Construction Effects

Alternative	Summary of Construction Effects
SR 99 Alternatives	
SR 99 Elevated Median	Highest Effect – Likely up to two lane closures on SR 99 during the construction period.
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	High Effect - Likely up to two lane closures on SR 99 during the construction period. 30th Avenue South would likely be restricted to local access only.
SR 99 Hybrid	Medium Effect – Could require closure of the outside lanes on SR 99 during construction activities which would impact the operations of the BAT lane. When alignment in median up to two SR 99 lane closures during the civil construction period.
I-5 Alternatives	
I-5 Mixed West Side	Lowest Effect – Would likely avoid I-5 mainline impacts but would require some closures of the southbound on- and off-ramps.
I-5 Mixed West Side/Median	High Effect - Likely requires the closure of the I-5 HOV lanes during the construction period as well as at least some southbound I-5 lanes during any crossing related construction work.

Discussion of Results

The median options on both the SR 99 and I-5 alternatives would likely have the greatest impact to traffic operations during construction activities. On I-5, the median alternative would likely require full lane closures of the northbound and southbound HOV lanes on I-5 due to the proximity of construction activities to the travel lanes and the higher operating speed on I-5. To

cross I-5, at least some of the southbound I-5 lanes would be closed when there is active construction work being done on the elevated structure. Closures would be timed to minimize effects on traffic; however some traffic effects could still occur.

On SR 99, while construction is active in the median, it would likely require the closure of two lanes of the roadway to provide adequate separation between the construction activities and adjacent vehicle travel. Construction of elevated median stations would likely require additional lane closures. The construction activities could possibly be staggered between the construction staging areas but this would need further review. With the SR 99 Hybrid alternative, there are substantial portions that are side-aligned and therefore would likely require closure of up to one lane of traffic. This could temporarily affect the business access transit (BAT) lane, affecting business access and transit reliability. Portions of the SR 99 Hybrid alternative that are in the median would have similar construction effects to traffic as the SR 99 Median Alternative. The 30th Avenue S. alternative would avoid construction across the congested SR 99 and Kent-Des Moines Road intersection, reducing the potential for effects on traffic at this intersection during construction.

The I-5 Mixed West Side alternative would likely have some effects at or near the I-5 southbound on- and off-ramps but would not likely affect any I-5 mainline operations. As such, this alternative has the lowest construction-related traffic impacts of all alternatives because it would have the least potential for lane closures and would have the least community disruption. Construction impacts would mostly be noticed by residential properties that are adjacent to I-5, and the construction area would be behind back yards and could be buffered by existing stands of large trees. Potential construction effects to these residences include noise, dust, and visual effects.

Based on the traffic effects described above, the SR 99 Elevated Median and 30th Avenue S. Elevated West Side alternatives would have the most disruption to the community in terms of general mobility, as lane reductions on SR 99 would reduce traffic capacity and potentially result in delays along the corridor. The 30th Avenue S. Elevated West Side alternative would also be the only alternative to pass directly through a residential neighborhood, and this neighborhood has high concentrations of minority and low-income populations. Potential construction effects to these residences include access, noise, dust, and visual effects.

Where the SR 99 Hybrid alternative would be side-running, it would have greater impacts on businesses and residents on that side of the road, although access would be maintained through the construction area to the extent possible. Driveways may need to be consolidated during construction but signage regarding business access would be provided. Effects on overall mobility during construction of the SR 99 Hybrid are expected to be less than the SR 99 Elevated Median alternative, which would close two travel lanes during construction.

Key Results

- The SR 99 Elevated Median alternative would require closure of up to two lanes of traffic along SR 99 during construction and would have the greatest construction effect on mobility within the community.
- The SR 99 Hybrid alternative would have less effect on traffic than the SR 99 Elevated Median alternative, but would have more effect on adjacent businesses and residents on the side of the road where it is being constructed.
- The 30th Ave S. alternative would construct a portion of the alternative in a residential neighborhood that has a high proportion of minority and low-income residents.
- The I-5 Mixed West Side/Median alternative would likely require closure of the HOV lanes on I-5 during construction activities and would require at least some I-5 southbound lane closures during the elevated construction across those southbound lanes.
- The I-5 Mixed West Side alternative would likely have the lowest impact with ramp closures for short durations, as it would likely avoid impacts to the I-5 mainline, but could have effects on adjacent residences during construction.

5.7 Design Considerations

5.7.1 Utilities

Methodology

Existing utility location information was obtained from publicly available Geographic Information System (GIS) data for the Cities of SeaTac, Des Moines, Kent, and Federal Way and from as-built information or system maps provided by utility owners. This information was used to perform a high-level evaluation of existing utilities, including water, sanitary sewer, electrical transmission/distribution, telecommunications, natural gas, and stormwater. Most providers have their own standards for utility construction, which tends to increase complexity when the same type of utility is affected in multiple jurisdictions. A more detailed evaluation of utility relocation requirements will be conducted as part of the EIS process after the engineering design process has advanced.

Discussion of Results

In general, roadway replacement and/or roadway widening is expected to require replacement in-kind of affected utilities. Direct conflict between the proposed LRT guideway and utilities is similarly expected to require replacement. Damage to existing infrastructure during construction is likely to require additional replacement.

Existing utility systems in the study area and their associated agencies are identified in **Table 5-22** below:

TABLE 5-22
Summary of Utility Providers

Utility Discipline	City of SeaTac	City of Des Moines	City of Kent	City of Federal Way	Highline Water District	Midway Sewer District	Lakehaven Utility District	Puget Sound Energy	Comcast	CenturyLink	Level 3 Communications	Seattle Public Utilities
Water					✓		✓					
Sanitary Sewer						✓	✓					
Electrical								✓				
Communications									✓	✓	✓	
Natural Gas								✓				
Stormwater	✓	✓	✓	✓								
Solid Waste												✓

Only those water systems with mains 12 inches or greater in diameter were evaluated. Highline Water District has numerous storage tanks adjacent to the western edge of the I-5 right-of-way north of S. 216th Street. **Table 5-23** provides a summary of the existing water facilities that parallel or cross SR 99 or I-5 within the study area.

Table 5-24 provides a summary of the existing sewer facilities that parallel or cross SR 99 or I-5 within the study area. There are no sewer pump stations or treatment plants within the study area.

TABLE 5-23
Summary of Existing Water Utilities

Alternative	Existing Water Facilities
SR 99 Elevated Median SR 99 Hybrid	• 16-inch water main along 28th Avenue S. from Angle Lake Station to SR 99. • Water mains along both sides of SR 99 from S. 200th Street to S. 279th Street. Generally, the 16-inch water main is on the east side of SR 99 and the 8-inch and 12-inch mains are on the west side. • 12-inch water main on the east side of SR 99 from S. 288th Street to S. 308th Street. • Dual 12-inch water mains, one on each side of SR 99, from S. 308th Street to S. 320th Street. • 10-inch to 18-inch water mains perpendicular to the alignment at arterial intersections from S. 200th Street to S. 320th Street (8 total).
I-5 Mixed West Side I-5 Mixed West Side/Median	• 16-inch water main along 28th Avenue S. from Angle Lake Station to SR 99. • 8-inch to 12-inch water mains along the streets crossed from S. 204th Street to I-5. • 30-inch water main along I-5 from S. 208th Street to near S. 216th Street. • Multiple water tanks (Highline Water District) on the west side of I-5 north of S. 216th Street. • 6-inch to 18-inch water mains perpendicular to the alignment along I-5 from S. 216th Street to S. 317th Street. (12 total)
30th Avenue S. Elevated West Side	• 12-inch water main along the east side of 30th Avenue S. from S. 216th Street to S. 240th Street.

TABLE 5-24
Summary of Existing Sewer Utilities

Alternative	Existing Sewer Facilities
SR 99 Elevated Median SR 99 Hybrid	• 8-inch sewer along 28th Avenue S. from Angle Lake Station to SR 99. • The west side of SR 99 has an 8-inch sewer from S. 208th Street to S. 216th Street. • The east side of SR 99 has a 10-inch sewer from S. 208th Street to S. 211th Street, and an 8-inch sewer from S. 211th Street to S. 216th Street. • Intermittent 8-inch to 12-inch sewers on the east side of SR 99 from S. 216th Street to S. 320th Street. • 8-inch to 14-inch sewer on the west side of SR 99 from S. 260th Street to S. 272nd Street.
I-5 Mixed West Side I-5 Mixed West Side/Median	• 8-inch sewer along 28th Avenue S. from Angle Lake Station to SR 99. • Various crossings, ranging from 8-inch to 18-inch along the alignment from S. 204th Street to S. 217th Street.
30th Avenue S. Elevated West Side	• 8-inch sewer on the west side of 30th Avenue S. from S. 224th Street to S. 240th Street.

Sound Transit requires a minimum clearance be maintained between its Overhead Catenary System (OCS) wires and any power lines. The electrical transmission facilities within the study area are primarily overhead lines, and are typically 115kV; these would need to be raised or relocated where they would not meet OCS separation standards with the proposed LRT guideway. The electrical distribution system is typically underground along SR 99 and overhead along surrounding streets. Except for a few crossings, there is no electrical transmission or distribution along the I-5 right-of-way. PSE's Midway Switch Station and Freeway Substation are co-located along I-5 south of S. 221st Street, and PSE has indicated that the steel lattice towers on either side of I-5 near S. 224th Street that serve these facilities would need to be replaced,

given their age and structure type, to accommodate a line raise/relocation. **Table 5-25** provides a summary of the existing electrical facilities that parallel or cross SR 99 or I-5 within the study area.

TABLE 5-25
Summary of Existing Electrical Transmission and Distribution Facilities

Alternative	Existing Electrical Transmission and Distribution Facilities
SR 99 Elevated Median SR 99 Hybrid	• 115kV on the east side of 28th Avenue S. from Angle Lake Station to SR 99. • 115kV on the west side of SR99 from S. 204th Street to S. 212th Street. • 115kV on the east side of SR 99 from S. 212th Street to S. 220th Street. • 115kV on the west side of SR 99 from S. 240th Street to S. 288th Street. • 115kV on the east side of SR 99 from S. 300th Street to S. 320th Street. • PSE substation on the east side of SR 99 at approximately S. 290th Street. • PSE substation on the east side of SR 99 at S. 316th Street.
I-5 Mixed West Side I-5 Mixed West Side/Median	• 115kV on the east side of 28th Avenue S. from Angle Lake Station to SR 99. • PSE substation at S. 221st Street. • Transmission lines cross I-5 at S. 216th Street, the PSE substation, and S. 288th Street. • Distribution lines cross I-5 at S. 221st Street, S. 259th Court, S. 272nd Street, S. 304th Street, and Military Road S.
30th Avenue S. Elevated West Side	• 115kV on the east side of 30th Avenue S. • Distribution on the west side of 30th Avenue S, except where it is on the east side of 30th Avenue S as it crosses Kent-Des Moines Road. • PSE substation at S. 221st Street.

The two primary telecommunications providers with major utility infrastructure in the study area are Comcast and CenturyLink. Their systems generally follow the electrical distribution network, buried along SR 99 and overhead on surrounding streets. There are no major telecommunications facilities parallel to I-5. A fiber optic system owned by Level 3 Communications follows Military Road S. through the study area and crosses I-5 at each Military Road S. undercrossing.

Puget Sound Energy is the natural gas provider within the study area. Most of the infrastructure encountered is local distribution consisting of 2-inch, 4-inch and 6-inch diameter intermediate-pressure pipelines. A 16-inch diameter high-pressure pipeline parallels the alignments along 28th Avenue S., and then follows SR 99 to S. 208th Street where it turns west; all alternatives have the potential to conflict with this pipeline segment as they depart Angle Lake Station. The 16-inch pipeline is encountered again at S. 272nd Street, where it crosses the SR 99 and I-5 alternatives. A branch of the 16-inch pipeline crosses the I-5 alignments once more at the southernmost crossing of Military Road S.

Only existing stormwater conveyance open channels and closed pipes that are 12 inches in diameter or greater and that parallel or cross SR 99 or I-5 within the study area were evaluated. Existing flow control and treatment facilities located along or downstream of the alternative routes were also located. **Table 5-26** provides a summary of the existing stormwater facilities.

TABLE 5-26
Summary of Existing Stormwater Facilities

Alternative	Existing Stormwater Facilities
SR 99 Elevated Median SR 99 Hybrid	• Approximately 71,300 feet of 12- to 24-inch-diameter conveyance pipe • Approximately 2,300 feet of 30- to 36-inch-diameter conveyance pipe • Approximately 1,000 feet of greater than 36-inch-diameter conveyance pipe • Publicly-owned 48-inch-diamter box culvert on the west side of SR 99, approximately 600 feet northwest of the intersection with S. 208th Street. • Approximately 4,300 feet of open channel conveyance • 7 flow control facilities • 4 water quality treatment facilities
I-5 Mixed West Side I-5 Mixed West Side/Median	• Approximately 29,000 feet of 12- to 24-inch-diameter conveyance pipe • Approximately 690 feet of 30- to 36-inch-diameter conveyance pipe • Approximately 1,600 feet of greater than 36-inch-diameter conveyance pipe • Privately-owned 42-inch-diamter pipe crossing I-5, approximately 1,000 feet north of the S. 288th Street underpass • Approximately 36,300 feet of open channel conveyance • 4 flow control facilities • Privately-owned 84-inch-diamter detention pipe on the west side of I-5, approximately 1,000 feet north of the S. 288th St. underpass • 3 water quality treatment facilities
30th Avenue S. Elevated West Side (connected to the SR 99 Elevated Median alternative)	• Approximately 62,400 feet of publically owned 12- to 24-inch-diameter conveyance pipe • Approximately 1,200 feet of privately owned 12- to 24-inch-diameter conveyance pipe • Approximately 2,300 feet of publically owned 30- to 36-inch-diameter conveyance pipe • Publicly-owned 48-inch-diamter box culvert on the west side of SR 99, approximately 600 feet northwest of the intersection with S. 208th Street. • Approximately 970 feet of publically owned conveyance pipe greater than 36-inch-diameter • Approximately 5,000 feet of open channel conveyance • 7 flow control facilities • 4 water quality treatment facilities
No information on existing stormwater management facilities was available for the section of I-5 north of S. 224th Street	

Midway Landfill is a closed municipal solid waste facility maintained by Seattle Public Utilities, located west of I-5 between S. 244th and S. 252nd Streets (see Section 5.7.3 for additional information). The potential presence of hazardous materials at the facility led to its designation as a Superfund site (see Section 5.7.2 for additional information).

A summary of the existing major utilities encountered along the SR 99 and I-5 corridors is listed in **Table 5-27**.

TABLE 5-27
Summary of Existing Major Utilities

Utility Type	SR 99	I-5
Water	• 16-inch, 18-inch, and 60-inch pipes	• 16-inch, 30-inch and 60-inch pipes • Highline Water District Tanks at S. 216th Street
Sanitary Sewer	• 36-inch pipe	• (None)
Electrical	• 115kV transmission parallel and crossing	• 115kV transmission crossing • 230kV transmission crossing • Substation adjacent
Stormwater	• 36-inch and 42-inch pipes • 48-inch box culvert	• (None)
Solid Waste	• (None)	• Midway Landfill

Key Results

- Utility work may cause service interruptions, requiring coordination with agencies, jurisdictions and affected neighborhoods to minimize disruptions.
- Utility construction work in SR 99 may affect traffic flow, potentially requiring lane closures and/or detours. Such conflicts are not likely to be substantial for I-5 alternatives.
- High-voltage electrical transmission facilities along the length of corridor, both parallel and crossing, will require line raising and/or relocation. These facilities affect the SR 99 alternatives more than they affect the I-5 alternatives.
- Highline Water District storage tanks and the Midway Landfill affect the LRT guideway for I-5 alternatives.

5.7.2 Hazardous Materials

The presence of contaminated sites in the project area can affect a project in multiple ways. Investigation may be required to determine the potential construction cost impacts of the contaminated site. Contaminated sites can also result in reduced property acquisition cost to account for the cost of mitigation during construction. Contaminated properties that are acquired could require remediation in order to serve their intended purpose on the project (such as a station, maintenance facility, etc.). Engineering controls (such as vapor intrusion mitigation) could also be required.

Methodology

Information on sites reported to be contaminated with hazardous materials within 1/8 mile of the alternative centerline was collected using a database research company and evaluated to determine which ones should be considered high risk for purposes of the project. High risk sites

are defined as sites that might be substantially contaminated and might create liability for Sound Transit either due to construction activities or by virtue of acquiring all or a portion of the site, such as for a station or parking facility. The 1/8 mile distance was used to identify sites that could be directly within the project footprint or could have contaminated groundwater that has spread within the project footprint.

Discussion of Results

Table 5-28 shows total high risk sites by alternative. **Exhibit 5-15** maps the locations of the identified high risk hazardous material sites. The SR 99 alternatives have the greatest number of high-risk sites, with a total of 68, which is roughly ten times the numbers of sites along the I-5 alternatives. This is not unusual, however, given the commercial oriented nature of the SR 99 corridor and the large number of gas stations and auto-repair oriented businesses along this corridor.

The Midway Landfill, located between SR 99 and I-5, is not considered a high-risk hazardous materials site, but has been designated as a Superfund site. The landfill was first capped in 1983 following its closure. Beginning in 1985, combustible gas was detected in nearby houses. The site has since been cleaned up by the City of Seattle with oversight from Washington Department of Ecology. The landfill remains capped and there are numerous wells in place to collect gases from below the cap. If an I-5 alignment is chosen, these documented issues will require extensive permitting work and carefully-planned waste disposal procedures and construction techniques to prevent potential groundwater contamination during construction.

TABLE 5-28
Total High Risk Sites within 1/8 Mile by Alternative

Alternative	High Risk Sites within 1/8 Mile
SR 99 Alternatives	
SR 99 Elevated Median	68
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	68
SR 99 Hybrid	68
I-5 Alternatives	
I-5 Mixed West Side	6
I-5 Mixed West Side/Median	7

Key Results

- Alternatives along SR 99 have more high-risk sites than alternatives along I-5.
- The closed Midway Landfill, managed by SPU, could have similar permitting and disposal issues to a high-risk hazardous materials site if an I-5 alternative is chosen.

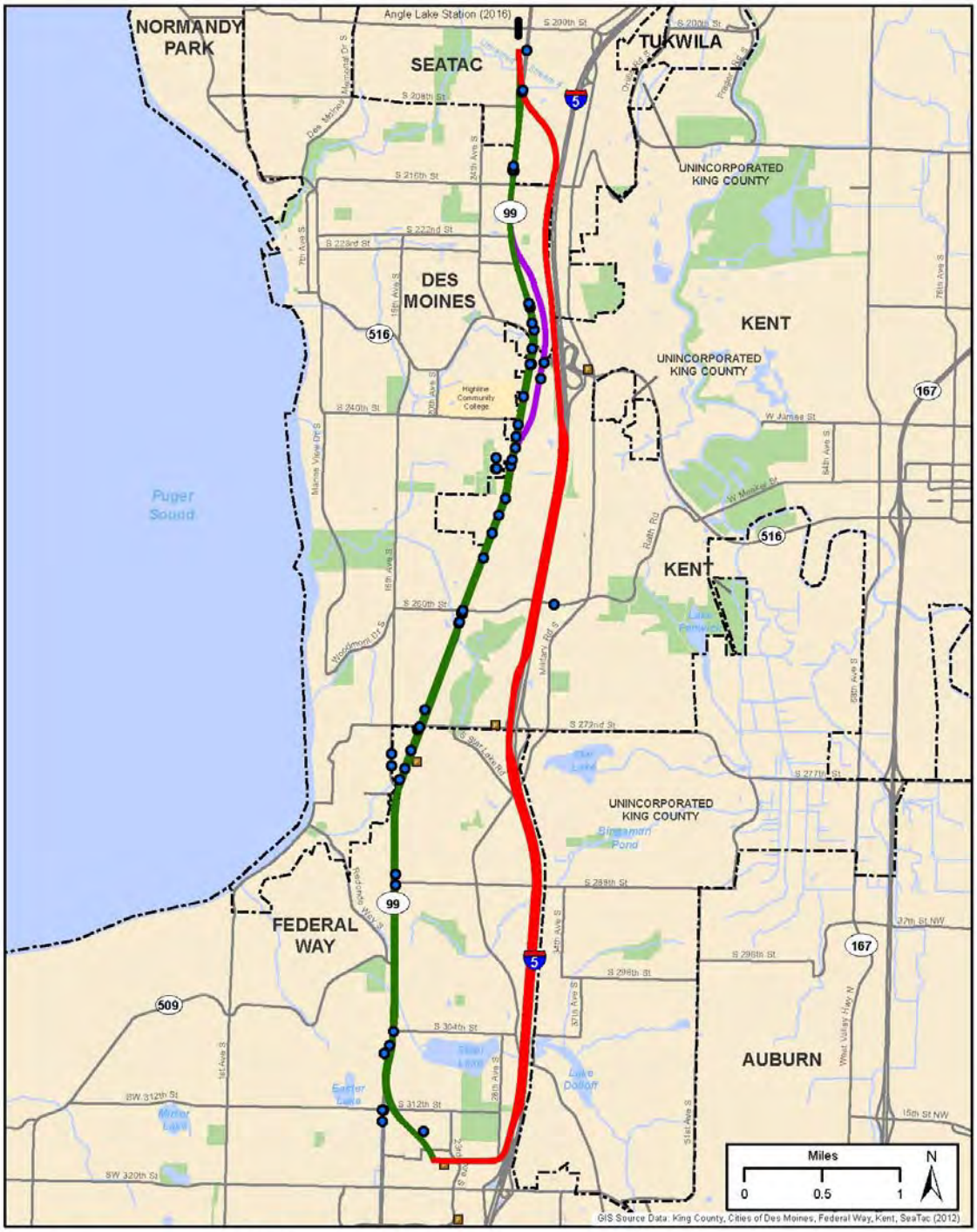


EXHIBIT 5-15
Hazardous Materials Sites

5.7.3 Geologic Issues

The Washington State Growth Management Act (GMA) (Revised Code of Washington Chapter 36.70A) requires all cities and counties to identify critical areas within their jurisdictions and to formulate development regulations for their protection. The GMA defines critical areas, including geologically hazardous areas, as areas that are susceptible to erosion, sliding, earthquake, or other geological events; therefore, they are not suited to the siting of commercial, residential, or industrial development consistent with public health or safety concerns.

Methodology

The FWTE passes through four cities (SeaTac, Des Moines, Kent, and Federal Way) and parts of unincorporated King County, all of which have defined geologically hazardous areas in their respective codes. These definitions and maps were reviewed to evaluate geologic hazards. Mapped geologic hazards are shown on **Exhibit 5-16**. Erosion hazard areas are not shown, although most of the project area would be subject to erosion during construction without the use of best management practices (BMPs).

Discussion of Results

Erosion and steep slope hazards are present throughout the study area. The Midway Landfill is a 60-acre former gravel quarry that was used as an unlined landfill from 1966 to 1983, ultimately taking approximately 3,000,000 cubic yards of waste, including demolition debris and municipal waste.

The I-5 Mixed West Side alternative would cross the eastern edge of the Midway Landfill and the mitigation and construction challenges associated with this crossing could be a primary factor in the alternative selection. These challenges include increased effort for design and permitting as well as increased construction costs due to the undocumented (but likely contaminated) character of the landfill debris present. There is a large area of wetland soils (identified as a seismic and settlement hazard area) bounded by S. 260th Street to the north, SR 99 to the west, S. 272nd Street to the south, and I-5 to the east. The selection of the location for the station at S. 272nd Street could be influenced by the presence of seismic and settlement hazards. Decisions on preferred foundation types would be affected by the presence of these hazards, as could the performance of surface parking facilities.

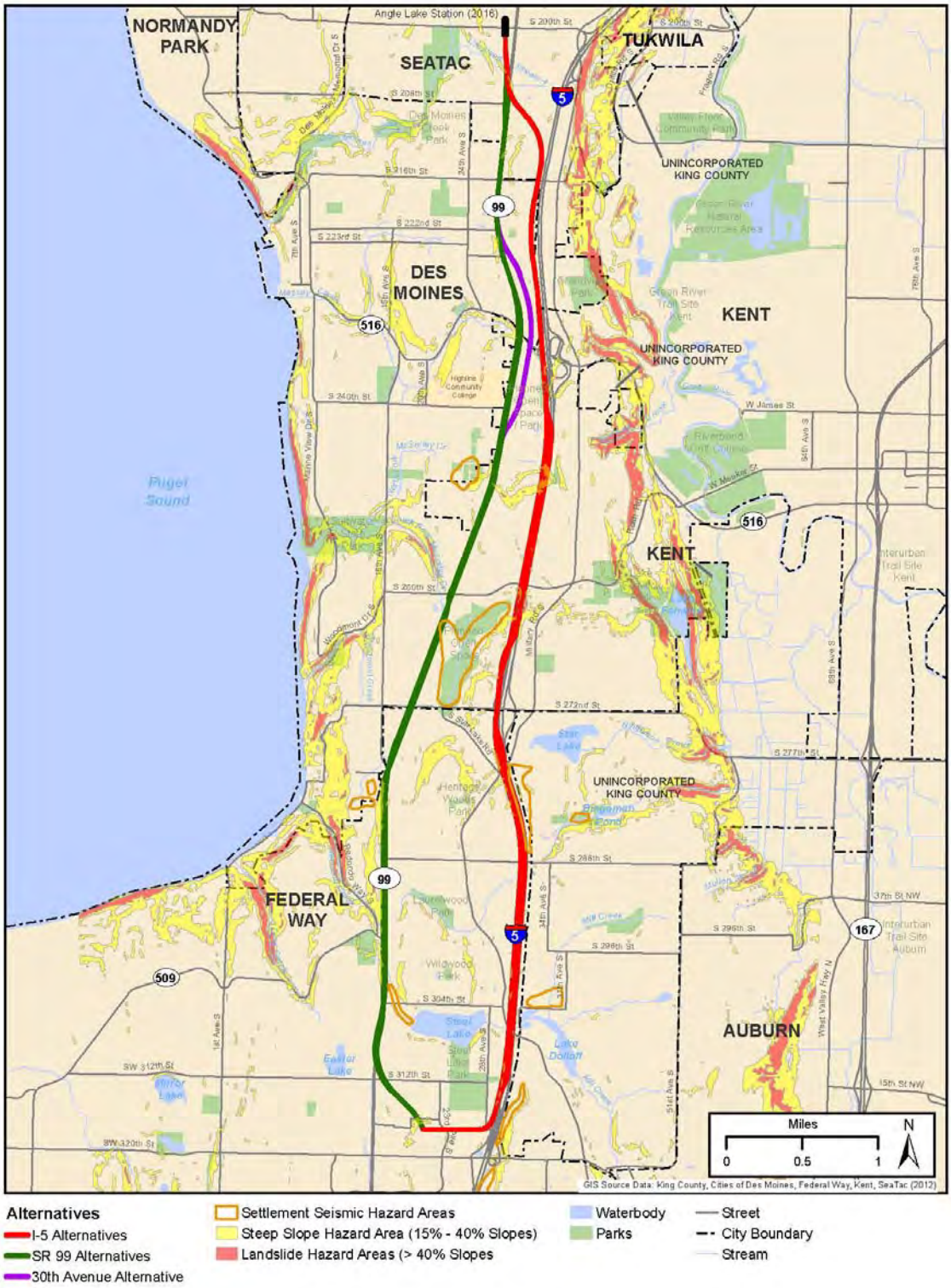


EXHIBIT 5-16
Geologic Hazards

Additional review of the area immediately west of SR 99 was performed in light of the SR 99 Hybrid alternative design refinement in this area. The guideway would be elevated from S. 272nd Street to S. Dash Point Road with this alternative, and may be elevated or at grade from S. Dash Point Road to S. 304th Street. Review of the geologic mapping and geologic hazards mapping for that area indicates no major geotechnical issues for construction in this alignment at this time. There are some areas of mapped wetland soils, but these areas appear to be at least 500 feet from SR 99. The elevated guideway design will need to consider potential impacts to the steep slopes that are present west of SR 99 from 16th Avenue S. to Dash Point Road S. It is anticipated that these impacts should be relatively minor because the soils in this area are mapped as glacial till, and could be addressed during a subsequent phase of more detailed design.

Key Results

- Portions of the alternatives cross or extend into areas mapped as erosion and steep slope hazards. These hazard areas are not likely to affect alternative selection because they appear to be relatively minor and can be addressed by typical BMPs and construction practices.
- Seismic and settlement hazard areas are present in limited areas in the central part of the project study area and could be a factor in determining the final location of the station near S. 272nd Street.
- The eastern edge of the Midway Landfill could have unstable subsurface material.

5.8 System Costs

The cost to build, operate, and maintain the project have been estimated at a planning level based on the conceptual design information available. These estimates are separated into the capital costs, which are one-time costs incurred at the beginning of the project to build it and purchase vehicles, and the ongoing annual costs to operate and maintain the part of the overall system this project represents.

5.8.1 Estimated Capital Cost

Planning-level capital cost estimates have been prepared for all Level 2 alternatives. For each alternative, a low and high end cost was estimated to accommodate unforeseen variables not identified at the level of design currently available.

Methodology

The Level 1 Alternatives Screening Report cost estimates were updated and used as a basis for the Level 2 effort. Both the Level 1 and Level 2 cost estimates used the Lynnwood Link

Extension Project's Unit Cost Library (which was based on the ST2 Unit Cost Library) to inform base unit costs for all estimates, which were escalated to 2013. Additional unit cost information was sourced from other relevant regional projects, including WSDOT sources. Some unit costs were updated or added to the Unit Cost Library as appropriate to the FWTE project.

Detailed estimates were produced according to FTA Standard Cost Categories (SCC), which are:

10. Guideway and Track Elements
20. Stations, Stops, Terminals, Intermodals
30. Yards, Shop, Administration/Support Facilities *(Note: this cost category is not included in the Level 2 capital cost estimates but will be developed by Sound Transit and provided in later phases)*
40. Sitework and Special Conditions
50. Systems
60. Right-of-Way, Land, Existing Improvements
70. Vehicles
80. Soft Costs
90. Unallocated Contingency
100. Finance Charges *(Note: This cost category is not included in the Level 2 capital cost estimates but is incorporated in the Sound Transit Financial Model)*

Costs for categories 10, 20, 40, and 50 were derived from the Level 2 alternatives, while costs for categories 60, 70, and 80 were derived with/from ST guidance. Total allocated contingencies applied to the different cost code categories vary from 10 percent to 40 percent depending on the category. Unallocated contingencies and project soft costs were also applied to the Level 2 cost estimates.

Several key design considerations have been identified at the conceptual design level that helped inform the Level 2 capital cost estimate:

- Most of the Level 2 alternatives have the design challenge of long span structures crossing I-5, SR 509, and/or SR 99.
- Stations and associated Park-and-Rides, ancillary buildings, and temporary transit facility requirements at the FWTC have been assumed for each alternative, although detailed station layouts have not been designed at this level.
- For each alternative, interim terminus designs have been assumed at each station to allow for phased construction.
- All alternatives have been assessed for site civil impacts including utility, roadway, retaining wall, etc.

- Level 2 right of way costs were developed by Sound Transit.

In addition to the Level 2 evaluation general design considerations, several key alternative-specific design considerations have also been identified that help drive the Level 2 cost estimates. All of the SR 99 alternatives would require some use of the SR 99 median. In general, where the median is at least 12 feet wide, no permanent widening is assumed to be needed. For this reason, the SR 99 Elevated Median alternative would generally require less acquisition of private property for right-of-way. The SR 99 Elevated Median alternative would also cross major intersections, such as S. 216th Street, Kent-Des Moines Road and S. 272nd Street, which would require major widening and/or large elevated structures for spanning the intersection.

The I-5 Mixed West Side alternative would run along the eastern edge of Midway Landfill for approximately one-third of a mile. Extensive investigation and the associated costs for waste mitigation and construction solutions will be required to prevent potential groundwater pollution and guideway settlement, among other issues. The I-5 Mixed West Side and I-5 Mixed West Side/Median alternatives both have the challenge of limited LRT placement and constrained space between WSDOT's future Gateway project, specifically near a WSDOT retaining wall and Highline Water District water tank support infrastructure near S. 216th Street, as well the proposed improvements planned at the Kent-Des Moines Road interchange.

The I-5 Mixed West Side/Median alternative assumes the alignment would cross over the I-5 southbound mainline lanes to access a station on the west side of I-5 at or near S. 272nd Street. The alignment would then cross back into the median until Federal Way Transit Center, at which point it crosses the I-5 southbound mainline lanes again.

Given the preliminary nature of this level of screening, cost estimates are rounded to the nearest $100 million (or $0.1 billion). A range of estimated capital costs for each alternative is shown in **Table 5-29**.

Table 5-29
Estimated Capital Cost ($billion, 2013)

Alternative	Range of Estimated Capital Costs
SR 99 Alternatives	
SR 99 Elevated Median	$1.5 to 1.8
30th Avenue. S. Elevated West Side (w/SR 99 Elevated Median)	$1.6 to 1.8
SR 99 Hybrid	$1.5 to 1.8
I-5 Alternatives	
I-5 Mixed West Side	$1.3 to 1.5
I-5 Mixed West Side/Median	$1.4 to 1.6
Note: Costs are rounded to the nearest $0.1 billion	

Discussion of Results

The highest overall capital cost alternatives are SR 99 Hybrid, SR 99 Elevated Median, and 30th Avenue S. due mainly to the amount of right-of-way costs. The I-5 alternatives currently have the lowest estimated capital costs.

The 30th Avenue S. Elevated West Side alternative has the highest construction costs (Category 10-50), due primarily to the amount of roadway/site civil reconstruction requirements. The SR 99 Elevated Median alternative has the second-highest construction costs and the I-5 Mixed West Side alternative has the lowest construction costs.

The SR 99 Hybrid alternative has the highest right-of-way costs of all the alternatives, with the SR 99 Elevated Median alternative having the second highest right-of-way costs. The I-5 Mixed West/Median alternative has the lowest right-of-way costs.

Key Results

- The SR 99 alternatives and the 30th Avenue S. alternative have slightly higher estimated capital costs than I-5 alternatives.

5.8.2 Estimated Operations and Maintenance Costs

Operations and Maintenance (O&M) costs have been estimated by Sound Transit staff in a planning exercise outside the Level 2 evaluation process. O&M cost estimates have been based on the following factors:

- Projected design-year ridership
- Projected train frequency and travel time

- Alignment length by profile type (at-grade, elevated, tunnel)
- Number of stations by profile type (at-grade, elevated, tunnel)

Because all of the alternatives have been designed to optimize speed and consist mostly of elevated track, the annual O&M costs are approximately the same for all five alternatives at the level of detail in use at this stage of project development. The estimate for annual O&M cost for the project in 2013 dollars is $6.5 million.

6.0 Level 2 Findings & Conclusions – Alignment Alternatives

This section summarizes the key data and analyses from the earlier chapters of this report, and presents the relevant findings and conclusions related to each of the Level 2 alternatives. Each of the following sections provides a table summarizing the relative strengths and weaknesses of each alternative. These strengths and weaknesses have been identified based on the alignment alternative definitions presented in Chapter 3, the evaluation criteria and measures described in Chapter 4, and the data and analysis results presented in Chapter 5. Following the strengths and weaknesses table for each alternative, there is a brief narrative that provides the summary conclusions and key findings for each alternative. A summary of conclusions is provided at the end of the chapter.

The findings and conclusions in this chapter are organized to compare the alternatives in two groups (the SR 99 alternatives and the I-5 alternatives) to identify the best alternatives within each corridor (the SR 99 alternatives are compared to each other and the I-5 alternatives are compared to each other). In addition the alternatives are compared across these two corridors within the study area. This approach has been taken because despite the amount and variety of data collected for Level 2 screening, the results provided both useful comparisons within each set of alternatives and do not paint a clear picture of whether or not one corridor performs clearly better than the other. In addition, the analysis suggests that alternatives from each corridor should be studied further in the Draft Environmental Impact Statement (EIS). The alternatives will be refined and developed to a higher level of detail before undergoing a more rigorous analysis in the Draft EIS.

6.1 SR 99 Corridor Alternatives

The SR 99 corridor generally features robust land use variety and corridor access, with areas of opportunity for targeted transit-oriented land use improvements along the proposed Light Rail Transit (LRT) alternatives. The SR 99 alternatives have been designed to connect these areas and optimize ridership by balancing the need for LRT system access with the need to serve regional destinations. The following subsections compare the SR 99 alternatives to each other.

6.1.1 SR 99 Elevated Median Alternative

TABLE 6-1
SR 99 Elevated Median Alternative: Summary of Strengths and Weaknesses

Strengths	Weaknesses
• No wetland effects • Fewest potential residential displacements • No potential for direct effects to community facilities • Fewer right of way effects due to available existing median space • Lowest estimated capital cost	• Higher potential length of stream effect • Higher potential effects on business traffic due to recirculation • Highest potential traffic effects during construction due to median guideway and stations • Challenge of crossing SR 99/Kent-Des Moines Road and other major intersections in median

The **SR 99 Elevated Median** alternative would include a light rail guideway on vertical columns in the median of SR 99. It would require construction of guideway support columns in the median of SR 99, which currently has a planted strip or intersection turning lanes for nearly all of the length of the study corridor.

The location of the columns for the proposed transit guideway in the existing median of SR 99 would be positive for this alternative because it would, in many locations, minimize or eliminate the need to widen the SR 99 roadway. Where the proposed columns would be placed in an existing planted strip, it has been assumed that the columns would fit within the available space. As a result, the SR 99 Elevated Median alternative would have fewer business displacements than the SR 99 Hybrid alternative. With the SR 99 Elevated Median alternative, residential displacements would be less than with each of the other SR 99 alternatives. Lane closures during construction activities would affect mobility within the SR 99 corridor. The elevated guideway would cross over major intersections such as the Kent-Des Moines Road intersection on a long elevated structure in the median of SR 99, which would increase cost and complexity.

With the elevated alignment in the median of SR 99, the number and locations of mid-block left turns and U-turns could be reduced and the revised median configuration could require additional roadway improvements to facilitate local circulation. This could result in additional traffic impacts at nearby signalized intersections.

The SR 99 Elevated Median alternative would be somewhat close to noise-sensitive receivers on both sides of the roadway, resulting in more potential noise effects than the SR 99 Hybrid alternative, as well as more potential indirect effects on community facilities.

Key Findings

1) The SR 99 Elevated Median alternative would have lower overall right-of-way requirements than other SR 99 alternatives.

2) It would have the greatest disruption to the community during construction of the SR 99 alternatives.

3) It would have the greatest potential for disruption to the community of the SR 99 alternatives once operations begin because of traffic and noise effects.

4) It would involve complex structural solutions (such as long spans and straddle bents) and/or substantial widening at major intersections to accommodate the median elevated guideway.

6.1.2 30th Avenue S. Elevated West Side with SR 99 Elevated Median Alternative

TABLE 6-2
30th Avenue S. Elevated West Side with SR 99 Elevated Median Alternative: Summary of Strengths and Weaknesses

Strengths	Weaknesses
• No wetland effects • Fewest business displacements • No potential for direct effects to community facilities	• Higher potential for stream effects • Higher potential for visual effects • Most potential residential displacements • Highest number of noise-sensitive receivers • Highest number of Category 2 vibration-sensitive receivers • Higher potential traffic effects during construction due to median guideway and stations

The **30th Avenue S. Elevated West Side** alternative would include a light rail guideway on vertical columns on the west side of 30th Avenue S. between S. 220th Street and S. 240th Street. North and south of these points it would have the same alignment as the SR 99 Elevated Median alternative, and effects in these areas would be the same as the SR 99 Elevated Median alternative. North of Kent-Des Moines Road, 30th Avenue S. is a primarily residential street with several large multi-family complexes as well as some single family homes. Locating the alignment on 30th Avenue S. in this area would avoid the traffic, design and cost issues associated with putting the light rail guideway through the complex SR 99/Kent-Des Moines Road intersection. It has greater potential for residential displacements and visual, noise and vibration effects than the other SR 99 alternatives, but would have fewer effects on businesses along SR 99 in this area.

Some of the negative effects could be reduced by moving the transition from SR 99 to 30th Avenue S. farther south than S. 220th Street. Also, although this alternative was evaluated as if it was connected to the SR 99 Elevated Median alternative, it could be combined with the SR 99 Hybrid alternative to the north or the south, or it could be connected to an I-5 alternative to the south.

Key Findings

1) The 30th Avenue S. Elevated West Side alternative would avoid the challenges associated with the complex crossing of the SR 99/Kent Des Moines Road intersection.

2) It would have greater potential for effects on residences than other SR 99 alternatives, especially north of Kent-Des Moines Road.

3) It would have lower potential for effects on businesses than other SR 99 alternatives.

6.1.3 SR 99 Hybrid Alternative

TABLE 6-3
SR 99 Hybrid Alternative: Summary of Strengths and Weaknesses

Strengths	Weaknesses
• Lower potential for stream effects • Lowest number of Category 2 noise-sensitive receivers • Lowest number of Category 2 vibration-sensitive receivers • Fewer congested intersections with potential traffic effects for SR 99 alternatives • Less potential for traffic effects during construction	• Potential effects to McSorley Creek wetland area • Most potential business displacements • Highest potential for direct effects to community facilities

The SR 99 Hybrid alternative light rail guideway would be constructed primarily on either the east or the west side of SR 99, minimizing reconstruction of SR 99 and potential traffic effects associated with occupying the median. It would also avoid crossing the SR 99/Kent Des Moines Road intersection in the median by crossing Kent Des Moines Road on the west side of SR 99. This alternative would have the least potential for noise and vibration effects on residences among the SR 99 alternatives, as well as less potential for effects on traffic during construction and operation.

This alternative would be located on the east side of SR 99 near the McSorley Creek wetland complex, resulting in potential effects to this wetland. These effects would be further defined in the EIS and would require additional information on the wetland boundary and the extent to which the wetland could be avoided. Being located on the side of the predominantly commercial SR 99 corridor, however would result in the greatest number of business displacements of any alternative, and could displace up to 3 commercial buildings where space is leased for religious facilities. The design of this alternative could be further refined to further avoid or minimize many of the identified adverse effects.

Key Findings

1) The SR 99 Hybrid would avoid most of the traffic and construction issues associated with construction and operation in the SR 99 median.

2) It is the only alternative with potential for effects on wetlands.

3) It would have greater impacts on businesses and community facilities than the other SR 99 alternatives.

6.2 I-5 Corridor Alternatives

The I-5 corridor studied is primarily within the I-5 right-of-way, which is adjacent to primarily single family land uses, except at the interchanges at Kent-Des Moines Road and S. 317th/320th streets, which have commercial land uses. The alternatives within this corridor are designed to connect access points at freeway interchanges to optimize ridership by balancing the need for LRT system access with the need to serve regional destinations.

The I-5 alternatives are subject to ongoing review and coordination with WSDOT. The "SR 167, SR 509, and I-5 Puget Sound Gateway Project" ("the Gateway Project") is a long-term effort to improve roadway access to the ports of Seattle and Tacoma, in the interest of maintaining and enhancing Washington's global economic competitiveness. The Gateway Project features three projects that, when combined, could add substantial width to I-5 in the FWTE project study area. In some parts of the study area, this additional roadway width would occupy all or most of the available WSDOT right-of-way.

The two I-5 alternatives being considered in this Level 2 screening process are subject to substantial change as new information becomes available about the spatial needs of the Gateway Project. Although these widening projects are not currently funded, discussions continue regarding the appropriate placement of the proposed LRT guideway along I-5. The assumptions contained in this report about LRT guideway placement represent the best information available at the time regarding right-of-way availability and WSDOT design coordination.

The following subsections compare the I-5 alternatives to each other.

6.2.1 I-5 Mixed West Side Alternative

TABLE 6-4
I-5 Mixed West Side Alternative: Summary of Strengths and Weaknesses

Strengths	Weaknesses
• Lower potential for traffic effects during construction • Lower estimated cost	• Higher potential for visual effects • Higher number of Category 2 and Category 3 noise-sensitive receivers • Higher number of Category 2 vibration-sensitive receivers • Cost and challenge of crossing Midway Landfill

The I-5 Mixed West Side alternative would be along the west side of I-5, primarily within or adjacent to the WSDOT right-of-way. It would be at-grade in some locations and grade-separated in others. Construction within WSDOT right-of-way on the west side of I-5 would minimize the need for lane closures on local roads as well as on I-5. The land uses adjacent to I-5 are primarily residential; consequently, this alignment has more potential for effects on residences, including displacements, noise, vibration and visual effects. This alternative would cross the Midway Landfill, which presents engineering challenges and additional costs. Both I-5 alternatives would also need to avoid or relocate the Highline Water District tanks and a major Puget Sound Energy substation. Coordination with WSDOT during the Level 2 process indicated that the availability of their right-of-way may be limited north of Kent-Des Moines Road, due to potential conflicts with the planned SR 509 extension (as part of the Gateway Project).

Key Findings

1) The I-5 Mixed West Side alternative would have greater potential for effects on residences.

2) Crossing the Midway Landfill would present engineering challenges and increased costs.

3) Use of WSDOT right-of-way may be limited north of Kent-Des Moines Road.

6.2.2 I-5 Mixed West Side/Median Alternative

TABLE 6-5
I-5 Mixed West Side/Median Alternative: Summary of Strengths and Weaknesses

Strengths	Weaknesses
• Lower potential for visual effects • Lower number of Category 2 and Category 3 noise-sensitive receivers • Lower number of Category 2 vibration-sensitive receivers • Avoids the Midway Landfill	• Lower potential for traffic effects during construction • Uncertainty regarding availability of the median for transit guideway due to the potential Puget Sound Gateway project • Crossing I-5 southbound lanes to get into and out of the median • Higher estimated cost

The I-5 Mixed West Side/Median alternative would be along the west side of I-5 primarily within or adjacent to the WSDOT right-of-way and within the median between the north and south bound lanes of I-5. This alternative would transition from west of I-5 to the I-5 median near S. 240th Street, primarily to avoid crossing the Midway Landfill, and would cross back to the west side of I-5 for stations at S. 272nd Street and the Federal Way Transit Center. Construction in the I-5 right-of-way would minimize disruption to the community, but could have effects on I-5 traffic. Construction in the median and to cross into and out of the median would result in lane closures and some traffic disruption on I-5, which would not occur with the I-5 Mixed West Side alternative.

Land use adjacent to I-5 is primarily residential, and therefore the alignment would have less potential for effect on businesses. The potential for noise, vibration, and visual effects on residences would be similar to the I-5 Mixed West Side alternative where the alignment is on the west side of I-5, but would be avoided when in the median. Coordination with WSDOT during the Level 2 process indicated that the availability of their right-of-way may be limited north of Kent-Des Moines Road, due to potential conflicts with the planned SR 509 extension (as part of the Gateway Project). Other components of the Gateway Project may require use of the median south of Kent-Des Moines Road.

Key Findings

1) The I-5 Mixed West Side/Median alternative would have less potential for effects on residences.

2) Constructing in the median and crossing I-5 would be more disruptive to I-5 traffic and more expensive than the I-5 Mixed West Side alternative.

3) Availability of WSDOT right-of-way for this project is uncertain.

6.3 Comparing SR 99 to I-5

TABLE 6-6
SR 99 and I-5: Summary of Strengths and Weaknesses by Corridor

SR 99 Corridor	I-5 Corridor
Strengths • More subsidized housing within ½ mile • Greater area zoned for high density development • More employment (existing and future) within ½ mile • More potential for non-motorized access • Fewer potential residential displacements • Avoids important large utility sites (e.g. water tanks, electrical substation)	**Strengths** • Slightly shorter travel time • Fewer potential business displacements • Less potential for indirect effects to community facilities • Fewer Category 3 noise-sensitive receivers • Lower potential for effects to community during construction • Lower estimated cost than SR 99 alternatives
Weaknesses • Slightly longer travel time • More potential business displacements • Greater potential for indirect effects to community facilities • More Category 3 noise-sensitive receivers • Higher potential for effects to community during construction • Higher estimated cost	**Weaknesses** • Less subsidized housing within ½ mile • Smaller area zoned for high density development • Less employment (existing and future) within ½ mile • Less potential for non-motorized access • More potential residential displacements • Affects important large utility sites (e.g. water tanks, electrical substation)

The SR 99 and I-5 corridors each offer strengths and weaknesses that are generally different from the other corridor, resulting in trade-offs of benefits and effects that are more different between the two corridors than between the various alternatives in each corridor. The SR 99 corridor is more densely developed and of a commercial and mixed use nature, and therefore has greater potential for effects to existing development, as well as more potential for new

development. The SR 99 corridor is more accessible by all modes (vehicle, transit or non-motorized) and more integrated into the communities along the route. The I-5 corridor is primarily residential on both sides, and therefore has less potential for overall community disruption such as effects to traffic, but greater potential for effects to individual residences, including noise, vibration and visual effects. The I-5 corridor generally has more existing express transit and better utilized park and rides. Alternatives in the SR 99 corridor have higher estimated costs than alternatives in the I-5 corridor.

6.4 Special Alignment Issues

This section documents issues related to alignments for which discussion does not fit easily within the context of the alternatives analysis documented in this report.

6.4.1 SR 99 / I-5 Connection

With the exception of both ends of the FWTE corridor where the guideway would connect to the stations that define its limits (Angle Lake and FWTC), the Level 2 alignment alternatives were defined as running along either SR 99 or I-5 for the entirety of the corridor. However, throughout the Level 1 and Level 2 analysis process, the project team has heard input and collected data indicating that the two alignments could each perform higher in different parts of the corridor. It is possible that an LRT alignment that crosses over from one to the other could perform better than the best alternative confined to each corridor for the entire length of the corridor and/or might be preferred in the study area. The combination of segments of the SR 99 and I-5 alignment alternatives would affect alignment development in the following two primary ways:

- Such a combination would require the conceptual design and analysis of a new track route between SR 99 and I-5 that has not been specifically analyzed so far in the study, and
- The resulting alternative would represent a new concept to the residents, business-owners, and other stakeholders in the corridor.

In order to avoid creating a route that would slow trains by forcing out-of-direction travel and having tight curves that would slow down the trains and increase travel time, the optimum connection location would be located where I-5 and SR 99 are close together, such as in the Kent-Des Moines Road area, rather than where they are not.

Although potential connections between the SR 99 and I-5 corridors have not been included formally in the alternatives analysis process, project planners and engineers have identified multiple potential locations to connect these corridors that could be considered. Examples of considerations that could influence a decision to investigate such a connection alignment include:

- Potential physical limitations in the I-5 right of way north of Kent-Des Moines Road;
- Challenges in crossing the Midway Landfill; or
- Local concerns regarding potential adverse effects.

While detailed alignments for potential connection locations have not been investigated, there are four general areas between the Kent-Des Moines and 272nd stations that have been identified in early discussions thus far. These areas are discussed in the following subsections and are illustrated in **Exhibit 6-1**.

1. Near Kent-Des Moines Road

A connection from SR 99 to I-5 (or I-5 to SR 99) could be located in the vicinity of Kent-Des Moines Road, such that the guideway would transition to the east out of the SR 99 corridor north of the Kent-Des Moines intersection and cross over Kent-Des Moines Road at or near the intersection with 30th Avenue S. It could continue along the south side of Kent-Des Moines Road to the I-5 corridor and turn south along the west side of I-5. Such a connection would be consistent with a proposed Kent-Des Moines station location near the I-5 right of way just south of Kent-Des Moines Road, as proposed in the City of Kent's Midway Subarea Plan.

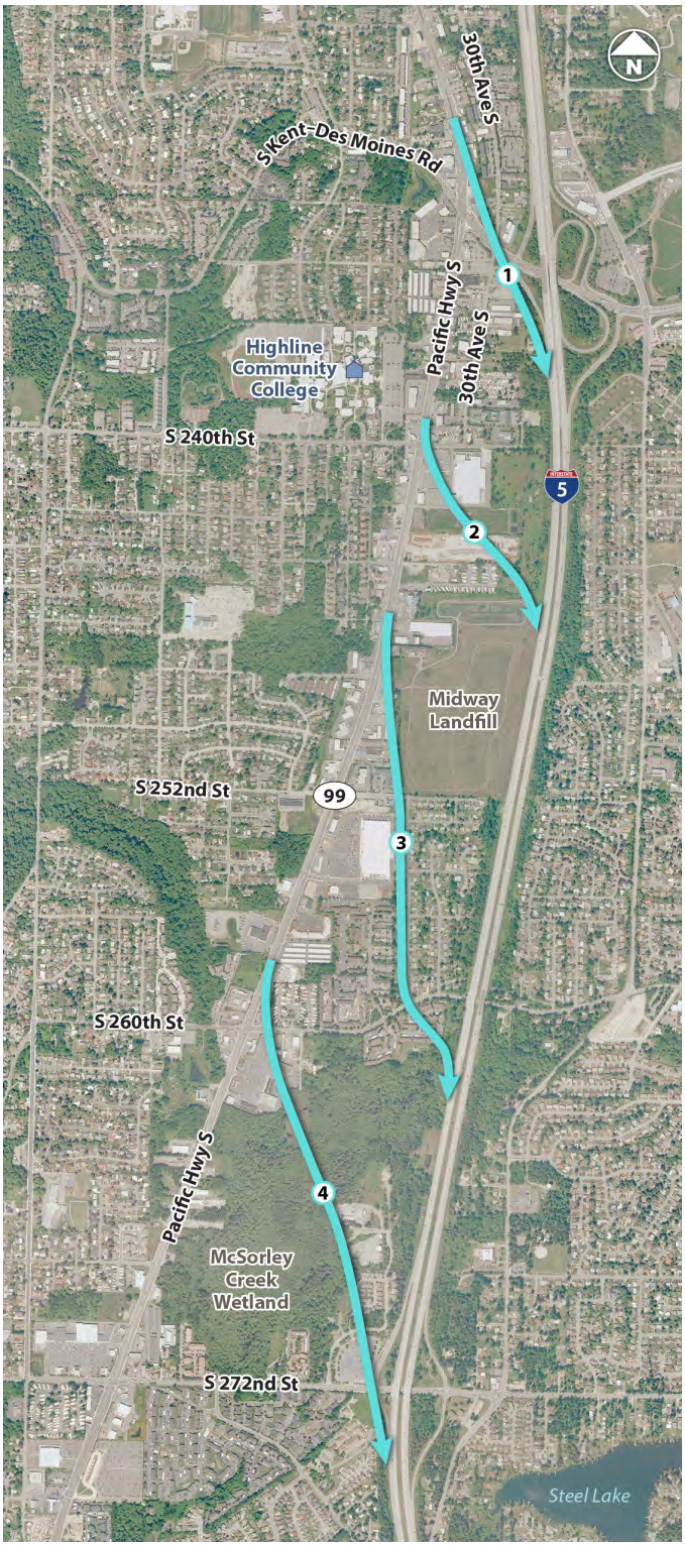


EXHIBIT 6-1
Potential SR 99/I-5 Connection Alignments

2. Between S. 240th St. and the Midway Landfill

This portion of the corridor could include a connection in either direction—from I-5 to SR 99 or from SR 99 to I-5—depending on the preferred alignment to the north and south of the connection. If the Kent-Des Moines station is located closer to S. 240th than to Kent-Des Moines Road, a connection could generally traverse vacant and lightly-used commercial land without substantially slowing down the train or increasing travel time. A connection in this area would have the advantage of being relatively short, but might still require crossing the Midway Landfill and/or be constrained by future WSDOT right-of-way needs in the I-5 right-of-way.

3. Between the Midway Landfill and the McSorley Creek Wetland Complex

The area south of the Midway Landfill and north of the McSorley Creek wetland complex consists almost entirely of existing single-family and multi-family residential land uses, and contains almost no vacant land. A potential connection through this area that would not impact either the landfill to the north or the wetland to the south could only be constructed by displacing multiple single family and multifamily residences. This location would avoid the challenge of crossing the Midway Landfill and the wetlands, but comes with the disadvantage of relatively extensive impacts to the existing residential community.

4. Crossing the McSorley Creek Wetland Complex

The McSorley Creek wetland complex is a potential opportunity to connect SR 99 and I-5 alternatives because it could be crossed diagonally on primarily undeveloped land. This potential alignment would access the Star Lake Park and Ride at S. 272nd Street and would allow trains to maintain desirable speeds and not affect travel time. This crossing could occur at the narrowest area of the wetland, minimizing effects on the wetland. While such a connection alignment has not been designed, it is possible with the elevated nature of the proposed guideway that the actual project footprint on the ground could be limited to fewer than ten columns in the area of the wetlands complex. A connection at this location has the advantage of avoiding effects on residential neighborhoods and the challenges of crossing the landfill, but the disadvantage of direct and indirect wetland effects. In addition, much of this property has been purchased by the City of Kent for preservation purposes, and this area is considered ecologically important by multiple government agencies because of its size. It is the headwaters for McSorley Creek, which supports anadromous and resident fish.

6.4.2 Future HCT Extension to the South

The choice between SR 99 and I-5 for the preferred FWTE alignment could influence (and/or be influenced by) a potential future extension of the Link system further south to Tacoma. In order to not preclude either SR 99 or I-5 as a feasible alignment for the future extension south, the

guideway and station could be located between these two major roadways and oriented north-south so as not to require a large amount of turning, which reduces train speeds, in order to reach either corridor.

If the FWTE alignment terminates at a station platform within a short walk of the existing FWTC bus platform location, the alignment would be somewhat likely to include low-speed curves and/or represent a crossing from I-5 to SR 99 (or vice versa) in the vicinity of the FWTC.

The future connection of the FWTE farther south to Tacoma is the subject of the South Corridor Alternatives Planning Study, which is being conducted concurrently with this alternatives analysis effort. Its purpose is to inform Sound Transit's Long Range Plan regarding the needs and opportunities for high capacity transit in that area, and may or may not identify a preferred corridor in this area.

6.5 Summary of Conclusions

The Level 2 evaluation has provided substantial additional data on the five alternatives considered, including a range of strengths and weaknesses that inform comparisons both within and across the two corridors under consideration. Because these comparisons have not indicated clear decisions regarding either advancing or removing any of the Level 2 alternatives, Sound Transit has determined that all five will be carried forward into the environmental scoping process for consideration as potential alternatives to study in a Draft EIS.

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7.0 Station Evaluation

The Level 2 alignment alternatives were evaluated with three proposed station locations as defined by previous planning documents, which are the Kent/Des Moines, S. 272nd Street and Federal Way Transit Center (FWTC) stations. These three station locations are considered part of the baseline project definition and are referred to as "baseline" stations in this analysis. As part of the Level 2 Evaluation, a comprehensive look at potential additional station locations was undertaken.

The station evaluation began with identification of an initial list of potential station locations. The initial list was based on input received from the public during early scoping and agencies through agency coordination, and staff assessment of possible station locations. The initial list included 22 potential additional locations that were subjected to a pre-screening process. Additional locations that were in very close proximity to baseline stations were combined with these stations for purposes of this evaluation.

After the pre-screening a smaller list of 11 potential station locations remained, which were evaluated in Level 2. These included the 4 baseline stations (at Kent/Des Moines Road, two at S. 272nd Street, and one at the FWTC) and 7 potential additional station locations. Four of the additional potential station locations are associated with the SR 99 alternatives and three are associated with the I-5 alternatives.

Section 7.1 describes how the stations were identified and evaluated, Section 7.2 presents the data developed to evaluate the stations, Section 7.3 provides the findings by station location and Section 7.4 provides a summary of the evaluation results. Data is first presented for the stations defined as part of the baseline project, and is then followed by data for the potential additional stations.

7.1 Station Evaluation Methodology

7.1.1 Initial List of Potential Station Locations

In addition to the four baseline stations located generally at Kent/Des Moines, S. 272nd Street (two locations) and FWTC, 21 potential additional station locations were initially identified, for a total of 25 possible station locations. The list of possible station locations came from multiple sources, including ST2, the early scoping process, the PSRC "Growing Transit Communities" Existing Conditions report and staff assessment of potential station locations. The initial list of potential additional station locations is provided in **Table 7-1** below (from north to south in the study area) and the locations are shown on **Exhibit 7-1**.

Table 7-1
Initial List of Potential Additional Station Locations

Station Location	Corridor (SR 99, I-5 or other)	In Vicinity of Baseline Station?
S. 216th St	SR 99, I-5	No
Kent/Des Moines Park-and-Ride	I-5	No
Highline Community College (HCC) parking lot	SR 99	Yes, in vicinity of Kent/Des Moines Station
Lowes parking lot along SR 99 (near HCC)	SR 99	Yes, in vicinity of Kent/Des Moines Station
S. 252nd Street Near Fred Meyer	SR 99	No
S. 260th Street	SR 99, I-5	No
Woodmont Library	SR 99	Yes, in vicinity of S. 272nd Station
LA Fitness parking lot (near Redondo Heights Park-and-Ride lot)	SR 99	Yes, in vicinity of S. 272nd Station
S. 288th Street	SR 99, I-5, Military Road	No
S. Dash Point Road	SR 99	No
Easter Lake (approximately S. 312th Street)	SR 99	No
S. 320th Street	SR 99	Yes, in vicinity of FWTC Station
The Commons at Federal Way	One location would connect to either SR 99 or I-5	Yes, in vicinity of FWTC Station
S. 320th Park-and-Ride at I-5	I-5	Yes, in vicinity of FWTC Station
21st Avenue S. near S. 336th Street	Beyond limits of study area	No
S. 348th Street Park-and-Ride	Beyond limits of study area	No
Kent Sounder Station	Beyond limits of study area	No

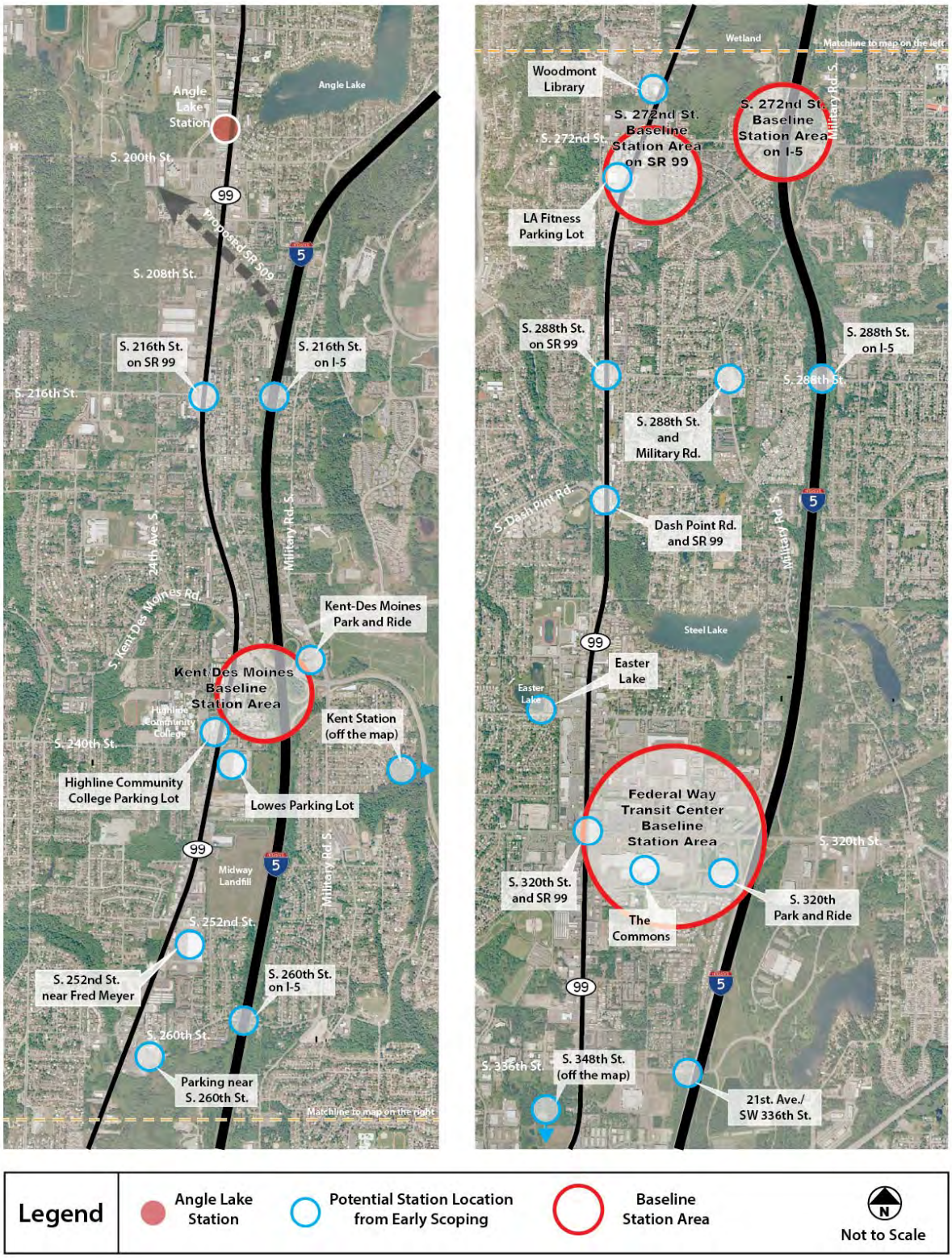

Exhibit 7-1
Initial List of Potential Station Locations

7.1.2 Pre-Screening of Initial Station Locations

Several of the initial station locations were pre-screened out prior to the more detailed Level 2 evaluation. The list of pre-screened locations and the reason for pre-screening them and excluding them from further analysis is summarized below in **Table 7-2**.

Table 7-2
Pre-Screening of Initial List of Potential Station Locations

Station Location	Pre-Screening Results
Kent/Des Moines Park-and-Ride (east side of I-5)	This station location would only work with an east of I-5 alignment. An east of I-5 alignment is not under consideration. Existing land uses and planned land uses would not be very supportive of a light rail station in this location.
S. 252nd Street near Fred Meyer	This location is not well connected to cross streets that would provide good access to a station and additional transit transfer opportunities.
S. 288th Street at Military Road	This location is approximately 0.5 miles east of the SR 99 alternatives and 0.4 miles west of the I-5 alternatives.
Easter Lake	This location is approximately 0.2 miles west of the SR 99 alternatives, is farther away from the FWTC, and in a predominantly single-family neighborhood.
21st Ave/S. 336th Street	There is no proposed light rail alignment in this area. This location is over 1 mile south of the southern terminus at the FWTC and outside the study area.
S. 348th Park-and-Ride	There is no proposed light rail alignment in this area. This location is approximately 3 miles southwest of the southern terminus at the FWTC and outside the study area.
Kent Sounder Station	There is no proposed light rail alignment near the Sounder alignment through Kent. This location is approximately 3 miles east of I-5 in downtown Kent and is outside the FWTE study area.

7.1.3 Station Locations Evaluated in Level 2

Following the pre-screening of the initial list of potential station locations, some remaining locations that were in very close proximity to baseline stations were combined with these stations. These locations are noted in the third column on **Table 7-1** and include the Highline Community College and Lowe's parking lots, which are in the general vicinity of the Kent/Des Moines Station, the Woodmont Library and the LA Fitness parking lot, which are in the general vicinity of the S. 272nd Street Station, and S. 320th Street, The Commons at Federal Way, and the S. 320th Street Park-and-Ride at I-5, which are in the general vicinity of the FWTC Station. Consolidating these stations resulted in seven potential additional station locations remaining for further and more detailed evaluation in Level 2. These remaining stations are listed in **Table 7-3** and shown in **Exhibit 7-2.**

Table 7-3
Level 2 Station Locations

Baseline Stations	Potential Additional Stations-SR 99	Potential Additional Stations-I-5
Kent/Des Moines	S. 216th Street	S. 216th Street
S. 272nd Street (Redondo Heights Park-and-Ride)	S. 260th Street	S. 260th Street
S. 272nd Street (Star Lake Park-and-Ride)	S. 288th Street	S. 288th Street
FWTC	S. Dash Point Road	

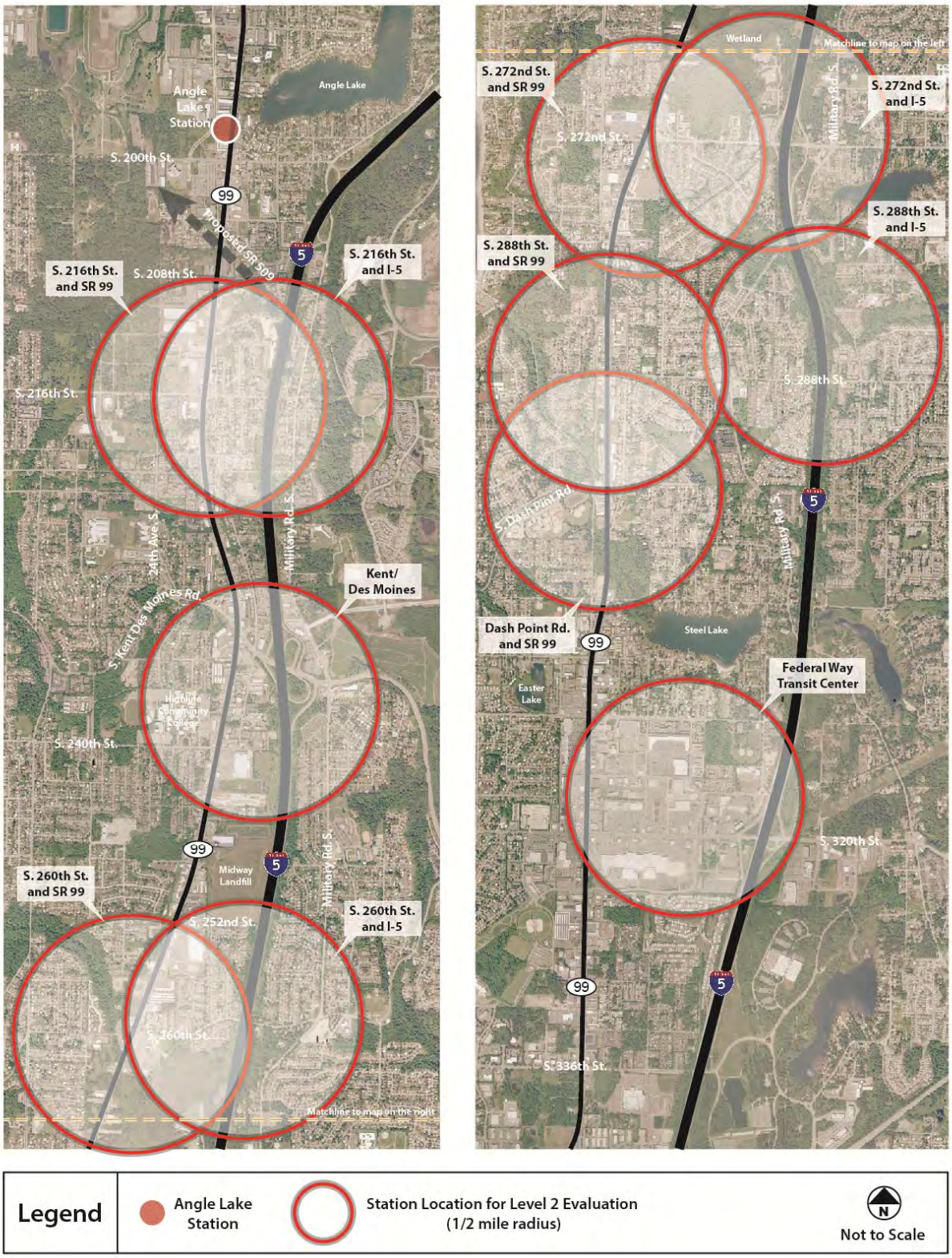

Exhibit 7-2
Level 2 Station Locations

7.1.4 Station Evaluation Criteria and Measures

Eleven station locations (4 baseline stations, 4 potential additional stations on SR 99, and 3 potential additional stations on I-5) were evaluated using primarily the same evaluation measures as described for evaluation of the Level 2 study alignment alternatives, *Objective 3: Serve Supportive Land Use Plans and Economic Development Objectives*. These measures were applied to a half mile radius around each potential station location in order to provide a more direct comparison between potential station locations. Additional measures for station boardings, access to activity centers and motorized access were also included. **Table 7-4** lists these measures and a brief statement explaining the methodology used.

7.2 Station Evaluation – Data Results

The following sections present the data that was compiled for each evaluation measure for each of the potential additional station locations.

7.2.1 Daily Project Ridership and Station Boardings

As presented in Chapter 5, the year 2035 project-wide ridership for all alignment alternatives is forecasted to be approximately 23,500 riders per day. The similarity in the ridership forecasts between the alternatives is due in part to two of the three stations (Kent/Des Moines and FWTC) associated with all the alternatives being in similar locations and therefore serving similar transit markets.

Table 7-5 shows the projected LRT ridership in the study area for all alternatives in the SR 99 and I-5 corridors for the three baseline stations as well as with three potential additional stations. The ridership estimate for the six station options would result in about 1,000 additional riders over the entire project length, for a total project-wide ridership of 24,500 riders per day. This slight ridership difference suggests that the ridership potential difference between three and six stations along SR 99 or I-5 is relatively small.

Table 7-6 presents projected station boardings for individual stations if additional stations were to be added to SR 99 and I-5 alternatives, and compares these with boardings for the three baseline station locations. The station area boardings at the potential additional stations at S. 216th Street, S. 260th Street, S. 288th Street and S. Dash Point Road would average between 500 and 1,000 boardings per day. In most cases, the majority of the boardings at these additional stations would result from shifting boardings from adjacent stations. These boardings would likely be from non-motorized and bus access as these additional stations were not assumed to have additional parking provided at the stations.

TABLE 7-4
Evaluation Measures Used for Station Evaluation

Measure	Methodology
Daily project ridership and station boardings	Using the ST forecasting model and general station area assumptions, produced 2035 estimated daily and annual ridership. Using the Sound Transit forecasting model and general station area assumptions, 2035 estimated station boardings were calculated. Unit of measure: 2035 Daily station boardings.
Travel time	Travel times were developed for new alternatives using a simple distance/speed estimate with time added for each station. Unit of measure: One way travel time between S. 200th Street and S. 320th Street.
Existing land use	Determined percentage of single family residential, multi-family residential, commercial, industrial, institutional, public and vacant land uses within ½ mile of each station using King County Assessor data. Land uses were generalized between jurisdictions as necessary. Unit of measure: Percent of each existing land use.
Planned land use	Determined percentage of planned land uses based on local comprehensive plans within ½ mile of each station. Land uses were generalized between jurisdictions as necessary. Unit of measure: Percent of each comprehensive land use.
High Density/TOD Zoning	Determined acres and percentage of existing zoning that is either high-density residential, transit oriented development (TOD), or allows mixed use within a 1/2 mile of each station. Zoning data was obtained from the cities of SeaTac, Des Moines, Kent and Federal Way. Unit of measure: Acres and percent of high density/TOD zoning.
Underutilized parcels	Determined number of parcels considered underutilized based on ratio of building to land value within ½ mile of each station. Underutilized parcels are those with a ratio of improvement value to land value of 1:1 or less, based on King County Assessor data. Unit of measure: Acres of underutilized land.
Population	Determined total population within ½ mile of each station based on U.S. Census data. Population was estimated based on percentage of each census blocks within study area. Unit of measure: Total existing population within ½ mile (rounded to nearest 1,000).
Employment	Determined total employment within ½ mile of each station based on data supplied by the Employment Securities Department (ESD) through PSRC. Employment data exists as points that were aggregated for a ½ mile buffer around each station. Unit of measure: Total employment (rounded to the nearest 1,000).
Households	Determined total number of households within ½ mile of each station based on U.S. Census data. Households were estimated based on percentage of each census blocks within study area. Unit of measure: Total households (rounded to the nearest 1,000).
Access to Regional Activity Centers	Determined if station provides access to regional level activity centers, defined as Highline Community College and Federal Way Transit Center. Unit of measure: Qualitative discussion.
Parking opportunities	This measure included the current number of park & ride parking spaces (publicly owned or leased facilities) and the number of potential park & ride facilities (such as church parking lots) within a ½ mile of each station. Utilization of existing parking lots was reported. The measure also qualitatively discussed areas where overflow parking from park & rides could be a problem. Unit of measure: Number and utilization of existing park-and-ride spaces, number of potential park and ride locations, and qualitative discussion.
Motorized Access	Determined the degree of access to a station from north, south, east and west, and determined the number of bus routes that provide direct access to the site. Unit of measure: Qualitative discussion of roadway access and quantitative evaluation of bus routes.
Non – motorized access	This measure qualitatively discusses existing and planned bike and pedestrian facilities and options for each station. Density of roadways that are arterials or smaller were calculated within a ½ mile of each station. The presence of bike lanes and sidewalks is also discussed. Unit of measure: Linear feet of roadway within ½ mile of each potential station location. Qualitative discussion of existing and planned bike lanes and sidewalks.
Estimated cost	Using Sound Transit's database of recent capital costs, a range of capital cost estimates was determined for alternatives in current year dollars. Annual operations and maintenance (O&M) costs were modeled using the Sound Transit O&M model. Unit of measure: Range of capital costs for alternatives ($2013); Annual O&M cost ($2013) provided by Sound Transit.

Table 7-5
2035 Alignment Ridership Potential

Corridor	2035 Daily Riders	2035 Annual Riders
Baseline Stations		
SR 99 or I-5 with 3 Stations ending at FWTC	23,500	7.4 million
Potential Additional Stations		
SR 99 or I-5 with 6 Stations ending at FWTC	24,500	7.6 million
Note: 2035 Daily riders are rounded to the nearest 500. 2035 Annual riders are rounded to the nearest 0.1 million.		

Table 7-6
Year 2035 Daily Station Boardings

Station Location	SR 99		I-5	
	3 Stations ending at FWTC	6 Stations ending at FWTC	3 Stations ending at FWTC	6 Stations ending at FWTC
S. 216th Street	n/a	1,000	n/a	1,000
Kent/Des Moines	3,000	2,000	2,500	1,500
S. 260th Street	n/a	1,000	n/a	500
S. 272nd Street	2,000	1,000	2,000	1,500
S. 288th Street	n/a	500[a]	n/a	500[a]
Dash Point Rd. S.	n/a	500[a]	n/a	n/a
FWTC	8,000	8,000	8,500	8,000
Total Boardings	**13,000**	**13,500**	**13,000**	**13,000**

Notes: 2035 Daily boardings are rounded to the nearest 500. For the 272nd Street corridor, the SR 99 alternatives include a station near the Redondo Heights Park-and-Ride, while the I-5 alternatives include a station near the Star Lake Park-and-Ride.

[a] It is assumed that the S. 288th Street and Dash Point Road S. stations would serve similar travel markets and that both would not be constructed since they are approximately 0.5 mile apart.

7.2.2 Travel Times

The projected travel time for the SR 99 and I-5 alternatives, each with three stations, is about 14 minutes. They would have generally similar travel times because they have similar lengths and all the alternatives are either elevated or grade-separated. The minor differences in alignment lengths and curvatures would result in slight travel time differences of one minute or less.

Table 7-7
Travel Times for Alignments with Station Options

Light Rail Alternative	Travel Time (minutes)
Baseline Stations	
SR 99 with 3 Stations ending at FWTC	14.5
I-5 with 3 Stations ending at FWTC	14.0
Potential Additional Stations	
SR 99 with 6 Stations ending at FWTC	16.5
I-5 with 6 Stations ending at FWTC	16.0
Note: Travel Times are rounded to the nearest half minute.	

Adding up to three additional stations (at S. 216th Street, S. 260th Street, and S. 288th or S. Dash Point Road) would add about two minutes of travel time to the SR 99 or I-5 alternatives, as shown in **Table 7-7**. The added travel time is due to a dwell time at the stations, and acceleration and deceleration of the trains at these stations. Each potential additional station would add approximately 40 seconds.

7.2.3 Land Use

This section discusses how well existing land uses would support a station location, and the potential for future development at station locations based on planned land use, zoning and underutilized parcels. Areas that are currently or proposed to be densely developed with commercial, mixed use or multi-family land uses are considered to be more supportive of a station than lower density land uses such as single-family residential or industrial. In addition, parcels that are currently vacant or considered underutilized area more likely to be redeveloped with land uses that may support a station, depending on zoning. Areas zoned for TOD or high-density zoning are also more likely to be redeveloped in a way that is supportive of a station. Existing land uses within a ½ mile of station locations are presented in **Table 7-8** and **Exhibit 7-3.**

Table 7-8
Existing Land Use by Station Area by Acres and (Percent of Total)

Station Location	Single Family	Multi-family	Commercial	Industrial	Insti-tutional	Parks/ Open Space	Vacant
Baseline Stations							
Kent/Des Moines	102 (21%)	37 (7%)	101 (10%)	<1 (<1%)	41 (9%)	1 (<1%)	82 (17%)
S. 272nd Street (Redondo Heights Park-and-Ride)	183 (36%)	99 (20%)	46 (9%)	0	17 (3%)	5 (1%)	81 (16%)
S. 272nd Street (Star Lake Park-and-Ride)	122 (24%)	69 (14%)	30 (6%)	0	31 (6%)	29 (6%)	108 (21%)
FWTC	27 (5%)	53 (10%)	219 (44%)	0	16 (3%)	45 (9%)	36 (7%)
Potential Additional Stations							
SR 99							
S. 216th Street	136 (27%)	60 (12%)	57 (11%)	2 (<1%)	27 (5%)	7 (1%)	105 (21%)
S. 260th Street	158 (31%)	72 (14%)	64 (13%)	3 (1%)	8 (2%)	19 (4%)	92 (18%)
S. 288th Street	221 (44%)	78 (16%)	17 (3%)	0	10 (2%)	0	75 (15%)
S. Dash Point Road	223 (44%)	32 (6%)	18 (4%)	0	25 (5%)	18 (4%)	93 (19%)
I-5							
S. 216th Street	146 (29%)	92 (18%)	46 (9%)	0	23 (4%)	2 (0%)	78 (15%)
S. 260th Street	163 (32%)	47 (9%)	48 (10%)	3 (1%)	25 (5%)	6 (1%)	79 (16%)
S. 288th Street	194 (39%)	111 (22%)	12 (2%)	0	3 (1%)	1 (0%)	54 (11%)
Note: Presented land use data excludes public and private rights-of-way and therefore percentages do not total 100.							

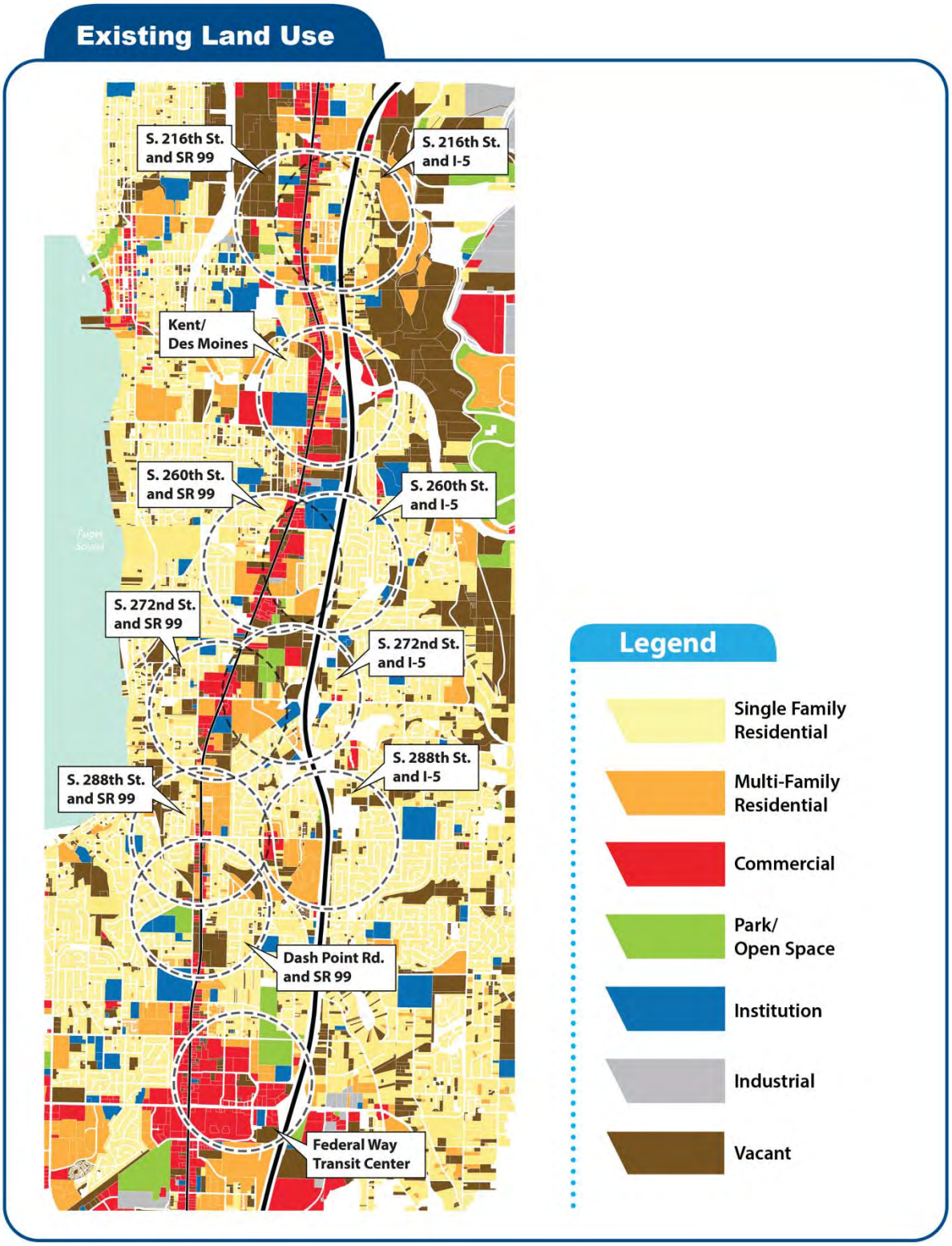

Exhibit 7-3
Existing Land Use by Station Area

The amount of the various existing land uses varies substantially between stations. The primary land uses within ½ mile of all station locations include:

- Commercial (ranging from 2-44% of the land in the station area)
- Single Family residential (ranging from 5-44% of the land in the station area)
- Vacant (ranging from 7-21% of the land in the station area)
- Multi-family residential (ranging from 6-22% of the land in the station area)
- All other uses account for 10% or less of the existing land use in the station areas.

Existing land uses at the baseline stations is generally diverse, with a mixture of single family and multi-family residential, commercial, institutional and park/open space land uses. Of the potential additional station locations, the one at SR 99 and S. 260th Street has the greatest amount of commercial land, while the potential stations at SR 99 and S. 288th and Dash Point Road have the greatest amount of single family residential land. The location at I-5 and S. 288th Street has the most multi-family residential land. The potential station location at SR 99 and S. 216th Street has the most vacant land within the half mile radius.

Existing land uses within a ½ mile of station locations are presented in **Table 7-9** and **Exhibit 7-4.** Planned land uses for the land within the study station areas are pretty similar to the existing land use for commercial, single and multi-family residential land uses; however with the planned land use, there is an increase in single family residential for all of the potential additional stations, with the exception of the location at S. 216th Street and SR 99, where there is an increase in multi-family and mixed use planned. The primary planned land uses include:

- Single Family residential (ranging from 6-64% of the land in the station area)
- Multi-family residential (ranging from 5-26% of the land in the station area)
- Commercial (ranging from 6-32% of the land in the station area)
- Mixed Use (0-57% of the land in the station area)
- All other uses account for less than 15% of the planned land use.

Both the Kent/Des Moines and FWTC stations have over 30 percent of land designated for mixed use, and have the most diverse planned land uses. Only the potential station locations at S. 216th Street (both SR 99 and I-5) and S. 260th and SR 99 have planned mixed use within a half mile. The S. 216th Street locations also have the largest planned commercial areas.

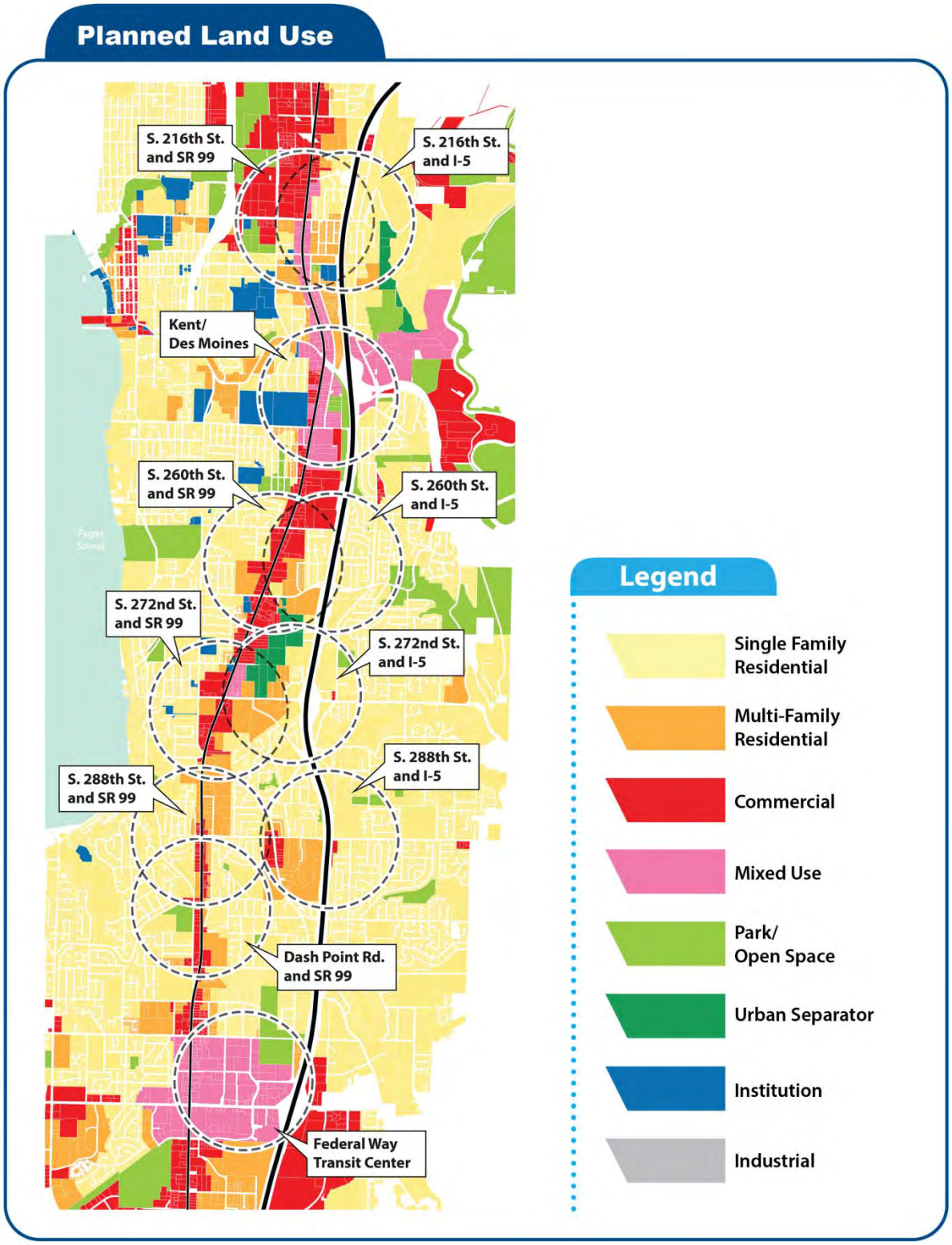

Exhibit 7-4
Planned Land Use by Station Area

Table 7-9
Planned Land Use by Station Area by Acres and (Percent of Total)

Station Location	Single Family	Multi-Family	Commercial	Industrial	Institution	Mixed Use	Parks/Open Space	Urban Separator
Baseline Stations								
Kent/Des Moines	138 (27%)	25 (5%)	76 (15%)	3 (<1%)	51 (11%)	178 (35%)	27 (5%)	0
S. 272nd Street and SR 99 (Redondo Heights Park-and-Ride)	242 (48%)	129 (26%)	61 (12%)	0	7 (1%)	19 (4%)	0	16 (3%)
S. 272nd Street and I-5 (Star Lake Park-and-Ride)	240 (48%)	79 (16%)	29 (6%)	0	2 (<1%)	19 (4%)	9 (2%)	67 (13%)
FWTC	29 (6%)	26 (5%)	12 (2%)	0	0	287 (57%)	44 (9%)	0
Potential Additional Stations								
SR 99								
S. 216th Street	114 (23%)	81 (16%)	159 (32%)	0	17 (3%)	43 (8%)	23 (5%)	0
S. 260th Street	229 (46%)	81 (16%)	128 (25%)	0	7 (1%)	<1 (<1%)	0	51 (10%)
S. 288th Street	296 (59%)	89 (18%)	28 (6%)	0	0	0	0	0
S. Dash Point Road	232 (64%)	28 (5%)	40 (8%)	0	0	0	21 (4%)	0
I-5								
S. 216th Street	201 (40%)	77 (15%)	63 (13%)	0	11 (2%)	40 (8%)	7 (1%)	20 (4%)
S. 260th Street	316 (63%)	52 (10%)	86 (17%)	0	0	0	14 (3%)	29 (6%)
S. 288th Street	260 (52%)	91 (18%)	22 (4%)	0	0	0	9 (2%)	0
Note: Most Comprehensive Plan land use data excludes public and private rights-of-way and therefore percentages do not total 100.								

Table 7-10 and **Exhibit 7-5** present the area with a ½ mile that is zoned for TOD or high-density land uses, such as mixed use or high-density multi-family residential. Of the baseline stations, both the Kent/Des Moines and FWTC stations have over 50 percent of land within a ½ mile zoned for TOD or high-density land uses, while the stations at S. 272nd Street have between 5 percent (Star Lake Park-and-Ride) and 16 percent (Redondo Heights Park-and-Ride). Of the potential additional stations, the stations at S. 216th Street and SR 99 or I-5 both have 21 percent of this area zoned for TOD or high-density land uses, while the rest of the potential stations have less than 10 percent zoned in this way.

As shown in **Table 7-11**, the amount of underutilized land is similar for most of the station areas, all ranging between 22-40%. At the baseline stations, the Kent/Des Moines and FWTC had the least amount of underutilized land with a half mile, with 26 and 23 percent, respectively. The stations at S. 272nd Street had between 30 percent (Star Lake Park-and-Ride) and 37 percent (Redondo Heights Park-and-Ride). Of the potential additional stations, the locations at S. 260th Street and SR 99 and I-5 have the greatest amount of underutilized land, with approximately 40 percent. Underutilized land within the station areas is shown in **Exhibit 7-6**.

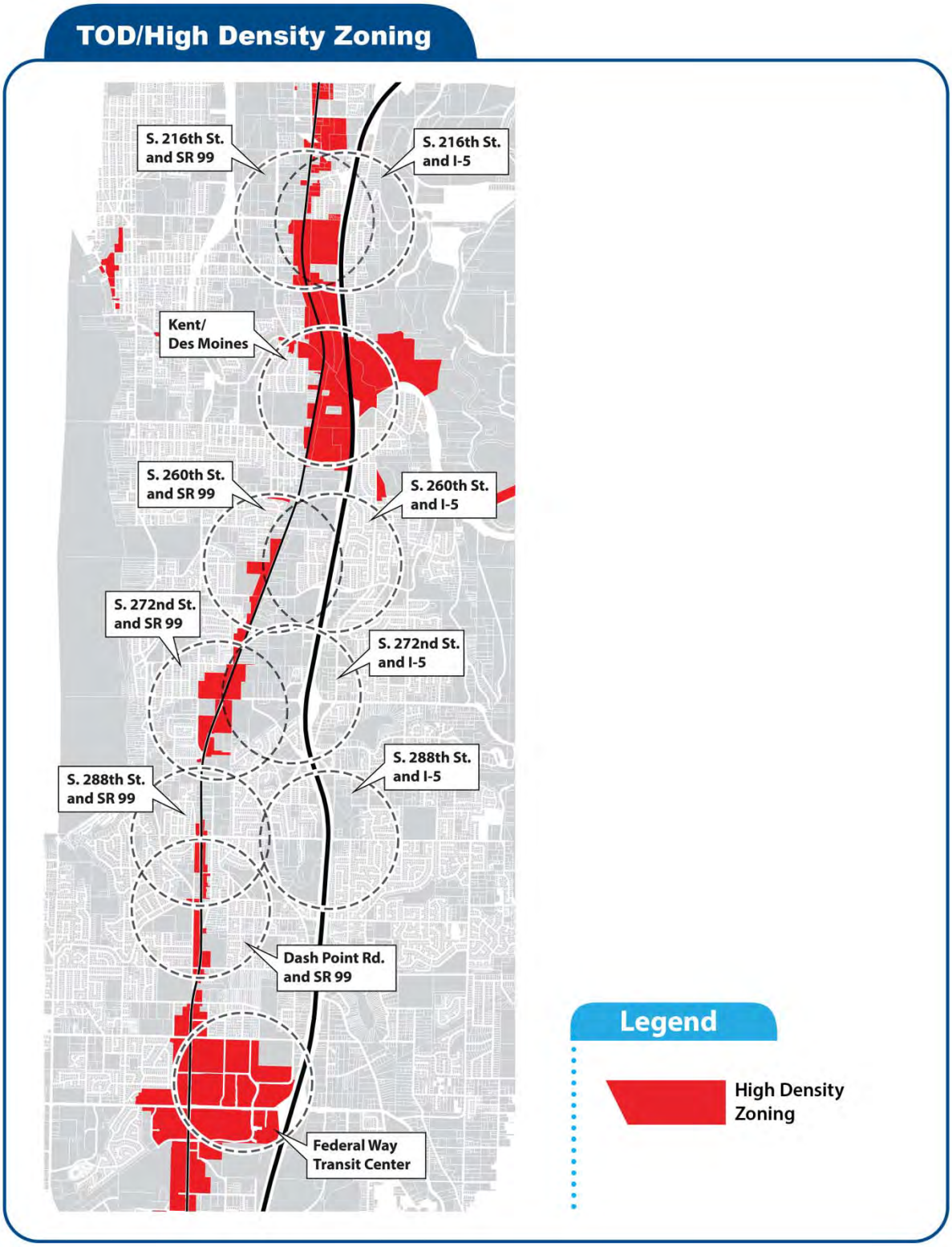

Exhibit 7-5
TOD/High-Density Zoning by Station Area

Table 7-10
TOD/High Density Zoning by Station Area by Acres and (Percent of Total)

Station	Acres	% of Total Land Use
Baseline Stations		
Kent/Des Moines	255	51%
S. 272nd Street (Redondo Heights Park-and-Ride)	81	16%
S. 272nd Street (Star Lake Park-and-Ride)	27	5%
FWTC	292	58%
Potential Additional Stations		
SR 99		
S. 216th Street	108	21%
S. 260th Street	36	7%
S. 288th Street	20	4%
S. Dash Point Road	37	7%
I-5		
S. 216th Street	104	21%
S. 260th Street	16	3%
S. 288th Street	0	0%

Table 7-11
Underutilized Parcels by Station Area by Acres and (Percent of Total)

Station	Acres	% of Total Land Use
Baseline Stations		
Kent/Des Moines	128	26%
S. 272nd Street (Redondo Heights Park-and-Ride)	188	37%
S. 272nd Street (Star Lake Park-and-Ride)	151	30%
FWTC	114	23%
Potential Additional Stations		
SR 99		
S. 216th Street	161	32%
S. 260th Street	200	40%
S. 288th Street	109	22%
S. Dash Point Road	113	23%
I-5		
S. 216th Street	165	33%
S. 260th Street	194	39%
S. 288th Street	120	24%

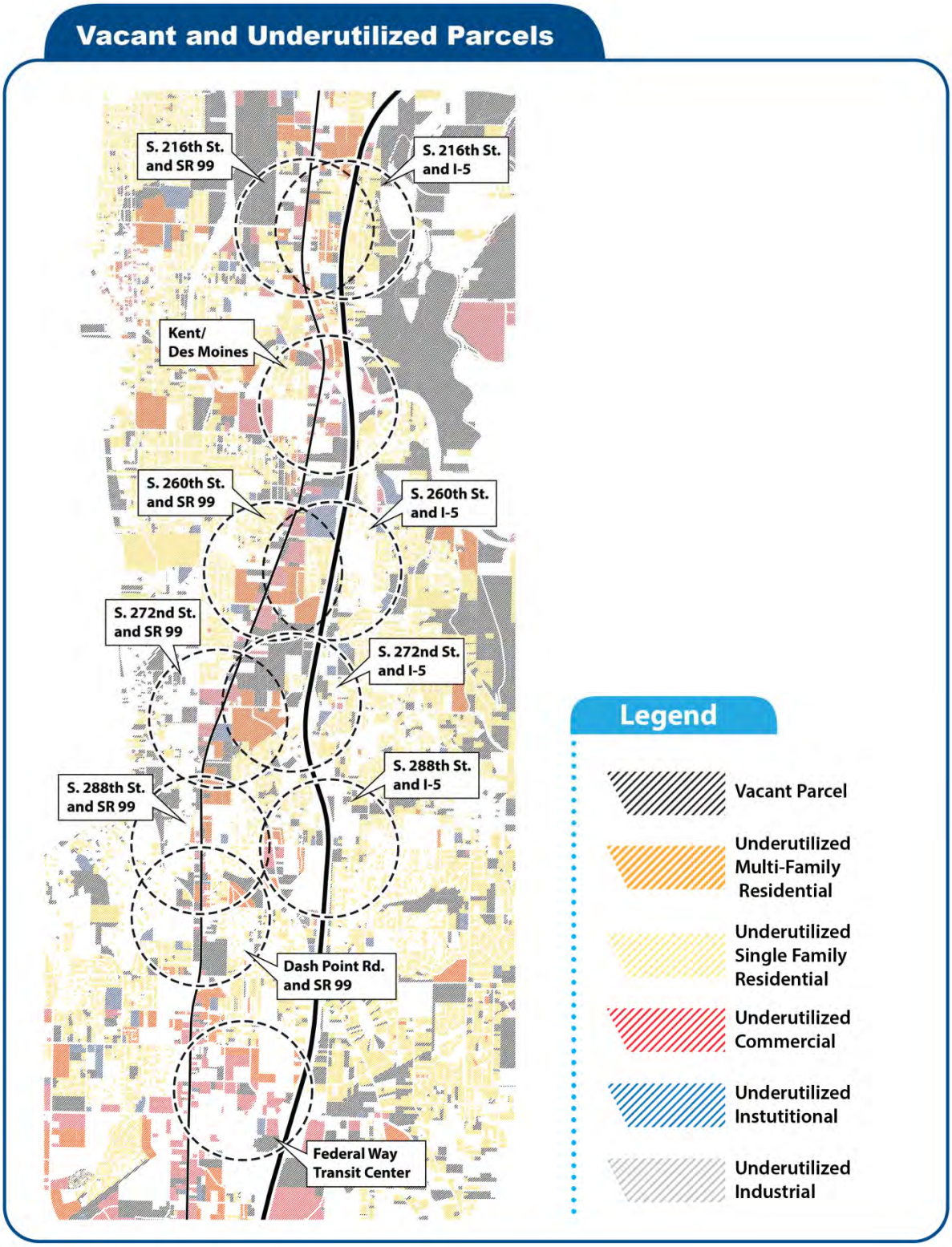

Exhibit 7-6
Vacant and Underutilized Parcels by Station Area

7.2.4 Population, Employment, and Households

Table 7-12 summarizes the current population, employment and households within a half mile of each station. The existing population and number of households do not differ substantially between the potential station areas, with the maximum variance between stations being 400 people and 500 households.

Employment at the baseline stations is highest at the FWTC station, with over 4,600 jobs, followed by the Kent/Des Moines station, with over 1,800 jobs. The stations at S. 272nd Street have smaller employment bases, with between 274 jobs (at I-5) and 580 jobs (at SR 99). Existing employment around the potential additional stations is highest at SR 99 and S. 216th Street, which is the only location with over 1,000 existing jobs. The station on I-5 at S. 288th Street has the lowest employment, likely because much of the area within a ½ mile is composed of I-5 and has no major commercial areas nearby.

Table 7-12
Current Population, Employment, and Households within Each 1/2-Mile Station Area

Station	Population	Households	Employment
Baseline Stations			
Kent/Des Moines	4,300	1,400	1,866
S. 272nd Street (Redondo Heights Park-and-Ride)	3,000	1,700	580
S. 272nd Street (Star Lake Park-and-Ride)	2,400	1,400	274
FWTC	3,900	1,200	4,670
Potential Additional Stations			
SR 99			
S. 216th Street	3,300	1,300	1,052
S. 260th Street	3,000	1,200	587
S. 288th Street	3,200	1,600	568
S. Dash Point Road	3,400	1,400	410
I-5			
S. 216th Street	3,100	1,200	856
S. 260th Street	3,200	1,100	599
S. 288th Street	3,100	1,600	249

7.2.5 Activity Centers

Major activity centers in the study area include HCC and the Federal Way City Center. The Kent/Des Moines Station would provide service to HCC, which is located west of SR 99, and the FWTC Station would provide service to the Federal Way City Center, which is located between SR 99 and I-5.

7.2.6 Parking Opportunities

There are existing Park-and-Ride lots within ½ mile of the baseline stations along SR 99 and I-5 but there are currently no Park-and-Ride facilities within a ½ mile of the potential additional stations at S. 216th Street, S. 260th Street, S. 288th Street or S. Dash Point Road. Below is a discussion of parking opportunities and potential for overflow parking issues at each station.

Baseline Stations

Kent/Des Moines at SR 99 or I-5

The Kent/Des Moines Park-and-Ride east of I-5 has 370 parking spaces and is currently 100% utilized. The neighborhoods surrounding this station area have a high degree of restricted parking with over 70 percent of the on-street parking restricted for residential use only. This park-and-ride is located on the east side of I-5, however, requiring users to cross under I-5 on Kent-Des Moines Road, a distance of approximately a 1/2 mile.

S. 272nd Street: Redondo Heights Park-and-Ride (SR 99) and Star Lake Park-and-Ride (I-5)

The Redondo Heights Park-and-Ride on SR 99 has 697 parking spaces and is currently 8% utilized. The Star Lake Park-and-Ride next to I-5 has 630 parking spaces and is currently 59% utilized. The majority of residential development south of the Star Lake Park-and-Ride and east of the Redondo Heights Park-and-Ride primarily is multi-family with private resident-only parking. The residential neighborhood north of the Star Lake Park-and-Ride lot off of 28th Avenue S. is relatively small with unrestricted on-street parking that is less than 10% utilized. The single-family neighborhood south of S. 272nd Street and west of Star Lake Road has on-street parking that is about 10% utilized during the day. The distance from this neighborhood is less than ½ mile from both the Star Lake and Redondo Heights Park-and-Ride lots; however due to a combination of vegetative barriers and street connectivity, access to either the Star Lake or Redondo station areas would require walking along S. 272nd Street, a 15- to 20-minute walk to either station location.

FWTC (SR 99 and I-5)

The FWTC has 1,190 parking spaces, which are currently 99% utilized. The Federal Way Park-and-Ride would be within a ½ mile of the FWTC station, and has 877 parking spaces, which are currently 45% utilized. Together, parking utilization in this area is approximately 76%. The nearest neighborhood to the FWTC area with on-street parking is located north of S. 312th Street. Access to a station at FWTC would require walking along 23rd Avenue S. or along 28th Avenue S and S. 317th Street. This is approximately a ½ mile walk that would take about 10

minutes. Therefore there is a low potential for riders parking in the neighborhood and walking to the transit center station.

Potential Additional Stations

S. 216th Street (SR 99 and I-5)

There are no existing Park-and-Ride lots within a ½ mile of these station locations. Immediately adjacent to SR 99 is mainly commercial or vacant property. To the east of SR 99, there are residential neighborhoods both north and south of S. 216th Street that are between a ¼ and ½ of a mile from SR 99. These neighborhoods have mostly unrestricted on-street parking that is 35 to 40 percent utilized during the day. These neighborhoods would be within a 10 - 15 minute walk of the potential stations at SR 99 and S. 216th Street. East of I-5 are smaller single family neighborhoods with some unrestricted on-street parking. These neighborhoods would be within a 15-minute walk of a potential station area at S. 216th Street and I-5 but would require walking across the S. 216th Street bridge crossing of I-5 which has narrow sidewalks in each direction.

S. 260th Street (SR 99 and I-5)

There are no existing Park-and-Ride lots within a ½ mile of these station locations. To the west between 20th Avenue S. and SR 99, the current land uses are a combination of multifamily housing and non-residential land uses with private parking. West of 20th Avenue S,, there are single family residential neighborhoods with on-street parking that is underutilized during the day. East of SR 99, the area between I-5 and SR 99 is single family and multi-family neighborhoods. These neighborhoods would all be within a 15-minute walk of a potential station area at S. 260th Street and SR 99 or I-5. East of I-5 and north of S. 259th Pl./S. 260th Street are single family neighborhoods with unrestricted on-street parking. These neighborhoods would be within a 15-minute walk of a potential station area at S. 260th Street and I-5. The area south of S. 259thPl./S. 260th Street is primarily undeveloped open space with a few large acre private residents that have no on-street parking.

S. 288th Street (SR 99 and I-5)

There are no existing Park-and-Ride lots within a ½ mile of either of these station locations. The neighborhoods west of the SR 99 station area are separated from SR 99 by a combination of green belt and non-residential land uses and would require walking along 16th Avenue S. to or from the north of S. 288th Street to access the station area. The land uses one block east of SR 99 to Military Road S. are generally single family residential in nature and have unrestricted on-street parking. Military Road S. is approximately ½ mile east of SR 99.

The development to the west of the I-5 station location and south of S. 288th Street is a combination of single and multi-family residents along with a large neighborhood of manufactured homes with limited on-street parking. The neighborhoods north of S. 288th Street are generally single-family residential with cul-de-sacs off of 30th Avenue with on-street parking space that is lightly utilized during the day. The distance from the neighborhoods north and south of S. 288th Street is about ½ mile from the I-5 and S. 288th Street station.

S. 288th Street crosses under I-5 and has narrow sidewalks on each side of the roadway. The residential development to the east of the I-5 station location and north of S. 288th Street is comprised mainly of a large multi-family complex with private resident only parking. Development south of S. 288th Street and east of I-5 is single family in nature with on-street parking that is underutilized during the day. These neighborhoods would be within a 15-minute walk of the potential station area at S. 288th Street and I-5.

S. Dash Point Road (SR 99)

There are no existing Park-and-Rides within a ½ mile of this station. The land uses directly adjacent to the possible Dash Point Road S. station location are Sacajawea Park and Middle School, multi-family residential and commercial. The neighborhoods west of the station area are separated from SR 99 by a combination of green belt and non-residential land uses and would require walking north or south along either 16th Avenue S. or Redondo Way to S. Dash Point Road. The land uses one block east of SR 99 are generally single family residential in nature and have on-street parking that is unrestricted and fairly underutilized during the day.

Table 7-13 summarizes the parking opportunities for each station area.

Table 7-13
Existing Park-and-Ride Spaces and Utilization within Station Areas

Station	Park-and-Ride Access (Number of Stalls / Percent Utilization)
Baseline Stations	
Kent/Des Moines	370 / 100%
S. 272nd Street (Redondo Heights)	697 / 8%
S. 272nd Street (Star Lake)	630 / 59%
FWTC	2,067 / 76%
Potential Additional Stations	
S. 216th Street (SR 99 or I-5)	None
S. 260th Street (SR 99 or I-5)	None
S. 288th Street (SR 99 or I-5)	None
S. Dash Point Road (SR 99)	None

7.2.7 Motorized Access

The ability to access station locations via personal vehicles or transit was evaluated by looking at the number of cardinal directions that a station could be accessed from, based on the existing road network, and the number of bus routes that would directly serve the station location. **Table 7-14** summarizes existing vehicle and transit access to these station locations.

The baseline stations would have access from all four directions (north, south, east and west), as do stations along SR 99 at S. 216th and S. 260th Streets. Stations along SR 99 at S. 288th Street and S. Dash Point Road would have north and south access on SR 99, but limited to no access to the west and the east, respectively. Stations along I-5 and S. 216th Street, S. 260th Street and S. 288th Street would have east and west access, but would lack north and south access from I-5. The nearest north-south roadways to these stations are either SR 99 or Military Road S.

Table 7-14
Existing Road and Transit Access

Station Location	Road Access	Bus Routes	Route Frequency
Baseline Stations			
Kent/Des Moines	All 4 directions	RapidRide A Line KCM 166	10 minutes peak hours, 15 minutes off-peak hours 30 minutes all day
S. 272nd Street (SR 99)	All 4 directions	RapidRide A Line	10 minutes peak hours, 15 minutes off-peak hours
S. 272nd Street (I-5)	All 4 directions	KCM 152, 190, 192, 193, 197 Sound Transit 574	10- 30 minutes during peak hours 30 minutes all day
FWTC	All 4 directions	KCM RapidRide A Line, 177,178,179, 193,197 Sound Transit 574, 577and 578 Pierce Transit 402, 500, 501	15-30 minutes peak hours 10-15 minutes peak hours, 30 -40 minutes off peak hours 60 minutes all day
Potential Additional Stations			
SR 99			
S. 216th Street	All 4 directions	RapidRide A Line	10 minutes peak hours, 15 minutes off-peak hours
S. 260th Street	All 4 directions	RapidRide A Line	10 minutes peak hours, 15 minutes off-peak hours
S. 288th Street	North, South and East only	RapidRide A Line	10 minutes peak hours, 15 minutes off-peak hours
S. Dash Point Road	North, South and West only	RapidRide A Line	10 minutes peak hours, 15 minutes off-peak hours
I-5			
S. 216th Street	East and West only	None	Not applicable
S. 260th Street	East and West only	None	Not applicable
S. 288th Street	East and West only	KCM 183	30 minutes pm peak, 60 minutes off peak to 7 pm

Transit access was evaluated based on existing transit routes. All routes along SR 99 would have transit access from the King County Metro (KCM) RapidRide A Line, and the station at Kent/Des Moines would also have access from KCM Route 166, which travels east-west on Kent-Des Moines Road and S. 240th Street between Kent and Des Moines, and also provides access to/from Burien to the north. Along the I-5 corridor, the S. 272nd Station at the Star Lake Park-and-Ride serves multiple local and regional routes, as does the FWTC. The S. 216th Street and S. 260th Street station locations along I-5 would have no direct transit access, while the station at

S. 288th Street and I-5 would have access from one route, KCM 183, which provides service between Federal Way and Kent.

7.2.8 Non-Motorized Access

Potential for non-motorized access (walking and bicycling) to station locations was measured by the density of local streets within ½ mile of each station, which could be used by pedestrians and bicyclists to access the stations. Known plans for improvements in these areas by local jurisdictions were also evaluated to determine if sidewalks or bike lanes are likely to be added to areas that currently lack them.

Baseline Stations

Pedestrian and bicycle access for station areas associated with the I-5 alternatives would be limited at Kent-Des Moines Road and the S. 272nd Street interchange areas. Access to the stations from the east side of I-5 would require crossing under the freeway and involves some change in elevation that could be a challenge for some non-motorized users. These interchange areas are both shown as priority pedestrian and bicycle areas in the City of Kent's Non-Motorized Plan, but currently lack bicycle facilities, and sidewalks around the interchanges are sporadic. The combination of high volume and congestion at the intersections at Kent-Des Moines Road and S. 272nd Street interchanges combined with minimal existing bicycle and pedestrian facilities would limit bike and pedestrian accessibility to stations in these locations.

Potential Additional Stations

The roadway system density (measured in miles of roadway) for all station areas ranges from 7.2 to 13.3 miles within a half-mile. The greatest density of roadways (local, collector and arterial classified streets) is at the station at S. Dash Point Road on SR 99. The station area with the lowest miles of street system is SR 99 and S. 260th Street. In general, SR 99 has sidewalks on both sides of the roadway which could provide access for non-motorized users to all stations along SR 99. Most of the other streets surrounding the potential station locations do not have continuous sidewalks. There are currently limited bicycle facilities along SR 99, however all potential station areas have been indicated as locations for future investments in both bicycle and pedestrian improvements by local agencies. The City of Kent has future plans for bike lanes and sidewalk improvements on both sides of S. 260th Street where it is within their jurisdiction. The City of Des Moines has future plans for either bike lanes or bike route improvements along S. 216th Street, S. 240th Street, S. 260th Street and S. 272nd Street, the last of which would connect with the City of Federal Way's future bicycle routes along S. 272nd Street. The City of Des Moines has also identified these roadways as part of their priority pedestrian network to improve sidewalk connectivity. The City of Federal Way has identified several bicycle improvements including a bike boulevard west of SR 99 near Dash Point Road S. and bike lanes

along S. 288th Street connecting to SR 99 near the Redondo Heights Park-and-Ride. The topography in the area between 16th Avenue S. and Dash Point Road S. is higher than SR 99 to the east and lower than SR 99 to the west, which would present a challenge for some non-motorized users approaching the SR 99 corridor from these directions. They are also planning to complete a variety of sidewalk improvements in the neighborhoods west of SR 99 near all possible station areas. **Table 7-15** summarizes the opportunities for non-motorized access for each station location. Major transit, bicycle, and pedestrian corridors are shown in **Exhibit 7-7**.

Table 7-15
Non-motorized Access at Station Areas

Station	Non-motorized Access (miles of Local Streets within ½ mile of Station location)
Baseline Stations	
Kent/Des Moines	6.7
S. 272nd Street (Redondo Heights Park-and-Ride)	8.4
S. 272nd Street (Star Lake Park-and-Ride)	5.0
FWTC	4.6
Potential Additional Stations	
SR 99	
S. 216th Street	7.7
S. 260th Street	7.2
S. 288th Street	12.9
S. Dash Point Road	13.3
I-5	
S. 216th Street	8.4
S. 260th Street	8.0
S. 288th Street	9.8

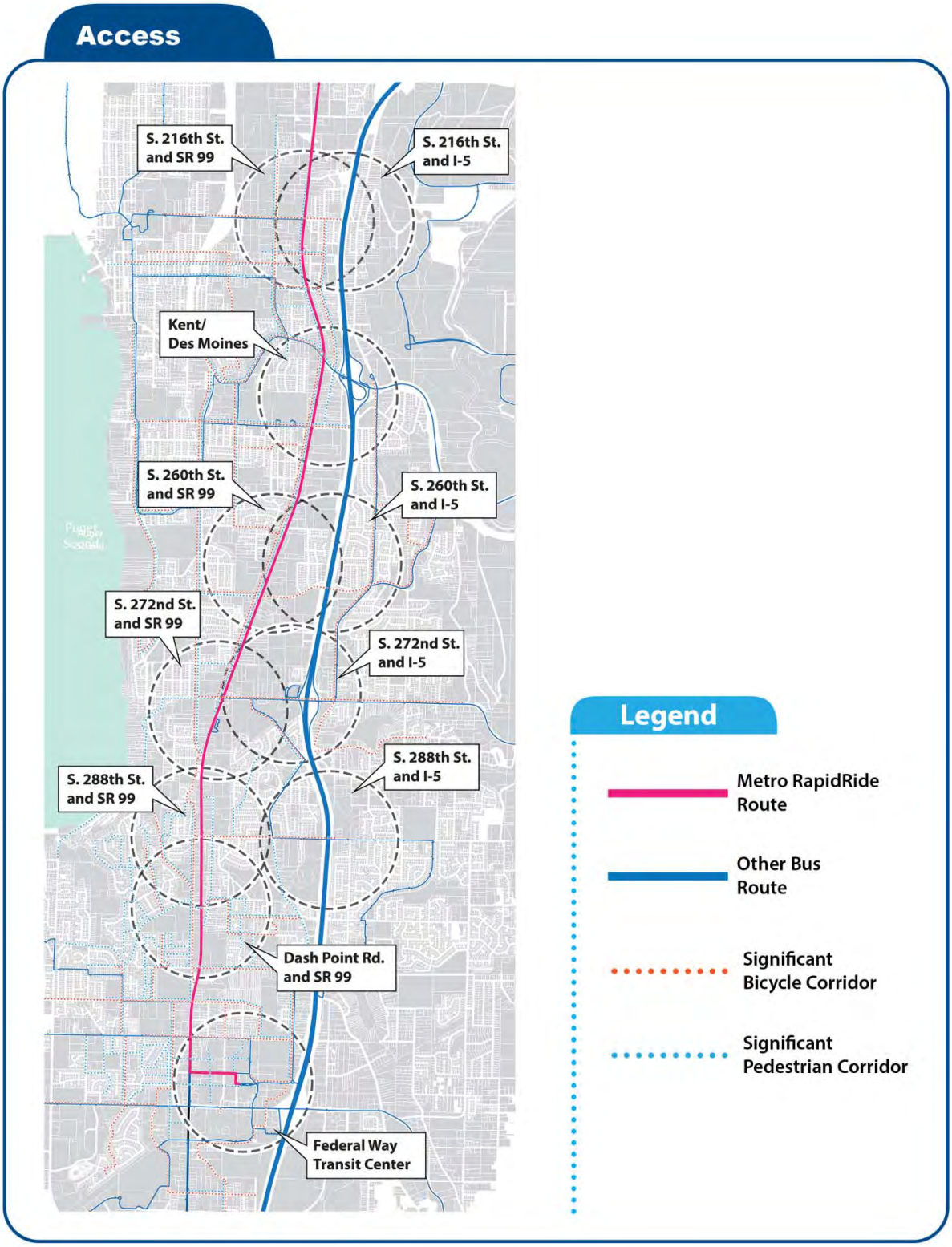

Exhibit 7-7
Non-Motorized Station Access

7.2.9 Estimated Costs

Based on the current level of conceptual design for the alternatives and stations, the estimated capital cost for the stations would be similar, at approximately $40 million (in 2013 dollars). If additional parking were to be included at a station, the cost would be higher. The incremental Operating and Maintenance cost for each station would be the same, at approximately $0.2 million per year.

7.3 Summary Findings by Station

The following sections summarize the strengths and weaknesses of all the stations evaluated in Level 2, and summarizes the key findings related to each of them. This includes the baseline stations and the potential additional stations.

7.3.1 Baseline Stations

Kent/Des Moines

TABLE 7-16
Strengths and Weaknesses of the Kent/Des Moines Station

Strengths	Weaknesses
• Authorized under ST2 • More TOD/high-density zoning (City of Kent's Midway Subarea Plan) • Moderate amount of developable parcels to support transit-oriented development • Higher existing population and employment within a half mile radius to support a transit station • Provides access to a regional activity center • Access from all directions • Reasonable amount of existing bus services, existing and planned bicycle and pedestrian network to support a transit station	• Limited access to existing parking • Existing high levels of traffic on Kent-Des Moines Road

The **Kent/Des Moines** station is one of the stations identified in the ST2 plan. It would be in close proximity to HCC, which is a major activity center in the corridor and would support strong ridership at this station. The area along SR 99 includes a mix of commercial land uses near this station location, including multiple large retail establishments. The existing population within ½ mile is the highest among the baseline and potential additional stations, and it has the second highest employment (after FWTC), which is related to HCC and surrounding businesses.

The City of Kent's Midway Subarea Plan calls for a substantial amount of TOD, mixed-use and high-density residential land uses in the area between SR 99 and I-5. Existing bus services, as well as an extensive network of planned bicycle and pedestrian connections would provide

opportunities for multi-modal connections in this area. Planned open space near the station area is part of the Midway Subarea Plan.

This station would have vehicle access from SR 99 and from I-5 via the interchange at Kent-Des Moines Road. Transit access would be provided by routes along SR 99, S. 240th Street, and Kent-Des Moines Road. Connecting from the east side of I-5 to this station location (from the Kent-Des Moines Park-and-Ride) would be a challenge for non-motorized users due to long travel distance (at least ½ mile) and topography. Kent-Des Moines Road currently operates over-capacity, and motorized and non-motorized access from and to this station area from east of I-5 could be difficult during peak periods. Non-motorized crossings (bikes and pedestrians) of Kent-Des Moines Road could also present challenges due to the long crossing distance and high traffic volumes. Analysis results for this station are shown graphically in **Exhibits 7-8a** and **7-8b**.

Key Findings

1) High concentration of existing and planned TOD and high-density development, as well as a large activity center (HCC) increases the potential for development in this station area.
2) This station would support the vision of City of Kent's Midway Subarea Plan.
3) This location is accessible from SR 99 and I-5, although Kent-Des Moines Road is currently over capacity.
4) Accessing the Kent/Des Moines Park-and-Ride from this station location would be challenging for non-motorized users due to the long distance and topographical changes.
5) Crossing Kent-Des Moines Road could be challenging for non-motorized users going to and from the north.

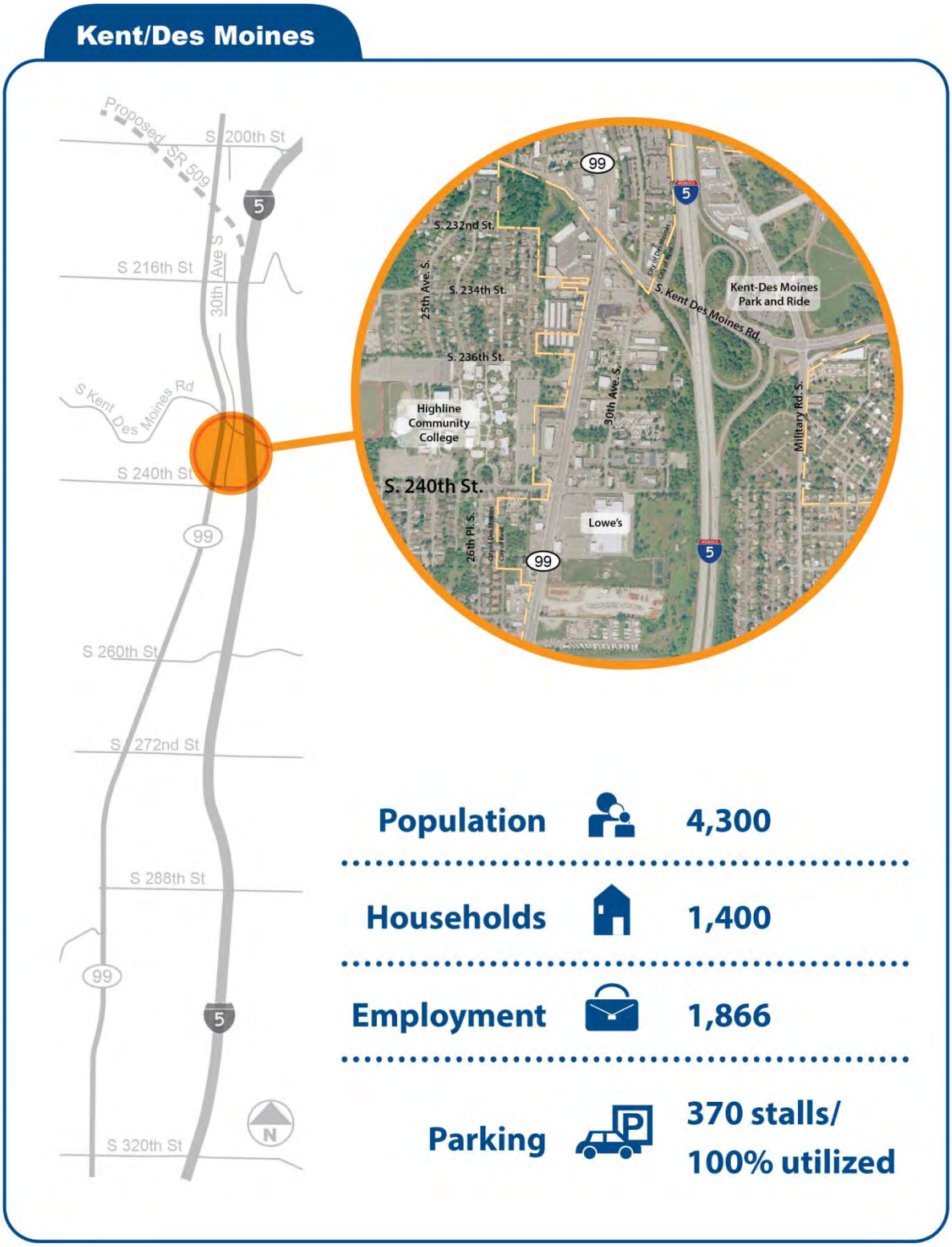

Exhibit 7-8a
Station at Kent/Des Moines: Location, Demographics, and Parking

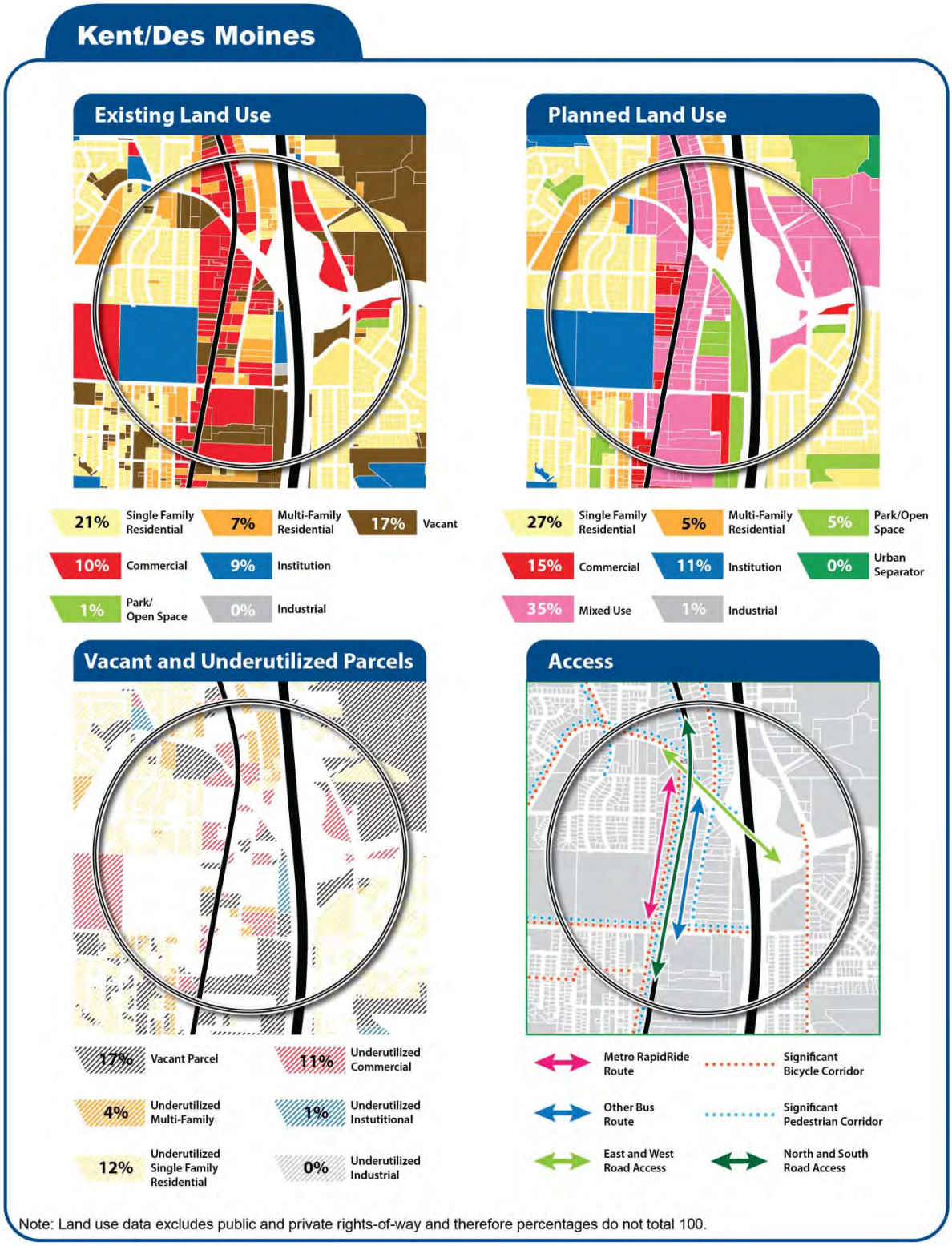

Exhibit 7-8b
Station at Kent/Des Moines: Land Use and Demographics

S. 272nd Street and SR 99 (Redondo Heights Park-and-Ride)

TABLE 7-17
Strengths and Weaknesses of S. 272nd Street and SR 99 Station

Strengths	Weaknesses
• Authorized under ST2 Plan • Moderate concentration of planned commercial/mixed-use/medium to high density residential • Existing Redondo Heights Park-and-Ride could be utilized for this station • Access from all directions • Reasonable amount of existing bus services, planned and existing bicycle and pedestrian network to support a transit station.	• Developable area near McSorley Creek wetland may be limited

The **S. 272nd Street and SR 99 Station** location would be located at the Redondo Heights Park-and-Ride in the City of Federal Way. The area within ½ mile would include parts of the cities of Des Moines and Kent as well. Commercial land uses along SR 99 in this area include Redondo Square complex and LA Fitness, as well as many small businesses. The majority of the residential land use is single family, with a high concentration of multi-family residential located south of S. 272nd Street. The large McSorley Creek wetland complex, much of which has been purchased by the City of Kent for preservation, is located within ½ mile of the station area.

Medium to high density residential and commercial uses are planned around S. 272nd Street and SR 99 and the City of Kent has specifically designated the area north of S. 272nd Street for a Transit-Oriented Community. Although there is a high amount of vacant and underutilized land that could support transit-oriented development, land uses around the wetland area should be examined in more detail to understand actual development/redevelopment potential. Redondo Heights Park-and-Ride is currently shown as underutilized, and could accommodate future parking for the station. The existing crossing under I-5 of S. 272nd Street would provide access to this station location from east of I-5. The Star Lake Park-and-Ride is located just over ½ mile from the station location. Besides the RapidRide A Line that runs on SR 99, there is limited other local transit service that connects to this station location. Major bicycle and pedestrian corridors are planned and are intended to connect to major activities. Analysis results for this station are shown graphically in **Exhibits 7-9a** and **7-9b**.

Key Findings

1) High concentration of planned commercial and mixed-use land uses along SR 99 increases the potential for development in this station area.
2) The Redondo Heights Park-and-Ride could accommodate additional station parking.
3) Land uses around the McSorley Creek wetland need further analysis to understand development potential.

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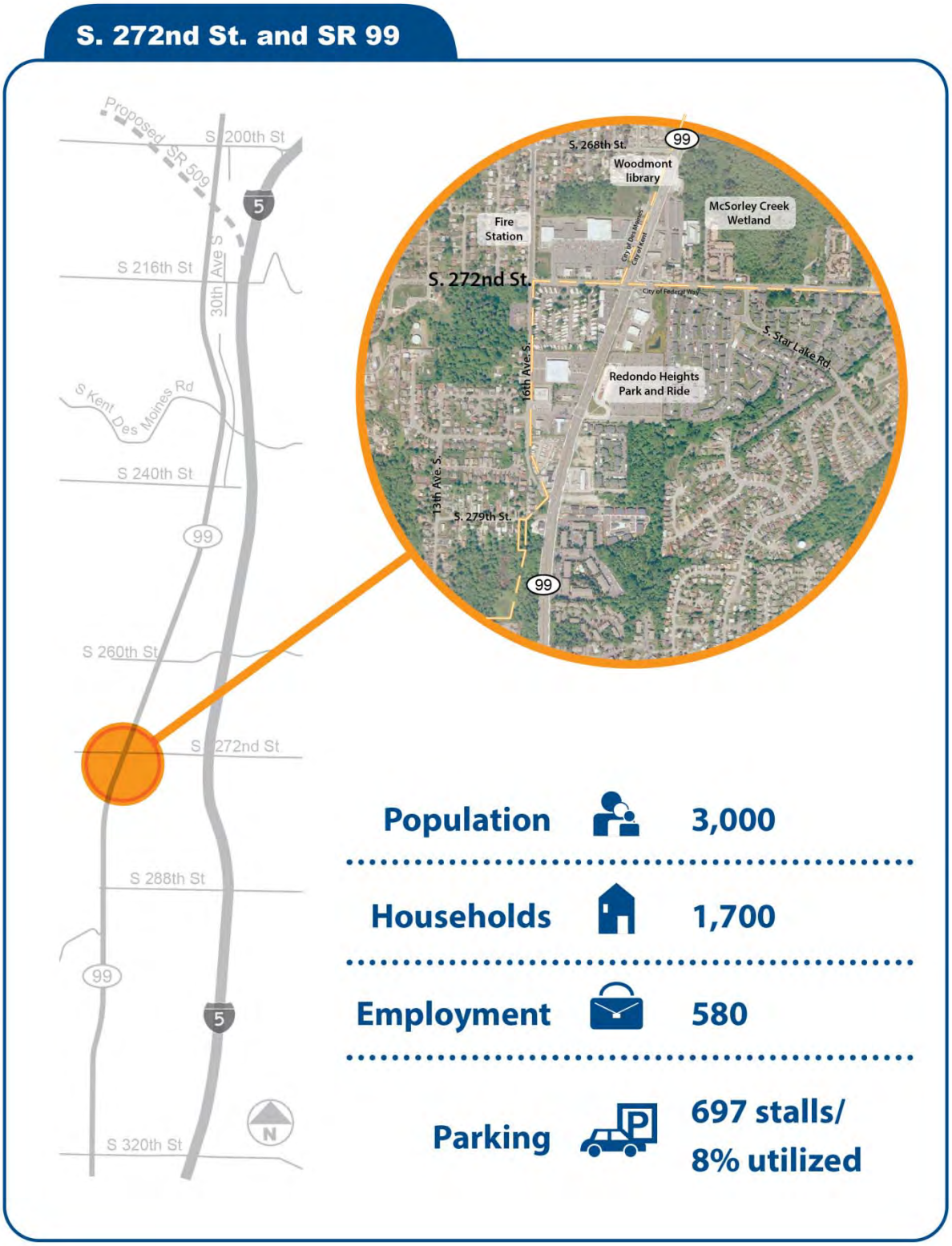

Exhibit 7-9a
Station at S. 272nd Street and SR 99: Location, Demographics, and Parking

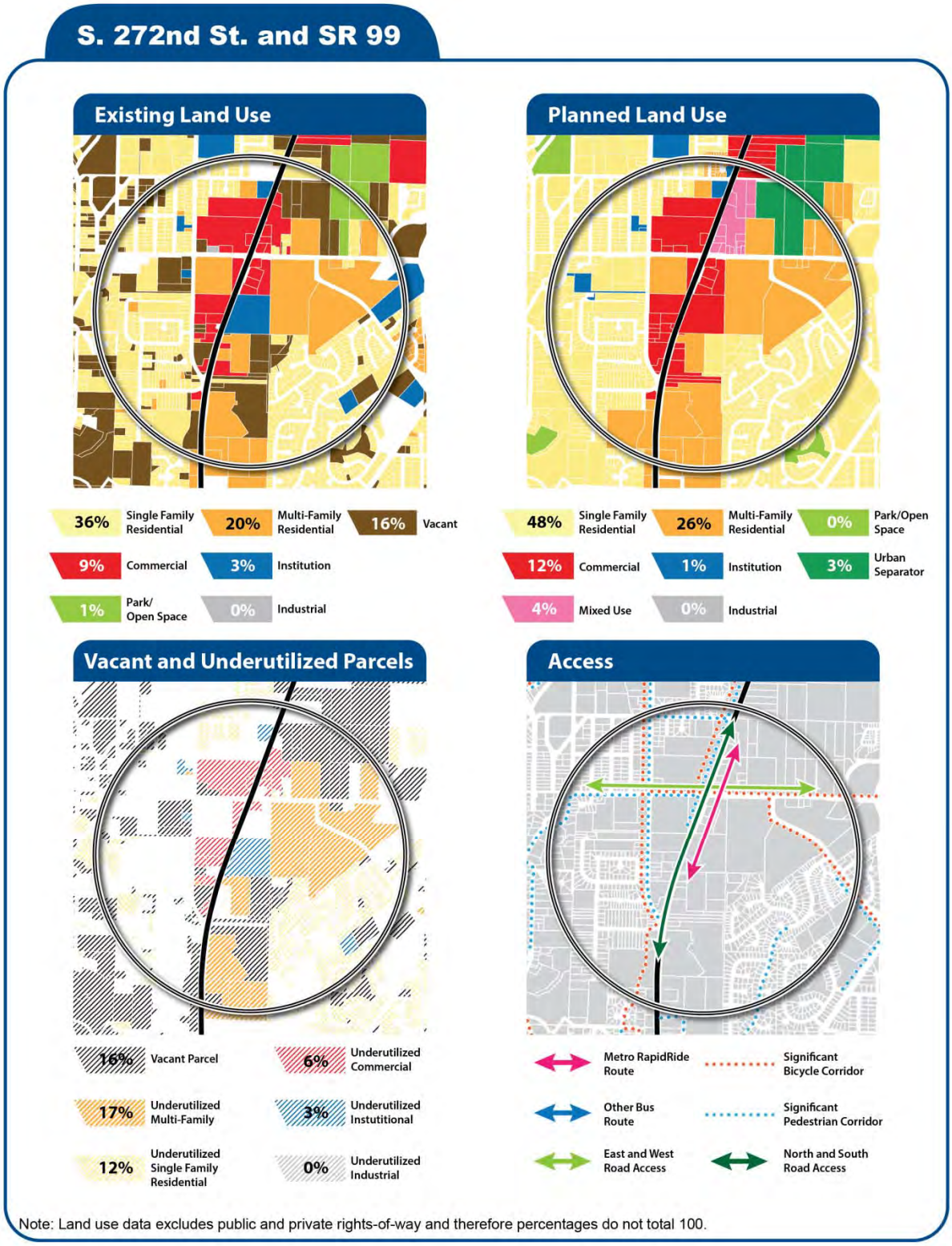

Exhibit 7-9b
Station at S. 272nd Street and SR 99: Land Use and Demographics

S. 272nd Street and I-5 (Star Lake Park-and-Ride)

TABLE 7-18
Strengths and Weaknesses of S. 272nd Street and I-5 Station

Strengths	Weaknesses
• Authorized under ST2 Plan • Existing Star Lake Park-and-Ride can be utilized for this station • Access from all directions • Reasonable amount of existing bus service, planned and existing bicycle and pedestrian network to support a transit station	• Less area of transit-supportive land uses • Low quality non-motorized connections • Developable area near McSorley Creek wetland may be limited

The **S. 272nd Street and I-5 Station** location is in the City of Kent, with the area within ½ mile including parts of the cities of Kent and Federal Way. The primary land uses in this area are single family residential and vacant property. A cluster of multi-family is located south of S. 272nd Street in between SR 99 and I-5. The station would be located at the existing Star Lake Park-and-Ride facility, which is served by bus routes on I-5 as well as a local bus route that operates east-west on S. 272nd Street. An elementary school is located south of S. 272nd Street.

This station location is on the western edge of I-5, and much of the ½ mile station area is composed of land used for I-5. Planned land use in this area would double the amount of single-family residential lands and would have a slight increase in multi-family residential. Commercial uses are only present on the western edge of the half mile radius along SR 99. The large McSorley Creek wetland complex, much of which has been purchased by the City of Kent for preservation, is located within ½ mile of the station area. Although there is a high amount of vacant and underutilized parcels in this station area, land uses around the wetland area should be further investigated to understand actual development/redevelopment potential. A station in this location therefore may have limited opportunity for transit-oriented development. Bicycle connections are planned on S. 272nd Street, but the crossing under I-5 may require improvements for non-motorized users. Analysis results for this station are shown graphically in **Exhibits 7-10a** and **7-10b**.

Key Findings

1) Existing and planned land uses are lower density and not likely to increase in density.
2) The Star Lake Park-and-Ride could accommodate future parking need if expanded.
3) Land uses around the wetland area need further analysis to determine potential for development.

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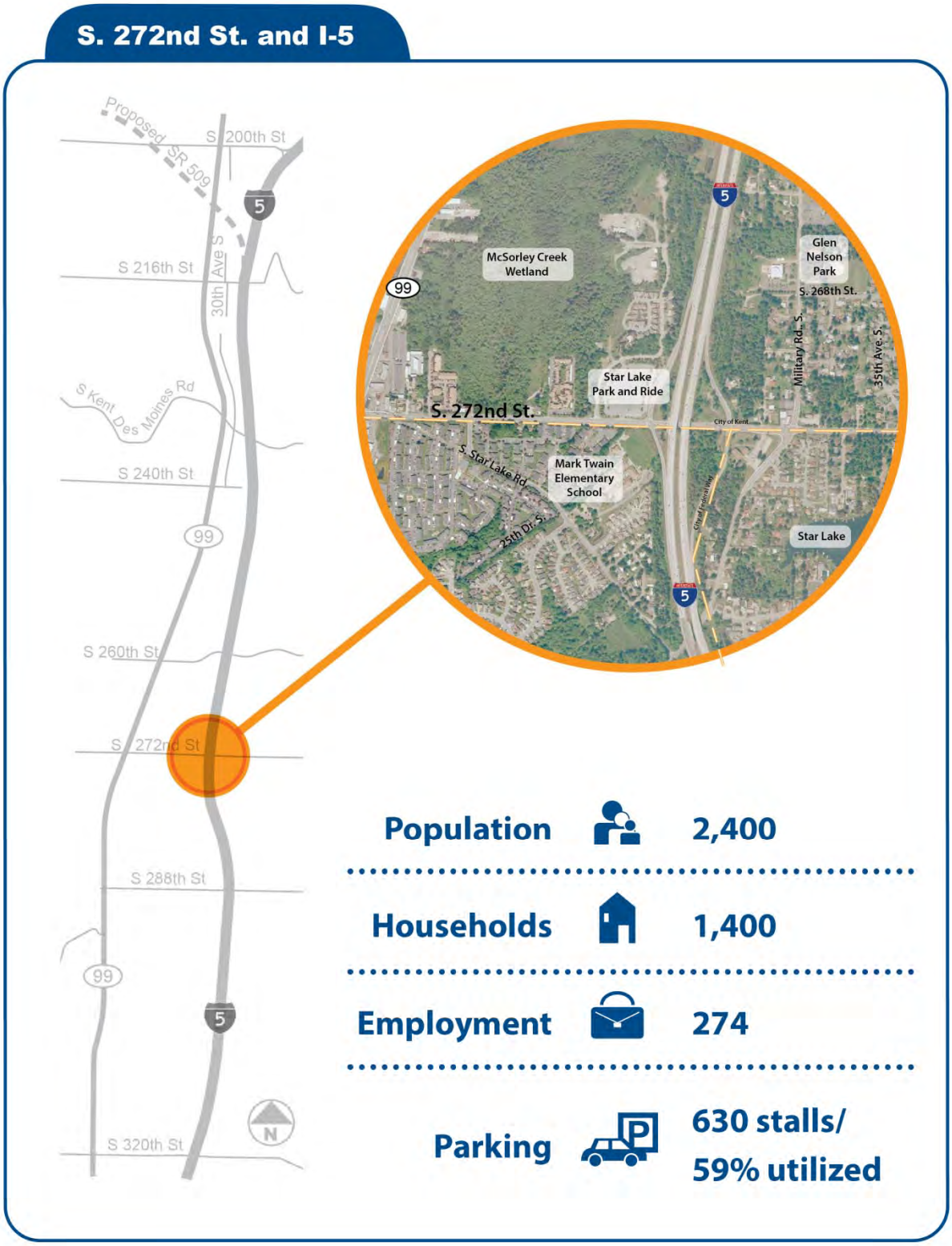

Exhibit 7-10a
Station at S. 272nd Street and I-5: Location, Demographics, and Parking

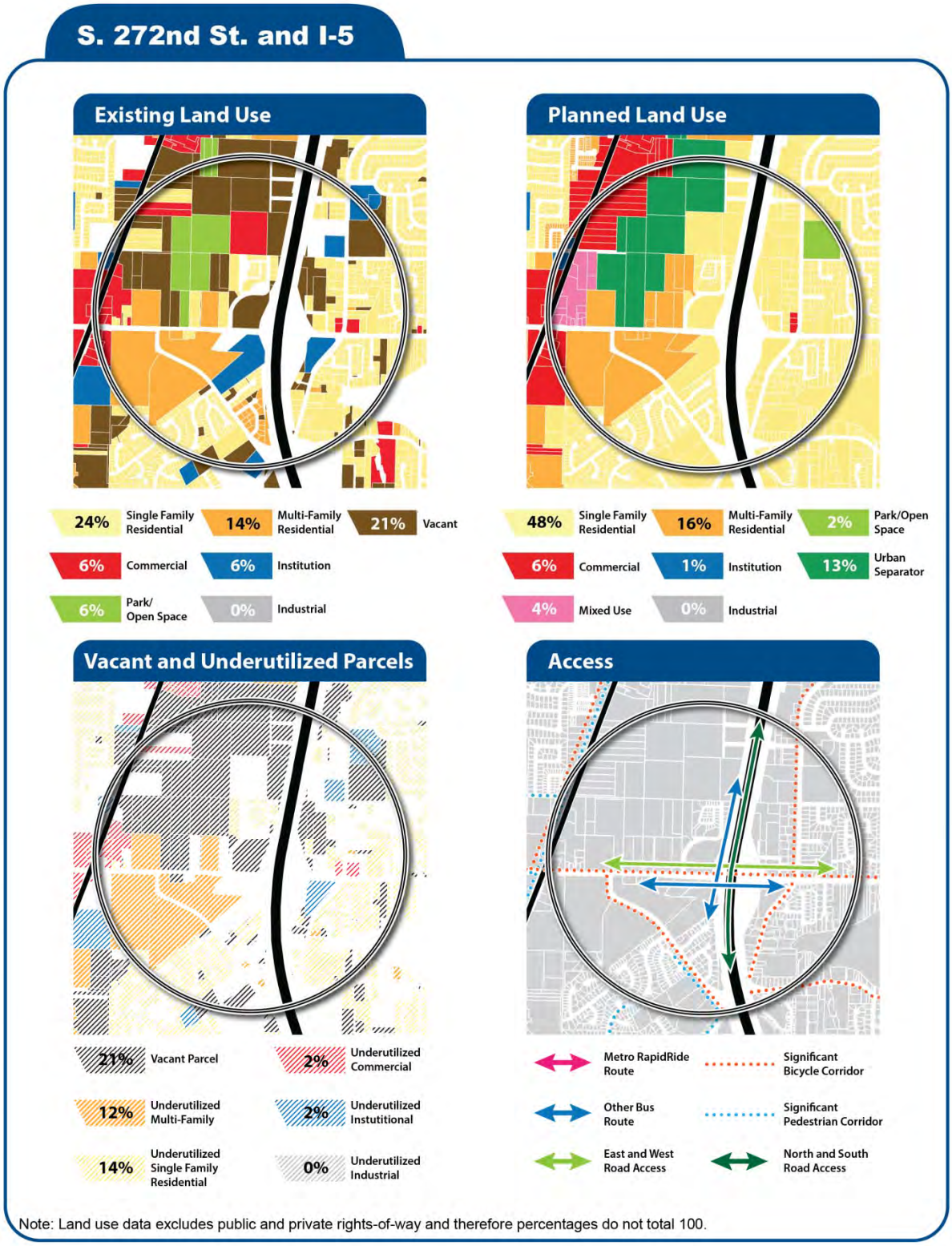

Exhibit 7-10b
Station at S. 272nd Street and I-5: Land Use and Demographics

FWTC

TABLE 7-19
Strengths and Weaknesses of FWTC Station

Strengths	Weaknesses
• More TOD/high-density zoning • High employment rate within a half mile radius to support a transit station • Provides access to a regional activity center • High volume of existing bus service, planned and existing bicycle and pedestrian network to support a transit station	• Not authorized under ST2

The **FWTC Station** would be located in the center of the Federal Way City Center. Commercial land uses dominate the area, with 'The Commons' shopping center as the focal point. Some single family and multi-family residential is located at the northern edge of the station area, within the half mile radius. The existing employment for the station area is the highest of all station locations. The existing Transit Center is well utilized and its parking structure is over capacity with demand exceeding supply. More than a dozen bus routes serve the transit center. Harry S. Truman High School and the 52-acre Steel Lake Park are located nearby.

Economic growth and high capacity transit are key focuses of Federal Way City Center. The existing commercial core and future planned development would strongly support transit-oriented development in this area. An emphasis on bicycle and pedestrian improvements would also promote safe and walkable connections to the station. Analysis results for this station are shown graphically in **Exhibits 7-11a** and **7-11b**.

Key Findings

1) High concentration of existing and planned commercial and mixed-use land uses increases the potential for development in this station area.
2) Existing FWTC is well used and contributes to a transit focused identity in the area.
3) Existing bus service at the FWTC would provide good transfer opportunities and would be a strong contributor to ridership at this station.

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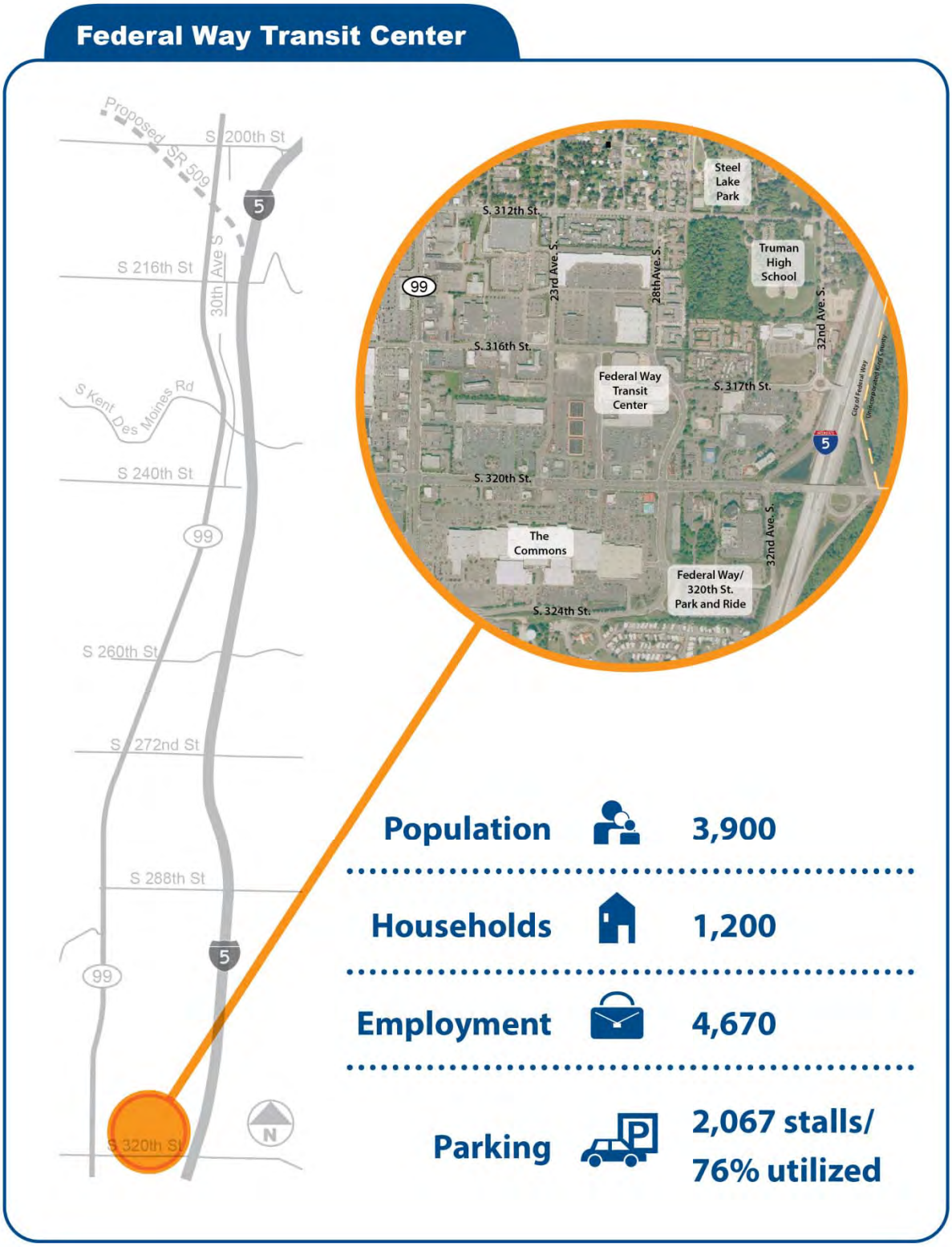

Exhibit 7-11a
Station at FWTC: Location, Demographics, and Parking

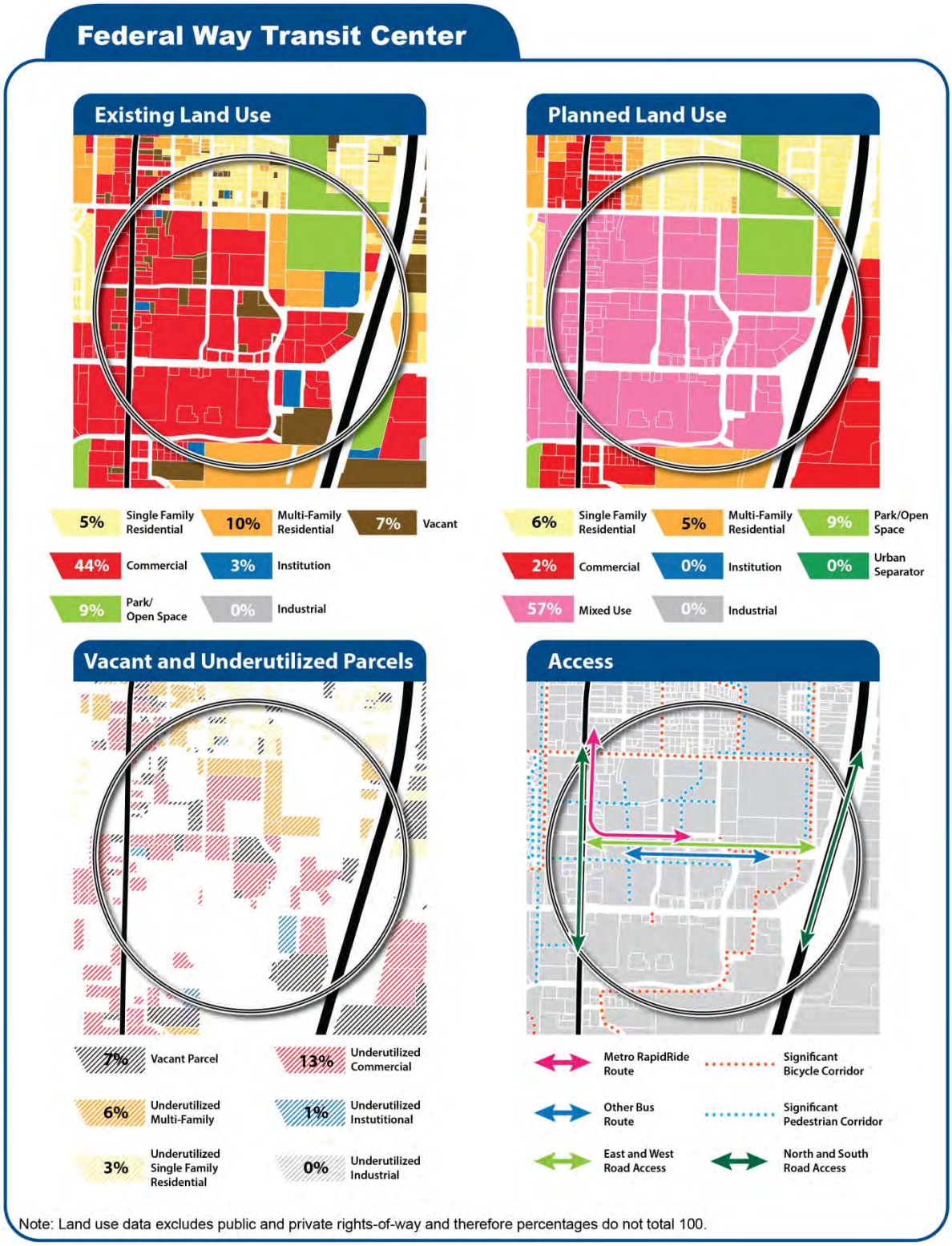

Exhibit 7-11b
Station at FWTC: Land Use and Demographics

7.3.2 Potential Additional SR 99 Stations

S. 216th Street (SR 99)

TABLE 7-20
Strengths and Weaknesses of S.216th Street and SR 99 Station

Strengths	Weaknesses
• More TOD/high-density zoning (City of Des Moines Pacific Ridge Plan) • Moderate amount of underutilized parcels that may support transit oriented development • Moderate size of existing population and employment within a half mile radius to support a transit station • Sufficient amount of existing bus services, existing and planned bicycle and pedestrian network to support a transit station • Access from all directions	• Not authorized under ST2 • No existing park-and-ride

The **S. 216th Street and SR 99** station would be located in the City of Des Moines, but the ½ mile station area would include land in the City of SeaTac. A variety of commercial uses are present along SR 99 in the area, from a large grocery store to smaller businesses such as restaurants and auto repair shops. Residential uses such as apartments and mobile homes are adjacent to SR 99 in this area, while the rest of the area is predominantly single family houses. The existing RapidRide A Line provides transit service on SR 99, with another local route that runs a portion on S. 216th Street. Steven J Underwood Memorial Park is a 20.5-acre public park within a half mile radius.

Mixed use and medium to high density residential uses are planned in the City of Des Moines Pacific Ridge Plan, which includes the area west of SR 99 and south of S. 216th Street on the east side of SR 99. The major concentration of vacant parcels in this study area is located north of S. 216th Street, west of SR 99. These parcels are planned for the future Des Moines Creek Business Park. There are plans for the bicycle and pedestrian network to be improved in this area to support planned land uses. Particularly, S. 216th Street has been identified as a significant corridor for both bicycle and pedestrian by the City of Des Moines. Analysis results for this station are shown graphically in **Exhibits 7-12a** and **7-12b**.

Key Findings

1) The planned land uses and the amount of developable parcels increases the potential for development in this station area.
2) Existing and planned motorized and non-motorized access would support a station at this location.
3) Not an authorized station location under ST2.

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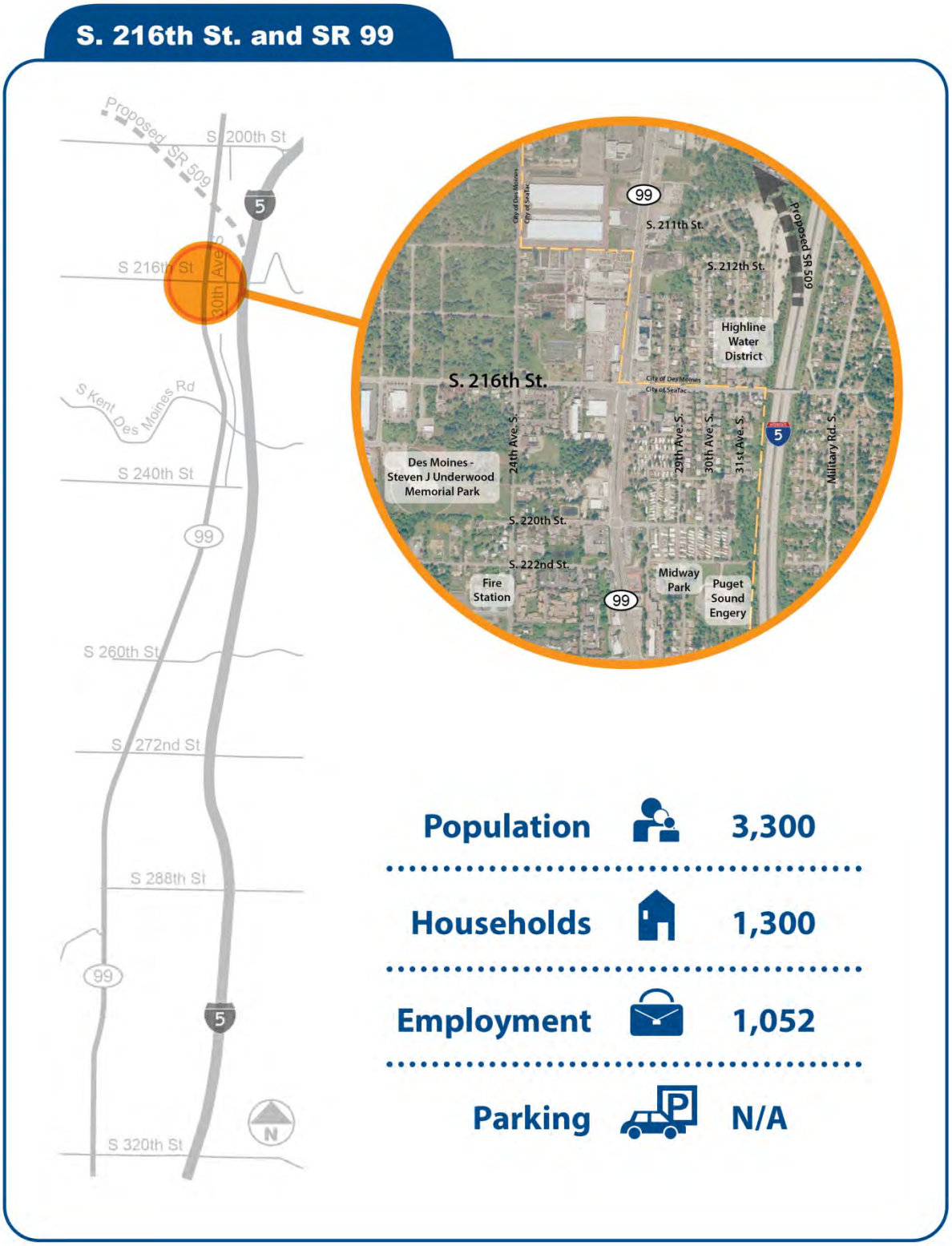

Exhibit 7-12a
Station at S. 216th Street and SR 99: Location, Demographics, and Parking

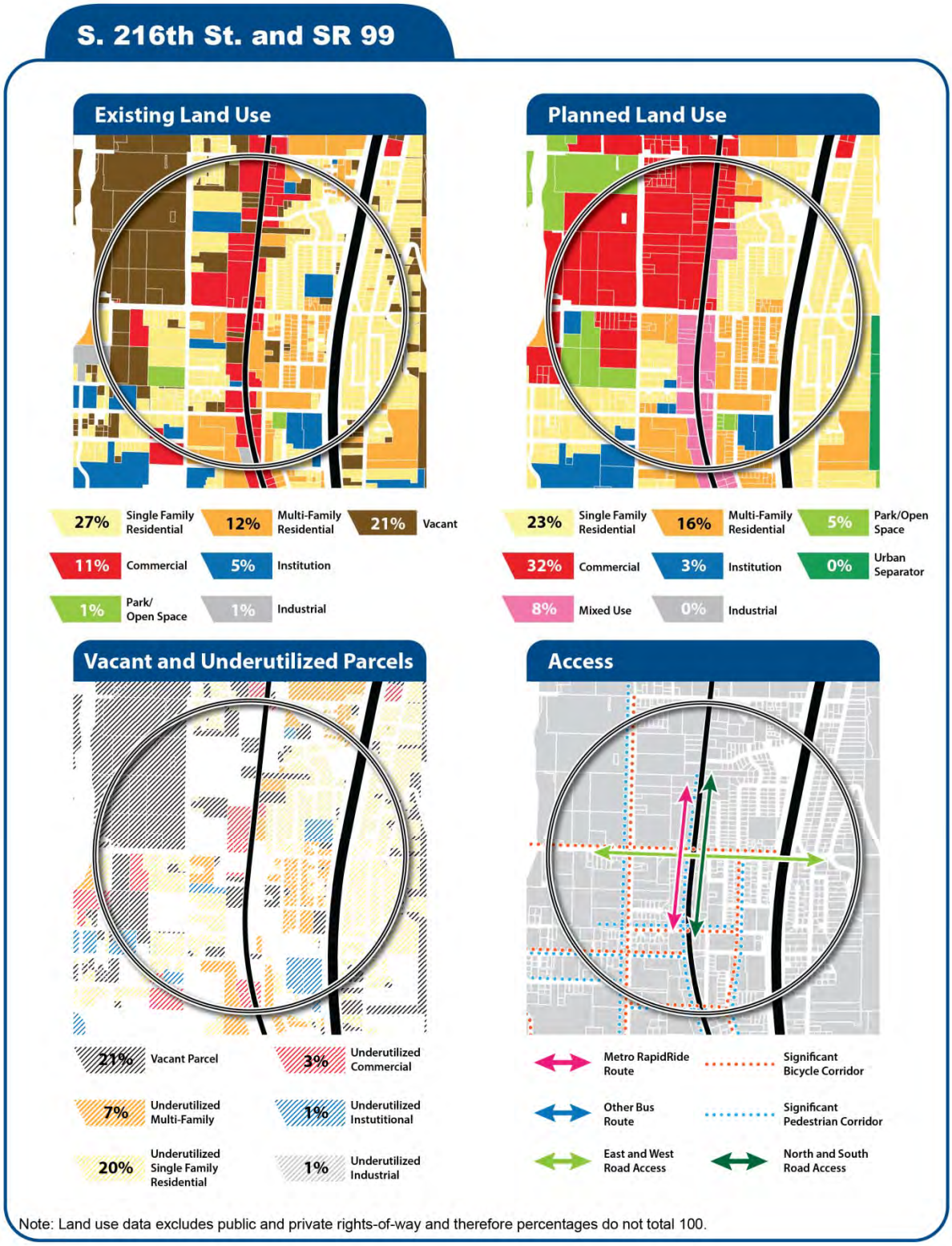

Exhibit 7-12b
Station at S. 216th Street and SR 99: Land Use and Demographics

S. 260th Street (SR 99)

TABLE 7-21
Strengths and Weaknesses of S.260th Street and SR 99 Station

Strengths	Weaknesses
• Moderate amount of planned commercial/mixed-use/medium to high density residential • High amount of underutilized parcels that may support transit oriented development • Access from all directions • Existing transit service provided by RapidRide A Line • Planned bicycle and pedestrian network to the west and east	• Not authorized under ST2 plan • Developable area near McSorley Creek wetland may be limited • No existing park-and-ride

The **S. 260th Street and SR 99 Station** would be either in the City of Des Moines or the City of Kent, and the area within ½ mile of the station would include areas of both cities. The area is primarily commercial adjacent to SR 99, including a Fred Meyer store and Mack Truck dealership, and many smaller businesses. The majority of the residential use is single family, with some multi-family residential located along S. 260th/S. 259th Pl. There is also a mobile home park land use designated near S.260th Street and SR 99 which is not expected to redevelop. The large McSorley Creek wetland complex, much of which has been purchased by the City of Kent for preservation, is located within ½ mile of the station area.

Both the City of Des Moines and City of Kent envision SR 99 in this area as a commercial corridor. Although there are high amount of vacant and underutilized parcels that could support transit-oriented development, land uses around the wetland area should be further investigated to understand actual development/redevelopment potential. Bus service includes the RapidRide A Line that operates on SR 99. An existing crossing under I-5 on S. 260th Street provides access from east of I-5 to this station area. Analysis results for this station are shown graphically in **Exhibits 7-13a** and **7-13b**.

Key Findings

4) High concentration of planned commercial and mixed-use land uses increases potential for development in this station area.
5) Land uses around the wetland area need further analysis to understand the development potential for TOD.
6) Not an authorized station location under ST2.

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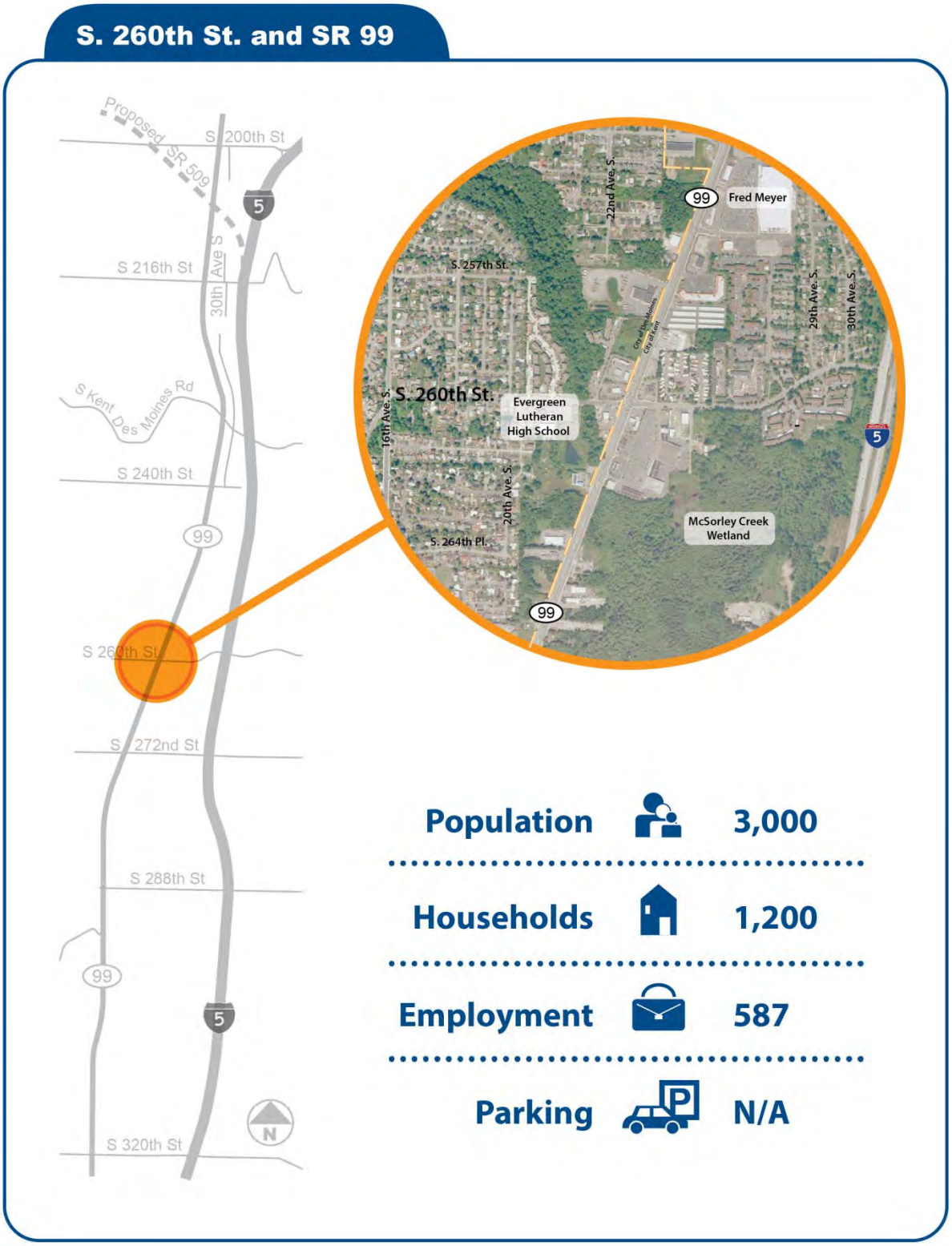

Exhibit 7-13a
Station at S. 260th Street and SR 99: Location, Demographics, and Parking

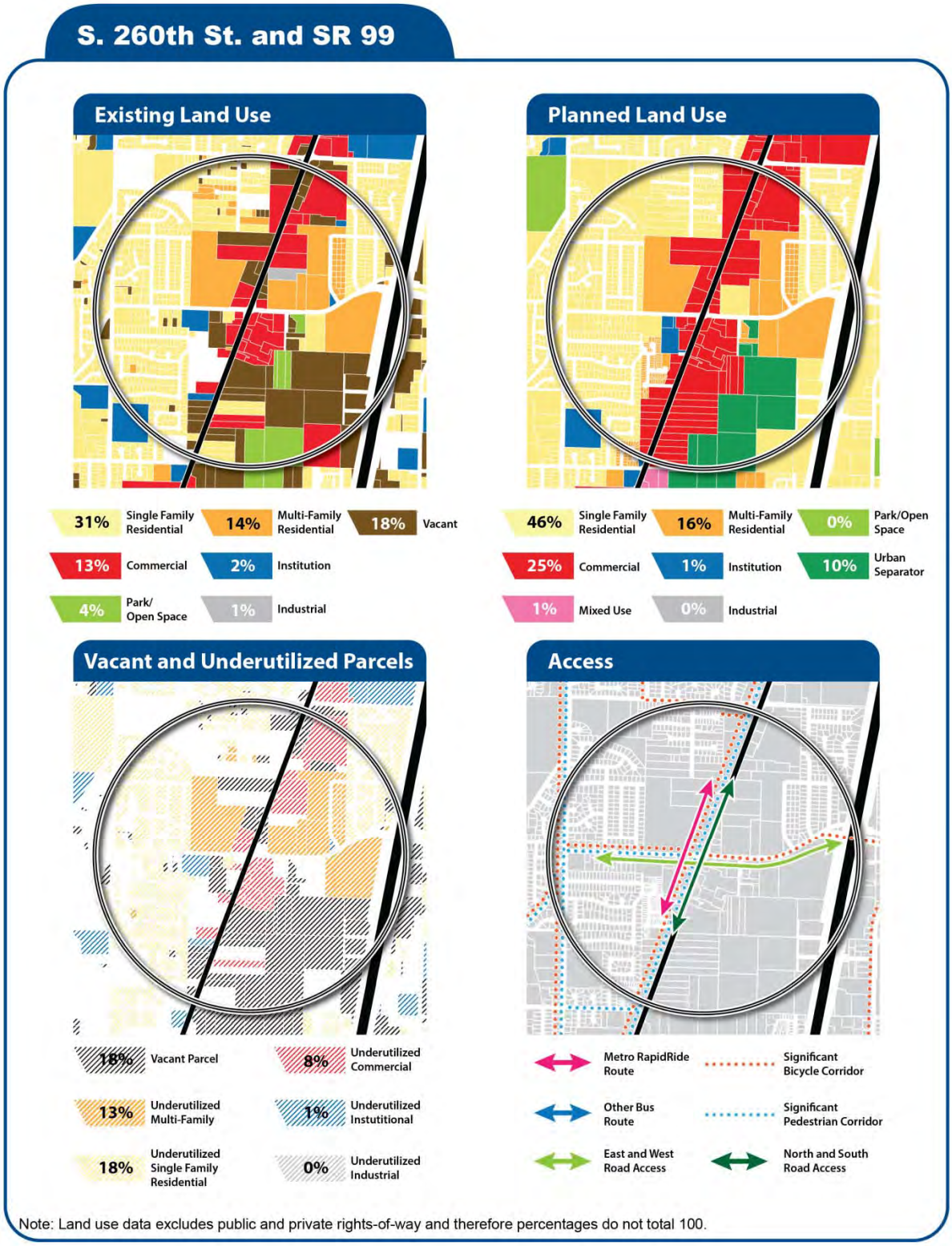

Exhibit 7-13b
Station at S. 260th Street and SR 99: Land Use and Demographics

S. 288th Street (SR 99)

TABLE 7-22
Strengths and Weaknesses of S. 288th Street and SR 99 Station

Strengths	Weaknesses
• Existing transit service provided by RapidRide A Line • Planned bicycle and pedestrian network to the east	• Not authorized under ST2 Plan • High concentration of existing and planned single family residential land use in surrounding area • Limited developable area due to topography • No existing park-and-ride • Access from north, south and east only • Non-motorized access to station location is challenging due to topography

The **S. 288th Street** station would be located in the City of Federal Way. The primary land use in the surrounding area is single family residential. SR 99 has a small amount of commercial uses with ½ mile of the station location as well as some multi-family residential. The topography changes from higher elevations to the east of SR 99 to lower elevations to the west, which limits development potential and access to this station location, particularly along the west of SR 99.

Plans for this area indicate an increase in single family residential land use. Although there is also a small planned increase in commercial and mixed-use, the limited number of developable parcels and topography do not favor any substantial transit-oriented development. There are planned enhancements to bicycle and pedestrian connections in this area. However, steep slopes on the west side of SR 99 present difficulty connecting non-motorized routes to the station location. Bus service includes the RapidRide A Line that operates on SR 99. Analysis results for this station are shown graphically in **Exhibits 7-14a** and **7-14b**.

Key Findings

1) Existing and planned land uses are lower density and not likely to increase in density.
2) Topography presents difficulty connecting to the station location.
3) Not an authorized station location under ST2.

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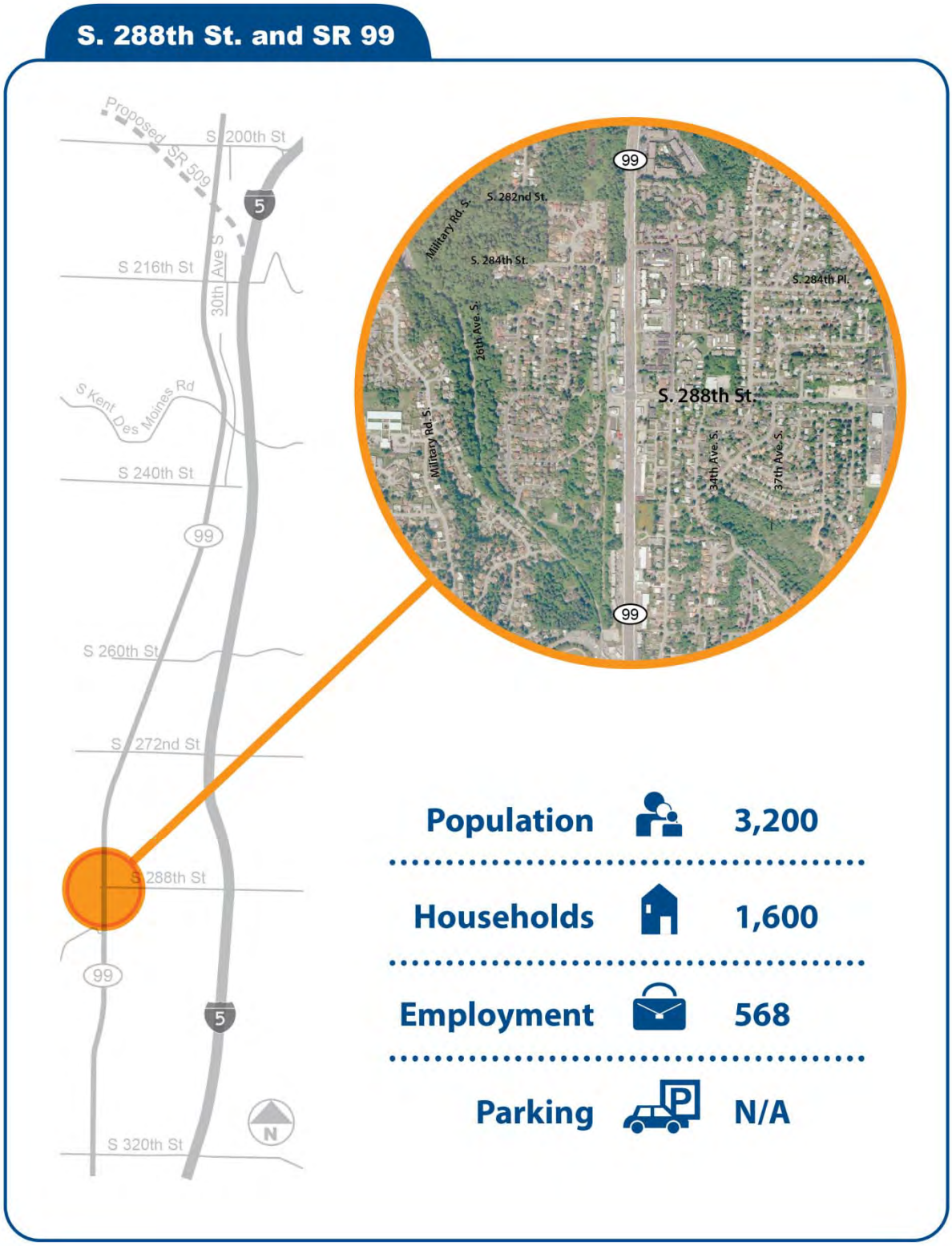

Exhibit 7-14a
Station at S. 288th Street and SR 99: Location, Demographics, and Parking

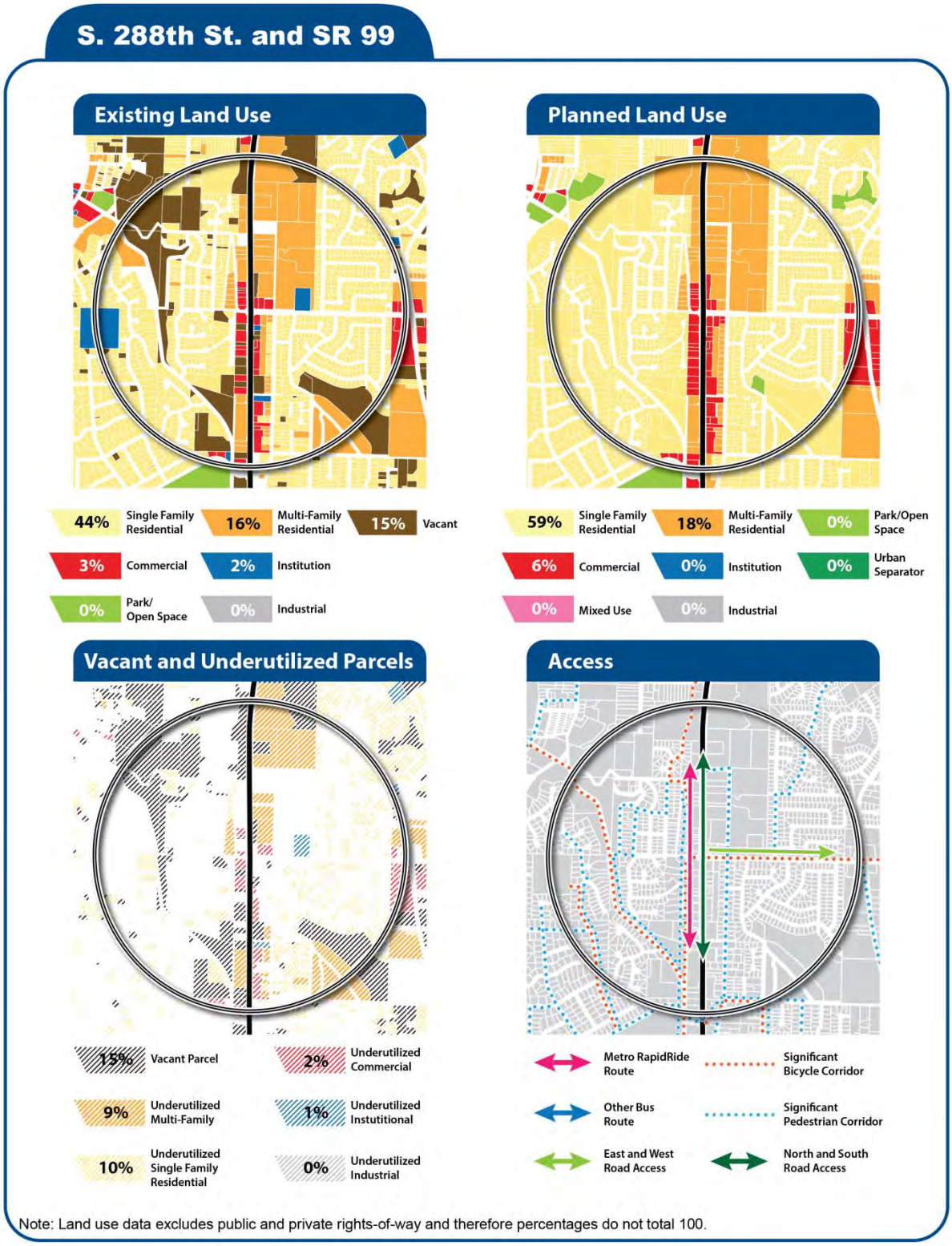

Exhibit 7-14b
Station at S. 288th Street and SR 99: Land Use and Demographics

S. Dash Point Road (SR 99)

TABLE 7-23
Strengths and Weaknesses of S. Dash Point Road and SR 99 Station

Strengths	Weaknesses
• Could attract riders west of SR 99 via S. Dash Point Road • Existing transit service provided by RapidRide A Line • Planned bicycle and pedestrian network to the west	• Not authorized under ST2 Plan • High concentration of existing and planned single family residential land use in the surrounding area • Limited developable area due to topography • Low employment base and potential for employment • No existing park-and-ride • Access from north, south and west only • Non-motorized access to station location is challenging due to topography

The **S. Dash Point Road at SR 99** station is located in City of Federal Way. The primary land use in this area is single family residential. SR 99 has some limited commercial uses with ½ mile of the station as well as some multi-family residential. The topography changes from higher elevations to the east of SR 99 to lower elevations to the west, which would limit development potential in the area and access to the station, particularly along the west of SR 99. Sacajawea Middle School and Park are located just southwest of S. Dash Point Road and SR 99.

Planned land uses in this area indicate an increase in single family residential land use, although the City of Federal Way Comprehensive Plan categorizes institutional land uses, such as Sacajawea Middle School, as single family residential. Although there is a planned increase in commercial land use, the limited number of developable parcels and topography do not favor any substantial transit-oriented development in the area. There are planned enhancements to bicycle and pedestrian connections in this area. However, steep slopes on the west side of SR 99 present difficulty connecting in non-motorized routes to the station location. Bus service includes the RapidRide A Line that operates on SR 99. Analysis results for this station are shown graphically in **Exhibits 7-15a** and **7-15b**.

Key Findings

1) Existing and planned land uses are lower density and not likely to increase in density.
2) Topography presents difficulty connecting to the station location.
3) Not an authorized station location under ST2.

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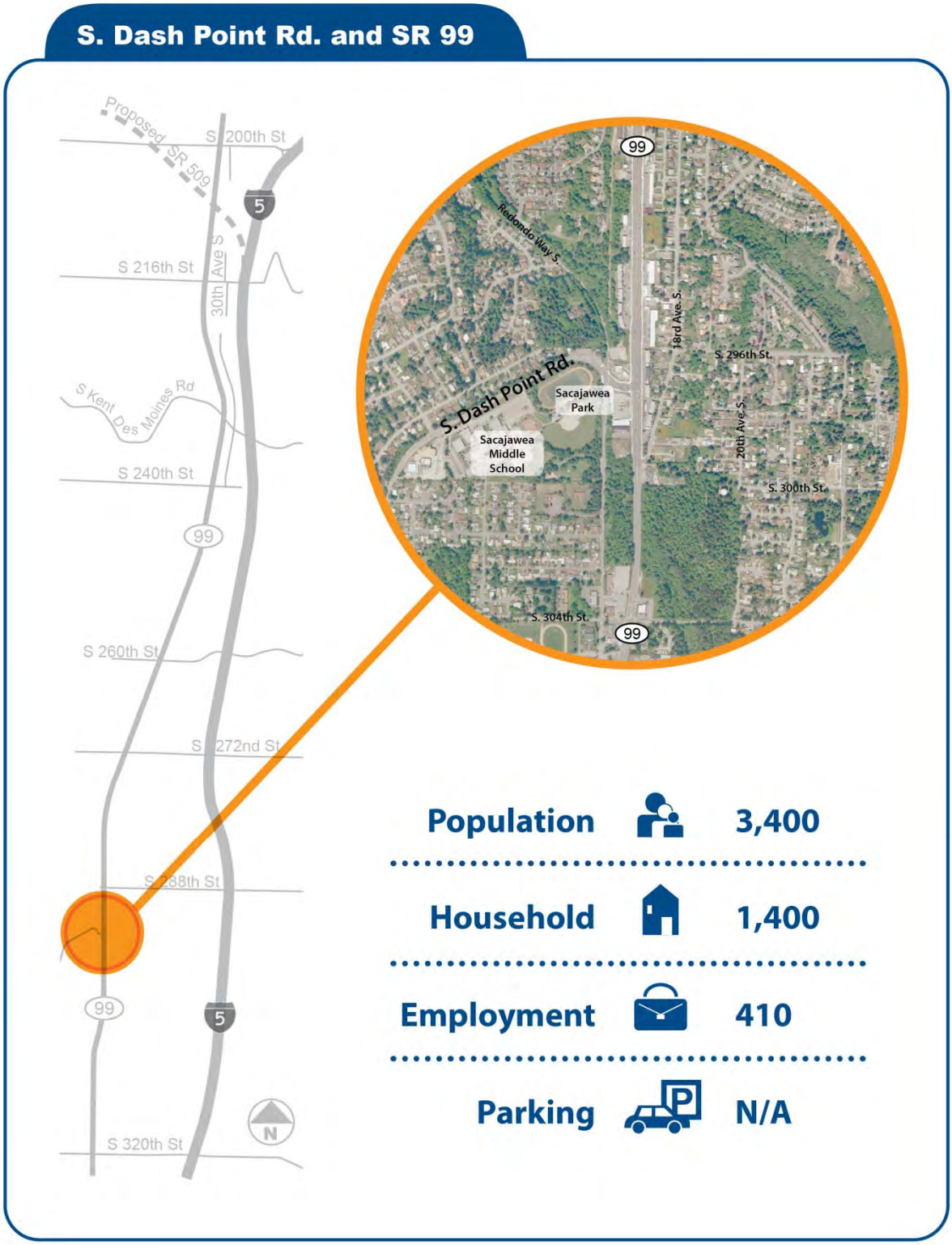

Exhibit 7-15a
S. Dash Point Rd. and SR 99: Location, Demographics, and Parking

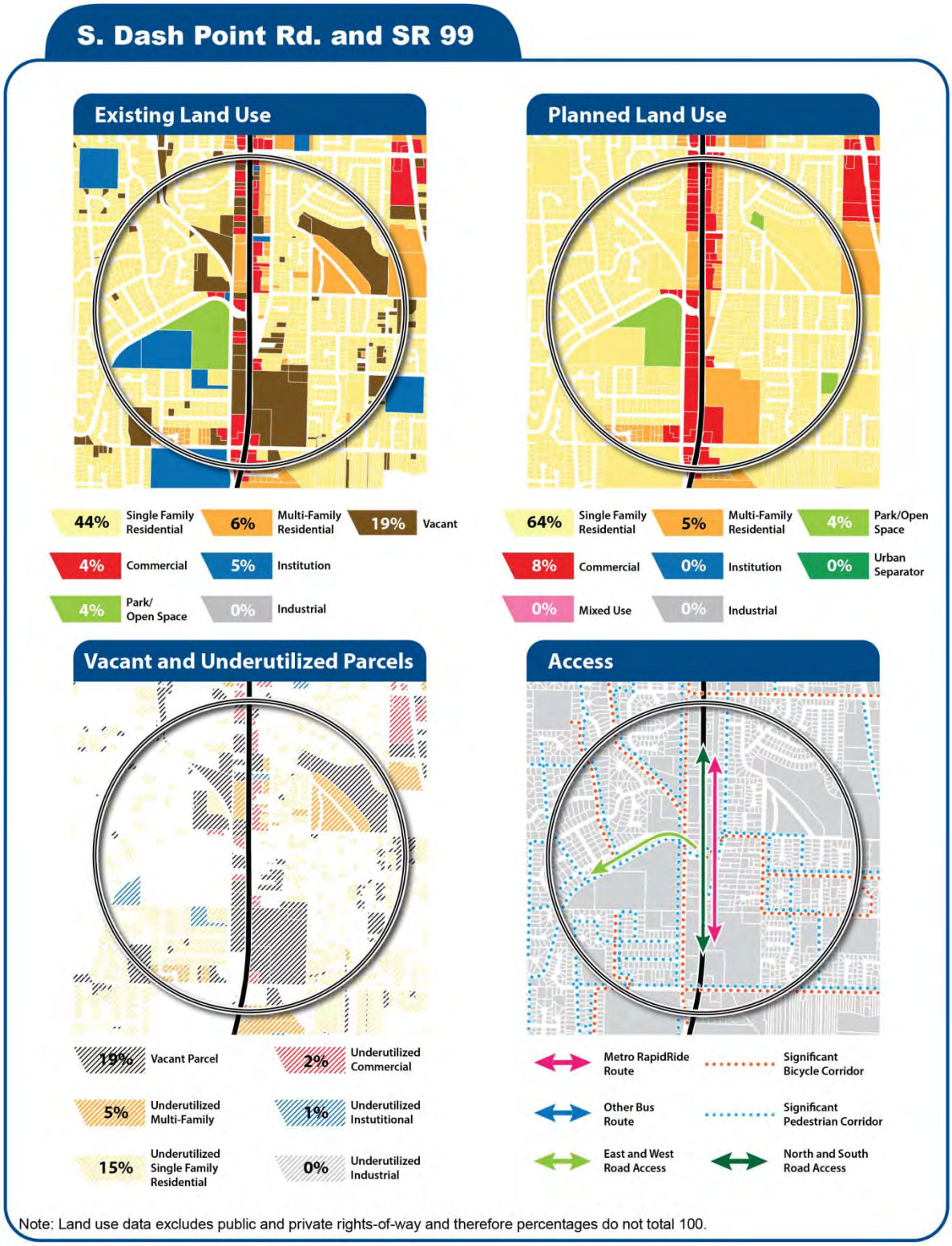

Exhibit 7-15b
S. Dash Point Rd. and SR 99: Land Use and Demographics

7.3.3 Potential Additional I-5 Stations

S. 216th Street (I-5)

TABLE 7-24
Strengths and Weaknesses of S.216th Street and I-5 Station

Strengths	Weaknesses
• Moderate amount of underutilized parcels that may support transit oriented development • Existing and planned bicycle and pedestrian network to the west	• Not authorized under ST2 • Planned land use near in surrounding area is primarily lower density single family residential • No north/south access to I-5, only access from east and west • No existing park-and-ride • No direct bus service

The **S. 216th Street and I-5** station would be located in the City of Des Moines, but the area within a ½ mile of the station includes land in the City of SeaTac. This station would be approximately ¼ mile from SR 99, where commercial land uses range from a large grocery store to smaller businesses such as restaurants and auto repair shops. To the north of S. 216th Street existing uses are primarily single family residential on both sides of I-5, while south of S. 216th Street land use is primarily multi-family residential on the west side of I-5 and single family residential on the east side. There is no transit service on S. 216th Street east of 24th Avenue S, which is approximately 0.5 miles to the west, and there is no direct connection to I-5. The nearest transit service is the existing RapidRide A Line, approximately ¼ mile west on SR 99.

The City of Des Moines Pacific Ridge Plan designates the majority of the area as single family residential, with mixed use and medium to high density residential uses for the area west of I-5 and south of S. 216th Street, as well as areas west of SR 99. There is a small concentration of vacant parcels in this area located north of S. 216th Street and west of SR 99. These parcels are planned for the future Des Moines Creek Business Park. A station in this area would be located on the fringe of this planned development, and would therefore be marginally supportive. There are plans for bicycle and pedestrian network improvements in this area. Specifically, S. 216th Street has been identified as a significant corridor for both bicycle and pedestrian by the City of Des Moines. Analysis results for this station are shown graphically in **Exhibits 7-16a** and **7-16b**.

Key Findings

1) Existing and planned land uses are lower density and not likely to increase in density.
2) Access to this station area is limited because there is no access to I-5 and there is no park-and-ride or bus service along S. 216th Street.
3) Not an authorized station location under ST2.

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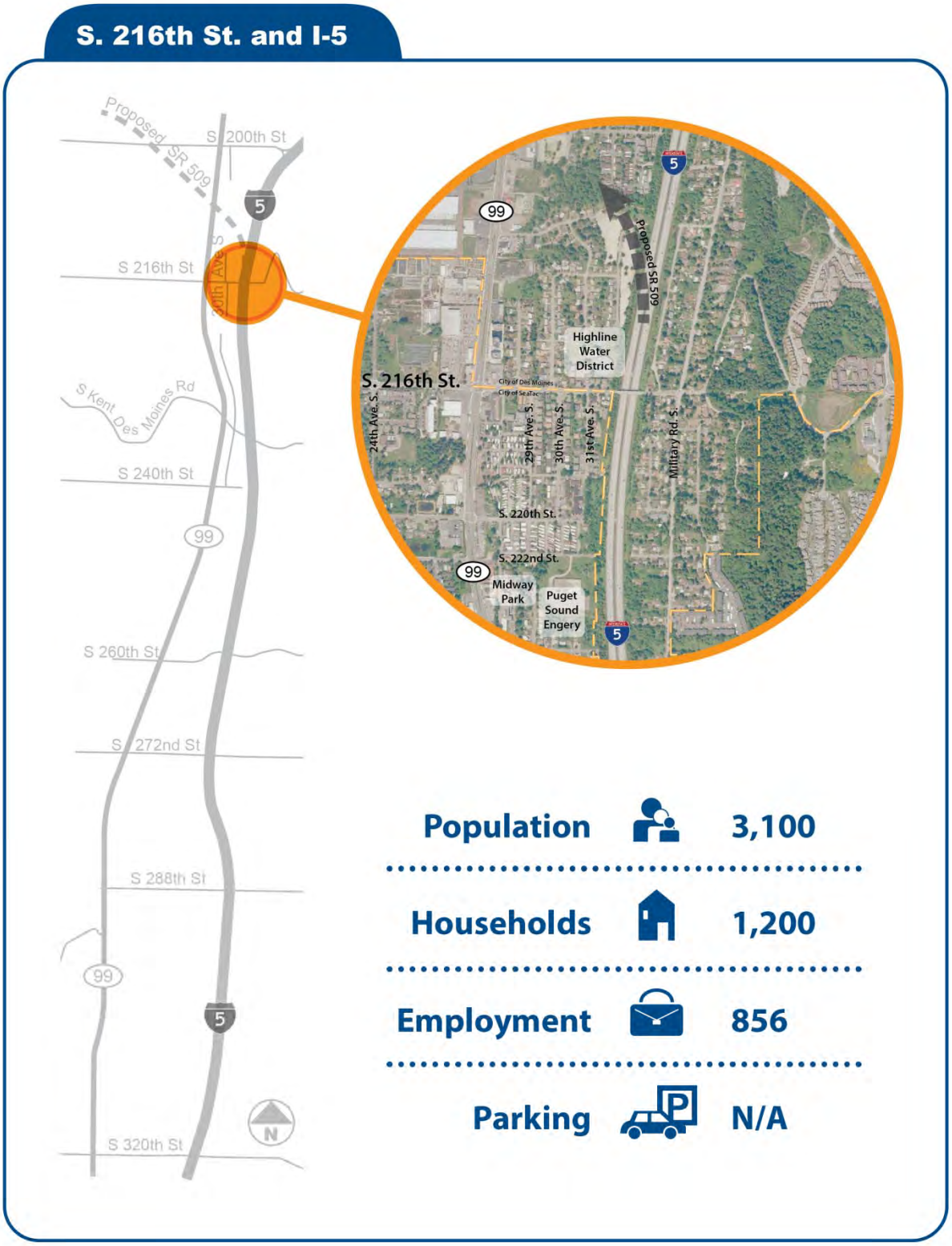

Exhibit 7-16a
Station at S. 216th Street and I-5: Location, Demographics, and Parking

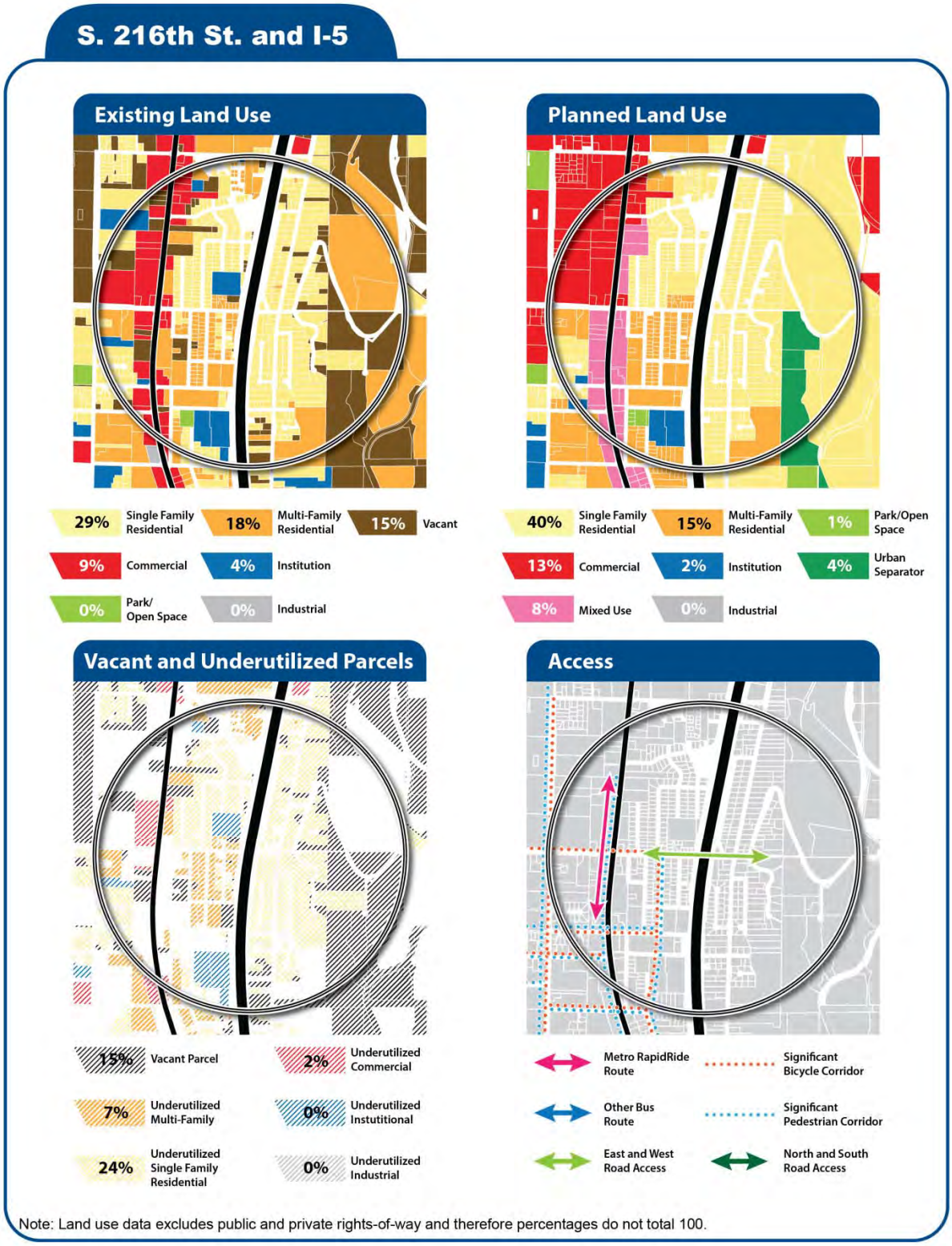

Exhibit 7-16b
Station at S. 216th Street and I-5: Land Use and Demographics

S. 260th Station (I-5)

TABLE 7-25
Strengths and Weaknesses of S.260th Street and I-5 Station

Strengths	Weaknesses
• High amount of underutilized parcels to support transit development	• Not authorized under ST2 plan • Planned land use near in surrounding area is primarily lower density single family residential • Developable area near McSorley Creek wetland may be limited • No north/south access to I-5, only access from east and west • No existing park-and-ride • No direct bus service

The **S. 260th Street and I-5 Station** would be located in the City of Kent, although areas within a ½ mile would be within the City of Des Moines. The area within ½ mile of the station would include land in both cities. The area along I-5 is primarily single family residential, with commercial adjacent to SR 99 (the outer edge of the station area), including a Fred Meyer store and Mack Truck dealership, and many smaller businesses. Multi-family residential is located along S. 260th Street and off of SR 99. There is also a mobile home park land use designated near S.260th Street and SR 99 which is not expected to redevelop. The large McSorley Creek wetland complex, much of which has been purchased by the City of Kent for preservation, is located within ½ mile of the station area. Although there is a high amount of vacant and underutilized parcels in this station area, land uses around the wetland area should be further investigated to understand actual development/redevelopment potential. S. 260th Street crosses under I-5 and provides access from east of I-5 to this station area, but there is no north/south access to I-5. The nearest bus service is on SR 99 (0.5 miles to the west) or on Military Road S. (0.4 miles to the east). Pedestrian amenities are present on S. 260th Street on the north side of the road only. Analysis results for this station are shown graphically in **Exhibits 7-17a** and **7-17b**.

Key Findings

1) Existing and planned land uses are lower density and not likely to increase in density.
2) Land uses around the McSorley Creek wetland complex need further analysis to understand the development/redevelopment potential.
3) Access to this station area is limited because there is no access to I-5 and there is no park-and-ride or bus service along S. 260th Street.
4) Not an authorized station location under ST2.

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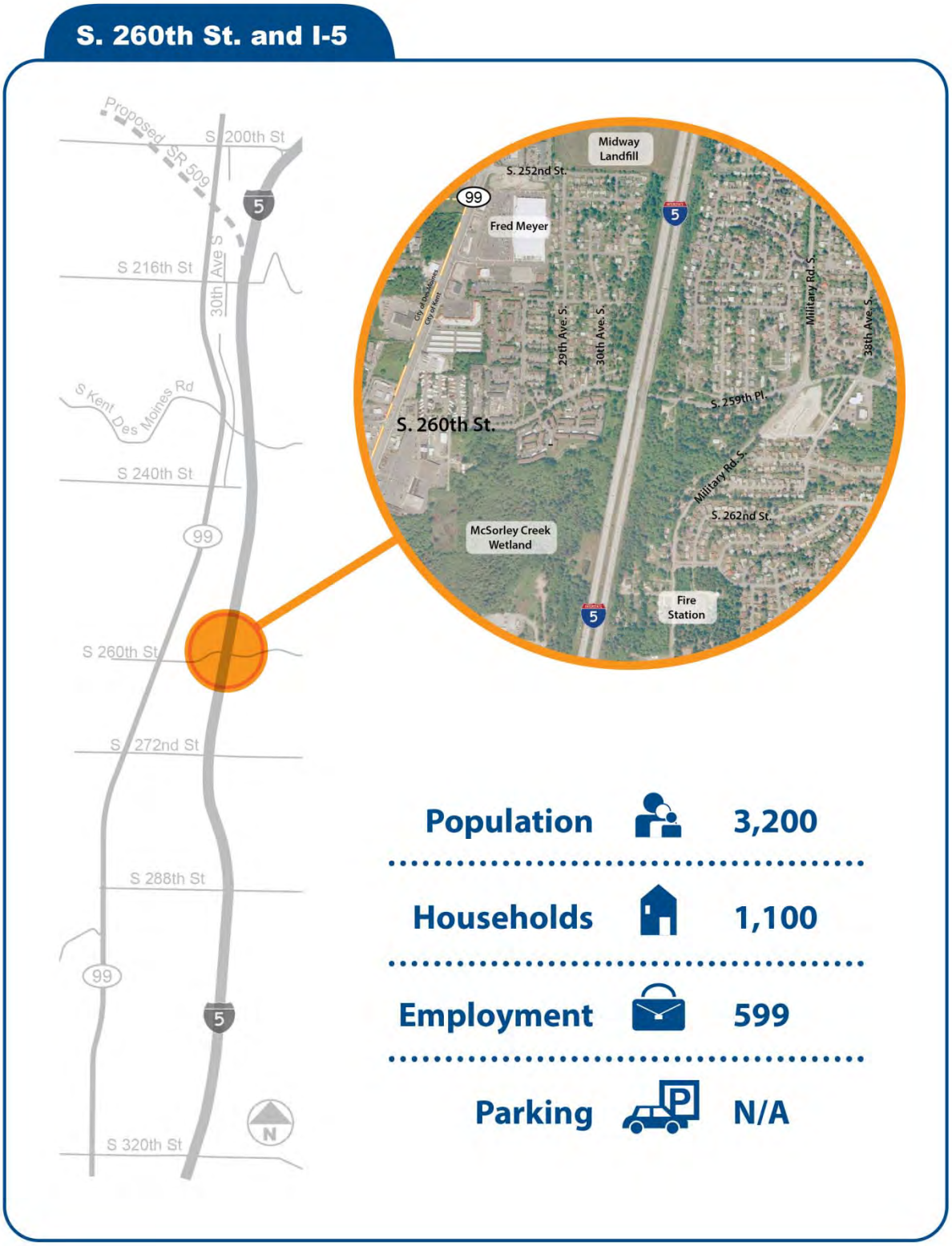

Exhibit 7-17a
S. 260th Street and I-5: Location, Demographics, and Parking

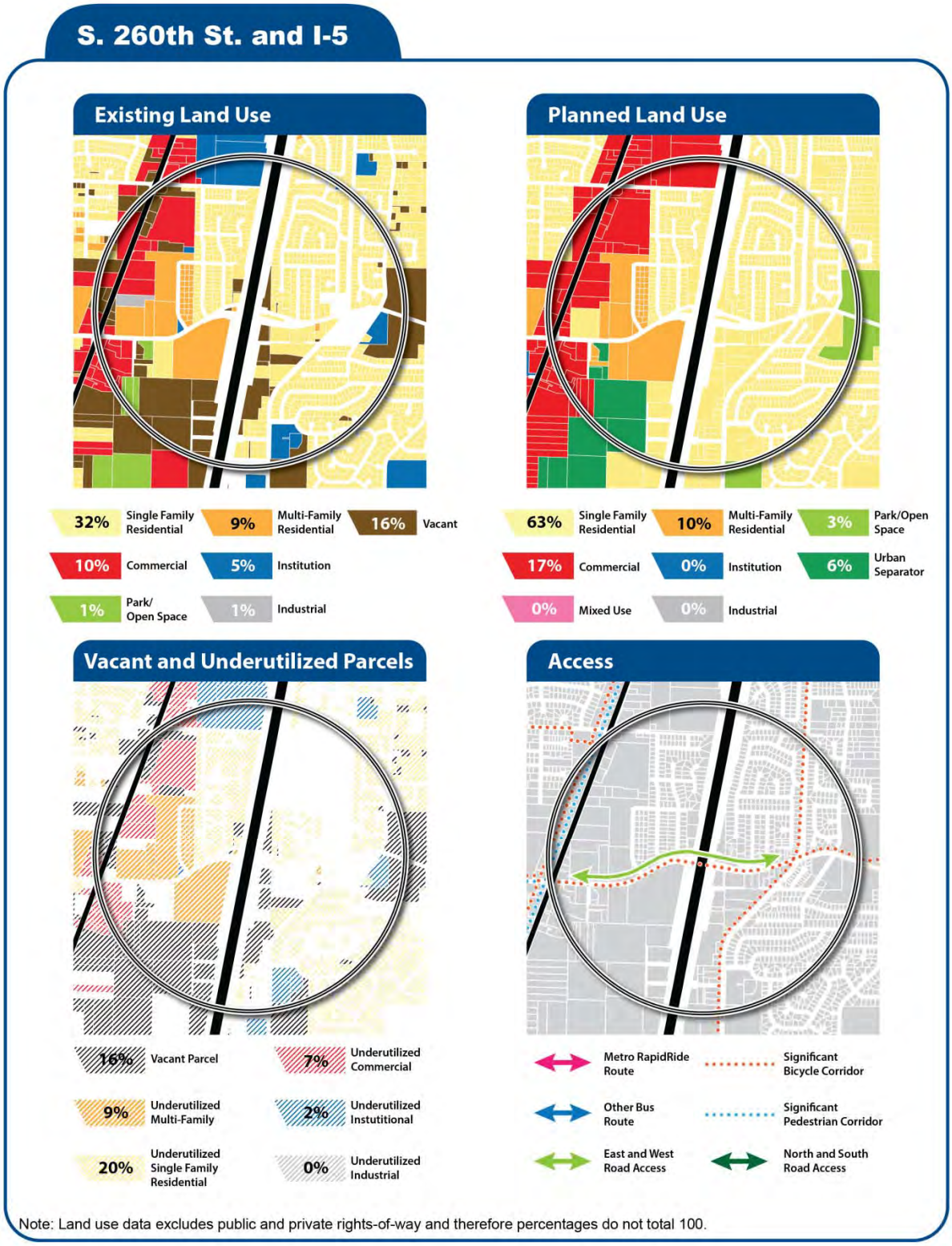

Exhibit 7-17b
S. 260th Street and I-5: Land Use and Demographics

S. 288th Station (I-5)

TABLE 7-26
Strengths and Weaknesses of S. 288th Street and I-5 Station

Strengths	Weaknesses
• Existing transit access	• Not authorized under ST2 Plan • High concentration of existing and planned single family residential land use • Planned land use near in surrounding area is primarily lower density single family residential • Low employment base and potential for employment • No north/south access to I-5, access only from east and west • No existing park-and-ride

The **S. 288th Street and I-5** station would be located in the City of Federal Way. The land use within a ½ mile is 61 percent residential, with single-family residential accounting for 39 percent of the area. Commercial land uses account for only 2 percent of the existing land use, with some commercial development along Military Road S., approximately 0.4 miles to the west. Single-family residential land use is planned for over 50 percent of the area, and only a two percent increase in commercial land use is planned. There are no plans for high-density zoning or TOD in this area.

SR 99 and Military Road S. are the major north-south arterials in this area, and no direct access to I-5 is available. There are planned enhancements to bicycle and pedestrian connections in this area. Analysis results for this station are shown graphically in **Exhibits 7-18a** and **7-18b**.

Key Findings

1) Existing and planned land uses are lower density and not likely to increase in density.
2) Access to this station area is limited because there is no access to I-5 and there is no park-and-ride. There is a local circulator bus service on S. 288th Street.
3) Not an authorized station location under ST2.

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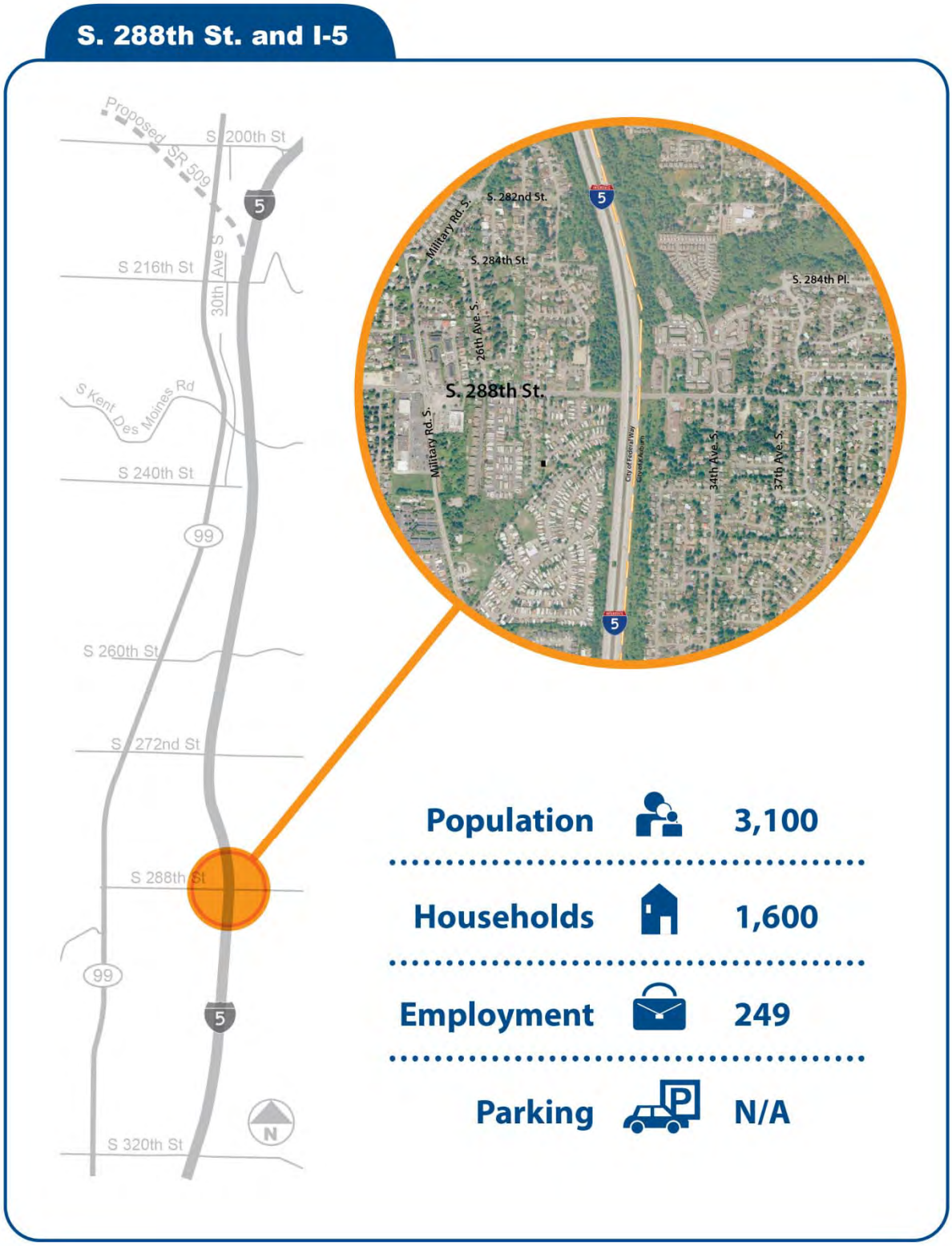


Exhibit 7-18a
S. 288th Street and I-5: Location, Demographics, and Parking

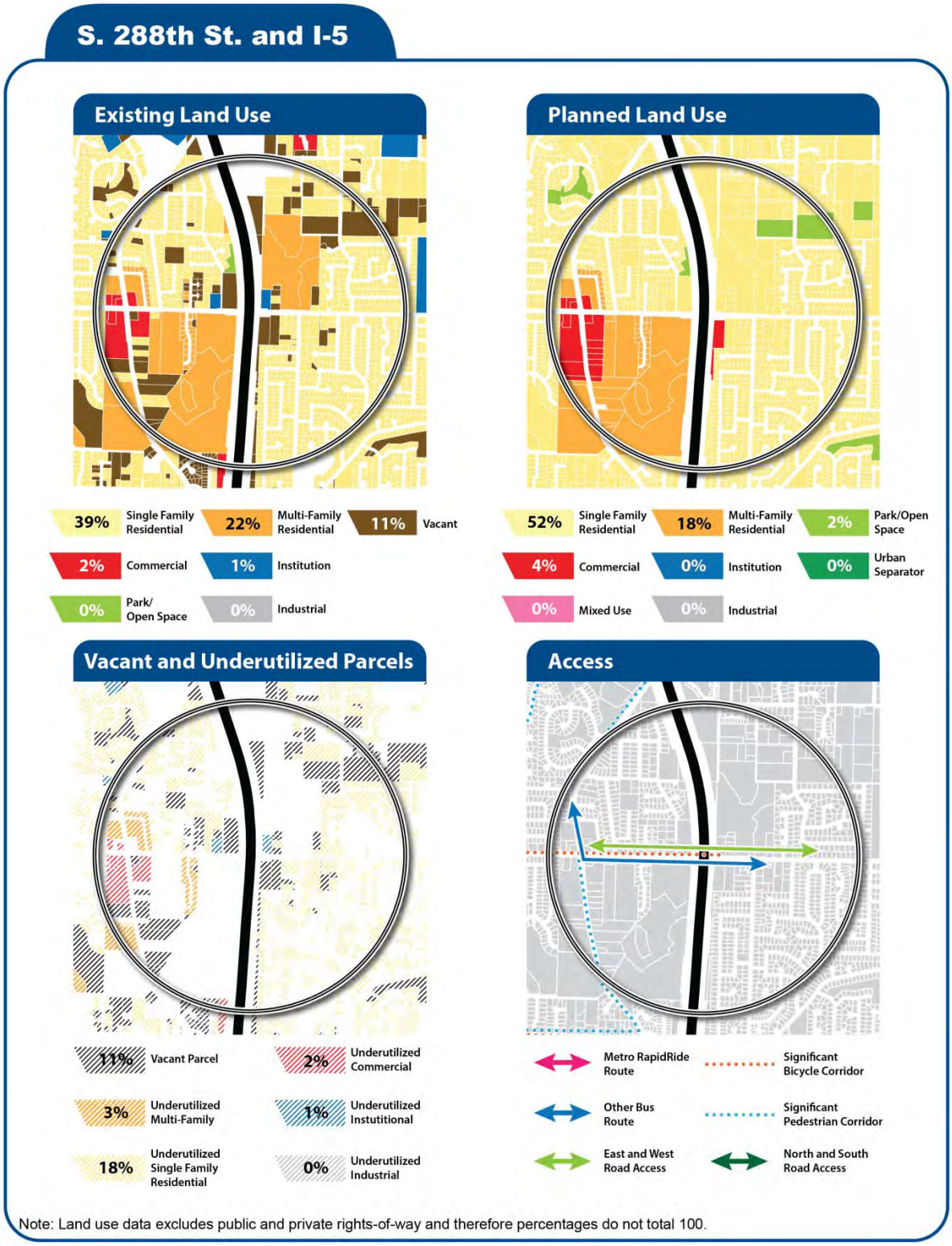


Exhibit 7-18b
S. 288th Street and I-5: Land Use and Demographics

7.4 Summary of Station Evaluations and Conclusions

The previous sections of this chapter have documented the Level 2 analysis related to the station location evaluation, including:

- how the list of possible station locations was developed and narrowed,
- the evaluation methods used to examine the station locations,
- the data that has been developed to understand and evaluate the station locations, and
- the strengths and weaknesses and key findings related to each individual station location.

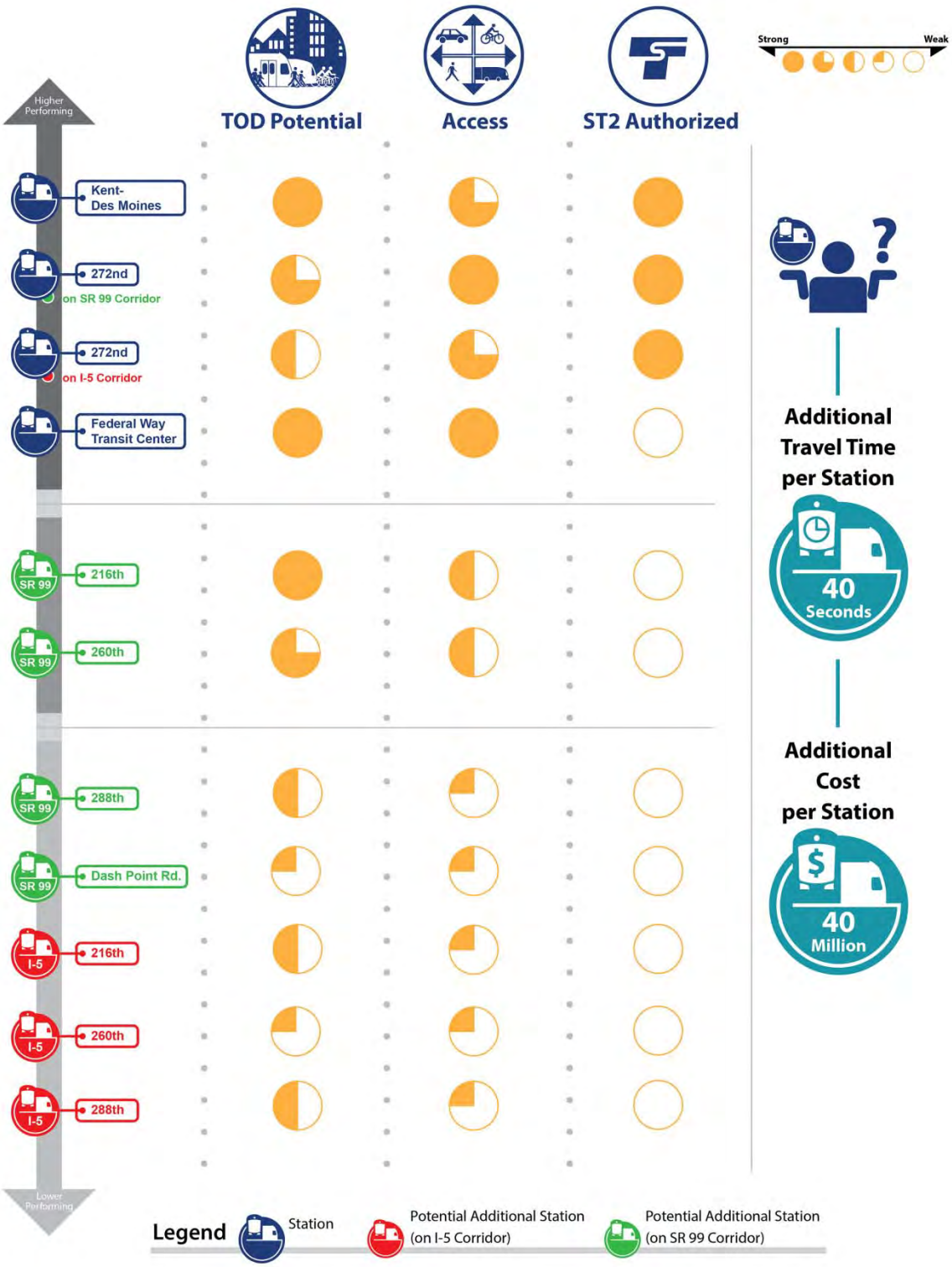
The purpose of this final section is to summarize the station evaluation findings and conclusions in a more comparative way to understand and document which station locations could be expected to be stronger performing stations and which would be weaker performing stations. The data compiled for the station location evaluation has been grouped into some general categories that put related characteristics together, as follows.

1. **Transit characteristics:** Includes ridership, increase in travel time, capital costs, and operations costs.
2. **Existing conditions:** Includes existing land use, proximity to activity centers, existing population and employment.
3. **Potential for TOD:** Includes planned land uses, TOD and high-density zoning and vacant and underutilized parcels.
4. **Access:** Includes motorized and non-motorized access such as roadway access, park-and-ride access, bus access, pedestrian and bike access.
5. **Included and authorized in the ST2 Plan** or not.

Table 7-27 summarizes the evaluation of each station by these generalized categories, with the exception of transit characteristics, which were found to be similar for all alternatives. It includes a generalized brief discussion about each of the above categories for each of the station locations. The results are also shown on **Exhibit 7-19**, with baseline stations at the top of the page, and the potential additional stations shown below them with those with higher potential as a station at the top of the page and the locations with less potential lower on the page. The results of the station evaluation indicate that all baseline stations would be expected to perform strongly because they have transit supportive existing and planned land use and multi-modal access. In addition, two of the potential additional station locations, S. 216th Street and S. 260th Street at SR 99, show promise as potential future light rail stations. The remaining five potential station locations do not appear to be as strong candidates for future light rail stations because they do not have supportive existing or planned land use or good multimodal access.

TABLE 7-27
Summary of Station Findings

Station	Existing Conditions	Potential for TOD	Access	ST2 Authorized
Baseline				
Kent Des/Moines	High diversity, includes single-family, multi-family, commercial and institutional; highest population and HCC as employment base	Higher, mix of commercial, mixed use, and residential planned	Good vehicle and transit access, improvements planned for bikes and pedestrians	Yes
S. 272nd Street (Redondo Heights Park-and-Ride)	Moderate diversity, includes single-family, multi-family, and commercial; moderate population and employment base	Higher, mix of commercial, mixed use, and residential	Good vehicle and transit access, improvements planned for bikes and pedestrians	Yes
S. 272nd Street (Star Lake Park-and-Ride)	Primarily single family and multi-family residential; moderate population and low employment base	Lower, primarily residential	Good vehicle and transit access, improvements planned for bikes and pedestrians	Yes
FWTC	Primarily commercial with some residential and park; high population and highest employment base	Higher, over 50% mixed use	Good vehicle and transit access, improvements planned for bikes and pedestrians	No
SR 99				
S. 216th Street	High diversity, includes single-family, multi-family, commercial and institutional; moderate population and high employment base	Planned mixed use and commercial in Pacific Ridge area	Good vehicle and transit access, bike lanes and sidewalks present on S. 216th	No
S. 260th Street	Mix of single family residential, multi-family residential and commercial; moderate population and employment base	Moderate, planned increase in single family residential, multi-family residential and commercial; highest amount of underutilized parcels	Good vehicle and transit access, improvements planned for bikes and pedestrians	No
S. 288th Street	Primarily single family and multi-family residential; moderate population and employment base	Lower, predominantly single family residential	Moderate vehicle and good transit access, improvements planned for bikes and pedestrians	No
S. Dash Point Road	Primarily single family residential; moderate population and lower employment base	Lower, predominantly single family residential	Moderate vehicle and good transit access, improvements planned for bikes and pedestrians	No
I-5				
S. 216th Street	High diversity, includes single-family, multi-family, commercial and institutional; moderate population and high employment base	Planned mixed use in Pacific Ridge area	No north/south access or transit service, bike lanes and sidewalks on S. 216th Street west of I-5	No
S. 260th Street	Mix of single family residential, multi-family residential and commercial; moderate population and employment base	Lower, predominantly single family residential	No north/south access or transit service, improvements planned for bikes and pedestrians	No
S. 288th Street	Primarily single family and multi-family residential; moderate population and low employment base	Lower, predominantly single family residential	No north/south access, one transit route, improvements planned for bikes and pedestrians	No
Note: Ridership, increase in travel time, capital costs and operations costs would be similar for all station locations.				



Additional stations were evaluated as part of the alternatives analysis process; these stations were not included in the voter-approved ST2 Plan and, if approved, would require additional taxing authority and funding.

P.10

Exhibit 7-19
Level 2 Station Results

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8.0 Next Steps

Based on the results of the Federal Way Transit Extension (FWTE) Project Alternatives Analysis (AA), Sound Transit plans to move forward with developing a major transit capital investment in the corridor between the Angle Lake Station at S. 200th Street and the Federal Way Transit Center. Following the completion of the AA technical analysis, the next step is to share the findings of the AA with the public and agencies to elicit feedback through the environmental scoping process. Following scoping, the Sound Transit Board will decide which alternatives to carry forward for further development, analysis, and environmental review under the National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA). Sound Transit plans to make this decision late this year after consideration of public and agency scoping comments. The public will have the opportunity to learn more about the project and provide comments throughout the duration of the NEPA/SEPA process.

The potential effects of the FWTE Project would be such that a NEPA/SEPA Environmental Impact Statement (EIS) is expected to be prepared to document the impacts of the project alternatives, and inform the decision making process. Work on the Draft EIS will start at the end of 2013 and take approximately 12 to 18 months to complete. A No Build Alternative will be identified to provide the basis for comparison of the impacts and benefits of the build alternatives.

Multiple build alternatives are expected to be studied in the Draft EIS. Following public review and comment on the Draft EIS, the Sound Transit Board of Directors is expected to identify a preferred alternative for study in the Final EIS. Once a preferred alternative has been identified, Sound Transit will begin preliminary engineering on the preferred alternative and develop a Final EIS. Following publication of the Final EIS, the Sound Transit Board is expected to select the project to build and operate. Sound Transit anticipates FTA will issue a Record of Decision (ROD) in 2016 and the project will then move into final design, followed by construction, start-up and testing, and ultimately operation. Service is planned to begin in 2023.

Exhibit 8-1 illustrates the schedule and process steps for the FWTE project.

EXHIBIT 8-1
FWTE Process and Schedule

August 2013

FEDERAL WAY TRANSIT EXTENSION

Scoping Summary Report

SOUNDTRANSIT

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REGIONAL TRANSIT AUTHORITY

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1. PURPOSE OF THIS REPORT

Sound Transit and the Federal Transit Administration (FTA) are preparing an environmental impact statement (EIS) for the Federal Way Transit Extension (FWTE) in compliance with the National Environmental Policy Act (NEPA) and the State Environmental Policy Act (SEPA). Sound Transit and the FTA conducted scoping from June 14 through July 17, 2013. This report describes how Sound Transit and FTA conducted scoping and summarizes the comments received during the scoping period. It also describes how Sound Transit and FTA used this information to help identify reasonable alternatives and environmental issues to be evaluated in the EIS.

The remainder of this report is organized into five sections:

- Overview of the Federal Way Transit Extension
- Description of the scoping process
- Overview of agency scoping activities and summary of scoping comments from agencies
- Overview of public scoping activities and summary of scoping comments from the public
- Next steps

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2. OVERVIEW OF THE FEDERAL WAY TRANSIT EXTENSION

Sound Transit is evaluating alternatives to extend light rail from the future Angle Lake light rail station at South 200th Street, to the Federal Way Transit Center area in Federal Way. The project corridor is approximately 7.6 miles long and parallels State Route 99 (SR 99) and Interstate 5 (I-5). Exhibit 1 shows where the Federal Way Transit Extension study area is located.

The Federal Way Transit Extension is an element of Sound Transit's adopted Long-Range Transit Plan and the ST2 Plan of transit investments approved by voters in 2008. The project is also part of the region's Metropolitan Transportation Plan, Puget Sound Regional Council's *Transportation 2040*. These plans anticipate the eventual extension of high capacity transit (HCT) service south to Tacoma.

Currently there is projected funding to construct the project to Kent/Des Moines in the vicinity of Highline Community College.

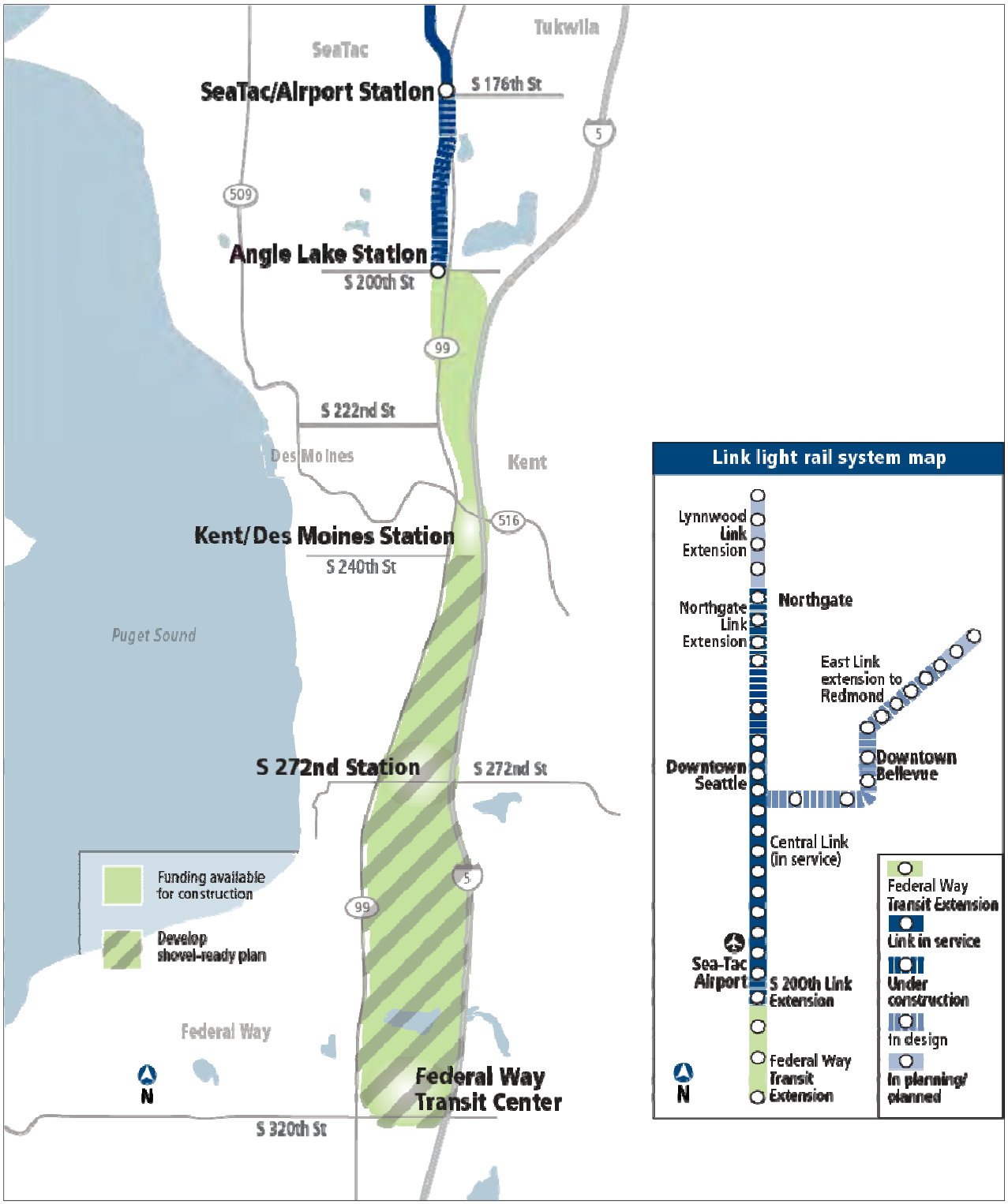

Exhibit 1 – Federal Way Transit Extension Project Area and Connection to the Link Light Rail System

The EIS phase for the Federal Way Transit Extension will build on the results of the project's Alternatives Analysis (AA) phase. During AA, Sound Transit developed and evaluated the benefits and impacts of a range of route alignments and station locations in the study area to identify reasonable alternatives to evaluate in the EIS. Sound Transit began the alternatives analysis phase with a 30-day early scoping public comment period in October and November 2012. The results of the alternatives analysis are available on the project website at www.soundtransit.org/FWextension.

Exhibit 2 shows the schedule for the Federal Way Transit Extension. Opportunities for public involvement will continue throughout the environmental review process and the subsequent steps.

Exhibit 2 – Schedule for Developing the Federal Way Transit Extension

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3. THE SCOPING PROCESS

3.1 Purpose of Scoping

Scoping is an early step in the NEPA/SEPA process. The purpose of scoping is to inform the public of the proposed project and the purpose and need for the project, seek public comment on the range of potential alternatives, and collect feedback from partner agencies, tribes, and the public on the scope of the environmental issues to study during the EIS process. During scoping, Sound Transit asked for comments from the public and agencies on:

- The draft purpose and need statement,
- The alternatives that Sound Transit should evaluate in the Draft EIS, and
- Social, economic, environmental, and transportation issues to evaluate in the Draft EIS.

Scoping for the Federal Way Transit Extension was conducted under NEPA and SEPA in accordance with applicable regulations and guidance. FTA is the lead federal agency under NEPA. Sound Transit is the lead agency under SEPA.

What is a Purpose and Need Statement?
A Purpose and Need Statement defines the objectives that project alternatives must meet. The Purpose and Need Statement will help guide decisions about the project.

3.2 Public Notices in the Federal Register and SEPA Register

The NEPA and SEPA scoping process began with formal notices to prepare an EIS. For NEPA, a Notice of Intent to prepare an EIS was published in the Federal Register on June 17, 2013. For SEPA, a Determination of Significance was published in the State's SEPA Register on June 12, 2013. Sound Transit also published legal notices in *The Seattle Times* on June 14, 2013, and June 21, 2013. The notices provided information about the Federal Way Transit Extension, the dates and times of agency and public scoping meetings, how to learn more about the project, and how to provide comment during the 30-day public comment period. A copy of the Federal Register and SEPA Register notices can be found in Appendix A.

3.3 Opportunities for the Public and Agencies to Comment

Scoping included a public comment period from June 14 through July 17, 2013. Sound Transit accepted comments by U.S. mail to Federal Way Transit Extension, c/o Kent Hale, Senior Environmental Planner, Sound Transit, 401 S. Jackson St., Seattle, WA 98104; email to fwte@soundtransit.org; or by filling out a comment card at a scoping meeting. The public also had the opportunity to provide comment and express opinions about the project by completing an online survey, which was available on the project website www.soundtransit.org/FWextension.

Sound Transit hosted an agency scoping meeting for federal, state, regional, and tribal governments on Tuesday, June 25, 2013, and held public scoping meetings on Wednesday, June 19, 2013, in Federal Way and on Wednesday, June 26, 2013, in Des Moines.

Copies of all scoping comments submitted to Sound Transit are available for review at Sound Transit's offices at 401 South Jackson Street, Seattle WA 98104-2826, or by contacting Tralayne Myers at tralayne.myers@soundtransit.org or (206) 398-5014.

3.4 Background Materials

Sound Transit produced the following publications to provide additional information about the Federal Way Transit Extension, outcomes of the alternatives analysis phase, and how the EIS will be conducted:

- *EIS Scoping Folio*: An overview of the project development and environmental review process, alternatives, and purpose and need statement.
- *Alternatives Analysis Summary*: A summary of the alternatives analysis process and results of Level 1 and Level 2 screening evaluations.
- *Level 1 Alternatives Screening Report*: Technical report describing the Level 1 alternatives evaluation criteria and results. It identifies the most promising alternatives to carry forward for Level 2 evaluation.
- *Level 2 Alternatives Screening Report*: Technical report describing the Level 2 alternatives evaluation criteria and results. It identifies the most promising alignments and station locations to be considered for further review in the EIS.
- *Draft Agency Coordination Plan*: A summary of the plan for engaging agencies and tribes in the environmental review process.

Sound Transit posted all publications to the project website prior to scoping and they were available at the public scoping meetings.

4. AGENCY SCOPING

4.1 Agency and Tribal Involvement

FTA and Sound Transit invited agencies to formally participate in the environmental review process by inviting them to be lead or co-lead agencies, cooperating agencies, and participating agencies. FTA also invited tribes to formally participate in the environmental process though initiation of tribal consultation under Section 106 of the National Historic Preservation Act. The following list shows the agencies and tribes that were invited to participate and their respective roles:

Cooperating Agencies

- Federal Highway Administration (FHWA)
- U.S. Army Corps of Engineers (USACE)
- Washington State Department of Transportation
- King County Metro
- City of Des Moines
- City of Federal Way
- City of Kent
- City of SeaTac

Participating Agencies

- U. S. Environmental Protection Agency (USEPA)
- National Parks Service (NPS)
- Washington Department of Archeology and Historic Preservation
- Washington Department of Ecology
- Washington Department of Fish and Wildlife
- Puget Sound Regional Council
- Highline Community College
- Seattle Public Utilities

Other Agencies Invited that Declined or Did Not Respond

- Advisory Council on Historic Preservation (ACHP)
- U.S. Department of Interior
- National Oceanic and Atmospheric Administration
- U.S. Fish and Wildlife Service
- Puget Sound Clean Air Agency
- Washington Department of Natural Resources

- Pierce Transit

Tribes Consulted

- Confederated Tribes and Bands of the Yakama Indian Nation
- Muckleshoot Indian Tribe
- Puyallup Tribe of Indians
- Snoqualmie Tribe
- Stillaguamish Tribe
- Suquamish Tribe
- Duwamish Tribe (not federally recognized)
- Snohomish Tribe (not federally recognized)

4.2 Agency Scoping Meeting

Sound Transit hosted a scoping meeting for federal, state, regional, and tribal governments on Tuesday, June 25, 2013, from 1 pm to 3 pm. Participants could attend the meeting in person or watch a live, streaming broadcast of the meeting on Sound Transit's website. Sound Transit distributed meeting invitations to approximately 91 agency staff representing 32 agencies.

Some of the agencies that were represented included:

- Federal Transit Administration
- King County Metro
- Puget Sound Regional Council
- Seattle Public Utilities
- Washington Department of Fish and Wildlife

The meeting consisted of a presentation by Cathal Ridge, Sound Transit's project manager for the Federal Way Transit Extension, and Kent Hale, Sound Transit's Environmental Lead for the Federal Way Transit Extension, followed by a question-and-answer session. The meeting also included an open house period with project information displays for participants who attended in person.

4.3 Interagency Work Group and Stakeholder Briefings

Throughout the alternatives analysis phase, Sound Transit met with a working group of local agency staff to encourage interagency involvement and coordination. The Interagency Work Group consists of representatives of jurisdictions or agencies that may be affected by the project's development. The Interagency Work Group advises Sound Transit as it moves through the project development process. As the project evolves, the Interagency Work Group will advise Sound Transit on strategies to avoid and minimize environmental impacts. The

Interagency Work Group will continue to meet on a regular basis throughout the EIS process and during later project phases. This group is not intended to provide official comments or recommendations on policy-related decisions.

The Interagency Work Group includes representatives of the following entities:

- City of Des Moines
- City of Kent
- City of Federal Way
- City of SeaTac
- Highline Community College
- King County Metro
- Puget Sound Regional Council
- Washington State Department of Transportation

The Interagency Work Group began meeting in September 2012. Meetings were designed to inform and obtain input from the affected agencies. The meetings held to-date and the purpose of the meeting are listed below.

Date	**Topic**
September 10, 2012	Process and schedule for developing the Federal Way Transit Extension
October 8, 2012	How the public and stakeholders can get involved in the Federal Way Transit Extension
November 13, 2012	Preliminary list of alternatives that Sound Transit will evaluate for the Federal Way Transit Extension and the criteria Sound Transit proposes to use to evaluate alternatives
December 10, 2012	Review of early scoping input and preview of initial screening results
January 21, 2013	Preview of Level 1 screening results
February 18, 2013	Preview of Level 1 screening results
March 18, 2013	Preview of Level 2 screening results
April 15, 2013	Preview of Level 2 screening results and EIS scoping materials
May 20, 2013	Review of potential Draft EIS alternatives
July 15, 2013	Review of public outreach and stakeholder coordination, and Level 2 alternatives and evaluation measures

Sound Transit also met with elected officials and representatives of local governments and other agencies to brief them on the project and inform them of scoping activities, as follows:

Agency	Date	Type of Meeting
Army Corps of Engineers	May 8, 2013	Pre-application meeting
City of Des Moines	August 14, 2012	Stakeholder interview
	August 15, 2012	Coordination meeting
	December 19, 2012	Coordination meeting
	February 7, 2013	Coordination meeting
	March 21, 2013	Coordination meeting
	April 2, 2013	Coordination meeting
	June 6, 2013	Coordination meeting
City of Federal Way	August 22, 2012	Coordination meeting
	December 18, 2012	Coordination meeting
	February 7, 2013	Coordination meeting
	April 4, 2013	Coordination meeting
	May 29, 2013	Coordination meeting
City of Kent	August 21, 2012	Coordination meeting
	December 17, 2012	Coordination meeting
	April 4, 2013	Coordination meeting
	April 30, 2013	Coordination meeting
	May 13, 2013	Coordination meeting
	June 7, 2013	Coordination meeting
City of SeaTac	August 14, 2012	Coordination meeting
	August 29, 2012	Stakeholder interview
	December 18, 2012	Coordination meeting
	April 9, 2013	Coordination meeting
	June 3, 2013	Coordination meeting
Des Moines City Council	October 18, 2012	Study session
	March 28, 2013	Briefing
	June 27, 2013	Briefing
Federal Highway Administration	July 17, 2012	Coordination meeting
	May 21, 2013	Coordination meeting
Federal Way Chamber of Commerce	January 22, 2012	Briefing
	June 18, 2013	Briefing
Federal Way City Council	November 20, 2012	Briefing
	March 19, 2013	Briefing
	June 18, 2013	Briefing
Federal Way Community and Economic Development	August 27, 2012	Stakeholder interview

Agency	Date	Type of Meeting
Department		
Highline Community College	August 6, 2012	Coordination meeting
	August 23, 2012	Stakeholder interview
	December 20, 2012	Coordination meeting
	April 2, 2013	Coordination meeting
Highline Water District	October 17, 2012	Coordination meeting
Kent Chamber of Commerce	August 27, 2012	Stakeholder interview
Kent City Council	July 2, 2013	Briefing
Kent Economic and Community Development Committee	October 8, 2012	Briefing
	March 11, 2013	Briefing
Kent Public Works Committee	October 22, 2012	Briefing
	December 12, 2012	Briefing
	March 18, 2013	Briefing
King County Department of Transportation	August 14, 2012	Stakeholder interview
King County Metro	September 6, 2012	Coordination meeting
	October 3, 2012	Coordination meeting
	December 12, 2012	Coordination meeting
	March 21, 2013	Coordination meeting
	April 12, 2013	Coordination meeting
	June 11, 2013	Coordination meeting
Puget Sound Energy	October 22, 2012	Coordination meeting
Puget Sound Regional Council	December 21, 2012	Coordination meeting
	June 10, 2013	Coordination meeting
SeaTac City Council	October 23, 2012	Study session
	December 11, 2012	Briefing
	March 26, 2013	Briefing
	June 25, 2013	Briefing
Seattle Public Utilities	October 25, 2012	Coordination meeting
	April 25, 2013	Coordination meeting
	May 13, 2013	Coordination meeting
South County Area Transportation Board	September 28, 2012	Briefing
	April 16, 2013	Briefing
Southwest King County Chamber of Commerce	August 17, 2012	Stakeholder interview

Agency	Date	Type of Meeting
U.S. Environmental Protection Agency	May 8, 2013	Coordination meeting
	May 13, 2013	Coordination meeting
Washington Department of Ecology	May 13, 2013	Coordination meeting
Washington State Department of Transportation	July 9, 2012	Coordination meeting
	July 17, 2012	Coordination meeting
	August 16, 2012	Coordination meeting
	October 26, 2012	Coordination meeting
	December 5, 2012	Coordination meeting
	January 9, 2013	Coordination meeting
	February 6, 2013	Coordination meeting
	February 27, 2013	Coordination meeting
	April 3, 2013	Coordination meeting
	April 10, 2013	Coordination meeting
	May 1, 2013	Coordination meeting
	May 16, 2013	Coordination meeting
	May 21, 2013	Coordination meeting
	June 5, 2013	Coordination meeting
	July 2, 2013	Coordination meeting
	July 10, 2013	Coordination meeting

4.4 Summary of Comments from Public Agencies, Jurisdictions, and Institutions

Eleven public agencies, jurisdictions, and institutions submitted written comment letters during scoping:

- Advisory Council on Historic Preservation (ACHP)
- City of Des Moines
- City of Federal Way
- City of Kent
- City of SeaTac
- Federal Highway Administration (FHWA)
- Highline Community College
- King County Metro

- Muckleshoot Tribe
- National Parks Service (NPS)
- U. S. Environmental Protection Agency (USEPA)

Letters from FHWA, NPS, and King County Metro were received shortly after the comment period had closed. The ACHP letter received stated that the agency declines participation in the review process under NEPA.

Highline Community College and all of the jurisdictions, except for Federal Way, commented on the location of the alignment. The City of SeaTac stated their preference for an alignment on the west side of 28th Avenue S and the west side of SR 99 to minimize impacts to residences (including affordable housing and senior housing). Highline Community College also supported an alignment on SR 99. The City of Des Moines prefers the alignment to be along I-5 in the Pacific Ridge area and then cross to SR 99 near Highline Community College. The City of Des Moines also commented that a 30th Avenue alignment would bisect the Pacific Ridge neighborhood, which is a disadvantaged area. The City of Kent commented that they do not support an alignment that would traverse from I-5 to SR 99 that would divide the Midway area planned for transit-oriented development. Highline Community College identified economic development potential as an important criterion when selecting an alignment.

All of the jurisdictions and Highline Community College commented on station locations. The City of SeaTac raised concerns that a station at S 216th Street and I-5 would require conversion of existing land uses and that a S 216th Street Station on either I-5 or SR 99 could create traffic impacts. However, the City of Des Moines requested that a station at S 216th and I-5 be considered. The City of Des Moines also stated support for stations at Redondo Heights along SR 99 at S 272nd Street, along SR 99 near S 240th Street and S 260th Street, and along I-5 at S 216th Street. The City of Kent supported a station at Highline Community College.

Highline Community College suggested that Sound Transit build stations on the same side of the road as activity centers. Highline Community College and the City of Federal Way suggested that potential for parking be considered when selecting station sites. Federal Way also suggested that adequate local transit at station sites could reduce the need for parking and suggested that travel speed, reliability, and ridership be considered when determining the number and location of stations.

FHWA commented on the purpose and need for the project and various agencies and institutions commented on environmental issues to study in the EIS. The City of SeaTac commented that visual impacts could occur from an elevated guideway, especially near residential areas along SR 99. The cities of SeaTac and Des Moines were concerned with potential effects of an I-5 alignment on the design of the future SR 509 corridor.

Highline Community College and the City of Kent expressed concern for pedestrian safety at a station near the college. They also expressed concern that a station at the college could increase east-west transit demand into Kent. Highline Community College suggested that impacts at an interim terminus station be considered in the environmental analysis including traffic congestion and increased crime. The City of Kent noted that project-related improvements should not divide a community, especially in the Midway area, or if Sound Transit chooses an alignment that crosses between SR 99 and I-5. The City of Kent also suggested that the environmental analysis address emergency vehicle access to the light rail cars.

The City of Federal Way commented on 15 environmental topics but had the most comments related to land use and transportation. They indicated that property acquisitions along stations and alignments would limit future redevelopment opportunities. Regarding transportation, the City of Federal Way noted that there could be traffic impacts near the terminus or with an alignment on SR 99. The City of Federal Way also suggested that the analysis consider effects on real estate value from changes in visual quality, light and glare, and noise and vibration. They requested that the study examine whether such changes could diminish the market's ability to meet housing targets in the City Center. The City of Federal Way also suggested that the environmental analysis study effects on plants and animals, especially in the landscaped areas around I-5. They also suggested that the study review health impacts such as air quality impacts, drippings and particles from elevated guideways, and health effects of noise and vibration.

The Muckleshoot Indian Tribe suggested ecological issues to study further including fish passage in streams, stream and wetland impacts from fill, and tree removal. The USEPA identified several sensitive aquatic sites such as McSorley Creek, Steel Lake, Redondo Creek, and an unnamed stream and suggested Sound Transit use low-impact development strategies and restore areas after construction. The USEPA noted that the Midway Landfill is a Superfund site and was concerned with impacts to the landfill, especially with the I-5 Mixed West Side Alternative. NPS suggested that any proposed alternative with the potential to affect Steel Lake Park in Federal Way should be closely coordinated with the Washington Recreation and Conservation Office and NPS.

King County Metro agrees with the assumption that RapidRide A Line service would remain the same with the FWTE project. They suggested that the EIS station boarding methodology consider access to light rail by actual network connections of different transportation modes. King County Metro also suggested that the EIS methodology look at ease for transit to connect to FWTE, especially in congested areas. If increased congestion were to occur from the FWTE, King County Metro expressed concern that congestion could affect bus speed and reliability,

make multimodal connections more expensive and difficult to provide, and affect the space available for bus zones and bus layover areas.

Appendix B includes a copy of each agency's comment letter.

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5. PUBLIC SCOPING

5.1 Public Scoping Meetings

Sound Transit hosted two public meetings during the scoping period as shown below. More than 160 people attended the public meetings.

Date and Time	Location	Number of Participants
Wednesday, June 19, 2013 3–6 p.m.	Federal Way Transit Center 31621 23rd Ave S. Federal Way, WA 98003	137 (17 people signed in)
Wednesday, June 26, 2013 5–7 p.m.	Parkside Elementary School 2104 S. 247th Street Des Moines, WA 98198	26 (26 people signed in)

5.2 Meeting Notification

Sound Transit advertised the public scoping meetings through a variety of methods, including a postcard mailing to approximately 24,900 single-family homes, apartments, and businesses within one-half mile of the project area; print and online advertising; a media advisory; and notification on the project website and various community calendars. Sound Transit also distributed postcards advertising the scoping meetings at libraries and community gathering places and through contacts at large employers throughout the project area.

Sound Transit placed display advertisements in the following print publications:

- *Federal Way Mirror* (June 14, 2013)
- *Highline Times* (June 14, 2013)
- *Korea Daily* (Korean, June 11, 2013)
- *La Raza (*Spanish, June 14, 2013)
- *Ngoui Viet Tay Bac (NW Vietnamese Weekly)* (Vietnamese, June 14, 2013)

Sound Transit posted advertisements in the following online publications:

- *Highline Times Blog* (June 12-26, 2013)
- *SeaTac Blog* (June 12-26, 2013)
- *Waterland Blog* (June 12-26, 2013)
- *Seattle Transit Blog* (June 5-26, 2013)

Samples of meeting notifications are provided in Appendix D. In addition, *The Highline Times/Des Moines News, Federal Way Mirror, Kent Reporter,* and *The Thunderword* published articles about the project during the scoping period. Copies of these articles are provided in Appendix E.

5.3 Public Outreach to Minority, Low-Income, and Limited-English-Proficient Populations

Sound Transit is committed to equal engagement opportunities for all interested members of the public. In addition to Sound Transit outreach policy, multiple federal laws and guidance encourage/require Sound Transit to provide meaningful opportunities for these groups to engage in the planning process. Title VI of the Civil Rights Act of 1964 prohibits discrimination based on race, color, or national origin. Executive Order 12898, signed by President Clinton in 1994, directs federal agencies, to make environmental justice a part of its mission by identifying and addressing disproportionately high and adverse human health and environmental effects of its programs, policies, and activities on minority and low-income populations. FTA and DOT guidance further describes how to incorporate environmental justice principles into plans, projects, and activities. This guidance includes a section on achieving meaningful public engagement with environmental justice populations.

Sound Transit used the following strategies to engage minority, low-income, and limited-English-proficient populations prior to and during scoping:

Strategy	Implementation	Outcome
Partner with community organizations to organize outreach events.	Hosted project information table at the Des Moines Senior Activity Center Transportation Fair on June 18, 2013.	Provided project information and announced the scoping meetings and comment period to 20 community members.
Build relationships with community organizations.	Attended monthly meetings with South King County Mobility Coalition, South King County Human Services, and City Vision in Federal Way.	Provided updates on project, distributed materials, and announced scoping meetings.
Host tabling events and conduct briefings at community gathering places.	Hosted 19 tabling events from March to June 2013 in SeaTac, Des Moines, Kent, and Federal Way. Provided briefings to the following neighborhood councils: • West Hill Council, June 19, 2013, at 7:00 p.m. at	Provided project information to approximately 375 community members, including minority, low-income and limited-English-proficient populations.

Strategy	Implementation	Outcome
	the Trinity Community Church in Kent • Saltair Hills Council, June 20, 2013, at 6:30 p.m. at Marcus Whitman Church in Des Moines	
Host meetings in transit-accessible facilities.	Hosted a public scoping meeting at the Federal Way Transit Center.	Engaged approximately 137 transit riders, including minority, low-income and limited-English-proficient populations.
Provide translation and interpretation services for project materials and interpretation services at public meetings.	Included translated statements on meeting advertisements and materials on how to access interpretation services.	Meeting advertisements included translated statements in Korean, Russian, Somali, Spanish, Tagalog, and Vietnamese with a phone number for non-English-speaking community members to access interpretation services and get more information about the scoping meetings.
Host meetings to accommodate shift workers.	Hosted scoping meetings and tabling events during the scoping period at a variety of dates and times: • Federal Way Transit Center scoping meeting, June 19, 2013, from 3-6 pm. • Parkside Elementary scoping meeting, June 26, 2013, from 5-7 pm. • Des Moines	Provided engagement opportunities to meet a variety of schedules.

Strategy	Implementation	Outcome
	Transportation Fair information table, June 18, 2013, from 11 am–1 pm.	
Distribute project information through trusted community organizations.	Produced Somali-language project overview video in partnership with SomTV. Posted video on SomTV website and YouTube channel and on the project web page.	433 video views since April 12, 2013, on SomTV's YouTube channel.
	Created coffee sleeves with Sound Transit logo and project web page.	Distributed by coffee shops on Highline Community College Campus and local shop on SR 99 that serves Highline Community College.

As the project moves forward, Sound Transit will continue to engage minority, low-income, and limited-English-proficient populations using the following strategies:

- Partner with community organizations to organize outreach events in the community and distribute project information through existing communication channels.
- Host tabling events at familiar, trusted community gathering places, such as community centers and local houses of worship.
- Work with SomTV to update the Somali-language Federal Way Transit Extension project overview video to include a description of the alternatives Sound Transit will be evaluating in the EIS.

5.4 Public Scoping Meeting Format

Sound Transit asked participants to sign-in as they arrived at the public scoping meetings. Staff members working at the welcome table explained the meeting purpose and format and provided participants with a copy of the EIS scoping folio and a comment form.

The meetings were conducted as an open house where participants were invited to review displays and discuss the project with Sound Transit staff and members of the consultant team. Displays provided information about the purpose of and need for the Federal Way Transit

Extension, project timeline, environmental review process, alternatives screening process, and the range of alignments and station locations that Sound Transit is considering evaluating in the EIS.

Participants were invited to provide comments through three interactive exercises:

1. Staff provided a map of the corridor on a long table. Participants could use markers and post-it notes to provide comments on the proposed alternatives and identify any important environmental or community resources.
2. Participants could use dot stickers to identify which elements of the purpose and need statement were most important to them.
3. Participants could complete a comment form or take the online survey at the comment station.

Examples of the display materials are provided in Appendix F.

5.5 Summary of Public Comments

Nineteen public comment submittals were received during the scoping period. Comment forms were distributed during the public scoping meetings and Sound Transit received 13 completed comment forms at the meetings. Six additional comments were submitted from the public through email and regular mail, including a comment letter from the Saltair Hills community. In addition, the public was able to provide input through an online scoping survey. One hundred and thirteen people took the online survey, which was provided on the project website. It should be noted that survey respondents were from a large geographical area and the majority of respondents identified themselves as not living in, working in, or owning a business in the corridor. No comments were received from businesses. In general, comments showed support for the FWTE and the increased availability of transit in the project area. Public scoping comments and survey results are provided in Appendix C.

Comment forms and the online scoping survey were set up to receive public input on three topics: 1) the purpose and need for the project, 2) potential light rail alternatives and station locations, and 3) how the project could affect people and the environment. The comments that were received and the results of the online survey are summarized below by these three categories.

5.6 Comments Related to the Purpose and Need

In general, the comments suggested that the project was needed to reduce heavy traffic congestion on highways and that the project was needed to help people reach their destinations faster. It was also noted that the project is needed to reduce congestion on the

King County Metro RapidRide A Line. One commenter suggested that the project is needed to connect people with schools at all levels (elementary, junior high, high school, college, and universities). Another commenter noted that the project is needed to provide better connections for airport employees who live south of Seattle-Tacoma International Airport. Other suggested purpose and need statements included decreasing transit travel times, reducing express bus overcrowding, encouraging transit-oriented development and development in general, and improving mobility as much as possible with available funding.

The online scoping survey provided the public a variety of potential purpose and need statements and asked the survey taker to vote on how strongly they agreed with each statement. From the online scoping survey, over 90 percent of the responders either agreed or strongly agreed that:

- More reliable and convenient public transportation should be provided to jobs and key destinations to meet the future demand for public transportation; and
- An alternative should be provided to traveling on congested roadways, and connections to the transportation system at all times of day should be improved.

Between 80 and 90 percent of responders either agreed or strongly agreed with the following objectives and statements:

- Supporting local land use, transportation, and economic development plans;
- Advancing the Sound Transit Long Range Plan by providing high-quality regional transit service connecting major activity centers in King, Pierce, and Snohomish counties;
- Building an affordable system that seeks to preserve and promote a healthy environment; and
- More people will be living and working in the project area.

Other potential purpose and need statements in the online survey received more neutral responses. These included lack of access to a car, future transit reliability, meeting the transportation needs of local people, consistency with regional plans, and reductions in vehicle miles traveled and greenhouse gas emissions.

5.7 Comments Related to the Alternatives

Over 83 percent of responders to the online survey commented that Sound Transit is considering the right alternatives for the project. Generally, comments received both online and otherwise supported an alignment on SR 99 instead of I-5 since SR 99 would provide better access to businesses and be more accessible to riders. One commenter stated that the City of

Des Moines and the Port of Seattle are planning a major development north of S 216th Street and west of 24th Avenue S and that the I-5 corridor options would poorly serve this area.

One commenter suggested having express service options and another suggested grade separation to increase the speed of the train. A commenter mentioned that the light rail should connect with South Center Mall. A bridge at 240th Street over I-5 was also suggested.

Two comments were received in support of increased bus service instead of light rail and it was suggested that there be additional parking at the Federal Way Transit Center. One commenter suggested that funds should be spent on roads and bridges instead of transit. Three online survey takers suggested that additional park-and-rides be considered. One commenter suggested that a light rail line should connect Vashon and Gig Harbor to downtown Seattle or Bellevue.

A letter was received from several Saltair Hills community members in Kent, which stated a preference for an alignment on the east side of SR 99 with a pedestrian overpass to Highline Community College.

Over 85 percent of the responders to the online scoping survey commented that Sound Transit is considering the right station locations. Sound Transit asked online survey participants to rate the potential additional station locations (in addition to the three baseline stations) it evaluated during alternatives analysis in order of which ones they would use the most.[1] The top three ranked stations were all on SR 99: 1) S 288th Street and SR 99, 2) Dash Point Road and SR 99, and 3) S 260th Street and SR 99. A station at S 216th Street and SR 99 was ranked in the middle. The lowest-ranked potential stations were the I-5 stations, with the S 216th Street and I-5 location getting the fewest votes. One survey-taker suggested that the station at Kent-Des Moines Road/Highline Community College and the track from near Angle Lake to the station should be placed in an area that impacts the fewest possible number of residences. Another commenter noted that a station should be at Highline Community College on SR 99 and that stations at Kent-Des Moines Road and S 272nd Street would not provide easy access to the college. One commenter suggested that Sound Transit not build too many stations because this could negatively affect travel time.

5.8 Comments Related to Potential Effects

Most of the online survey responders (73-77 percent) noted that transit and traffic were the two most relevant environmental issues to consider. Comments received at the public meetings on environmental effects generally expressed the opinion that the project could reduce gas use and improve air quality. It was also mentioned that increased public transportation would help

[1] The additional station locations are not part of the voter-approved ST2 Plan and would require additional taxing authority and funding for construction.

seniors and persons with disabilities get around easier and could save people money on downtown parking costs. Fifty-seven percent of online survey responders also noted the need to study effects on land use and economic activity. One online commenter noted concern that potential businesses such as Boeing could move out of the area because of poor transportation options for employees.

Public concerns about potential environmental effects included residential and business displacements, noise impacts, disruption of traffic during construction, cost, and not providing enough parking at the stations. One commenter suggested that Sound Transit consider paid parking to counter parking shortages. Another commenter expressed concern that if drivers in the project area switch from driving to light rail, other people with longer commutes will drive to work on I-5, and as a result light rail could indirectly increase sprawl.

A letter from several Saltair Hills community members stated concern that the SR 99 Hybrid Alternative could result in additional noise, increased traffic at S 252nd Street, adverse effects on businesses, and disruption to their community.

6. NEXT STEPS

6.1 Identifying the Draft EIS Alternatives and the Scope of the EIS

The public and agency comments received during scoping will help Sound Transit (at the direction of the Sound Transit Board) and FTA finalize the purpose and need for the project and identify the issues and alternatives to be considered in the Draft EIS.

In September 2013, the Sound Transit Board is expected to consider a motion to provide direction on the range of alternatives to be studied in the Draft EIS. The consideration of any motions will be conducted in regularly scheduled meetings of the Board and will be open to the public.

6.2 Draft EIS

Work on the Draft EIS is expected to begin in late 2013 and will take about 12 to 18 months to complete. The Draft EIS will describe the benefits and adverse effects of each alternative and will outline potential ways to avoid, minimize, or mitigate negative effects.

Sound Transit is planning to issue the Draft EIS for public and agency review in late 2014. The Draft EIS will be available for a minimum 45-day public comment period that will include public hearings. After the close of the Draft EIS public comment period, the Sound Transit Board will consider public comments as well as the information in the Draft EIS when it identifies the preferred alternative for the Final EIS.

6.3 Final EIS

The Final EIS will identify Sound Transit's preferred alternative and will contain a response to comments received on the Draft EIS. The Final EIS will also outline mitigation for unavoidable environmental impacts. Work on the Final EIS is expected to begin in early 2015 with publication scheduled for mid 2016.

6.4 Record of Decision

After the publication of the Final EIS, FTA is expected to prepare a Record of Decision (ROD). The ROD will document what project Sound Transit will build and how it will avoid, minimize, and mitigate for environmental impacts.

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APPENDIX A – FEDERAL REGISTER AND SEPA REGISTER NOTICES

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outside the U.S. as gasoline or diesel vehicles are imported to the United States and then retrofitted or modified in the United States so that they can operate on alternative fuels. Another commenter suggested that FHWA issue a policy that defines the acceptable limit on domestic content.

In response to these comments, the FHWA does not believe that it is appropriate to establish a vehicle domestic content requirement threshold at the present time. The FHWA is uncertain whether such a condition would further the objectives of CMAQ Program to encourage State and local entities to pursue clean fuel technologies. Moreover, the FHWA has no data in order to determine what such a content standard should be. Also, the practicality of establishing such a limit for just the iron and steel components in a vehicle is questionable. The FHWA is unaware of any method by which the agency can use to determine where the steel and iron contained in the steel and iron components of a vehicle were manufactured. Similarly, the FHWA has no basis for defining the point of final assembly for vehicle retrofit projects other than the location where the retrofitting of the vehicle takes place prior to turning the vehicle over to the owner. As such, the FHWA is not prepared to address these issues as part of this particular waiver request.

As a result, State departments of transportation (DOT) will need to make a good faith effort to determine whether the final assembly of a vehicle or vehicle retrofit occurs in the United States. With respect to passenger motor vehicles, the FHWA notes that the National Highway Traffic Safety Administration has established criteria in 49 CFR Part 583 for vehicles subject to the America Automobile Labeling Act (AALA) (*http://www.nhtsa.gov/Laws+&+Regulations/Part+583+American+Automobile+Labeling+Act+(AALA)+Reports*). Vehicles meeting the criteria for final assembly under the AALA is one option for State DOTs to make a good faith effort in determining whether final assembly of vehicles subject to AALA requirements occurs in the United States. The FHWA will publish a notice in the **Federal Register** at a future date to request public comments on what standards should apply to vehicles. In the meantime, the FHWA does not wish to further delay these projects while the appropriate standard for vehicles is established.

While the FHWA has not located a vehicle that meets a 100 percent domestic iron and steel content requirement, the FHWA does not find that a complete waiver based on non-availability pursuant to 23 U.S.C. 313(b)(2) is appropriate. However, the FHWA also recognizes that at least a conditional waiver is necessary in order to permit the State DOTs to proceed with the projects. The FHWA believes that a conditional waiver that allows the public agencies to purchase vehicles so long as the final assembly of the vehicle as the end product occurs in the United States is appropriate. This approach is similar to the conditional waivers given to Alameda County, San Francisco County, and Merced County, CA, for vehicle purchases on November 21, 2011 (76 FR 72027 and 76 FR 72028) and March 30, 2012 (77 FR 19410).

In conclusion, and in light of the above, pursuant to 23 U.S.C. 313(b)(1), the FHWA finds that it is in the public interest to grant a conditional waiver from the general 100 percent domestic content requirement that applies to Federal-aid highway projects under Buy America. Under this conditional waiver, however, the final assembly of any vehicles purchased with HTF funds must occur in the United States. Thus, so long as the final assembly of the 74 vehicle projects (including sedans, vans, pickups, SUVs, trucks, buses, and equipment, such as backhoes, street sweepers, and tractors) occurs in the United States, applicants to this waiver request may proceed to purchase these vehicles and equipment consistent with the Buy America requirement.

In accordance with the provisions of section 117 of the SAFETEA–LU Technical Corrections Act of 2008 (Pub. L. 110–244, 122 Stat. 1572), the FHWA is providing this notice as its finding that a conditional waiver of Buy America requirements is appropriate. The FHWA invites public comment on this finding for an additional 15 days following the effective date of the finding. Comments may be submitted to the FHWA's Web site via the link provided to the waiver page noted above.

Authority: 23 U.S.C. 313; Pub. L. 110–161, 23 CFR 635.410.

Issued on: June 6, 2013.

Victor M. Mendez,

Administrator, Federal Highway Administration.

[FR Doc. 2013–14146 Filed 6–14–13; 8:45 am]

BILLING CODE 4910–22–P

DEPARTMENT OF TRANSPORTATION

Federal Transit Administration

Notice of Intent to Prepare an Environmental Impact Statement for the Federal Way Transit Extension, King County, Washington

AGENCY: Federal Transit Administration (FTA), DOT

ACTION: Notice of intent to prepare an environmental impact statement.

SUMMARY: The Federal Transit Administration (FTA) and the Central Puget Sound Regional Transit Authority (Sound Transit) are planning to prepare an Environmental Impact Statement (EIS) for Sound Transit's proposed Federal Way Transit Extension (FWTE) project. The FWTE project would allow Sound Transit to improve public transit service between the cities of SeaTac and Federal Way in King County, Washington. The FWTE project would also respond to a growing number of transportation and community needs identified in the agency's regional transit system plan, Sound Transit 2 (ST2).

The EIS will be prepared in accordance with the National Environmental Policy Act (NEPA) and Washington's State Environmental Policy Act (SEPA). This Notice of Intent initiates formal scoping for the EIS, invites interested parties to participate in the EIS process, provides information about the purpose and need for the proposed transit project, includes the general set of alternatives being considered for evaluation in the EIS, and identifies potential environmental effects to be considered. This notice invites public comments on the scope of the EIS and announces the public scoping meetings to receive comments. Alternatives being considered for evaluation include a No-Build alternative and various build alternatives to develop light rail in the FWTE corridor. The light rail alternatives were developed through an early scoping process, and an alternatives analysis study. Early scoping notification for the alternatives analysis phase was announced in the **Federal Register** on October 16, 2012. Results of the early scoping process, the alternatives analysis findings, and other background technical reports are available on the project Web site.

DATES: Written comments on the scope of alternatives and impacts to be considered in the EIS must be received no later than July 15, 2013, and must be sent to Sound Transit as indicated below. Information about the proposed

project, the alternatives analysis findings, the Scoping Information Folio, and the EIS process will be available at two public scoping meetings (on June 19 and June 26) and one scoping meeting for tribal and agency representatives (on June 25) at the locations described below. Sound Transit and FTA will accept comments at those meetings.

1. June 19, 2013, 3:00 p.m.–6:00 p.m.

Federal Way Transit Center, 31621 23rd Ave S., Federal Way, WA 98003.

2. June 26, 2013, 5:00 p.m.–7:00 p.m.

Parkside Elementary School, 2104 S. 247th Street, Des Moines, WA 98198.

3. (Agency and Tribal Meeting) June 25, 2013, 1:00 p.m.–3:00 p.m.

Sound Transit, Union Station, Ruth Fisher Boardroom, 401 S. Jackson Street, Seattle, WA 98104.

Invitations to the agency and tribal scoping meeting have been sent to appropriate Federal, tribal, state, and local governmental units. All public meeting locations are accessible to persons with disabilities who may also request materials be prepared and supplied in alternate formats by calling Tralayne Myers, (206) 398–5014 at least 48 hours in advance of the meeting. Persons who are deaf or hard of hearing may call (888) 713–6030 TTY.

Scoping information as well as general information is available at: *http://www.soundtransit.org/FWextension.*

The scoping period extends to July 15, 2013, or 30 days from the date of this notice, whichever is later. Written scoping comments are requested by July 15, 2013 at the address above, or they can be submitted at the public meetings.

ADDRESSES: Federal Way Transit Extension (c/o Kent Hale, Senior Environmental Planner) Sound Transit, 401 S. Jackson Street, Seattle, WA 98104–2826, or by email to *FWTE@soundtransit.org.*

FOR FURTHER INFORMATION CONTACT: Steve Saxton, FTA Transportation Program Specialist, phone: (206) 220–4311.

SUPPLEMENTARY INFORMATION:

The Proposed Project. Sound Transit is proposing to extend Link light rail transit service from the future Angle Lake Link light rail station at South 200th Street in SeaTac to the Federal Way Transit Center area in Federal Way. The project corridor is approximately 7.6 miles long and parallels State Route 99 (SR 99) and Interstate 5 (I–5). It generally follows a topographic ridge between Puget Sound and the Green River Valley where the city limits of SeaTac, Des Moines, Kent, and Federal Way meet. The project is part of the ST2 Plan of transit investments approved by the voters in 2008. Currently, there is projected funding to construct to Kent/Des Moines in the vicinity of Highline Community College.

Purpose of and Need for the Project. The purpose of the Federal Way Transit Extension is to expand the Sound Transit Link light rail system from SeaTac to the cities of Des Moines, Kent, and Federal Way in King County in order to meet the following objectives:

- Provide a rapid, reliable, accessible, and efficient alternative for travel to and from the corridor and other urban growth and activity centers in the region with sufficient capacity to meet projected demand.
- Expand mobility alternatives to traveling on congested roadways and improve connections to the regional multimodal transportation system with peak and off-peak service.
- Provide the high-capacity transit (HCT) infrastructure to support adopted regional and local land use, transportation, and economic development plans.
- Advance the long-range vision, goals, and objectives for transit service established by the Sound Transit Long-Range Plan for high-quality regional transit service connecting major activity centers in King, Pierce, and Snohomish counties.
- Implement a financially feasible system that seeks to preserve and promote a healthy environment.

The following conditions within the project corridor demonstrate the need for the project:

- North-south transit demand is expected to grow by 30 to 40 percent by 2035 as a result of residential and employment growth in the FWTE corridor and regionally.
- The FWTE corridor population is a highly transit-dependent population with needs for efficient, reliable regional connectivity.
- Congestion on I-5 and on the key corridor arterials leading in and out of the study area will increase and further degrade existing transit performance and reliability.
- There is a lack of reliable and efficient peak and off-peak transit service connecting persons in the FWTE corridor with the region's growth centers.
- Regional and local plans call for HCT in the corridor consistent with PSRC's VISION 2040 and the Regional Transit Long-Range Plan.
- Implementing the project will help meet environmental and sustainability goals of the state and region, including reduced vehicle miles traveled and greenhouse gas emissions.

Potential EIS Alternatives. Sound Transit and FTA are considering multiple alternatives for study in the EIS including a No-Build alternative and several light rail alternatives operating between the cities of SeaTac and Federal Way. Preliminary light rail alternatives were developed through an alternatives analysis process, the early scoping process (October 18 through November 19, 2012), and previous regional and local planning studies. Each light rail alternative includes three general station locations: the vicinity of South 240th Street (near Highline Community College), the vicinity of South 272nd Street (near the Redondo and Star Lake park-and-ride facilities), and the vicinity of South 317th Street (near the Federal Way Transit Center). The alternatives may include other additional station locations identified through the early scoping and alternatives analysis processes. FTA and Sound Transit invite comments on these preliminary alternatives. Public and agency input received during the scoping period will help FTA and Sound Transit develop a range of reasonable alternatives to evaluate in the Draft EIS.

No Build Alternative. NEPA requires consideration of a No-Build Alternative. It reflects the existing transportation system plus the transportation improvements included in PSRC's Transportation Improvement Program.

Potential I–5 Alternatives. The potential I–5 Alternatives consist of light rail guideway along I–5 in two configurations. In one configuration, the guideway would run along the south side of the proposed SR 509 right-of-way to I–5 and then along the west side of the I–5 right-of-way. The guideway would deviate west from the I–5 right-of-way near 317th Street to access the Federal Way Transit Center area. For the other configuration, the alignment would transition from the west side of I–5 to the median of I–5 south of S. 240th Street, briefly transition back to the west side at 272nd Street, then continue in the median to 317th Street before transitioning back to the west side to access the Federal Way Transit Center area Station locations proposed for evaluation with the I–5 Alternative include the vicinity of South 240th Street near Highline Community College; the vicinity of South 272nd Street near the Star Lake park-and-ride facility; and the vicinity of South 317th Street near the Federal Way Transit Center.

Potential SR 99 Alternatives. The potential SR 99 Alternatives would

consist of light rail guideway along SR 99 in two configurations. In one configuration the guideway would follow the median for most of the length of SR 99. For the other configuration, the guideway could utilize and transition between the east side, west side, and/or median of SR 99. Station locations proposed for evaluation with the SR 99 Alternatives include the areas near the vicinity of South 240th Street near Highline Community College; the vicinity of South 272nd Street near the Redondo park-and-ride facility; and the vicinity of South 317th Street near the Federal Way Transit Center. The SR 99 alternatives may include other additional station locations in the vicinities of South 216th Street and South 260th Street identified through the early scoping and alternatives analysis processes.

Potential 30th Avenue Alternative. The potential 30th Avenue Alternative would consist of light rail guideway along a portion of 30th Avenue South in the cities of Des Moines and Kent. From Angle Lake Station, the guideway would travel along SR 99 and transition east to 30th Avenue at approximately South 220th Street. The guideway would remain on 30th Avenue South from South 224th Street to approximately South 240th Street. From South 240th Street, the guideway would transition to SR–99 or I–5 and continue towards Federal Way. The station locations would be the same as those described in the previous alternatives.

Scope of Environmental Analysis. The EIS process explores in a public setting the potentially significant effects of implementing the proposed action (and alternatives to the proposed action) on the physical, human, and natural environment. Areas of investigation for this project may include, but might not be limited to, transportation, land use and consistency with applicable plans, land acquisition and displacements, socioeconomic impacts, park and recreation resources, historic and cultural resources, environmental justice, visual and aesthetic qualities, air quality, noise and vibration, energy use, safety and security, and ecosystems, including threatened and endangered species. These effects will be evaluated for both the construction period and the long-term period of operation. Indirect, secondary and cumulative impacts will also be evaluated. The EIS will identify measures to avoid, minimize, or mitigate significant adverse impacts.

Roles of Agencies and the Public. NEPA, and FTA's regulations for implementing NEPA, call for public involvement in the EIS process, including: (1) Invitations to other Federal and non-Federal agencies and Indian tribes that may have an interest in the proposed project to become ''cooperating'' or ''participating agencies,'' (2) opportunities for involvement by agencies and the public in helping to define the proposed project's purpose and need, as well as the range of alternatives for consideration in the impact statement, and (3) a plan for coordinating public and agency participation in and comment on the environmental review process.

An invitation to become a cooperating or participating agency will be extended to Federal and non-Federal agencies and Indian tribes that may have an interest in the proposed project. Any agency or tribe interested in the project that does not receive such an invitation should promptly notify the Sound Transit Senior Environmental Planner identified above under **ADDRESSES.**

A draft Coordination Plan for public and agency involvement is available for review at the project Web site. It identifies the project's coordination approach and structure, details the major milestones for agency and public involvement, and includes an initial list of interested agencies and organizations.

FTA and Sound Transit welcome comments from interested individuals, organizations, tribes and agencies. Comments are invited regarding the preliminary statement of purpose and need; the alternatives to be evaluated in the EIS; and any significant environmental issues related to the alternatives. Suggested reasonable alternatives that meet the project purpose and need will be considered. To assist the public during scoping, Sound Transit has prepared an Environmental Scoping Information Folio describing the project, potential alternatives, potential impact areas to be evaluated, and the preliminary EIS schedule. You may request a copy from Tralayne Myers, Sound Transit, 401 S. Jackson Street, Seattle, WA 98104–2826, telephone: (206) 398–5014 or email: *traylane.myers@soundtransit.org.* It is also available at *http://www.soundtransit.org/FWextension.* After the comment period, Sound Transit will publish a summary of the public and agency comments it receives. After scoping concludes later this year, the Sound Transit Board is expected to consider the scoping comments received and then act on a motion addressing the purpose and need for the project, the scope of environmental review, and alternatives to be considered in the draft EIS.

FTA and Sound Transit will comply with all applicable Federal environmental laws, regulations, and executive orders during the environmental review process. These requirements include, but are not limited to, the regulations of the Council on Environmental Quality implementing NEPA, and FTA's own NEPA regulations (40 CFR parts 1500–1508, and 23 CFR part 771); the air quality conformity regulations of the U.S. Environmental Protection Agency (EPA) (40 CFR part 93); the Section 404(b)(1) guidelines of EPA (40 CFR part 230); the regulations implementing Section 106 of the National Historic Preservation Act (36 CFR part 800); the regulations implementing Section 7 of the Endangered Species Act (50 CFR part 402); Section 4(f) of the Dept. of Transportation Act (23 CFR part 774); Executive Order 12898 on Environmental Justice, 11988 on floodplain management, and 11990 on wetlands; and DOT Order 5610.2(a) on Environmental Justice.

Paperwork Reduction. The Paperwork Reduction Act seeks, in part, to minimize the cost to the taxpayer of the creation, collection, maintenance, use, dissemination, and disposition of information. Consistent with this goal and with principles of economy and efficiency in government, FTA limits as much as possible the distribution of complete sets of printed environmental documents. Accordingly, absent a specific request for a complete printed set of environmental documents (preferably in advance of printing), Sound Transit will distribute only the executive summary of the environmental document together with a compact disc of the complete environmental document. A complete printed set of the environmental document will be available for review at the grantee's offices and elsewhere; an electronic copy of the complete environmental document will also be available on Sound Transit's Web page.

Issued On: June 11, 2013.

Kenneth A. Feldman,

Deputy Regional Administrator.

[FR Doc. 2013–14296 Filed 6–14–13; 8:45 am]

BILLING CODE 4910–57–P

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

[NHTSA Docket No. NHTSA–2013–0075]

Federal Interagency Committee on Emergency Medical Services; Meeting

AGENCY: National Highway Traffic Safety Administration (NHTSA), DOT.

Sound Transit
Federal Way Transit Extension
Determination of Significance
And Request for Comments on Scope of EIS

SOUNDTRANSIT

Description of Proposal
The Central Puget Sound Regional Transit Authority (Sound Transit) is issuing this notice to advise other agencies, tribes, and the public that an Environmental Impact Statement (EIS) will be prepared to evaluate the Federal Way Transit Extension project. Sound Transit is the lead agency under the State Environmental Policy Act (SEPA) and the Federal Transit Administration (FTA) is the lead federal agency under the National Environmental Policy Act (NEPA). Together, the agencies will prepare a combined NEPA/SEPA EIS.

The proposed project would extend Link light rail transit service from the future Angle Lake Link light rail station at South 200th Street in SeaTac to the Federal Way Transit Center area in Federal Way. The project corridor is approximately 7.6 miles long and parallels State Route 99 (SR 99) and Interstate 5 (I-5). It generally follows a topographic ridge between Puget Sound and the Green River Valley where the city limits of SeaTac, Des Moines, Kent, and Federal Way meet. The project is part of the ST2 Plan of transit investments approved by the voters in 2008. Currently, there is projected funding to construct to Kent/Des Moines in the vicinity of Highline Community College.

The purpose of the Federal Way Transit Extension is to expand the Sound Transit Link light rail system from SeaTac to the cities of Des Moines, Kent, and Federal Way in King County in order to meet the following objectives:

- Provide a rapid, reliable, accessible, and efficient alternative for travel to and from the corridor and other urban growth and activity centers in the region with sufficient capacity to meet projected demand.
- Expand mobility alternatives to traveling on congested roadways and improve connections to the regional multimodal transportation system with peak and off-peak service.
- Provide the high-capacity transit (HCT) infrastructure to support adopted regional and local land use, transportation, and economic development plans.
- Advance the long-range vision, goals, and objectives for transit service established by the Sound Transit Long-Range Plan for high-quality regional transit service connecting major activity centers in King, Pierce, and Snohomish counties.
- Implement a financially feasible system that seeks to preserve and promote a healthy environment.

The following conditions within the project corridor demonstrate the need for the project:

- North-south transit demand is expected to grow by 30 to 40 percent by 2035 as a result of residential and employment growth in the FWTE corridor and regionally.
- The FWTE corridor population is a highly transit-dependent population with needs for efficient, reliable regional connectivity.
- Congestion on I-5 and on the key corridor arterials leading in and out of the study area will increase and further degrade existing transit performance and reliability.
- There is a lack of reliable and efficient peak and off-peak transit service connecting persons in the FWTE corridor with the region's growth centers.

- Regional and local plans call for HCT in the corridor consistent with PSRC's VISION 2040 and the Regional Transit Long-Range Plan.
- Implementing the project will help meet environmental and sustainability goals of the state and region, including reduced vehicle miles traveled and reduced greenhouse gas emissions.

Potential Alternatives

Sound Transit and FTA are considering multiple alternatives for study in the EIS including a No-Build alternative and several light rail alternatives. Light rail alternatives would operate between the cities of SeaTac and Federal Way. Preliminary light rail alternatives were developed through an alternatives analysis process, the early scoping process (October 18 through November 19, 2012), and previous regional and local planning studies. Each light rail alternative includes three general station locations: the vicinity of South 240th Street (near Highline Community College), the vicinity of South 272nd Street (near the Redondo and Star Lake park-and-ride facilities), and the vicinity of South 317th Street (near the Federal Way Transit Center). The alternatives may include other additional station locations identified through the early scoping and alternatives analysis processes, but these additional stations are not funded under ST2. FTA and Sound Transit invite comments on these preliminary alternatives. Public and agency input received during the scoping period will help FTA and Sound Transit develop a range of reasonable alternatives to evaluate in the Draft EIS.

No Build Alternative. NEPA and SEPA require consideration of a No-Build or No Action Alternative. It reflects the existing transportation system plus the transportation improvements included in PSRC's Transportation Improvement Program.

Potential I-5 Alternatives. The potential I-5 Alternatives consist of light rail guideway along I-5 in two configurations. In one configuration, the guideway would run along the south side of the proposed SR 509 right-of-way to I-5 and then along the west side of the I-5 right-of-way. The guideway would deviate west from the I-5 right-of-way near 317th Street to access the Federal Way Transit Center area. For the other configuration, the alignment would transition from the west side of I-5 to the median of I-5 south of S. 240th Street, briefly transition back to the west side at 272nd Street, then continue in the median to 317th Street before transitioning back to the west side to access the Federal Way Transit Center area. Station locations proposed for evaluation with the I-5 Alternative include the vicinity of South 240th Street near Highline Community College; the vicinity of South 272nd Street near the Star Lake park-and-ride facility; and the vicinity of South 317th Street near the Federal Way Transit Center.

Potential SR 99 Alternatives. The potential SR 99 Alternatives would consist of light rail guideway along SR 99 in two configurations. In one configuration the guideway would follow the median for most of the length of SR 99. For the other configuration, the guideway could utilize and transition between the east side, west side, and/or median of SR 99. Station locations proposed for evaluation with the SR 99 Alternatives include the areas near the vicinity of South 240th Street near Highline Community College; the vicinity of South 272nd Street near the Redondo park-and-ride facility; and the vicinity of South 317th Street near the Federal Way Transit Center. The SR 99 alternatives may include other additional station locations in the vicinities of South 216th Street and South 260th Street identified through the early scoping and alternatives analysis processes.

Potential 30th Avenue Alternative. The potential 30th Avenue Alternative would consist of light rail guideway along a portion of 30th Avenue South in the cities of Des Moines and Kent. From Angle Lake Station, the guideway would travel along SR 99 and transition east to 30th Avenue at

approximately South 220th Street. The guideway would remain on 30th Avenue South from South 224th Street to approximately South 240th Street. From South 240th Street, the guideway would transition to SR-99 or I-5 and continue towards Federal Way. The station locations would be the same as those described in the previous alternatives.

Proponent: Sound Transit

Location of proposal: The proposed project is located in the cities of SeaTac, Kent, Des Moines, and Federal Way in King County.

Lead agency: Sound Transit is the lead agency for SEPA review (FTA is the lead agency for NEPA review)

EIS Required. The lead agency has determined this proposal is likely to have a significant adverse impact on the environment. An environmental impact statement (EIS) is required under RCW 43.21C.030(2)(c) and will be prepared.

The lead agency has identified the following areas for discussion in the EIS: transportation, land use, economic activity and development potential, land acquisition and displacements, community facilities and neighborhoods, park and recreation resources, historic and cultural resources, visual and aesthetic qualities, air quality (including greenhouse gas emissions), noise and vibration, energy use, hazardous materials, construction impacts, public utilities and services, water resources, geology and soils, cumulative effects, and ecosystems, including threatened and endangered species. The following areas will also be included for the purposes of meeting NEPA requirements in this combined SEPA/NEPA EIS: Section 4(f)/6(f) resources (public parks, recreation areas, wildlife and waterfowl refuges, and historic sites of national, State, or local significance), Section 106 resources (historic and cultural properties on or eligible for listing in the National Register of Historic Places), and environmental justice (effects on low-income and minority populations). The scoping process may result in a more narrow scope of elements analyzed in the EIS.

Scoping. Agencies, affected tribes, and members of the public are invited to comment on the scope of the EIS. You may comment on the proposed range of alternatives, mitigation measures, probable significant adverse impacts, and licenses or other approvals that may be required. Two public scoping meetings and one agency scoping meeting are scheduled. The method and deadline for providing comments is as follows:

Comment Deadline: July 15, 2013

Comment Online: http://www.soundtransit.org/FWextension

Mail: Federal Way Transit Extension (c/o Kent Hale, Senior Environmental Planner)
Sound Transit
401 S Jackson St., Seattle, WA 98104

Email: FWTE@soundtransit.org

At a public meeting:

1. June 19, 2013, 3:00 pm to 6:00 pm

Federal Way Transit Center
31621 23rd Ave S.
Federal Way, WA 98003

2. June 26, 2016, 5:00 pm to 7:00 pm
Parkside Elementary
2104 S. 247th Street
Des Moines, WA 98198

3. Agency and Tribal Meeting
June 25, 2013, 1:00 pm to 3:00 pm
Sound Transit, Union Station, Ruth Fisher Boardroom
401 South Jackson Street
Seattle, WA 98104

All public meeting locations are accessible to persons with disabilities who may also request materials be prepared and supplied in alternate formats by calling Tralayne Myers, (206) 398-5014 at least 48 hours in advance of the meeting. Persons who are deaf or hard of hearing may call (888) 713–6030 TTY.

Responsible Official: Perry Weinberg

Position/title: Director, Environmental Affairs and Sustainability Phone: 206-689-4931

Address: 401 S. Jackson Street, Seattle 98104

Additional environmental scoping information, including alternatives under consideration, topics for discussion in the EIS, and the project Purpose and Need Statement is available at http://www.soundtransit.org/FWextension or can be obtained by calling Tralayne Myers at 206-398-5014. For information on the scoping process, contact Kent Hale, Senior Environmental Planner, at 206-398-5103.

Date: 6/12/13 Signature: Perry Weinberg

Perry Weinberg, Director
Office of Environmental Affairs and Sustainability
SEPA Responsible Official

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APPENDIX B – AGENCY COMMENT LETTERS

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City of Des Moines

ADMINISTRATION
21630 11TH AVENUE SOUTH, SUITE A
DES MOINES, WASHINGTON 98198-6398
(206) 878-4595 T.D.D.; (206) 824-6024 FAX:(206) 870-6540

July 3, 2012

Sound Transit
401 S. Jackson Street
Attn: Kent Hale
Seattle, WA 98104

Subject: *EIS Scoping for the Federal Way Transit Extension*

Dear Mr. Hale:

The City of Des Moines is pleased to provide our Environmental Impact Statement (EIS) scoping comments for the *Federal Way Transit Extension* (FWTE) for Link Light Rail.

Extending Link Light Rail initially to Highline Community College and then on to Federal Way will have a profound effect on our community and neighboring cities. As such, the Des Moines City Council and City staff are committed to working with Sound Transit and our neighbor cities (SeaTac, Kent and Federal Way) to ensure the *Federal Way Transit Extension* meets local and regional interests, fully supports Highline Community College, promotes economic and community development, minimizes impacts on businesses and residents, and maintains the economic vitality and livability of our respective communities.

We have prepared detailed comments organized by topic area (alignments, station locations and system needs/operations) that are provided as Attachment 1 to this letter. Key considerations for Sound Transit to keep in mind as potential alignments and station locations are analyzed include:

- The City's long standing and adopted Comprehensive Plan and Council policy, which calls for light rail alignment along the I-5 corridor through Pacific Ridge. An I-5 alignment should not, however, compromise or conflict with a future SR509 extension and associated I-5 collector distributor project.
- The City's commitment to ensure the light rail alignment does not diminish the economic value of prime under-developed commercial properties in Des Moines and Kent that are expected to begin redeveloping over the next decade.
- Immediate proximity to the Highline Community College campus, preferably in the vicinity of SR99 and South 240th Street as the College has requested.
- Support for an eventual stop in the vicinity of South 260th and a full station in the Redondo area on SR99 to serve the Woodmont and Redondo neighborhoods and facilitate more dense transit oriented development at those locations and along the SR99 corridor south of Kent-Des Moines Road.

We look forward to our continued collaboration with Sound Transit. Please feel free to contact me or City Manager Tony Piasecki if you have questions about our comments.

Sincerely,

Dave Kaplan, Mayor

C: Matt Pina, Mayor Pro-tem
Jeanette Burrage, Councilmember
Carmen Scott, Councilmember
Jeremy Nutting, Councilmember
Melissa Musser, Councilmember
Bob Sheckler, Councilmember
Tony Piasecki, City Manager

Attachment 1:

The City of Des Moines has identified the following EIS scoping comments for Sound Transit to consider as it analyzes identified alternative alignments and station locations during the environmental review of the Federal Way Transit Extension:

Alignment Impacts

- Need to understand the neighborhood and economic development benefits, potential, costs and preferences for the Cities of Des Moines, SeaTac, Kent, Federal Way and Highline Community College (HCC):
    - transition from South 200th Street Station to SR 99 or I-5
    - transition to and from Kent-Des Moines Road/HCC Station
    - transition to and from Redondo Station
    - possibility of additional stops at South 216th at I-5 and South 260th Streets

- Practicality of routes based on engineering feasibility, cost, economic impacts and system operations (speed, ridership, travel times)

- Physical constraints/opportunities of topography – what can be done with the elevation changes and tightness of curves

- Evaluate economic benefits and disadvantages of alignments:
    - impacts to commercial properties
        - Des Moines' largest commercial properties are located between South 216th and South 208th on both SR99 and 24th Avenue S.
        - Numerous un- or under-developed parcels along SR 99 south from South 216th Street to South 272nd Street, but especially in Pacific Ridge
    - community, economic development and transportation impacts of elevated alignment
    - impacts of interim end-of-line station at Kent-Des Moines Road/HCC Station

- SR 509/I-5 alignment to Highline Community College
    - offers opportunities to follow existing alignment and park and ride lots without impacting prime commercial development along SR99 in Pacific Ridge
    - rider views of Mount Rainier, the Kent Valley, Vashon Island and the Olympic Mountains
    - if a stop at South 216th Street on I-5 – the potential transit oriented development density and economic benefits that might be realized
    - if no stop at South 216th Street on I-5 – evaluate the lost opportunity benefits of the transit oriented development at this node which serves a major population and employment center and low income residents
    - fails to realize any of the one-time opportunities of transit oriented development and place making along the SR99 corridor if additional well-spaced stops are added in the future
    - can be flexible if Metro Transit system can integrate and enhance its connecting east-west services to stations and stops

- SR 99 alignment
  - impacts on the viability and desirability of existing and future commercial properties
  - premium view blockage of Puget Sound and the Olympics
  - noise
  - need to consider on-going and expected investments in right of way improvements along S. 216th north to 29th Ave. S and S. 24th/28th corridors from S. 216th to S. 200th by Des Moines and SeaTac expected before 2023 including reconstruction of intersection at SR 99 and S. 216th

- 30th Avenue South alignment
  - bisects the Pacific Ridge Neighborhood, already the most disadvantaged and crime-prone in Des Moines
  - net financial/economic/property value/social impact of an elevated structure as weighed against the financial/economic/property value/social benefit to neighborhood

- Kent-Des Moines Road Crossing and SR99 intersections
  - do not reduce level of service

Station Locations

- Light Rail stop seems warranted at South 216th on I-5
  - a major hub with Artemis Hotel, Des Moines Creek Business Park and other potential development within ½ miles of this location
  - significant employment and population growth projected for this area
  - serves economically distressed and ethnically diverse neighborhoods where transit is the primary means to access jobs and services
  - anything that can help move people to job centers to the north in SeaTac and Seattle and eventually south to Federal Way and Tacoma would be helpful
  - I-5 station at 216th would complement A-Line service on SR99
  - impact of METRO service cuts
  - spacing between stations seems consistent with those in Rainier Valley

- Highline Community College is also a major hub – the biggest between Sea-Tac Airport and the Federal Way Transit Center. The station location MUST be pedestrian and disabled friendly and have adequate parking similar to Angle Lake, not 154th

- Station areas around Highline Community College and S 272nd also serve diverse populations that rely on transit and access to jobs. I-5 station locations south of Kent-Des Moines Road would not be as convenient for these populations than stations on SR99

- Options for stations near Star Lake and Redondo Park and Rides need to be evaluated

System Needs/Operations

- Evaluate the impact of no parking at South 216th on I-5 versus a full station/hub (e.g., HCC and South 272nd Street)
- Don't compound parking problems at Highline Community College

- how much ST-provided parking would be needed, both long term and as interim end of the line
- where would it be located (land supply) – Kent, Des Moines and/or on College campus

- Evaluate impacts associated with the interim terminus location at Highline Community College such as rail spur, storage, maintenance and parking demand

- Evaluate transit-only connecting road between SR 99/KDM – cut corner and facilitate east-west connection with the Kent Valley and East Hill

- Evaluate the Park and Ride Lot (Military Road/I-5) as a potential supplement to HCC station parking with improved transit connections or shuttle

- Evaluate existing and improved east-west transit connections w/ King County METRO at S 272nd (Star Lake) to help meet parking demands for SR99 Station in the vicinity of Redondo Park & Ride.

CITY OF
Federal Way

CITY HALL
33325 8th Avenue South
Federal Way, WA 98003-6325
(253) 835-7000
www.cityoffederalway.com

July 16, 2013

Mr. Kent Hale
Senior Environmental Planner
Sound Transit
401 South Jackson
Seattle, WA 98104

Re: Federal Way Transit Extension EIS Scoping Comments

Dear Mr. Hale:

Thank you for the opportunity to provide scoping comments on the above referenced project. We hope that our comments are useful in helping you develop a comprehensive and thorough scope for the project EIS. We have organized our comments by potentially affected areas of the environment.

EARTH
Evaluate the impact of potential pier locations on unstable slopes, particularly on SR 99 alignments.

AIR
Include disclosure of any impacts on people or property from overhead guide ways, from which particles, drippings, and other ejecta could be released.

WATER
Include disclosure of any impacts on surface water quality of pollutants potentially released by trains or guide ways, such as oils, brake material particles, mechanical/hydraulic fluids, etc.

PLANTS
Include disclosure of impacts to landscaped areas and plant material contained therein within the alignment alternatives; be that formal street trees and plantings or more "native" vegetation such as present in parts of the I-5 right-of-way.

ANIMALS
Include disclosure of any impacts to small animals, birds, and raptors of diminution of landscaped areas within the I-5 corridor.

ENVIRONMENTAL HEALTH
Include disclosure of health effects of noise and vibration impacts, as well as emissions into the air of particles from the trains or guide ways.

LAND AND SHORELINE USE
The SR 99 alignments would necessitate property and business takings, potentially leaving foreshortened, shallower commercially zoned parcels. Discuss the impacts of both the elimination of businesses and/or

residences, as well as the potentially diminished likelihood of redevelopment on smaller, less developable parcels. What are the effects on real estate values and redevelopment potential near station areas and long alignments from noise and visual impacts? Weigh the impact of property takings and related issues noted above versus the potential economic development benefits around station areas.

It will be important to conduct a thorough analysis of the impacts of the terminus location on its surroundings. If a terminus alternative is intended to be located anywhere near the existing Transit Station in the City Center, how does the approach alignment affect nearby properties and their redevelopability? If a tail track would be required, how/where would that be accommodated and, again, affect nearby properties, redevelopment potential, etc.?

HOUSING
Disclose any potential loss of housing from property takings. Discuss the effect on real estate values and redevelopment potential near station areas and along alignments from noise and visual impacts; analyze whether any of these negative effects could diminish the market's ability to meet the City's housing targets in the City Center.

AESTHETICS
Discuss visual impacts to both residential and commercial properties of structures along alignments, particularly on high value view-sheds of the Olympic Mountains, Puget Sound, and Mount Rainier. Do these impacts reduce property values, rental rates? Do they encourage higher vacancy rates of affected properties, units? Do these impacts compound diminished redevelopability from land takings, as discussed above under "Land Use"?

LIGHT AND GLARE
Disclose impacts from headlights, or other glare, into residential properties/units— most likely associated with any veers of the guide way off the grid pattern.

RECREATION
Discuss potential 4(f) and 6(f) issues associated with Steel Lake Park, Truman High School, and Mark Twain Elementary School.

HISTORY AND CULTURAL PRESERVATION
As per federal and state requirements, disclose any impacts to historical or cultural resources within any of the alignments.

TRANSPORTATION
Note that the largest commuter markets being served by ST2 are SeaTac, Downtown Seattle, University of Washington, Downtown Bellevue, and Overlake. Due to distances involved, travel speed and reliability are important to South King County. Additional stations and slower alignments may cause ridership to be reduced for longer trips where the greatest VMT reductions could be achieved; whereas, shorter trips may be adequately served by existing transit routes. Please analyze these contrasting issues.

Analyze impacts on vehicle circulation within the local street system, especially with an SR 99 alignment. Will turning movements be restricted? Will access to businesses and properties flanking SR 99 be more limited than at present? Does the alignment structure create any impacts to pedestrian or bicycle circulation?

Provide a thorough analysis of the competing and contrasting variables and impacts associated with different locations for the interim terminus, or City Center, station. While the existing Transit Center may suggest itself as a logical terminus locale, there may be numerous variables that reduce its adaptability as a terminus. For example, especially with an I-5 alignment, would an I-5 terminus make sense accompanied potentially by a continuous shuttle or other connection to the Transit Station? These issues must be thoroughly analyzed and evaluated. How do the different options affect design speeds?

Lower design speeds in the immediate vicinity of stations should be considered to reduce impacts on right-of-way and minimize areas of noise impacts on horizontal curves, especially in City Center area.

Evaluate impacts of tail track design, assuming Federal Way Transit Center is an interim terminus.

Discuss provision of adequate parking supply at stations; conversely, provision of adequate local transit service to potentially reduce parking demand.

Evaluate surface transportation impacts to ensure the City's adopted transportation LOS is maintained. Note that the City does not exempt any land uses from concurrency or traffic impact fees.

Discuss integration of light rail with existing and planned King County Metro and Pierce Transit services.

Evaluate adequacy of site circulation and transportation safety for all modes in and around station areas.

PUBLIC SERVICES
Evaluate emergency response impacts generated by access restrictions on SR 99 alignments, or any potential street closures and potential right-of-way impacts to City Maintenance Yard of I-5 alignment.

ENVIRONMENTAL JUSTICE
Evaluate the relative environmental justice implications of the two general alignments (I-5 and SR-99).

Again, thank you for this opportunity to provide comments. If you have any questions, please do not hesitate to contact me. I can be reached at (253) 835-2612, or patrick.doherty@cityoffederalway.com.

Sincerely,

Patrick Doherty, Director
Community and Economic Development

c: Mayor Skip Priest
Cary Roe, Director, Public Works and Parks, Recreation, & Cultural Services
Rick Perez, City Traffic Engineer
Isaac Conlen, Planning Manager

ECONOMIC & COMMUNITY DEVELOPMENT
Ben Wolters
Director
220 4th Avenue South
Kent, WA 98032
Fax: 253-856-6454

PHONE: 253-856-5454

July 16, 2013

Federal Way Transit Extension
c/o Kent Hale, Senior Environmental Planner
Sound Transit
401 S. Jackson Street
Seattle, WA 98104-2826

RE: Federal Way Transit Extension EIS Scoping

Dear Mr. Hale:

The City of Kent is pleased to participate in scoping for the Federal Way Transit Extension (FWTE). Extension of light rail through the Kent-Des Moines-Federal Way area is a key implementation strategy for the Midway Subarea Plan that was adopted by the Kent City Council in December, 2011. Along with the Midway Design Guidelines and development regulations, this plan provides for the development of a walkable community with a mix of mid- and high-rise residential, retail and commercial uses, all supported by Sound Transit light rail.

The City would like the following analyses incorporated into the EIS for the project:

- The City's priority for the FWTE is to support the transit-oriented community envisioned in the Midway Subarea Plan. This would include not bifurcating the community, for example if the alignment traverses from one roadway to another, e.g., SR-99 to I-5; orienting the alignment and station for ease of multimodal access; avoiding visual and noise impacts; incorporating security measures; and developing the station as an attractive public gathering space with amenities such as electric charging stations, restrooms, snack bars, and areas which can transform into public markets or other public events.
- Strong pedestrian gateway connections should be made to Highline Community College and the population and job centers envisioned in the Midway Subarea Plan. A station near Highline Community College should provide equitable service to Kent and to Des Moines. Station locations should facilitate student choices of transportation modes in a realistic and practical manner, especially for today's youth.

- The Kent Valley includes a regional growth center in its downtown area, a regionally-designated manufacturing/industrial center, and a wholesale and distribution center that is the second largest on the west coast and the 4th largest in the nation. Providing connections from light rail to the valley's job centers should be a major consideration.
- The Kent-Des Moines area is a significant transportation hub, with I-5, SR-99, Rapid Ride A Line, Military Road Park and Ride Lot, and future SR-509 extension. For the FWTE, it is critical to avoid disruption of east-west auto/ pedestrian/bike travel, to demonstrate ease of multi-directional access and parking at the stations, increased mobility and reliability of service, and offer alternative travel should the area be affected by catastrophic disruption of other travel modes. The FWTE should enhance frequency of service, extended hours of service, and connections between regional growth and activity centers.

- Alignment and station location alternatives should include:
  1. Elevated, mixed at-grade/elevated, or hybrid median, east or west side alignments along SR-99, with the following options:

     - A station location along the median of SR-99 at Highline Community College with a shared parking structure on both the east and west sides of SR-99; an attractive, protected pedestrian overpass to the garages; and a new signalized right of way at Highline Community College.

     - A station location on the west side of SR-99 on or near the Highline CC campus or spanning the campus and property to the north or south of the campus; an attractive covered pedestrian overpass serving development on the east side of SR-99; a shared parking structure on both the east and west sides of SR-99; and a new signalized right of way at Highline Community College.

     - A station location on the east side of SR-99 across from Highline CC; with an attractive, covered pedestrian overpass serving development on the west side of SR-99; a shared parking structure on both the east and west sides of SR-99; and a new signalized right of way at Highline Community College.

     - Having garages on both sides of SR-99 supports multi-directional access to the stations with less interruptions to the transportation system and would serve TOD development on the east side, Highline CC, and Sound Transit.

     - Elevated rail would maintain the auto orientation of SR-99 and allow 30th Avenue to be the pedestrian-oriented TOD activity hub.

2. Elevated, mixed at-grade/elevated, or hybrid alignments along I-5 or crossing between SR-99 and I-5 (without bifurcating the Midway TOD area) with a station location at or near Highline Community College; a parking garage; a new signalized right of way at Highline Community College; and an attractive, covered, and moving pedestrian walkway from the station to the college. Improvements to the pedestrian and bicycle network would be required. Roadway access improvements also would be required. Easy transit access and mitigating impacts from increased traffic to the station location are critical.

3. The analysis should address access for emergency vehicles to the rail cars both along the alignment and at the station locations.

The environmental analysis for the project should consider the Tacoma Smelter Plume (http://www.ecy.wa.gov/programs/tcp/sites_brochure/tacoma_smelter/2011/ts-hp.htm) as well as other brownfield sites that may be in the vicinity of the alignment and station alternatives. The analysis also should include in the utility section the high tension power lines located along SR-99 and 30th in the vicinity of Kent and Des Moines.

The City appreciates the opportunity to participate in the FWTE project and looks forward to having it serve our community.

Sincerely,

Ben Wolters, Director
Economic & Community Development

Tim Laporte, Director
Public Works

4800 South 188th Street
SeaTac, WA 98188-8605

City Hall: 206.973.4800
Fax: 206.973.4809
TDD: 206.973.4808

July 12, 2013

Federal Way Transit Extension
c/o Kent Hale, Sr. Environmental Planner
Sound Transit
401 S. Jackson
Seattle, WA 98104

Re: Federal Way Transit Extension EIS Scoping

Mr. Hale:

Thank you for the opportunity to comment on the proposed scope of the Environmental Impact Statement that will be prepared for the Federal Way Transit Extension. The City of SeaTac previously submitted early scoping comments on November 12, 2012 (copy attached). The purpose of this letter is to provide additional comments now that the range of alternatives has been narrowed.

It is our understanding that both the SR 99 and I-5 corridor options are under consideration, with the potential of a future rail station being located at S. 216th St., along either corridor. Though currently unfunded, the location of this potential station needs to be considered in our comments. The remainder of the extension project will occur south of the SeaTac city limits.

Specific areas the EIS should focus upon:

<u>Land use</u>
The City's Comprehensive Plan identifies the west side of 28th Ave. S. and the west side of International Blvd. (SR 99) as the preferred route south of the Angle Lake Station to S. 216th St. This route minimizes impacts to residential uses located on the east side of this corridor. Should a different alignment be chosen, impacts to residential uses would be significant. The EIS needs to thoroughly evaluate the land use impacts of the various routes under consideration, particularly the impacts on residential areas.

A potential additional station at I-5 and S. 216th St. could have significant land use impacts, as this area currently offers little vacant land to accommodate a station and the amount of parking that would be needed to serve patrons. Station development in this area would likely require the removal of many existing land uses. This impact should be thoroughly studied in the EIS.

Mayor
Tony Anderson

Deputy Mayor
Mia Gregerson

Councilmembers
Barry Ladenburg
Rick Forschler
Terry Anderson
Dave Bush
Pam Fernald

City Manager
Todd Cutts

Assistant City Manager
Gwen Voelpel

City Attorney
Mary Mirante Bartolo

City Clerk
Kristina Gregg

Housing
The Firs Mobile Home Park is located on the east side of International Blvd., south of S. 204th St. A route on the east side of SR 99 could impact this affordable housing resource.

Other multifamily housing exists along the SR 99 corridor, such as the Viewpoint Apartments at 21428 International Boulevard. An assisted living facility is also located along the east side of International Boulevard in the 21200 block. An alignment along the east side of SR 99 would have impacts to both of these properties.

Impacts to affordable housing and vulnerable populations therefore need to be thoroughly studied for each of the proposed alignments.

Noise
Potential routes either adjacent to, or passing through residential areas could have significant noise impacts that would need to be mitigated. The EIS should evaluate these impacts and explore potential mitigation measures.

Transportation
Traffic impacts could be significant with a S. 216th St. station located along an I-5 route, as its presence would create a destination point in an area that currently experiences only moderate amounts of traffic. Construction of a station in the vicinity of S. 216th St. and SR 99 also would most likely necessitate substantial traffic system modifications at this intersection. The EIS should fully evaluate these impacts and identify potential mitigation measures.

The I-5 route would also involve extending the light rail line along the undeveloped SR 509 corridor, potentially resulting in negative impacts to freeway design options. This impact should be thoroughly studied to ensure maximum capacity is maintained for the future highway.

Aesthetics
An elevated guideway will be a significant visual impact in whatever route is selected, but will be particularly significant when passing by or through residential areas. Along the SR 99 route, there could also be impacts to views of Puget Sound from properties such as the Viewpoint Apartments at 21428 International Boulevard. This aesthetic impact should be thoroughly studied and mitigations explored in the EIS.

An elevated route down the landscaped International Boulevard median would have a significant aesthetic impact, as it is unlikely vegetation could thrive under a guideway. This is another impact that requires evaluation.

Again, thank you for the opportunity to comment. The City looks forward to working with Sound Transit to ensure a successful project that meets area transit needs with minimal negative environmental impacts to our community.

Sincerely,

Joseph Scorcio, AICP
Community and Economic Development Director
SEPA Responsible Official

cc: Todd Cutts
Gwen Voelpel
Soraya Lowry

Highline
COMMUNITY COLLEGE

Office of the President

MS 1-1
P.O. Box 98000
Des Moines, WA 98198-9800

July 16, 2013

Kent Hale, AICP
Senior Environmental Planner
Planning, Environment & Project Development
Sound Transit
401 S. Jackson Street
Seattle, WA 98104

Re: EIS Scoping for the Federal Way Transit Extension

Dear Mr. Hale:

Highline Community College submits the following comments on the scope of the Environmental Impact Statement for the Federal Way Transit Extension project as they relate to the alignment and station location near us.

Potential Alternatives

- We believe Sound Transit has identified all of the likely alignment alternatives for the project. As we stated in our letter dated November 19, 2012, we believe the economic development potential of each alignment should be a major criterion when ranking the alignments.
- Pedestrian safety should be a consideration for the Highway 99 alignment station criteria because pedestrians will be crossing a four lane highway to access the stations.
- Station evaluation criteria should include proximity to the principal activity center when considering whether the alignment should be on the east or west side of Highway 99, e.g., if the principal activity center is on the west side of Highway 99, then the alignment should be on the west side of Highway 99. Additionally, the walking distance from the station to the principal activity center should not exceed a quarter mile.
- The impact of increased east-west transit travel demand to Kent generated by the station near the college should be investigated.

www.highline.edu

phone (206) 878-3710, ext. 3200 fax (206) 870-3754

- Potential for additional parking should be a station evaluation criterion. The existing criteria only mention existing park-and-ride capacity. However, in the case of the "end of track" or interim terminus station, parking demand will likely be very high by commuters from areas beyond the immediate vicinity.
- Other issues related to the interim terminus location that should be reviewed include traffic congestion near the station due to intermodal connections with local bus, RapidRide, carpools, bicycles, and drop offs; criminal activity related to passengers waiting during layovers, and light rail equipment maintenance and storage.
- Our work with the South King County Economic Development Initiative (SKCEDI) revealed significant interest by the member agencies in creating infrastructure that encourages the creation of new businesses along the SR99 corridor between South 240th Street and the city of Federal Way. A Sound Transit Link Light Rail alignment on SR99 is certainly one of the infrastructure improvements that would fulfill that objective.

We are pleased that we are included in the development of Sound Transit service planning in our area and we look forward to continued collaboration on the Link Light Rail Federal Way Transit Extension project. Please contact me or Larry Yok, Vice President for Administration, if you require clarification of these comments.

Sincerely,

Jack Bermingham, PhD
President

King County
Department of Transportation
Metro Transit Division
General Manager's Office
201 S. Jackson Street
KSC-TR-0415
Seattle, WA 98104-3856

July 15, 2013

Federal Way Transit Extension
(c/o Kent Hale, Senior Environmental Planner)
Sound Transit
401 S. Jackson Street
Seattle, WA 98104-2826
FWTE@soundtransit.org

Sound Transit Federal Way Transit Extension (FWTE)

Dear Mr. Hale:

The King County Department of Transportation/Metro Transit Division (Metro) is pleased to accept the invitation to become a participating agency on the environmental process for the above-referenced project. The signed Participating Agency Designation form is attached.

As you know from Metro's early scoping comment letter (November 9, 2012), our goal during environmental review is to encourage the development of an integrated and multimodal transit network to maximize ridership and connectivity, and to optimize previous investments in infrastructure. This letter continues to promote the need for a thorough analysis of how this investment can enhance the existing network.

King County Metro staff has reviewed the Level 1 and Level 2 alternatives analysis reports. The evaluation criteria that have the most relevance for Metro are integration with bus facilities and services, access to express transit, development potential, non-motorized access, and traffic.

With respect to integration with the bus system and access to express transit, the results of the Level 2 alternatives screening analysis indicated that there would likely be minimal effects to RapidRide A Line with any of the alternatives. This is good news considering the investment Metro and the FTA have made in the RapidRide facilities. Further, Metro concurs with the assumption for the upcoming EIS that Rapid Ride A Line service would remain the same and anticipates that no changes to Rapid Ride A Line facilities would be proposed as a result of the project development process for the Federal Way Transit Extension.

The overall boardings at the three proposed stations are similar and do not help to differentiate among the alternatives. We suggest that Sound Transit adjust the methodology for analyzing access to light rail by different modes to look at actual network connections. A finer-grained approach could help reveal important differences in access and integration potential.

This suggestion to have a finer-grained analysis of the actual street network would also benefit planning for specific station areas and non-motorized access at the three proposed station locations, as well as at potential additional stations currently being considered. The characteristics of the station areas along I-5 and SR 99 are similar when uses and modal access are evaluated within a certain radius of the stations. However, we know that the street networks are materially different. Instead of looking only at the population within a half-mile of an express transit route, basing the analysis on the actual multi-modal network could be more revealing for decision makers. Such analysis could be used to more finely evaluate potential surrounding TOD opportunities as well.

The Level 2 traffic analysis reveals preliminary congestion impacts by alternative. Congestion is likely to affect bus speed and reliability, make transit and other modal connections more expensive and difficult to provide, and to affect the space available for bus zones and layover areas. Consequently, we anticipate more in-depth analysis of traffic operations and congestion impacts in the EIS and look forward to reviewing the proposed methodology for traffic analysis. We would suggest the EIS methodology look at how easily transit can connect to alignments, especially where connections are through congested areas. Our goal is to encourage the selection of an alternative that maximizes the effectiveness of the overall transit system.

We also encourage Sound Transit to continue to work closely with Washington State Department of Transportation (WSDOT) during the environmental review process to ensure that the analysis takes into account state and regional potential future tolling opportunities.

We appreciate the level of coordination and the opportunity for review provided during the early scoping process and we look forward to continuing to work closely with Sound Transit as the Federal Way Transit Extension project moves forward.

Sincerely,

Kevin Desmond
General Manager
Metro Transit Division

Attachment

cc: Gary Kriedt, Environmental Planner, Design and Construction Section

From: Karen Walter <KWalter@muckleshoot.nsn.us>
Sent: Monday, July 15, 2013 11:49 AM
To: james.saxton@dot.gov; Hale, Kent
Subject: Sound Transit Federal Way Extension Project, Scoping Notice

Follow Up Flag: Follow up
Flag Status: Flagged

James and Kent,
In response to the Scoping Notice that the Muckleshoot Indian Tribe Fisheries Division received for Sound Transit's Federal Way Transit Extension project, I am forwarding you the comments we sent previously for this project in response to the pre-application meeting with the Corps of Engineers and other regulatory agencies. Please let me know if you have any questions about the comments below.

Thank you,
Karen Walter
Watersheds and Land Use Team Leader

Muckleshoot Indian Tribe Fisheries Division
Habitat Program
39015 172nd Ave SE
Auburn, WA 98092
253-876-3116

From: Karen Walter
Sent: Wednesday, May 08, 2013 2:14 PM
To: 'Anderson, Suzanne NWS'; 'Ziegler, Ellie'
Subject: RE: Sound Transit - Pre-Application Meeting May 8, 2013, 1:00pm - Puget Sound Conference Room (UNCLASSIFIED)

Suzanne and Ellie,
Sorry I missed the pre-app today; I was held up in another meeting. Anyway, I got a copy of the PPT that Kent sent out and likely provided at the meeting. Based on this information, I think the issues of concerns would generally be:

1. Stream crossings (there are at least two, maybe three). McSorley Creek on SR 99 is identified as a fish passage barrier on WSDOT's 2012 barrier list (#991196). Any modified stream crossing should be made fish passable using stream sim. If the culvert is not modified, then Sound Transit needs to ensure that any future culvert repair using the stream sim design criteria can be used and not precluded by the rail system/corridor.

2. The various alternatives appear to affect different streams and/or wetlands. There would be the usual concerns regarding impacts to these features both direct due to fill and potential buffer impacts (both permanent and temporary). Mitigation will likely be needed.

3. The project should look at tree removal activities for the different alternatives by each subbasin as there are several individual subbasins draining to Puget Sound that appear could be affected by the project. Several of these areas had some previous evaluation work done as part of either the WRIA 9 limiting factors analysis or individual basin plans.

Some existing info is available at:
http://green.kingcounty.gov/WLR/Science/Seminar/pdfs/PDF76.pdf

http://pugetsoundstreambenthos.org/Projects/Default.aspx?P=91

http://www.kingcounty.gov/environment/watersheds/central-puget-sound.aspx

http://your.kingcounty.gov/dnrp/library/2009/kcr2068.pdf

There is a basin plan for Des Moines Creek but I can't find it online. King County has copies for sale.
http://www.kingcounty.gov/environment/wlr/publications.aspx

Hope this helps!

Karen Walter
Watersheds and Land Use Team Leader

Muckleshoot Indian Tribe Fisheries Division
Habitat Program
39015 172nd Ave SE
Auburn, WA 98092
253-876-3116

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
ECOSYSTEMS,
TRIBAL AND PUBLIC
AFFAIRS

July 15, 2013

Mr. J. Steve Saxton
Federal Transit Administration, Region 10
915 Second Avenue, Suite 3142
Seattle, Washington 98174-1002

Mr. Kent Hale, Senior Environmental Planner
Planning, Environment & Project Development
Sound Transit
401 S. Jackson Street
Seattle, Washington 98104-2826

Re: Federal Way Transit Extension – Scoping, EPA Region 10 Project Number 12-0058-FTA

Dear Mr. Saxton and Mr. Hale:

The U.S. Environmental Protection Agency would like to thank you for your June 11, 2013 letter inviting us to participate in the environmental review process and scoping notice for the Federal Way Transit Extension project. We accept your invitation to be a participating agency in project development and are submitting scoping comments in accordance with our responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act. We appreciate your efforts to keep us informed and involved.

During the early scoping period we submitted comments (letter of November 19, 2012), which apply to the current scoping period as well. We request that they be incorporated as our NEPA scoping comments together with those provided here. We offer the following comments as follow-up to our discussions with Sound Transit regarding the proposed alternatives and potential associated impacts:

Midway Landfill
The I-5 Mixed West Side Alternative would traverse the northern portion of the Midway Landfill, which is a Superfund Site listed on the National Priorities List. There is a Record of Decision for the Midway Landfill, which, as mentioned in our early scoping letter, includes a surface cap over the landfill as part of the remedy. Any disturbance to this cap and the underlying waste would likely require a Record of Decision amendment, which can take several months to complete and involves a public comment period. It is important to keep this in mind as the project moves forward and alternatives are further analyzed. We ask that you keep us informed regarding the nature and extent of potential effects to the Site and the potential need for a ROD amendment. If you have questions or would like to discuss specific aspects of the Midway Landfill, contact Laura Buelow in our Hanford Project Office at (509) 376-5466 or at buelow.laura@epa.gov.

Aquatic Resources
Based on the current level of analysis, a number of sensitive aquatic sites have been identified in the project area that should be avoided and/or any potential impacts minimized to the greatest extent possible. These include:

- McSorley Creek Wetland of over 100 acres, which includes some mitigation wetlands, and McSorley Creek, which drains to Saltwater State Park, bears salmon up to SR 99, and has a substantial forested buffer through the City of Des Moines;
- Steel Lake and its associated natural area complex;
- Redondo Creek; and
- An unnamed stream near 204th Street.

Further study of the project area and proposed alignment corridors, which is necessary to fully identify and characterize potential impacts, is yet to occur and may reveal additional aquatic resources and/or other sensitive habitats. Impacts to any other sensitive areas that may be identified should also be avoided and minimized. We encourage FTA and Sound Transit to work closely with resource agencies to protect these resources, which are important to sustain ecological function and provide ecosystem services within the project area and beyond, and to support the health of Puget Sound. We also recommend that project proponents seek to maximize the environmental benefits of the project by enhancing and restoring natural areas, using low impact development techniques, restoring natural hydrology and habitat connectivity, and contributing to the aesthetic beauty and character of the affected area.

Thank you for the opportunity to offer these additional scoping comments. We look forward to continued involvement as the project develops. If you have questions or need more information, please contact me at (206) 553-2966, or by electronic mail at somers.elaine@epa.gov.

Sincerely,

Elaine L. Somers
Environmental Review and Sediment Management Unit

Enclosure

cc: Laura Buelow, EPA Hanford Project Office
Ching-Pi Wang, Department of Ecology
Jeff Neuner, City of Seattle

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
ECOSYSTEMS,
TRIBAL AND PUBLIC
AFFAIRS

November 19, 2012

Mr. J. Steve Saxton
Federal Transit Administration, Region 10
915 Second Avenue, Suite 3142
Seattle, Washington 98174-1002

Mr. Kent Hale, Senior Environmental Planner
Planning, Environment & Project Development
Sound Transit
401 S. Jackson Street
Seattle, Washington 98104-2826

Re: Federal Way Transit Extension – Early Scoping (EPA Region 10 Project Number 12-0058-FTA).

Dear Mr. Saxton and Mr. Hale:

The U.S. Environmental Protection Agency has reviewed the Early Scoping Report for the Federal Way Transit Extension Project, and we participated in the November 7, 2012 Agency/Tribal Early Scoping Meeting to learn more about the proposed project. We are submitting early scoping comments in accordance with our responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act. Thank you for involving us.

Federal Transit Administration and Sound Transit are initiating the public planning and environmental process for the Federal Way Transit Extension in South King County as part of the Sound Transit 2 Plan approved by voters in 2008. The project corridor is 7.6 miles in length, extending from S. 200th in City of SeaTac to the Transit Center in Federal Way.

Purpose and Need, Evaluation Criteria
We support the elements included in the project purpose, need and evaluation criteria stated in the Early Scoping Report and Agency/Tribal presentation. In addition to whether or not a proposed alternative would meet the project purpose and need, the evaluation criteria should reflect additional project goals and objectives that help to define a successful project. In other words, the purpose and need should be met in a manner that is also responsive, to the extent possible, to the stated goals and objectives. We encourage developing these goals and objectives, because they give rise to helpful evaluation criteria, which would likely include those stated and possibly additional ones.

Range of Alternatives
We support the proposed project, and a range of alternatives that reflect the intent of the ST2 Plan. We also recommend that the alternatives be designed to avoid and minimize impacts to the natural and human environment, and maximize environmental and community benefits. Based on the information presented thus far regarding the project corridor, specific ways to do this include:

Maximize the Use of Existing Infrastructure and Rights-of-Way. The environmental impacts of most concern in determining the transit corridor are aquatic and terrestrial habitat loss, fragmentation, and degradation, and the associated consequences for species, ecological processes, and ecosystem services. Environmentally sensitive areas, such as, shorelines, floodplains, wetlands, estuaries, rivers and streams, biodiversity hotspots, threatened/endangered/rare species habitats should be avoided. For example, avoid bisecting the Kent/Des Moines wetland complex, its riparian corridors, and other natural areas.

In general, the best means to avoid and/or minimize these impacts is to maximize the use of existing transportation corridors and rights-of-way to the extent possible, retrofit them as needed to make them serviceable and less environmentally damaging, and minimize the need for creating new corridors. This would include adhering as close as possible to I-5, SR-99, or other substantial north-south transportation corridors.

Consider Redevelopment. Transportation can help to make cities vibrant and attractive. Where it may be necessary to create new corridors, first consider redevelopment of existing developed or urbanized areas. In particular, seek under-utilized urban areas, such as, oversized paved areas/parking lots and vacant properties, and make it a priority to use brownfield or contaminated sites. The clean-up and re-use of contaminated sites would maximize the environmental and community benefits of the project, while preventing "greenfield" development of farms, forests, and natural areas. However, the integrity of the remedy for the Midway Landfill Superfund site would need to be maintained (see additional comments below).

Apply Zero or Low Impact Development (ZID/LID). Avoid/minimize creating new impervious surface, associated with the proposed project. For example, an elevated guideway on structure would be preferable to an at-grade roadway, such as, for bus rapid transit. Use pervious pavement and other LID techniques for managing storm water, and avoid building over ground water recharge areas. Consider de-paving areas as compensatory mitigation for any new impervious surface needed for the project to achieve no net increase in pollution generating impervious surface.

Analysis of Environmental Impacts

A list of high-level environmental impacts for the built and natural environments would likely include the following:

Built Environment:
Transportation
Cultural resources
Environmental justice
Hazardous materials
Land use
Noise and vibration
Safety and security
Special lands (Section 4(f), and 6(f))
"Green" buildings, construction, management
Utilities

Natural Environment:
Air quality and climate change
Biological resources
Aquatic resources
Ecological connectivity
Tribal treaty resources
Energy
Invasive species
Geological resources
Indirect and cumulative effects

We offer the following additional comments, which pertain to several of these issues, to assist your analysis:

Midway Landfill Superfund Site
Due to its location adjacent to the I-5 corridor, it is likely that project alternatives will explore the use of the Midway Landfill Superfund site. The Midway Landfill still has an active remedy in place. West of I-5, FTA and Sound Transit need to be aware that there is a landfill cap that needs to be maintained to prevent infiltration. The slope of the cap is important because it is designed to drain into the storm water detention pond on the north end of the property. There is an active gas control system that consists of both extraction wells and gas monitoring probes and there are groundwater monitoring wells on the property.

Ecology is the regulatory agency in charge of the cleanup. The contact at Ecology is Ching-Pi Wang at (425) 649-7134, or cwan@ecy.wa.gov. The City of Seattle is responsible for the cleanup. The City of Seattle contact is Jeff Neuner at (206) 684-7639 or at neuner.jeff@seattle.gov.

Ecological Connectivity
Ecological Processes, Hydrological Connectivity. The siting and design of linear transportation corridors should provide for unimpeded natural ecological processes, such as, the movement of water, wood, sediment, nutrients, and species. It is important to maintain and preserve natural stream characteristics and hydrology, and restore and preserve the natural and beneficial effects of riparian areas and floodplains. Avoid/minimize encroachment upon, or disturbance to, natural stream hydrology, stream migration zones, stream banks and channels, riparian areas, wetlands, floodplains, groundwater recharge and seepage areas. The EIS should analyze, disclose, and mitigate impacts to fish, fish habitat, fish passage, and effects to other aquatic biota.

Habitat Connectivity. In addition to habitat loss, fragmentation, and alteration from potential project construction, the project operational impacts resulting from potential new right-of-ways for rail or roadway vehicles would be increased potential for wildlife collisions. Over the past 20 years there has been a substantial increase in the level of knowledge, awareness, and action to address the habitat fragmentation effects and wildlife mortality associated with roadways[1]. Wildlife mortality also occurs on railways. Whether the alternatives involve roadways or railways, it is important to include means to make the transportation corridor permeable to wildlife movements, such as, with an elevated guideway. For existing or new at-grade transportation corridors, incorporate wildlife crossing structures of appropriate number, design, size, and location to adequately accommodate movement of all wildlife species that might be expected to move within or across the corridor, including high mobility species, such as wide-ranging carnivores, and low mobility species, such as amphibians. Appropriate fencing, adequately maintained, is also needed to prevent wildlife entry onto the right-of-way and to funnel animals to crossing structures.

Suitable wildlife crossing locations would likely include, but not necessarily be limited to areas such as, wetlands, stream/riparian corridors, forest and agricultural land interface areas, migration corridors, and relatively undisturbed upland habitats. Where bridges or large culverts are installed for aquatic features, these could be enlarged to span upland habitats as well to facilitate movement of terrestrial species. We recommend information gathering and collaboration with federal and state wildlife agencies to inform this process.

[1] See ICOET proceedings, http://www.icoet.net/links.asp

Environmental Justice/Vulnerable Populations
Along with low income and minority populations considered in the environmental justice analysis, impacts to other vulnerable populations should be addressed, including the elderly, disabled, and children.

Biological Resources
In addition to issues discussed above for ecological connectivity, this portion of the NEPA document should also address federal and state threatened, endangered, candidate, and sensitive animal and plant species and their habitats.

Aquatic Resources
The NEPA analysis should address all potentially affected aquatic resources, including surface water and ground water, water quality and quantity, hydrology, and sensitive aquatic areas, such as, wetlands, streams, floodplains, shorelines, riparian areas, ground water recharge areas, hyporheic zones, drinking water sources and supplies.

The NEPA document should describe aquatic habitats in terms of habitat type, plant and animal species, functional values, and integrity. Evaluate impacts in terms of the aerial (acreage) or linear extent to be impacted and by the functions they perform. The effects assessment must address changes in the extent of impervious surface, stormwater runoff, treatment and management, including use of Low Impact Development strategies, effects to CWA 303(d) listed waters, compliance with Total Maximum Daily Loads, and anti-degradation requirements. For construction activities that would disturb more than one acre of land (40 CFR 122.26(b)), a National Pollutant Discharge Elimination System permit is required.

Project proponents should plan, design, construct and maintain the project to avoid or have minimal long-term water quality and aquatic resources impacts. For any impacts that cannot be avoided through siting and design, the NEPA document should include protection measures and describe the types, location, and estimated effectiveness of best management practices applied to minimize and mitigate impacts to aquatic resources.

The proposed activities may require a Clean Water Act Section 404 permit from the Army Corps of Engineers. For wetlands and other special aquatic sites, the Section 404(b)(1) guidelines establish a presumption that upland alternatives are available for non-water dependent activities. The 404(b)(1) guidelines require that impacts to aquatic resources be (1) avoided, (2) minimized, and (3) mitigated, in that sequence. The NEPA document should discuss in detail how planning efforts (and alternative selection) conform to Section 404(b)(1) guidelines sequencing and criteria. In other words, the project proponent must show that they have avoided impacts to wetlands and other special aquatic sites to the maximum extent practicable. The NEPA document should discuss alternatives that would avoid wetlands and aquatic resource impacts from fill placement, water impoundment, construction, and other activities before proceeding to minimization/mitigation measures.

Project planning and design should avoid/minimize encroachment upon, or disturbance to, natural stream hydrology, stream migration zones, stream banks and channels, riparian areas, wetlands, and floodplains. It is important to maintain and preserve natural stream characteristics and hydrology, and restore and preserve the natural and beneficial effects of riparian areas and floodplains.

If there are 303(d) listed water bodies in the project area, the NEPA document must also disclose information regarding Total Maximum Daily Loads, the water bodies to which they apply, and pollutants of concern. The proposed project should not further degrade 303(d) listed waters and should be consistent with Total Maximum Daily Loads to restore beneficial use support for impaired waters. If additional pollutant loading is predicted to occur to a 303(d) listed stream as a result of the proposed project, the project should include measures to control existing sources of pollution to offset pollutant additions, such as from road construction, so that no deterioration of water quality occurs.

Source Water Protection Areas: Project construction, operation, and maintenance may adversely affect waters that serve as sources of drinking water for communities. Source water is untreated water from streams, rivers, lakes, springs, and aquifers that is used as a supply of drinking water. Source Water Areas are the sources of drinking water delineated and mapped by the states for each federally-regulated public water system.

State agencies have been delegated responsibility to conduct source water assessments and provide a database of information about the watersheds and aquifers that supply public water systems. In Washington, contact Department of Ecology to help identify source water protection areas within or downstream of the project area. The EIS should:

- Identify all federally-regulated source water protection areas and state-regulated source water protection areas within or downstream of the project area.
- Identify all activities that could potentially affect source water areas.
- Identify all potential contaminants that may result from the proposed project.
- Identify all measures that would be taken to protect the source water protection areas.

Air Toxics, Construction Emissions Mitigation

The EIS should disclose whether air toxics emissions would result from project construction and operations, discuss the cancer and non-cancer health effects associated with air toxics and diesel particulate matter, and identify sensitive receptor populations and individuals that are likely to be exposed to these emissions.

Air toxics and diesel emissions, which are emitted from mobile sources, construction vehicles and equipment, are known or suspected to cause cancer or other serious health effects, such as respiratory, neurological, reproductive, and developmental effects. The proposed project should include measures to substantially reduce emissions of and exposure to these air pollutants for construction workers and nearby residents and businesses. We recommend including and committing to implement a full suite of construction mitigation measures, such as those from the Clean Construction USA Web site at http://www.epa.gov/otaq/diesel/construction/ . Measures such as diesel engine retrofit technology in off-road equipment would greatly help to reduce air toxics and diesel particulate emissions. Such technology may include diesel oxidation catalyst/diesel particulate filters, engine upgrades, engine replacements, newer model year equipment, use of biodiesel, or combinations of these strategies. For more information about air toxics, please contact Wayne Elson of our Air Program office at (206) 553-1463.

Community Impact Assessment

We recommend conducting community impact assessments for communities that would potentially be most affected by the proposed project. These usually include communities adjacent to or bisected by a

proposed project, although an analysis of the direct, secondary, and cumulative effects of proposed alternatives may reveal additional affected populations/communities. Impacts from increased number and frequency of trains, safety issues, traffic delay from at-grade crossings, and other issues that may arise need to be addressed. The Federal Highway Administration publication, *Community Impact Assessment: a Quick Reference for Transportation* [publication No. FHWA-PD-96-036, HEP-30/8-96(10M) P] is available as guidance.

Tribal Consultation
The EIS should discuss whether or not the proposed action may affect tribal treaty resources. These include natural resources, historical or traditional cultural places of importance to affected Native American Tribes. The EIS needs to identify these resources, and assure that treaty rights and privileges are addressed appropriately. If the proposed project would have effects on tribal treaty resources, development of the EIS should be conducted in consultation with all affected tribal governments, consistent with Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments.*

Climate Change
The EIS should discuss the potential direct and indirect effects of the proposed action with respect to greenhouse gas emissions and climate change, and any potential effects of climate change on the proposed project. These results should be incorporated into project planning and design in order to mitigate GHG emissions from project construction and operation, anticipate and adapt to climate-related changes and effects, and contribute to public education about climate change and its consequences.

Invasive Species
Ground disturbing activities create opportunity for establishment of non-native invasive species. In compliance with NEPA and with the Executive Order 13112, analysis and disclosure of these actions and their effects, as well as any mitigation to prevent or control such outbreaks should be included. We urge that disturbed areas be revegetated using native species and that there be ongoing maintenance (wholly or primarily non-chemical means) to prevent establishment of invasives in areas disturbed by project activities.

Green Buildings and Management Practices
We recommend that the EIS address the federal "green" requirements and opportunities that may apply to design, operation, and maintenance of project-related facilities and equipment, such as rail stations and maintenance buildings. The green requirements pertain to high performance buildings, energy efficiency, and use of renewable energy, water conservation, waste diversion, stormwater runoff, and LEED certification:

- E.O. 13423, Strengthening Federal Environmental, Energy, and Transportation Management, Section 2(f); Section 2(b); Section 9(g)-(h); Section 2(c) (2007)
- E.O. 13514, Federal Leadership in Environmental, Energy, and Economic Performance (2009)
- Energy Independence and Security Act of 2007, 42 U.S.C. Section 17061 *et seq;* Section 17094; US EPA, Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act, www.epa.gov/owow/nps/lid/section438 (2009)
- National Energy Conservation Policy Act, 42 U.S.C. Section 8253(a)(1); Section 8253(f)(1); Section 8253(f)(3)(A); Section 2(d)(i); Section 2(e)(ii) (2009)

- Energy Conservation and Production Act, 42 U.S.C. Section 6834(a)(3)(D); Section 6834(a)(3)(A) (2009)
- USGBC: LEED for Existing Buildings, http://www.usgbc.org/
- USGBD: LEED Public Policies, http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1852#federal

EPA Region 10 has developed a voluntary partnership program with federal facilities, the Federal Green Challenge, to assist them in meeting their Executive Order commitments. There are currently 22 agency partners representing hundreds of facilities. In the first year, partners reduced an estimated 26,000 metric tons carbon dioxide equivalent, which is equivalent to the greenhouse gas emissions savings of removing 4,500 automobiles from the road for a year, and saved approximately $850,000. For more information, including how to join, please see the website: www.epa.gov/federal_greenchallenge.

Cumulative and Indirect Impacts

The project evaluation should consider the effects of the proposed project when added to other past, present and reasonably foreseeable future projects within and outside the project area. Cumulative impacts can result from individually minor, but collectively significant actions taking place over time.

The EPA has issued guidance on how we are to provide comments on the assessment of cumulative impacts in *Consideration of Cumulative Impacts in EPA Review of NEPA Documents*, which can be found on the EPA web site at: http://www.epa.gov/compliance/resources/nepa/nepa/. This guidance includes five key areas of focus when assessing cumulative effects:

- Identify resources, if any, that are being cumulatively affected.
- Determine the appropriate geographic (within natural ecological boundaries) area and the time period over which the effects have occurred and would occur;
- Look at all past, present, and reasonably foreseeable future actions that have affected, are affecting, or would affect resources of concern.
- Describe a benchmark or baseline.
- Include scientifically defensible threshold levels.

Indirect effects are those that are caused by the 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, road systems and access, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems (40 CFR Part 1508.8).

Thank you for the opportunity to offer early scoping comments for the Federal Way Transit Extension project. If you have questions or would like more information, please contact me at (206) 553-2966 or via electronic mail at somers.elaine@epa.gov.

Sincerely,

Elaine L. Somers
Environmental Review and Sediment Management Unit

WK
/Scan

Preserving America's Heritage

July 3, 2013

R.F. Krochalis
Regional Administrator
U.S. Department of Transportation
Federal Transit Administration
915 Second Avenue
Federal Building Suite 3142
Seattle, WA 98174-1002

Ref: *Invitation to Participate in Environmental Review Process*
Sound Transit Federal Way Transit Extension, Federal Way, Washington

Dear Mr. Krochalis:

On June 17, 2013, the Advisory Council on Historic Preservation (ACHP) received your invitation to participate in the environmental review process for the referenced undertaking pursuant to the National Environmental Policy Act (NEPA). We respectfully decline the invitation to participate in the review process under NEPA. However, the ACHP encourages the Federal Transit Administration (FTA) to coordinate its NEPA process for this undertaking with its compliance with Section 106 of the National Historic Preservation Act by continuing consultation with the Washington State Historic Preservation Officer (SHPO), and initiating consultation with any Tribal Historic Preservation Officers (THPOs), Indian tribes, and other consulting parties pursuant to the regulations implementing Section 106, "Protection of Historic Properties" (36 CFR Part 800). Through early consultation, your agency will be able to determine the appropriate strategy to ensure Section 106 compliance is completed in a timely manner for this undertaking.

FTA should continue consultation with the SHPO, THPOs, Indian tribes, and other consulting parties, as appropriate, to identify and evaluate historic properties within the undertaking's area of potential effects and to assess any potential adverse effects that may result to historic properties. If FTA finds through consultation with the consulting parties that the undertaking may adversely affect historic properties, or that the development of a programmatic agreement is necessary, FTA must notify the ACHP and provide the documentation detailed in 36 CFR §800.11(e).

JUL 8 2013 AM10:53

ADVISORY COUNCIL ON HISTORIC PRESERVATION

1100 Pennsylvania Avenue NW, Suite 803 • Washington, DC 20004
Phone: 202-606-8503 • Fax: 202-606-8647 • achp@achp.gov • www.achp.gov

Thank you for inviting our participation in the environmental review for this project. Should you have any questions as to how your agency should comply with the requirements of Section 106, please contact Kelly Fanizzo at (202) 606-8507 or via e-mail at kfanizzo@achp.gov.

Sincerely,

Charlene Dwin Vaughn

Charlene Dwin Vaughn, AICP
Assistant Director
Office of Federal Agency Programs

From: lindsey.handel@dot.gov [mailto:lindsey.handel@dot.gov]
Sent: Wednesday, July 24, 2013 10:07 AM
To: *Federal Way Transit Extension Scoping; Hale, Kent; Ridge, Cathal
Cc: sharon.love@dot.gov; elizabeth.healy@dot.gov; sharleen.bakeman@dot.gov; sidney.stecker@dot.gov; don.petersen@dot.gov
Subject: EIS Scoping Public Comment - FHWA Comments

Hi,

We understand the EIS scoping public comment period ended on July 17, 2013, but FHWA has some comments on the purpose and need documents we are hoping to incorporate into the project documents.

1. "The purpose of the Federal Way Transit Extension is to expand the Sound Transit Link light rail system from SeaTac to the cities of Des Moines, Kent, and Federal Way in King County…". Suggest adding "the corridor" after King County.
2. Bullet point 2 under the purpose: "congested roadways". Can specificity be added to this? Can we call out the roadways we are talking about?
3. Bullet point 3 under the need: "Congestion on I-5". Can you add clarity about the congestion on I-5? We think this statement is somewhat vague and we need more clarity on what you are referring to, such as the limits of congestion.
4. Can the purpose and need statement include something about the highway coordination component of the project?
5. For the level 2 alternatives and SR 99 hybrid alternative graphics: can you show the I-5 and SR 99 roadway details better? Also, we think it would be helpful to have the cross streets font a bit darker or called out more.
6. For the cross-section view of the 5 alignment alternatives: we think this should be presented in the same order of the plan view graphics. Also, we think the graphics do a great job of explaining how the modes interface, could this be better described in the P&N statement?

Please let us know if you need clarification on our comments.

Thanks you,

Lindsey L. Handel, P.E.
Urban Transportation Engineer
Federal Highway Administration
711 S. Capitol Way, Suite 501
Olympia, WA 98501-1284
Lindsey.Handel@dot.gov
360-753-9550

From: noreply@nps.gov
Sent: Tuesday, July 16, 2013 10:11 AM
To: FWTE
Cc: alan_schmierer@nps.gov; roxanne_runkel@nps.gov; lisa_treichel@ios.doi.gov
Subject: National Park Service Comments, Federal Way Transit Extension Project
Attachments: attachment.zip

Dear Sir/Madam,

Attached please find National Park Service comments on the Federal Way Transit Extension Project.

If you have questions, please contact Alan Schmierer (REC) at Alan_Schmierer@nps.gov.

Comments for ER Control Number: ER-13/0429

genck@nps.gov 6/17/2013

dtrevino@nps.gov 6/27/2013

HRamsay@nps.gov 7/5/2013

Any proposed routing with the potential to impact Steel Lake Park in Federal Way, which appears to be within the proposed project area, should be closely coordinated with the Washington Recreation and Conservation Office and NPS for possible LWCF 6(f)3 implications.

APPENDIX C – PUBLIC COMMENT LETTERS

- Comment Letters
- Scoping Meeting Comment Forms
- Online Survey Results

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From: Kevin Vandehey <kevinvandehey@yahoo.com>
Sent: Thursday, June 13, 2013 5:24 PM
To: FWTE
Subject: Comments

Please divert all transit funds to roads and bridges for roads.

Thank you.

From: Richard Kennedy <richard_kennedy@ci.des-moines.wa.us>
Sent: Sunday, July 14, 2013 9:07 PM
To: FWTE
Subject: Sound Transit Federal Way Transit Extension -- Scoping Comments

I am strongly opposed to any I-5 Corridor option for the Sound Transit Federal Way Transit Extension. This corridor is furthest from the population that is centered along SR 99 and existing bus routes. The City of Des Moines and the Port of Seattle are planning a major development north of South 216th Street and west of 24th Avenue South. An I-5 corridor options would also poorly serve this major new development. Because of these factors I would be in favor of either the 24th Avenue South or SR 99 corridor alternatives.

I am also very concerned that a station is not planned for Highline Community College along SR 99 at about South 240th Street. Stations at Kent-Des Moines Road and South 272nd Street ill serve this major designation in south King County. If a station for Highline Community College cannot be funded at this time, at least design the Sound Transit Federal Way Transit Extension to allow for the construction of such a station in the future.

-- Richard T. Kennedy
-- 18825 6th Avenue Southwest
-- Normandy Park, WA 98166-3978

From: William Condon <kodiack16@aol.com>
Sent: Wednesday, July 17, 2013 1:23 PM
To: FWTE
Subject: Get it done

Put whatever money you can behind this project. Reenergize the area near the federal way transit center. Put businesses and shops near the old toy r us and turn into a similar kent station set up. Kent station blows but it would work near the commons. Your light rail would revitalize the area and create and sf, San Jose relationship between Seattle and Tacoma. Hurry up and connect the light rails so the area can move into the future.
Sent from my iPhone

From: Terry & Kathie Forsyth <cooper1@rockisland.com>
Sent: Wednesday, July 17, 2013 8:23 PM
To: FWTE
Subject: Extension from Angels Station/Federal Way

I find a certain parallel to this with discussion of light rail from downtown to Ballard. Surely the Ballard line will eventually continue to Shoreline or it doesn't make fianancial sense to just jump over from downtown to Ballard and stop.

Better discussions may include:

The proposal of a north-south light rail line down east side may do well to turn west to South Center then what? Continue to the 200th S station then continue west with stop(s) in Des Moines on its way to a stop at Vashon and on to Gig Harbor? This would make the 200th S station a cross station with the southbound line from downtown like Judicial Square or Metro Center in the DC Metro rail system where the two lines cross (separated) and continue there merry way.

A proposed line down 167 that could join the southbound eastside line before a South Center station that continued to Vashon and Gig Harbor would be worthy of consideration as it would get Valley passengers intermediate stops with only one connection to downtown Seattle or Bellevue.

As side note, when the Air Florida 737 went down in DC January 13 in the 80s (I think) a half hour later there was a DC Metro system crash downtown that also stopped traffic on the only operating line crossing the Potomac River that evening (Yellow/Green bridge was yet built). If the downtown line connected directly to the eastside north-south line, any major catastrophe in the Northgate-downtown tunnel would allow continued transportation of light rail passengers throughout Seattle via Bellevue.

I look forward to any questions you may ask of me,

Terry Forsyth

COMMENT FORM

Federal Way Extension - Link light rail

(Comment period through July 15, 2013)

We want your comments on –

1) The purpose and need for the project.

Obviously necessary

2) Potential light rail alternatives.

I like 99 better because the freeway (I5) already is an alternative for buses especially with its Diamond Lanes.

I assume that Rapid Ride would continue as a to provide more frequent stops.

3) How the project could affect people and the environment.

Hopefully it would help with pollution and with heavy car traffic.

In the meantime why do we keep encouraging businesses and therefore more people to come here!

Please feel free to write all other comments on the back of this sheet

Optional:

Name Miriam Helgeland

Address 3840 Star Lake Rd. Auburn 98001

Email X Phone

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kent.hale@soundtransit.org

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SOUNDTRANSIT

COMMENT FORM

Federal Way Extension - Link light rail

(Comment period through July 15, 2013)

We want your comments on –

1) The purpose and need for the project.

2) Potential light rail alternatives.

Best option = Mixed West side, due to lower cost but staying close to residence who will use service + where transit center is already.

3) How the project could affect people and the environment.

There will be major upset until construction completed, be aware of water table in area. + want to stay away from private lands ie Weyerhaeuser campus.

Please feel free to write all other comments on the back of this sheet

Optional:

Name Moniza Miller

Address P.O. Box 4374 Federal Way, WA 98063

Email andramidr@hotmail.com Phone 253.924.6856

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Mail: Sound Transit: Attn: Kent Hale, 401 S. Jackson St., Seattle, WA 98104
kent.hale@soundtransit.org

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SOUNDTRANSIT

COMMENT FORM

Federal Way Extension - Link light rail

(Comment period through July 15, 2013)

We want your comments on –

1) The purpose and need for the project.

This will be an excellent way to reduce the increasing congestion on the Rapid Ride A line between the airport and the Transit center. I feel that it is highly beneficial.

2) Potential light rail alternatives.

A route along the median of SR99 has the greatest potential to gain ridership and increase gentrification in neglected neighborhoods along the route.

3) How the project could affect people and the environment.

Please feel free to write all other comments on the back of this sheet

Optional:

Name Stephen Yemanek

Address 805 S. 265th st.

Email MochiHHL@yahoo.com Phone (206) 617-4823

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Mail: Sound Transit: Attn: Kent Hale, 401 S. Jackson St., Seattle, WA 98104
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SOUNDTRANSIT

COMMENT FORM

Federal Way Extension - Link light rail

(Comment period through July 15, 2013)

We want your comments on –

1) The purpose and need for the project.

to link the light rail to all of the
elementary
Junior High
High Schools
Universities
Colleges

2) Potential light rail alternatives.

32nd Pl. So. in the neighborhood
where Waterbury Park Apts are to get rid of SOL
Also to go all the way down 320th Street & Pac Hwy
South

3) How the project could affect people and the environment.

to help others in wheel chairs
crutches
walkers
cans
to get around alot better

Please feel free to write all other comments on the back of this sheet

Optional:

Name Jennie M. Hills

Address 32723 19th Pl. So. Apt #N-105 FW WA 98003

Email jenniemmalcolm@yahoo.com Phone (253) 569-9610
217-2693

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kent.hale@soundtransit.org

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SOUNDTRANSIT

COMMENT FORM

Federal Way Extension - Link light rail

(Comment period through July 15, 2013)

We want your comments on –

1) The purpose and need for the project.

2) Potential light rail alternatives.

I'm not a big fan of light rail. The track is way more expensive than buses and buses have the flexibility to change their routing as needs grow and change. Light rail track is relativly permanant. Perhaps the money should be spent on ~~my parking~~ more parking at the federal way transit center

3) How the project could affect people and the environment.

Please feel free to write all other comments on the back of this sheet

Optional:

Name Dave Eick

Address

Email Phone

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Mail: Sound Transit: Attn: Kent Hale, 401 S. Jackson St., Seattle, WA 98104
kent.hale@soundtransit.org

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SOUNDTRANSIT

COMMENT FORM

Federal Way Extension - Link light rail

(Comment period through July 15, 2013)

We want your comments on –

1) The purpose and need for the project.

2) Potential light rail alternatives.

3) How the project could affect people and the environment.

I talked to Kent Hale regarding our approximately 13.5 ac. plus Midway Mobile Home Park, plus - Tip Top M.H. park. Our property is for sale. Please call if interested.

S. 240th & Hwy. 99

Please feel free to write all other comments on the back of this sheet

Optional:

Name Betty Lou Kapela (Argus Devel. Co.)

Address

Email BLK206Davisinvestors.com Phone 425/885-7996 H

425-246-7282 C.

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Mail: Sound Transit: Attn: Kent Hale, 401 S. Jackson St., Seattle, WA 98104
kent.hale@soundtransit.org

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SOUNDTRANSIT

COMMENT FORM

Federal Way Extension - Link light rail

(Comment period through July 15, 2013)

We want your comments on –

1) The purpose and need for the project.

great way to avoid traffic
funtonde

2) Potential light rail alternatives.

Express 577-578 are great! But too crowded and parking is a problem

If there were no express options it is unlikely people would use it I probably would not

3) How the project could affect people and the environment.

I don't know how to answer this

I used to be a daily commuter to Seattle
Now I am retired but still use Rt 577-578 to go to Seattle

Please feel free to write all other comments on the back of this sheet

Optional:

Name Kathleen DeVange

Address 31317 41st Pl SW, Federal Way

Email kdevange@comcast.net Phone 253-661-0990

Please return to Sound Transit staff at the end of the meeting, or mail it to:
Mail: Sound Transit: Attn: Kent Hale, 401 S. Jackson St., Seattle, WA 98104
kent.hale@soundtransit.org

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SOUNDTRANSIT

COMMENT FORM

Federal Way Extension - Link light rail

(Comment period through July 15, 2013)

We want your comments on –

1) The purpose and need for the project.

People get to work, College, Seattle Center, MALL-WestLake Etc- Faster!

2) Potential light rail alternatives.

Elevated Median- Need to Faster transportion directly to Southcenter MALL- tourists Need it Also, husbands go to meeting- wifes go to MALLs

3) How the project could affect people and the environment.

Very Convenient + Beautiful Clean transportation!

Please feel free to write all other comments on the back of this sheet

Optional:

Name Sylvia Ann Cortinas

Address 30853-14th Ave So. Apt. 14-Federal Way WA. 98003-9007

Email No Computer Phone (253) 941-4901

Please return to Sound Transit staff at the end of the meeting, or mail it to:

Mail: Sound Transit: Attn: Kent Hale, 401 S. Jackson St., Seattle, WA 98104

kent.hale@soundtransit.org

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SOUNDTRANSIT

COMMENT FORM

Federal Way Extension - Link light rail

(Comment period through July 15, 2013)

We want your comments on –

1) The Project purpose and needs for the public.

Very much an improvement to our situation for elderlys. Need lots of parking or service like at Tukwila is not so appropriate

2) Potential light rail alternatives.

hix — ~~[illegible]~~.

3) How the project could affect people and the environment.

environment: electric not so polluting

people: big help with Parking Fees downtown and mileage saving on cars

great representives for this presentation.

Please fill free to write all other comments on the back of this sheet

Optional:

Name John Corr

Address 23025 17th Ave S Des Moines 98198

Email Corrseekingerman98@yahoo.com Phone 206 824 3555

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kent.hale@soundtransit.org

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SOUNDTRANSIT

COMMENT FORM

Federal Way Extension - Link light rail

(Comment period through July 15, 2013)

We want your comments on –

1) The purpose and need for the project.

DEFINITELY NEEDED!

2) Potential light rail alternatives.

INCREASE BUS & SOUNDER SERVICE

3) How the project could affect people and the environment.

IT CAN HAVE THE POTENTIAL TO THROW ALOT OF PEOPLE OUT OF THEIR HOMES OR APARTMENTS

RUN THE RAIL LINE DOWN HWY 99 TO 25TH AND RUN IT DOWN THAT STREET JUST TO THE EAST OF HIGHLINE COMMUNITY COLLEGE. IT'S A MORE DIRECT ROUTE THAN I5, 30TH AVE S, OR HWY 99 ALONE. IT WILL PROVIDE HIGHLINE COLLEGE WITH A LARGER STUDENT BASE & MAKE IT EASIER FOR STUDENTS TO GET AROUND THE AREA, EITHER TO THE AIRPORT OR DOWNTOWN SEATTLE

Please feel free to write all other comments on the back of this sheet

Optional:

Name WALTER TOMASZEWSKI

Address 23014 30TH AVE S/APT 157 DES MOINE WA

Email JAMAL SHOOKUP@GMAIL.COM Phone 206.878.8363

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Mail: Sound Transit: Attn: Kent Hale, 401 S. Jackson St., Seattle, WA 98104
kent.hale@soundtransit.org

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SOUNDTRANSIT

COMMENT FORM

Parkside

Federal Way Extension - Link light rail

(Comment period through July 15, 2013)

We want your comments on –

1) The purpose and need for the project.

I feel its very necessary ~~to~~ In order to keep
- commute times low
- ~~[illegible]~~ for the economy to continue
growing in the King County area

2) Potential light rail alternatives.

3) How the project could affect people and the environment.

I definitely feel like parking could adverely affect people if its not managed properly. I believe paid parking should be considered for future parking projects @ Light Rail sites.

Please feel free to write all other comments on the back of this sheet

Optional:

Name Ben Caparoso

Address

Email Phone 415-236-2272

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Mail: Sound Transit: Attn: Kent Hale, 401 S. Jackson St., Seattle, WA 98104
kent.hale@soundtransit.org

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SOUNDTRANSIT

parkside

COMMENT FORM

Federal Way Extension - Link light rail

(Comment period through July 15, 2013)

We want your comments on –

1) The purpose and need for the project.

Cut down on buying fuel from foreign countries

2) Potential light rail alternatives.

None

3) How the project could affect people and the environment.

Save on gas, cleaner air

Please feel free to write all other comments on the back of this sheet

Optional:

Name Jackie Buckingham

Address 23410 28 Ave South Des Moines 98198

Email _____ Phone 206 409 4437

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Mail: Sound Transit: Attn: Kent Hale, 401 S. Jackson St., Seattle, WA 98104
kent.hale@soundtransit.org

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SOUNDTRANSIT

Parkside

COMMENT FORM

Federal Way Extension - Link light rail

(Comment period through July 15, 2013)

We want your comments on –

1) ~~The purpose and need for the project.~~

There needs to be a bridge at 240th over the Freeway.
Also keep it off the street to keep the train speed up!

2) Potential light rail alternatives.

3) How the project could affect people and the environment.

Please feel free to write all other comments on the back of this sheet

Optional:

Name Judy Terrana

Address

Email Judyaterrana@msn.com Phone

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Mail: Sound Transit: Attn: Kent Hale, 401 S. Jackson St., Seattle, WA 98104
kent.hale@soundtransit.org

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SOUNDTRANSIT

COMMENT FORM

Federal Way Extension - Link light rail

(Comment period through July 15, 2013)

We want your comments on –

1) The purpose and need for the project.

2) Potential light rail alternatives.

SEE ATTACHMENT

3) How the project could affect people and the environment.

Please feel free to write all other comments on the back of this sheet

Optional:

Name_____

Address_____

Email_____ Phone_____

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SOUNDTRANSIT

Comments from some residents of Saltair Hills Community.

Our community is located west of U.S. 99 and bounded by South 248th and South 252nd on the north and south respectively. The eastern boundary is on SR 99 and the western boundary by 20th ave. South.

One of the Federal Way Extension of the light rail route being considered will directly impact our community.

We are concerned that we will be faced with another environmental impact of noise and disruption.The airplane traffic pattern follows 20th avenue. Also, we have had additional noise impact by expansion of the airport with a third runway. With the "SR 99 Hybrid Alternative" being considered – we will encounter additional noise and disruption.

It appears that one of the light rail routes being considered would go to the west side of SR 99 at the midway intersection and return to the east side of SR 99 at 260th. The reason for this cross 99 sections appears to be for the benefit of The Highline Community College. It would seem that continuing on the east side of SR 99 would encounter more vacant lots such as a vacant lot South of Lowe's, the midway land fill and other properties such as more than one heavy equipment storage lots. An additional empty lot is located North of Fred Meyers at 252nd. A pedestrian overpass to Highline Community College would allow use of an existing parking lot at Lowe's.

On West side of SR 99 adjacent to our community are several small business that would also be affected.

An additional concern is the traffic congestion that would be encountered at 252nd. This street connects to 16th ave. and is a route for commuter traffic from Des Moines.

Signed by concerned citizens of Saltair Hills, in Kent

Name	Address
Kenneth D. Groom	2505 South 250th Place
Joseph R Colgan	24451 So 249th Pl, Kent
Pat Colgan	2451 So 249th Pl, Kent
Colleen K. Cristel	2013 So. 250th St, Kent, 98032
Brenda Oberto	25012 25th Ave S. Kent 98032
Geraldine R. Colgan	2109 S. 250th St. Kent 98032

COMMENT FORM

Federal Way Extension - Link light rail

(Comment period through July 15, 2013)

We want your comments on –

1) The purpose and need for the project.

IT Would be A Better Route for People
More peacefull ride,

2) Potential light rail alternatives.

A More Comterble ride
A fun Aventure

3) How the project could affect people and the environment.

Get People To Where They Have To go Quicker.

Please feel free to write all other comments on the back of this sheet

Optional:

Name

Shelly Gaub
33314 17th Ln S Apt B206
Federal Way, WA 98003

Address

Email Na

Phone (253) 617-5264

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Mail: Sound Transit: Attn: Kent Hale, 401 S. Jackson St., Seattle, WA 98104
kent.hale@soundtransit.org

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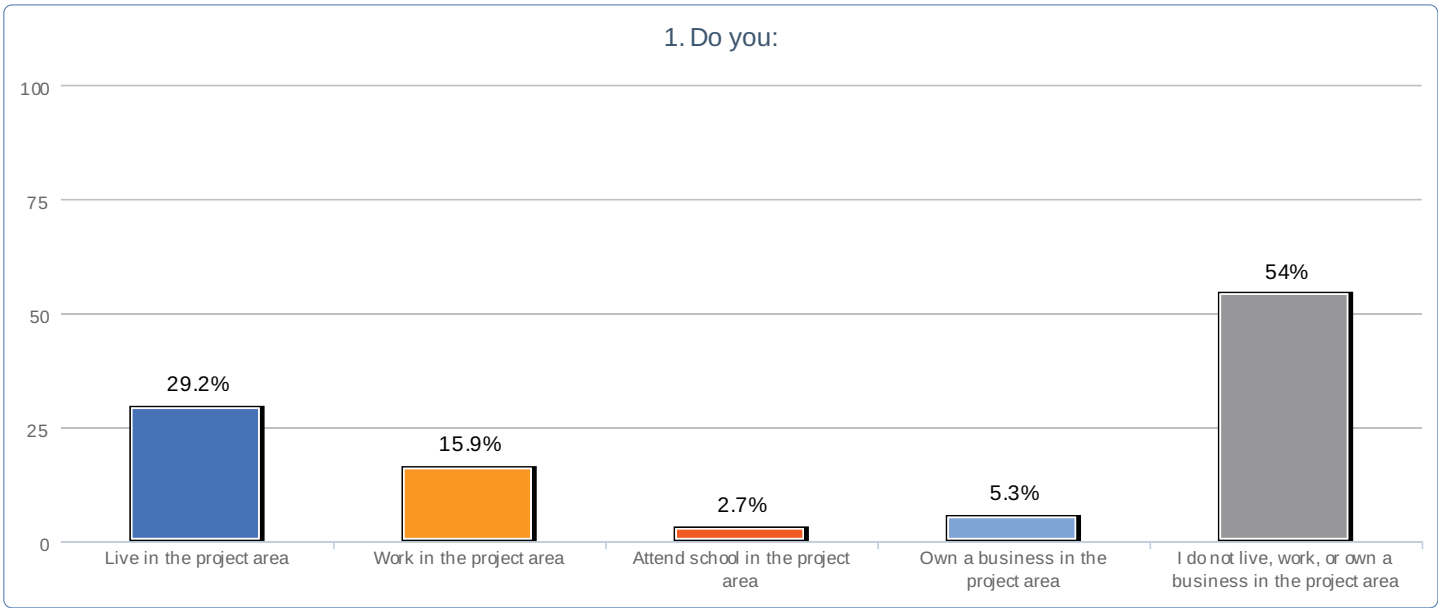
SOUNDTRANSIT

Summary Report - Auto Run

Survey: Federal Way Transit Extension Scoping Online Survey



1. Do you:

Value	Count	Percent %
Live in the project area	33	29.2%
Work in the project area	18	15.9%
Attend school in the project area	3	2.7%
Own a business in the project area	6	5.3%
I do not live, work, or own a business in the project area	61	54.0%

Statistics	
Total Responses	113

2. What is your zipcode?

Count	Response
2	20011
1	97005
3	98001
3	98002
19	98003
2	98006
1	98012
3	98023
1	98026
1	98031
8	98032
1	98042
1	98043

1	98059
6	98102
1	98103
1	98104
3	98105
1	98106
2	98107
2	98108
1	98110
1	98112
1	98115
2	98118
1	98119
1	98121
4	98122
1	98125
1	98144
1	98146
1	98164
2	98166
4	98168
12	98198
2	98199
1	98310
1	98321
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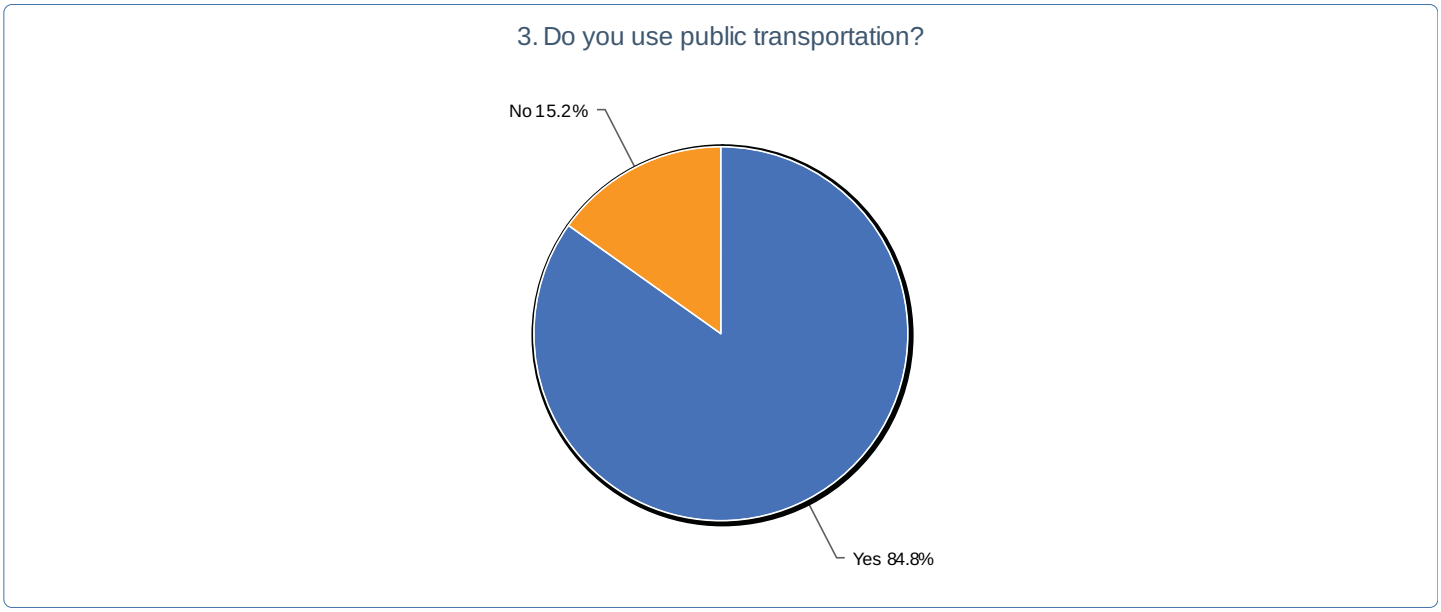
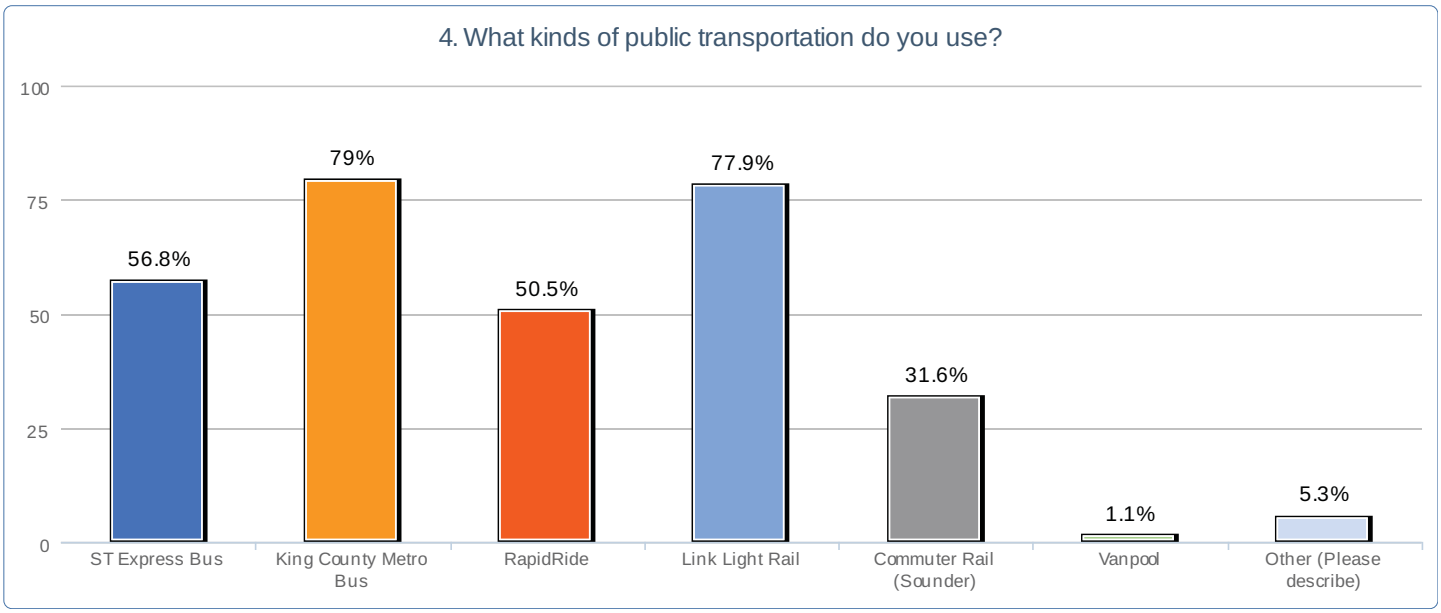
1	98444
1	98465
1	98498



3. Do you use public transportation?

Value	Count	Percent %
Yes	95	84.8%
No	17	15.2%

Statistics	
Total Responses	112

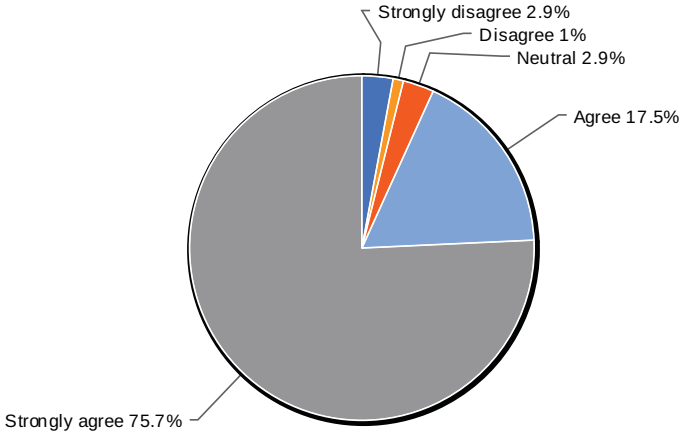


4. What kinds of public transportation do you use?

Value	Count	Percent %
ST Express Bus	54	56.8%
King County Metro Bus	75	79.0%
RapidRide	48	50.5%
Link Light Rail	74	77.9%
Commuter Rail (Sounder)	30	31.6%
Vanpool	1	1.1%
Other (Please describe)	5	5.3%

Statistics	
Total Responses	95

5. Provide more reliable and convenient public transportation to jobs and key destinations and meet future demand for public transportation.

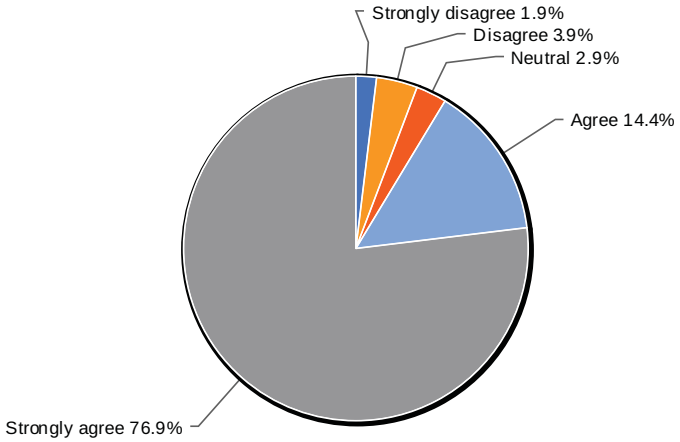


5. Provide more reliable and convenient public transportation to jobs and key destinations and meet future demand for public transportation.

Value	Count	Percent %
Strongly disagree	3	2.9%
Disagree	1	1.0%
Neutral	3	2.9%
Agree	18	17.5%
Strongly agree	78	75.7%
Not Applicable	0	0.0%

Statistics	
Total Responses	103
Sum	476.0
Avg.	4.6
StdDev	0.8
Max	5.0

6. Provide an alternative to traveling on congested roadways and improve connections to the transportation system at all times of day.



6. Provide an alternative to traveling on congested roadways and improve connections to the transportation system at all times of day.

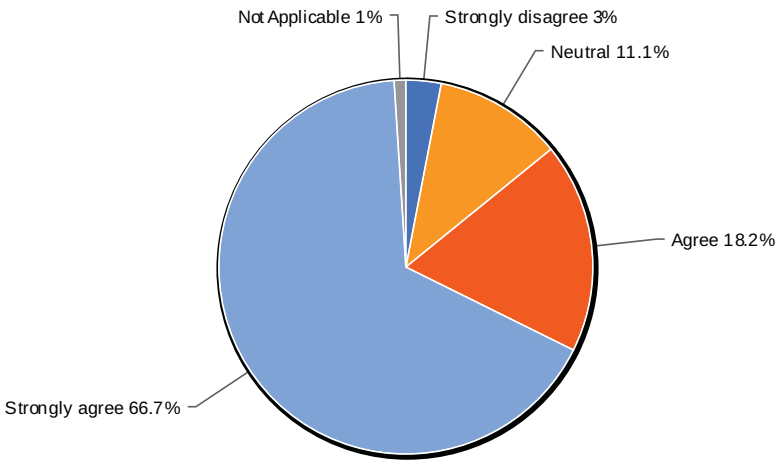
Value	Count	Percent %

Statistics	

Strongly disagree	2	1.9%
Disagree	4	3.9%
Neutral	3	2.9%
Agree	15	14.4%
Strongly agree	80	76.9%
Not Applicable	0	0.0%

Total Responses	104
Sum	479.0
Avg.	4.6
StdDev	0.9
Max	5.0

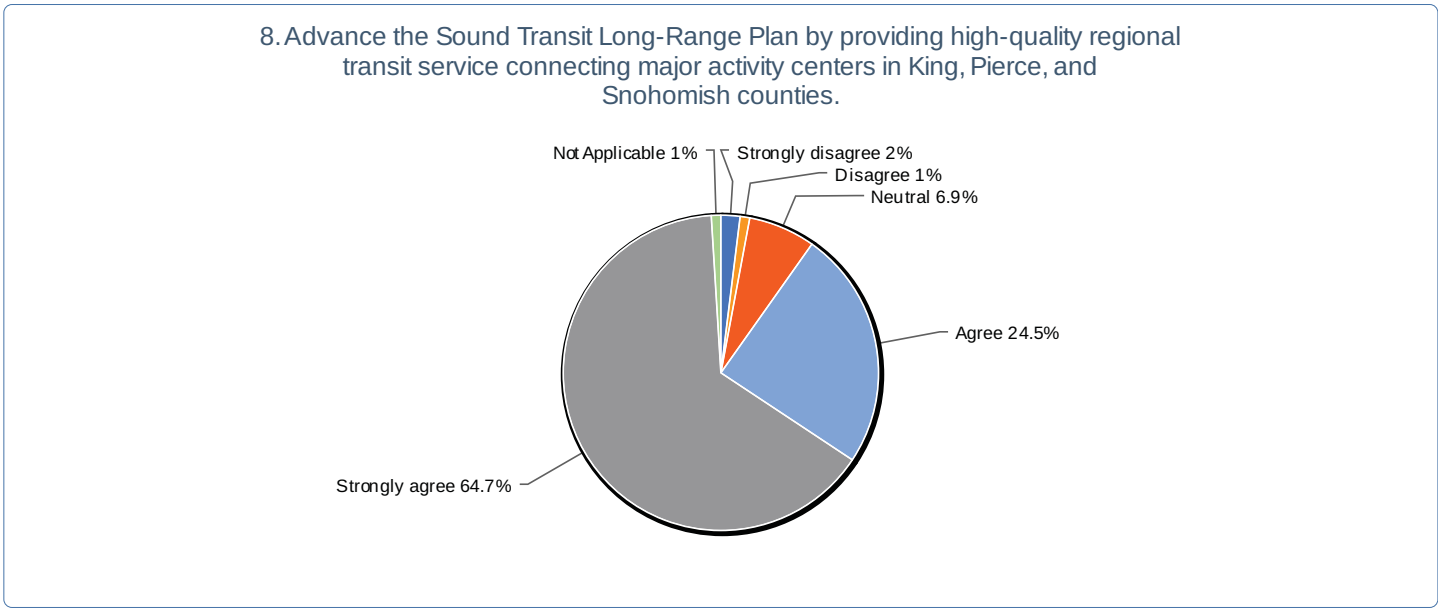
7. Support local land use, transportation, and economic development plans.



7. Support local land use, transportation, and economic development plans.

Value	Count	Percent %
Strongly disagree	3	3.0%
Disagree	0	0.0%
Neutral	11	11.1%
Agree	18	18.2%
Strongly agree	66	66.7%
Not Applicable	1	1.0%

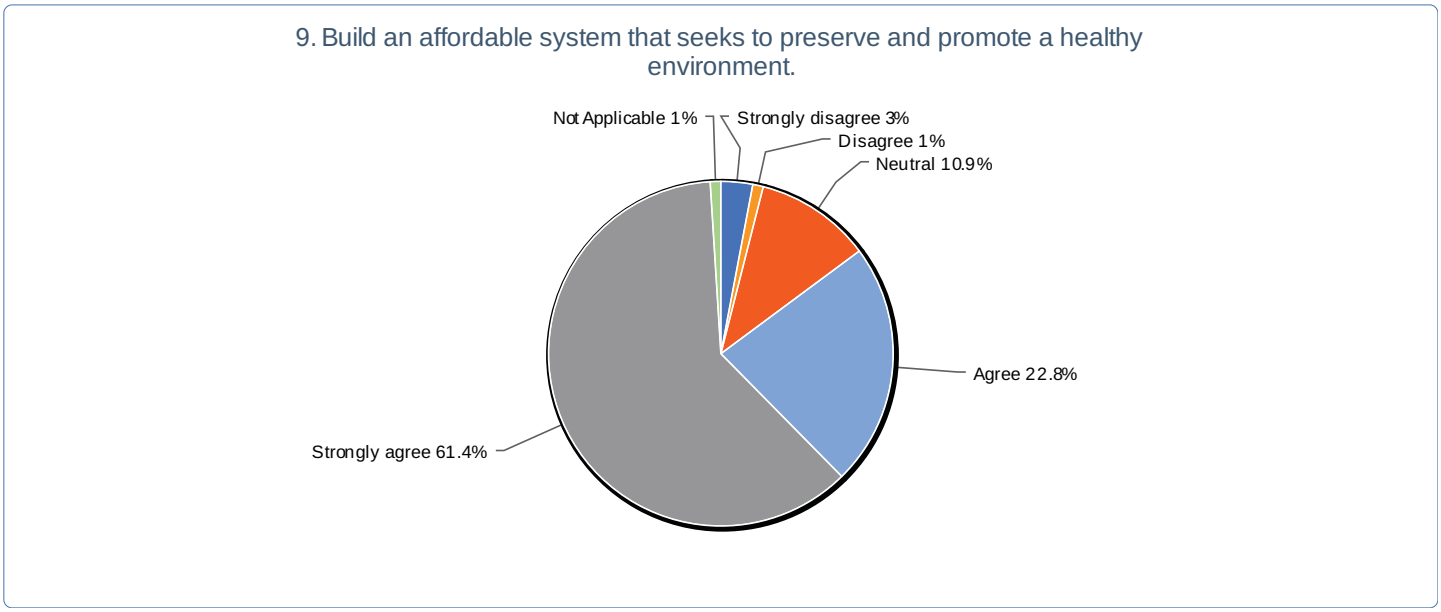
Statistics	
Total Responses	99
Sum	438.0
Avg.	4.5
StdDev	0.9
Max	5.0



8. Advance the Sound Transit Long-Range Plan by providing high-quality regional transit service connecting major activity centers in King, Pierce, and Snohomish counties.

Value	Count	Percent %
Strongly disagree	2	2.0%
Disagree	1	1.0%
Neutral	7	6.9%
Agree	25	24.5%
Strongly agree	66	64.7%
Not Applicable	1	1.0%

Statistics	
Total Responses	102
Sum	455.0
Avg.	4.5
StdDev	0.8
Max	5.0



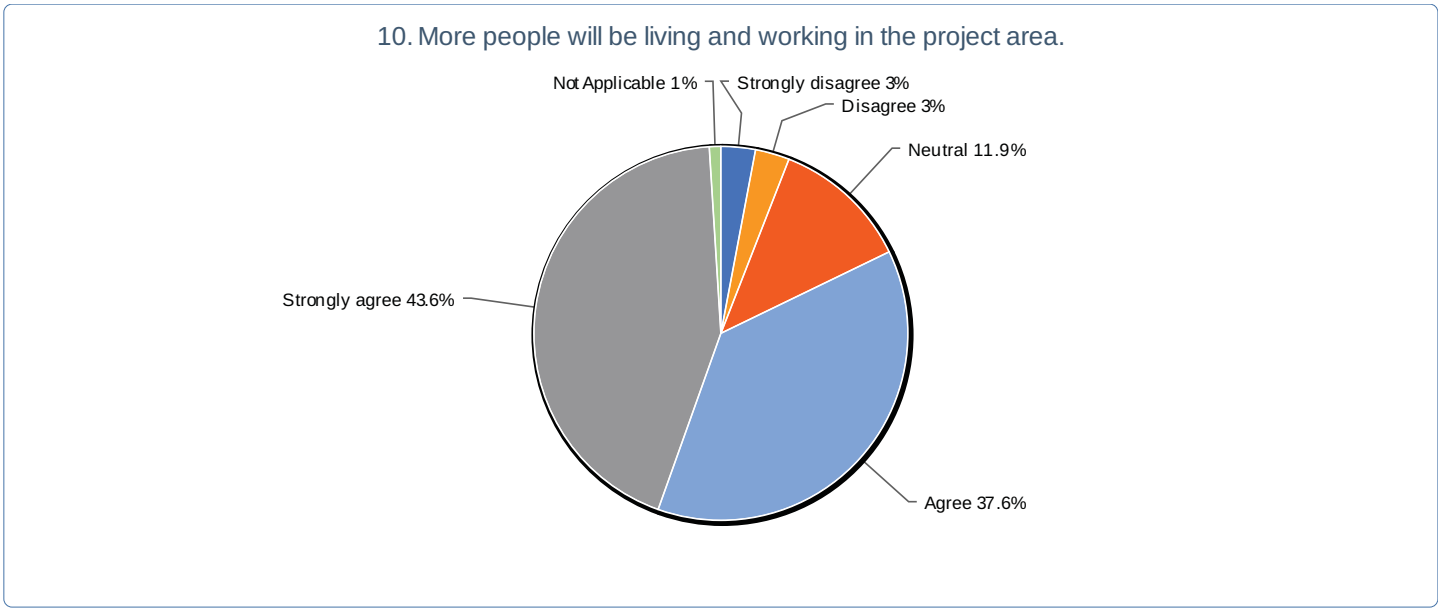
9. Build an affordable system that seeks to preserve and promote a healthy environment.

Value	Count	Percent %
Strongly disagree	3	3.0%
Disagree	1	1.0%
Neutral	11	10.9%

Statistics	
Total Responses	101
Sum	440.0
Avg.	4.4

Agree	23	22.8%
Strongly agree	62	61.4%
Not Applicable	1	1.0%

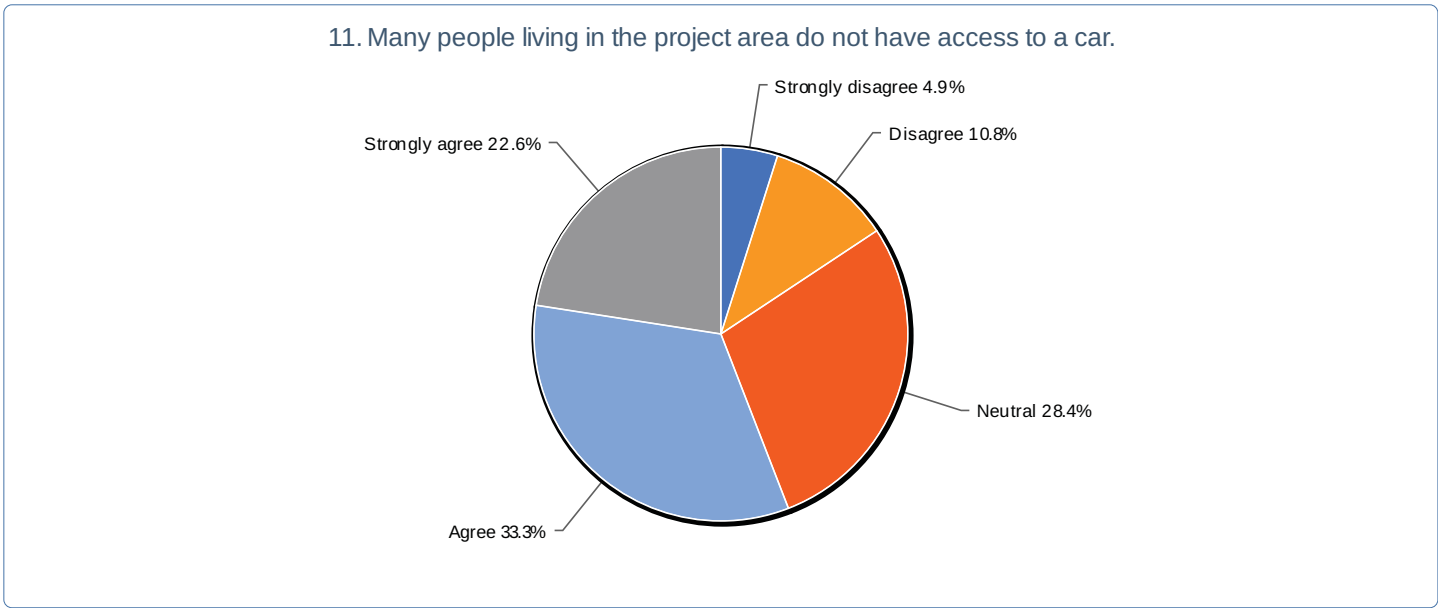
StdDev	0.9
Max	5.0



10. More people will be living and working in the project area.

Value	Count	Percent %
Strongly disagree	3	3.0%
Disagree	3	3.0%
Neutral	12	11.9%
Agree	38	37.6%
Strongly agree	44	43.6%
Not Applicable	1	1.0%

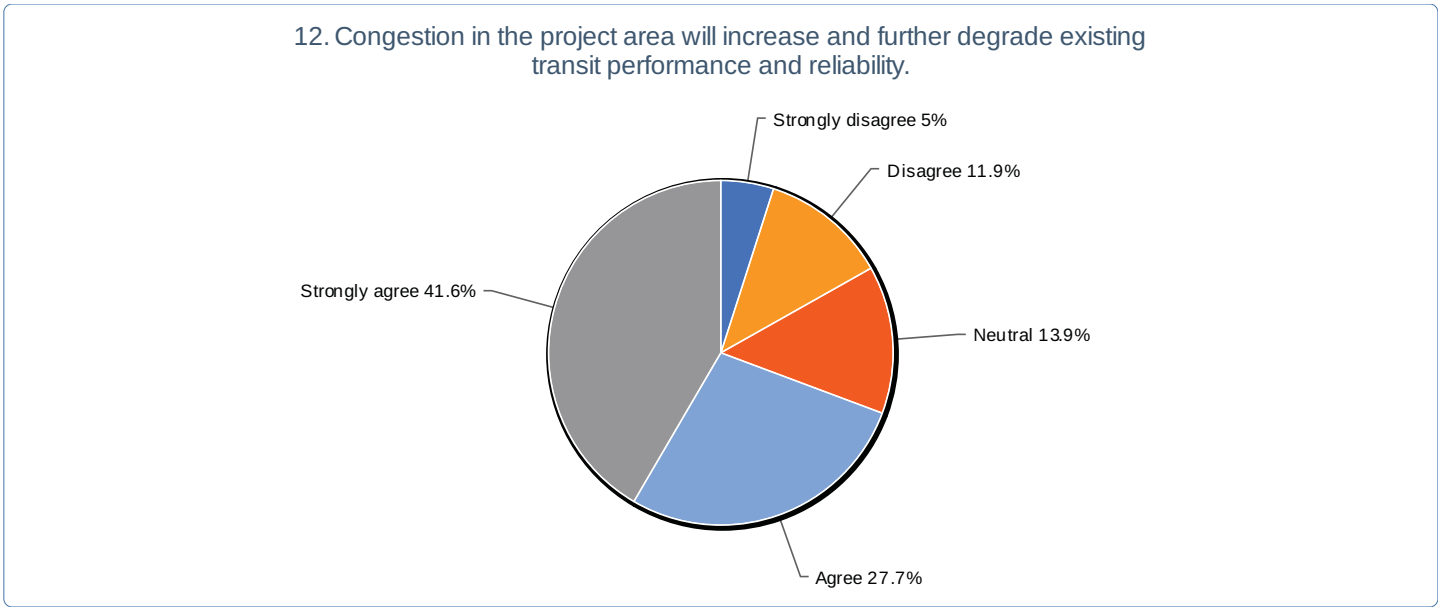
Statistics	
Total Responses	101
Sum	417.0
Avg.	4.2
StdDev	1.0
Max	5.0



11. Many people living in the project area do not have access to a car.

Value	Count	Percent %
Strongly disagree	5	4.9%
Disagree	11	10.8%
Neutral	29	28.4%
Agree	34	33.3%
Strongly agree	23	22.6%
Not Applicable	0	0.0%

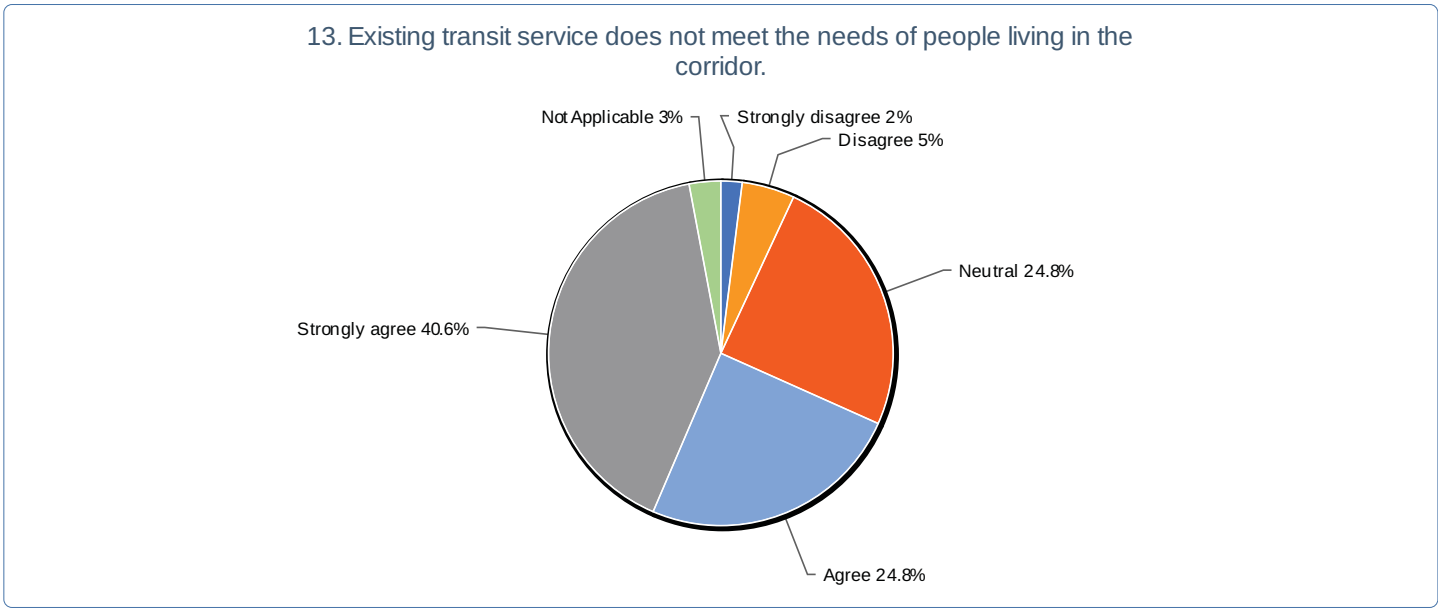
Statistics	
Total Responses	102
Sum	365.0
Avg.	3.6
StdDev	1.1
Max	5.0



12. Congestion in the project area will increase and further degrade existing transit performance and reliability.

Value	Count	Percent %
Strongly disagree	5	5.0%
Disagree	12	11.9%
Neutral	14	13.9%
Agree	28	27.7%
Strongly agree	42	41.6%
Not Applicable	0	0.0%

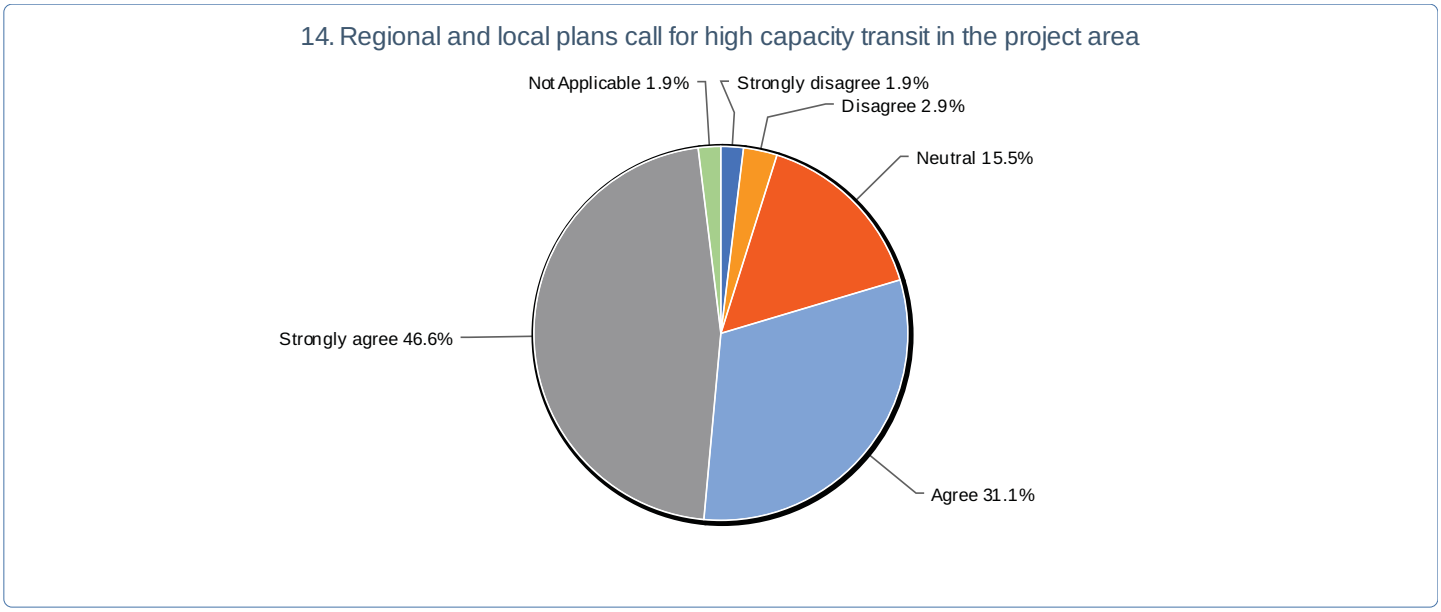
Statistics	
Total Responses	101
Sum	393.0
Avg.	3.9
StdDev	1.2
Max	5.0



13. Existing transit service does not meet the needs of people living in the corridor.

Value	Count	Percent %
Strongly disagree	2	2.0%
Disagree	5	5.0%
Neutral	25	24.8%
Agree	25	24.8%
Strongly agree	41	40.6%
Not Applicable	3	3.0%

Statistics	
Total Responses	101
Sum	392.0
Avg.	4.0
StdDev	1.0
Max	5.0



14. Regional and local plans call for high capacity transit in the project area

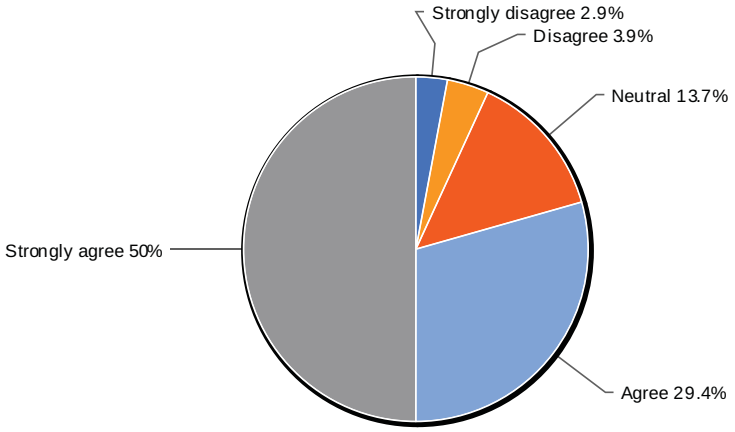
Value	Count	Percent %
Strongly disagree	2	1.9%
Disagree	3	2.9%
Neutral	16	15.5%
Agree	32	31.1%

Statistics	
Total Responses	103
Sum	424.0
Avg.	4.2
StdDev	0.9

Strongly agree	48	46.6%
Not Applicable	2	1.9%

Max	5.0

15. The project will help reduce vehicle miles traveled and greenhouse gas emissions



15. The project will help reduce vehicle miles traveled and greenhouse gas emissions

Value	Count	Percent %
Strongly disagree	3	2.9%
Disagree	4	3.9%
Neutral	14	13.7%
Agree	30	29.4%
Strongly agree	51	50.0%
Not Applicable	0	0.0%

Statistics	
Total Responses	102
Sum	428.0
Avg.	4.2
StdDev	1.0
Max	5.0

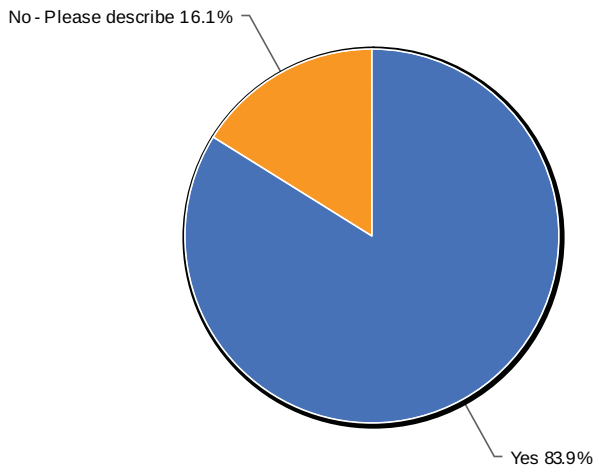
16. Is there anything that should be added to the purpose and need statement?

Count	Response
1	Build a system that is entirely grade-separated and can travel at high sustained speed.
1	I don't know what a "purpose and need statement" is. Sounds term of art-y
1	Improve overall mobility and transit ridership as much as possible with available funding
1	More park and rides
1	Park and Rides Should be added
1	Reduce over crowding on express buses serving the fed way tc after 6:30 pm
1	Specifically call-out encouraging Transit Oriented Development.
1	The project should be designed to significantly reduce travel time for those taking transit.
1	The project should support future development.
1	To serve people who need transit, it should be located on SR 99, not I5
1	WE NEED IT TO COME FASTER
1	please define affordable
1	we need more park and rides
1	Major roadway (I-5) unable to support commuter traffic and heavy congestion during major events in the Puget Sound

	Region. Additional lanes to the Interstate 5 corridor difficult to build because of bottleneck regions (mainly through Seattle).
1	More frequent service will increase security bc it will reduce wait times standing out on the street at night
1	Eventually the light link rail needs to go from Tacoma to Seattle, the sooner this happens the better.
1	The project area keys on the blue collar work force creating affordable transportation and parking alternatives and allowing that same work force to have access to better paying jobs. High speed trains also generate commerce by allow easy accesss to areas of entertainment dining and schools at all levels (primary and secondary, colleges and universities)
1	Let's get with the times and provide our community with a reliable and efficient alternative to sitting in our cars.
1	Light rail is an important opportunity to build compact, complete, connected communities. Our highest priority should be building immensely walkable & bikeable communities connected to the Link light rail system for the 1.5 million people moving to the region over the next 30 years.
1	More stations between Kent/Des Moines and Federal Way. My only means of transportation is by public transit and I'm sure many people in the area would agree.
1	1.I live in the residential area by the intersection of S 288th St & Pacific Hwy S. I frequently walk over to Pacific Hwy to grab the bus. I went to the ST Federal Way Transit Extension meeting at Parkside Elementary and saw there could be plans to build a station at the S 288th St & Pacific Hwy S intersection. I think this location would be great for all of us living in the area. I live in a lower income demographic area where majority of the households have 0 cars or 1 crappy car and we use public transit a lot or we just walk. I really think this is a good location to consider building a ST Station. Many of us will be able to jump on the train and go shopping to Federal Way and the 272nd St Plaza which will make it quite easy to get around especially shopping for groceries. As a single mother without a car, I would benefit greatly from a ST Station here. All the residents in my area would feel more connected to everything at Federal Way and 272nd plaza. I hope you really look into this location. I have talked to many of my neighbors and we all feel our community would benefit a lot. Even though I rent, the property values in this area would go up and I think it would help a lot of people. Also, this will prevent some people to drive old pollution producing cars that they currently own because they can't afford to buy environmentally friendly cars so they have to make ends meet with what they have. If a station was build here, those people would just take the train because they would be well connected to all the major areas. Currently this intersection has a lot of vacant buildings and land that isn't being put to good use so there shouldn't be any problem for you to buy the land and build a station here. I don't think anyone would lose by a station being built here. Everyone would only gain and this station would bring some life to this intersection. The idea should be to connect the residential areas to main areas of the city so that we can easily walk to the train and travel to our destinations. I don't think there is a more need anywhere else than this intersection because all of us living here would have a great, environmental friendly way of transportation. I really hope you consider this location. Thank you very much for listening to me.
1	Please maximize the amount of parking at the transit stations. It's disheartening to have my sights on taking the light rail and then I can't find parking at the SeaTac station, and the bus service there takes too long.
1	Public transportation will keep vehicles off the highways that would have to be improved to handle all the traffic - so public transportation saves in he long run.
1	SR99 is where light rail needs to be. It's more expensive, but if the alternative is I-5, then it's still better, because all of the businesses are on 99. If we build all this rail away from the businesses, then it's a tremendous waste; likewise, the local resident gets light rail right in front of his house. Based on the cost of this investment, it would also be unfair for certain residents to get light rail at their front door and to have a 10-20 block walk from the station to local places where people actually want to go. I also think that there needs to be more stations, because if this line is a viable alternative to RapidRide A-line, then we could cancel it, and save money over the long run.
1	As a Ground Service Agent for Horizon Air at SeaTac Airport, I have encountered dozens, if not hundreds of airport employees who live in the project area. Most are low income and many do not own cars, limiting their mobility to transit. There is a strong desire for fast, reliable, high frequency transit to Federal Way among airport employees. In my years working at SeaTac Airport I have yet to encounter any employee who does not support Sound Transit's goals for expanding high capacity transit in the greater Seattle area. This link extension would greatly benefit tourists as well, providing access to hotels and commercial destinations south of the airport. Additionally, providing a direct connection between Highline Community College and the University of Washington would be a boon for higher education in the region. As a science alum at HCC I would have loved the opportunity such a connection would have provided.
1	I would use the light rail to commute to highline community college and save tremendously on gas and parking cost.
1	People in surrounding areas (i.e. Auburn and Kent) need more options for commuting downtown that put less wear and

	tear on their vehicles.
1	Thank you for considering to extend the route. I don't know if I will still be living in the region, when the project is completed, but it's a good plan. My biggest concern is the cost to utilize the light rail. As convenient as it may be, it is already expensive to use the light link between downtown and the airport. The extension migh just make it cost-prohibitive to those who absolutely rely on public transportation.
1	I used to live in the FW area and transportation was always at capacity and traffic was horrible during rush hour. I ended up taking the train from Kent because it was more comfortable and I didn't have to stand on the ST Express with heavy bags (when I brought home my work laptop).
1	What needs to be mentioned is that we have reached a statistical peak driving. Congestion during the rush hours now has sometimes gone to 60-80 minutes at times. If there was an actual automated system versus the at-grade intersections with Link, I could only imagine having Link to Federal Way in 40-45 minutes every time. At that rate, why would you want to take your vehicle into work? I think the purpose and need for this is there. I-5 from the 405 interchange south is congested every single morning. We need to move off our oil dependency and have more coordination to fill Link up further south.
1	This is an incredibly poorly worded question. Are you saying that you want an opinion on whether or not these are good goals, or are you asking if *this project as proposed* will help meet these goals? I'm answering neutral for everything because it's unclear what you are asking.
1	Sound Transit is notorious for it's boondoggling. Once in my naive youth I voted for light rail, because THE PROPOSAL INCLUDED SERVICING MY AREA IN FEDERAL WAY. Now, surprise, and true to Sound Transit's inability to follow a budget or accurately project costs, my area has no funding. fool me once, shame on you, Fool me twice - shame on me. Find funding to complete the line as proposed when approved by voters or you'll NEVER get another approval vote from me.
1	I totally understand municipal finance - but I wish these systems could be built out faster - by the time light rail arrives in Federal Way - I won't have a need for it, as I'll be retired - in 20 years!
1	i whould like to see the station to be boilt on 288 and pacific hwy. because here is thousands of people living in apartmens on this intersection. thanks

17. Is Sound Transit considering the right alternatives?



17. Is Sound Transit considering the right alternatives?

Value	Count	Percent %
Yes	78	83.9%
No - Please describe	15	16.1%

Statistics	
Total Responses	93

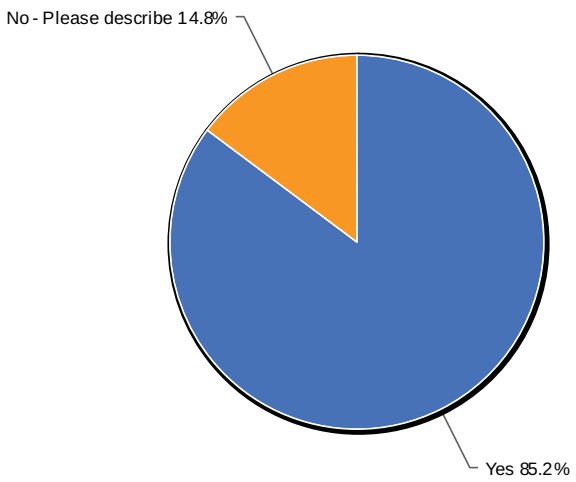
18. Sound Transit has included three stations in its planning for the Federal Way Transit Extension:• Kent-Des Moines Road*• S. 272nd Street*• Federal Way Transit Center Sound Transit evaluated the following additional station locations during alternatives analysis based on comments received during early scoping. Please prioritize using numbers 1-7 which stations you would use the most, with one being the station you would use the most and seven being the station you would use the least.

Item	Total Score[1]	Overall Rank
S. 288th Street and SR 99	399	1
Dash Point Road and SR 99	351	2
S. 260th Street and SR 99	329	3
S. 216th Street and SR 99	322	4
S. 288th Street and I-5	283	5
S. 260th Street and I-5	240	6
S. 216th and I-5	238	7

Total Respondents: 84

[1] Score is a weighted calculation. Items ranked first are valued higher than the following ranks, the score is the sum of all weighted rank counts.

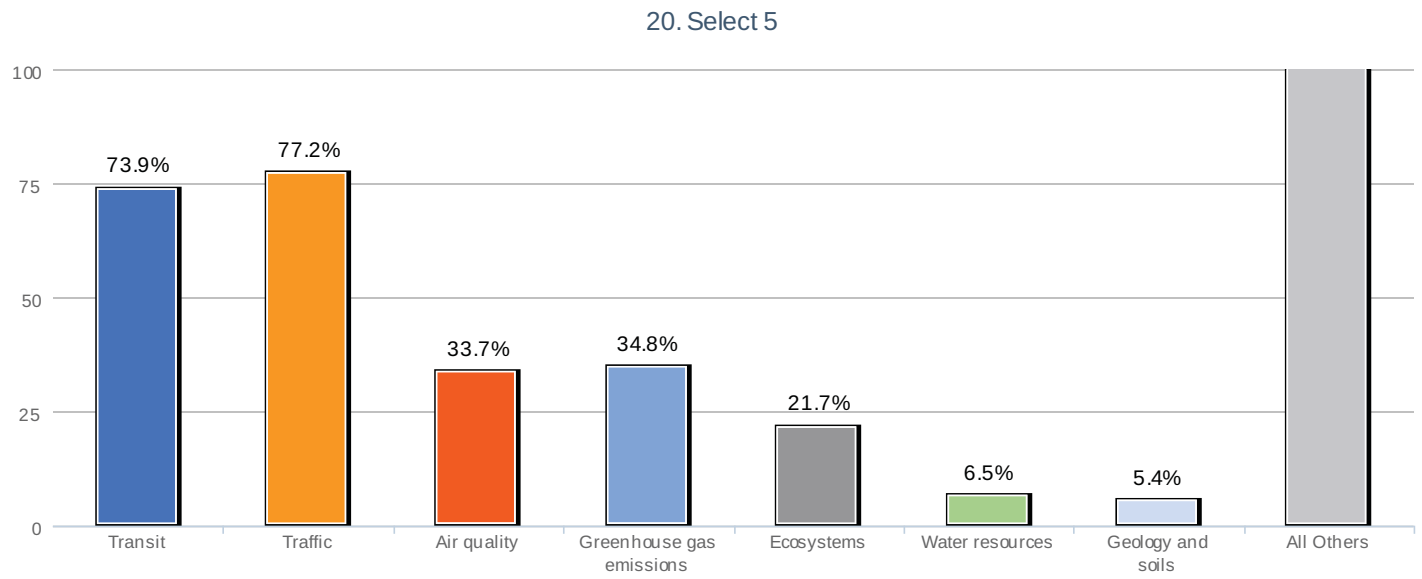
19. Is Sound Transit considering the right station locations?



19. Is Sound Transit considering the right station locations?

Value	Count	Percent %
Yes	75	85.2%
No - Please describe	13	14.8%

Statistics	
Total Responses	88



20. Select 5

Value	Count	Percent %
Transit	68	73.9%
Traffic	71	77.2%
Air quality	31	33.7%
Greenhouse gas emissions	32	34.8%
Ecosystems	20	21.7%
Water resources	6	6.5%
Geology and soils	5	5.4%
Noise and vibration	26	28.3%
Visual effects	18	19.6%
Land use and economic activity	51	55.4%
Acquisitions, displacements and relocations	19	20.7%
Energy use	14	15.2%
Hazardous materials	6	6.5%
Public services and utilities	16	17.4%
Impacts on low-income and minority populations	33	35.9%
Cultural, historic and archaeological resources	7	7.6%
Parks	5	5.4%
Construction impacts	19	20.7%

Statistics	
Total Responses	92

21. Please provide additional information on the environmental issues marked in the question above, or share if there are other issues we should consider.

Count	Response
1	Be smart and thrifty.
1	Freeway on ramps and offramps from the park and ride
1	I'm not sure how Kent is represented, but it needs to be in the mix.
1	None
1	Reducing passenger car usage should help the environment the most.

1	Study possible slide problems - and avoid them!
1	n/a
1	na
1	none
1	I think building a station by the low income and minority populations is going to be great for us because most of us use public transportation.
1	my main concern is acquisitions/displacements. I live near the MIdway shopping center. Do NOT want house values to go down because of a light rail track 'in our yard'
1	Potential impact of businesses moving out of the area (i.e. Boeing) because of poor infrastructure (transportation) for employees.
1	The ability to reduce emissions by maximizing the bus platform hours Link will replace is a major point in building this project. Travel time on the line should be minimized, so that it is competitive with express buses. Connections to local bus lines (e.g. a station entrance at Pac Hwy and 320th St) is key to capturing ridership. Please move the Federal Way Station to where it will have a walkshed and bus connections that don't require multiple turns and an extra five minutes to get to the station.
1	Light rail is better for the the greater good of the entire population from better access to schools, entertainment and employment to air and water quality... it should increase property values to those in the direct area and routes.
1	Light rail should be considered beneficial for improving transit, reducing greenhouse gas emissions, and improving local land use patterns to be more walkable with more local businesses.
1	You need to put the rail down 99 or I-5, not 30th. Put up a sound wall before you start on the I-5 route. Do not keep me up at night!!!
1	I think 288th & Pacific Hwy S station would have a great impact for the residents in the area. It would connect us with major areas and we would be able to travel without any inconveniences. Currently it is very difficult to travel with public transportation in this area.
1	We deserve more specifics about the proposed plans. The information in the paper was so vague that you have residents up in arms thinking their houses are going to be demolished.
1	I commute everyday to work from Redondo Beach neighborhood to Downtown Seattle. It would be ideal to have a train station on 288th & SR99 so I could jump on the train instead of driving and being stuck in traffic.
1	Ensure that this route avoids the same noise issues encountered (and which you are now spending lots of funds to retroactively fix) along the current Central Link route. As someone who lives 1.5 blocks from the route along MLK, I believe more could have been done to mitigate the noise problems we now experience.
1	I support efforts to reduce the amount of greenhouse gases our region emits for transportation, and believe this extension should be built to provide high speed transit now, but more importantly to provide a template for future dense development that takes advantage of the line.
1	would it end up like the light rail link to seattle with all the small parcels of land that are fenced off and of no use to anyone?

22. Do you have any other thoughts or questions regarding the Federal Way Transit Extension?

Count	Response
1	Again, specifics! Please share your details with those who reside in those areas!!!
1	Build it on SR99. And include a stop at Highline Community College.
1	I recommend to build a light rail station at 288th & SR99 intersection.
1	ITS TAKING TOO LONG TO CONSTRUCT - MAKE IT COME FASTER!
1	If you build it, they will ride! Tacoma please!! All the way to the airport!
1	Keep this on 99! Do not stray to i-5
1	None
1	Prefer alignment on/near SR-99.

1	TOD is important. SR 99 wins there.
1	Very important project to anyone living south of Seattle.
1	Want it to go to Tacoma.
1	You can't buld it fast enough!!!
1	it needs to go where people are ... not down I5
1	n/a
1	no.
1	park and rides with freeway on-ramps and off-ramps
1	I think it would be better to run the line along SR 99 to make it connect to Federal Way job centers and business centers rather than just be a way to get to Seattle.
1	I-5 is an awful alignment. We need transit to focus on providing direct access to users equitably. This can ONLY be done on arterial and surface streets. I oppose ANY alternative that focuses on I-5 as an option. SoundTransit needs to stop focusing stations along highways. This kills all-day ridership, walksheds, connectivity, and potential land use benefits.
1	I would honestly reject any alignment via I-5. The reason to build transit is to not serve as a freeway duplicate but serve areas that are not easily served by roadways. There is a reason why median-freeway transit systems do not work well like BART. BART has 3 times the track as Skytrain in Vancouver, BC but the same ridership. That is due to mostly park & ride stations and not allowing for development around stations. The City of Federal Way should be supported in permitting transit-oriented development near proposed Link Stations and I believe people would prefer to be along the SR 99 corridor rather than I-5.
1	Please do not build the I-5 alternatives. SR-99 has much more potential for development, meaning that there is much higher long term potential to increase ridership.
1	I feel the station at Kent Des Moines Road/Highline, and the track from Anlge lake to it, should be placed in an area that impacts the LEAST amount of residences.
1	Feel that the opportunities for Transit Oriented Development are extremely important, and create the greatest possible economic impact from the project, which will also spur ridership.
1	As I go to school in the federal way area, the S. 288th Street and SR 99 station would be the most useful for me because it would be convenient to commute to Highline community college by getting on at the station at 288th street and SR 99.
1	I hope the Kent-Des Moines Road station is placed as close to Highline Community College as possible.
1	The most important station is the one that will serve Central Washington University-Des Moines and Highline Community College. A station entrance should be on the west side of Pac Hwy, as close as possible to the campus. Minimizing travel time on the line should be a primary goal. The second-most important station would serve downtown Federal Way, including easy connection to all the bus lines that serve the spine of residential Federal Way on 320th. ST should reconsider locating a station at the parking garage. However, the transit center has to remain in name, and there should be quick bus or other walkway access between the garage and the station. However, most of the long-term ridership will come from neighborhood buses and people accessing the business corridor, not people parking their cars, if the station entrances are located where more people than just car parkers can access the station. Locating the station at FWTC forces additional curves and additional travel time into the line. The more such curviness is added to the line, the less likely it will ever compete with express bus service. Such an approach will render the line to be a low-ridership copycat of the failed Denver highway light rail with parking lots approach.
1	I think it is really important to grade-separate Link from cars. Otherwise, it doesn't save enough time to be worth the cost.
1	Extending to Federal Way Transit Center would improve my life greatly, as a daily commuter from Seattle to Federal Way.
1	I've spoken to many other property owners in the intersection of S 288th St & Pacific Hwy S (SR 99) and they agree that this intersection is a great location for a light rail station. There are a lot of lower income people living in the area that use public transit quite a bit. Even my vacant property located at 28806 Pacific Hwy S gets used as a Park & Ride on a regular basis by commuters that drive to this location and jump on the bus. I think this shows how ideal this location would be for a light rail station.
1	I question to many stations --- each stop would add minutes to the commute; favor identified stations with larger parking areas/garages.
1	Cost seems to be the biggest factor but it isn't on your list. I think the I-5 option would be the cheapest because it could

	be at grade more of the time.
1	I think that a SR-99 alignment will provide better future growth. It will provide more opportunities for people to live near and walk/bike to light rail stations, provides more overlap with RapidRide for better transit connections. It must be fully grade-separated to ensure fast travel and no car/pedestrian accidents.
1	I fully support any one of the Highway 99 options, but I DO NOT SUPPORT THE I-5 OPTIONS!!! Build the option that will work best for us over the next 100 years, not the option that is cheapest or easiest now.
1	The Highway 99 alignment options present the BEST opportunity for T.O.D. (ideally, by the private sector). I also believe it is best to distribute one's transportation corridors as comprehensively as possible and layering LINK over I-5 in the south end of King County will delay the further economic development & prosperity of the southwest corner of the county.
1	I would hope that the train that comes will be offered 247 and not become extremely limited after hours
1	I think the best thing would be to use the route along Pacific Hwy because that is where all the activity happens. People will be able to get on and off at the stations and do shopping or go to work if they work there. Also, please think about the station at S 288th & Pacific Hwy S. Building along I-5 isn't as good of idea as building on Pacific Hwy because of walking distances.
1	To me, it remains doubtful whether extending Link to Federal Way is worth the cost, given that it will not improve transit travel times to Downtown Seattle. Building BRT along I-5 with frequent service in dedicated center lanes and additional freeway stations seems like it would improve mobility more for a lower cost. In addition, the lower cost of this alternative could provide extra funding to improve local transit connections (both in coverage and frequency), which would cause ridership to increase as well.
1	When will it connect to Tacoma? Also, the route chosen should be the quickest one linking Federal Way to SeaTac Airport.
1	I'd be using the southern most station of the light rail when it's completed, mostly to get to Sounder's games and Pioneer Square
1	Considering where the rail will be which houses, business and apartments will be bought out and the families displaced?
1	I own commercial land at the intersection of S 288th St & Pacific Hwy S (SR 99) where I could possibly build a small retail strip center. However only reason I have not done so yet is because this is an economically distressed area with not much going on. I feel if there was a light rail station build at this location, it would result in a lot of economic development. Property values would go up and more businesses would open up at this intersection to serve the newly generated traffic. This would be an ideal location for a light rail station to stimulate economic activity. In my potential retail strip center alone, there would be 4-5 new businesses opening up.
1	Build it on SR99. Do not build it on I-5. The travel time would not be competitive with existing express bus service.
1	If some people switch to the train, others (with longer commutes) will take their space on I-5. Single-driver commute times will stay the same. Sprawl will increase.
1	It would be better to build nothing, rather than build along I5. Buinding along the freeway would result in no TOD, additional transfers and travel time, and worthless station walksheds
1	Based on these alternatives, ST hasn't yet determined whether South Link is intended for medium-speed local travel or express regional travel. FWTC is 23 miles from downtown Seattle. I did a comparison of the travel times from locations 23 miles out at a variety of cities in Seattle's size range: Berlin, Lisbon, Montreal, Boston, Washington DC. Answer: most city's rapid transit lines only extend about 10 miles from the city center. Commuter rail is used to serve locations 23 miles out, with typical travel times of 40 to 55 minutes (these lines operate all day long at least hourly). Driving the same distance (with traffic) typically took 30 to 45 minutes. Exception: The Shady Grove Red line in DC extends 23 miles from DC Union Station. Travel time is 40 minutes. Application to South Link: (A) The linear shape of the metro area and is the only justification to build rapid transit south of Angle Lake Station. (B) Long term, this corridor should be served by a new commuter rail/HSR alignment directly serving Sea-Tac airport but generally in the I-5 right-of-way. (C) In the interim, South Link could function as an express commuter rail by building only the stations called out in ST2 along the 99 alignment. 50 minute travel time to downtown is actually reasonable per international standards. (D) If and when the new commuter rail service is built, Link could be converted to medium-distance service by adding all the in-fill stations proposed, and replacing parking garages with mixed-use TOD.
1	Omitted answers to 18 & 19 since its been a while since living in the area and not sure what stations might be best for the community.
1	I feel very strongly that it should be elevated like in Tukwila rather than at-grade like in Seattle. I think that there should be

	some attention to visual enhancements such as landscaping under the line.

23. Do you wish to receive email updates about the Federal Way Transit Extension?

Value	Count	Percent %
Yes - Please provide your email address	0	0.0%
No	0	0.0%
Yes - please provide your email address	0	0.0%

Statistics	
Total Responses	0

APPENDIX D – MEETING ADVERTISEMENTS

- Postcard
- Display Advertisements
- Blog Advertisements

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SOUNDTRANSIT
RIDE THE WAVE

Federal Way Transit Extension

Extending Link light rail to Federal Way

Over the past year, Sound Transit has evaluated alternatives to extend high-capacity transit from the future Angle Lake light rail station on S. 200th Street in SeaTac to the Federal Way Transit Center, a distance of about 7.6 miles. Currently, there is projected funding to construct to Kent/Des Moines. The agency is developing a shovel-ready plan to extend light rail to Federal Way when additional funding is secured.

PLEASE JOIN US!

Scoping meeting dates

June 19, 3–6 p.m.
Federal Way Transit Center Plaza
31621 23rd Ave S.
Federal Way, 98003

June 26, 5–7 p.m.
Parkside Elementary cafeteria
2104 S. 247th St.
Des Moines, 98198

Sound Transit and the Federal Transit Administration will prepare an Environmental Impact Statement (EIS) that evaluates how the project could affect the community and the environment. As the EIS phase gets underway, scoping meetings will be held to give the public and agencies opportunity to provide comments on the project. **Comments will be accepted through July 15, 2013.**

Questions? Please visit soundtransit.org/FWextension or contact Tralayne Myers, Community Outreach Specialist, at 206-398-5014 or tralayne.myers@soundtransit.org.
For information in alternative formats, call 1-800-201-4900/TTY Relay: 711 or email accessibility@soundtransit.org

At the scoping meeting, you will have an opportunity to:

- Learn about the project purpose and need
- Review potential light rail alternatives
- Tell us how the project could affect people and the environment
- Ask project staff questions
- Tell us what you think

How to comment:

- In person: Attend a scoping meeting and fill out a comment form
- Online: Complete a scoping survey at soundtransit.org/FWextension
- Email: FWTE@soundtransit.org
- Mail: Sound Transit, Attn: Kent Hale, 401 S. Jackson St., Seattle, WA 98104

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请致电 1-800-823-9230，向我们了解更多有关"Federal Way 公共交通扩展"的信息，並提供您的反馈意见。

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Extending Link light rail to Federal Way

Federal Way Transit Extension

Please join us!

PUBLIC MEETINGS

June 19, 3–6 p.m.
Federal Way Transit Center Plaza
31621 23rd Ave S.
Federal Way, 98003

June 26, 5–7 p.m.
Parkside Elementary cafeteria
2104 S. 247th St.
Des Moines, 98198

Sound Transit and the Federal Transit Administration will prepare an Environmental Impact Statement that evaluates how this project could affect the community and the environment. Public scoping meetings will be held to give the public and agencies the opportunity to provide comments on options and issues that should be studied. **Public comments will be accepted until July 15, 2103.**

Currently, there is projected funding to construct to Kent/Des Moines. Sound Transit is developing a shovel-ready plan to extend light rail to Federal Way when additional funding is secured.

For more information, contact Tralayne Myers at 206-398-5014 or tralayne.myers@soundtransit.org or visit soundtransit.org/Fwextension.

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Federal Way Transit Extension
PUBLIC MEETINGS
JUNE 19 3–6 p.m.
JUNE 26 5–7 p.m.
click for more information
SOUNDTRANSIT
soundtransit.org

APPENDIX E – MEDIA COVERAGE

- *The Thunderword*, May 30, 2013
- *The Highline Times/Des Moines News,* June 18, 2013
- *Federal Way Mirror*, June 19, 2013
- *The Highline Times/Des Moines News,* July 3, 2013
- *Kent Reporter,* July 9, 2013

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Light Rail moving closer to campus

By Ryan Johnston
Staff Reporter

Sound Transit's Light Rail is moving a bit closer to the Highline campus with the groundbreaking on the line's Angle Lake Station late last month.

The Angle Lake Station on South 200th Street is scheduled to open to riders in late 2016, four years ahead of schedule.

The Angle Lake Station is Part One of the three stations planned for the Kent and Des Moines areas as the link pushes south to, eventually, Tacoma.

The other two stations are planned for Midway near the Highline campus, and near South 272nd Street.

Those are scheduled for completion by 2023.

"We've been working with Highline to extend Light Rail [to the campus]," Kimberly Reason, public information officer for Sound Transit, said.

"[But] in terms of specific location, we haven't decided on one yet," she said.

There has been considerable debate over the route from South 200th Street to the Highline campus area.

The Des Moines City Council has advocated routing the line closer to Interstate 5 in order to minimize the impact on residential areas within the city.

The City of Kent has produced plans for commercial and residential opportunities on the east side of Pacific Highway South in the vicinity of the college.

Right now, students living in Federal Way are out of luck for the near future.

"We have funding to get to the Kent/Des-Moines area, but we'd need additional funding to get to Federal Way," Reason said. South King County lost 41 percent of its tax revenue due to the Great Recession, significantly impacting funding for Light Rail projects, Reason said.

Light Rail will eventually reach to South 320th Street, but no tentative construction date could be given.

In total, construction on Angle Lake Station is estimated to cost $383 million.

U.S. Sen. Patty Murray, D-Wash., worked with the U.S. Department of Transportation to secure $26 million for the project.

Sound Transit will be paying for the rest of the project, unless it can secure more money from the Legislature through grants.

The City of SeaTac and the Port of Seattle are also offering help.

"[They] are key partners with us," Reason said.

The City of SeaTac offered the property necessary to locate Angle Lake Station just west of International Boulevard, behind the Bull Pen Tavern.

The Port of Seattle could offer construction and/or monetary help, Reason said.

The Angle Lake Station will include a 700-stall parking garage providing parking for commuters using the station. Four hundred interim spaces are also included, providing intermediary parking for other stations.

Sherry Holt/THUNDERWORD

Construction has begun on the Angle Lake Station on South 200th Street north of Highline.

Gone with the weeds: Goats finish spring cleaning

Rebecca Starkey/ THUNDERWORD

Campus friendly goats came last week for the second time this year to help clean up some of the invasive species here on campus. The goats have been coming to Highline as part of the campus's efforts to go green.

Spotlight will shine tonight on students of color

By Jawaahir Omar
Staff Reporter

The Seventh Annual Multicultural Graduation Reception unfolds tonight, May 30, from 6-8 p.m. in the Mount Townsend room of the Student Union.

This years' theme is Shine Bright Like a Diamond.

The event is open to all students, faculty and staff and will focus on students of color who have conquered challenges during their college experience, Director of Multicultural Affairs and Leadership Natasha Burrowes, said.

Multicultural Affairs is sponsoring the event and guest speakers will include two student leaders and Dr. Rolita Ezenu, dean of Instruction, Transfer and Pre-College Education.

"[This event is] to celebrate and acknowledge students of color," Burrowes said.

Although all students are invited to attend and invite their families, only students who pre-registered will receive a stole to wear at Commencement on June 12.

Live music and light refreshments will be provided.

Junior Little League Softball state champion crowned The perilous pathway to the 2013

SLIDESHOW: To Burien and back again Jerry Gay's been on an eventful journey Former

Arrest of Big Top Bandits suspects tops police blotter By Shara Wallace HIGHLINE

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NEWS

Man Rams Truck into Hospital

Review: Stirring drama for a late summer evening presented in Burien

Highline Historical Society seeks items for exhibit

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Law enforcement officers learn about identity theft during Burien seminar

Letter: Supports Obama's climate change plan

B-Town and Beat Music Artwalk will rock the town Aug. 1

Crowd overflows chambers as SeaTac

Sound Transit hosts open house on Des Moines transit extension

06/18/2013

Sound Transit is conducting an open house June 26 at Parkside Elementary, 2104 S. 247th St., 5-7 p.m. to seek public comment on its evaluation of alternatives to extend Link light rail from SeaTac to the Kent/Des Moines and Federal Way areas.

The current work will support efforts to reach the Kent/Des Moines area in 2023 and go further when funding is available.

The agency expects to obtain a Record of Decision from the Federal Transit Administration (FTA) in 2016, with construction to Kent/Des Moines planned to begin in 2019.

During the last year, Sound Transit has evaluated alternatives between the Angle Lake light rail station at SeaTac's South 200th Street, scheduled to open in 2016, and the Federal Way Transit Center, a distance of about 7.6 miles.

The meeting will give the public the opportunity to provide comments on analysis done to date and suggest options and issues to be studied further as planning work continues.

Sound Transit and the FTA will prepare a draft environmental impact statement analyzing alternatives. The events are part of a formal environmental planning public comment period that continues until July 15.

Following the open house and a review of the input provided by the public during the comment period, the Sound Transit Board expects to identify the alternatives to be further evaluated in a draft EIS starting this fall.

The draft EIS will examine how project alternatives could affect the community and environment and should be available for public and agency review in late 2014. A Final EIS is planned for 2015.

In 2008, voters approved the extension of light rail from Sea-Tac Airport to South 272nd Street at the northern edge of Federal Way as part of the Sound Transit 2 package.

The extension beyond Kent/Des Moines lacks funding due to the impact of the national recession on local tax revenues, with a projected 41 percent drop in Sound Transit 2 revenues for South King County.

The analysis underway will establish a shovel-ready plan to extend light rail to the heart of Federal Way by supporting project eligibility for federal funding and efforts by Sound Transit to secure additional funding.

Additional opportunities for public involvement will occur throughout the environmental and design process.

For more information on the Federal Way Transit Extension, go to soundtransit.org/FWextension.

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lawmakers place minimum wage measure on ballot

Burien sends out proposal requests for city manager search firms

Letter: Burien not mailing newsletter to Area Y residents

Boeing Employees Community Fund supports upgraded family rooms at Highline Medical Center

CLARIFICATION: Burien animal control officer available for emergencies after hours

Highline Director of Technology Services earns rigorous certification

Dates reversed for Burien Shakespeare in Park performances

Burglars caught in the act stealing firearms from North Highline home

Letter: Klan group litters Burien neighborhood with flyers

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Community Calendar Week of 7-22-13

We encourage our readers to comment. No registration is required. We ask that you keep your comments free of profanity and keep them civil. They are moderated and objectionable comments will be removed.

Comments for this thread are now closed.

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Letter: Response to potential paper-eater 1 comment

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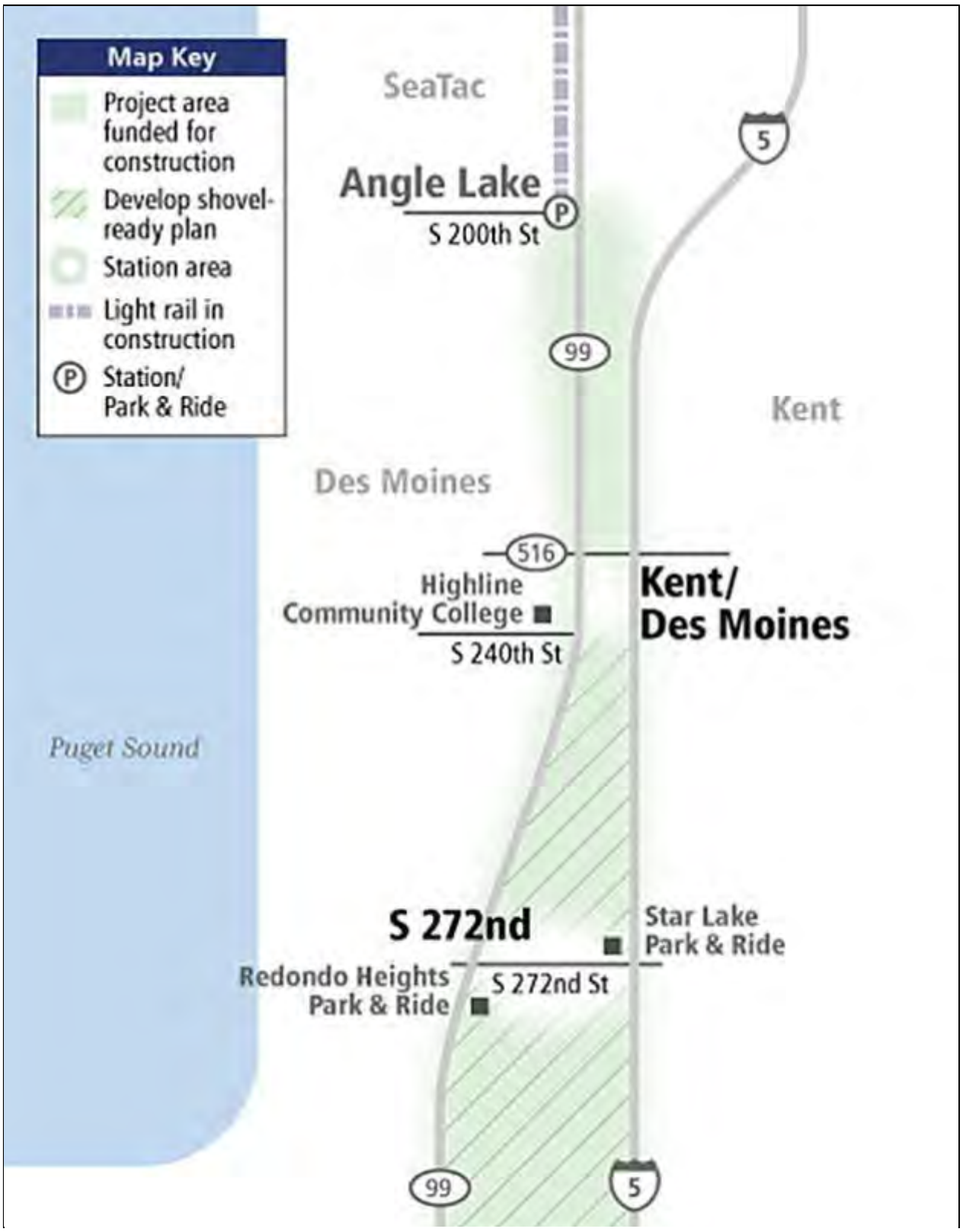
Light rail: Sound Transit explores possible routes to FW



COURTESY OF SOUND TRANSIT
Sound Transit is evaluating alternatives to extend light rail from the future Angle Lake light rail station on South 200th Street in SeaTac to the Federal Way Transit Center, a distance of about 7.6 miles. Currently, there is projected funding to build the extension to Kent/Des Moines.

By GREG ALLMAIN
Federal Way Mirror reporter
JUNE 19, 2013 · 2:40 PM

Representatives of Sound Transit were in Federal Way this week to give updates on the "alternatives analysis" related to potential alignments for a light rail connection to the city.

The five alignments for a possible connection to Federal Way include two that would move along I-5, two that would move along SR 99, and one that would dip into the city of Des Moines.

This whole process is to make the project "shovel ready" in case funding - which Sound Transit thought it would secure with the 2008 ST2 ballot measure - becomes available in the future, said Cathal Ridge, light rail development manager.

At the Federal Way City Council's June 18 meeting, Ridge explained that the next stage of project development is the public comment period for the Environmental Impact Statement (EIS).

"We're moving forward on this process all the way down to Federal Way…(that) if we can find or come across funding at some point in the future, we'll be able to move forward with the project development process, and have the (EIS) already in place," he said.

Two changes had occurred since Ridge last presented before the council in March. The first was the development of a "hybrid" alignment along SR 99, and the other was the inclusion of "transit oriented development" (TOD) in Sound Transit's planning processes.

Ridge indicated that the "new" alignment along SR 99 would switch back and forth along the east and west side of the roadway, in an attempt to avoid issues with major intersections along that route. This is being considered, he said, because of cost factors that would be involved with building the connection through those intersections.

In addition, right-of-way issues would have to be taken into consideration, Ridge said.

"Obviously, the issue with that is it would have commercial or residential impacts on whatever side of the street it happens to be on," he said.

Transit oriented development is a planning tool Sound Transit recently integrated into its planning processes that looks at a number of factors when considering large-scale projects like this, Ridge said.

"It looks at a number of things," he said. "We looked at population, households, employment, activity centers."

Essentially, transit oriented development is an attempt to see if planned projects will be built in an area with access and populations to use them. Ridge said they looked at the TOD opportunities along the alignment routes, and also in conjunction with the possible station locations that would be built as part of any future project.

Ridge said that TOD did come into consideration with two new station locations that had been suggested by the public in the previous round of public comment. Those locations were along SR 99 at 216th Street and 260th Street, he said, but cautioned that those ideas are probably pretty much static for now.

"These (stations) were not considered in the ST 2 plan, they were not voter approved. We cannot use ST 2 funding to construct these station locations," he said, referring to the Sound Transit 2 proposal that voters approved in 2008 to bring light rail to South 272nd Street in Federal Way.

Sound Transit has enough funding to build light rail from South 200th Street to Kent/Des Moines (near Highline Community College). Light rail may not reach the northern edge of Federal Way until 2034 or later. The ultimate goal is to connect light rail to the Federal Way Transit Center.

Public comment

Those interested in providing comment can mail a letter to Kevin Hale, Sound Transit, 401 Jackson St, Seattle, WA 98104, email FWTE@soundtransit.org, visit www.soundtransit.org/FWextension or attend a public meeting and fill out a comment form.

The first public meeting was held June 19 at the Federal Way Transit Center. Another meeting is scheduled from 5 to 7 p.m. June 26 at Parkside Elementary in Des Moines.

Contact Federal Way Mirror reporter Greg Allmain at gallmain@fedwaymirror.com or 253-925-5565 ext. 5054.

Find this article at:
http://www.federalwaymirror.com/news/212223841.html

☐ Check the box to include the list of links referenced in the article.

Junior Little League Softball state champion crowned The perilous pathway to the 2013

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Arrest of Big Top Bandits suspects tops police blotter By Shara Wallace HIGHLINE

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Law enforcement officers learn about identity theft during Burien seminar

Letter: Supports Obama's climate change plan

B-Town and Beat Music Artwalk will rock the town Aug. 1

Crowd overflows chambers as SeaTac

Photo by Katie Nelson

Residents look over alternative locations for the Des Moines light-rail station.

Where should Des Moines light-rail station go?

07/03/2013

By Katie Nelson
HIGHLINE TIMES

Approximately 30 community members congregated at Parkside Elementary School in Des Moines on June 26 to give their input on the extension of light rail service from the Federal Way Transit Center to the new Angle Lake station, which is currently under construction.

The light rail route passes by Kent-Des Moines Road, where Sound Transit is hoping to erect a new station by 2023.

The public meeting is part of an environmental impact statement scoping survey, which is the second step on the project's continuum. The purpose of scoping is to gain public opinion on the location of potential building areas.

"Our goal is to determine the range of alternatives to study for the draft of the environmental impact statement," said Kimberly Reason, Sound Transit spokesperson. "What we want to do is explain to the constituents in the corridor what the Federal Way Transit Center project is, where we are right now in terms of what kinds of alignments we're studying … what the cost parameters are, and what we're looking at down the road here."

The building process has been hindered largely due to the onset of the recession in 2008, according to Reason. Because 90 percent of Sound Transit's funds are obtained through sales tax, the economic downturn resulted in the loss of $4.1 billion, which would have gone toward the ballot measure supporting the light rail extension. This means that the original building timeline developed in November 2008, which predicted the entire extension's completion by 2023, will be pushed back. Sound Transit's new timeframe includes building the Kent-Des Moines Road station by 2023.

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Burien sends out proposal requests for city manager search firms

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Highline Director of Technology Services earns rigorous certification

Dates reversed for Burien Shakespeare in Park performances

Burglars caught in the act stealing firearms from North Highline home

Letter: Klan group litters Burien neighborhood with flyers

Wesley Homes in Des Moines to offer monthly rentals

Community Calendar Week of 7-22-13

While the funds for building to Kent-Des Moines Road are nearly cemented, the exact location for the light rail's route is not. Part of the meeting included images portraying optional locations for both stations and tracks, known as alignments.

"Right now we're looking at a total of 10 stations in the study area … and five different alignments," Reason said. "We're looking at alignments on Highway 99, as well as I-5."

As far as which options are considered the best, Reason said it is too early to tell, and that all options are being weighed equally.

"That's what this whole [scoping] process is about, to thoroughly look at the impact, how much right of way are we going to need to acquire, how much transit-oriented development, how much ridership, travel time, what elements might impede, delay or make more expensive each of those alignments," she said.

Pati Guenther, a Des Moines resident who lives on the north side of Highline Community College, was present at the June 26 meeting and had attended several other events pertinent to the construction over the past few years. The future location of the Kent-Des Moines Road station is near the college, ensuring an alignment will run somewhere alongside it.

While Guenther remarked that she will definitely use the service and is excited for it to be built, she also expressed uncertainty.

"I'm just curious as to how it's going to affect my home and where I live and my neighborhood," Guenther said. "I have the concern that probably most of the homeowners have, and that is, 'How is this going to affect the worth of my property?'"

The project's next step is to evaluate community responses and to create an environmental impact statement, which will help determine the best locations for the stations and alignments. The EIS will be drafted in late 2013 and early 2014.

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Sound Transit seeks best light rail route through Kent

By STEVE HUNTER
Kent Reporter Courts, government reporter
JULY 9, 2013 · 4:43 PM

COURTESY GRAPHIC, SOUND TRANSIT
Sound Transit will expand light rail to Kent by 2023.

Sound Transit officials are trying to figure out in the next few years where to build light rail tracks when they extend the line along Kent's West Hill by 2023.

After numerous studies and public input, Sound Transit has narrowed the options to five potential routes, mainly along Pacific Highway South or Interstate 5, as it aims for a decision on a preferred route by 2015 with a final selection in 2016.

Light rail is funded to be built from South 200th Street in SeaTac to Kent/Des Moines near Highline Community College, just north of South 240th Street.

But transit officials are designing a route to South 272nd Street in Federal Way, including $8 million in the 2013 budget for project development. Officials want the route designed to Federal Way in case money becomes available to build the line that far.

Cathal Ridge, South Corridor development manager of Sound Transit, presented an update about the project July 2 to the Kent City Council at a workshop.

"By late 2016 the board will select a project (route) to build," Ridge said to the council.

Here are the options:

• Interstate 5 westside

This route along the west side of I-5 could cause problems because the state Department of Transportation (DOT) has limited right-of-way north of 240th Street. The DOT also may want to use the right-of-way to add toll lanes, Ridge said.

• I-5 mix

Part of the route along the west side of the freeway and part of it down the freeway median. Sound Transit is uncertain if the median is available if DOT wants to expand freeway lanes.

• State Route 99 (Pacific Highway)

Tracks could be elevated and go down the median of SR 99, also known as Pacific Highway South. This would cause minimal impact to existing vehicle lanes and businesses but would be an issue at crossing intersections and where the highway doesn't have a median.

• 30th Avenue South

Elevated along the west side of the street that runs east of Pacific Highway South. Could be difficult to transition the track from Pacific Highway to 30th Avenue.

• State Route 99 (Pacific Highway) hybrid

Track would run along west side of street in some areas; down the median in some areas and along the east side in other areas. Track would be elevated in most areas, at-grade in others.

"I've been tracking this for a couple of years and the hybrid (option) looks like the more elegant solution I've seen," said Councilwoman Elizabeth Albertson in response to the proposals listed by Ridge.

"We looked at all of the configurations and screened out a lot," Ridge said. "It was not good to go all on the east side or all on the west side. It (the hybrid) is kind of the best of all worlds. But this is out there for consideration, it's not how it has to be. There may be questions about why it's on the east side or the west side (at certain spots)."

Sound Transit also needs to determine where to put stations and how many stations to have. Right now the primary stations are expected to be at Kent/Des Moines near Highline Community College and at South 272nd Street (either along I-5 or SR 99).

Light rail currently runs from Sea-Tac Airport to downtown Seattle. Sound Transit has started construction on a new 1.6-mile line from the airport south to South 200th Street in SeaTac that is expected to open in 2016. That route will run on an elevated guideway primarily along 28th Avenue South and is budgeted for $72 million this year.

Sound Transit gets the majority of its funding through sales taxes, vehicle licensing fees, federal grants and fare box revenue.

Voters initially approved funding light rail in 1996 and approved a sales tax increase in 2008 to fund expansion projects through 2023 to Southwest King County, Overlake and Lynnwood.

Ridge said once a route is picked, it will take until 2014 to compile a draft Environmental Impact Statement (EIS) and until 2016 to get a final EIS. Design of the project takes another two to three years. Construction takes three to four years, with a projected start of construction in 2019. That pushes the project completion date to 2023.

Councilman Bill Boyce asked Ridge if Sound Transit had heard any strong opposition to the project.

"No, not yet," Ridge said. "I don't know if that's good or bad. Maybe people don't know about the project. But we sent mailings to everyone in or near the corridors."

For more information and to comment about Sound Transit's light rail plans, go to www.soundtransit.org/Projects-and-Plans/Federal-Way-Transit-Extension.

Contact Kent Reporter Courts, government reporter Steve Hunter at shunter@kentreporter.com or 253-872-6600, ext. 5052.

Find this article at:
http://www.kentreporter.com/news/214836711.html

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APPENDIX F – INFORMATION MATERIALS

- EIS Scoping Folio
- Alternatives Analysis Summary
- Public Scoping Meeting Displays

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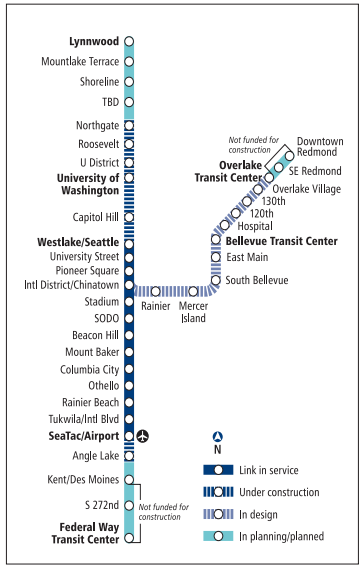
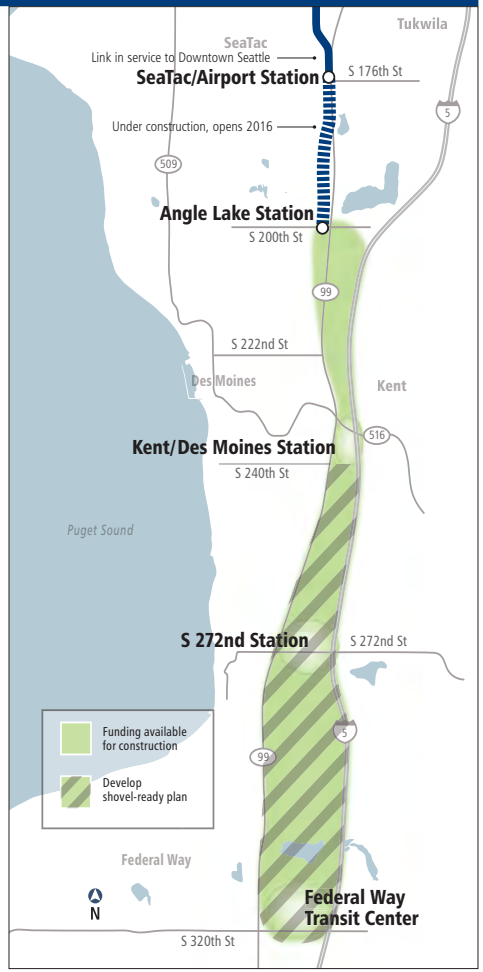
FEDERAL WAY TRANSIT EXTENSION

Expanding the regional transit system

In 2008, the region's voters approved Sound Transit 2, a major expansion of the regional transit system with substantial extensions of Link light rail throughout the region plus more Sounder train and ST Express bus services.

Link light rail system





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Naga soo wac 1-800-823-9230 si aad wax badan uga ogaato Fidinta Federal Way Transit oo aad uga dhilbato ra'yigaaga.

Tawagan kami sa 1-800-823-9230 upang malaman ang mas marami pa ukol sa Federal Way Transit Extension (Pagdurugtong ng Sistemang Sasakyang Pampubliko sa Federal Way) at magbigay ng inyong komentaryo.

Xin gọi cho chúng tôi ở số điện thoại 1-800-823-9230 để biết thêm tin tức về Hệ Thống Chuyên Chở Mở Rộng Đến Federal Way và cho biết ý kiến của quý vị.

请致电 1-800-823-9230，向我们了解更多有关"Federal Way 公共交通扩展"的信息，並提供您的反馈意见。

SOUNDTRANSIT
RIDE THE WAVE

Federal Way Transit Extension

JUNE 2013

Extending link light rail to Federal Way

Sound Transit is evaluating alternatives to extend light rail from the future Angle Lake light rail station on South 200th Street in SeaTac to the Federal Way Transit Center, a distance of about 7.6 miles. Currently, there is projected funding to build the extension to Kent/Des Moines.

Project Funding

In 2008 voters approved the extension of light rail from Sea-Tac International Airport to South 272nd Street at the northern edge of Federal Way as part of the Sound Transit 2 package. Based on current revenue forecasts, Sound Transit has enough funding to build light rail from South 200th to Kent/Des Moines and is working to ensure that the segment to the Federal Way Transit Center is ready for construction once funding is secured.

Purpose and Need Statement

The Purpose and Need Statement is intended to briefly explain the underlying purpose and need for the project (see Purpose and Need Statement insert). The scoping process provides an opportunity for public and agency comments about the Purpose and Need statement through July 15, 2013.

Sound Transit plans, builds and operates regional transit systems and services to improve mobility for Central Puget Sound.

Sound Transit | 401 S. Jackson St. | Seattle, WA 98104-2826 | 1-800-201-4900 / TTY Relay: 711 | main@soundtransit.org | www.soundtransit.org

Alternatives Analysis

Sound Transit and the Federal Transit Administration (FTA) have conducted an Alternatives Analysis (AA) to start the public planning and environmental phases for this project. An AA is a way to evaluate costs, benefits, and impacts of a range of alternatives designed to meet the purpose and need of the people and community in the project corridor.

Multiple alternatives are being considered to study in the Environmental Impact Statement (EIS) including a No-Build alternative and five light rail alternatives. Potential alternatives came from regional and local planning studies and from the public and agencies comments received during the early scoping process from Oct. 18 to Nov. 19, 2012. Reports related to the AA process are available on the project website at: www.soundtransit.org/FWextension.

Environmental review

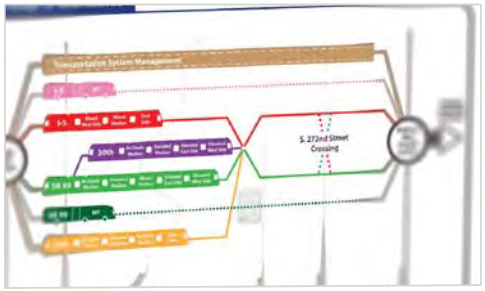
Sound Transit and the FTA will prepare an EIS under the National Environmental Policy Act (NEPA) and Washington State Environmental Policy Act (SEPA) to further examine how the project could affect the community and environment. In fall 2013, the Sound Transit Board will identify the alternatives to be further evaluated in the draft EIS. The draft EIS is anticipated for public and agency review in late 2014.

Environmental scoping meetings

Sound Transit is considering five potential alternatives for further analysis in the environmental review process (*see insert*: What alternatives are being considered?):

Sound Transit invites comments on the potential alternatives, purpose and need statement and impacts on the environment:

- In Person: Attend a scoping meeting and fill out a comment form
- Online: Complete a scoping survey at soundtransit.org/FWextension.
- Email: FWTE@soundtransit.org
- Mail: Sound Transit, Attn: Kent Hale, 401 S. Jackson St., Seattle, WA 98104
- 30-day comment period ends July 15, 2013.



Currently there is sufficient funding to build light rail to Kent/Des Moines

Early Scoping & Alternatives Analysis → **Environmental Review** → **Final Design** → **Construction** → **Testing & Pre-operations** → **Start of Service**

Early Scoping & Alternatives Analysis — 2017 – 2018

Analyze a range of transit modes and alignment alternatives. Narrow these to a range of alternatives to consider.

Oct 2012
Public comment

June 2013
Alternatives Analysis Report
Determine the range of alternatives and "scope" of issues to study in the EIS.

June 2013
Public comment

Sept 2013
Sound Transit Board identifies alternatives for EIS

We are here

Environmental Review — 2019 – 2022

Describe the benefits and adverse effects of each alternative. Outline ways to avoid, minimize or mitigate negative effects.

Late 2014
Draft EIS

Late 2014
Public comment

Early 2015
Sound Transit Board identifies preferred alternative

Mid 2016
Final EIS
Respond to comments received on the Draft EIS. Outline mitigation for unavoidable environmental impacts.

Late 2016
Sound Transit Board selects project to build

Late 2016
Federal Transit Administration issues Record of Decision
Document what project Sound Transit will build and how it will avoid, minimize and mitigate for environmental impacts.

Final Design — 2022 – 2023

Construction — 2023

Testing & Pre-operations — 2023

Start of Service

STAY INVOLVED!
Join us for environmental scoping meetings

June 19, 3–6 p.m.
Federal Way Transit Center Plaza
31621 23rd Ave S.
Federal Way, 98003

June 26, 5–7 p.m.
Parkside Elementary cafeteria
2104 S. 247th St.
Des Moines, 98198

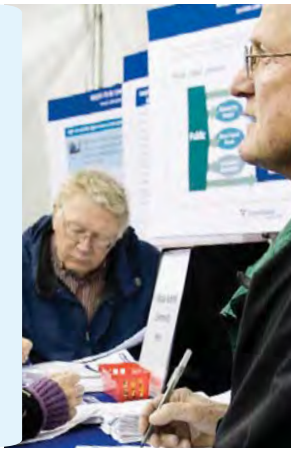
To request accommodations for persons with disabilities or information in alternate formats, call 1-800-201-4900/TTY Relay: 711 or email accessibility@soundtransit.org.

Find project information, updates and upcoming events on our website. Please visit **www.soundtransit.org/FWextension**

For additional information about Federal Way Transit Extension or to request a project briefing for your organization, contact Tralayne Myers, South Corridor Outreach Specialist, at 206-398-5014 or tralayne.myers@soundtransit.org.

Receive E-mail Updates

Sign up for email updates at www.soundtransit.org/subscribe



Federal Way Transit Extension

Purpose and Need Statement

The following is a Purpose and Need Statement for review during this Scoping process. After considering the Scoping comments received, the Federal Transit Administration under the National Environmental Policy Act and Sound Transit under the State Environmental Policy Act will finalize the Purpose and Need Statement and determine the range of alternatives to be evaluated in the EIS.

The purpose of the Federal Way Transit Extension is to expand the Sound Transit Link light rail system from SeaTac to the cities of Des Moines, Kent, and Federal Way in King County in order to meet the following objectives:

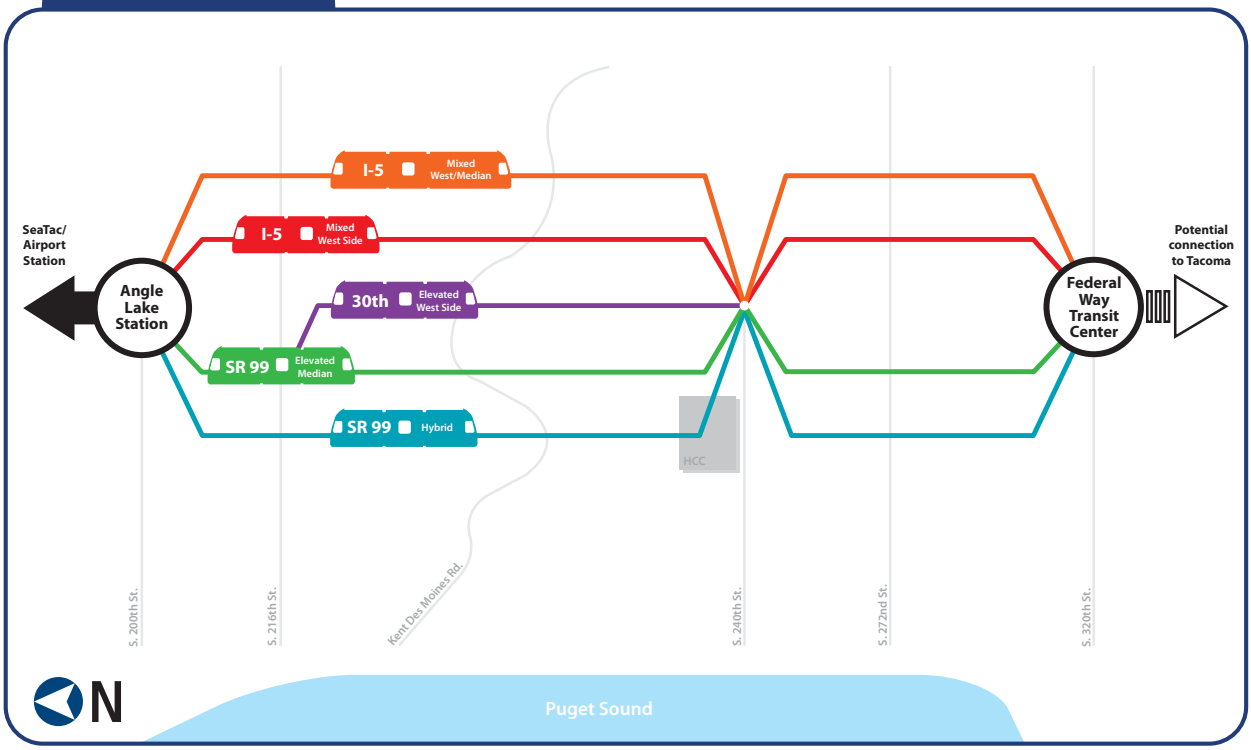
- Provide a rapid, reliable, accessible, and efficient alternative for travel to and from the corridor and other urban growth and activity centers in the region with sufficient capacity to meet projected demand.
- Expand mobility alternatives to traveling on congested roadways and improve connections to the regional multimodal transportation system with peak and off-peak service.
- Provide the high-capacity transit (HCT) infrastructure to support adopted regional and local land use, transportation, and economic development plans.
- Advance the long-range vision, goals, and objectives for transit service established by the Sound Transit Long-Range Plan for high-quality regional transit service connecting major activity centers in King, Pierce, and Snohomish counties.
- Implement a financially feasible system that seeks to preserve and promote a healthy environment.

The following conditions within the project corridor demonstrate the need for the project:

- North-south transit demand is expected to grow by 30 to 40 percent by 2035 as a result of residential and employment growth in the FWTE corridor and regionally.
- The FWTE corridor population is a highly transit-dependent population with needs for efficient, reliable regional connectivity.
- Congestion on I-5 and on the key corridor arterials leading in and out of the study area will increase and further degrade existing transit performance and reliability.
- There is a lack of reliable and efficient peak and off-peak transit service connecting persons in the FWTE corridor with the region's growth centers.
- Regional and local plans call for HCT in the corridor consistent with PSRC's *VISION 2040* and the *Regional Transit Long-Range Plan*.
- Implementing the project will help meet environmental and sustainability goals of the state and region, including reduced vehicle miles traveled and greenhouse gas emissions.

What alignment alternatives are being considered?

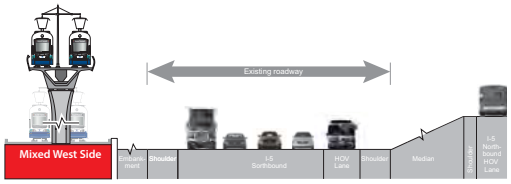
Level 2 Alternatives



SR 99 Hybrid Alternative

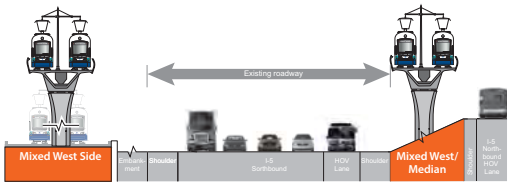
About the five alignment alternatives

I-5 Mixed West Side



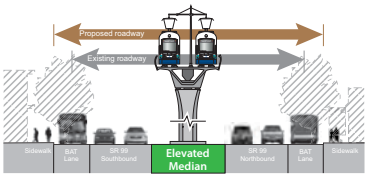
Traffic	ROW Effect	TOD Potential	Cost	Visual/ Noise	Complexity
Low Effects	High Residential (north of 240th)	Weaker along I-5	1.5 Billion	Residential along I-5	I-5 Expansion, Landfill, Water Tanks, Substation

I-5 Mixed West/Median



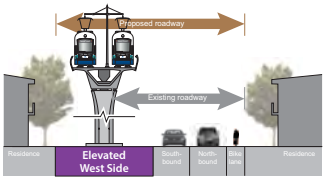
Traffic	ROW Effect	TOD Potential	Cost	Visual/ Noise	Complexity
Low Effects	High Residential (north of 240th)	Weaker along I-5	1.6 Billion	Residential along I-5	I-5 Expansion, transitions to I-5 Median

SR 99 Elevated Median



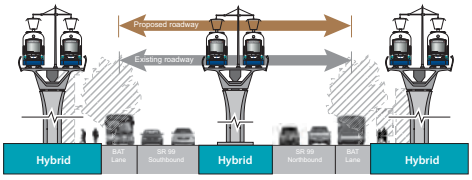
Traffic	ROW Effect	TOD Potential	Cost	Visual/ Noise	Complexity
Moderate Effects	Moderate Residential and Commercial	Stronger along SR 99	1.8 Billion	Residential East/ West of SR 99	Utilities, Hazmat, Major Intersections

30th Elevated West Side



Traffic	ROW Effect	TOD Potential	Cost	Visual/ Noise	Complexity
Moderate Effects	High Residential (along 30th)	Stronger along SR 99	1.8 Billion	Residential along 30th Ave. S.	Utilities, Hazmat, Major Intersections

SR 99 Hybrid



Traffic	ROW Effect	TOD Potential	Cost	Visual/ Noise	Complexity
Low Effects	Moderate Residential, High Commercial	Stronger along SR 99	1.8 Billion	Residential East/ West of SR 99	Utilities, Hazmat, Topography

What results were common to all Level 2 alternatives?

- Daily Ridership ▸ 23,000 Riders
- Travel Time ▸ 14 to 15 mins
- Population ▸ 35,000 to 36,000 people
- Employment ▸ 11,000 to 14,000 Jobs
- Households ▸ 13,000 to 14,000 Households

How did we assess TOD Potential?

- Population
- Households
- Employment
- Activity Centers
- Existing/Planned Land Use
- Existing Vacant/Underutilized Parcels
- Existing/Planned Bus Access
- Existing/Planned Ped/Bike Access
- Potential Development Plans

SOUNDTRANSIT
RIDE THE WAVE

Federal Way Transit Extension

JUNE 2013

What is the environmental review process?

Steps in preparing an EIS

Early Scoping and Alternatives Analysis (2012-2013)
Analyze a range of transit modes and alignment alternatives. Narrow these down to a range of alternatives to consider.

Scoping (2013) — We are here
Determine the range of alternatives and "scope" of issues to study in the EIS.

Draft EIS (2013-2014)
Describe the benefits and adverse effects of each alternative.

Outline ways to avoid, minimize or mitigate negative effects.

Final EIS (2015-2016)
Respond to comments received on the Draft EIS.

Identify preferred alternative.

Outline mitigation for unavoidable environmental impacts.

Record of Decision (2016)
Document what project Sound Transit will build and how it will avoid, minimize and mitigate for environmental impacts.

Public review and comment

Sound Transit and the Federal Transit Administration will prepare an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) and the Washington State Environmental Policy Act (SEPA). In the EIS, Sound Transit will evaluate how the project could affect the community and the environment.

What is typically studied in an EIS?

Transportation:
- Transit
- Traffic

Natural environment:
- Air quality
- Greenhouse gas emissions
- Ecosystems
- Water resources
- Geology and soils

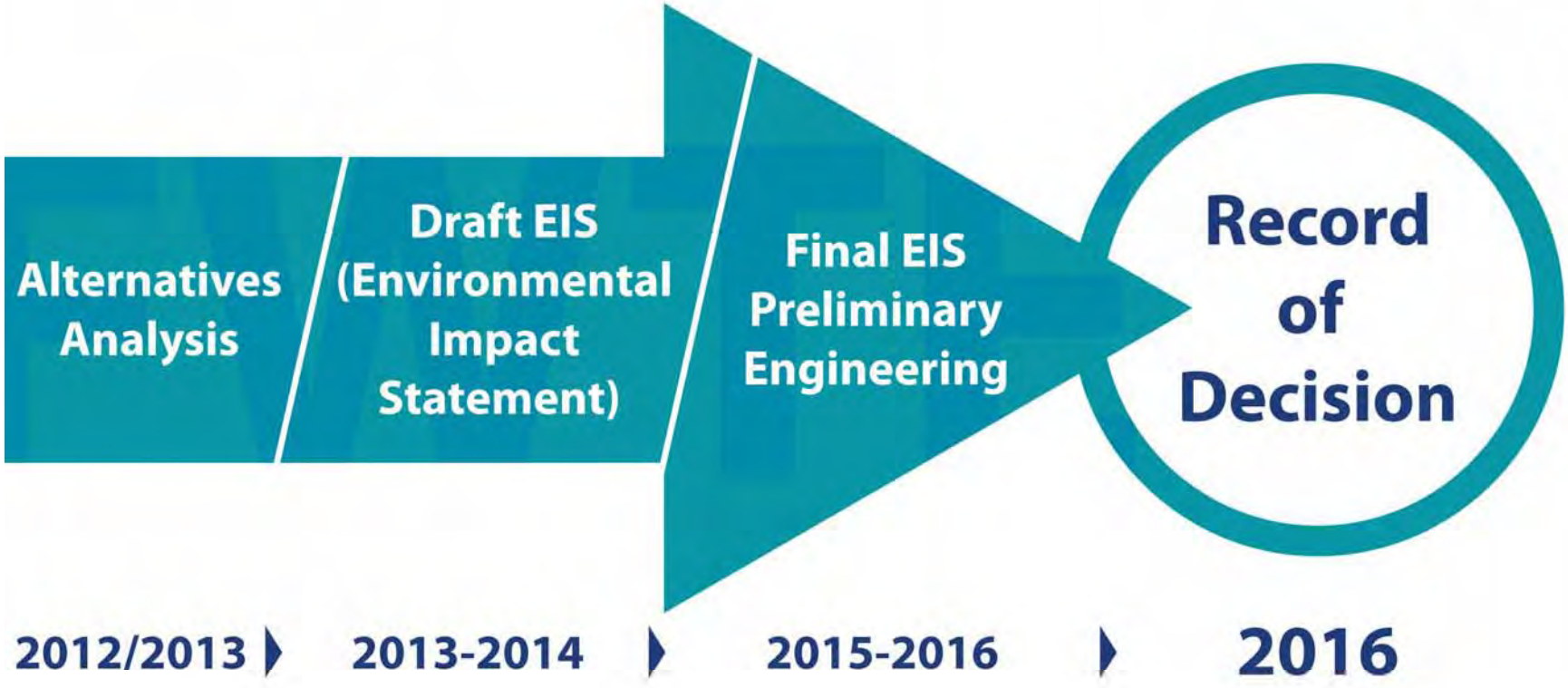
Community impacts:
- Noise and vibration
- Visual effects
- Land use and economic activity
- Acquisitions, displacements and relocations
- Energy use
- Hazardous materials
- Public services and utilities
- Impacts on low-income and minority populations
- Cultural, historic and archaeological resources
- Parks
- Construction impacts

Federal Way Transit Extension

Alternatives Analysis Summary

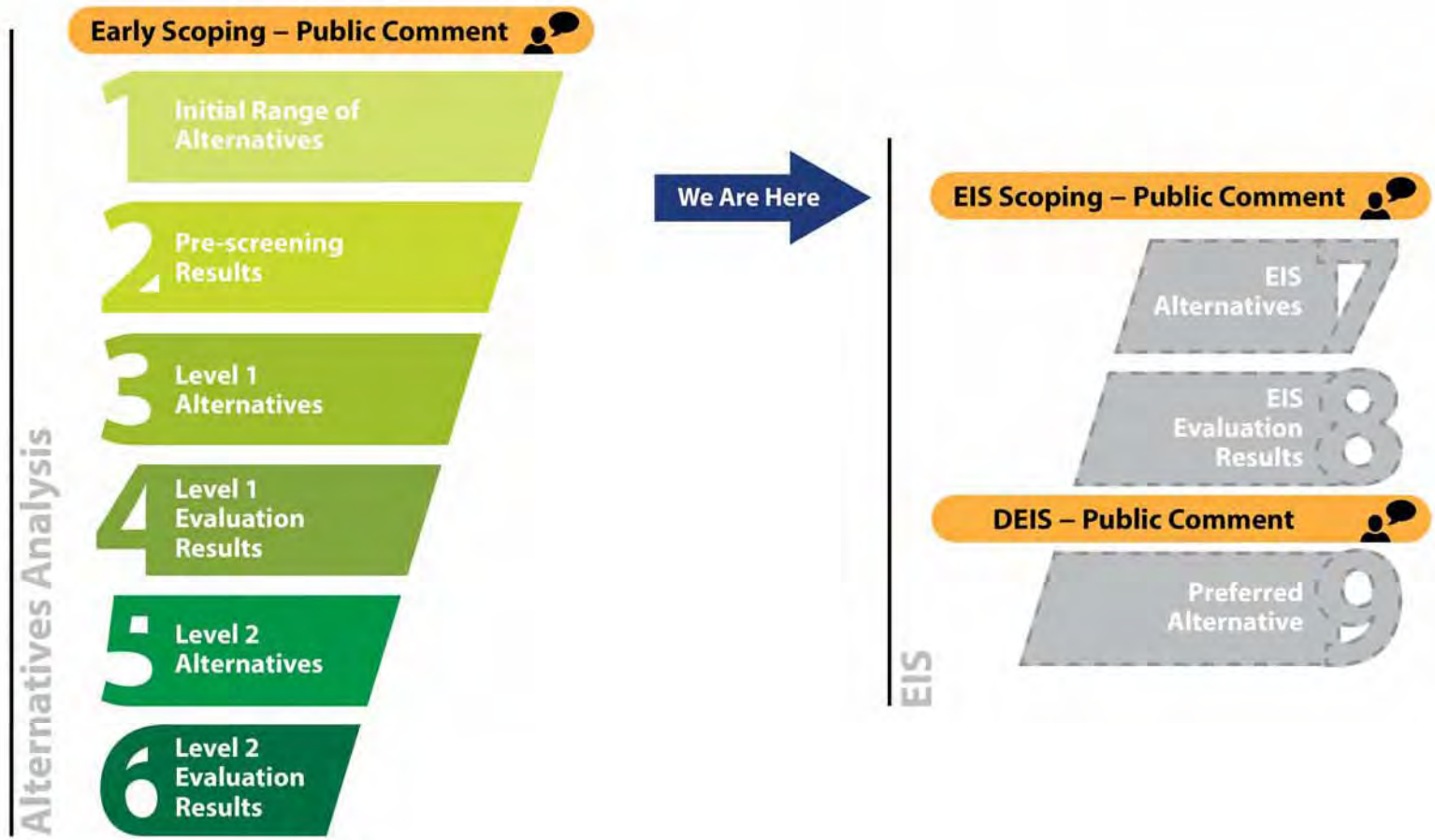
June 2013

Sound Transit is evaluating alternatives to extend high capacity transit from the future Angle Lake light rail station on South 200th Street in SeaTac to the Federal Way Transit Center.



The Alternatives Analysis (AA) phase is almost done. It will be followed by a Draft Environmental Impact Statement (EIS) phase through 2014, and a Final EIS phase through mid-2016. The environmental review process will conclude with a Record of Decision from the Federal Transit Administration in late 2016.

Alternatives Analysis Process



Sound Transit began the AA phase with an Early Scoping public comment period in October 2012. The results of the AA are now available and will be presented to the public during the EIS Scoping period in June 2013.

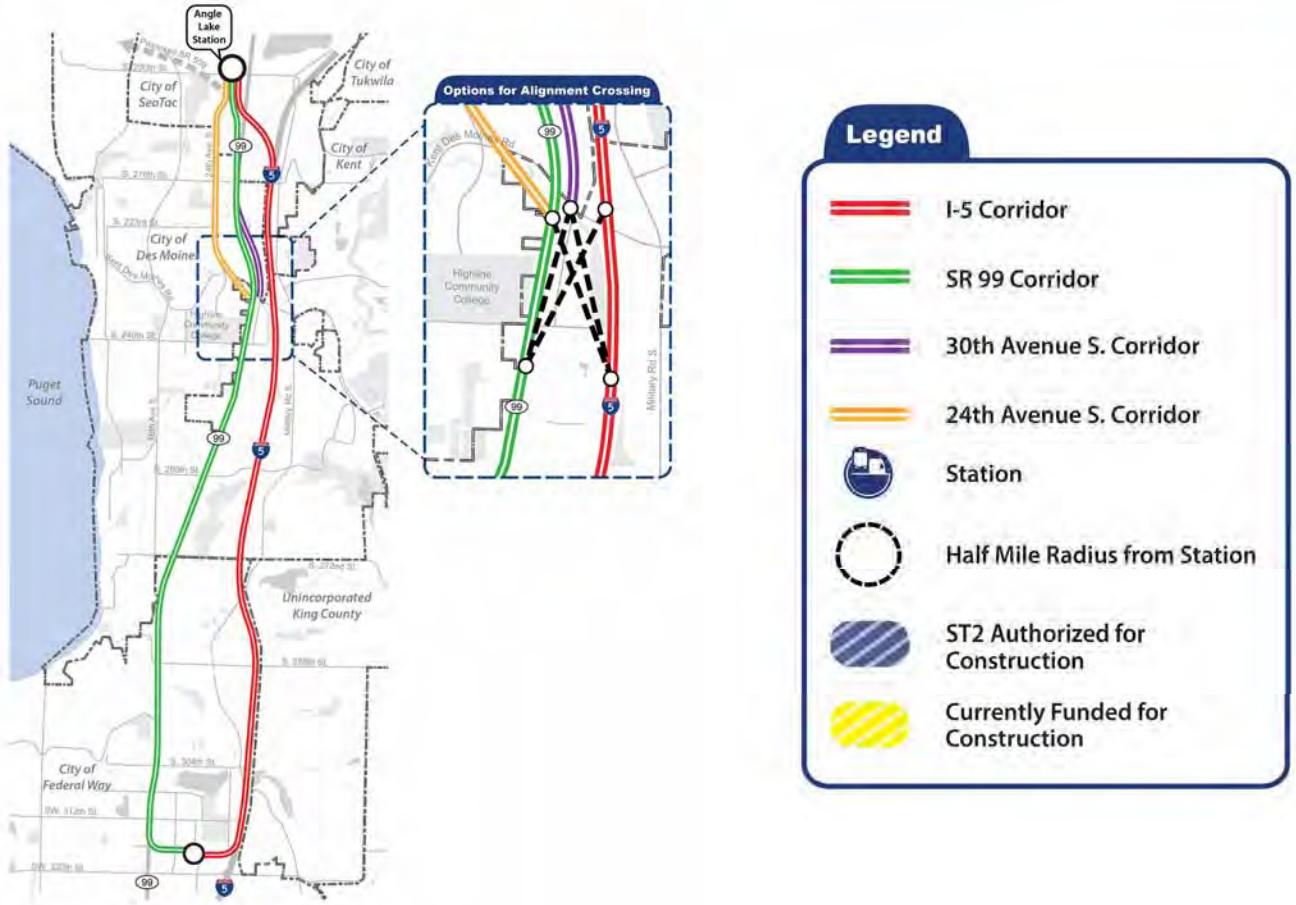
Initial Range of Alternative Corridors

Legend

- I-5 Corridor
- SR 99 Corridor
- 30th Avenue S. Corridor
- 24th Avenue S. Corridor
- Station
- Half Mile Radius from Station
- ST2 Authorized for Construction
- Currently Funded for Construction

Based on public input during the Early Scoping public comment period, Sound Transit studied alternatives along the I-5 Corridor, SR 99 Corridor, as well as along 24th Avenue South and 30th Avenue South in the City of Des Moines.

Initial Range of Alternative Corridors

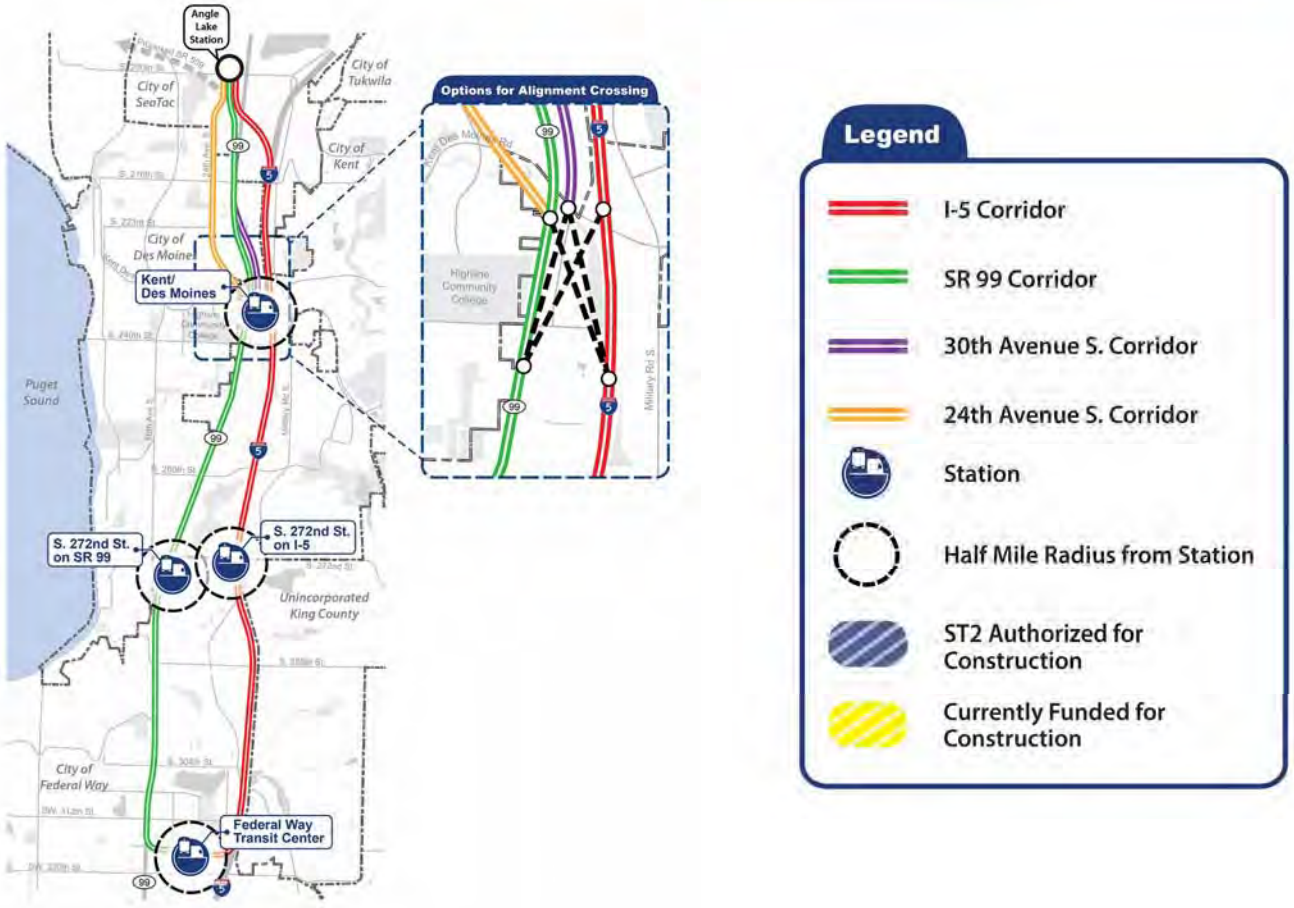


In the Kent/Des Moines area, the alignment could potentially transition from one corridor to another. The enlarged box shows potential crossing options.

Federal Way Transit Extension
Alternatives Analysis Summary

Initial Range of Alternative Corridors

SOUNDTRANSIT
RIDE THE WAVE



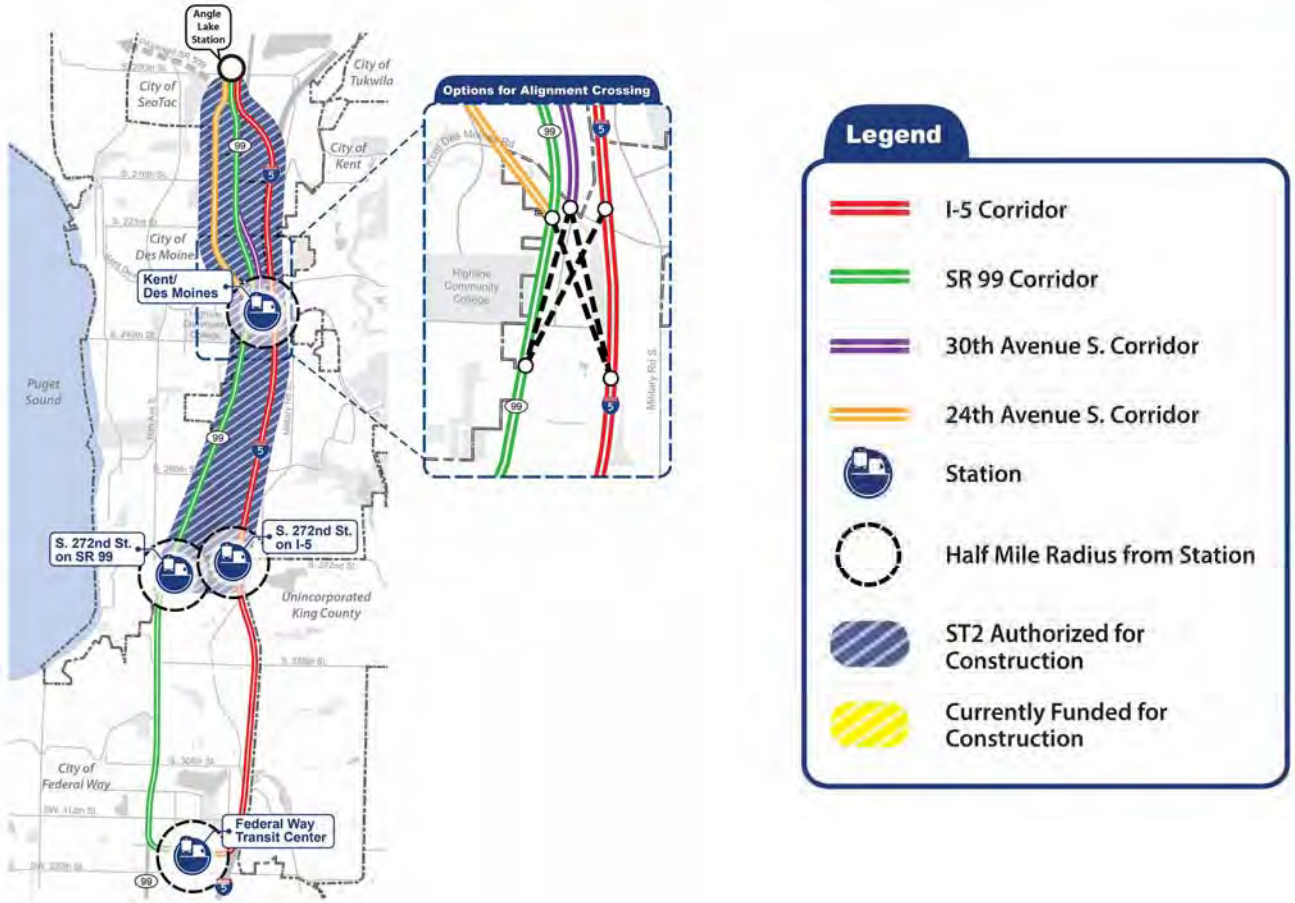
Previous planning identified potential station locations at Kent/Des Moines (in the vicinity of Highline Community College), South 272nd Street (Redondo or Star Lake park-and-rides), and the Federal Way Transit Center.

Federal Way Transit Extension

Alternatives Analysis Summary

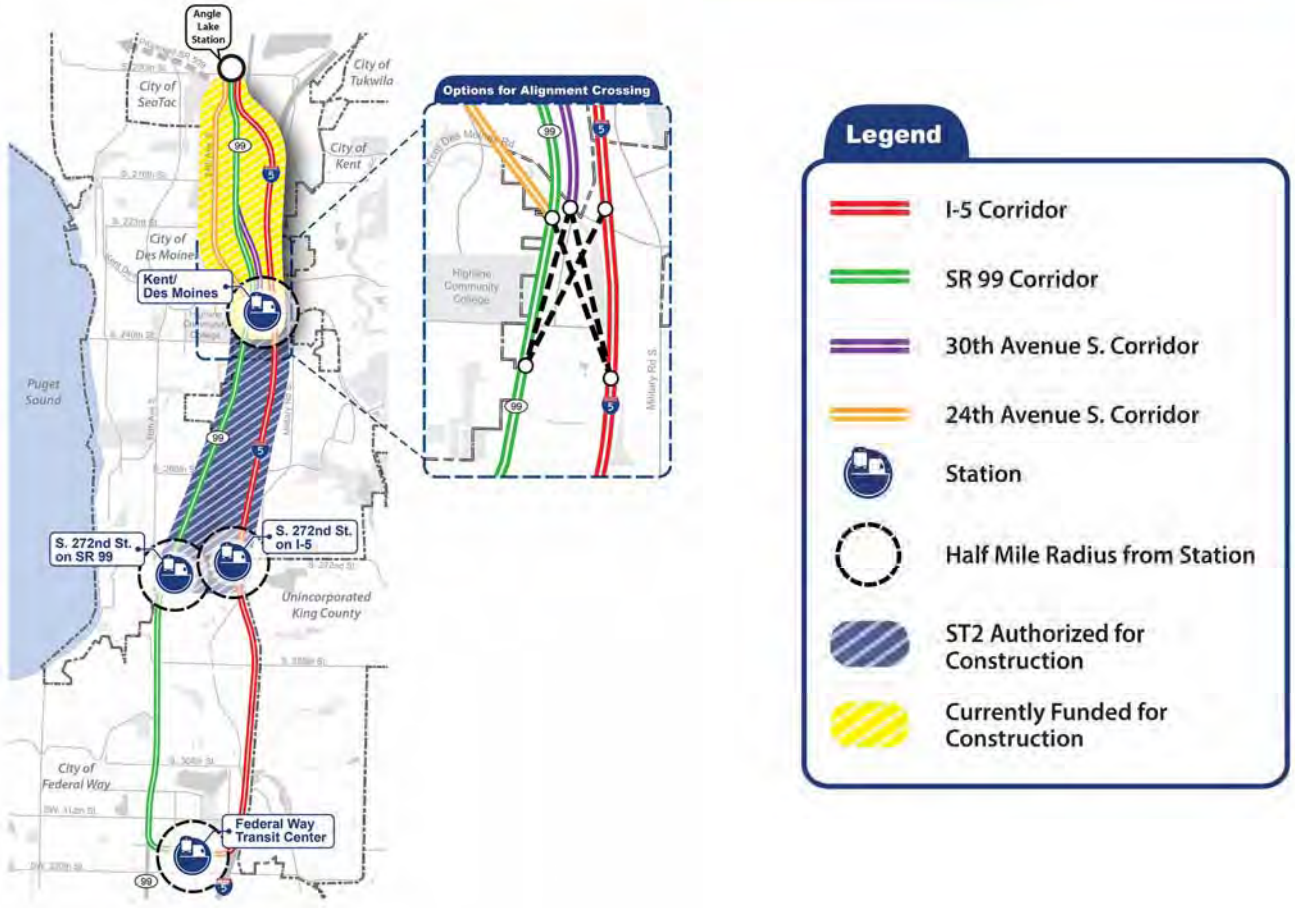
Initial Range of Alternative Corridors

SOUNDTRANSIT RIDE THE WAVE

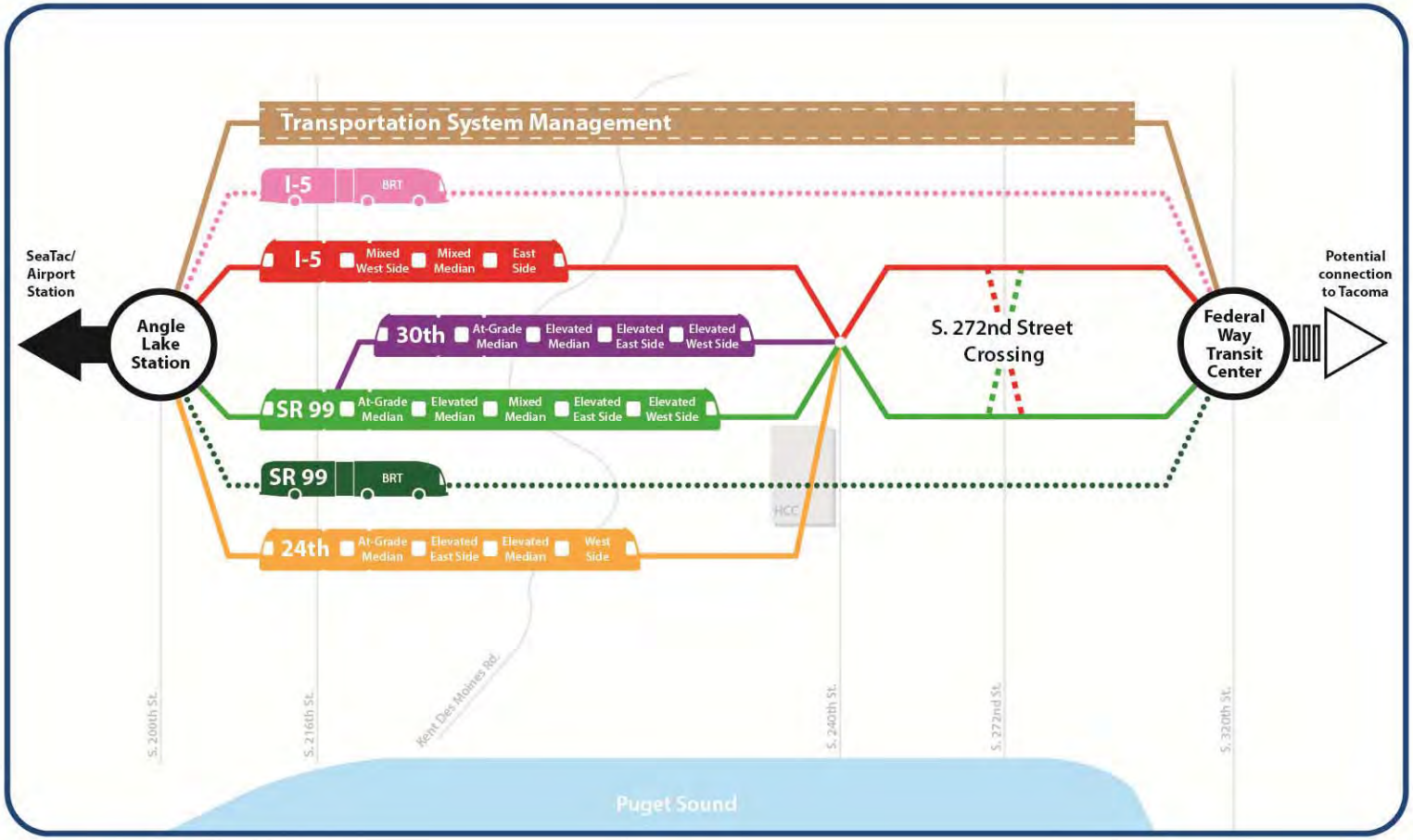


The Sound Transit 2 Plan, which was approved by the voters in 2008, included funding to build light rail as far as South 272nd Street on the border of Federal Way.

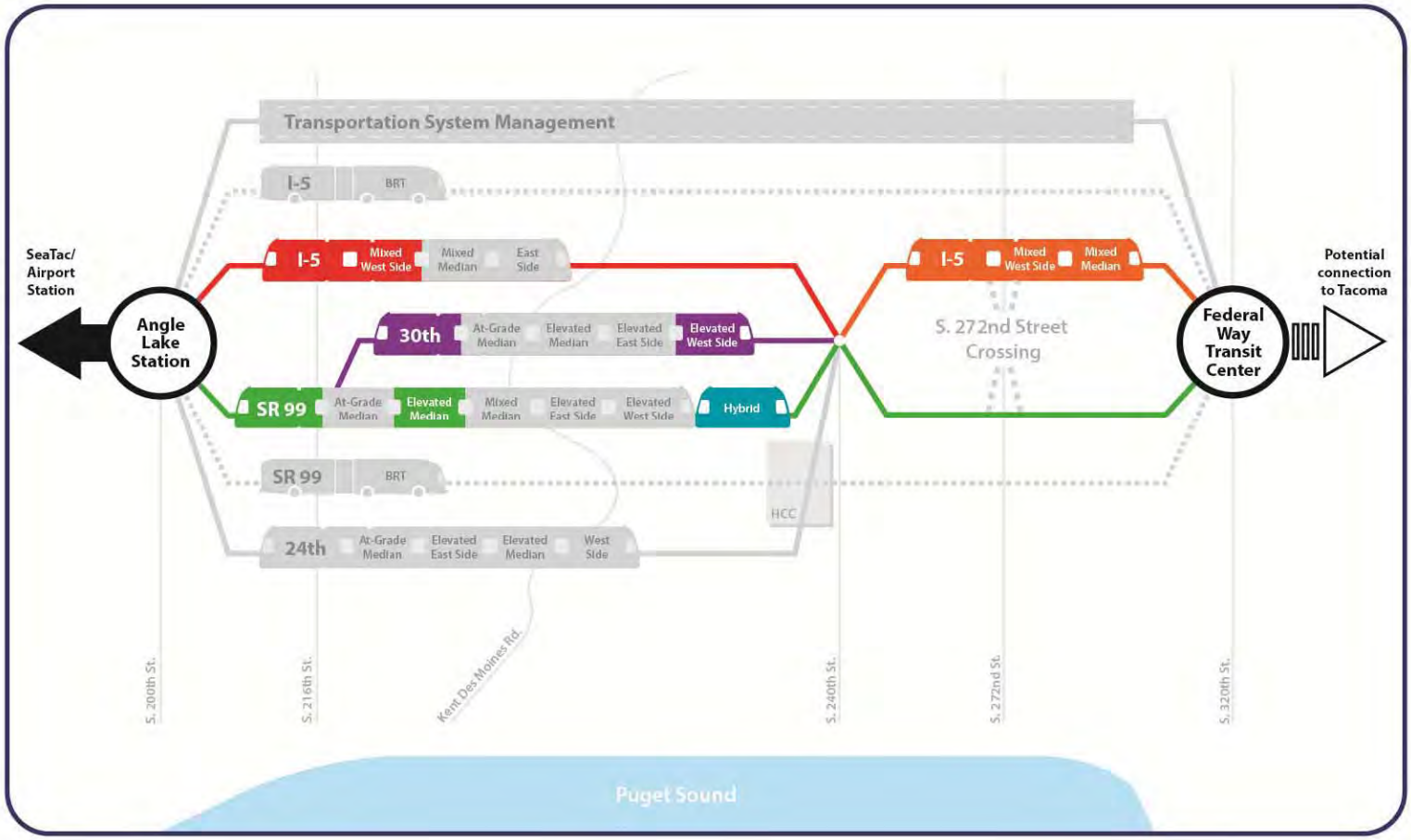
Initial Range of Alternative Corridors



Based on current revenue forecasts, Sound Transit has enough funding to build light rail to Kent/Des Moines and is working to ensure that the segment to the Federal Way Transit Center is ready for construction once funding is secured.

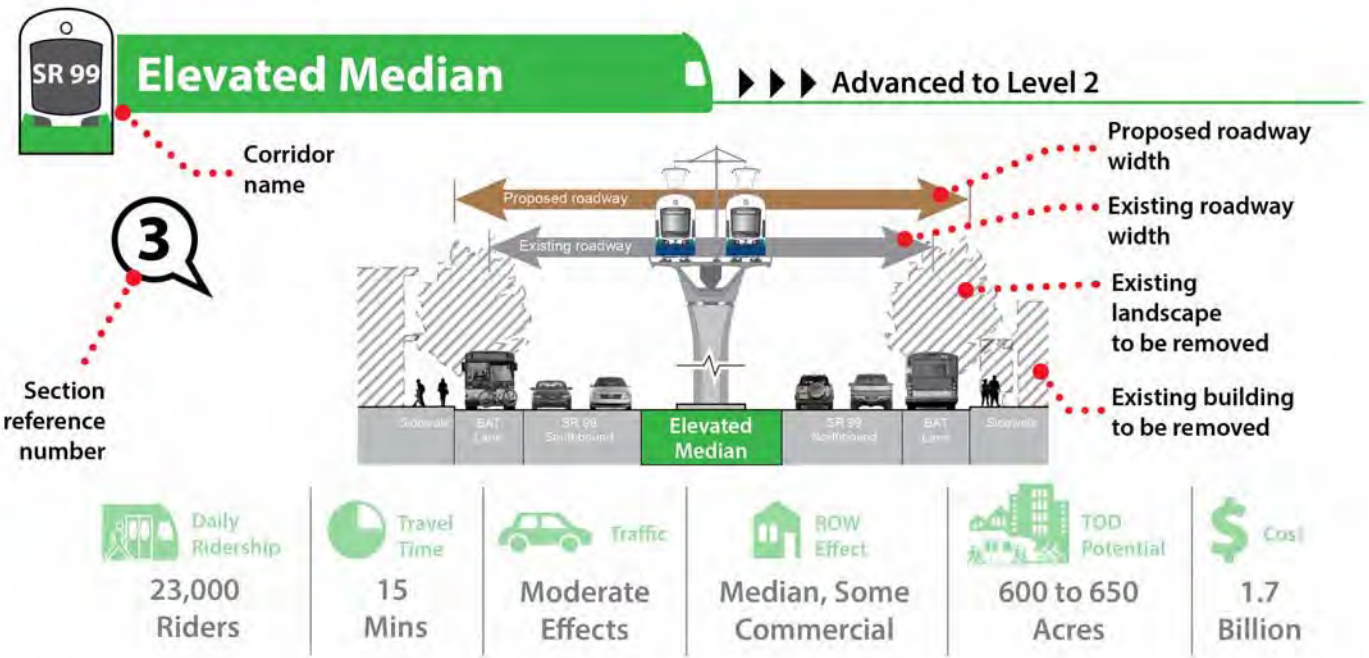


Alternatives suggested during the Early Scoping public comment period included light rail alignments on I-5, SR 99, 24th Avenue South and 30th Avenue South, as well as Bus Rapid Transit (BRT) on I-5 and SR 99, and improvements to the existing transportation system (TSM).

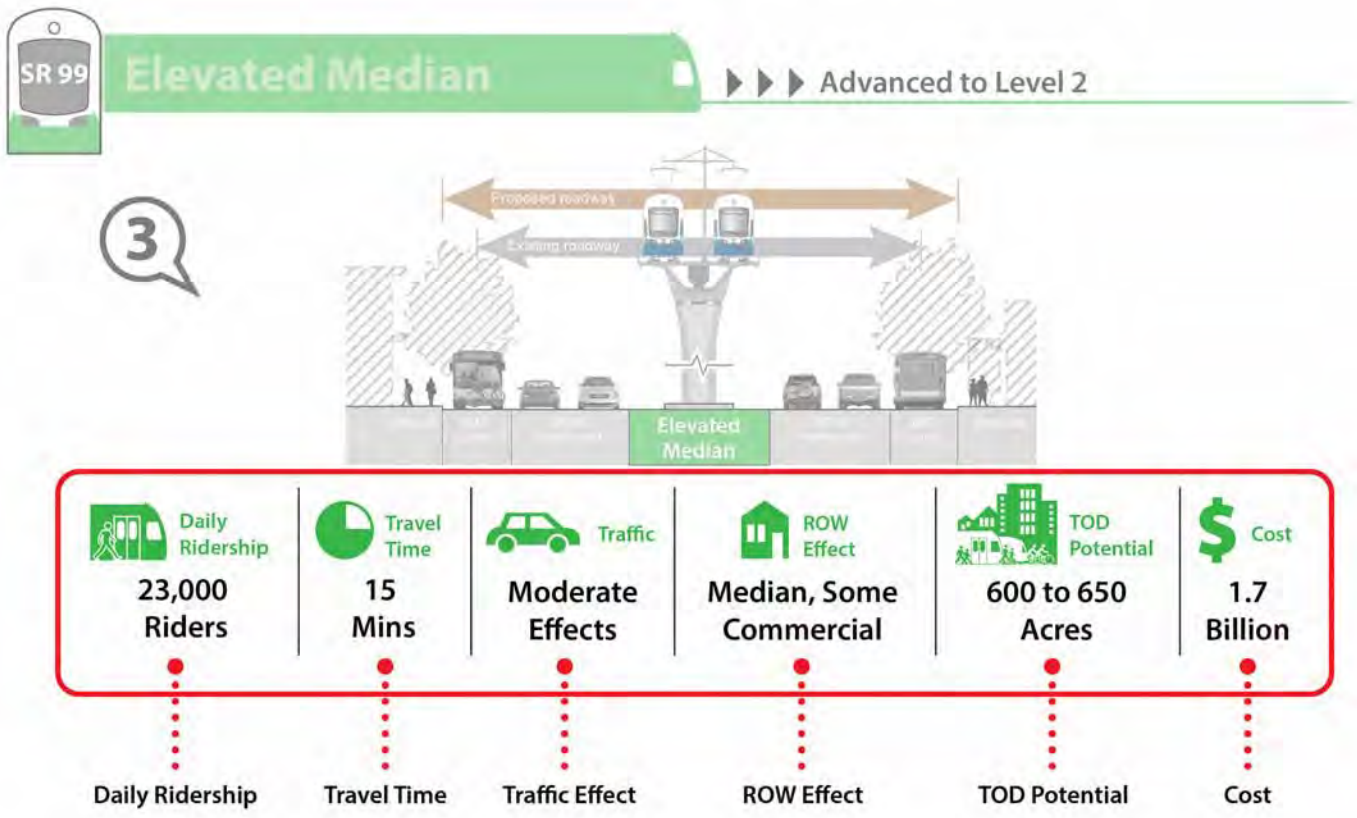


Following pre-screening of the alternatives, and a Level 1 evaluation, five light rail alignment alternatives were advanced for further evaluation in the Level 2 analysis. Previous planning in the corridor, such as the Regional Transit Long Range Plan, evaluated several transit modes and recommended light rail. Bus and BRT alternatives were considered again but not advanced because they would have a slower travel time, less ridership capacity, and would not as effectively accommodate future population growth and transit demand in the corridor.

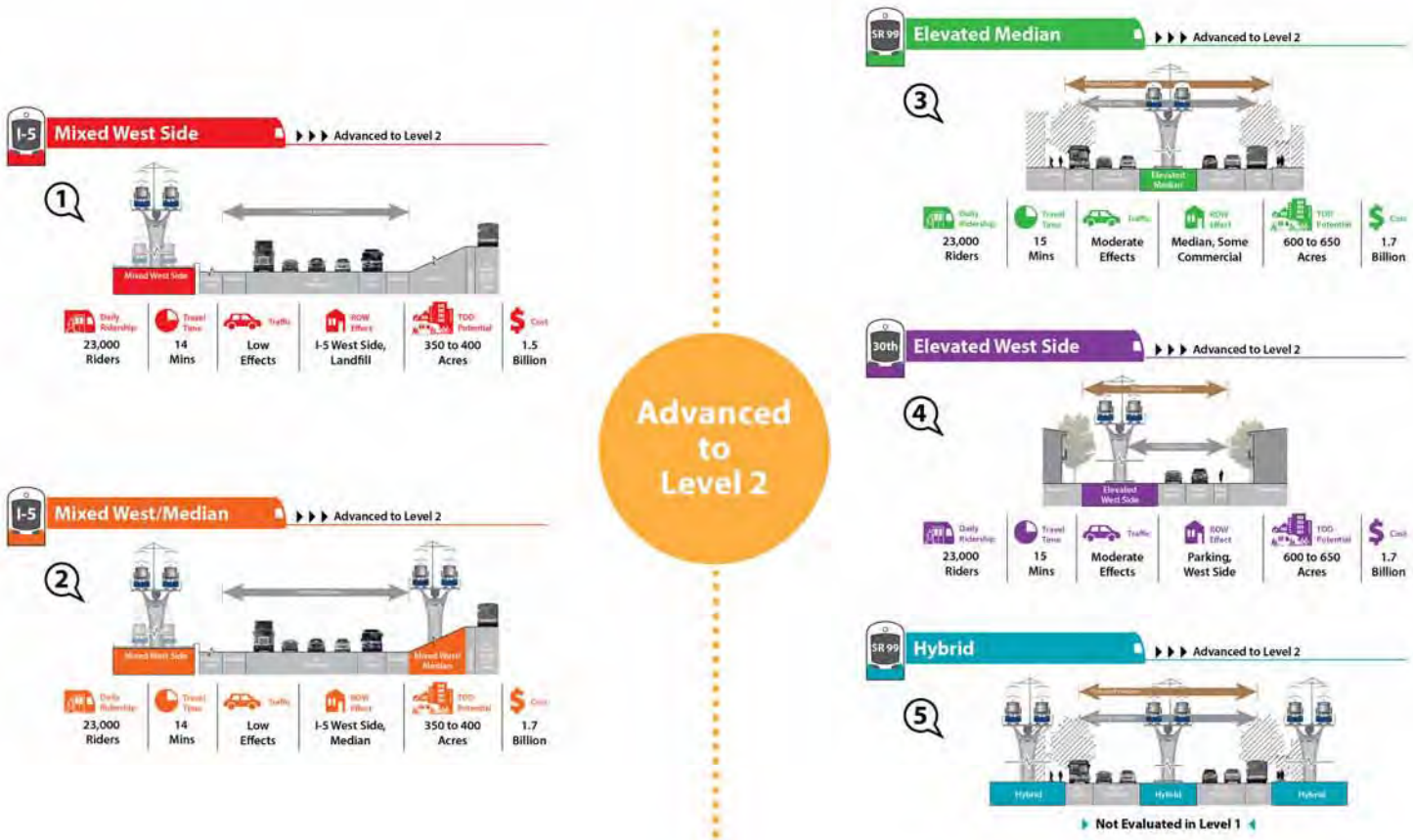
How to Read Typical Section



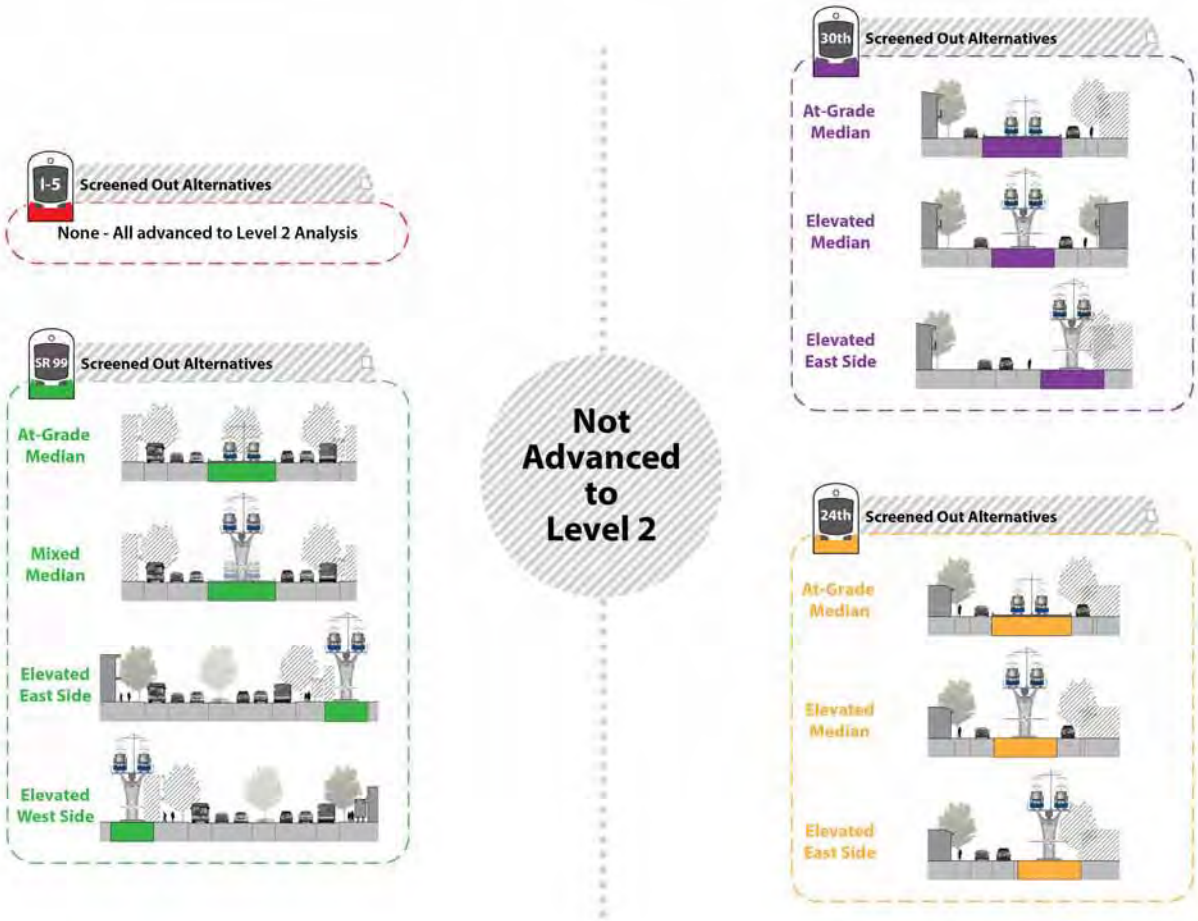
Representative cross sections are shown for each of the five alternatives that advanced to Level 2. Each cross section provides a schematic representation of how the light rail alignment would affect existing roadway widths, existing landscaping, and adjacent buildings.



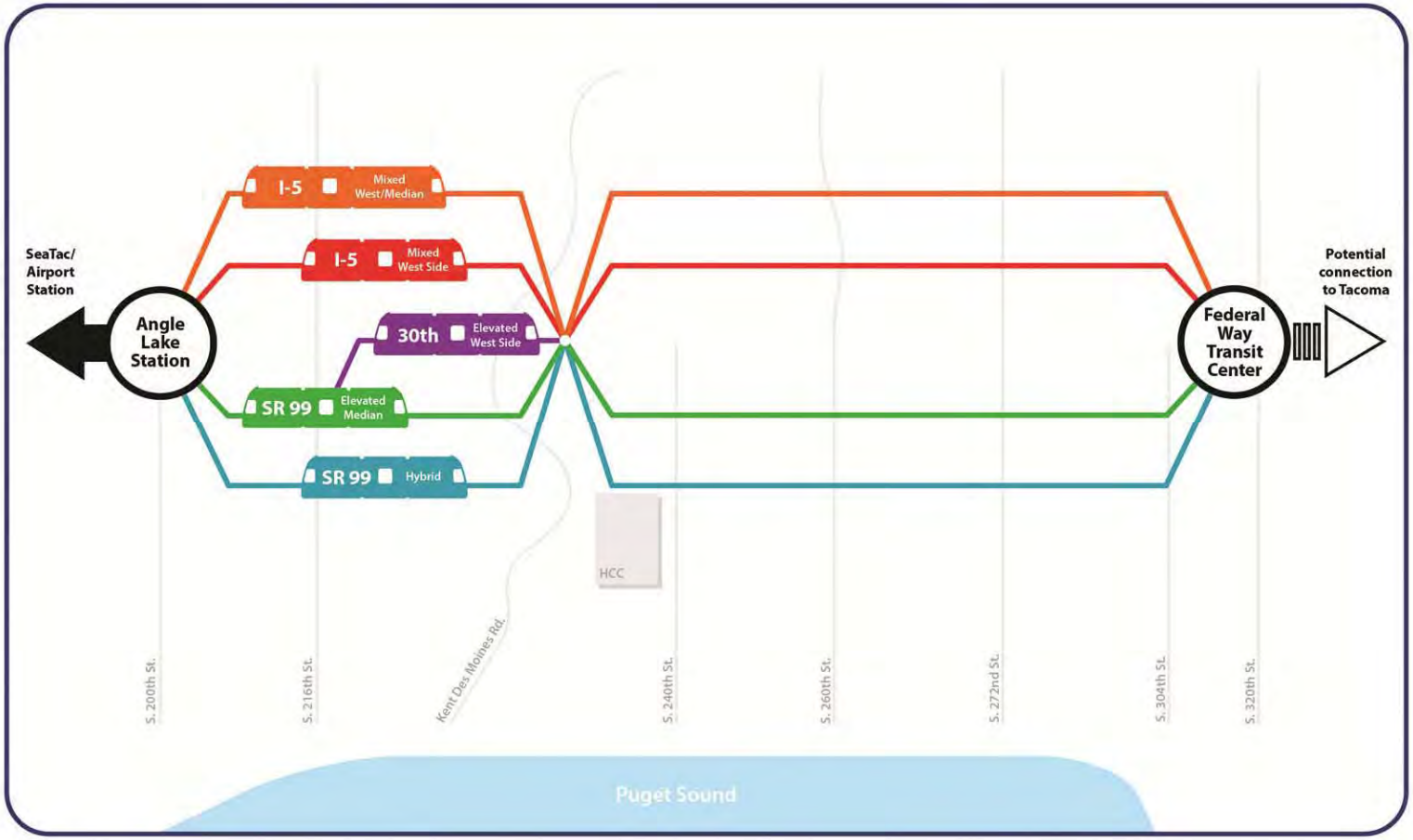
The key measures that differentiated the five remaining alignment alternatives are shown below each cross section.



The five cross sections shown represent the alternatives that were proposed for further study in the Level 2 analysis, based on the key findings, the project's purpose and need, and the Level 1 evaluation criteria. All of the alternatives would have similar ridership and travel time. The SR 99 Hybrid alternative was a new alternative that was developed based on information learned during the Level 1 analysis.



These cross sections represent the light rail alternatives that were not proposed for further study in the Level 2 analysis, based on the key findings, the project's purpose and need, and the evaluation criteria. In general, alternatives were not advanced if they had less ridership, a longer travel time, or had greater right-of-way effects.



The five alternatives that were further defined and evaluated in the Level 2 evaluation included two alternatives along I-5, one alternative on 30th Avenue South and two alternatives, (including a new hybrid alignment), along SR 99.

SR 99 Hybrid Alternative

The Level 1 analysis showed that several standalone alternatives along SR 99 had flaws, but that different segments of the various SR 99 alternatives could work better if combined together into a new 'hybrid' alternative. The hybrid was designed to avoid impacts to key intersections and community facilities, and was informed by considerations such as topography and convenient access to existing park-and-ride lots.

Over thirty different measures were evaluated to help distinguish the pros and cons of the Level 2 alternatives. A number of the measures yielded results that were common to all the Level 2 alternatives.

Level 2 Evaluation Results

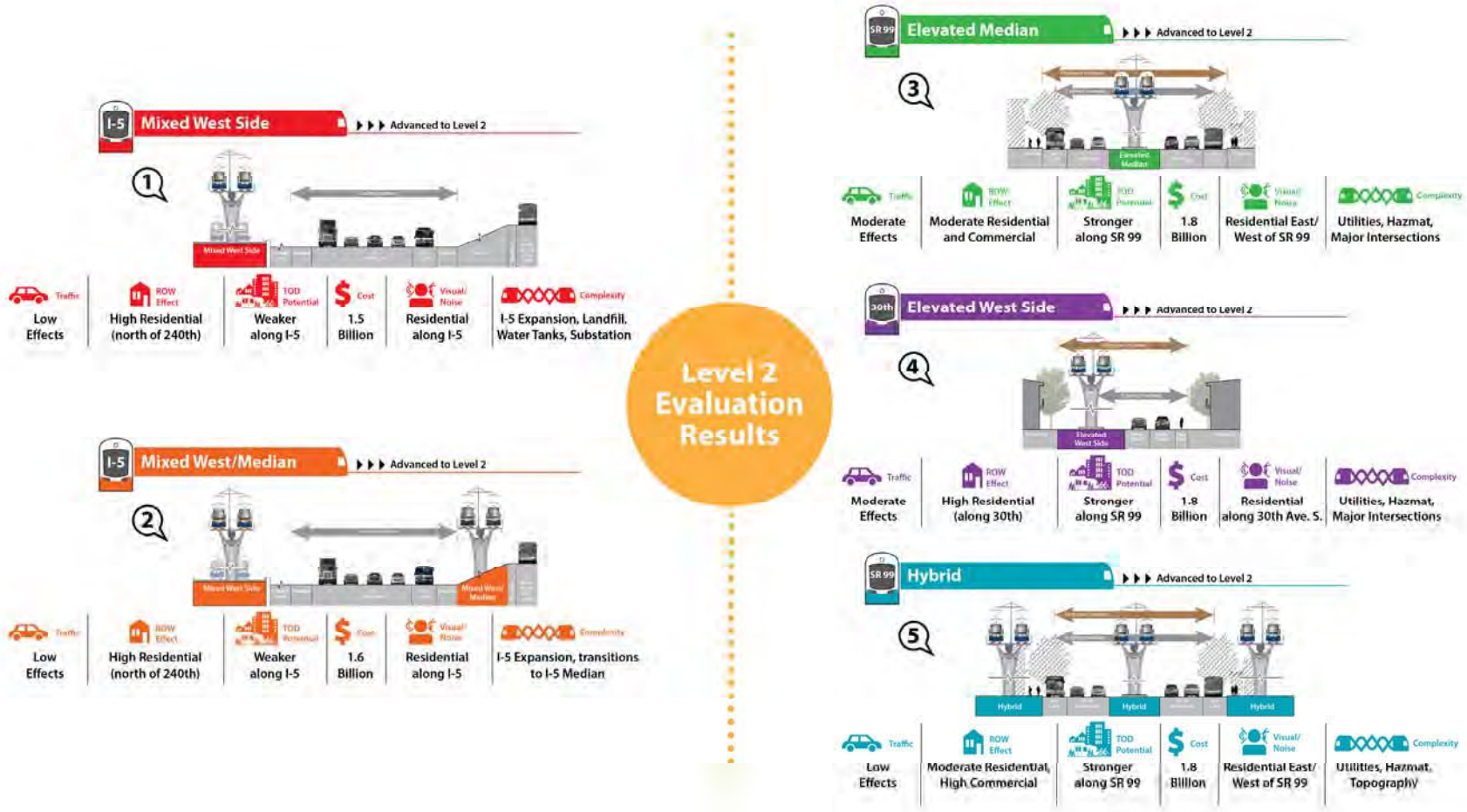
What results were common to all Level 2 alternatives?

Level 2

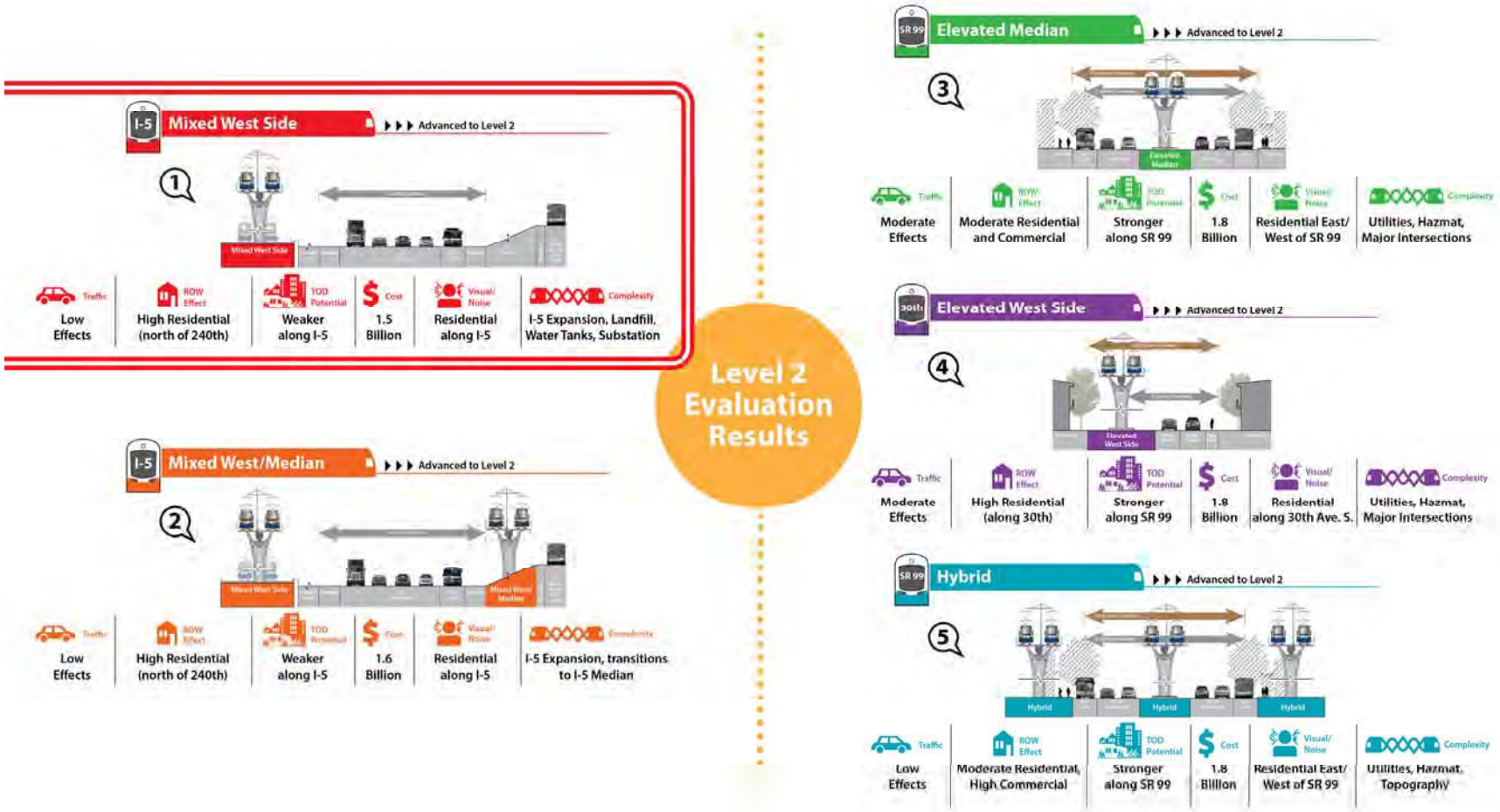
Daily Ridership	23,000 Riders
Travel Time	14 to 15 mins
Population	35,000 to 36,000 people
Employment	11,000 to 14,000 Jobs
Households	13,000 to 14,000 Households

Daily ridership and travel time are expected to be about the same for all five of the Level 2 alternatives. The number of people, jobs, and households currently located within a half mile of each alignment are also similar for each alternative.

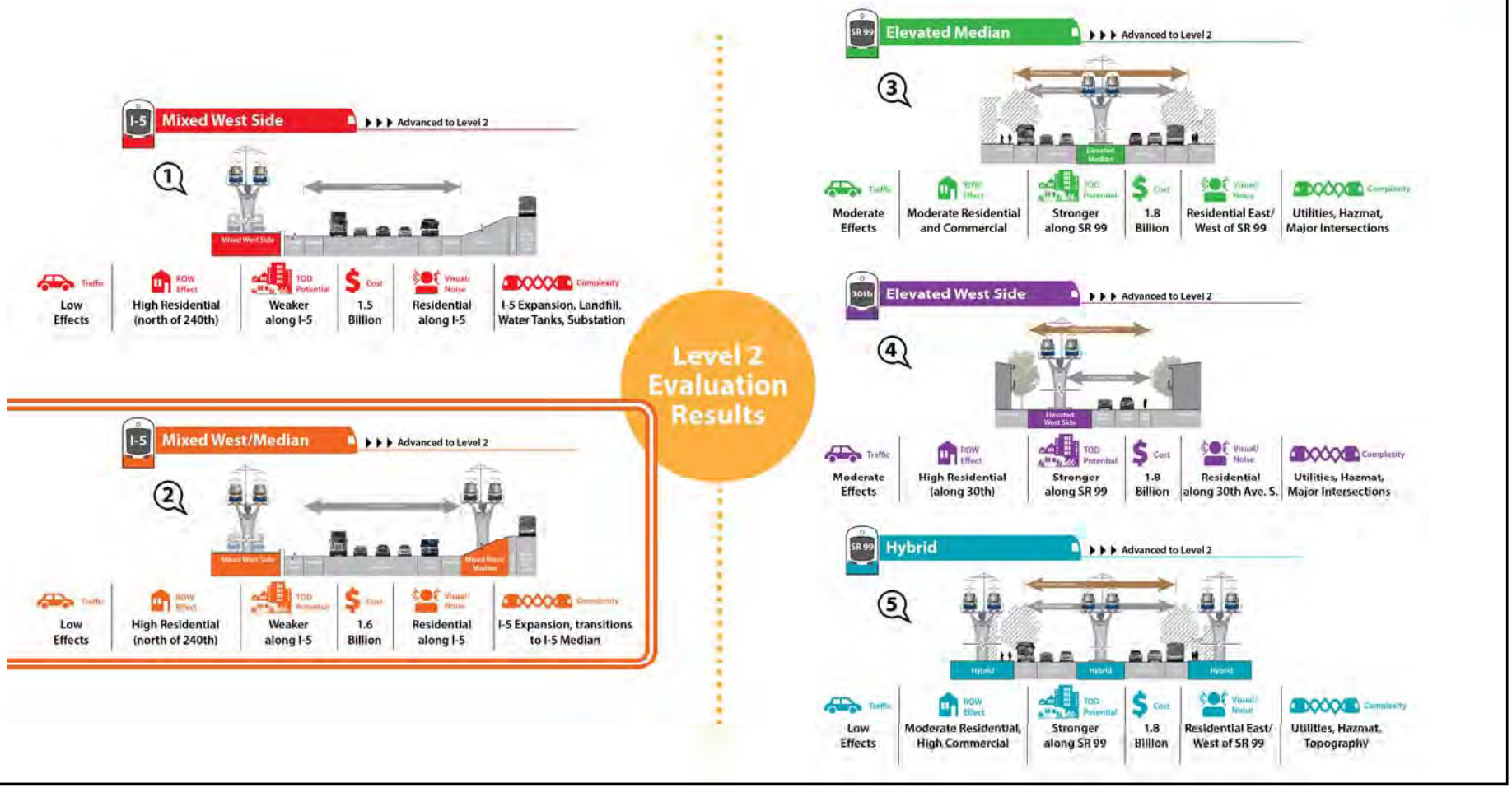
Level 2 Evaluation Results



Some of the key distinguishers between the Level 2 alternatives are illustrated in this graphic.



The I-5 Mixed West Side alternative would likely have high residential effects north of South 240th Street and would have weaker transit oriented development (TOD) potential. Engineering challenges could include the Midway landfill south of South 240th Street, and proximity to the Highline Water District storage tanks, and a PSE substation.

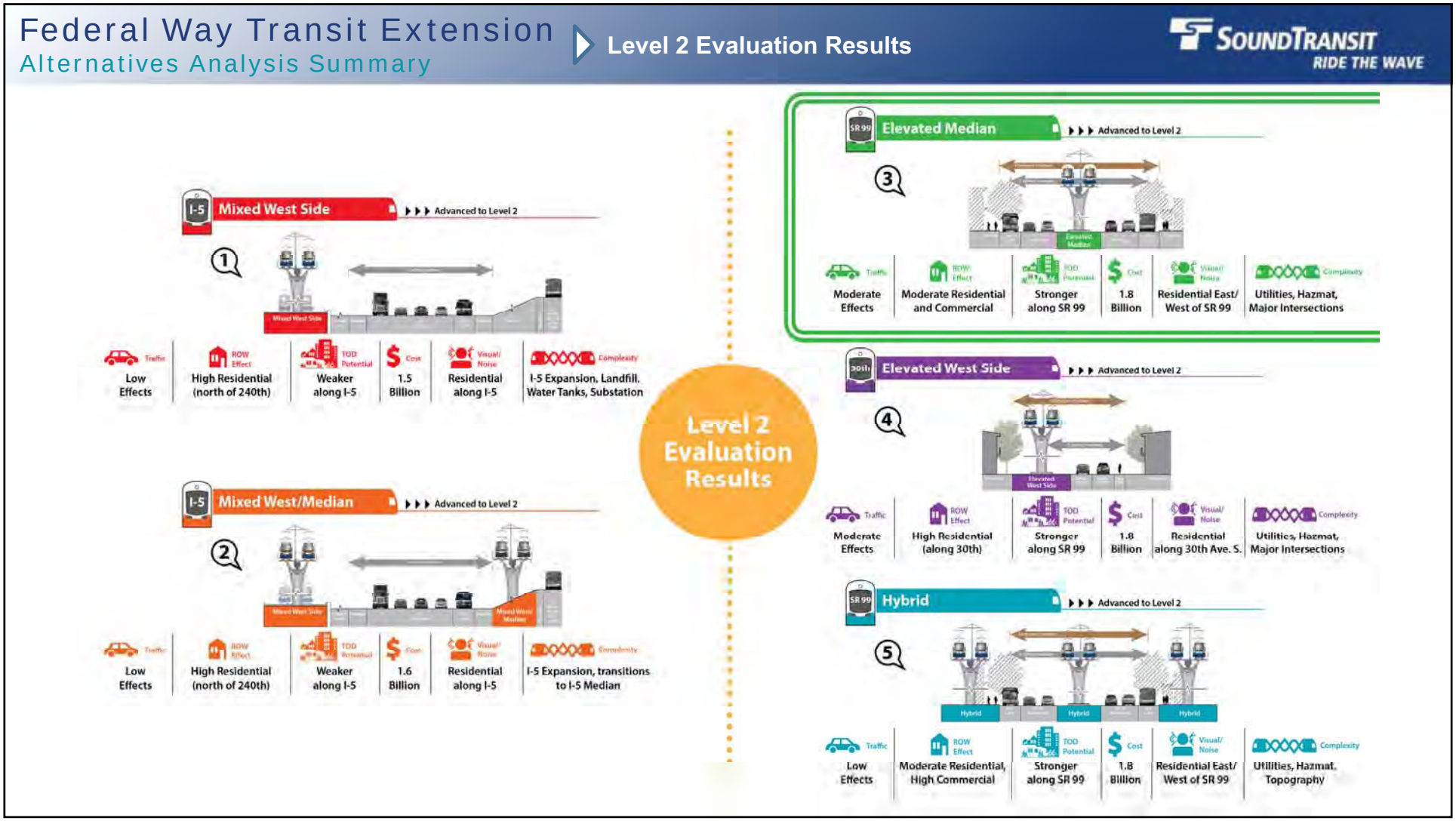


The I-5 Mixed West/Median alternative would also likely have high residential effects north of South 240th Street and weaker TOD potential. It would avoid the Midway landfill but would require large structures to transition to the I-5 median (south of South 240th Street) and then back to the west side at South 272nd Street and the Federal Way Transit Center.

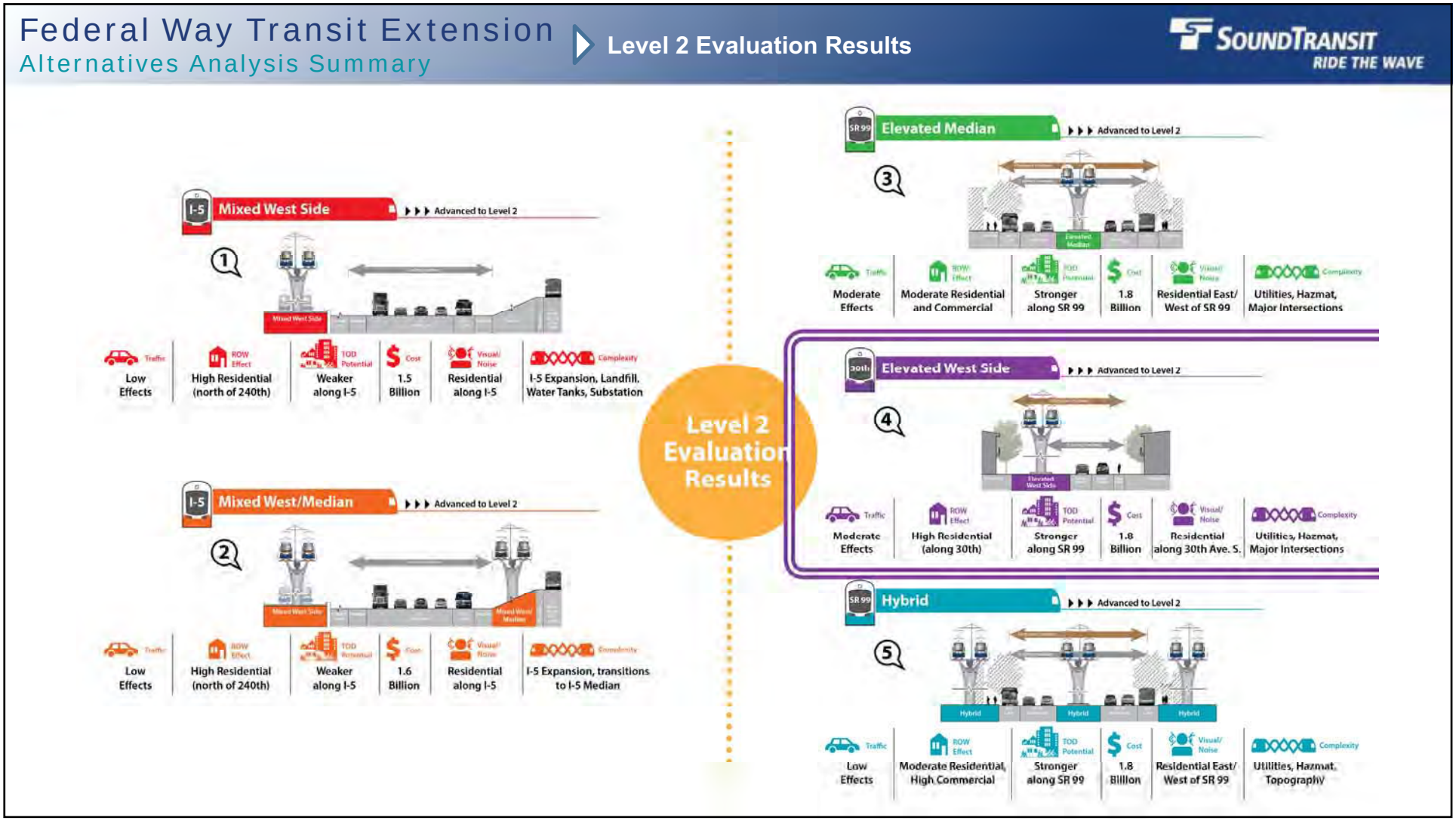
Federal Way Transit Extension
Alternatives Analysis Summary

Level 2 Evaluation Results

SOUNDTRANSIT
RIDE THE WAVE



The SR 99 Elevated Median alternative would be located within the median of SR 99. It would have less effect to the roadway and adjacent buildings than other alternatives along SR 99 but would require major construction to cross key intersections along the alignment.



The 30th Avenue South Elevated West Side alternative would transition from SR 99 at about South 220th Street and then continue within the existing parking setback along 30th Avenue South. This alternative would affect commercial and residential properties at the transition point and could have noise and visual effects to properties along 30th Avenue South.

Level 2 Evaluation Results

1 Mixed West Side

Advanced to Level 2

Traffic	ROW Effect	TOD Potential	Cost	Visual/ Noise	Complexity
Low Effects	High Residential (north of 240th)	Weaker along I-5	1.5 Billion	Residential along I-5	I-5 Expansion, Landfill, Water Tanks, Substation

2 Mixed West/Median

Advanced to Level 2

Traffic	ROW Effect	TOD Potential	Cost	Visual/ Noise	Complexity
Low Effects	High Residential (north of 240th)	Weaker along I-5	1.6 Billion	Residential along I-5	I-5 Expansion, transitions to I-5 Median

3 Elevated Median

Advanced to Level 2

Traffic	ROW Effect	TOD Potential	Cost	Visual/ Noise	Complexity
Moderate Effects	Moderate Residential and Commercial	Stronger along SR 99	1.8 Billion	Residential East/ West of SR 99	Utilities, Hazmat, Major Intersections

4 Elevated West Side

Advanced to Level 2

Traffic	ROW Effect	TOD Potential	Cost	Visual/ Noise	Complexity
Moderate Effects	High Residential (along 30th)	Stronger along SR 99	1.8 Billion	Residential along 30th Ave. S.	Utilities, Hazmat, Major Intersections

5 Hybrid

Advanced to Level 2

Traffic	ROW Effect	TOD Potential	Cost	Visual/ Noise	Complexity
Low Effects	Moderate Residential, High Commercial	Stronger along SR 99	1.8 Billion	Residential East/ West of SR 99	Utilities, Hazmat, Topography

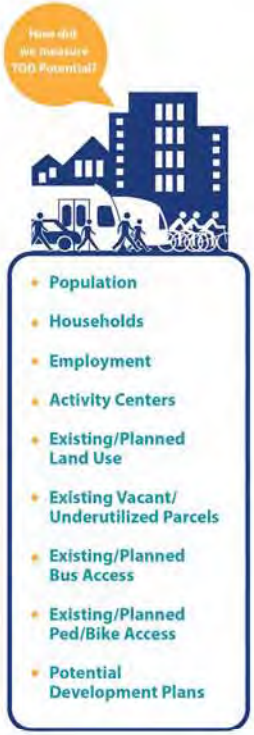
The SR 99 Hybrid alternative would affect commercial and residential properties at various locations along SR 99 but would avoid major effects to key intersections or community facilities.

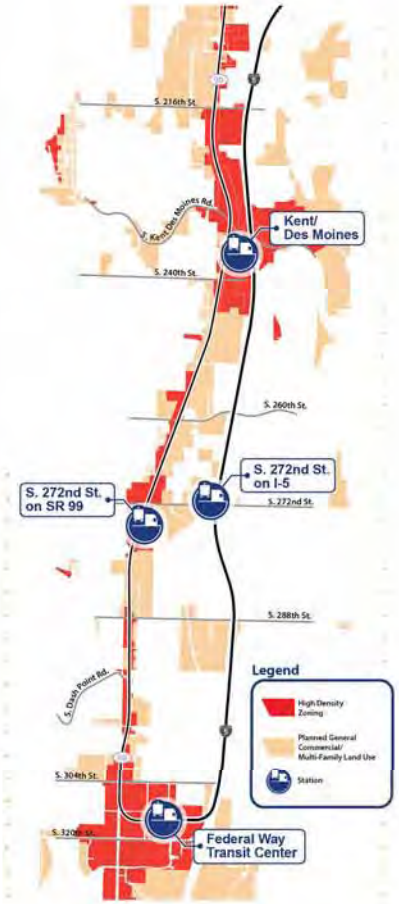
TOD Potential

- Population
- Households
- Employment
- Activity Centers
- Existing/Planned Land Use
- Existing Vacant/Underutilized Parcels
- Existing/Planned Bus Access
- Existing/Planned Ped/Bike Access
- Potential Development Plans

As part of the alternatives analysis, Sound Transit analyzed the transit oriented development (TOD) potential of the various alternatives. This analysis was conducted in accordance with Sound Transit's TOD policy. The assessment of TOD potential considered a range of issues. Both alignment alternatives and station location alternatives were assessed.

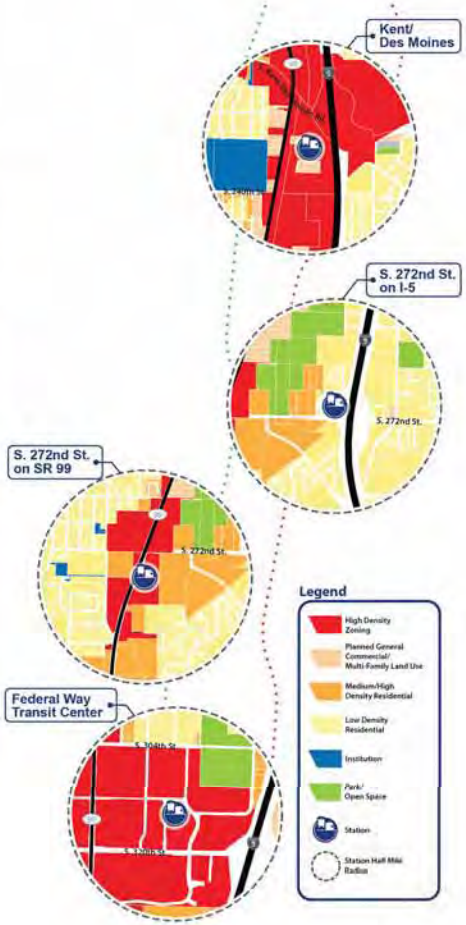
TOD Potential - Alignments



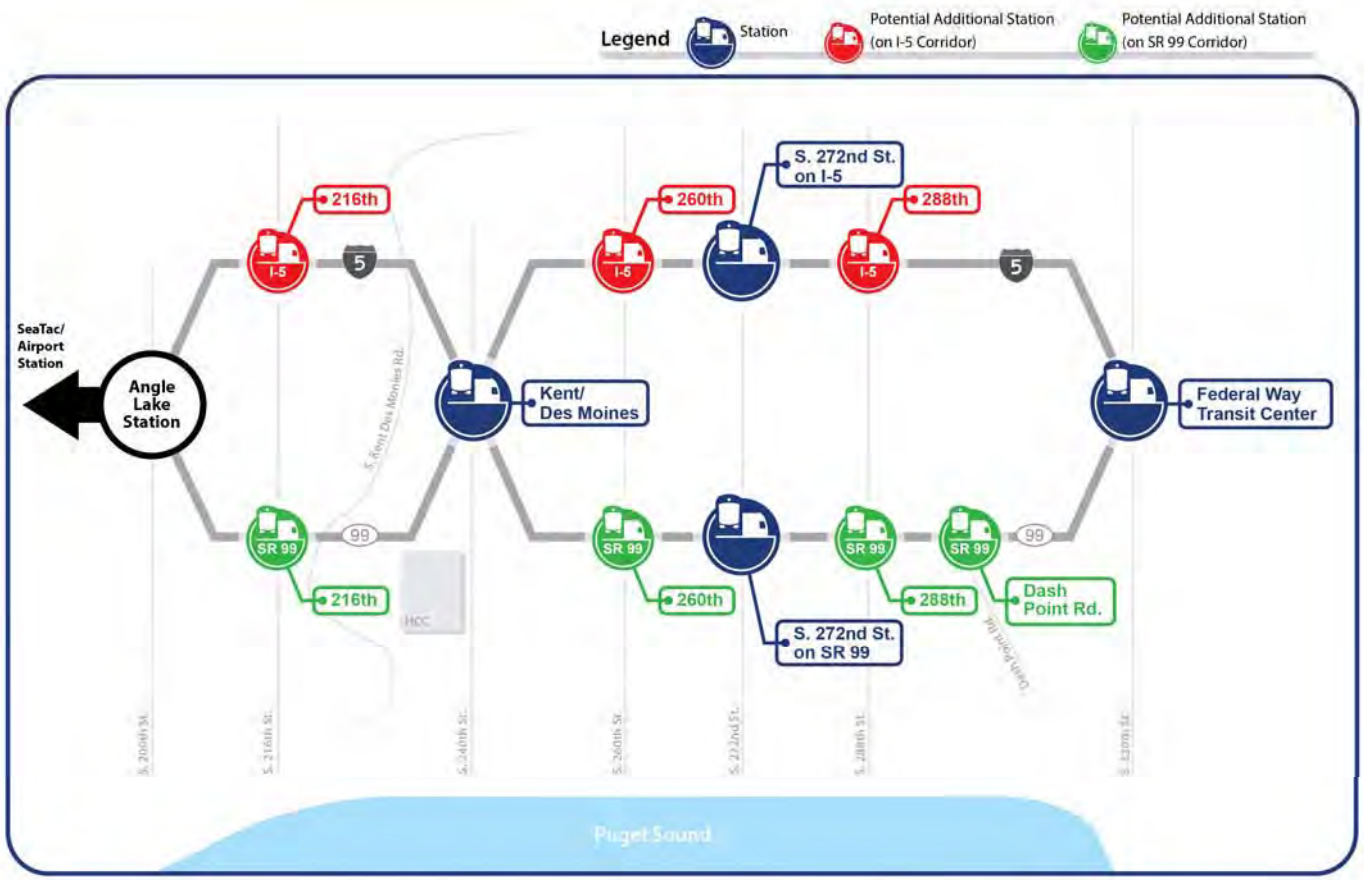


The graphic on the right illustrates the high density zoning and the planned commercial and multi-family land uses within ¼ mile of the alignment alternatives. TOD potential is generally higher along the SR 99 alignment alternatives.

TOD Potential - Stations



The analysis of TOD potential for stations generally looked at the area within ½ mile of the station locations. The stations at Kent/Des Moines and the Federal Way Transit Center would generally be in the same location for all alternatives, but the South 272nd Street station would be in different locations for the SR 99 and I-5 alternatives. The South 272nd Street station on SR 99 would have higher TOD potential.



*Additional stations were evaluated as part of the alternatives analysis process; these stations were not included in the voter-approved ST2 Plan and, if approved, would require additional taxing authority and funding.

During the Early Scoping public comment period a number of potential additional station locations were suggested. Some were screened out because they were outside the study area, or in close proximity to existing locations. Seven locations were then evaluated in more detail (four along SR 99 and three along I-5).

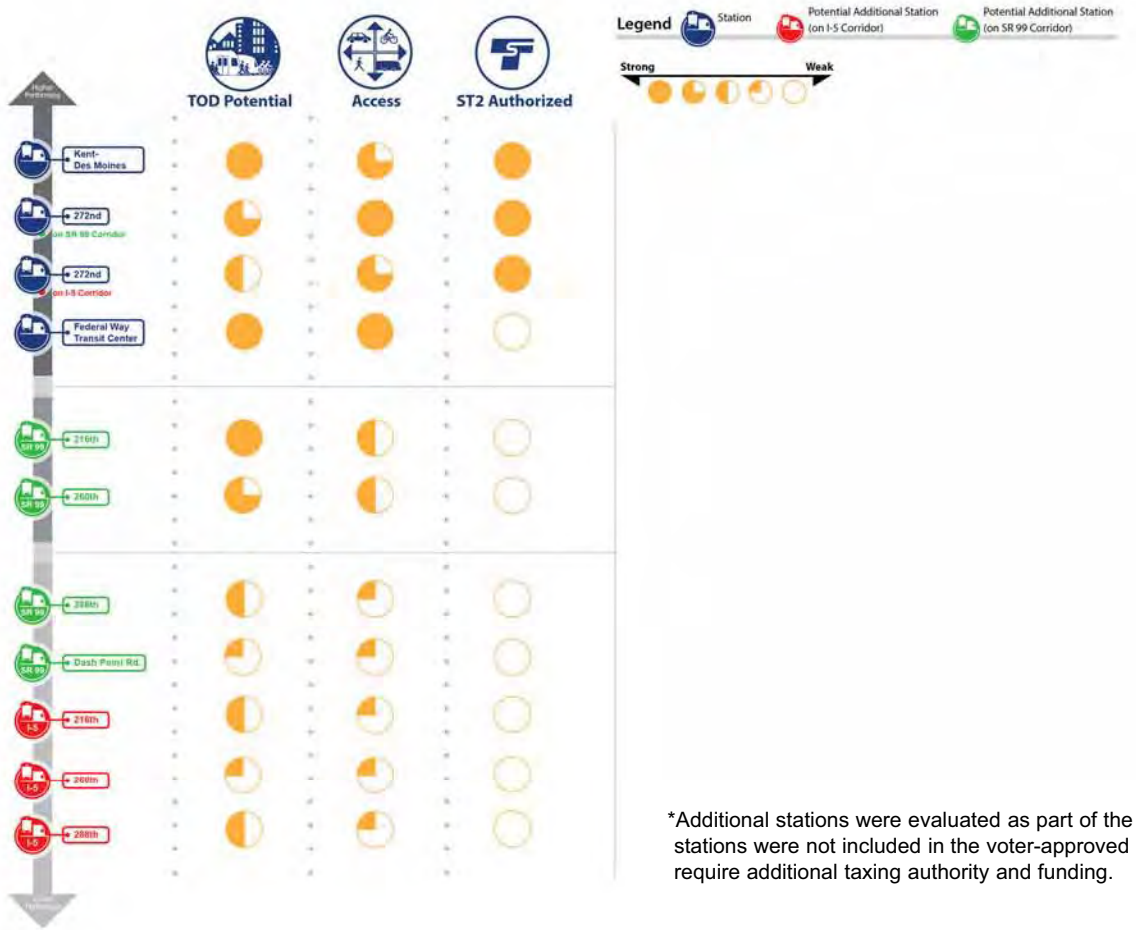
- Population
- Households
- Employment
- Activity Centers
- Existing/Planned Land Use
- Existing Vacant Parcels
- Existing Underutilized Parcels
- Potential Development Plans

- Bus Access
- Ped/Bike Access
- East - West Auto Access
- North - South Auto Access
- Existing Park-and-Ride Capacity

*Additional stations were evaluated as part of the alternatives analysis process; these stations were not included in the voter-approved ST2 Plan and, if approved, would require additional taxing authority and funding.

The station evaluation examined both TOD potential and multimodal access.

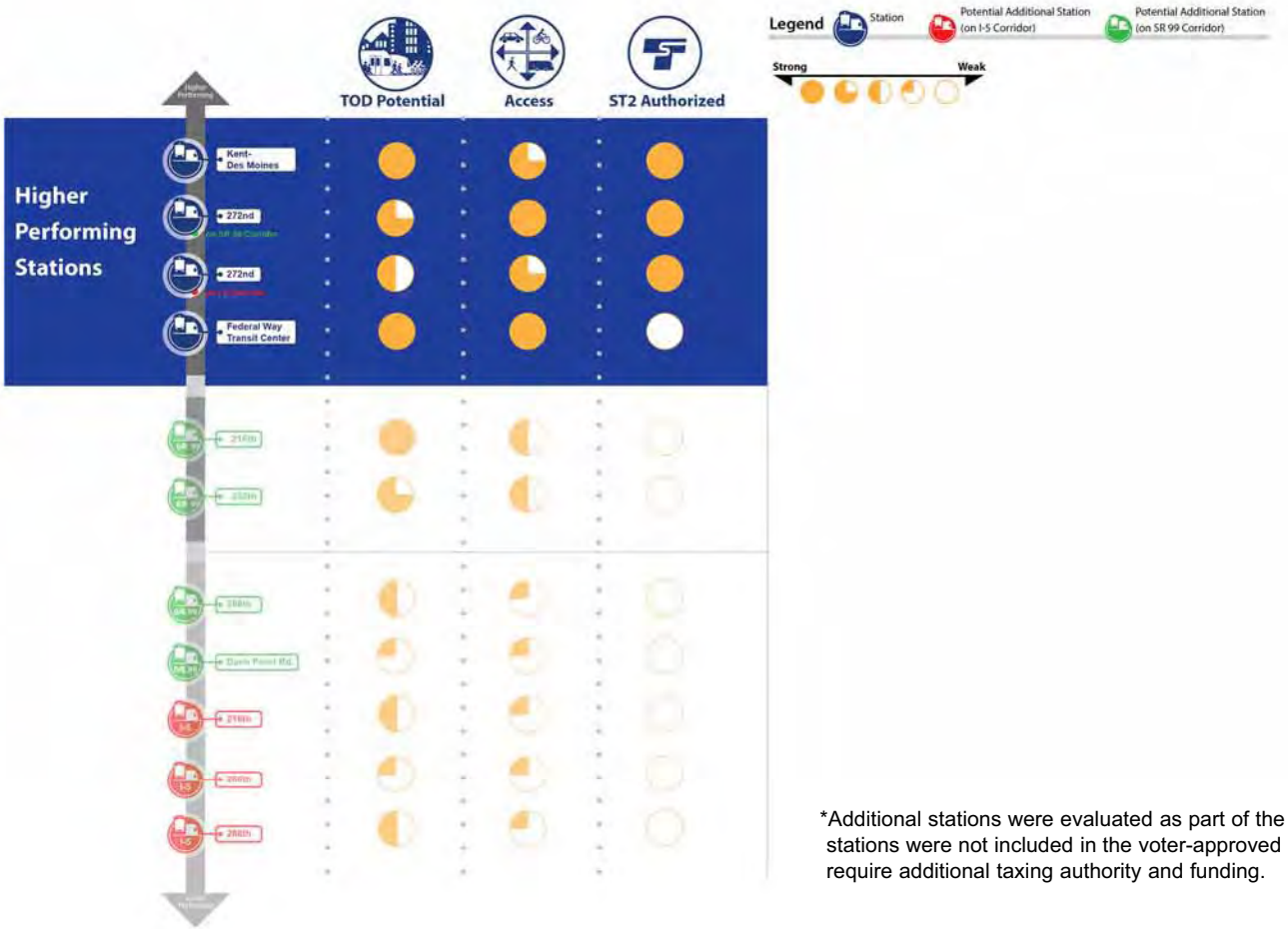
Station Evaluation Results



*Additional stations were evaluated as part of the alternatives analysis process; these stations were not included in the voter-approved ST2 Plan and, if approved, would require additional taxing authority and funding.

The four station locations identified in previous studies were evaluated along with the seven potential additional station locations that were suggested during the Early Scoping public comment period.

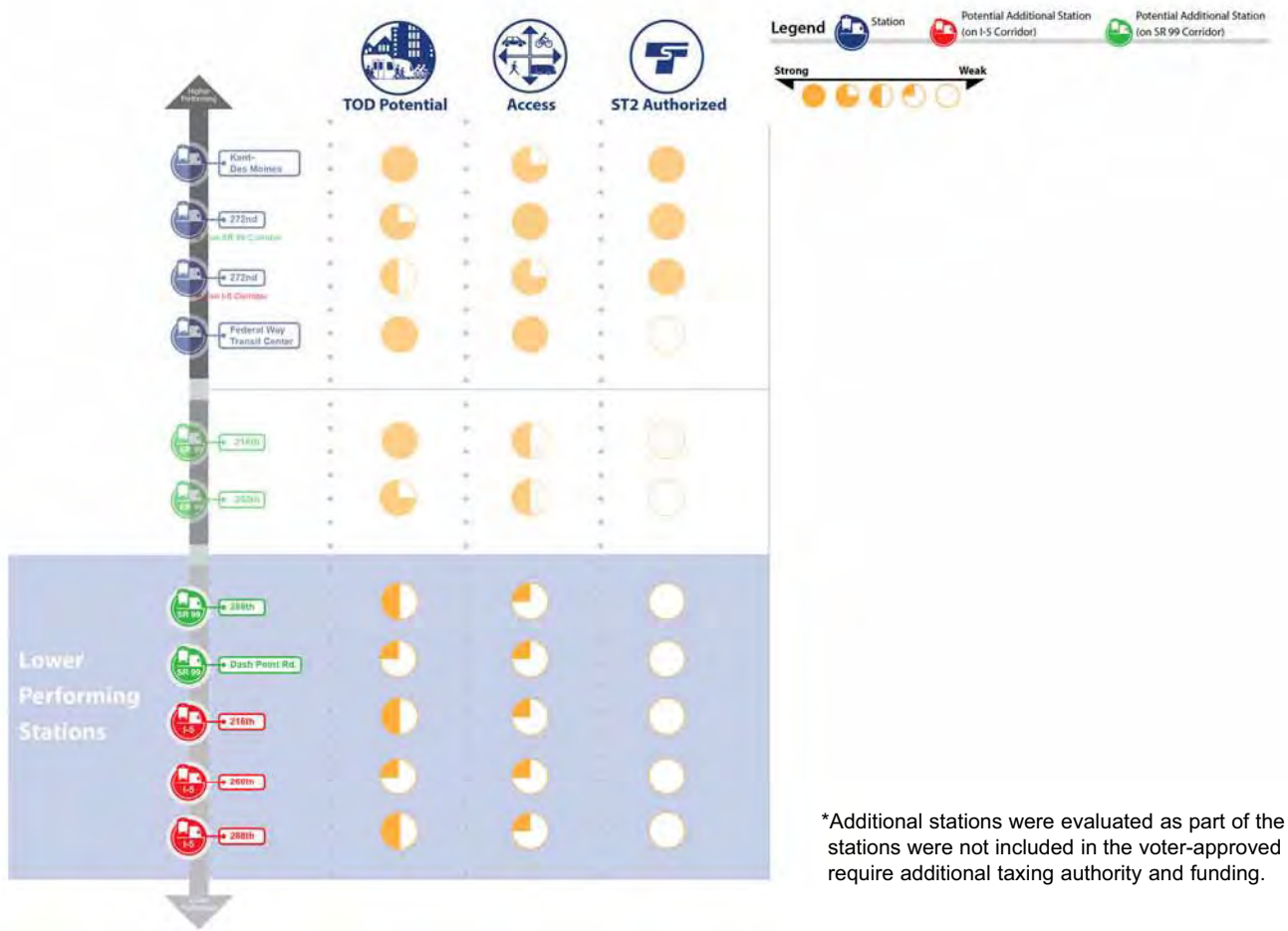
Station Evaluation Results



*Additional stations were evaluated as part of the alternatives analysis process; these stations were not included in the voter-approved ST2 Plan and, if approved, would require additional taxing authority and funding.

The station locations at Kent/Des Moines, South 272nd Street and the Federal Way Transit Center have good TOD potential and good access.

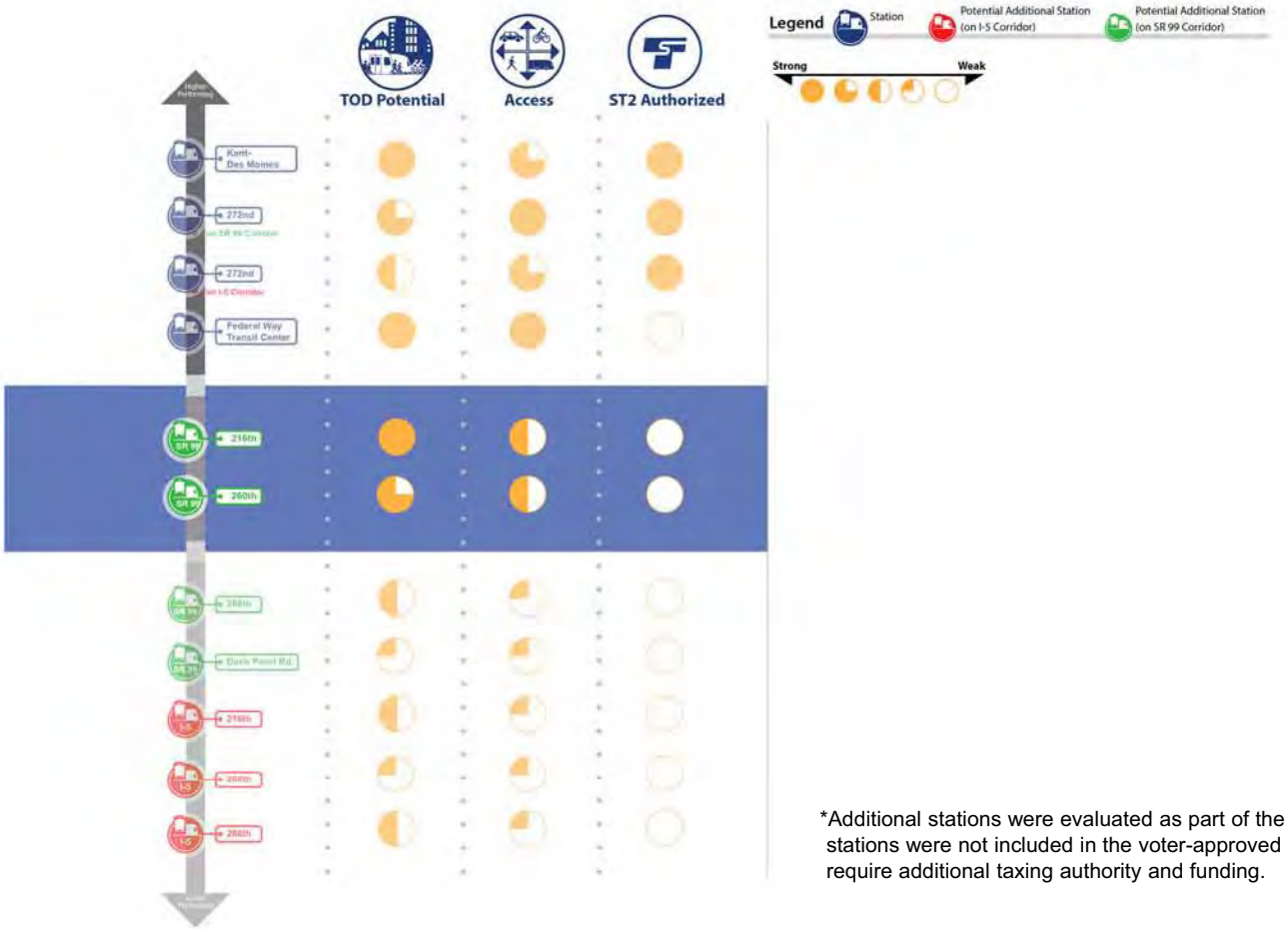
Station Evaluation Results



*Additional stations were evaluated as part of the alternatives analysis process; these stations were not included in the voter-approved ST2 Plan and, if approved, would require additional taxing authority and funding.

A number of the suggested additional station locations do not perform well. Generally, these locations have low density residential development around the station area and do not have good auto, bus, or pedestrian access.

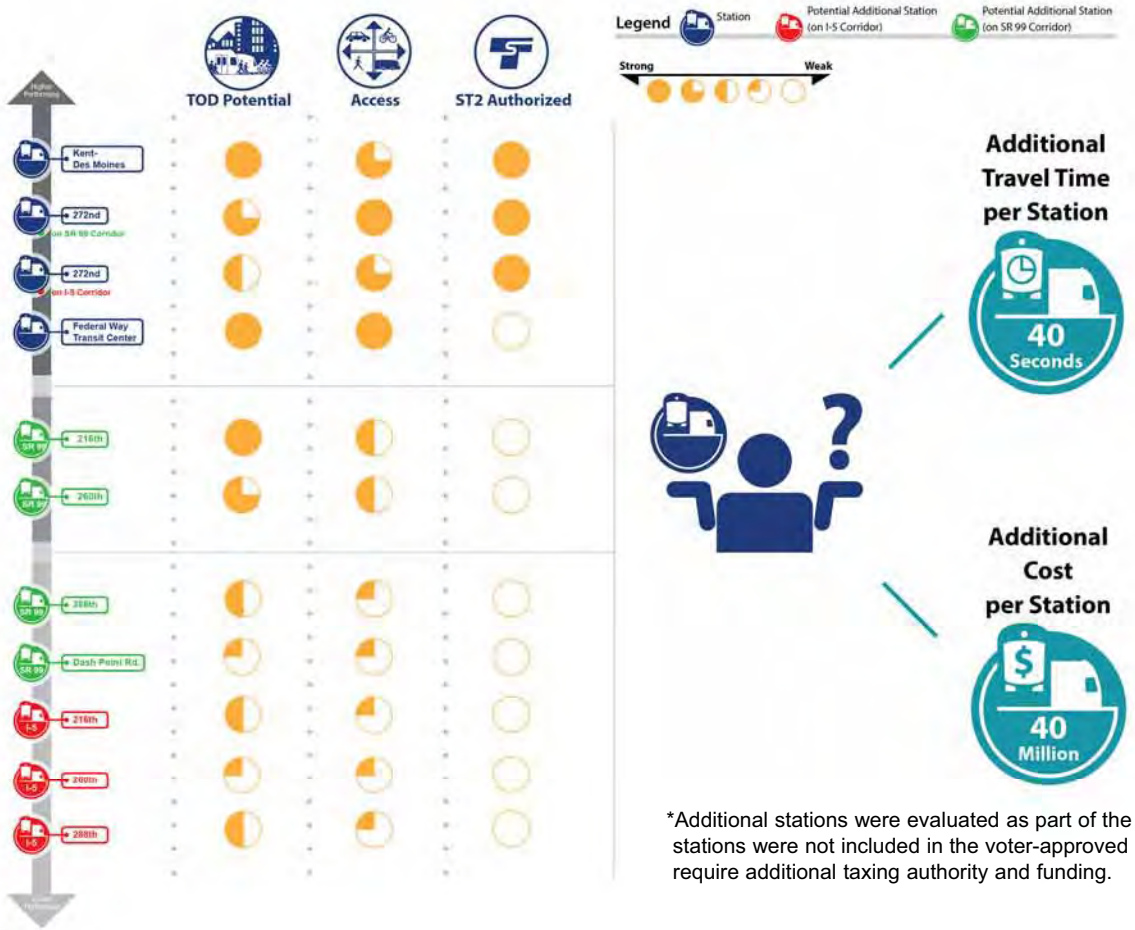
Station Evaluation Results



*Additional stations were evaluated as part of the alternatives analysis process; these stations were not included in the voter-approved ST2 Plan and, if approved, would require additional taxing authority and funding.

Two of the suggested additional locations do perform well in terms of TOD potential (along SR 99 at South 216th Street and South 260th Street). They do not have as good access as the baseline locations.

Station Evaluation Results



*Additional stations were evaluated as part of the alternatives analysis process; these stations were not included in the voter-approved ST2 Plan and, if approved, would require additional taxing authority and funding.

Each additional station would increase the end-to-end travel time by about 40 seconds. The cost of constructing an additional station is about $40 million.

Federal Way Transit Extension

Alternatives Analysis Summary

Timeline/Process

SOUNDTRANSIT RIDE THE WAVE

*Final Design and Construction currently funded to Kent/Des Moines.

The results of the AA will be presented to the public during the EIS Scoping period in June 2013. Based on input received during scoping, the Sound Transit Board will then identify which alternatives should be studied in more detail in the Draft EIS. The Draft EIS will be available for public comment in late 2014. A final decision on which alternative should be built will be made after publication of a Final EIS in 2016.

Scoping Period:
June 14 - July 15, 2013

June 19, 2013
3 p.m. – 6 p.m.

Federal Way Transit Center Plaza
31621 23rd Ave S.
Federal Way, 98003

June 26, 2013
5 p.m. – 7 p.m.

Parkside Elementary cafeteria
2104 S. 247th St.
Des Moines, 98198

The EIS Scoping public comment period will last until July 15, 2013. Public meetings will be held at the locations and times noted above.

Send us your comments by July 15, 2013

Mail:
Kent Hale
Sound Transit, 401 S Jackson St., Seattle, WA 98104

Email:
FWTE@soundtransit.org

Online:
Complete a scoping comment form at
www.soundtransit.org/FWextension

Attend a public meeting
and fill out a comment form

Comments regarding the AA and which alternatives should be studied further in the Draft EIS should be submitted by one of the methods above by July 15, 2013.

Additional information regarding the Federal Way Transit Extension is available on the project website at **www.soundtransit.org/FWextension**. To view the Level 1 and Level 2 Alternatives Screening reports, click on "Federal Way document archive" in the bottom right corner of the project home page.

WELCOME

FEDERAL WAY TRANSIT EXTENSION

Meeting Purpose

Today, you will have the opportunity to:

- Learn about the project purpose and need.
- Review potential alternatives.
- Tell us how the project could affect people and the environment.
- Ask questions of project staff.
- Tell us what you think.

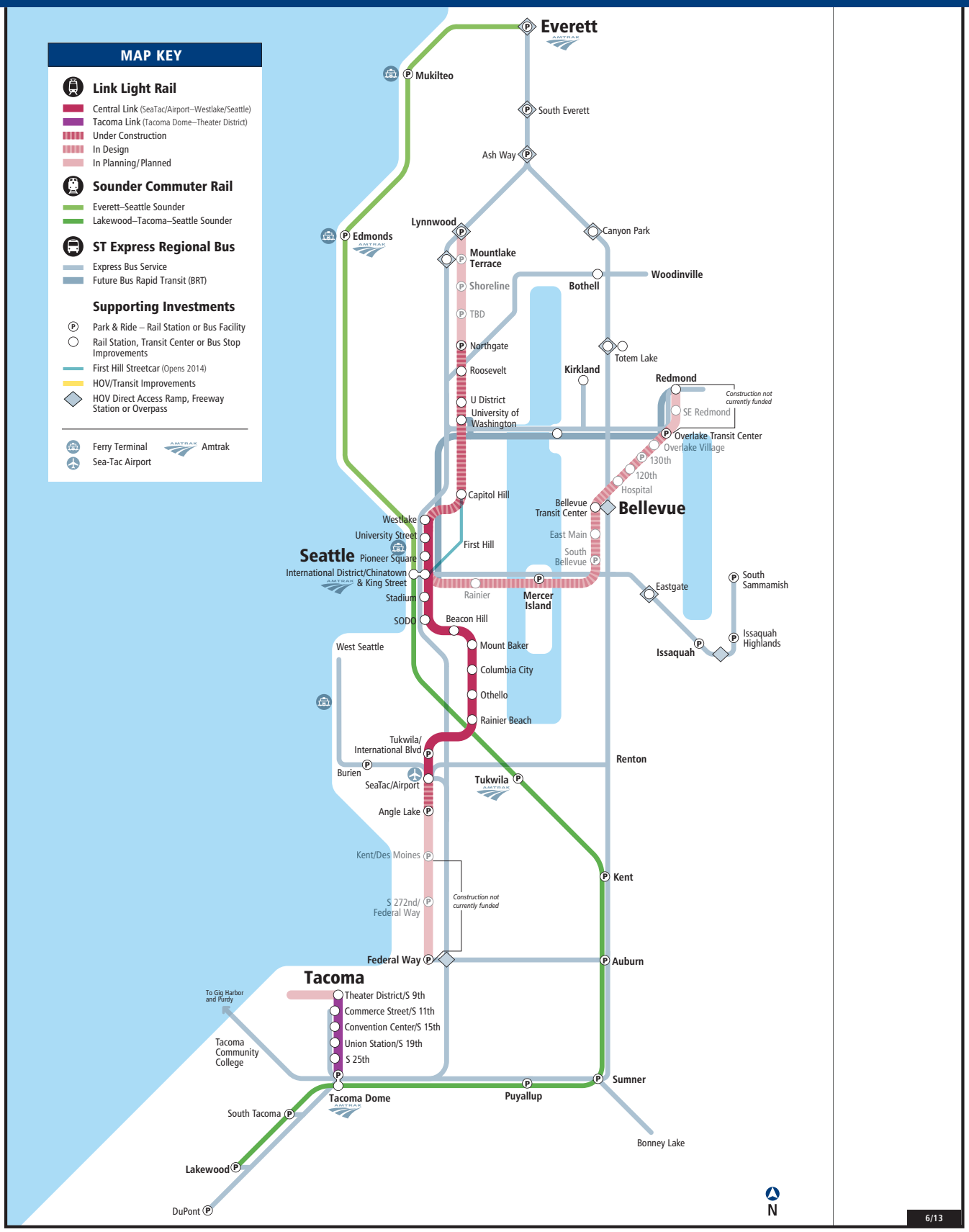
This scoping open house is an important part of the environmental review process.

Thank you for coming!

SOUNDTRANSIT
RIDE THE WAVE

SOUND TRANSIT CURRENT SERVICE AND APPROVED PROJECTS

FEDERAL WAY TRANSIT EXTENSION



6/13

SOUNDTRANSIT
RIDE THE WAVE

WHAT IS THE PROJECT FUNDING STATUS?

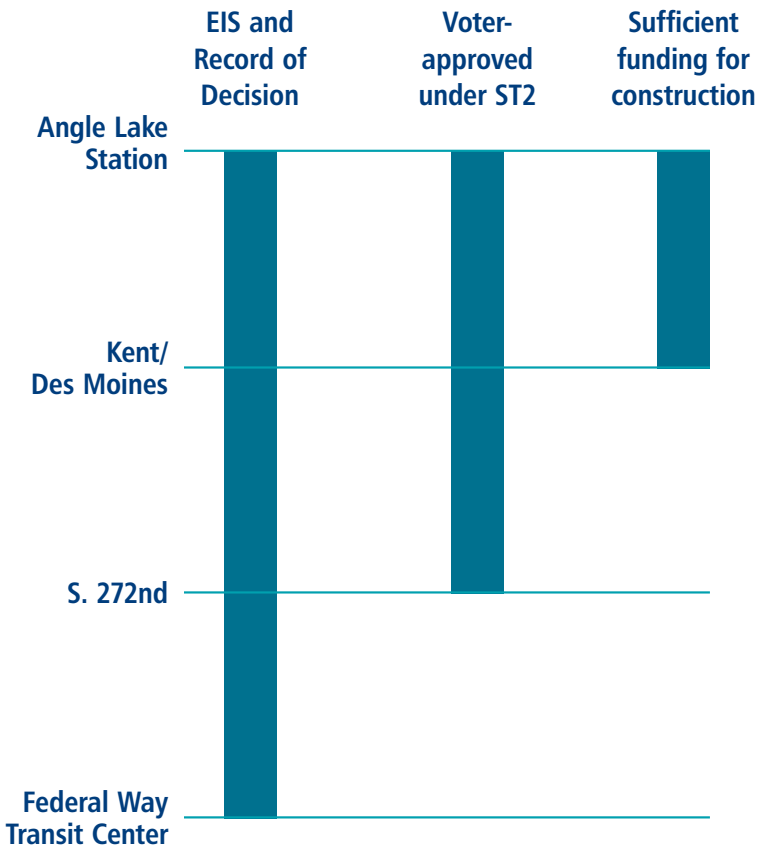
FEDERAL WAY TRANSIT EXTENSION

Sound Transit is in the process of delivering major voter-approved high capacity transit investments throughout the region. The national recession has significantly reduced funding, including a projected 41 percent reduction in in South King County revenues through 2023. Currently, project funding is available for construction to Kent/Des Moines.

Your help identifying light rail alternatives in South King County is vital to:

- Extending light rail from S. 200th Street to Kent/Des Moines.
- Developing a shovel-ready plan to extend services all the way to the heart of Federal Way.

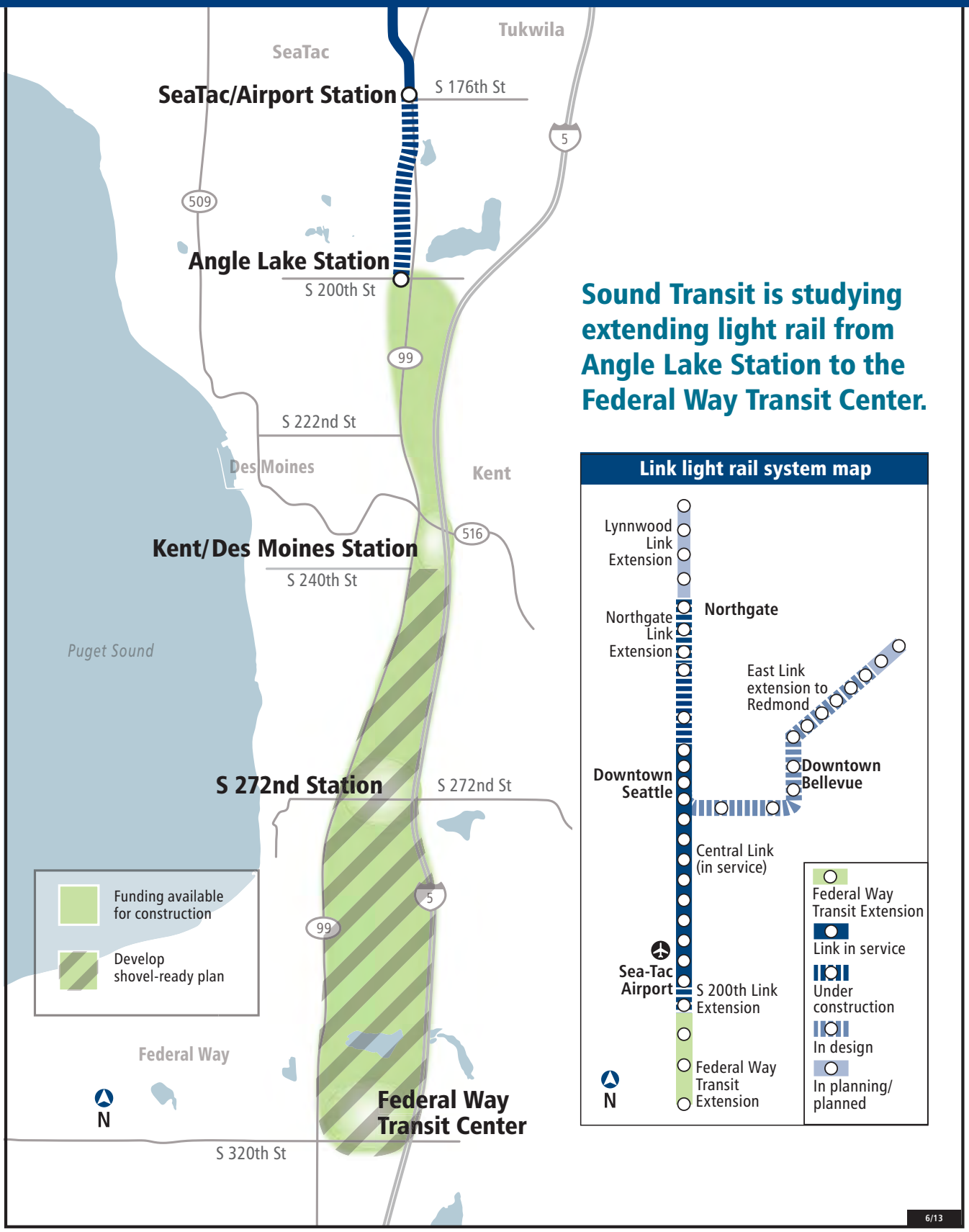
Project Funding Status



SOUNDTRANSIT
RIDE THE WAVE

FEDERAL WAY TRANSIT EXTENSION CORRIDOR

FEDERAL WAY TRANSIT EXTENSION



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RIDE THE WAVE

WHAT IS THE PROJECT PURPOSE?

FEDERAL WAY TRANSIT EXTENSION

A purpose and need statement will help guide decisions about the project.

The project purpose is:

- Provide an alternative to traveling on congested roadways.

- Improve mobility and access to transit.

- Provide more reliable and convenient public transportation to jobs and key destinations.

- Support local and regional land use, transportation and economic development plans.

- Preserve and promote a healthy environment.

SOUNDTRANSIT
RIDE THE WAVE

PROJECT PURPOSE: TELL US WHAT YOU THINK

FEDERAL WAY TRANSIT EXTENSION

Understanding your priorities helps us evaluate alternatives.

The project purpose is:	Place a dot next to the issues that are most important to you.
Provide an alternative to traveling on congested roadways.	
Improve mobility and access to transit.	
Provide more reliable and convenient public transportation to jobs and key destinations.	
Support local and regional land use, transportation and economic development plans.	
Preserve and promote a healthy environment.	

SOUNDTRANSIT
RIDE THE WAVE

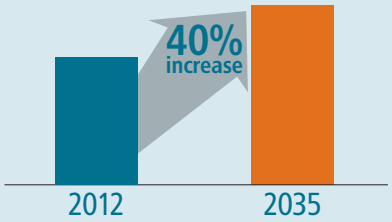
WHAT IS THE PROJECT NEED?

FEDERAL WAY TRANSIT EXTENSION

A purpose and need statement will help guide decisions about the project.

This project is needed because:

Demand for transit service



- More people will be living and working in the project area.

- Traffic congestion on I-5 will continue to worsen.

In 2035, it will take **25% longer** to drive between Seattle and Federal Way during rush hour.

- Travel times will increase.

- Limited evening and weekend service.
- Does not connect to jobs and key destinations.
- Requires too much time and too many transfers.

- Existing transit service does not meet the needs of people in the corridor.

SOUNDTRANSIT
RIDE THE WAVE

PROJECT NEED: TELL US WHAT YOU THINK

FEDERAL WAY TRANSIT EXTENSION

Understanding your priorities helps us evaluate alternatives.

The project is needed because:	Place a dot next to the topics that are most important to you.
More people will be living and working in the project area.	
Traffic congestion on I-5 will continue to worsen.	
Travel times will increase.	
Existing transit service does not meet the needs of people in the corridor.	

SOUNDTRANSIT
RIDE THE WAVE

TIMELINE/PROCESS

FEDERAL WAY TRANSIT EXTENSION

Currently there is sufficient funding to build light rail to Kent/Des Moines

Early Scoping & Alternatives Analysis

Analyze a range of transit modes and alignment alternatives. Narrow these to a range of alternatives to consider.

Oct 2012
Public comment

June 2013
Alternatives Analysis Report
Determine the range of alternatives and "scope" of issues to study in the Environmental Impact Statement (EIS).

June 2013
Public comment

We are here

Sept 2013
Sound Transit Board identifies alternatives for EIS

Environmental Review

Describe the benefits and adverse effects of each alternative. Outline ways to avoid, minimize or mitigate negative effects.

Late 2014
Draft EIS

Late 2014
Public comment

Early 2015
Sound Transit Board identifies preferred alternative

Mid 2016
Final EIS
Respond to comments received on the Draft EIS. Outline mitigation for unavoidable environmental impacts.

Late 2016
Sound Transit Board selects project to build

Late 2016
Federal Transit Administration issues Record of Decision
Document what project Sound Transit will build and how it will avoid, minimize and mitigate for environmental impacts.

Final Design

2017 – 2018

Construction

2019 – 2022

Testing & Pre-operations

2022 – 2023

Start of Service

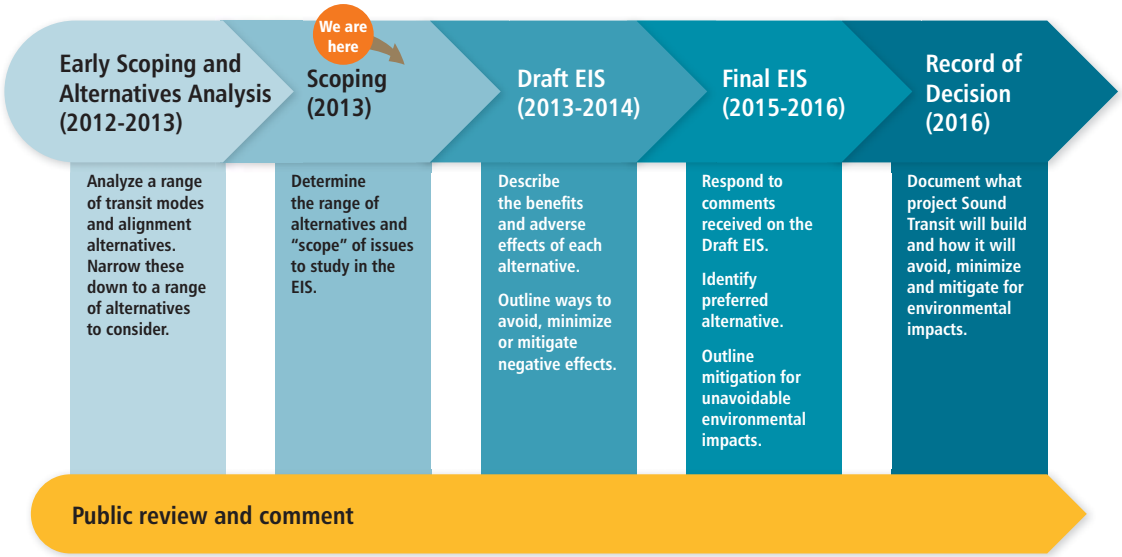
2023

SOUNDTRANSIT
RIDE THE WAVE

WHAT IS THE ENVIRONMENTAL REVIEW PROCESS?

FEDERAL WAY TRANSIT EXTENSION

Steps in preparing an EIS



Sound Transit and the Federal Transit Administration will prepare an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) and the Washington State Environmental Policy Act (SEPA). In the EIS, Sound Transit will evaluate how the project could affect the community and the environment.

What is typically studied in an EIS?

Transportation:
- Transit
- Traffic

Natural environment:
- Air quality
- Greenhouse gas emissions
- Ecosystems
- Water resources
- Geology and soils

Community impacts:
- Noise and vibration
- Visual effects
- Land use and economic activity
- Acquisitions, displacements and relocations
- Energy use
- Hazardous materials
- Public services and utilities
- Impacts on low-income and minority populations
- Cultural, historic and archaeological resources
- Parks
- Construction impacts

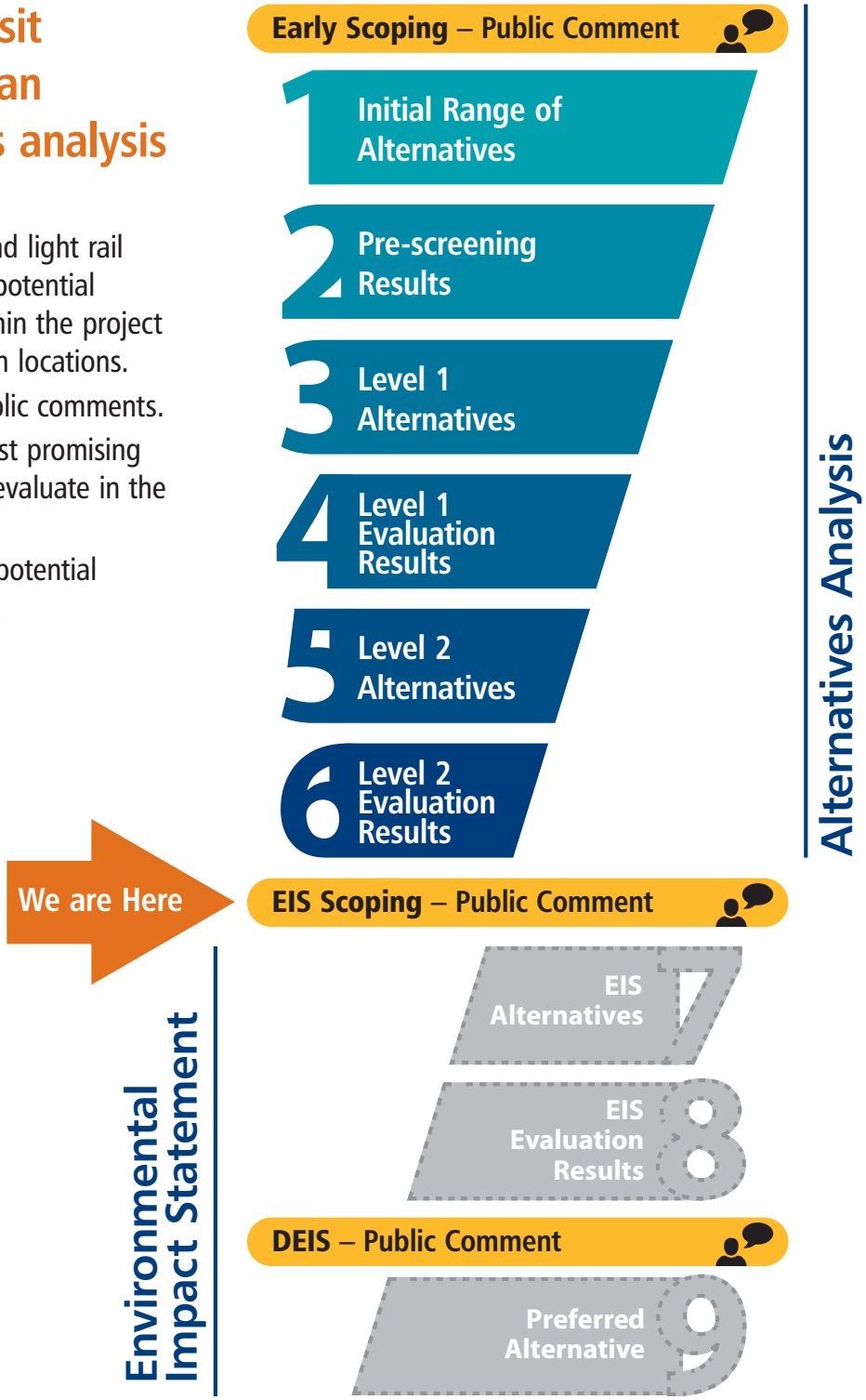
SOUNDTRANSIT
RIDE THE WAVE

WHAT IS AN ALTERNATIVES ANALYSIS?

FEDERAL WAY TRANSIT EXTENSION

Sound Transit conducted an alternatives analysis process to:

- Examine bus and light rail transit modes, potential alignments within the project area and station locations.
- Incorporate public comments.
- Identify the most promising alternatives to evaluate in the Draft EIS.
- Help to secure potential federal funding.



6/13

SOUNDTRANSIT
RIDE THE WAVE

WHAT DID WE HEAR DURING ALTERNATIVES ANALYSIS?

FEDERAL WAY TRANSIT EXTENSION

What people said...

We need parking at stations.

I think elevated light rail will cause less disruption.

I think elevated light rail will cost less to build.

I think at-grade light rail will make traffic congestion worse.

We are concerned about impacts to natural resources.

How will buses connect to new stations?

Consider bikes and pedestrians.

How will this project affect our neighborhoods?

We prefer light rail.

What about an alignment along 24th Ave S.

Will this project affect the value of my property?

I think at-grade light rail will make for a slower trip.

I think elevated light rail will be faster.

I think elevated light rail will be safer.

Light rail should be faster than travel by bus or car.

What about an alignment along 30th Ave S.

We are concerned about noise.

What will this project do to traffic?

We need more transit service.

Build light rail all the way to Tacoma.

What else should we consider?

6/13

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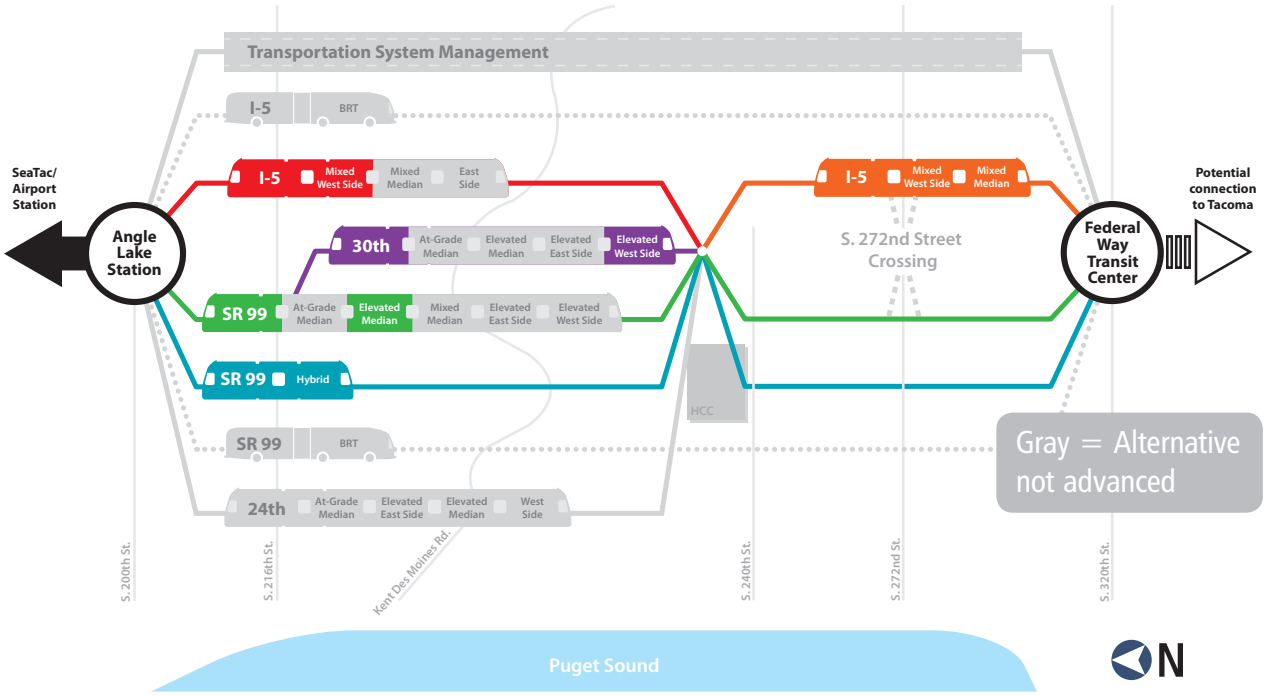
RIDE THE WAVE

For each alignment under consideration, we asked these questions. Would this alignment:

- ✓ Increase transit ridership?
- ✓ Improve connections to regional transit?
- ✓ Improve transit service for people who do not have access to a car?
- ✓ Serve an area that is home to many low-income and/or minority residents?
- ✓ Connect to existing neighborhoods or major activity centers?
- ✓ Minimize impacts to the natural environment (such as wetlands, streams and lakes)?
- ✓ Minimize impacts to the built environment (such as parks, community facilities or private property)?
- ✓ Minimize or avoid traffic, noise and visual impacts?
- ✓ Be affordable to build?

Evaluation Results



Alternatives were not evaluated further if they:

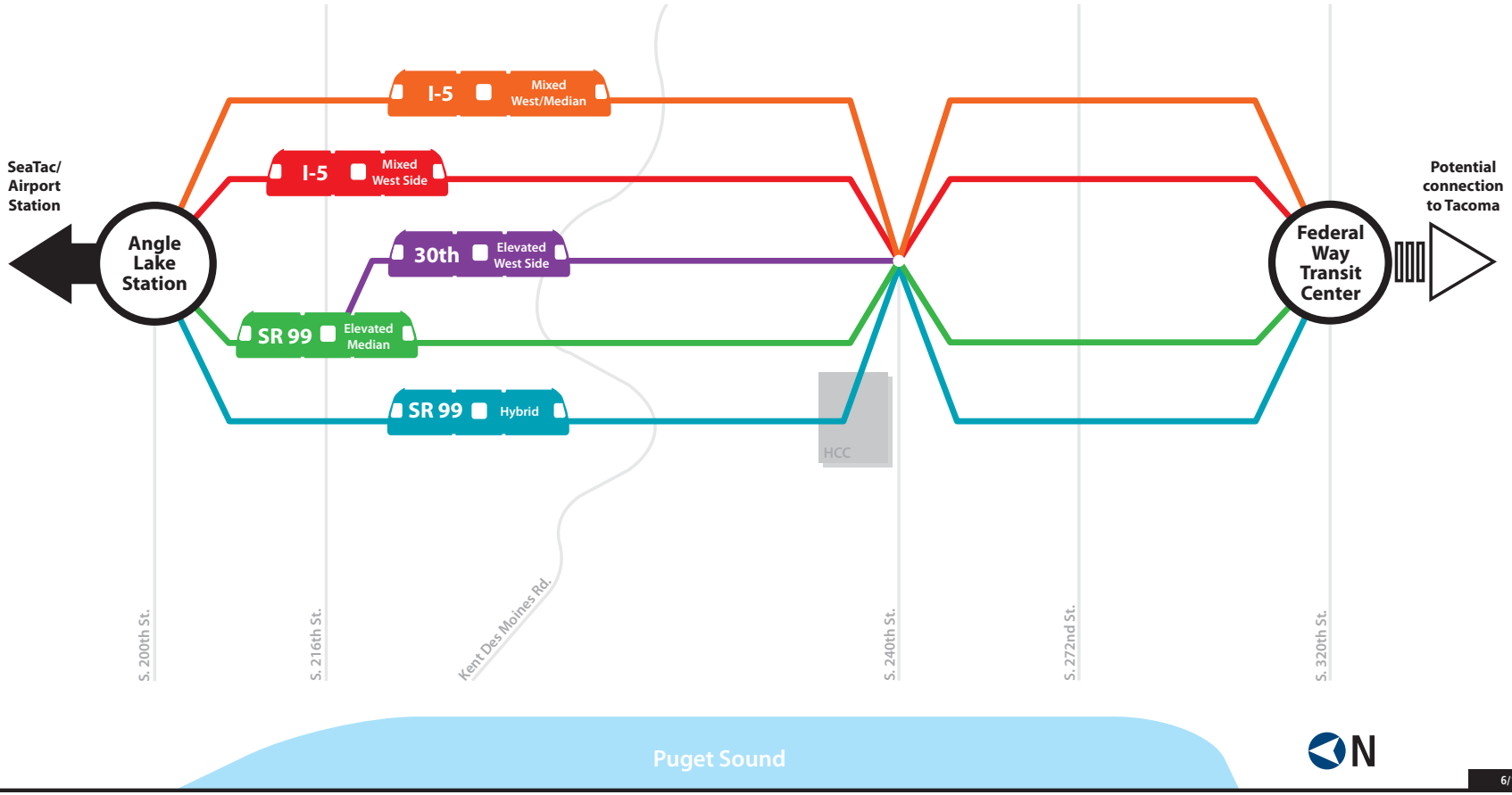
- Would not meet the project purpose and need.
- Would cause substantial impacts to the environment or communities.
- Would be too expensive to build compared with other alternatives.

SOUNDTRANSIT
RIDE THE WAVE

WHAT ALIGNMENT ALTERNATIVES SHOULD WE STUDY IN THE DRAFT EIS?

FEDERAL WAY TRANSIT EXTENSION

Five alignment alternatives remain:



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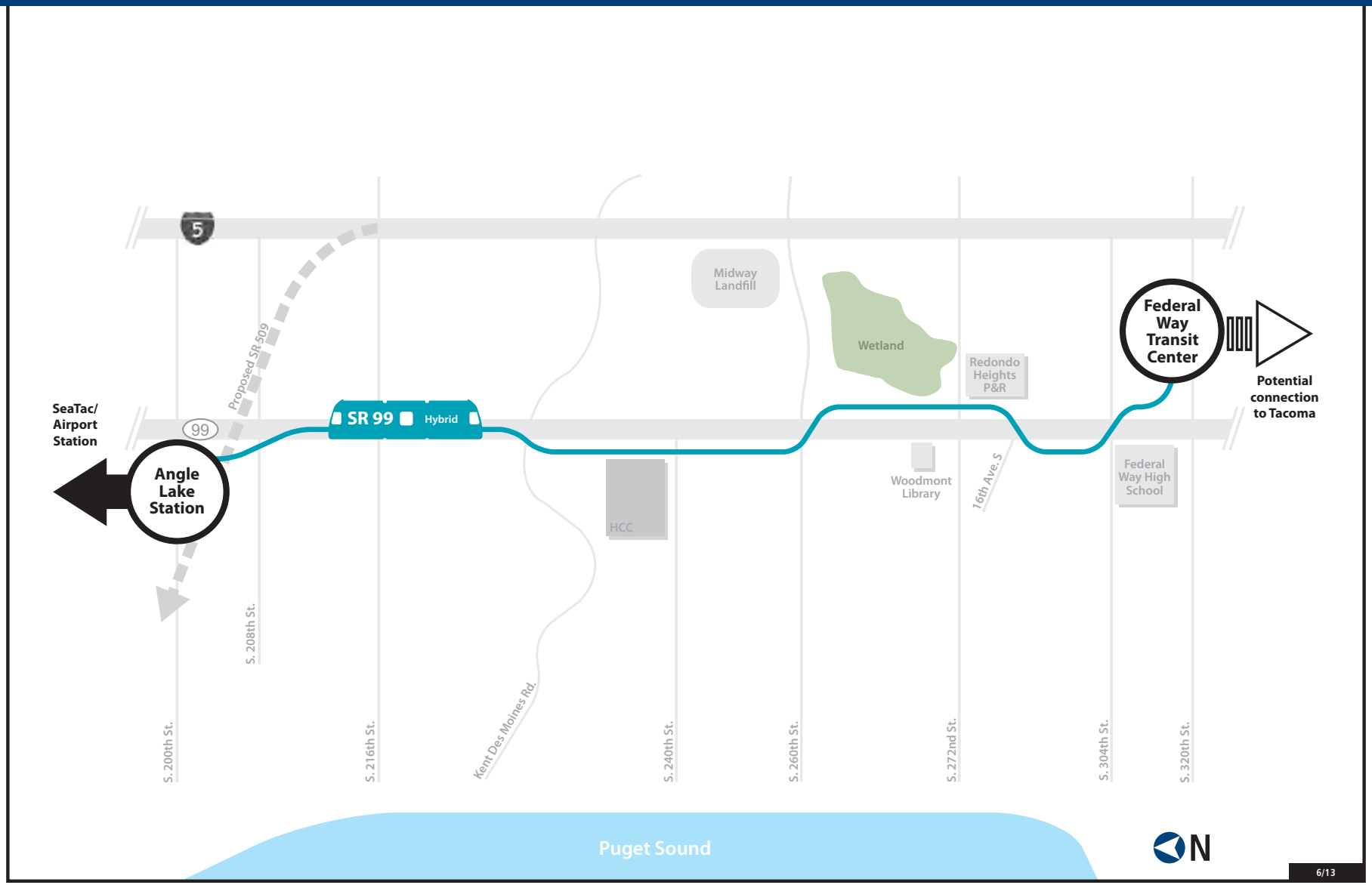
ABOUT THE SR 99 HYBRID ALTERNATIVE

FEDERAL WAY TRANSIT EXTENSION



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RIDE THE WAVE

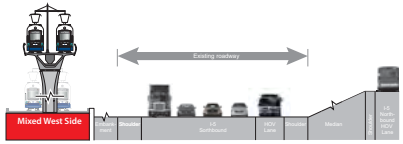
ABOUT THE FIVE ALIGNMENT ALTERNATIVES

FEDERAL WAY TRANSIT EXTENSION

Common characteristics*:

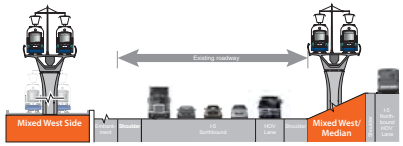
- Daily Ridership: 23,000 Riders
- Travel Time: 14 to 15 mins
- Population: 35,000 to 36,000 people
- Employment: 11,000 to 14,000 Jobs
- Households: 13,000 to 14,000 Households

I-5 Mixed West Side



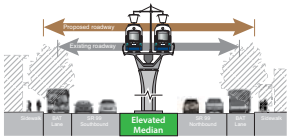
Traffic	ROW Effect	TOD Potential	Cost	Visual/ Noise	Complexity
Low Effects	High Residential (north of 240th)	Weaker along I-5	1.5 Billion	Residential along I-5	I-5 Expansion, Landfill, Water Tanks, Substation

I-5 Mixed West/Median



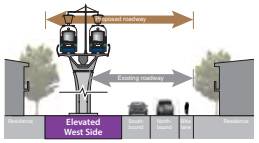
Traffic	ROW Effect	TOD Potential	Cost	Visual/ Noise	Complexity
Low Effects	High Residential (north of 240th)	Weaker along I-5	1.6 Billion	Residential along I-5	I-5 Expansion, transitions to I-5 Median

SR 99 Elevated Median



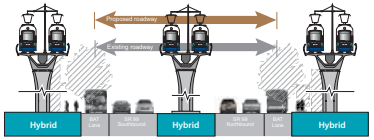
Traffic	ROW Effect	TOD Potential	Cost	Visual/ Noise	Complexity
Moderate Effects	Moderate Residential and Commercial	Stronger along SR 99	1.8 Billion	Residential East/ West of SR 99	Utilities, Hazmat, Major Intersections

30th Elevated West Side



Traffic	ROW Effect	TOD Potential	Cost	Visual/ Noise	Complexity
Moderate Effects	High Residential (along 30th)	Stronger along SR 99	1.8 Billion	Residential along 30th Ave. S.	Utilities, Hazmat, Major Intersections

SR 99 Hybrid



Traffic	ROW Effect	TOD Potential	Cost	Visual/ Noise	Complexity
Low Effects	Moderate Residential, High Commercial	Stronger along SR 99	1.8 Billion	Residential East/ West of SR 99	Utilities, Hazmat, Topography

*Population, employment and household data within 1/2 mile of stations.

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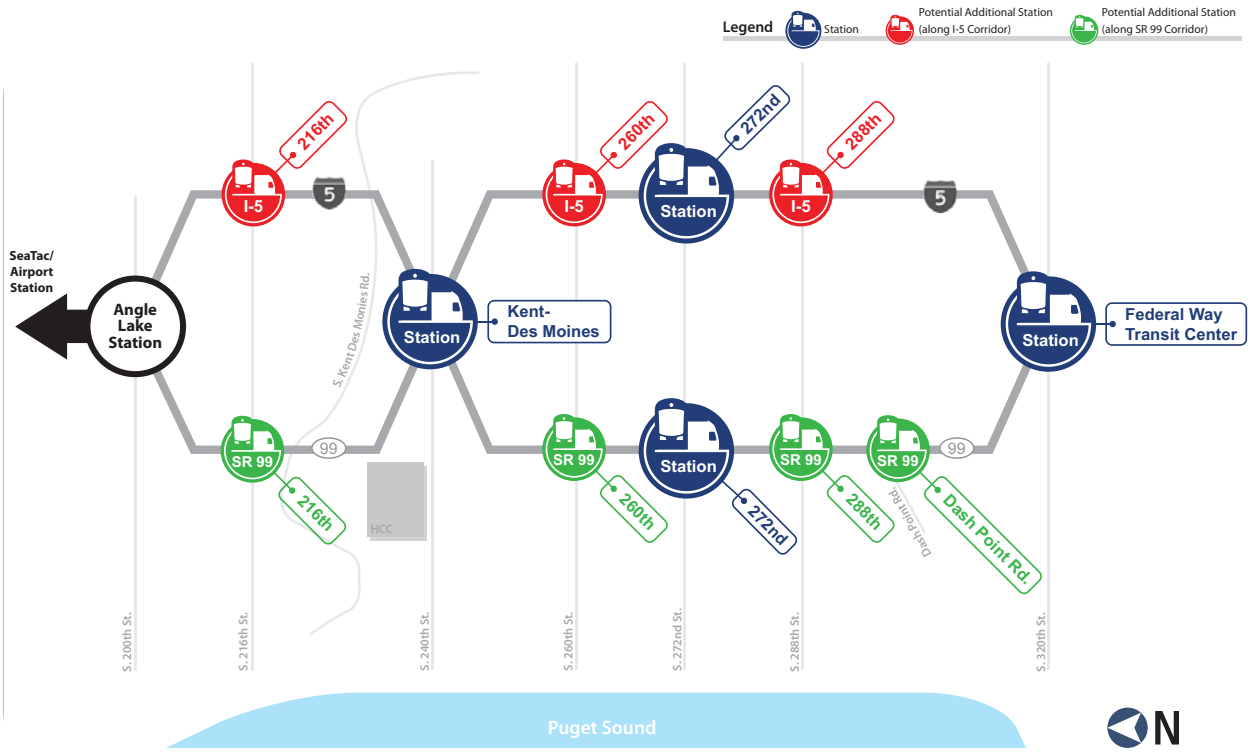
RIDE THE WAVE

WHAT STATION ALTERNATIVES DID WE STUDY?

FEDERAL WAY TRANSIT EXTENSION



Sound Transit evaluated additional station locations during alternatives analysis based on comments received during early scoping.

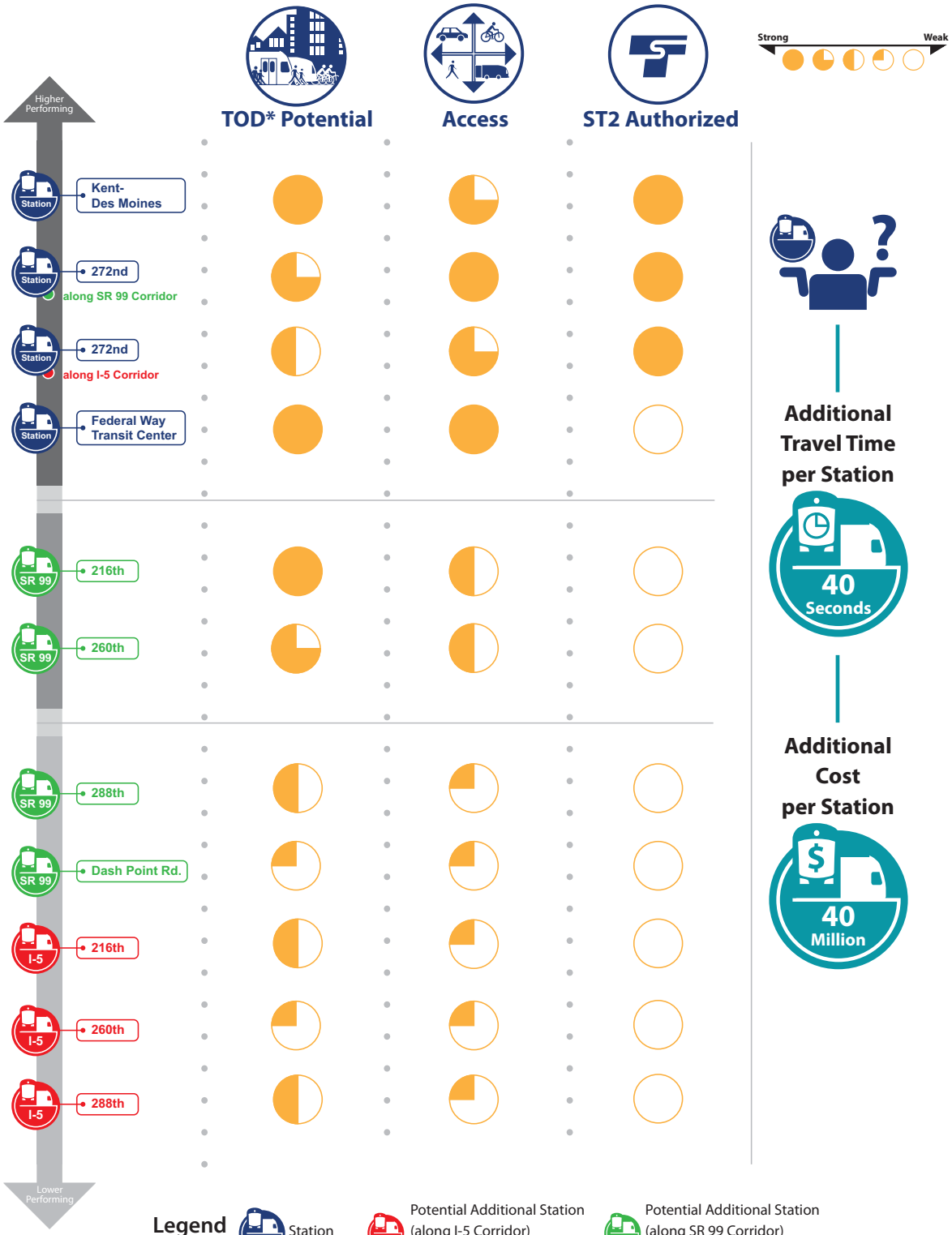
Stations other than those identified in the voter-approved ST2 Plan would require additional taxing authority and funding.

The Sound Transit Board will decide which stations to evaluate further when it identifies the EIS alternatives in September 2013.

SOUNDTRANSIT
RIDE THE WAVE

WHAT WERE THE RESULTS OF THE STATION EVALUATION?

FEDERAL WAY TRANSIT EXTENSION



*TOD=Transit Oriented Development

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SOUNDTRANSIT
RIDE THE WAVE

YOUR COMMENTS ARE IMPORTANT!

FEDERAL WAY TRANSIT EXTENSION

Tell us what you think:

- Are there changes Sound Transit should consider making to the draft purpose and need statement?
- Is Sound Transit considering the right alternatives?
- What social, economic, environmental and transportation issues are you concerned about in the project area?

How to comment:

- Fill out a comment form and drop it in a comment box or mail it from home.
- Online: Complete a scoping comment form at *soundtransit.org/FWextension*.
- Email: *FWTE@soundtransit.org*
- Mail: Kent Hale, Sound Transit
  401 S Jackson St., Seattle, WA 98104

How to stay involved:

- Sign up for the latest project updates by visiting *soundtransit.org/subscribe*.

Receive E-mail Updates

Send us your comments by July 15, 2013

SOUNDTRANSIT
RIDE THE WAVE