Regional Transit Long-Range Plan Update

APPENDIX K
Transportation Technical Report

November 2014

SOUNDTRANSIT

Contents

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Acronyms and Abbreviations

ACCESS	King County Metro paratransit service
BAT	Business access and transit
BNSF	Burlington Northern Santa Fe
BRT	bus rapid transit
CBD	central business district
DART	King County Metro Dial-A-Ride Transit
DSTT	Downtown Seattle Transit Tunnel
FTA	Federal Transit Administration
HCT	High-capacity transit
HOT	High-occupancy toll
HOV	High-occupancy vehicles
I-5	Interstate 5
mph	miles per hour
OMSF	operations and maintenance satellite facility
PSRC	Puget Sound Regional Council
SEIS	Supplemental Environmental Impact Statement
Sound Transit	Central Puget Sound Transit Authority
SOV	single occupant vehicle
SR	State Route
ST2	Sound Transit 2 (second phase system plan adopted in 2008)
UW	University of Washington
VMT	vehicle miles traveled
WSDOT	Washington State Department of Transportation

1 Introduction and Background

Sound Transit has prepared a Final Supplemental Environmental Impact Statement (SEIS) to support the agency's current planning and decision-making efforts for an updated Long-Range Plan and future Regional Transit System Plan. It supplements EISs prepared in 2005 (*Final Supplemental Environmental Impact Statement on the Regional Transit Long-Range Plan*) and in 1993 (*Final Environmental Impact Statement Regional Transit System Plan*). The purpose of the Long-Range Plan Update is to define a regional high-capacity transit (HCT) system that could effectively and sustainably serve the mobility needs of the central Puget Sound region through 2040 and beyond. Sound Transit is updating its Long-Range Plan to make it consistent with updated local and regional plans; to incorporate updated population and employment forecasts from PSRC; and to identify potential modifications to the current plan that could serve as the basis for the next phase of high-capacity transit (HCT) improvements.

This *Transportation Technical Report* presents information on the existing regional transportation system and the system under ST2, and evaluates potential impacts and mitigation measures associated with the alternatives studied in the Long-Range Plan Update SEIS. These alternatives, the Current Plan Alternative and the Potential Plan Modifications Alternative, are described in Chapter 2 of the Regional Long-Range Plan Update Final SEIS. The information in this *Transportation Technical Report* supports Chapter 3, Transportation, of the Final SEIS. This report also provides new information and updated analyses from that initially presented in the Transportation Chapter of the 2005 SEIS for the Long-Range Plan.

1.1 Background

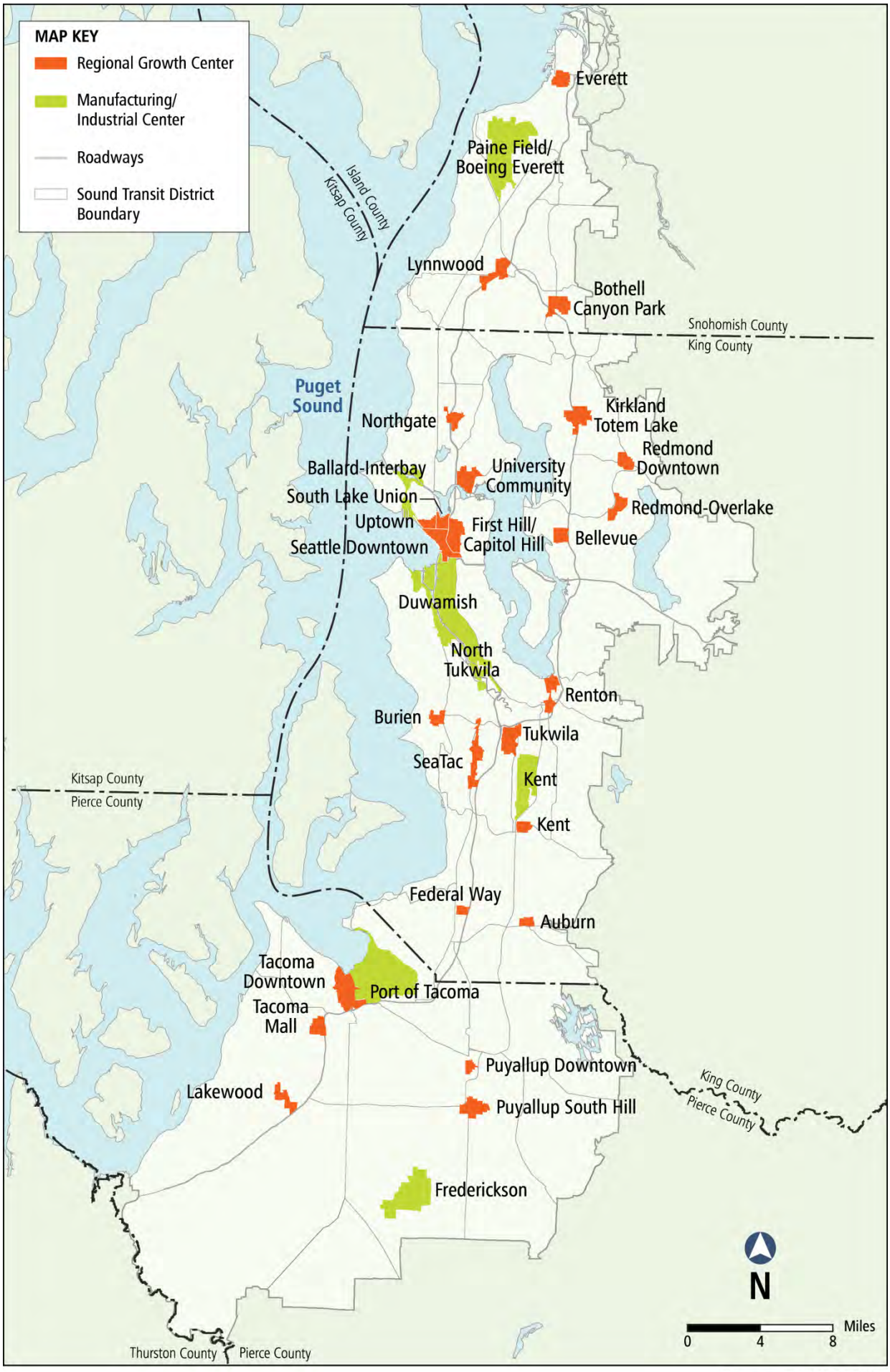
When possible, information in this report is presented for the Plan area, which is made up of those portions of Snohomish, King, and Pierce Counties within the Sound Transit district boundary. For some items presented in this section, the data is not available except at the county level and will include information for areas in Snohomish, King, and Pierce Counties that are beyond the Sound Transit district boundary. For other items in this section, information reflects the four-county central Puget Sound region (Snohomish, King, Pierce, and Kitsap Counties).

Figure 1-1 shows the Sound Transit district boundary, which defines the agency's service area as established by state law. The study area for purposes of the Final SEIS is referred to as the Plan area and includes the entire Sound Transit service area. Regional Growth Centers located within the Plan area, as designated by the Puget Sound Regional Council (PSRC), are also shown in Figure 1-1.

Travel demand in the region, including within the Plan area, has been influenced by road congestion, trends in employment, housing, development patterns, the economy, transportation options, and the cost of fuel. The following sections further identify these trends.

1.1.1 Highway system congestion and vehicle operating cost

The region's existing highway system is at capacity on key corridors such as I-5, I-405, SR 520, and I-90 for multiple hours of the a.m. and p.m. peak-period commute. These conditions have resulted in greater incentives to use alternative travel modes, such as public transit. Similarly, the rising cost of fuel also has motivated some drivers to consider public transit.



Source: PSRC 2014b

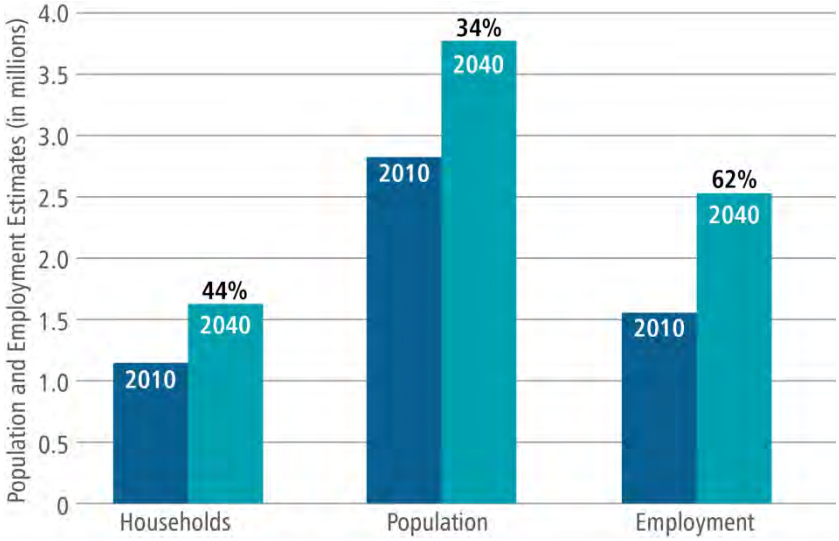
Figure 1-1. Sound Transit district boundary

1.1.2 Growth in population, households, and employment

Growth trends for the Plan area are shown in Figure 1-2. Key items relating to the growth trends include the following:

- Between 2010 and 2040, households in the Plan area are expected to grow by 44 percent, from approximately 1.13 million to 1.63 million.
- Population is estimated to increase by 34 percent, from 2.81 million in 2010 to approximately 3.77 million in 2040.
- Employment in the Plan area will grow at a higher rate than population and households. By 2040, employment will grow by 62 percent, from approximately 1.55 million in 2010 to 2.52 million in 2040.

According to PSRC forecasting model, all of these new households, people, and jobs are expected to boost demand for travel within and through the Plan area by about 25 percent in terms of vehicle miles traveled between 2012 and 2040. Transit ridership results that were included in the Final SEIS reflect 2013 population, employment, and household information as provided by PSRC.



Source: PSRC Estimates & Land Use Targets Forecast (2013)

Figure 1-2. Households, population, and employment growth rate in the plan area, 2010 to 2040

1.1.3 Change in demographics

Changes in demographics and lifestyle preferences affect transit use. For example, the number of people reaching retirement age and those with disabilities are increasing. The growing preference by many younger people is to live in urban areas. Many people are also choosing transit for quality of life factors or concern for the environment. The combined result of these changing demographic patterns could affect demand for public transit services beyond what would result from estimated growth in population, households, and employment described above.

1.1.4 Effect of growth on the highway and arterial system

The growth in population, households, and employment is projected to exceed the planned capacity improvements on the regional highway and arterial system. Overall, future congestion and delay will exceed today's conditions, even with investments in key transportation corridors (PSRC 2010). Travel-time reliability will also be worse as accidents, disabled vehicles, and severe weather impacts are magnified by increased traffic volumes.

1.1.5 Regional growth strategy

In PSRC's *VISION 2040,* the Regional Growth Strategy focuses the majority of the four-county central Puget Sound region's employment and housing growth into Regional Growth Centers that include Metropolitan Cities (Bellevue, Bremerton, Everett, Seattle, and Tacoma) and Core Cities (Auburn, Bothell, Burien, Federal Way, Kent, Kirkland, Lakewood, Lynnwood, Puyallup, Redmond, Renton, SeaTac, Silverdale, and Tukwila). All these cities, except Bremerton and Silverdale, are located in the Plan area.

The PSRC-designated Regional Growth Centers located in the Plan area were shown in Figure 1-1. As a regional transit provider, Sound Transit focuses its services on providing connections between the Regional Growth Centers located within the Plan area. Of the regional growth that is projected to occur between 2010 and 2040, 32 percent will occur in the five Metropolitan Cities and 22 percent will occur in the Core Cities.

1.2 Ridership forecasting methodology

The methodology for the ridership forecasting included in this analysis generally follows that used in the 2005 Final SEIS on the Regional Transit Long-Range Plan. Information in this report updates the transportation analysis conducted for the 2005 Final SEIS. The Sound Transit ridership forecasting model has been updated and revalidated twice since the 2005 Long-Range Plan—once in 2006 for Sound Transit 2 (ST2), and most recently in 2012 for the Lynnwood Link Extension Environmental Impact Statement. Likewise, PSRC has updated its regional population and employment forecasts, most recently in April 2014.

For purposes of the Final SEIS, the Sound Transit ridership forecasting model was used to compare transit ridership in 2040 between ST2, the Current Plan Alternative, and the Potential Plan Modifications Alternative. ST2 is the funded program of high-capacity transit (HCT) expansion approved by the voters in 2008, which in this analysis includes amendments made through Sound Transit Board actions. The most distant future year for which regionally adopted population and employment forecasts are available is 2035. These forecasts were extrapolated to determine 2040 estimates. This extrapolation matches the horizon year for PSRC's adopted Metropolitan Transportation Plan, called *Transportation 2040*. There is not an expected completion date for any potential elements of the existing or updated Long-Range Plan.

The Sound Transit ridership model methodology is described in more detail in the *Transit Ridership Forecasting Methodology Report* (Sound Transit 2014a). For several key inputs, the methodology relies on the PSRC regional travel demand forecasting model currently in use on major projects by the Washington State Department of Transportation (WSDOT). The model also relies on transit passenger counts and survey data from the region's transit operators, as well as data from the employer Commute Trip Reduction surveys (WSDOT) and the American Communities Survey (US Census).

The ridership model methodology must include the adopted PSRC population and employment forecasts. Accordingly, while new transit infrastructure, over the long-term, can affect land use, travel patterns, and development density, the Sound Transit ridership forecasting model assumes that land use, travel patterns, and overall travel demand remain constant when comparing alternative 2040 scenarios. The methodology approach, therefore, does not allow for a comparison of how different transit options may contribute to possible changes in land use and travel patterns. Other tools and techniques are available for comparing the effect of alternate transit investments on land use and travel patterns. Similarly, assumptions regarding future transit fares, parking prices, regional incomes, and regional highway tolling (as assumed in PSRC's *Transportation 2040*) are held constant when assessing the Current Plan Alternative, the Potential Plan Modifications Alternative and ST2.

The methodology used for the transit ridership forecast is in accordance with Sound Transit's standard practice when preparing forecasts in cooperation with the Federal Transit Administration (FTA) for major transit investments. FTA guidelines are described in its *New and Small Starts Evaluation and Rating Process: Final Policy Guidance* (FTA 2013).

2 Alternatives Analyzed

This report presents the analyses of transportation-related impacts for two future 2040 alternatives. These alternatives are the Current Plan Alternative (No Action Alternative) and the Potential Plan Modifications Alternative (Action Alternative). Each alternative is described briefly below and presented in more detail in Chapter 2 of the Final SEIS.

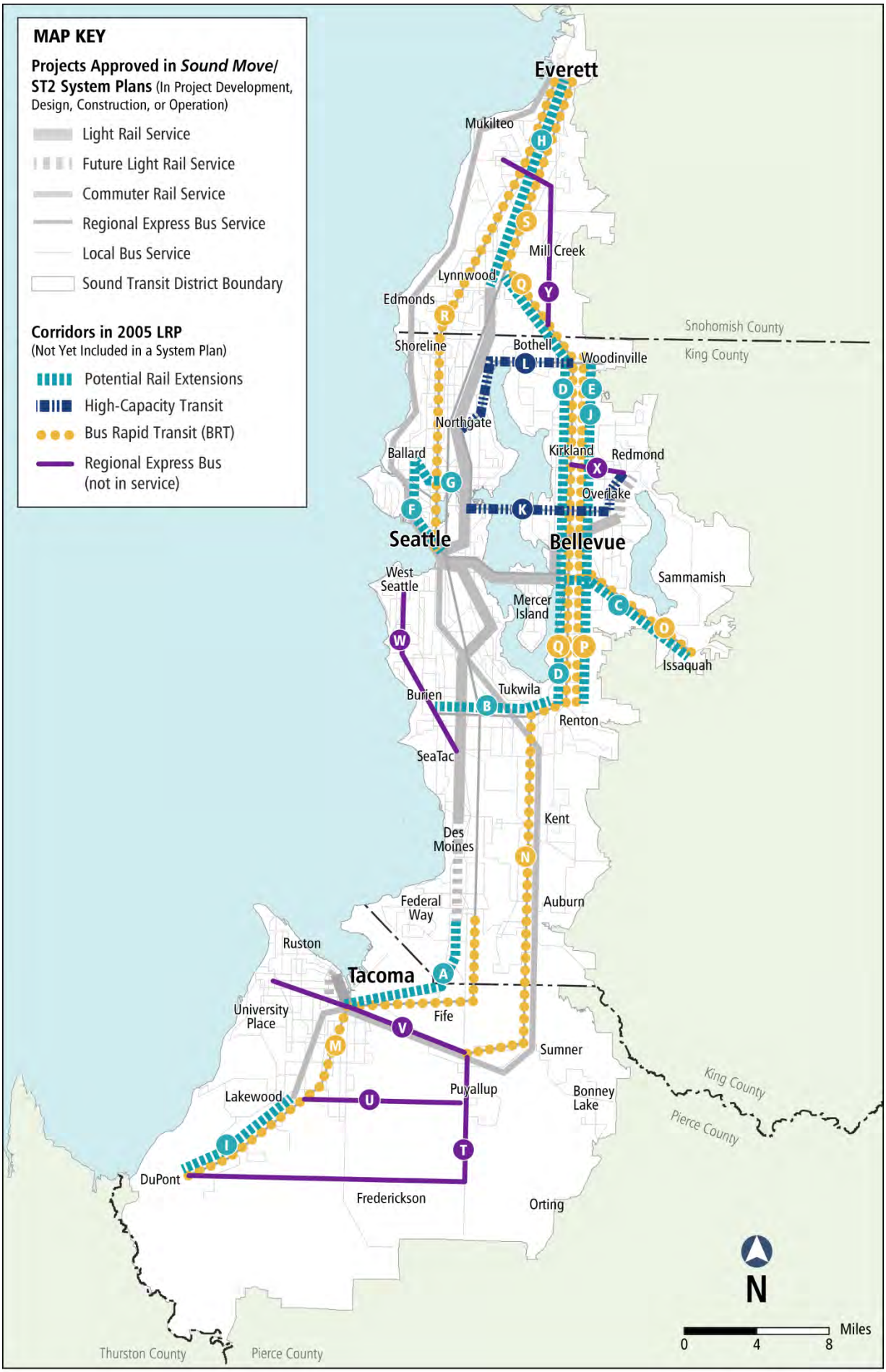
2.1 Current Plan Alternative

The Current Plan Alternative (shown in Figure 2-1) is the existing 2005 Long-Range Plan plus the subsequent Sound Transit Board actions implementing the plan. Subsequent to adoption of the 2005 Long-Range Plan, the Sound Transit Board developed an updated Regional Transit System Plan known as Sound Transit 2 (ST2). As part of the development and implementation of ST2, a number of decisions were made by the Sound Transit Board that affected certain corridors in the 2005 Long-Range Plan. These Board actions implementing the Plan are considered part of the Current Plan Alternative for the Final SEIS.

2.2 Potential Plan Modifications Alternative

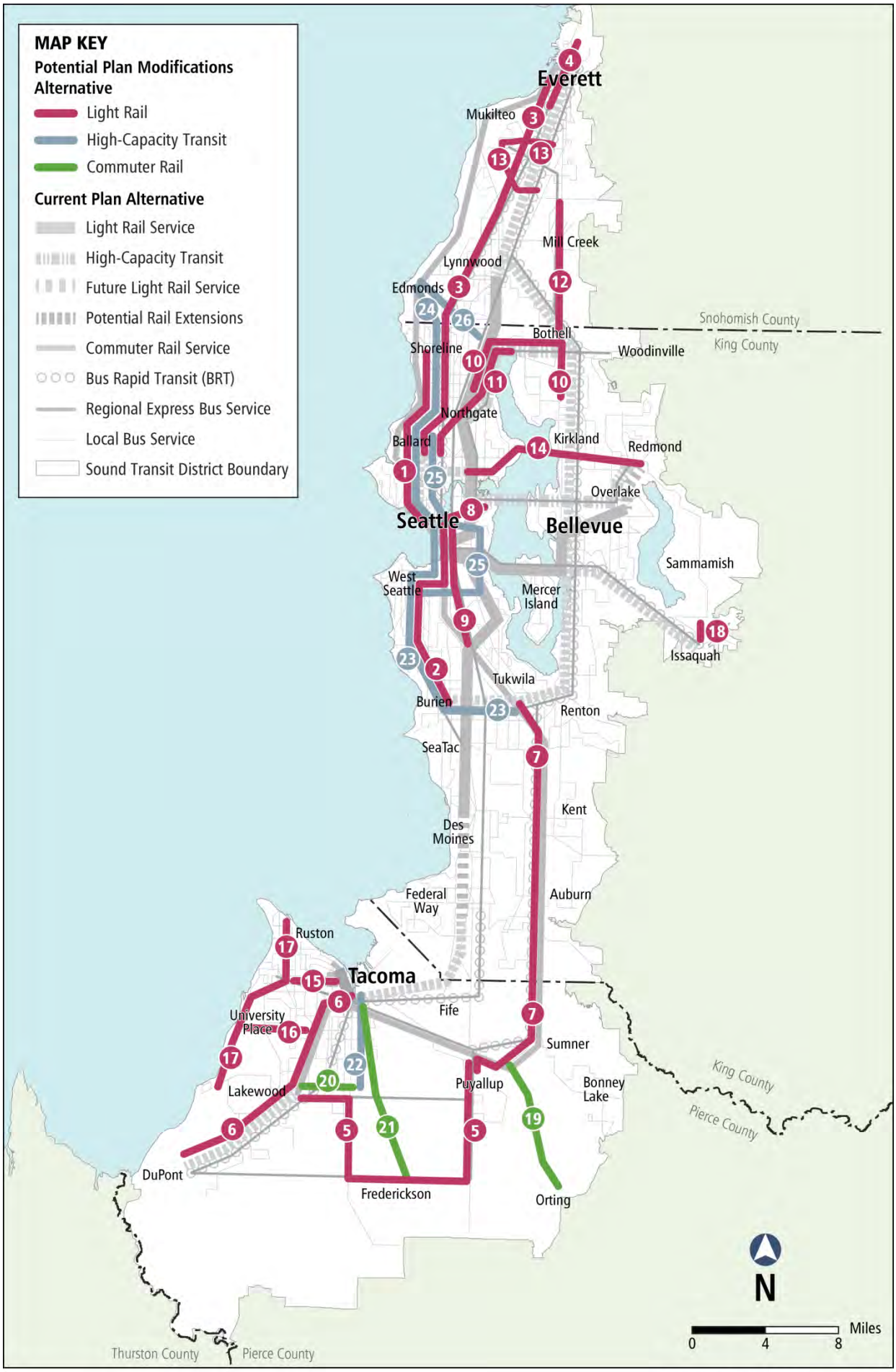
The Potential Plan Modifications Alternative is a menu of options that the Sound Transit Board could choose from when updating the Long-Range Plan. The menu of options developed during the scoping and screening steps of the EIS is described in more detail in Chapter 2 of the Final SEIS.

Figure 2-2 illustrates the light rail, commuter rail, and high-capacity transit (mode not specified) corridors of the Potential Plan Modifications Alternative. Figure 2-3 illustrates the regional express bus and bus rapid transit (BRT) corridors of the Potential Plan Modifications Alternative. Figure 2-4 illustrates potential streetcar services in the Potential Plan Modifications Alternative. The corridor numbers shown on Figure 2-2 and Figure 2-3 relate to the corridor numbers identified in Table 2-1 and Table 2-2 and described in Chapter 2 of the Final SEIS.



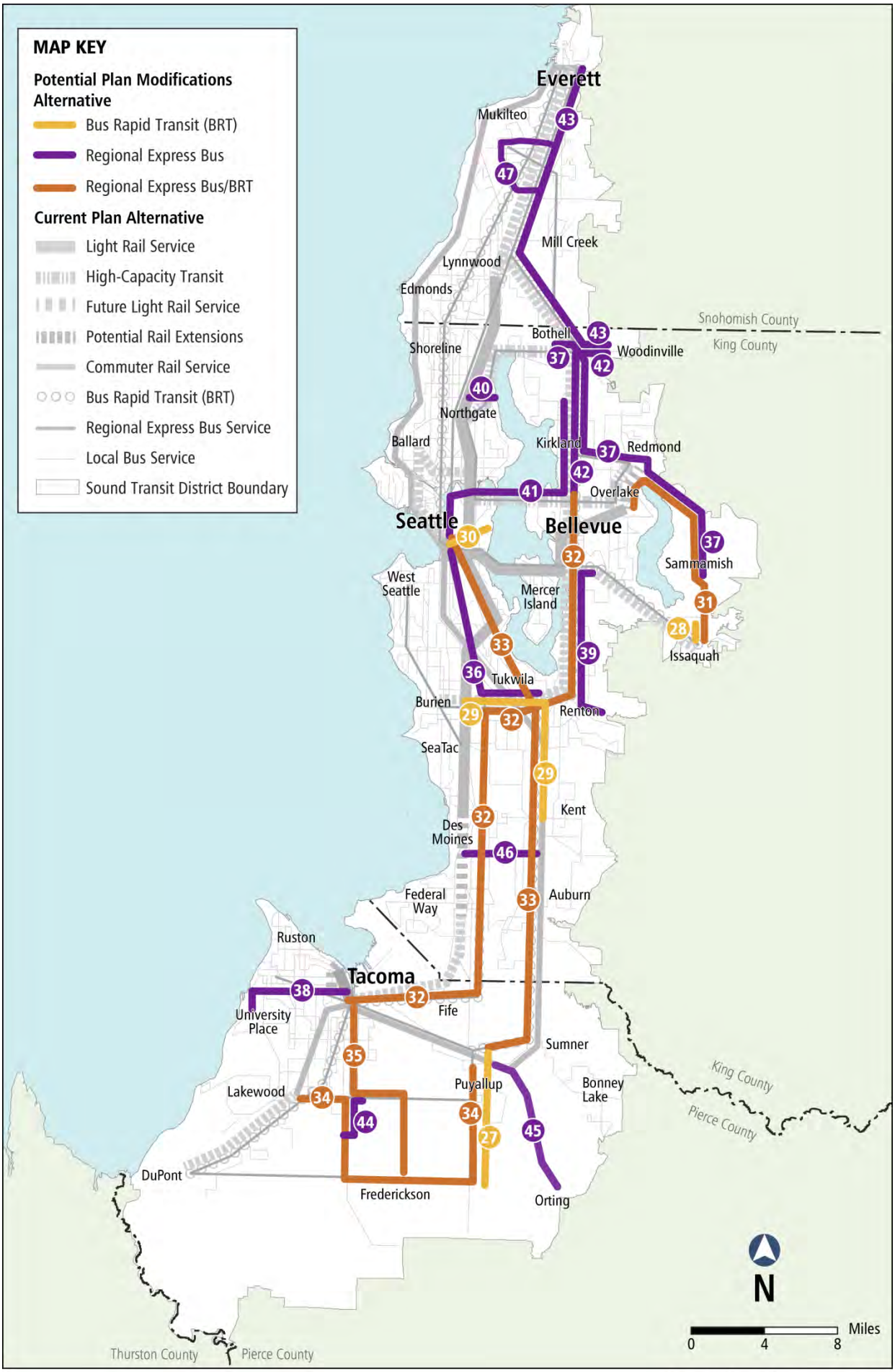
Source: Sound Transit 2014

Figure 2-1. Current Plan Alternative



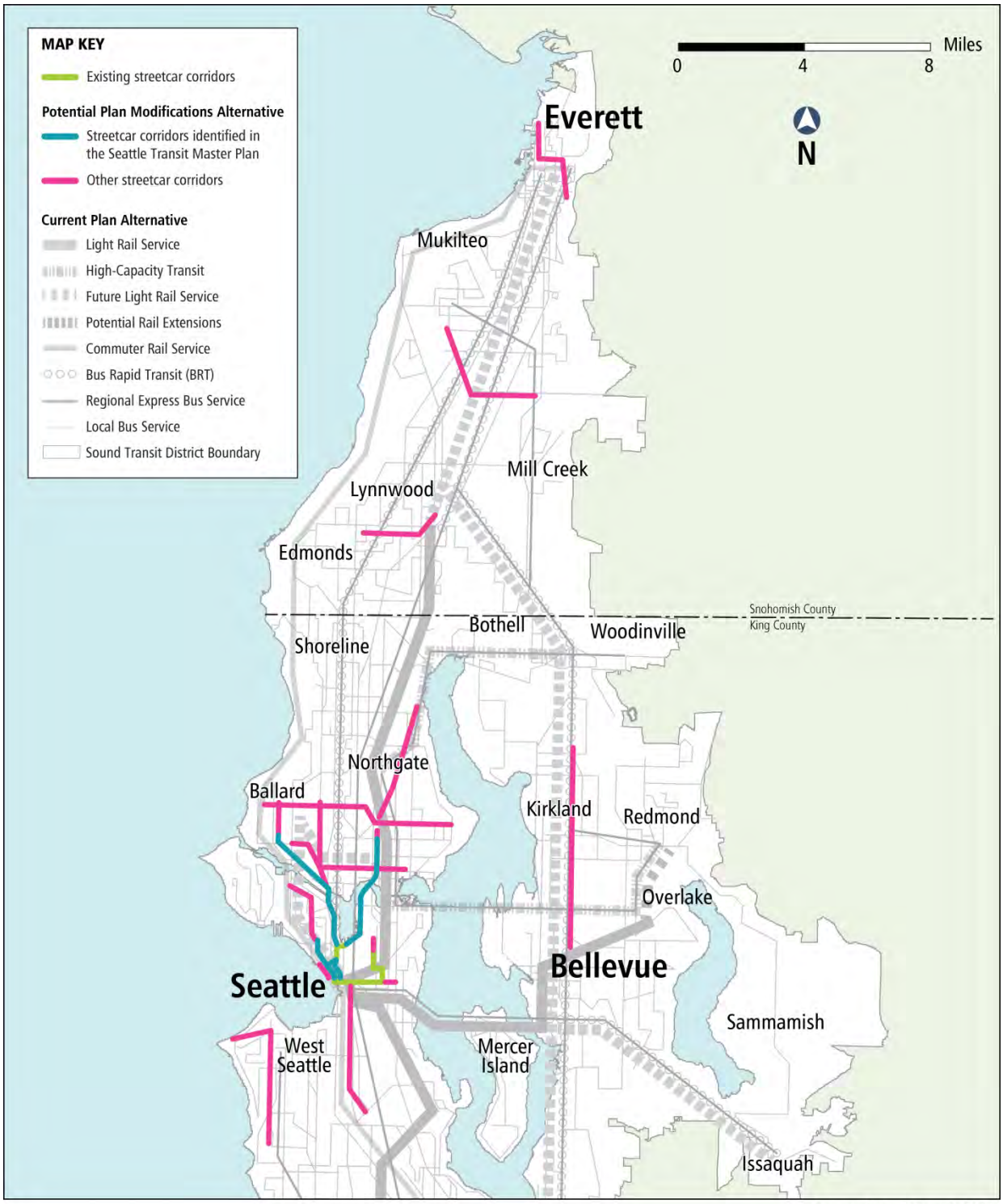
Source: Sound Transit 2014

Figure 2-2. Potential Plan Modifications Alternative—light rail, Sounder, and high-capacity transit



Source: Sound Transit 2014

Figure 2-3. Potential Plan Modifications Alternative—regional express bus and bus rapid transit



Source: Sound Transit 2013

Figure 2-4. Potential Plan Modifications Alternative—streetcars

Table 2-1. Study corridors in the Current Plan Alternative

ID	Corridor location
Potential rail extensions, assumed light rail	
A	Tacoma to Federal Way
B	Burien to Renton
C[1]	Bellevue to Issaquah along I-90
D	Renton to Lynnwood along I-405
E	Renton to Woodinville along Eastside Rail Corridor
F[1]	Downtown Seattle to Ballard
G[1]	Ballard to University of Washington
H	Lynnwood to Everett
Potential rail extensions, assumed commuter rail	
I	DuPont to Lakewood
J	Renton to Woodinville along Eastside Rail Corridor
HCT (mode not specified)	
K[1]	University of Washington to Redmond via SR 520
L	Northgate to Bothell on SR 522
Bus rapid transit (BRT)	
M	Federal Way to DuPont along I-5
N	Renton to Puyallup along SR 167
O	Bellevue to Issaquah along I-90
P	Renton to Woodinville along Eastside Rail Corridor
Q	Renton to Lynnwood along I-405
R	Seattle to Everett along SR 99
S	Lynnwood to Everett along I-5
Regional express bus	
T	Puyallup to DuPont via Cross Base Highway
U	Puyallup to Lakewood
V	Puyallup to Tacoma
W	SeaTac to West Seattle
X	Redmond to Kirkland
Y	North Bothell to Mill Creek to Mukilteo

[1] Portions of these corridors could be constructed in tunnels.

Table 2-2. Study corridors in the Potential Plan Modifications Alternative

ID	Corridor location
Potential rail extensions, assumed light rail	
1	Downtown Seattle to Magnolia/Ballard to Shoreline Community College
2[1]	Downtown Seattle to West Seattle/Burien
3	Ballard to Everett Station via Shoreline Community College, Aurora Village, and Lynnwood
4	Everett to North Everett
5	Lakewood to Spanaway to Frederickson to South Hill to Puyallup
6	DuPont to downtown Tacoma via Lakewood and Tacoma Mall
7	Puyallup/Sumner to Renton via SR 167
8	Downtown Seattle along Madison Street
9	Tukwila to SODO via Duwamish industrial area
10	North Kirkland or University of Washington Bothell to Northgate via SR 522
11	Ballard to Bothell via Northgate
12	Mill Creek, connecting to Eastside Rail Corridor
13	Lynnwood to Everett, serving Southwest Everett Industrial Center (Paine Field and Boeing)
14[1]	UW to Sand Point to Kirkland to Redmond
15	Downtown Tacoma to Tacoma Community College
16	Tacoma Mall to University Place
17	Steilacoom to Ruston via University Place
18	Issaquah to Issaquah Highlands
Potential rail extensions, assumed commuter rail	
19	Puyallup/Sumner to Orting
20	Lakewood to Parkland
21	Tacoma to Frederickson
HCT (mode not specified)	
22	Downtown Tacoma to Parkland
23	Tukwila Sounder station to downtown Seattle via Sea-Tac Airport, Burien, and West Seattle
24	Downtown Seattle to Edmonds via Ballard and Shoreline Community College
25	West Seattle to Ballard via Central District and Queen Anne
26	Edmonds to Lynnwood Link
Bus rapid transit (BRT)	
27	Puyallup vicinity, notably along Meridian Avenue
28	Issaquah to Issaquah Highlands
29	Kent to Sea-Tac Airport
30	Downtown Seattle along Madison Street
Regional express bus/BRT (mode not specified)	
31	Issaquah to Overlake via Sammamish and Redmond
32	Tacoma to Bellevue
33	Puyallup to downtown Seattle via Kent, Rainier Valley
34	Lakewood to Spanaway to Frederickson to South Hill to Puyallup
35	Tacoma to Frederickson

Table 2-2. Study corridors in the Potential Plan Modifications Alternative (continued)

ID	Corridor location
Regional express bus	
36	Renton to downtown Seattle
37	UW Bothell to Sammamish via Redmond
38	University Place to Titlow Beach to downtown Tacoma
39	Renton (Fairwood) to Eastgate via Factoria
40	145th Street from I-5 to SR 522
41	North Kirkland to downtown Seattle via SR 520
42	Woodinville to Bellevue
43	Woodinville to Everett
44	Connection to Joint Base Lewis-McChord
45	Puyallup/Sumner to Orting
46	Kent to Kent-Des Moines Station
47	Lynnwood to Everett, serving Southwest Everett Industrial Center (Paine Field and Boeing)

[1] A portion of this corridor could be constructed in a tunnel.

3 Affected Environment

This section includes descriptions of existing transportation conditions including 1) regional and local public transit service and infrastructure, 2) roadway system information, 3) movement of freight, and 4) non-motorized transportation.

When possible, information in this report is presented for the Plan area, which encompasses those portions of Snohomish, King, and Pierce Counties within the Sound Transit district boundary. However, depending on the data source, the information in some instances reflects the four-county central Puget Sound region (Snohomish, King, Pierce, and Kitsap Counties). At other times, the data reflects the entire three-county area of Snohomish, King, and Pierce Counties including areas beyond the Sound Transit district boundary.

3.1 Public transit service and infrastructure

A variety of regional and local public transit services and agencies operate in the Plan area, as shown in Table 3-1. Information on services and facilities presented in the Final SEIS represent transit system operations in 2014. Ridership information is the most recent available from the American Public Transportation Association's *Public Transportation Ridership Report* (APTA 2013) and the National Transit Database Monthly Module Adjusted Data Release administered by the Federal Transit Administration (FTA 2014).

Table 3-1. Public transit services operating in the Sound Transit service area

Transit agency	Type of transit service							
	Light rail	Commuter rail	Express bus/BRT	Local bus	Streetcar	Ferry	Monorail	Paratransit
Sound Transit	✓	✓	✓					✓
Community Transit			✓	✓				✓
Everett Transit			✓	✓				✓
King County Metro			✓	✓				✓
King County Marine Division						✓		
City of Seattle					✓		✓	
Pierce Transit			✓	✓				✓
Washington State Ferry System						✓		

3.1.1 Transit service

Integration of regional and local transit services

As indicated in Table 3-1, numerous transit agencies operate in the region and coordination among these agencies is essential to delivering efficient transit services to the public. While coordination has been ongoing over many years, Sound Transit and King County Metro have recently taken steps to plan and implement a higher degree of transit system integration in the region. These efforts were initiated through two directives in June 2014 (Sound Transit Board Motion #2014-44 and King County Executive Order ACO-9-1) that led to the publication of the *Getting There Together Transit Integration Report* (Sound Transit and King County Metro 2014).

The transit integration report provides a blueprint for ongoing planning of service integration between Sound Transit and the other transit agencies in the Sound Transit service area. Primary goals of the integration effort, as reflected in Sound Transit Board Motion No. M2014-44, are:

- Plan and implement a higher degree of transit system integration in the near and longer terms to maximize the performance of all transit modes for the public.
- Achieve a higher level of in the delivery of transit service and infrastructure; and
- Provide a higher quality, more seamless experience for transit customers

As indicated in Motion M2014-44, these goals would be achieved in the following ways:

- Develop plans and proposals to integrate bus and rail over time to fully utilize the significantly greater operating speeds, reliability, and capacity of Link light rail and RapidRide investments.
- Optimize efficiency by increasing and improving coordinated operations, maintenance, administration, transparency, and accountability measures that Sound Transit and King County Metro currently take.
- Deploy savings from Sound Transit operating costs to improve service or complete voter approved transit plans.
- Jointly plan high-capacity transit facilities to best integrate access for all transportation modes.

Regional (Sound Transit)

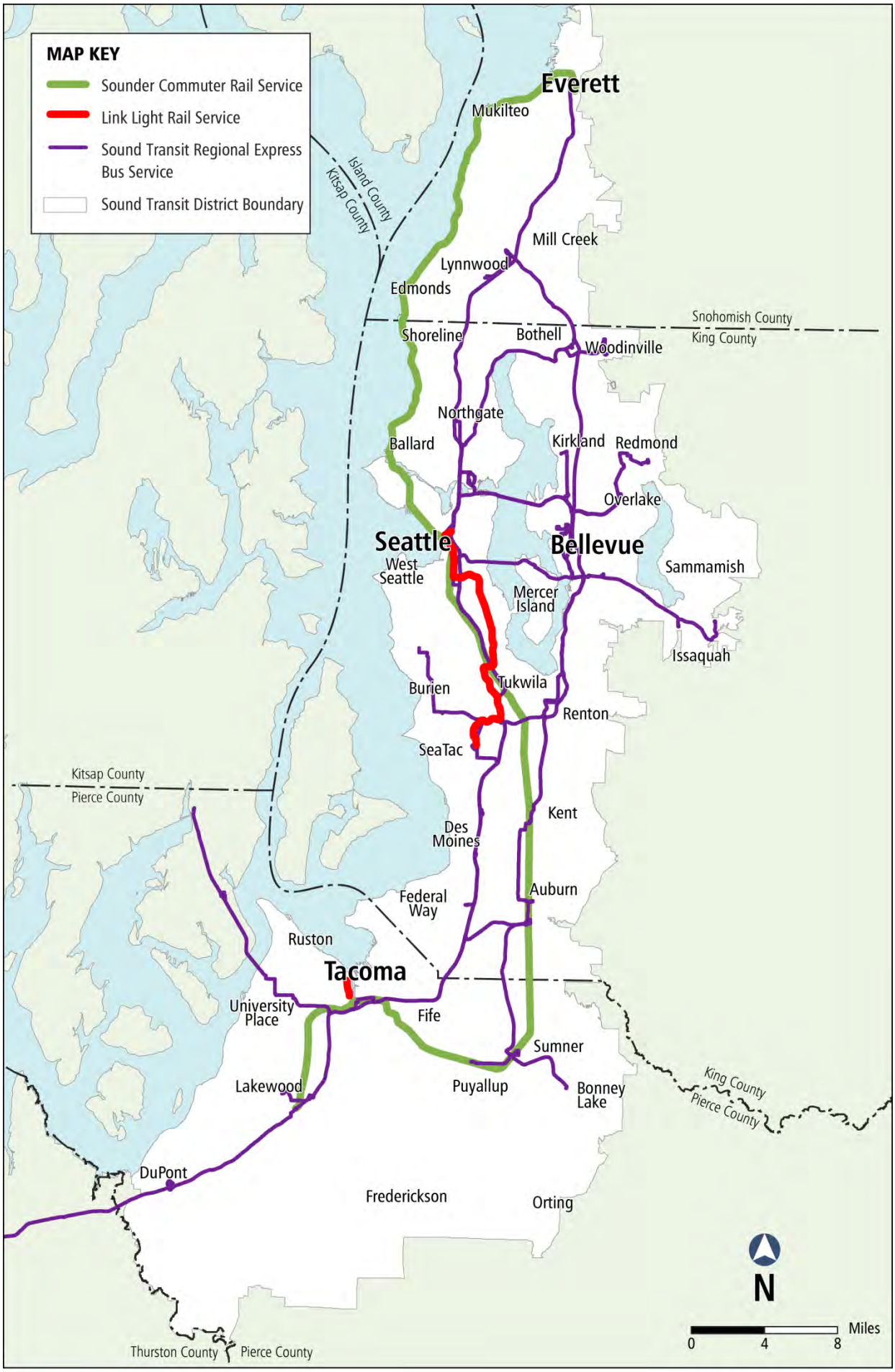
Sound Transit currently provides three modes of regional HCT service or interim HCT service—light rail transit (Central Link and Tacoma Link), commuter rail (Sounder), and regional bus (ST Express). Figure 3-1 shows the existing Sound Transit HCT services while Figure 3-2 shows ST2 as adopted in the 2008 Regional Transit System Plan. Updated elements of ST2 are noted as follows:

- The light rail extension from Overlake Transit Center to Redmond is identified as "In Planning/ Planned"; however, the rail network in the ridership estimates for ST2 is extended only to the Overlake Transit Center since that was the East Link terminus identified in ST2.
- The light rail extension from S. 200th Street to Federal Way is identified as "In Planning/Planned"; however, the rail network in the ridership estimates for ST2 is extended from Kent/Des Moines to the Federal Way Transit Center.
- The light rail extension from Sea-Tac Airport to S. 200th, shown as "In Design," is now under construction.
- Further definition on a potential extension of light rail in Tacoma was addressed in the Tacoma Link Expansion project. The preferred alternative is a 2.4 mile, 5 station extension of rail within Tacoma.

Sound Transit light rail service and support facilities

Service

Link light rail service operates between downtown Seattle and Sea-Tac Airport (Central Link), and between the Tacoma Dome Station and downtown Tacoma (Tacoma Link). In 2013, there were 9.7 million boardings on Central Link and 1.0 million boardings on Tacoma Link. Sound Transit also has a complementary paratransit obligation in connection with light rail service. In 2013, approximately 27,000 paratransit trips were provided.



Source: Sound Transit 2014

Figure 3-1. Existing Sound Transit high-capacity transit services

Source: Sound Transit 2008

Figure 3-2. Sound Transit 2 (ST2) as adopted in 2008

Central Link light rail operates 20 hours per day Monday through Saturday and 19 hours per day on Sunday between the Westlake Station at the north end of downtown Seattle and Sea-Tac Airport. It also serves communities in Beacon Hill, the Rainier Valley, and Tukwila. The total travel time for the full length of the line is 38 minutes. Weekday time between trains, or *headways,* are 7.5 minutes during the morning and afternoon peak commute, 10 minutes mid-day, and 15 minutes early morning and late evening. Light rail service between downtown Seattle and Sea-Tac Airport operates along a variety of guideway types, including the Downtown Seattle Transit Tunnel (DSTT), the Beacon Hill Tunnel, and elevated guideways. Light rail also operates on exclusive right-of-way on surface streets such as Martin Luther King Jr. Way. Light rail operations on these surface streets also cross surface streets and are affected by traffic signals and cross-traffic conditions.

Tacoma Link light rail is a 1.6-mile segment that serves downtown Tacoma, with headways approximately every 12 minutes. The majority of Tacoma Link service operates in exclusive right-of-way.

The DSTT is 1.3 miles long and includes four light rail stations: Westlake, University Street, Pioneer Square, and International District/Chinatown. A turnback track for light rail trains is provided in the tunnel located north of the Westlake Station. Currently, transit operations in the DSTT involve a mix of buses and light rail trains. The Convention Place Station is served by buses only.

As light rail headways decrease to every 4 minutes by 2023, it is Sound Transit's planning assumption that only rail service will operate within the tunnel, with rail services equally divided between north to east operations (Lynnwood Transit Center to Overlake) and north to south (Lynnwood Transit Center to Kent/Des Moines). Meeting fire/life safety standards with 4-car light rail operation limits headways to no less than 3 minutes (Core Light Rail System Plan, Sound Transit 2012). This limit would be met by the service pattern referred to as the "spine" (light rail system extending north-south from Everett to Tacoma, and east-west from Redmond to Seattle). It has been the assumed policy that once the system requires 3-minute headways in the tunnel, there will be no operational capacity to add more lines from outside the core system, and that the transit tunnel platform length limits trains to a maximum of four cars.

Several light rail projects identified in *Sound Move* and ST2 are currently under construction. As part of *Sound Move*, University Link is being constructed via a tunnel alignment from downtown Seattle to Capitol Hill and Husky Stadium at the University of Washington. Light rail service on this extension will open in 2016. Several projects included in ST2 are also under construction. These projects include the extension of University Link north from Husky Stadium to the Northgate Transit Center. This extension, which will open in 2021, will be mostly underground except just south of the Northgate Transit Center. ST2 also includes construction of the Central Link extension from Sea-Tac Airport south to the Angle Lake Station. This extension will be on an elevated guideway and will include one additional elevated station at Angle Lake that will open in 2016.

ST2 also includes an extension of light rail north from the Northgate Transit Center to the Lynnwood Transit Center, east from downtown Seattle to Overlake/Redmond, and south from Sea-Tac Airport to Kent/Des Moines. These extensions will begin operation in 2023. In Pierce County, ST2 identified expansion of Tacoma Link and included funding for a partnership to explore options for expanding Tacoma Link. A project-level environmental study is currently underway to continue project development of this extension.

Support facilities

All light rail vehicles are owned by Sound Transit. Maintenance and storage facilities for Central Link light rail cars are located at Forest Street in the SODO district, shown on Figure 3-3. This facility is owned by Sound Transit. Both Link operations and maintenance services are provided by King County Metro under contract to Sound Transit.

Source: WSDOT 2013

Figure 3-3. Existing maintenance facilities

The SODO operations and maintenance facility will not be large enough to accommodate the additional light rail vehicles as light rail service expands under ST2. Accordingly, Sound Transit plans to build an additional light rail operations and maintenance satellite facility (OMSF) in Bellevue. The site alternatives for this facility are being evaluated in the *Link Light Rail Operations and Maintenance Satellite Facility Environmental Impact Statement* (Sound Transit 2014). In July 2014 following issuance of the Draft EIS, the Sound Transit Board of Directors identified a preferred alternative for evaluation in the Final EIS along with other alternatives. The preferred alternative identified is the Burlington Northern Santa Fe (BNSF) site located south of SR 520 and north of Northeast 12th Street on the east side of the former BNSF railway corridor in Bellevue. A final decision on the OMSF site will be made after completion of the Final EIS in 2015.

Sound Transit also owns a rail maintenance facility in Tacoma for Tacoma Link. Maintenance personnel at this facility are Sound Transit employees. The Link maintenance facility will be expanded to support the Tacoma Link 2.4 mile expansion currently in project development.

Support facilities for light rail also include park-and-ride lots or garages and access improvements for pedestrians and bicyclists. For pedestrian and bicycle access, support facilities include bicycle parking at rail stations. Bicycles can also be accommodated on light rail vehicles. Access for pedestrians has been accommodated through sidewalks and signage at stations. At some stations such as Sea-Tac Airport, pedestrian bridges have been provided.

Sound Transit regional express bus service and support facilities

Service

Sound Transit regional express bus service (ST Express) operates on 26 routes and provides frequent regional service to major urban centers using major arterials, freeways, and high-occupancy vehicle (HOV) lanes. Local transit agencies operate the bus routes under contract to Sound Transit. Community Transit currently operates 6 ST Express routes; King County Metro operates 8 ST Express routes; and Pierce Transit operates 12 ST Express routes. Typical weekday peak-period headways are 5 to 15 minutes and range from 15 to 60 minutes off-peak.

In 2013, regional express bus services had approximately 16.6 million boardings.

Most of Sound Transit's regional express routes operate within the agency's service area. Exceptions include two routes that extend outside of the Plan area and are partially funded by partner agencies. One is Route 592, which provides peak-period service between Olympia and downtown Seattle with connections at the Lakewood commuter rail station, DuPont, the SR 512 park-and-ride facility, and the Tacoma Dome. The operational costs for the service outside of the Plan area are partially paid for by Intercity Transit. In addition, Route 595 provides peak-period service between Gig Harbor in Pierce County and downtown Seattle with a connection at the Tacoma Community College Transit Center. The operational costs for this service are partially paid for by Pierce Transit.

Currently, several regional express bus services operate in the DSTT. The routes serve the five stations in the tunnel: Convention Place, Westlake, University Street, Pioneer Square, and International District/ Chinatown. For buses operating in the DSTT, staging areas are located at each end of the tunnel. The tunnel has bi-directional access to the reversible, one-way I-5 express lanes at the north end. For buses traveling to and from the east, bus-only ramps connect the south entrance of the DSTT to the I-90 express lanes, which are HOV-only from Fifth Avenue to Rainier Avenue S. For buses traveling to and from the south, the SODO Busway is available.

Support facilities

Support facilities for regional express bus service include park-and-ride lots, transit centers, operations and maintenance facilities, bicycle and pedestrian amenities, and access improvements such as direct access ramps.

Many regional express bus routes operate in the region's HOV and general purpose lanes as well as arterials. HOV lanes provide semi-exclusive right-of-way for Sound Transit regional express bus routes. However, these buses operate in mixed traffic in general-purpose lanes located between HOV lanes and freeway ramps. While the HOV lanes provide semi-exclusive operations along a portion of their routes, buses also operate in mixed traffic including traffic in general purpose lanes located between HOV lanes and freeway on- and off-ramps. HOV lanes are available on most segments of I-5, I-405, I-90, and SR 167. In addition, SR 522 has bus-only shoulder or business access and transit (BAT) lanes for certain segments. In general, the region's HOV lanes are currently designated as 2+ carpools, except at the westbound approach to SR 520 which is designated for 3+ carpools. These designations are assumed to continue in the future until the limited access highway network becomes tolled, as assumed in PSRC's *Transportation 2040* plan.

For pedestrian and bicycle access, support facilities include bicycle parking at transit centers and park-and-ride lots. Also, storage racks for bicycles have been provided on all regional express vehicles. Access for pedestrians has been provided through sidewalks and signage, and at some facilities, such as the Kingsgate park-and-ride lot, pedestrian bridges have been provided.

Sound Transit does not currently own operations and maintenance facilities for regional express bus service. Instead, the fleet is operated and maintained under contract by its transit partners: Community Transit, King County Metro, and Pierce Transit. Community Transit has two maintenance bases and contracts with Snohomish County Senior Services to run a third base for DART service vehicles. King County Metro has seven storage and maintenance facilities. Everett Transit and Pierce Transit each have one maintenance base (shown on Figure 3-3).

Sound Transit is designing a midday bus storage facility near downtown Seattle that will be used to store regional express buses during off-peak periods. ST2 also allocated funding for planning, design, and construction of Sound Transit's own operations and maintenance facilities to support regional express bus.

Transit centers and park-and-ride facilities

Transit centers and park-and-ride facilities exist throughout the Plan area offering multimodal access, convenient transit transfer locations, and commuter parking. While many of these facilities are served by Sound Transit, most are not owned or operated by Sound Transit.

Multimodal transit centers provide access and connections to light rail, commuter rail, regional express bus, local bus, intercity bus, and ferry systems. Transit centers that only serve buses are central, convenient connection points for several routes. At some locations, connections are timed so riders can transfer between bus routes within a short time period avoiding lengthy layovers.

Park-and-ride facilities provide access to the regional transit service in lower density areas where riders have limited options to arrive by alternative modes to the transit centers. Park-and-ride facilities are a significant investment as part of the regional HOV system.

A network of park-and-ride facilities in the Plan area also provides access for regional express bus services. Several of these facilities existed prior to implementation of Sound Transit regional express

service. However, as part of *Sound Move*, funding was provided for new and expanded park-and-ride facilities. Examples of new facilities include the Federal Way Transit Center park-and-ride garage and expansion of park-and-ride capacity at the Lynnwood Transit Center. Funding for expanded facilities was provided for the Burien Transit Center park-and-ride garage and at Everett Station.

Table 3-2 summarizes transit centers and park-and-ride facilities that include over 150 parking spaces. Details summarized in Table 3-2 include location name, address, rider amenities, service provider and routes, number of parking spaces, and fall 2013 parking utilization. As shown in Table 3-2, the majority of the park-and-ride facilities in the Plan area are currently at or near capacity. Table 3-3 summarizes transit centers and ferry terminals that do not include parking.

Sound Transit commuter rail service and support facilities

Service

Commuter rail (Sounder) service operates on two lines, South and North. The South Line connects Lakewood in Pierce County and downtown Seattle with stations at Lakewood, South Tacoma, Tacoma, Puyallup, Sumner, Auburn, Kent, Tukwila, and King Street in Seattle. Ten round trips per day are provided between King Street Station and the Tacoma Dome Station on the south end of downtown Tacoma, and six of these trips extend to Lakewood Station south of Tacoma. In addition, commuter rail service is provided between Pierce County and Seattle during selected weekend events, such as Seahawks and Mariners games and Sounders matches.

In 2013, Sound Transit's commuter rail service (Sounder) had approximately 3.0 million boardings.

ST2 identified four additional commuter rail round trips between downtown Seattle, South King County, and Pierce County. One of these trips was implemented in 2013 and the remaining three will be in place by 2017 assuming completion of the Tacoma Trestle replacement project. Of the trips to be added, at least one will provide reverse commute service to Lakewood; southbound in the AM peak and northbound in the PM peak. Other additional trips to South King County and Pierce County will operate to Lakewood; however, final determination regarding these trips will be affected by WSDOT plans for track capacity expansion south of Tacoma.

On the North Line, commuter rail operates between downtown Seattle and Everett, with stops at King Street, Edmonds, Mukilteo, and Everett. There are four trains southbound for the morning commute and four trains northbound for the afternoon commute. Each station, except for King Street, includes park-and-ride facilities.

Commuter rail operations are provided under contract with BNSF, and fleet maintenance is provided under contract by Amtrak at its facility south of downtown Seattle. For both the South and North Lines, Sound Transit purchased easements from BNSF to use its main line and invests in track and signal improvements. Sound Transit has separate operating agreements with BNSF for Seattle-Tacoma (Freighthouse Square), Seattle-Everett, and Tacoma-Lakewood operations.

The region includes a large network of active rail freight lines, as shown in Figure 3-4. Some of the rail lines shown in Figure 3-4 are also used by passenger trains. Both the Sounder North Line and South Line commuter rail operate on a BNSF rail line from Tacoma to Everett and on a triple-track segment south of downtown Seattle that is shared between BNSF and Union Pacific. Sound Transit owns and operates track between Tacoma (Freighthouse Square) and Lakewood, and owns track south to Nisqually (11 miles south of Lakewood) where Amtrak has plans to operate by 2017.

Table 3-2. Transit centers and park-and-ride facilities (150 spaces or more)

Transit facility (alphabetically)	Address	Rider amenities	Transit service (agency, route)	Number of spaces	Fall 2013 utilization[1]
Ash Way Park-and-Ride	16327 Ash Way, Lynnwood	Bicycle Lockers	ST 511, ST 512, ST 532, CT 112, CT 115, CT 116, CT 119, CT 201, CT 202, CT 413, CT 415, CT 810, CT 860, CT 880	1,022	105%
Auburn Park-and-Ride	101 15th St NE, Auburn	Bicycle Lockers	ST 566, M 952	358	67%
Auburn Station	A Street SW & 2nd Street SW, Auburn	Bicycle Lockers, Ticket Vending Machines, Pay Phones	Sounder, ST 566, ST 578, M 180, M 181, M 186, M 910 DART, M 915 DART, M 917 DART, PT 497	633	100%
Aurora Village Transit Center	1524 N 200th St, Shoreline	Bicycle Lockers, On-Demand Bicycle eLockers	CT Swift, CT 101, CT 115, CT 130, M RapidRide E, M 301, M 303, M 331, M 342, M 346, M 373	202	100%
Bear Creek Park-and-Ride	7760 178th Pl NE, Redmond	Bicycle Lockers	ST 545, M 216, M 248, M 268, M 269, M 982	283	108%
Bonney Lake Park-and-Ride	184th Ave E & SR 410, Bonney Lake		ST 596	356	69%
Bothell Park-and-Ride	10303 Woodinville Drive, Bothell		ST 525, ST 535, M 238, M 312, M 342, M 372	220	99%
Brickyard Park-and-Ride	15530 Juanita-Woodinville Way NE, Bothell	Bicycle Lockers, Electric Vehicle Charging Stations	ST 532, ST 535, M 236, M 237, M 238, M 255, M 257, M 311, M 342, M 952	443	82%
Burien Transit Center	14900 4th Ave SW, Burien	Bicycle Lockers, Ticket Vending Machines, Electric Vehicle Charging Stations, Kiss & Ride quick drop area	ST 560, M RapidRide F, M 120, M 121, M 122, M 131, M 132, M 140, M 166, M 180	504	58%
Canyon Park Park-and-Ride	22400 17th Ave SE, Bothell	Bicycle Lockers	ST 532, ST 535, CT 105, CT 106, CT 120, CT 435	302	99%
Eastgate Park-and-Ride	14200 SE Eastgate Way, Bellevue	Bicycle Lockers, Bicycle Racks, Ticket Vending Machines, On-demand Bicycle eLockers	ST 555, M 212, M 217, M 221, M 226, M 240, M 241, M 245, M 246, M 271, M 888, M 981, M 989	1,614	99%
Eastmont Park-and-Ride	9029 E El Capitan Way, Everett	Bicycle Lockers	ST 513, ET 29	389	42%
Edmonds Park-and-Ride	21300 72nd Ave W, Edmonds	Bicycle Lockers	CT Swift, CT 405, CT 871	255	45%
Edmonds Station	210 Railroad Ave, Edmonds	Bicycle Lockers	Sounder, CT 116, CT 130, CT 196, CT 416, Amtrak, WSF Kingston	259	n/a
Everett Station	3201 Smith Ave, Everett	Bicycle Lockers, Bicycle Racks, Ticket Vending Machines, Restrooms, Pay Phones, Customer Information, Security Office	Sounder, ST 510, ST 512, ST 532, CT Swift, CT 201, CT 202, CT 270, CT 275, CT 277, CT 280, ET 3, ET 4, ET 5, ET 6, ET 7, ET 8, ET 17, ET 18, ET 29, ET 701, Skagit Transit, Amtrak, Northwestern Trailways	1067	75%

Table 3-2. Transit centers and park-and-ride facilities (150 spaces or more) (continued)

Transit facility (alphabetically)	Address	Rider amenities	Transit service (agency, route)	Number of spaces	Fall 2013 utilization[1]
Federal Way/S 320th St Park-and-Ride	32320 23rd Ave S, Federal Way	Bicycle Lockers	M 177, M 178, M 193	877	41%
Federal Way Transit Center	31621 23rd Ave S, Federal Way	Bicycle Lockers, Ticket Vending Machines, Restrooms, Pay Phones, Customer Information, Security Office	ST 574, ST 577, ST 578, M RapidRide A, M 179, M 181, M 182, M 183, M 187, M 193, M 197, M 901 DART, M 903 DART, PT 402, PT 500, PT 501	1190	97%
Green Lake Park-and-Ride	6601 8th Ave NE, Seattle	Bicycle Lockers	ST 542, M 48, M 64, M 66, M 67, M 76, M 242, M 316	411	102%
Houghton Park-and-Ride	7024 116th Ave NE, Kirkland	Bicycle Lockers	M 238, M 245, M 277, M 342, M 952, M 986	470	39%
Issaquah Highlands Park-and-Ride	1755 Highlands Drive NE, Issaquah	Bicycle Lockers, Bicycle Racks, On-Demand Bicycle eLockers, Electric Vehicle Charging Stations	ST 554, ST 555, ST 556, M 216, M 218, M 219, M 269	1,010	98%
Issaquah Transit Center	1050 17th Ave NW, Issaquah	Bicycle Lockers, Bicycle Racks, Permit-only parking spaces	ST 554, ST 555, ST 556, M 200, M 208, M 214, M 269, M 271	819	99%
I-5/SR 512 Park-and-Ride	10617 S Tacoma Way		ST 574, ST 592, ST 594, PT 204, PT 300, IT 603/605/612, IT 609, IT 620	493	98%
Kenmore Park-and-Ride	7346 NE Bothell Way, Kenmore	Bicycle Lockers, Bicycle Racks, On-Demand Bicycle eLockers	ST 522, M 234, M 244, M 309, M 312, M 331, M 342, M 372	603	102%
Kent-Des Moines Park-and-Ride	23405 Military Rd S, Kent		ST 574, M 158, M 159, M 166, M 192, M 193, M 197	370	91%
Kent/James St Park-and-Ride	902 W James St, Kent	Bicycle Lockers	M 150, M 158, M 159, M 166, M 180, M 913 DART, M 918 DART	713	21%
Kent Station Transit Center	301 Railroad Ave N, Kent	Bicycle Lockers, Ticket Vending Machines	Sounder, ST 566, M 150, M 153, M 158, M 159, M 164, M 166, M 168, M 169, M 180, M 183, M 913 DART, M 918 DART, M 952	996	97%
Kimball Drive Park-and-Ride	6808 Kimball Drive, Gig Harbor	Bicycle Lockers, Bicycle Racks	ST 595, PT 100, PT 102	306	89%
Kingsgate Park-and-Ride	13001 116th Way NE, Kirkland	Bicycle Lockers	M 235, M 238, M 244, M 252, M 255, M 257, M 277, M 930	502	106%
Lakewood Station	11424 Pacific Hwy SW, Lakewood	Ticket Vending Machines	Sounder, ST 592, ST 594, PT 300, PT 51, IT 603/605/612, IT 609, IT 620	600	74%
Lake Meridian Park-and-Ride	26805 132nd Ave SE, Kent		M 157, M 158, M 159, M 168, M 914 DART	172	28%

Table 3-2. Transit centers and park-and-ride facilities (150 spaces or more) (continued)

Transit facility (alphabetically)	Address	Rider amenities	Transit service (agency, route)	Number of spaces	Fall 2013 utilization[1]
Lynnwood Transit Center/Park-and-Ride	20100 48th Ave W, Lynnwood	Bicycle Lockers, Bicycle Racks, Ticket Vending Machines, Restrooms, Pay Phones	ST 511, ST 512, ST 535, CT 112, CT 113, CT 115, CT 116, CT 120, CT 130, CT 201, CT 202, CT 402, CT 417, CT 421, CT 422, CT 425, CT 810, CT 821, CT 855	1,370	100%
Mercer Island Park-and-Ride	8000 N Mercer Way, Mercer Island	Bicycle Lockers	ST 550, ST 554, M 201, M 204, M 216, M 981, M 989	447	100%
Mariner Park-and-Ride	13132 4th Ave W, Everett	Bicycle Lockers	CT 101, CT 105, CT 106, CT 115, CT 201, CT 202, CT 410, CT 810, CT 860, ET 2	667	75%
McCollum Park Park-and-Ride	620 128th St SE, Mill Creek	Bicycle Lockers	CT 412, CT 810, CT 860	409	98%
Mountlake Terrace Transit Center	6001 236th St SW, Mountlake Terrace	Bicycle Lockers, Bicycle Racks, Electric Vehicle Charging Stations	ST 511, ST 512, ST 513, CT 111, CT 112, CT 119, CT 130, CT 413, CT 415, CT 810, CT 871	877	100%
Mukilteo Station	920 First Street, Mukilteo	Ticket Vending Machines	Sounder, WSF Clinton, CT 113, CT 417, CT 880, ET 18, ET 70	< 150	n/a
Narrows Park-and-Ride	7201 Sixth Ave	Bicycle Lockers, Bicycle Racks	ST 595, PT 100	195	61%
Newport Hills Park-and-Ride	5115 113th Pl SE, Newcastle	Bicycle Lockers	ST 560, M 111, M 167, M 342, M 824, M 952	275	84%
Northgate Mall Park-and-Ride	NE 103rd St & 1st Ave NE, Seattle		ST 555, ST 556, M 16, M 40, M 41, M 66, M 67, M 68, M 75, M 242, M 303, M 345, M 346, M 347, M 348, M 995	280	99%
Northgate Transit Center	10200 1st Ave NE, Seattle	Bicycle Lockers, On-Demand Bicycle eLockers, Ticket Vending Machines	ST 555, ST 556, M 16, M 40, M 41, M 66, M 67, M 68, M 75, M 242, M 303, M 345, M 346, M 347, M 348, M 995	296	99%
Northgate Transit Center Extension/Carpool Lot Park-and-Ride	3rd Ave NE & NE 103rd St, Seattle	Carpool parking spaces	ST 555, ST 556, M 16, M 40, M 41, M 66, M 67, M 68, M 75, M 242, M 303, M 345, M 346, M 347, M 348, M 995	448	100%
Overlake Park-and-Ride	2650 152nd Ave NE, Redmond	Bicycle Racks	M RapidRide B, M 242, M 249, M 269	203	42%
Overlake Transit Center	15590 NE 36th St, Redmond	Bicycle Lockers	ST 542, ST 545, ST 566, M RapidRide B, M 221, M 232, M 244, M 245, M 249, M 268, M 269, M 982	222	104%
Purdy Park-and-Ride	6519 144th St NW, Gig Harbor		ST 595, PT 100, PT 102, KT Purdy Connection	200	94%
Puyallup Fair Red Lot	5th St SW & 9th Ave SW, Puyallup		PT 400, PT 495	219	85%
Puyallup Station	131 W Main Ave, Puyallup	Bicycle Lockers, Ticket Vending Machines, Pay phones	Sounder, ST 578, PT 400, PT 402, PT 409, PT 495, PT 503	432	100%

Table 3-2. Transit centers and park-and-ride facilities (150 spaces or more) (continued)

Transit facility (alphabetically)	Address	Rider amenities	Transit service (agency, route)	Number of spaces	Fall 2013 utilization[1]
Redmond Transit Center (Park at Redmond Park-and-Ride Garage location)	16201 NE 83rd St, Redmond	Bicycle Lockers, Bicycle Racks, Electric Vehicle Charging Stations	ST 542, ST 545, M RapidRide B, M 221, M 224, M 232, M 248, M 930 DART, M 931 DART	377	100%
Redondo Heights Park-and-Ride	27454 Pacific Hwy S, Federal Way		M RapidRide A, M 190	697	8%
Renton City Municipal Garage	655 S 2nd St, Renton		ST 560, ST 566, M 101, M 105, M 106, M 107, M 110, M 140, M 143, M 148, M 153, M 167, M 169, M 240, M 342, M 907 DART, M 908 DART	200	87%
Renton Transit Center/Park-and-Ride	232 Burnett Ave S, Renton	Electric Vehicle Charging Stations	ST 560, ST 566, M RapidRide F, M 101, M 105, M 106, M 107, M 110, M 140, M 143, M 148, M 153, M 167, M 169, M 240, M 342, M 907 DART, M 908 DART	150	96%
Shoreline Park-and-Ride	18821 Aurora Ave N, Shoreline	Bicycle Lockers	M RapidRide E, M 301, M 303, M 342, M 373	393	72%
South Bellevue Park-and-Ride	2700 Bellevue Way SE, Bellevue	Bicycle Lockers, Bicycle Racks	ST 550, ST 555, ST 556, ST 560, M 241, M 249	519	107%
South Everett Freeway Station	112th Street & I-5, Everett	Bicycle Lockers, Bicycle Racks	ST 510, ST 512, ST 532, ET 29	397	100%
South Federal Way Park-and-Ride	901 S 348th St, Federal Way		M 178, M 182, M 903 DART, PT 62	515	36%
South Hill Park-and-Ride	94th St SW & 104th St E, Puyallup	Bicycle Lockers	PT 400, PT 495	354	71%
South Kirkland Park-and-Ride	3677 108th Ave NE, Bellevue	Bicycle Lockers, Bicycle Racks, On-Demand Bicycle eLockers, Electric Vehicle Parking Spaces	ST 540, M 234, M 235, M 249, M 255, M 981, M 986	783	75%
South Renton Park-and-Ride	S Grady Way & Shattuck Ave, Renton	On-Demand Bicycle eLockers	M 101, M 102, M 140, M 148, M 153, M 167, M 169	373	100%
South Sammamish Park-and-Ride	3015 228th Ave SE, Sammamish	Bicycle Lockers, On-Demand Bicycle eLockers	ST 554, M 216, M 269	265	64%
South Tacoma Station	5650 S Washington St, Tacoma	Bicycle Lockers, Ticket Vending Machines	Sounder, PT 300	220	26%
Star Lake Park-and-Ride	27015 26th Ave S, Kent		ST 574, M 183, M 190, M 192, M 193, M 197	549	57%
Sumner Station	810 Maple St, Sumner	Ticket Vending Machines, Restrooms	Sounder, ST 578, ST 596	343	101%
Swamp Creek on 164th Park-and-Ride	3115 164th St SW, Lynnwood	Bicycle Lockers	CT 112, CT 413, CT 415, CT 880	410	72%

Table 3-2. Transit centers and park-and-ride facilities (150 spaces or more) (continued)

Transit facility (alphabetically)	Address	Rider amenities	Transit service (agency, route)	Number of spaces	Fall 2013 utilization[1]
Tacoma Dome Station	424 E 25th St, Tacoma	Ticket Vending Machines, Restrooms	Tacoma Link, Sounder, ST 574, ST 586, ST 590, ST 594, PT 13, PT 14, PT 41, PT 42, PT 102, PT 400, PT 500, PT 501, IT 603/605/612, Northwestern Trailways	2,273	96%
Thornton Place Garage	3rd Ave NE & NE 100th St, Seattle		ST 555, ST 556, M 16, M 40, M 41, M 66, M 67, M 68, M 75, M 242, M 303, M 345, M 346, M 347, M 348, M 995	350	74%
Tibbetts Lot Park-and-Ride	1674 Newport Way NW, Issaquah		ST 554, ST 555, ST 556, M 200, M 214, M 269, M 271	594	32%
Tukwila International Blvd Station	15426 35th Ave S, Tukwila	Bicycle Lockers, Permit-only Parking Spaces, Ticket Vending Machines, Passenger drop-off area, Restrooms	Central Link, M RapidRide A, M RapidRide F, M 124, M 128, M 140	600	99%
Tukwila Park-and-Ride	13445 Interurban Ave S, Tukwila	Bicycle Lockers, On-Demand Bicycle Lockers	M 150, M 154, M 193	255	101%
Tukwila Station—Sounder	7301 South Longacres Way, Tukwila	Bicycle Lockers, Ticket Vending Machines	Sounder, M 110, M 140, M 154	233	88%
Twin Lakes Park-and-Ride	21st Ave SW & SW 344th, Federal Way		M 179, M 181, M 197, PT 62	600	14%
Wilburton Park-and-Ride	720 114th Ave SE, Bellevue		ST 560	186	87%
Woodinville Park-and-Ride	17800 140th Ave NE, Woodinville	Bicycle Lockers	ST 522, M 236, M 237, M 311, M 372	438	59%

Sources: Sound Transit (ST), Community Transit (CT), Everett Transit (ET), King County Metro (M), Pierce Transit PT, Intercity Transit (IT), Kitsap Transit (KT)

[1] WSDOT Park-and-Ride Inventory, Fall 2013

Table 3-3. Transit centers (without parking)

Transit facility (alphabetically)	Address	Rider amenities	Transit service (agency, route)
72nd Street Transit Center	E 72nd St & Portland Ave, Tacoma		PT 41, PT 42, PT 56, PT 202, PT 409
Bellevue Transit Center	10850 NE 6th Street, Bellevue	Ticket Vending Machines, Passenger Drop-Off Area, Rider Services Building, Bicycle Racks	ST 532, ST 535, ST 550, ST 555, ST 556, ST 560, ST 566, M RapidRide B, M 226, M 232, M 234, M 235, M 237, M 240, M 241, M 246, M 249, M 271, M 342, M 885, M 886
College Station	2000 Tower Street, Everett		CT 201, CT 202, ET 4, ET 5, ET 7, ET 29
Colman Dock	801 Alaskan Way, Seattle	Bicycle Racks	WSF Bremerton, WSF Bainbridge Island
Edmonds Community College Transit Center	68th Avenue W & 202nd Street SW, Edmonds	Bicycle Lockers	CT 115, CT 116, CT 120
Everett Mall Map	1330 SE Everett Mall Way, Everett	Customer Service Center	ET 2, ET 12, ET 7, ET 17, ET 29, ET 701
Fauntleroy Ferry Terminal	Fauntleroy Way SW & SW Barton St, Seattle		M 116, M RapidRide C, WSF Vashon, WSF Southworth
King Street Station	301 S Jackson St, Seattle	Ticket Vending Machines	Sounder, Amtrak
Kirkland Transit Center	3rd Street and Park Lane, Kirkland		ST 540, M 234, M 236, M 238, M 245, M 248, M 255
Lakewood Transit Center	5815 Lakewood Towne Center Blvd, Lakewood		ST 574, PT 2, PT 3, PT 48, PT 51, PT 202, PT 204, PT 206, PT 212, PT 214
Montlake Station	Montlake Boulevard E & SR 520, Seattle	Bicycle Lockers	M 25, M 43, M 48
Parkland Transit Center	213 121st Street S, Parkland	Bicycle Racks	PT 1, PT 45, PT 55, PT 204, PT 410
Point Defiance Ferry Terminal	Ferry Crossing Landing Road & N Waterfront Drive, Tacoma		PT 10, PT 11, WSF Tahlequah
South Hill Mall Transit Center	39th Ave E, Puyallup		PT 400, PT 402, PT 410, PT 495
Tacoma Community College Transit Center	6501 S 19th St, Tacoma		PT 1, PT 2, PT 10, PT 16, PT 28, PT 52, PT 53, PT 100
Tacoma Mall Transit Center	S 48th & Oaks, Tacoma		PT 3, PT 52, PT 53, PT 54, PT 55, PT 56, PT 57, PT 300, IT 620
Totem Lake Transit Center	120th Ave NE & NE 128th St		M 236, M 238, M 930 DART

Sources: Sound Transit (ST), Community Transit (CT), Everett Transit (ET), King County Metro (M), Pierce Transit (PT), Intercity Transit (IT), Kitsap Transit (KT)

Figure 3-4. Existing active rail freight lines

Amtrak intercity rail service operates on several active rail lines, including lines that are also used by Sounder commuter rail. Amtrak operates in the Plan area and beyond. Amtrak will shift operations to Sound Transit-owned right-of-way between the Thurston County line and Tacoma when the WSDOT Point Defiance bypass project is completed. The Point Defiance Bypass project proposes to reroute passenger trains to an existing rail line along the west side of I-5 through south Tacoma, Lakewood, and DuPont to provide faster, more reliable passenger service.

The Eastside Rail Corridor, which at one time included a network of active freight rail lines, is a 42-mile rail corridor located between north Renton and Snohomish. It was owned by BNSF but now is in ownership by several public entities including Sound Transit, King County, the Port of Seattle, the City of Kirkland, and the City of Redmond. Sound Transit has a high-capacity transit easement on the Eastside Rail Corridor within the Plan area from Woodinville to North Renton. The portion of the Eastside Rail Corridor from Renton to Woodinville, and the entirety of the Redmond Spur, was "railbanked" under the federal National Trails Act, which is also known as the Rails to Trails Act.

Railbanking preserves disused portions of interstate rail lines by allowing them to be used for trails for an indefinite but interim period. All interim uses of railbanked corridors are subject to reactivation of potential interstate freight rail service.

Currently, there is limited active freight rail service on the Eastside Rail Corridor, including in the vicinity of the Boeing Renton plant and between Woodinville and the City of Snohomish. BNSF retained five miles of the corridor from the BNSF mainline to Coulon Park in Renton to serve the Boeing plant.

Support facilities

Commuter rail stations at Lakewood, South Tacoma, Tacoma, Puyallup, Sumner, Auburn, Kent, and Tukwila have park-and-ride facilities. Additional support facilities include bicycle parking at stations. Access for pedestrians has been provided through sidewalks and signage. At some facilities, such as the Auburn, Lakewood and Kent Stations, pedestrian bridges that span the tracks have been provided. There is an underpass for pedestrians at the Tukwila Station.

The operations and maintenance facility for commuter rail service is owned by Amtrak and is located in the SODO area of Seattle, as shown in Figure 3-4. Maintenance service for commuter rail vehicles is provided by Amtrak under contract to Sound Transit. Under ST2, a new yard and shop facility was funded, which will be located in Lakewood. The Sounder Commuter Rail Yard in Lakewood was shown in Figure 3-3. For the next phase of the Sounder Yard Expansion in Lakewood, Sound Transit is determining the feasibility of building a new yard and shops facility. The facility would support in-house maintenance of existing and future Sounder train service.

Local transit

Several agencies provide public transportation in the Plan area. Sound Transit provides regional high-capacity transit service, stations, and supporting facilities. The agency's partners—Community Transit, Everett Transit, King County Metro, and Pierce Transit—provide local or countywide service, paratransit service, and express bus service. The City of Seattle currently operates monorail and streetcar service. The City of Seattle has initiated streetcar service in South Lake Union, and an additional streetcar line funded by Sound Transit to connect the Capitol Hill Link station with the International District Station is expected to start service in 2015. Local and countywide transit services are described below.

Community Transit

Community Transit operates within Snohomish County and to Bothell, the University of Washington (Seattle and Bothell campuses), and downtown Seattle. Community Transit operates local, subscription or paratransit, Swift BRT, and commuter express bus service. Commuter service operates to destinations in King County weekdays in the peak period and peak direction with typical headways of 30 minutes. In 2013, Community Transit had 8.2 million boardings.

Everett Transit

Everett Transit provides local and paratransit service within the City of Everett and to some locations just outside the city limits. Typical weekday headways are from 20 to 60 minutes with more limited service provided on weekends. Everett Transit had 2.1 million boardings in 2013.

King County Metro

King County Metro provides transit service within King County. Service includes local and express bus service, RapidRide, and paratransit. Paratransit services (ACCESS) provides demand-responsive service to persons with disabilities while Dial-A-Ride Transit (DART) operate on fixed routes or via demand-response with advance reservations. RapidRide service is a frequent limited stop bus service operating on 10- to 15-minute headways. Six RapidRide lines are currently operating in King County. Metro had 118.6 million boardings in 2013.

City of Seattle

The City of Seattle constructed the South Lake Union streetcar line, which operates between Lake Union and Westlake Center. The service operates every 15 minutes except during weekday PM peak periods when 10-minute service is provided. This streetcar line, which is operated under contract by King County Metro, was funded by the City of Seattle and a local improvement district. The South Lake Union streetcar had approximately 761,000 boardings in 2013.

The First Hill Streetcar, funded as part of ST2, is under construction with operations expected to begin in 2015. ST2 included funding for the First Hill Streetcar as a mitigation measure because a First Hill Link light rail station did not move forward due to constructability risks. This First Hill light rail station was initially identified for the University Link extension from downtown Seattle to the University of Washington. The streetcar service will provide a rail connection between the Sound Transit Capitol Hill light rail station, First Hill, and regional HCT services at the International District/Chinatown Station and King Street Station.

The Seattle Center Monorail is owned by the City of Seattle and operated by Seattle Monorail Services. The monorail had approximately 2.1 million boardings in 2012.

Pierce Transit

Pierce Transit provides local bus service, paratransit service, vanpools, and commuter express bus service within Pierce County. Service is also provided to Federal Way in King County and Olympia in Thurston County. Peak headways range from 15 to 60 minutes. Off-peak and weekend headways range from 15 minutes to 2 hours. Pierce Transit had 10.3 million annual boardings in 2013.

Other bus transit services connecting to Plan area

Some bus services originate outside of the Plan area but serve locations in the area. Service is provided from:

- **Island County—**Island Transit provides service to the Everett Station where it connects with Sound Transit commuter rail, Community Transit express bus service, and Everett Transit local bus routes. Schedules are designed to meet start and finish times for Everett Boeing employees.
- **Skagit County—**Skagit Transit provides service to the Everett Station where it connects with Sound Transit commuter rail, Community Transit express bus service, and Everett Transit local bus routes.
- **Kitsap County—**Several Kitsap Transit routes serve Gig Harbor where connections are available to Sound Transit regional express bus service to Tacoma and downtown Seattle.
- **Thurston County—**Several Intercity Transit routes serve downtown Olympia where connections are available to Sound Transit regional express bus service to DuPont and downtown Seattle.

Bus maintenance and operations facilities in Plan area

The Sound Transit regional express bus fleet is operated and maintained under contract with Sound Transit's transit partners: Community Transit, King County Metro, and Pierce Transit. The maintenance and storage facilities for bus services were described previously and are shown in Figure 3-3.

Ferry service

Washington State Ferries provides vehicle and passenger service from Seattle and Tacoma to Vashon Island, from Mukilteo to Whidbey Island, from Edmonds and Vashon Island to Kitsap County, and from downtown Seattle to Bainbridge Island and Bremerton, also in Kitsap County. Some loading docks include HOV lanes to give priority to buses and carpools at peak commute periods. The routes listed above had 19.7 million boardings in 2013 (Washington State Ferries, 2014).

The King County Marine Division operates ferry service known as *water taxis* to West Seattle and Vashon Island from Pier 50 in downtown Seattle. Water taxis currently serve West Seattle during peak periods seven days a week. The service to Vashon Island is provided during peak periods on weekdays only. The water taxi had 445,000 boardings in 2013.

In Pierce County, the Pierce County Ferry links Steilacoom to Ketron Island and Anderson Island. This service, which is available seven days a week, is operated by the Pierce County Public Works and Utilities Department and had 183,000 boardings in 2013.

Pedestrian and bicycle access to transit

Pedestrian facilities that provide access to transit stations include sidewalks, sidewalks with buffers, crosswalks, signalized intersections, ramps for persons with disabilities at intersections, overpasses and underpasses, escalators, and elevators. Lower density areas served within the Plan area often have a less well-developed sidewalk network than higher density areas within the Plan area. In these areas, it can be more difficult for pedestrians to reach bus routes or transfer between routes, even when transit service is available. Projects implemented with *Sound Move* and ST2 have included improvements to the pedestrian environments near transit stations. For example, the Sounder stations in Seattle, Kent, and Auburn include pedestrian bridges over the railroad tracks, providing a safe and accessible path between commuter rail platforms, parking areas, and bus facilities.

Bicycle amenities are provided by transit agencies, including bike storage on light rail vehicles, bicycle storage on commuter rail, bike-on-bus programs, bicycle parking, and bicycle lockers. Sound Transit rail stations include bicycle lock-up facilities, except in downtown Seattle. Sound Transit works with local jurisdictions and communities to determine appropriate bicycle improvements such as creating or enhancing bicycle

connections and posting directional signs on established bicycle routes within a half-mile radius of stations and transit centers.

3.1.2 Transit fares

Fares for Sound Transit's services operating in the Plan area are paid using the ORCA card or cash. The ORCA card is read by devices located at light rail and commuter stations, some King County RapidRide stations, as well as on buses. Payment is loaded onto the ORCA card E-purse, which works the same as cash for a transit fare, and the total fare is subtracted from the E-purse. A monthly pass also is available with payment based on the trip length and time-of-day the trip is taken. ORCA cards also can be used to pay fares on Community Transit, Everett Transit, King County Metro, the South Lake Union Streetcar, Kitsap Transit, Pierce Transit, King County Water Taxis, and Washington State Ferries.

3.1.3 Transit ridership

Table 3-4 presents transit ridership trends for Snohomish, King, and Pierce Counties, as well as population trends between 2008 and 2013 (PSRC 2013d). This information reflects the three-county area; however, most of this population and transit ridership occurred in the Plan area. The numbers below reflect transit boardings from all transit providers in these counties.

Table 3-4. Transit ridership and population trends in Snohomish, King, and Pierce Counties, 2008 to 2013

Year	Annual boardings for King, Sound Transit, Pierce, Community, and Everett Transit[1]	Population[2]				Ridership (boardings) per capita
		Snohomish	King	Pierce	Three-county total	
2008	163,437,952	699,330	1,891,125	794,330	3,384,785	48.3
2009	157,723,596	705,894	1,909,205	796,900	3,411,999	46.2
2010	158,042,986	713,335	1,931,249	795,225	3,439,809	45.9
2011	161,117,997	717,000	1,942,600	802,150	3,461,750	46.5
2012	164,463,944	722,900	1,957,000	808,200	3,488,100	47.2
2013	176,340,000	730,500	1,981,900	814,500	3.526,900	50.0

Sources:

[1] PSRC, Puget Sound Trends May 2014

[2] Puget Sound Trends October 2013, Appendix B; Census 2010; OFM 2011, 2012, 2013

Along with job losses during the recession from late 2007 to mid-2009, total annual boardings declined by 3.7 percent from approximately 163.4 million in 2008 to 157.7 million in 2009. Since 2009, transit boardings have gradually increased, with 2013 transit boardings well above 2008 levels. Although population in the three-county area grew between 2008 and 2013, transit ridership increased at a higher rate. This resulted in a higher level of rides per capita (50.0) in 2013 than during the pre-recession (48.3) in 2008.

In 2013, approximately 176.3 million annual boardings occurred, with King County Metro accounting for about 70 percent of these boardings. Sound Transit combined rail and bus services contributed about 17 percent; Pierce Transit, Community Transit, and Everett Transit accounted for the remaining 13 percent.

Access to transit

How people get to transit is an important consideration that affects the transportation system as a whole. From home, people may walk or bike to their bus stop or light rail station, drive to a park-and-ride lot, or they may catch a local bus and then transfer onto the regional transit system.

Sound Transit's System Access Policy (Resolution No. R2013-03—Attachment A) establishes a framework to guide Sound Transit's management of and investment in infrastructure and facilities to provide customer access to its transit services. The policy aims to encourage convenient and safe connections to Sound Transit services through all access modes including connecting transit and ferry services, paratransit, pedestrian access, bicycle access, private vehicle pick-up and drop-off, and parking for transit users.

Table 3-5. Estimated auto access share for transit trips, 2012

County	% of trips that access transit from auto
Snohomish County	46%
North King County	4%
East King County	47%
South King County	39%
Pierce County	37%
Systemwide	**22%**

Source: Sound Transit Ridership Forecasting Model.

Table 3-5 summarizes 2012 mode of access for transit riders. As shown in the table, the percentage of transit trips that access transit from automobiles typically ranges between 35 and 50 percent with the exception of north King County where the share is less than five percent. The systemwide average is 22 percent.

3.1.4 Transit travel times

Table 3-6 summarizes estimated (2012) AM peak-period transit travel times between selected activity centers in the region. Transit travel time includes all trips from one point to another, but only includes in-vehicle time and does not include time spent waiting for and transferring between routes. A range of travel times is presented since they represent estimates based on the Sound Transit ridership forecasting model.

Table 3-6. Estimated AM peak transit travel times, 2012

Destination / Origin	Seattle CBD travel time (minutes)	Bellevue CBD travel time (minutes)	Kent CBD travel time (minutes)	Everett CBD travel time (minutes)	Tacoma CBD travel time (minutes)
Everett CBD	65–70	60–65	110–115		120–125
Paine Field	45–50	40–45	90–95	30–35	120–125
Edmonds	30–35	60–65	50–55	45–50	90–95
Lynnwood	30–35	45–50	95–100	35–40	100–105
Bothell	40–45	10–15	65–70	45–50	115–120
Woodinville	40–45	10–15	65–70	45–50	110–115
Kirkland	35–40	10–15	60–65	45–50	105–110
Overlake	35–40	15–20	65–70	75–80	105–110
Redmond	45–50	10–15	70–75	70–75	115–120
Bellevue CBD	35–40		50–55	60–65	95–100
Issaquah	35–40	25–30	75–80	85–90	95–100
Northgate	20–25	30–35	85–90	80–85	90–95
Ballard	20–25	50–55	85–90	70–75	95–100
U District	10–15	30–35	80–85	50–55	85–90
Capitol Hill	5–10	30–35	75–80	60–65	80–85
Seattle CBD		30–35	65–70	70–75	70–75
West Seattle	20–25	55–60	80–85	95–100	85–90
Renton	20–25	45–50	40–45	100–105	65–70
Burien	35–40	25–30	15–20	85–90	70–75
Tukwila	40–45	40–45	20–25	100–105	50–55
SeaTac	35–40	55–60	25–30	115–120	55–60
Federal Way	55–60	75–80	20–25	130–135	25–30
Kent CBD	25–30	50–55		110–115	40–45
Tacoma CBD	65–70	90–95	40–45	145–150	
Puyallup	50–55	70–75	20–25	130–135	25–30
Lakewood	85–90	115–120	60–65	165–170	40–45
DuPont	85–90	110–115	55–60	165–170	20–25

Source: Sound Transit Ridership Forecasting Model

Transit travel times have generally been increasing over time in relation to increasing freeway and arterial congestion, except in areas where new HOV or transit priority facilities have been implemented. Average transit travel times during the AM peak-period for 2012 are 65 to 70 minutes between Everett and Seattle, 65 to 70 minutes between Tacoma and Seattle, and 35 to 40 minutes between Bellevue and Seattle. In addition to travel time data between selected activity centers and Seattle, Table 3-6 summarizes travel times between selected activity centers and Seattle, Bellevue, Kent, Everett, and Tacoma.

3.2 Roadway system

The following summarizes the existing freeway and arterial roadway system used by transit throughout the Plan area.

3.2.1 Roadway infrastructure

Roadway system

The roadway system includes freeways, arterials, collector roadways, and the local street system. Within King, Pierce, and Snohomish Counties, there are almost 4,800 miles of roadway. Almost 50 percent are principal and minor arterials, 30 percent collector and local roadways, and 20 percent freeway or interstate roadways.

Transit priority is provided on the roadway system via high-occupancy vehicle (HOV) lanes, high-occupancy toll (HOT) lanes, transit signal priority, signal queue jumps, and business access and transit (BAT) lanes. The following sections further describe HOV lanes, HOT lanes, and BAT lanes. The freeway HOV lane system is shown in Figure 3-5 and the WSDOT Tolling Program map is shown in Figure 3-6.

HOV lanes

HOV lanes can improve transit, carpool, and vanpool speed and reliability compared to vehicles traveling in adjacent general purpose lanes. However, HOV lanes can experience congestion along travel corridors. Congested conditions occur where HOV demand exceeds capacity or where speeds in adjacent lanes are so slow that drivers in the HOV lane will not travel at the posted speed limit. The slower speeds are due to concerns over potential merging and diverging traffic from a slow-moving adjacent lane. The freeway HOV lane system is shown in Figure 3-5.

Approximately 310 miles of the planned 320-mile HOV freeway system are complete, as well as arterial HOV lanes, priority lanes on freeway ramps, and HOV lanes for preferential boarding of some ferries. HOV lanes are available on segments of I-5, I-90, I-405, SR 16, SR 167, and SR 520. All of the freeway HOV lanes are designated as 2+ carpools, except at the westbound approach to SR 520, which is designated for 3+ carpool. All freeway HOV lanes are in operations from 5 a.m. to 7 p.m. with some also in operation 24 hours a day.

The HOV lanes on I-5, I-405, and westbound SR 520 are well used, are usually congested during the peak periods, and no longer meet the established WSDOT performance standard of 45 miles per hour (mph). This makes it difficult for regional express buses to meet their schedules, impedes speed and travel time reliability for vanpoolers and carpoolers, and reduces the incentive for all users to share rides. WSDOT is working to address both over- and under-utilized HOV lanes through conversion of some HOV lanes to HOT lanes.

Source: WSDOT, 2010
Parsons Brinckerhoff, 2014

Figure 3-5. Freeway HOV lane systems in Puget Sound region

Source: WSDOT 2014

Figure 3-6. WSDOT tolling program and study map

Sound Transit has invested in HOV direct-access ramps on I-5, I-405, and I-90 that connect HOV lanes with transit stations, park-and-ride lots, and other transit facilities. Nine of the eleven direct access ramps currently completed are open to carpools, vanpools, buses, single-occupant motorcycles, and emergency vehicles. Direct-access ramps are generally subject to the same eligibility and usage limitations that apply to HOV lanes; i.e. these ramps remain HOV-only, 24 hours a day, seven days a week. The two direct-access ramps that are available only to buses are Ash Way and Mountlake Terrace.

HOV direct access ramps and freeway stations completed and open to traffic are as follows:

- Ash Way Access (Ash Way Park-and-Ride) (transit only)—opened 2005
- Downtown Bellevue HOV Access (Bellevue Transit Center)—opened 2004
- Downtown Everett HOV Access—opened 2008
- Eastgate HOV Access (Eastgate Park-and-Ride)—opened 2006
- Federal Way HOV Access (Federal Way Transit Center)—opened 2006
- I-90 Two-Way Transit and HOV Operations, Stage 1 (Mercer Island and South Bellevue Park-and-Rides)—opened 2008
- Lynnwood HOV Access (Lynnwood Transit Center)—opened 2004
- South Everett Freeway Station—opened 2008
- Totem Lake Freeway Station and HOV Direct Access (Kingsgate Park-and-Ride)—opened 2007
- Mountlake Terrace Freeway Station (Mountlake Terrace Transit Center) (transit only)—opened 2011
- I-90 Two-Way Transit and HOV Operations, Stage 2 (Mercer Island and South Bellevue Park-and-Rides)—opened 2012; Stage 3 (part of ST2)—in final design

High occupancy toll lanes

WSDOT has begun implementing HOT lanes (also called express toll lanes) in the Plan area. The WSDOT Tolling Program and Study Map is shown in Figure 3-6. WSDOT is implementing tolling to help manage congestion, enhance mobility and generate revenue for future improvements. The initial project is the development of HOT lanes along SR 167, which are used by drivers in single-occupant vehicles who pay a toll. Carpools/vanpools and buses can use the lanes toll-free. The toll rates vary by level of congestion in the HOT lane to manage demand and maintain operational performance.

The next planned managed lane project will be on I-405. The first phase of I-405 express toll lanes is currently being constructed between Bellevue and Lynnwood, with a planned opening date of mid-2015. The I-405 express toll lanes would give drivers the choice to use the carpool lanes by paying a toll while allowing toll-free trips for transit and vanpools. WSDOT is conducting an assessment to determine the potential environmental, social and economic effects of tolling I-90 between I-5 and I-405.

BAT lanes

BAT lanes are located on several arterials in the Plan area. These facilities are provided to improve speed and reliability for buses. BAT lanes, located in the right-hand lanes, are restricted to buses and drivers accessing businesses located along the arterial.

BAT lanes currently exist on SR 99 in South and North King County and Snohomish County, on Elliott Avenue/15th Avenue W in Seattle, and on SR 522 in North King County. Preferred design elements for transit facilities to accompany BAT lanes include enhanced transit stops with easy boarding and transit signal priority systems. King County Metro RapidRide service on 15th Avenue W in Seattle is an example of this type of treatment. SR 522, as an example, is a BAT lane with a few of these types of treatments.

3.2.2 Regional transportation travel conditions

Vehicle miles of travel

Vehicle miles of travel (VMT) represents a measure that quantifies the total number of miles traveled each day by drivers in the region. In 2011, there were 79.4 million VMT daily in the four-county Puget Sound region (PSRC model). Traffic volumes on the urban Interstate and highway system are at capacity for multiple hours of the day on many segments of the highway system. Many arterials are over capacity during the morning and evening commutes and on weekends and during large special events.

Travel delay occurs when the region's highways and arterials are at capacity for many hours of the day. Additional VMT on roadways that are already congested results in considerable increases in delay. Delay not only affects travel times, travel plans, and the economy, but is another factor in air quality conditions.

Travel time reliability

Congestion and reduced speeds result in unreliable travel times. These unreliable travel times affect both the general-purpose and HOV facilities. While a large number of express bus routes operate in HOV lanes, they must still use general-purpose lanes for some of their service and some HOV lanes can become congested at times.

Freeway volumes that are at or exceed capacity result in congestion levels and travel times that are increasingly sensitive to incidents. A roadway operating well under its capacity can absorb the impact of a stalled car, debris, or an accident without dramatic impacts on travel times. However, as freeways reach capacity, disruptions (e.g., stalled vehicles, weather, or incidents) to traffic flow can have a significant impact on travel times.

The following sections describe congestion-related conditions on general-purpose and HOV facilities in the Plan area.

General-purpose facilities

As a measure of congestion and travel time reliability, WSDOT has identified high-demand commutes on Puget Sound regional highways and calculates both travel time variability and extreme congestion. Travel time variability considers the 95th percentile travel time. Delay is evidenced by the frequency of speeds slower than 85 percent of the posted speed limit. For the 19 morning high-demand commutes, the average of the 95th percentile travel time is about 2.6 times greater than what the travel time would be if a driver could travel at the posted speed limit. For the 21 evening high-demand commutes, the travel time is even greater, with the average of the 95th percentile travel time 3.0 times longer than the travel time if a driver could travel at the posted speed limit.

For example, a trip from Federal Way to Seattle during the morning commute should take about 22 minutes at the posted speed. However, due to the high levels of congestion and speed variability on that section of I-5 during peak periods, one would have to allow 69 minutes for the trip in order to have a high reliability of arriving on time.

Table 3-7 identifies the impact of congestion on travel time, in particular the required time travelers would have to allow in order to make the trip and arrive at a destination on time. To ensure on-time arrival, travelers must often require a travel time that is significantly longer than the typical or average travel time. Table 3-7 presents the travel time required to arrive at a destination on time 95 percent of the time.

Table 3-7. Existing average and required travel times, 2013

Route	Route description	Mode	Travel time (minutes) in peak period in peak direction		
			Average	Required travel time[1]	Required travel time percent increase over average[2] travel time[3]
			Yellow—Less than 30% increase Orange—30 to 50% increase Red—Over 50% increase		
I-5	Everett to Seattle (AM)	SOV	50	80	60%
		HOV	39	61	60%
	Seattle to Everett (PM)	SOV	39	57	50%
		HOV	35	48	40%
	Federal Way to Seattle (AM)	SOV	49	69	40%
		HOV	36	49	40%
	Seattle to Federal Way (PM)	SOV	32	48	50%
		HOV	29	41	40%
I-405	Lynnwood to Bellevue (AM)	SOV	44	69	60%
		HOV	22	30	40%
	Bellevue to Lynnwood (PM)	SOV	34	47	40%
		HOV	22	29	30%
	Tukwila to Bellevue (AM)	SOV	36	50	40%
		HOV	18	27	50%
	Bellevue to Tukwila (PM)	SOV	35	47	30%
		HOV	19	29	50%
SR 520	Redmond to Seattle (AM)	SOV	18	25	40%
		HOV	18	23	30%
	Seattle to Redmond (PM)	SOV	18	24	30%
		HOV	17	22	30%
I-90	Bellevue to Seattle (AM)	SOV	18	26	40%
		HOV	14	18	30%
	Seattle to Bellevue (PM)	SOV	17	28	60%
		HOV	12	18	50%
SR 167	Auburn to Renton (AM)	SOV	17	28	60%
		HOV	12	17	40%
	Renton to Auburn (PM)	SOV	18	35	90%
		HOV	12	17	40%

Source: WSDOT 2014

[1] Travel time that has to be allowed for by travelers in order for them to be on time 95 percent of the time.

[2] Rounded to nearest 10 percent

[3] Variations between required travel time and average travel time indicate the relative level of unreliable travel conditions due to congestion on the affected corridor.

The values are highlighted red where the required travel time to achieve reliability exceeds 150 percent of the average travel time. Orange indicates the required travel time is 130 to 150 percent longer than the average and yellow where the required travel time is less than 130 percent longer than the average. The corridors with the lowest travel time reliability are I-5 from Everett to Seattle (both in the HOV and single-occupant vehicle (SOV) lanes), I-405 from Lynnwood to Bellevue (SOV lanes), I-90 from Seattle to Bellevue (SOV lanes), and SR 167 in both directions between Renton and Auburn (SOV lanes).

Information presented in Table 3-7 indicates that several major transportation corridors are congested in peak periods to the point that, in order to ensure an on-time arrival, travelers using general purpose lanes have to build in additional time when making a trip. For people using public transit service, this added time also applies to conditions in HOV lanes. For Everett to Seattle travel, the percent increase between the required travel time (to arrive on time 95 percent of the time) and average travel time is the same—60 percent for both SOV and HOV travelers. In comparing required and average travel times variations for other corridors, the ones for SOV and HOV are also the same for Federal Way to Seattle and Seattle to Redmond. Between Tukwila and Bellevue in both directions, the percent difference is higher for HOV as compared to SOV users. Thus peak period travel times can be unreliable on several corridors even for riders on buses using HOV lanes.

HOV facilities

The increase in vehicular travel and congestion also results in increasing congestion in the HOV lanes. As noted in Table 3-7, the travel time unreliability for several major corridors occurs for SOV and HOV travelers. This affects the travel-time reliability of buses and carpools in HOV lanes. The WSDOT operating guidelines state that HOV lanes should operate with a volume-to-capacity ratio no greater than 0.7 and speeds of at least 45 mph at least 90 percent of the time during the morning and afternoon rush hour. As indicated in Table 3-8, most of the corridors monitored by WSDOT operated below the speed goal of 45 mph in 2012.

In addition, for WSDOT's planned I-405 Express Toll Lanes, WSDOT has been directed to ensure that average vehicle speeds in toll lanes remain above 45 mph at least 90 percent of the time during peak hours (RCW 47.56.880).

Table 3-8. Peak-hour HOV lane operations, 2013

Route	Route description	Percent of time HOV lane speed maintained at 45 mph or better
Morning peak-direction commutes		
I-5	Everett to Seattle	42%
I-5	Federal Way to Seattle	43%
I-405	Lynnwood to Bellevue	54%
I-405	Tukwila to Bellevue	65%
I-90	Issaquah to Seattle	100%
SR 520	Redmond to Bellevue	50%
SR 167[1]	Auburn to Renton	94%
Evening peak-direction commutes		
I-5	Seattle to Everett	66%
I-5	Seattle to Federal Way	53%
I-405	Bellevue to Lynnwood	46%
I-405	Bellevue to Tukwila	41%
I-90	Seattle to Issaquah	99%
SR 520	Redmond to Bellevue	52%
SR 167[1]	Renton to Auburn	98%

Source: WSDOT 2014

[1] SR 167 is a HOT lane

Red = below guideline of 90%

White = meets guideline

3.3 Movement of freight

Freight moves through the Puget Sound region via freeways and major state highways, county roads and city streets, the rail system, airports, and the ports. The Washington State Freight and Goods Transportation System is used to classify roadways, freight railroads and waterways according to the annual freight tonnage carried on these systems. Freeways and other roadways are classified as T1 through T5 routes, as follows:

- T-1—More than 10 million tons per year
- T-2—4 million to 10 million tons per year
- T-3—300,000 to 4 million tons per year
- T-4—100,000 to 300,000 tons per year
- T-5—At least 20,000 tons in 60 days and less than 100,000 tons per year

Freight railroads are classified using five freight tonnage classifications, R1 through R5, as follows:

- R1—more than 5 million tons per year
- R2—1 million to 5 million tons per year
- R3—500,000 to 1 million tons per year
- R4—100,000 to 500,000 tons per year
- R5—less than 100,000 tons per year

Freight waterways are classified using five freight net tonnage classifications, W1 though W5, as follows:

- W1—more than 25 million tons per year
- W2—10 million to 25 million tons per year
- W3—5 million to 10 million tons per year
- W4—2.5 million to 5 million tons per year
- W5—0.9 million to 2.5 million tons per year

The state Freight and Goods Transportation System is primarily used to establish funding eligibility for Freight Mobility Strategic Investment Board grants, fulfill federal reporting requirements, support transportation planning process, and plan for pavement needs and upgrades.

In 2013, a total of 2,521 state route miles were designated as either T1 or T2 corridors, representing 36 percent of all state route miles. Some of the T1 and T2 routes that are heavily used by regional and local transit in the Plan area include I-5, I-90, I-405, SR 16, SR 18, SR 99, SR 161, SR 167, SR 512, SR 520, SR 522, SR 525, SR 526, and SR 599.

The BNSF and Union Pacific rail lines that serve the Plan area are classified as R1. In addition to the freight tonnage along these rail lines, Sounder commuter rail and Amtrak operate on these rail lines.

The major deep-water ports in the Plan area include the Port of Everett, Port of Seattle, and Port of Tacoma. The Port of Seattle and Port of Tacoma carry cargo in and out of the Puget Sound region and combined are the second largest marine container port in North America.

Freight is also transferred at the Sea-Tac Airport and King County International Airport (Boeing Field).

3.4 Non-motorized transportation

The non-motorized transportation system includes shared use paths, bike lanes and other systems such as a city's designated bike route.

Transportation 2040 states that the non-motorized system has three key functions which include:

- Linking communities at the regional level
- Substituting non-motorized trips for vehicle trips at the local level
- Providing intermodal connections at rail, ferry, and other transit stops

As described in PSRC's *Transportation 2040*, there are five general types of non-motorized facilities, each with varying levels of separation from adjacent roadways:

- **Shared use bicycle/pedestrian paths—**Facilities that are physically separate from roadways. These are usually appropriate for both bicycle and pedestrian travel.
- **Bike lanes—**Portions of roadways that are physically designated for exclusive bicycle travel by signs and pavement markings.
- **Bike routes—**Portions of roadways that are signed as preferred routes for bicycle travel, but not striped for exclusive bicycle use. On-road markings such as sharrows (bicycle symbol markings that indicate to motorists that they should expect to see and share the lane with bicyclists), and other non-exclusive markings or signage, fall into this category.
- **Bikeways—**Portions of roadways that are not signed or marked, but are accessible to bicycle travel and identified by the local jurisdiction as a preferred bicycle route.
- **Walkways—**Pedestrian facilities that can be either separated from roadways, such as sidewalks and paths, or part of roadways, such as crosswalks or wide shoulders. Walkways are designed, or appropriate, for use by pedestrians.

The Active Transportation Plan (PSRC 2014) is an appendix to *Transportation 2040* and emphasizes planning for pedestrians and bicyclists. In preparing the plan, PSRC developed a set of definitions for bicycle facilities:

- **Shared use path—**Facilities are separated from motorized vehicular traffic and are for the exclusive use of pedestrians, bicyclists, and other active transportation users
- **Cycle track (protected bicycle lane)—**Exclusive bicycle facility within or adjacent to the roadway but separated from motor vehicle traffic by a physical barrier or change in elevation; also known as "protected bicycle lanes"
- **Bike lane—**Portion of the roadway designated for preferential use by bicyclists
- **Paved and striped shoulder—**Paved shoulders defined by a fog line but without bike pavement markings indicating preferential bicycle use
- **Shared lane markings (sharrow)—**Pavement markings, or "sharrows," are used to indicate roadways that have a shared lane environment for bicycles and automobiles
- **Neighborhood greenway—**Low-speed, low-volume local streets that prioritize pedestrian and bicycle travel with traffic calming treatments and improving arterial crossings

4 Long-Term Impacts

Potential changes to the HCT system as a result of either alternative would affect transportation characteristics such as travel times and transit demand levels. The changes could also impact the transportation system in the region, including existing public transit service and facilities, roadways, and the bicycle and pedestrian network.

Long-term impacts on the characteristics of the regional transit system, including transit travel times, are affected by potential levels of investments that could be made. Accordingly, this section describes impacts to the transportation system for the Current Plan Alternative and compares results with the adopted ST2. In addition, the analysis in this section presents the net effects of changes to the HCT system with the Potential Plan Modifications Alternative as compared to the Current Plan Alternative. Potential mitigation measures for these impacts are also presented in this section.

4.1 Transit ridership

The transit ridership changes that result from the Current Plan and Potential Plan Modifications Alternatives would be influenced by several factors. These include future conditions of the roadway system, the transit networks that were included in the travel forecasting for the Current Plan and Potential Plan Modifications Alternatives, and how various corridors identified in the Current Plan and Potential Plan Modifications Alternatives would affect transit travel times. These factors are further described below.

4.1.1 Transportation network assumptions

Roadway network

Travel demand forecasting for the Current Plan Alternative, the Potential Plan Modifications Alternative, and ST2 in 2040 includes changes to the roadway system as adopted in the *Transportation 2040* plan using the financially constrained system. Major elements of that plan influencing transit speed, reliability, and ridership are listed below.

- Completion of the new SR 520 Bridge, including connections with I-5 and Eastside improvements
- Completion of the I-90 two-way transit and HOV lanes
- The funded I-405 program and ramp improvements at I-90
- I-5 northbound peak-period transit lane from Olive Way to SR 520
- Systemwide tolling on all limited access facilities (freeways)

Systemwide tolling

A key difference between the roadway system assumed for the 2005 Long-Range Plan SEIS and the current Final SEIS is the potential systemwide tolling that would affect traffic conditions in the Plan area. PSRC's Transportation 2040 assumes systemwide tolling of all lanes (including HOV lanes) on all limited access facilities (freeways). The intent is to set tolls by time of day and direction of travel to levels sufficient to minimize congestion and maintain good traffic flow without unnecessarily diverting traffic to other facilities, thereby minimizing overall network travel times. This procedure was implemented in a version of the current PSRC travel demand model that has been used for WSDOT's project level planning and tolling/revenue analysis.

HCT corridor planning studies help inform Long-Range Plan Update

ST2 included funding for a series of high-capacity transit (HCT) corridor studies to help inform the Board and the region about specific HCT corridors. The corridors included in the HCT corridor studies are shown in the table below.

Within each HCT corridor study, several representative alternative alignments and modes were compared to each other. While ridership, cost and other information about the alternatives were documented in technical reports, the HCT studies did not identify preferred alignments, modes, or stations.

Although the HCT corridor studies were conducted separately from this SEIS, a summary of ridership results is included below because the studies provide additional information to help support the update to the Long-Range Plan. Note, however, that the ridership estimates from the HCT corridor studies cannot be directly compared to the screenline ridership information included in this Final SEIS because the analysis differs in several important ways:

- Daily ridership on a line, as identified in the HCT corridor studies, is a different measure from daily transit passenger volumes across a screenline,
- Each HCT corridor study evaluated impacts for a single corridor improvement within the regional system while the Final SEIS evaluates many improvements together, which limits the degree to which the impacts of any particular corridor improvement can be assessed in the Final SEIS, and
- The HCT corridor studies used a forecast year of 2035 and did not assume systemwide tolling, while the Final SEIS forecast year is 2040 and includes an assumption of systemwide tolling.

Summary of 2035 daily ridership ranges for alternatives in HCT corridor studies

HCT study corridor	Mode	Corridor length (miles)[1]	Travel time (minutes)[1]	2035 daily ridership range for project alternatives[1]
Lynnwood to Everett				
Lynnwood to Everett Station	Light rail: BRT:	13 to 16 14 to 20	22 to 33 50 to 56	32,000 to 51,000 12,000 to 21,000
Lynnwood to Everett Community College	Light rail: BRT:	15 to 17 18 to 24	29 to 37 64 to 70	35,000 to 53,000 13,000 to 23,000
Ballard to downtown Seattle	Light rail: Rapid Streetcar:	5 to 7 6 to 7	11 to 19 15 to 21	14,000 to 30,000 14,000 to 18,000
Central to East				
Ballard to University District	Light rail: BRT:	3 to 5 3 to 5	6 to 10 12 to 22	20,000 to 28,000 10,000 to 17,000
University District to Kirkland to Redmond	Light rail: BRT:	9 to 18 9 to 18	15 to 31 30 to 40	7,000 to 22,000 7,000 to 13,000
Kirkland to Bellevue to Issaquah	Light rail: BRT:	16 to 23 16 to 23	22 to 28 18 to 32	9,000 to 11,000 6,000 to 11,000
I-405 BRT	BRT:	28 to 37	73 to 98	17,000 to 25,000
Eastside Rail Corridor (Renton to Woodinville)	Light rail: Commuter Rail: BRT:	23 23 23	52 to 64 52 to 64 53 to 64	9,000 to 11,000 3,500 to 5,000 9,000 to 11,000
South King County				
Downtown Seattle to West Seattle/White Center	Light rail: BRT:	9 9	18 to 21 39 to 47	32,000 to 41,000 14,000 to 17,000
Downtown Seattle to West Seattle, Burien, and Renton	Light rail: BRT:	25 to 30 25 to 30	37 to 47 73 to 89	63,000 to 103,000 30,000 to 66,000
Federal Way to Tacoma	Light rail: BRT:	10 10	16 to 19 16 to 30	18,000 to 24,000 6,000 to 11,000

[1] Ranges vary based on alternative alignments and termini.

The goal of systemwide tolling is to optimize toll cost on each roadway segment to minimize highway segment congestion levels. The PSRC model has features that attempt to arrive at a balance between the segment tolling rates and the volume/delay relationships on each segment. This balancing of toll rates and highway operations occurs both on the network as a whole, and on each segment. The overall delay in the region is constrained to remain constant and as a result there are no differences between the alternatives for traffic-related delay. All freeway speeds are constant at approximately 45 mph.

Transit network

Both the Current Plan Alternative and Potential Plan Modifications Alternatives include a variety of changes in the overall transportation system, as included in PSRC's Transportation 2040. For HCT-specific items, these alternatives include elements that may not necessarily be identified in Transportation 2040.

The model network includes operating characteristics of light rail for the Current Plan Alternative and the Potential Plan Modifications Alternative. Figure 4-1 and Figure 4-2 show the light rail operations network for the Current Plan Alternative and the Potential Plan Modifications Alternative, respectively. For the Current Plan, light rail operations reflect an operating concept for the 2005 Long-Range Plan and subsequent updates. The Potential Plan Modifications Alternative reflects individual suggestions identified during the SEIS scoping process and the Draft SEIS comment period, and that met the screening criteria as discussed in the Final SEIS. A complete list of corridors included in the Current Plan Alternative and Potential Plan Modifications Alternative are shown in Figure 2-1 through Figure 2-4 in Chapter 2 of this technical report.

In order to develop transit ridership forecasts for the Potential Plan Modifications Alternative, an overall system operations network was developed for future rail services, including the suggested light rail extensions. This operations network reflects how the proposed light rail elements could be operated should they be selected. However, if light rail elements are selected for implementation, more detailed operations plans would be developed to identify items such as start and endpoints for each train, which trains would be directly through-routed or interlined and during which parts of the day, etc.

One outcome of the development of the operations plan for the Potential Plan Modifications Alternative was the identification of the potential need for an additional facility or facilities that would provide north-south passage through downtown Seattle for rail serving West Seattle and Burien. This facility could also potentially serve Ballard and communities to the north.

Non-motorized network

Non-motorized improvements are focused in regional growth centers and include facilities that complete a missing link or are within close proximity to existing and planned transit stations. Ferry service is planned to be maintained with additional passenger-only ferry service connecting to Seattle from Vashon and West Seattle.

Public transit

The transit elements of the Current Plan Alternative and Potential Plan Modifications Alternative are described in Chapter 2 of this report.

Figure 4-1. Light rail operations for Current Plan Alternative

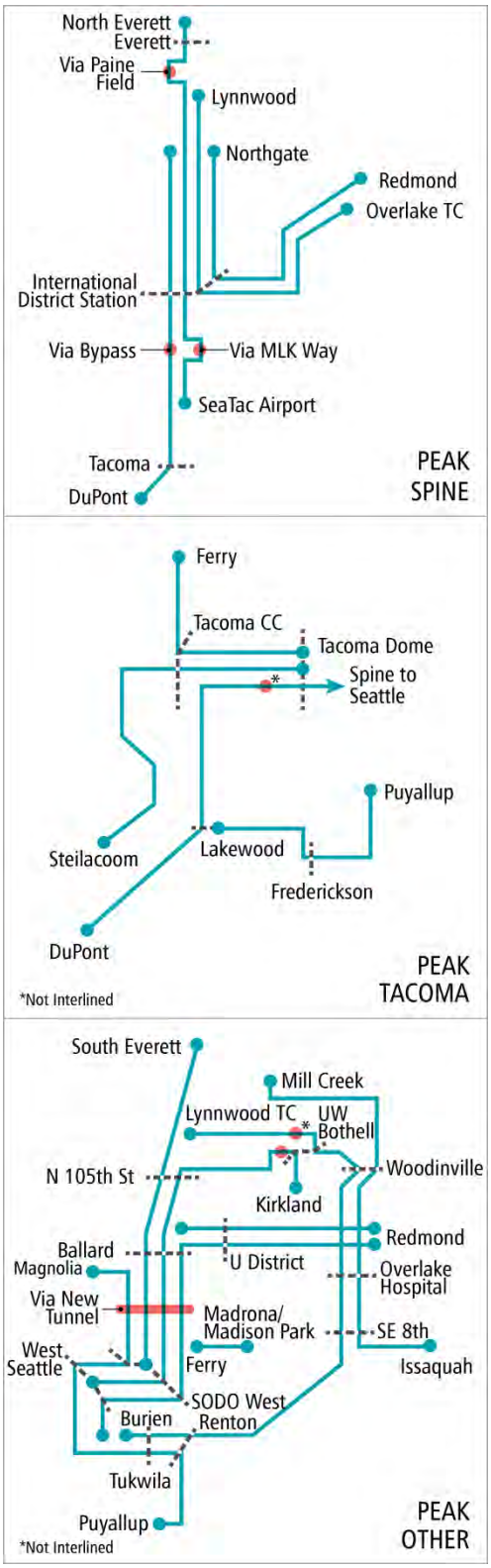


Figure 4-2. Light rail operations for Potential Plan Modifications Alternative

4.1.2 Transit system performance measures

Transit ridership

Table 4-1 shows estimated 2040 transit ridership for ST2 and changes with the Current Plan Alternative and the Potential Plan Modifications Alternative. Ridership in this context is defined as all public transit systems operating in Snohomish, King, and Pierce Counties. This table also shows the breakdown of transit ridership changes by Sound Transit services—light rail, commuter rail, and regional express as well as by local transit services.

For the Current Plan Alternative and Potential Plan Modifications Alternative, ridership forecasts are presented in ranges because corridors in these alternatives do not have detailed characteristics such as station locations, right-of-way, and operations plans. There are also uncertainties relating to future tolling. For ST2, even though more detailed system characteristics are known, a range of transit ridership results is still necessary to reflect uncertainties relating to estimated long-term ridership forecasts.

Table 4-1. Transit ridership estimates in 2040 and incremental changes for alternatives—Snohomish, King, and Pierce Counties

	2040 ST2	Incremental change		
		2040 Current Plan Alternative relative to ST2	2040 Potential Plan Modifications Alternative relative to Current Plan Alternative	2040 Potential Plan Modifications Alternative relative to ST2
Annual total transit boardings (in millions)	330 to 370	+25 to +40	+40 to +65	+65 to +105
Annual light rail boardings (in millions)	100 to 110	+40 to +65	+60 to +100	+100 to +165
Annual ST bus[1] boardings (in millions)	20 to 30	+10 to +20	-15 to -10	< +5
Annual local bus boardings (in millions)	180 to 200	-35 to -20	-45 to -25	-80 to -50
Annual commuter rail boardings (in millions)	10 to 20	< -5	< -5	< -5
Annual streetcar boardings (in millions)	<10	< +5	+20 to +30	+20 to +30
Annual service hours (in millions)	5.7	+0.4	+0.8	+1.2

Source: Sound Transit Ridership Forecasting Model

[1] ST Bus mode includes ST Express buses, BRT, and HCT.

Forecasts are presented as annual boardings by light rail, ST bus, local bus, commuter rail, streetcar, and total transit. In addition, annual service hours are presented for all transit systems.

Annual transit demand in Table 4-1 includes a variety of transit modes. However, in the Potential Plan Modifications Alternative, light-rail transit boardings exceed bus transit boardings with the addition of about 100 miles of light rail transit in the Potential Plan Modifications Alternative beyond that provided by the Current Plan Alternative.

While all transit service is included in the ridership estimates, Sound Transit services would account for all the net increases in demand. As compared to ST2, forecasted annual light rail boardings under the Current Plan Alternative would grow by almost 52 percent. Also, for Sound Transit regional express bus service, the growth would be 60 percent while ridership for local bus service would decrease by 15 percent. Relatively small decreases in commuter rail ridership would occur. Annual streetcar boardings would remain about the

same between the Current Plan Alternative and ST2 because this alternative does not include new streetcar corridors.

As compared to the Current Plan Alternative, annual light rail boardings under the Potential Plan Modifications Alternative would increase by almost 50 percent. Annual bus boardings would decline by 38 percent, and annual streetcar boardings would increase considerably from less than 10 million to over 30 million.

The decline in annual bus boardings reflects a major shift in service supply from bus to light rail and streetcar services with the Potential Plan Modifications Alternative as compared to the Current Plan Alternative. While the Current Plan Alternative would include a substantial network of rail service, the Potential Plan Modifications Alternative would add substantially more to this network. This additional rail service would result in added transit ridership as well as a shift in demand from buses to rail.

With the Current Plan Alternative, annual service hours (all bus and light rail systems) would increase by 7 percent, and total ridership in 2040 would increase by approximately 9 percent as compared to ST2. With the Potential Plan Modifications Alternative, annual service hours (bus and light rail) would increase by 13 percent and total ridership in 2040 would increase by approximately 13 percent as compared to the Current Plan Alternative. System productivity, measured by boardings per service hour, would generally be similar between ST2, the Current Plan Alternative and the Potential Plan Modifications Alternative. These productivity levels represent a mix of bus and rail operations and resulting ridership.

Transit travel times

Transit travel time is a key service characteristic that affects transit ridership. The various HCT corridors and services included in the alternatives would have a range of impacts on transit services operating in the Plan area. In some locations, there would be no impacts or very low impacts on transit travel times. For others, moderate travel time changes would occur. For several locations, there would be substantial changes, such as faster transit travel times.

This section describes the estimated changes in transit travel times within the Plan area for five origin-destination travel markets. These destinations are central business districts (CBD) located in each of the subareas in the Plan area. Several of these CBDs, such as Seattle, Bellevue, Everett, and Tacoma, comprise a substantial portion of daily transit demand in the Plan area. Kent is also included given its proximity to major employment in South King County and current concentrations of both regional express bus and commuter rail services.

The 27 origins addressed in the transit travel time analysis represent a cross-section of locations in the Plan area. These locations are included in one or more of the HCT corridors and services included in the Potential Plan Modifications Alternative.

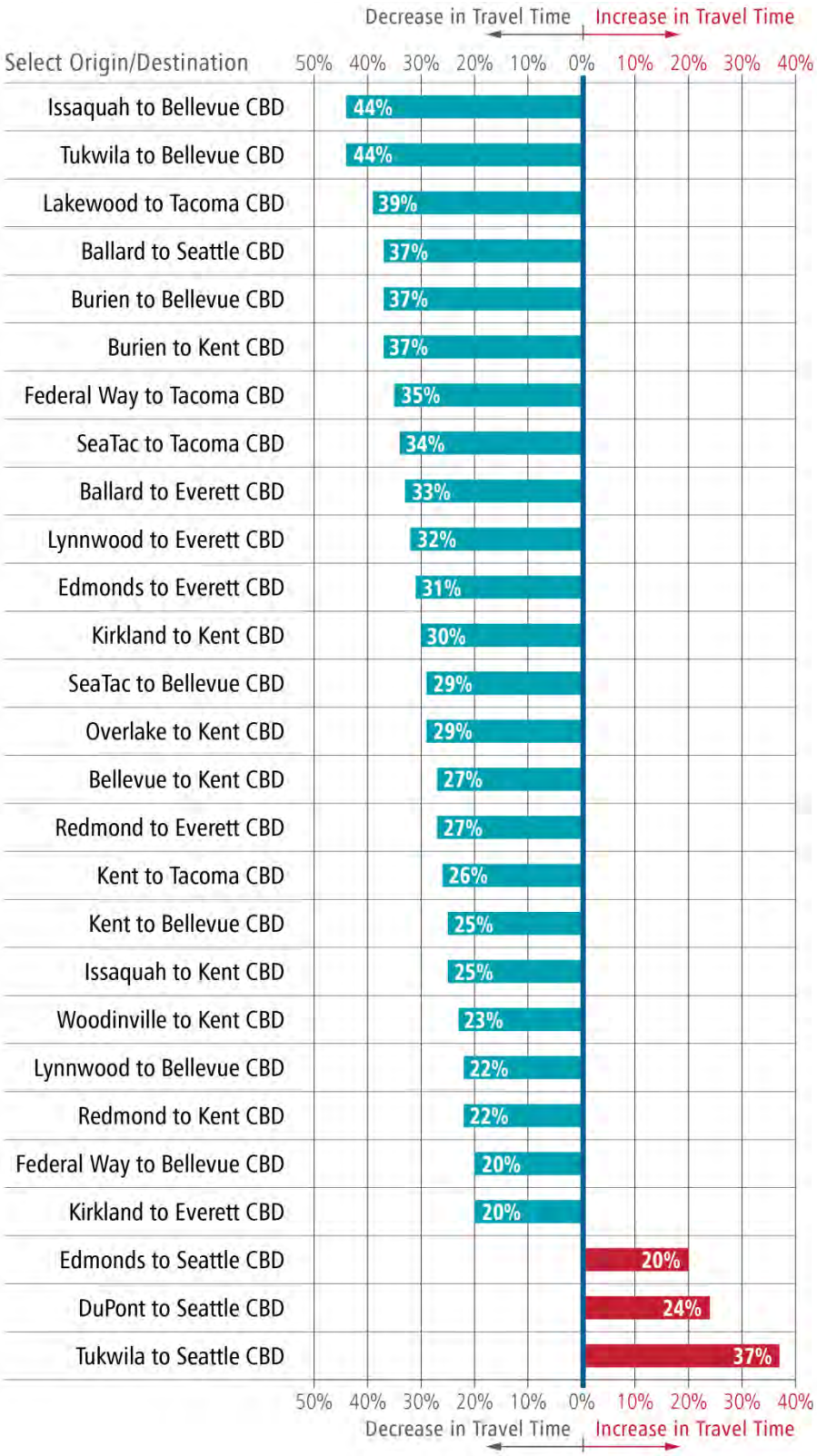
Current Plan Alternative transit travel times

Table 4-2 presents the estimated changes in 2040 transit travel time between ST2 and the Current Plan Alternative for selected origin-destination pairs. Figure 4-3 shows changes in transit travel times between CBDs that are more than a 20 percent decrease with the Current Plan Alternative than ST2. For three origin-destination pairs, Edmonds to Seattle CBD, DuPont to Seattle CBD, and Tukwila to Seattle CBD, there would be increases in transit travel times. These increases would result from additional rail stations being added in the Current Plan Alternative as compared to ST2.

Table 4-2. AM peak travel times—Current Plan Alternative vs. ST2, 2040

Destination / Origin	Seattle CBD		Bellevue CBD		Kent CBD		Everett CBD		Tacoma CBD	
	ST2 travel time (minutes)	Change with Current Plan Alternative	ST2 travel time (minutes)	Change with Current Plan Alternative	ST2 travel time (minutes)	Change with Current Plan Alternative	ST2 travel time (minutes)	Change with Current Plan Alternative	ST2 travel time (minutes)	Change with Current Plan Alternative
Everett CBD	55—60	-8%	60—65	-9%	75—80	9%			120—125	4%
Paine Field	50—55	-14%	40—45	0%	80—85	9%	20—25	0%	120—125	-4%
Edmonds	30—35	20%	45—50	12%	50—55	14%	50—55	-31%	90—95	5%
Lynnwood	25—30	4%	50—55	-22%	55—60	12%	35—40	-32%	95—100	5%
Bothell	35—40	0%	10—15	0%	70—75	-10%	40—45	-13%	95—100	5%
Woodinville	35—40	0%	10—15	-7%	70—75	-23%	45—50	-1%	95—100	-4%
Kirkland	30—35	0%	10—15	0%	65—70	-30%	60—65	-20%	95—100	-8%
Overlake	35—40	0%	10—15	0%	65—70	-29%	75—80	-8%	95—100	5%
Redmond	40—45	4%	15—20	-4%	70—75	-22%	80—85	-27%	100—105	5%
Bellevue CBD	20—25	0%			55—60	-27%	60—65	-8%	85—90	-11%
Issaquah	30—35	0%	30—35	-44%	65—70	-25%	95—100	-10%	90—95	5%
Northgate	10—15	0%	35—40	0%	80—85	0%	45—50	-15%	80—85	6%
Ballard	20—25	-37%	45—50	-14%	85—90	0%	80—85	-33%	100—105	-6%
U District	5—10	0%	30—35	2%	75—80	0%	50—55	-13%	75—80	6%
Capitol Hill	<5	0%	25—30	0%	70—75	0%	55—60	-12%	70—75	7%
Seattle CBD			20—25	0%	65—70	0%	60—65	-12%	75—80	3%
West Seattle	25—30	0%	40—45	0%	85—90	0%	90—95	-9%	75—80	6%
Renton	20—25	3%	35—40	2%	40—45	3%	85—90	-8%	60—65	-17%
Burien	35—40	0%	30—35	-37%	20—25	-37%	90—95	-7%	60—65	-9%
Tukwila	15—20	37%	50—55	-44%	20—25	0%	85—90	0%	45—50	10%
SeaTac	30—35	5%	50—55	-29%	30—35	0%	95—100	-6%	55—60	-34%
Federal Way	50—55	3%	65—70	-20%	25—30	0%	110—115	-4%	30—35	-35%
Kent CBD	25—30	14%	40—45	-25%			90—95	-7%	40—45	-26%
Tacoma CBD	65—70	11%	85—90	-9%	40—45	2%	125—130	3%		
Puyallup	45—50	14%	65—70	-11%	20—25	13%	110—115	-1%	15—20	0%
Lakewood	75—80	9%	90—95	-8%	50—55	6%	140—145	-1%	45—50	-39%
DuPont	75—80	24%	90—95	4%	50—55	18%	140—145	7%	25—30	0%

Source: Sound Transit Ridership Forecasting Model
Transit travel times only include in-vehicle travel times.
CBD = central business district



Includes travel time changes for major markets and where there are changes over 20%.

Figure 4-3. Changes in transit travel times—Current Plan Alternative vs. ST2

With the Current Plan Alternative, substantial transit travel time savings would occur for several markets as a result of new HCT corridors. These corridors include new light rail service to downtown Tacoma which would decrease transit travel times to the Tacoma CBD from locations such as SeaTac, Federal Way, and Bellevue. As a result of higher-level bus service, including improved freeway access to and from bus lanes, transit travel times would also be affected by BRT service on I-5 between Federal Way and DuPont. Along SR 167, BRT would be operating along its full length, from Renton to Puyallup. With HCT on the Eastside Rail Corridor, which would include features to improve transit travel times, or for BRT on I-405, several markets in South King and East King County would have substantial transit time savings. These markets include trips to the Bellevue CBD from Tukwila, Burien, Federal Way, and Lynnwood.

Extension of light rail service from downtown Seattle to Ballard would result in substantially reduced transit travel times along the affected corridor. Also, trips between Ballard Edmonds, Lynnwood, Kirkland, Northgate, and the Everett CBD would also have reduced transit travel times.

Potential Plan Modifications Alternative transit travel times

Table 4-3 presents the estimated 2040 changes in transit travel time between the Potential Plan Modifications Alternative and Current Plan Alternative in 2040 for selected origin-destination pairs. For travel between the five CBDs, the transit travel time reduction for the most part will be 15 percent or less. The one exception is between Bellevue and Kent at 23 percent less travel time. Figure 4-4 provides an overview of the more notable changes (20 percent decrease or increase) in transit travel times for selected origins and destinations. In most cases, the changes in transit travel times reflect added rail service under the Potential Plan Modifications Alternative. For three origin-destination pairs, Northgate to Everett CBD, Bothell to Everett CBD, and Lynnwood to Everett CBD, there would be increases in transit travel times. These increases would result from substituting a Lynnwood-Paine Field-Everett light rail line for a more direct Lynnwood to Everett light rail line.

The following text presents key findings of the transit travel time analysis. For key outcomes relating to travel times, major elements of the Potential Plan Modifications Alternative are presented to help explain the results. Corridors referenced by number in this section below are described in more detail in Chapter 2, Table 2-1 and Table 2-2 of this report and are shown in Figure 2-1 through Figure 2-4.

Seattle CBD

As indicated by Table 4-3, there would be no major differences between the Current Plan Alternative and the Potential Plan Modifications Alternative for many transit trips to the Seattle CBD. These include trips from north of downtown Seattle, such as the U-District and Capitol Hill; some Eastside communities, including Bellevue and Overlake; and locations along the I-405 corridor, such as Woodinville.

Trips from other Eastside origins to the Seattle CBD would have major transit travel time reductions as a result of corridors in the Potential Plan Modifications Alternative. These origins include Kirkland and Redmond which would benefit from light rail on corridor 14 (UW to Sand Point to Kirkland to Redmond). Another corridor contributing to travel time reductions is 41 (North Kirkland to downtown Seattle via SR 520). In addition, reduced transit travel times from Bothell and Kirkland to the Seattle CBD would occur with corridor 10 (Bothell/Kirkland to Northgate).

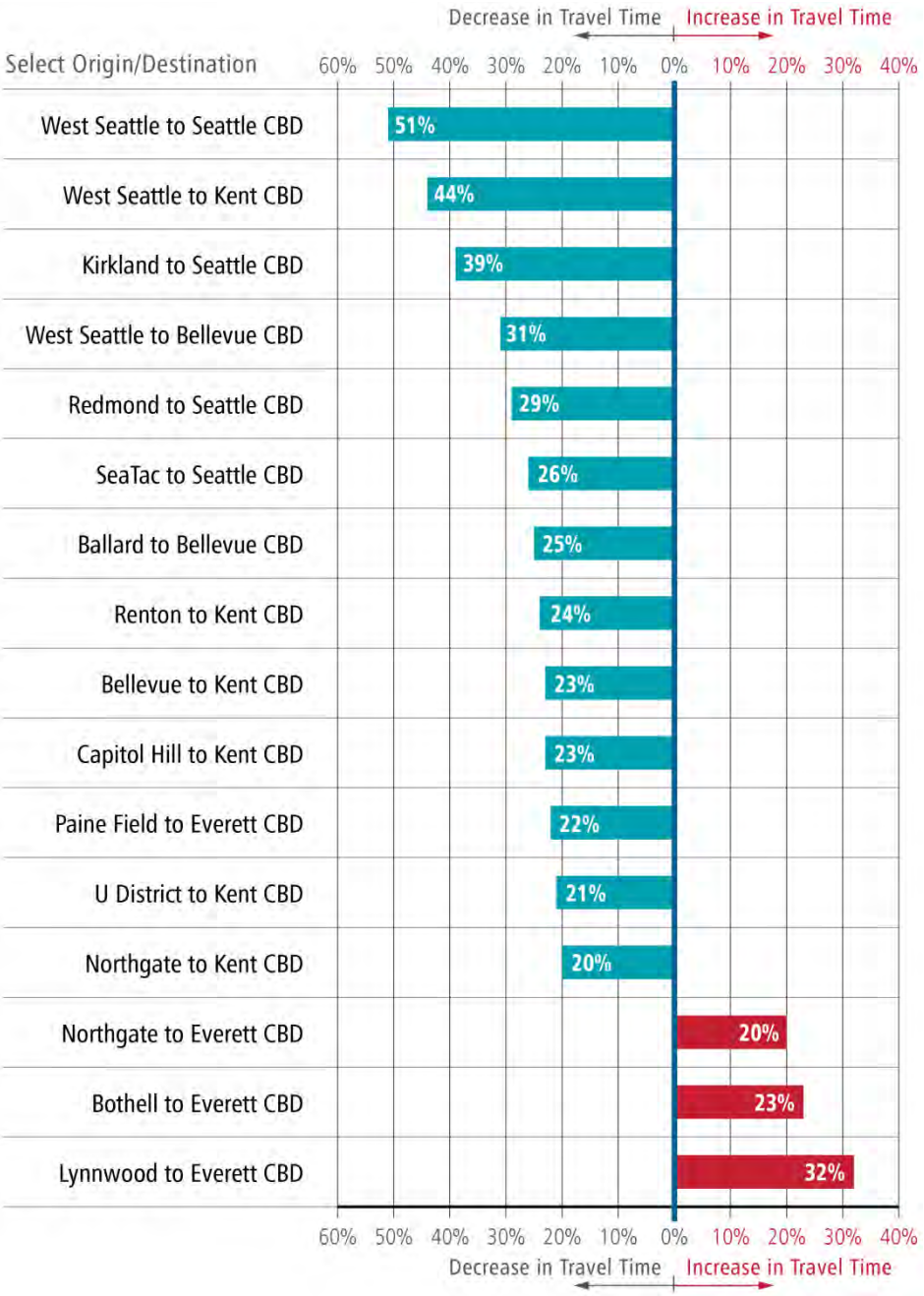
Table 4-3. AM peak travel times (minutes)—Potential Plan Modifications Alternative vs. Current Plan Alternative, 2040

Origin \ Destination	Seattle CBD		Bellevue CBD		Kent CBD		Everett CBD		Tacoma CBD	
	Current Plan Alternative travel time (minutes)	Change with Potential Plan Modifications Alternative	Current Plan Alternative travel time (minutes)	Change with Potential Plan Modifications Alternative	Current Plan Alternative travel time (minutes)	Change with Potential Plan Modifications Alternative	Current Plan Alternative travel time (minutes)	Change with Potential Plan Modifications Alternative	Current Plan Alternative travel time (minutes)	Change with Potential Plan Modifications Alternative
Everett CBD	50–55	9%	55–60	14%	85–90	7%			125–130	4%
Paine Field	45–50	-13%	40–45	3%	85–90	–2%	20–25	–22%	115–120	0%
Edmonds	35–40	0%	50–55	0%	55–60	0%	35–40	-12%	95–100	0%
Lynnwood	30–35	0%	40–45	0%	60–65	0%	20–25	32%	100–105	-2%
Bothell	35–40	–18%	10–15	0%	60–65	–5%	35–40	23%	100–105	-1%
Woodinville	35–40	0%	10–15	0%	55–60	–6%	45–50	17%	–95–100	0%
Kirkland	30–35	-39%	10–15	0%	45–50	–9%	50–55	16%	85–90	0%
Overlake	35–40	0%	10–15	0%	45–50	–8%	65–70	0%	100–105	-3%
Redmond	40–45	-29%	15–20	0%	55–60	–13%	55–60	0%	105–110	-7%
Bellevue CBD	20–25	0%			40–45	–23%	55–60	14%	75–80	0%
Issaquah	30–35	0%	15–20	0%	50–55	–7%	85–90	9%	95–100	0%
Northgate	10–15	0%	35–40	20%	80–85	0%	40–45	20%	85–90	-3%
Ballard	15–20	0%	40–45	–25%	85–90	–12%	50–55	-1%	95–100	-6%
U District	5–10	0%	30–35	0%	75–80	–21%	45–50	17%	80–85	-4%
Capitol Hill	<5	0%	25–30	0%	70–75	–23%	50–55	15%	75–80	-4%
Seattle CBD			20–25	0%	65–70	–11%	50–55	15%	75–80	–8%
West Seattle	25–30	–51%	40–45	–31%	85–90	–44%	80–85	–8%	80–85	–18%
Renton	20–25	0%	35–40	0%	45–50	–24%	75–80	10%	50–55	0%
Burien	35–40	1%	15–20	0%	10–15	–6%	85–90	9%	55–60	0%
Tukwila	25–30	0%	25–30	0%	20–25	0%	85–90	8%	50–55	0%
SeaTac	35–40	–26%	35–40	0%	30–35	0%	90–95	9%	35–40	0%
Federal Way	50–55	–18%	50–55	0%	25–30	0%	110–115	-1%	20–25	0%
Kent CBD	25–30	0%	30–35	0%			85–90	9%	30–35	0%
Tacoma CBD	75–80	–12%	75–80	0%	40–45	0%	130–135	-1%		
Puyallup	55–60	–18%	55–60	0%	25–30	0%	110–115	-2%	15–20	0%
Lakewood	80–85	–8%	85–90	–2%	50–55	0%	135–140	-1%	25–30	0%
DuPont	95–100	-2%	95–100	–2%	60–65	0%	150–155	-1%	25–30	0%

Source: Sound Transit Ridership Forecasting Model

Transit travel times only include in-vehicle travel times.

CBD = central business district



Includes travel time changes for major markets and where there are changes over 20 percent.

Figure 4-4. Changes in transit travel times—Potential Plan Modifications Alternative vs. Current Plan Alternative

Although the Potential Plan Modifications Alternative includes HCT elements north of Seattle (corridor 3 (light rail from Ballard to North Everett via Shoreline Community College, Aurora Village, and Lynnwood)) and on the Eastside (corridor 32 (regional express bus/BRT south of I-90 and along I-405, Tacoma to Bellevue), these HCT elements would not reduce travel time from these areas to the Seattle CBD as compared to operating conditions in the Current Plan Alternative. For example, direct light rail service between downtown Seattle, Bellevue, and Overlake will be provided under the Current Plan Alternative, and no HCT elements in the Potential Plan Modifications Alternative would result in lower transit travel times between the Seattle CBD and these locations.

Corridor 9 (light rail from Tukwila to SODO via Duwamish industrial area) in the Potential Plan Modifications Alternative is an alternative corridor for light rail service operating between SODO and Tukwila that does not go through the Rainier Valley. This corridor would provide substantial transit travel-time savings for those traveling directly between SODO and Tukwila. For those riders traveling to or from the Rainier Valley, this corridor would not affect transit travel times. Also, maintaining the desired service headways of light rail with this rail corridor also could result in the reduction of light rail service frequencies in the Rainier Valley or the introduction of a new transfer to reach downtown Seattle.

Corridor 9 (Tukwila to SODO via Duwamish industrial area) would also provide some transit travel savings for trips from Tukwila and locations to the south. Although for some trips to downtown Seattle, the savings would represent relatively small percentages of transit travel time reductions.

As shown in Table 4-3, major improvements in transit travel times to the Seattle CBD would occur from West Seattle, SeaTac, and Federal Way. Travel time savings from these areas, particularly West Seattle, to the Seattle CBD would range from 10 to 15 minutes. For West Seattle to downtown Seattle, this represents a 51 percent decrease in travel time. These savings would result from the new light rail connection in the Potential Plan Modifications Alternative with corridor 2 (downtown Seattle to West Seattle and Burien).

Bellevue CBD

Rail service under the Current Plan Alternative includes light rail from Seattle to Bellevue and Redmond, and potential rail along the entire eastside from Burien to Lynnwood (for example corridor E along either I-405 or in the Eastside Rail Corridor). BRT service could include Renton to Lynnwood along I-405 (corridor Q). These elements affect travel to the Bellevue CBD from other locations on the Eastside, most Seattle locations, and South King County communities. As indicated by Table 4-3, transit travel times to the Bellevue CBD from most of the selected locations would have relatively small decreases in transit travel times as a result of the Potential Plan Modifications Alternative.

Exceptions to the small decreases in transit travel times include transit travel times from Ballard and West Seattle to the Bellevue CBD. The Potential Plan Modifications Alternative would reduce travel time to or from West Seattle as a result of a new light rail connection from West Seattle to downtown Seattle (corridor 2) with a one-transfer connection to light rail serving Bellevue. Travel time from Ballard to downtown Bellevue would also benefit by light rail from UW to Sand Point to Kirkland to Redmond (corridor 14).

Kent CBD

For several locations in South King and Pierce Counties, there would be relatively small decreases in transit travel times as a result of the Potential Plan Modifications Alternative. These locations include Tukwila, SeaTac, the Tacoma CBD, and Lakewood.

However, with the Potential Plan Modifications Alternative, major reductions in travel times would occur from origins in Seattle, such as downtown Seattle, Capitol Hill, the University District, and Northgate. As indicated in Table 4-3, improvements in travel times to the Kent CBD would also occur from origins along the I-405/I-5 corridors (e.g., the Bellevue CBD, Renton, Kirkland, and Everett). These reduced transit travel times would result from direct light rail service operating under the Potential Plan Modifications Alternative between Kent and locations to the north. The light rail station would be adjacent to the Kent CBD; however, rail travel times and frequent service under the Potential Plan Modifications Alternative would still provide benefits to riders. The line could operate through downtown Seattle while

also providing transfer opportunities to other light rail lines in downtown Seattle, downtown Renton, and the existing Tukwila International Boulevard light rail station.

With the Potential Plan Modifications Alternative, relatively low levels of travel-time savings would occur between locations in South King County and Pierce County. These relatively small changes in transit travel times would be due in part to operating characteristics of a new light rail line along the SR 167 corridor from Puyallup/Sumner to Renton (corridor 7). This line would include more stations in the corridor compared to what would be served by commuter rail under the Current Plan Alternative. These include added light rail stations between Puyallup and Sumner, Sumner and Auburn, and Tukwila and downtown Seattle. Serving these additional light rail stations would result in longer transit travel times as compared to the Current Plan Alternative.

Everett CBD

The Potential Plan Modifications Alternative includes HCT elements serving Everett from several communities in the region (e.g., a new light rail line from Ballard to Everett Station via Shoreline Community College, Aurora Village, and Lynnwood (corridor 3) and a new regional express route between Woodinville and Everett (corridor 43).The Potential Plan Modifications Alternative also realigns light rail between Lynnwood and Everett so it serves the Southwest Everett Industrial Area including Paine Field and Boeing (corridor 13).

The alignment of corridor 13 has an overall effect of increasing travel time between most origins and Everett, as compared to the Current Plan Alternative, due to serving additional stations along a longer corridor (approximately 3 additional miles compared to the light rail corridor under the Current Plan Alternative). The added travel time would also result from slower speeds associated with curves along the alignment. Compared to the Current Plan Alternative, only three origins—West Seattle, Paine Field, and Edmonds—would realize faster transit travel-time to the Everett CBD under the Potential Plan Modifications Alternative.

While the potential new light rail corridor to Paine Field would increase transit travel times, it would also provide direct HCT access to a major employment area from several locations in the Plan area. Any specific alignments that could serve this corridor would be examined in subsequent project development, including any project-level environmental review.

Tacoma CBD

As shown in Table 4-3, with the Potential Plan Modifications Alternative there would be no transit time savings for trips to the Tacoma CBD from Puyallup, Lakewood, and DuPont in Pierce County. No transit travel savings would occur for several locations in South King County, including Federal Way, Kent, and Puyallup. Most new light rail lines in Pierce County, as identified in the Potential Plan Modifications Alternative, would be located along corridors outside of the Tacoma CBD or they would use similar alignments as current express bus service.

With the Potential Plan Modifications Alternative, the greatest transit-time reduction to the Tacoma CBD (18 percent) would occur for trips from West Seattle to the Tacoma CBD. This time saving would be a direct result of a new light rail line (corridor 2) that would connect West Seattle with downtown Seattle and Burien. This corridor would facilitate transfers to the light rail corridor between Seattle and Tacoma.

For several locations, including the Seattle CBD and Northgate, there would be some transit travel-time reductions from the Tacoma CBD under the Potential Plan Modifications Alternative. As indicated previously, these travel-time reductions would be due to a new, more direct light rail line located between

the south area of downtown Seattle and Tukwila, which would connect with potential rail service to downtown Seattle.

Daily transit ridership at screenlines

A typical method of measuring the effects of transportation projects is to estimate the average weekday ridership crossing a screenline at key locations throughout the Plan area. It should be noted that any change in transit ridership across a screenline represents transit travel along one segment, but it does not necessarily represent transit ridership along an entire corridor or transit line. In some cases, more than one corridor would be affecting ridership changes. Changes in transit ridership at a screenline reflect a variety of factors, such as reduced transit travel times and improved travel time reliability For the Final SEIS, 24 locations were selected as screenlines to show estimated changes in ridership associated with the proposed corridors crossing that screenline, as shown in Figure 4-5 and Figure 4-6**.**

The screenline data for the Current Plan Alternative and the Potential Plan Modifications Alternative are shown in ranges that represent a ±20 percent variation for the results generated by the ridership forecasting model. There are several reasons why this range is appropriate for a programmatic SEIS:

- The level of project definition at this stage of analysis is much more general than at either a planning-level study or at the project level. For example, alignments and station locations have not been defined or evaluated.
- Ridership forecasting requires the development of systemwide operating plans. At the Long-Range Plan level of analysis, corridors have not been assembled and optimized as a package as they would be at the system-planning level.
- PSRC's *Transportation 2040* adopted plan calls for region-wide tolling on limited access highways, and proposes that tolls are implemented in phases over the next 30 years. However, there is no definite schedule for the phasing in of region-wide tolling at this time.
- Some screenline results may be affected by the performance of bus/BRT corridors that operate on limited access highways. How buses would actually perform on these managed facilities depends on how successfully WSDOT is able to maintain managed lane speeds of 45 mph at least 90 percent of the time during peak hours without diverting significant traffic to arterials and other local streets.

Figure 4-5 shows the daily transit ridership changes at selected screenlines between the Current Plan Alternative compared to ST2. Figure 4-6 shows the daily transit ridership changes at selected screenlines between the Potential Plan Modifications Alternative and the Current Plan Alternative.

Screenline volumes represent the number of transit trips from all transit services crossing that line. Hence, the model output shown in the screenlines takes into account shifts that could occur from existing service (e.g., a current bus line) to a proposed light rail line.

Ridership changes—Current Plan Alternative compared to ST2

Table 4-4 represent net increases in the volume of daily transit trips resulting from the Current Plan Alternative compared to ST2. The changes in transit volumes at a screenline reflect a variety of factors, including reduced transit travel times, market conditions influencing transit ridership, and the potential for multiple HCT facilities to affect a single screenline. Table 4-5 summarizes the factors contributing to the estimated increases in transit ridership at screenlines of the Current Plan Alternative compared to ST2 and the likely related corridors that are affecting these ridership volumes.

Figure 4-5. Daily transit ridership changes at selected screenlines—Current Plan Alternative vs. ST2

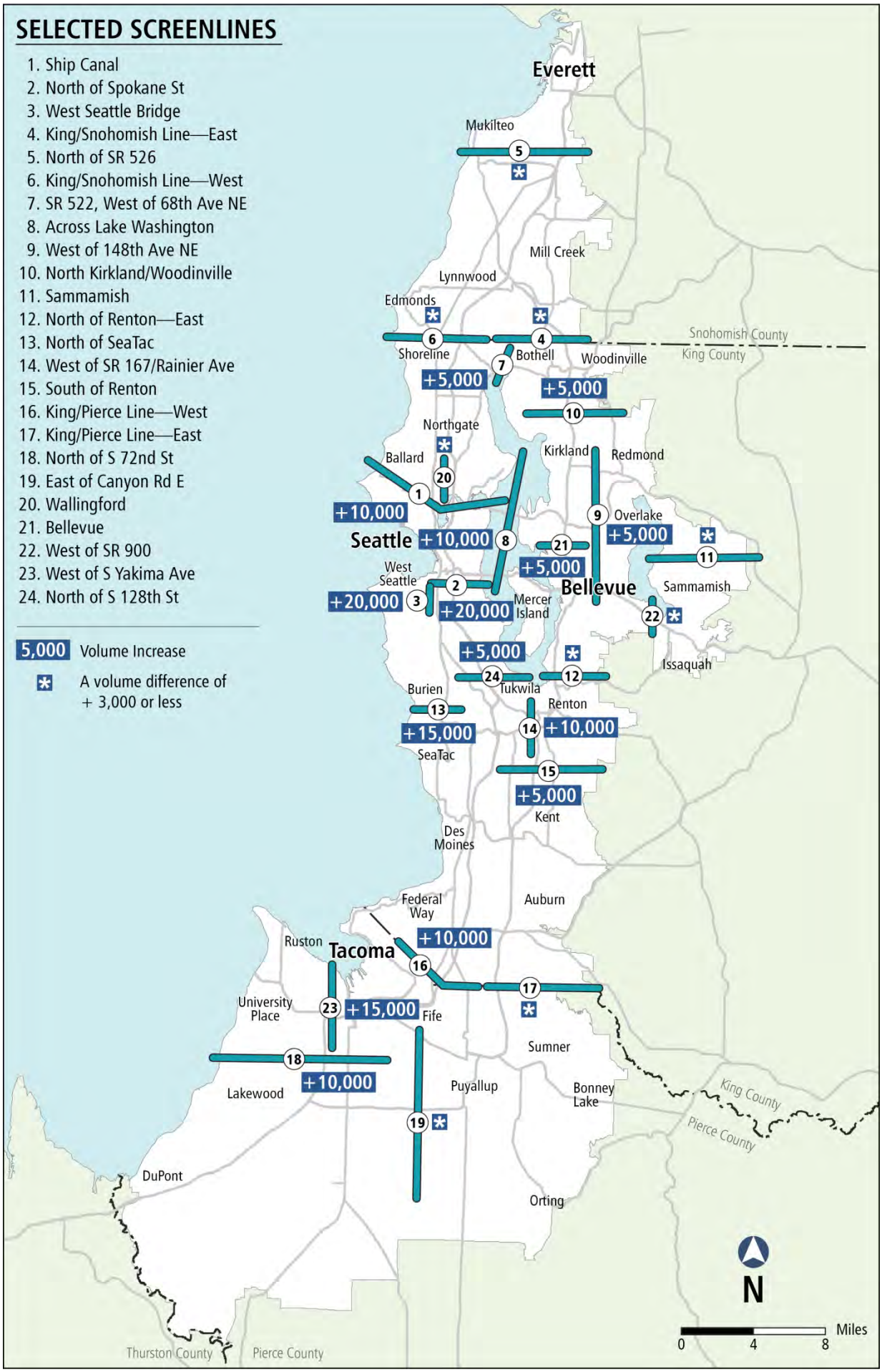


Figure 4-6. Daily transit ridership changes at selected screenlines—Potential Plan Modifications Alternative vs. Current Plan Alternative

Table 4-4. Difference in daily screenline transit rider volumes—ST2 and Current Plan Alternative, 2040

Screenline number	Screenline	Direction of travel	ST2	Current Plan Alternative relative to ST2	
				Change[1]	Percent change[2]
1	Ship Canal	North/South	172,000 to 190,000	+ 10,000	5%
2	North of Spokane Street	North/South	162,000 to 179,000	*	*
3	West Seattle Bridge	East/West	24,000 to 26,000	*	*
4	King/Snohomish Line: East	North/South	4,000	+ 5,000	125%
5	North of SR 526	North/South	23,000 to 25,000	+ 5,000	25%
6	King/Snohomish Line: West	North/South	65,000 to 72,000	+ 10,000	15%
7	SR 522, West of 68th Ave NE	North/South	5,000	*	*
8	Across Lake Washington	East/West	52,000 to 58,000	*	*
9	West of 148th Ave NE	East/West	38,000 to 42,000	*	*
10	North of Kirkland/Woodinville	North/South	6,000 to 7,000	+ 5,000	55%
11	Sammamish	North/South	< 1,000	*	*
12	North of Renton: East	North/South	6,000 to 7,000	+ 5,000	115%
13	North of SeaTac	North/South	5, 000 to 6,000	*	*
14	West of SR 167/Rainier Avenue	East/West	12,000 to 13,000	+ 10,000	80%
15	South of Renton	North/South	39,000 to 43,000	*	*
16	King/Pierce Line: West	North/South	25,000 to 27,000	+ 15,000	55%
17	King/Pierce Line: East	North/South	28,000 to 31,000	*	*
18	North of S. 72nd Street	North/South	18,000 to 20,000	*	*
19	East of Canyon Road E	East/West	18,000 to 20,000	*	*
20	Wallingford	East/West	11,000 to 12,000	+15,000	135%
21	Bellevue	North/South	12,000 to 13,000	*	*
22	West of SR 900	North/South	7,000 to 8,000	*	*
23	West of S. Yakima Avenue	North/South	25,000 to 28,000	+5,000	20%
24	North of S. 128th Street	East/West	102,000 to 113,000	+10,000	10%

[1] Calculated absolute change using midpoints of ranges then rounded to the nearest 5,000

[2] Calculated percent change using absolute change prior to rounding; then rounded the percent change rounded to the nearest 5%

* Less than 3,000 daily transit riders

Table 4-5. Estimated daily ridership at screenlines and key contributing elements—Current Plan Alternative to ST2

Screenline	Added transit volumes	Related corridors in the Current Plan Alternative (Figure 2-1)	Key factors affecting relative changes in transit volumes
16 King/Pierce Line West	15,000	A Light rail between Tacoma and Federal Way M BRT between Federal Way and DuPont on I-5	Faster transit travel times to Tacoma from locations primarily in King County Availability of service with via light rail vs. commuter rail
20 Wallingford	15,000	G Light rail between Ballard and the University of Washington (UW)	Faster transit travel times between Ballard and UW High-density travel corridors; serves UW Connecting with U-Link
1 Ship Canal	10,000	F Light rail between downtown Seattle and Ballard H Light rail between Lynnwood and Everett R BRT between Seattle and Everett along SR 99	Faster transit travel times to Seattle from Everett, Paine Field, and Ballard High-density travel corridors
6 King/Snohomish Line West	10,000	H Light rail between Lynnwood and Everett R BRT between Seattle and Everett along SR 99	Faster transit travel times between Seattle and Everett Expanded availability of service with light rail vs. commuter rail
14 West of SR 167/ Rainier Avenue	10,000	B Light rail between Burien and Renton	Faster transit travel times between Burien and the east side of Lake Washington High-density travel corridors; serves Southcenter (Tukwila Center) Connecting with light rail at Tukwila International Boulevard
24 North of S 128th Street	10,000	A Light rail between Tacoma and Federal Way B Light rail between Burien and Renton M BRT between Federal Way and DuPont on I-5	Faster transit travel times between Seattle and Tacoma
4 King/Snohomish Line East	5,000	D Light rail between Renton and Lynnwood along I-405 Q BRT between Renton and Lynnwood along I-405	Multiple light rail, BRT and regional express bus elements serving one screenline Faster transit travel times from Lynnwood to Bellevue and Kirkland to Everett
5 North of SR 526	5,000	H Light rail between Lynnwood and Everett R BRT between Seattle and Everett along SR 99 S BRT between Lynnwood and Everett along I-5 Y Regional express bus between North Bothell, Mill Creek and Mukilteo	Faster transit travel times to downtown Everett from Lynnwood, Seattle, Bellevue, Renton, and Kent Expanded availability of service with light rail vs. commuter rail Light rail, BRT and regional express bus elements serving one screenline

Table 4-5. Estimated daily ridership at screenlines and key contributing elements—Current Plan Alternative to ST2 (continued)

Screenline	Added transit volumes	Related corridors in the Current Plan Alternative (Figure 2-1)	Key factors affecting relative changes in transit volumes
10 North Kirkland/Woodinville	5,000	D Light rail between Renton and Lynnwood along I-405 E Light rail between Renton and Woodinville along Eastside Rail Corridor J Rail extension (assumed commuter rail) between Renton and Woodinville along Eastside Rail Corridor P BRT between Renton and Woodinville along Eastside Rail Corridor Q BRT between Renton and Lynnwood along I-405	Multiple light rail, commuter rail and BRT elements serving one screenline Faster transit travel times from Lynnwood to Bellevue and Kirkland to Everett
12 North of Renton: East	5,000	D Light rail between Renton and Lynnwood along I-405 E Light rail between Renton and Woodinville along Eastside Rail Corridor J Rail extension (assumed commuter rail) between Renton and Woodinville along Eastside Rail Corridor P BRT between Renton and Woodinville along Eastside Rail Corridor Q BRT between Renton and Lynnwood along I-405	Multiple light rail, commuter rail and BRT elements serving one screenline Faster transit travel time from Renton to Everett
23 West of S Yakima Avenue	5,000	I Rail extension (assumed commuter rail) between DuPont and Lakewood M BRT between Federal Way and DuPont on I-5	Multiple rail and BRT elements serving one screenline
2 North of Spokane Street	Low additional demand	A Light rail between Tacoma and Federal Way	Did not increase ridership notably beyond transit service already provided
3 West Seattle Bridge	Low additional demand	None	No additional transit service provided across this screenline
7 SR 522, West of 68th Ave NE	Low additional demand	L HCT between Northgate and Bothell	No major transit service improvement as compared to ST2
8 Across Lake Washington	Low additional demand	C Light rail between Bellevue and Issaquah along I-90 K HCT between UW and Redmond via SR 520	Did not increase ridership beyond service already provided; for example express bus service in ST2 between the UW and Redmond and light rail along the I-90 corridor
9 West of 148th Avenue NE	Low additional demand	C Light rail between Bellevue and Issaquah along I-90 K HCT between UW and Redmond via SR 520 O BRT between Bellevue and Issaquah along I-90 X Regional express bus between Redmond and Kirkland	Does not increase ridership notably beyond service already provided along Bellevue-Issaquah corridor, which is served by express bus service provided in ST2 HCT between the UW and Redmond does not increase ridership notably beyond existing express bus service
11 Sammamish	Low additional demand	None	No major transit service improvement as compared to ST2
13 North of SeaTac	Low additional demand	W Regional express bus between SeaTac and West Seattle	No major transit service improvement as compared to ST2
15 South of Renton	Low additional demand	N BRT between Renton and Puyallup along SR 167	Low-density development along corridor. Currently served by Sounder commuter rail

Table 4-5. Estimated daily ridership at screenlines and key contributing elements—Current Plan Alternative to ST2 (continued)

Screenline	Added transit volumes	Related corridors in the Current Plan Alternative (Figure 2-1)	Key factors affecting relative changes in transit volumes
17 King/Pierce Line East	Low additional demand	N BRT between Renton and Puyallup along SR 167	Low-density development along corridor. Currently served by Sounder commuter rail
18 North of S 72nd Street	Low additional demand	I Rail extension (assumed commuter rail) between DuPont and Lakewood M BRT between Federal Way and DuPont on I-5	No major transit service improvement as compared to ST2
19 East of Canyon Road E	Low additional demand	T Regional express bus between Puyallup and DuPont via Cross Base Highway U Regional express bus between Puyallup and Lakewood V Regional express bus between Puyallup and Tacoma	Relatively minor changes in transit service provided across this screenline
21 Bellevue	Low additional demand	D Light rail between Renton and Lynnwood along I-405 E Light rail between Renton and Woodinville along Eastside Rail Corridor J Rail extension (assumed commuter rail) between Renton and Woodinville along Eastside Rail Corridor P BRT between Renton and Woodinville along Eastside Rail Corridor Q BRT between Renton and Lynnwood along I-405	No major transit service improvement as compared to ST2
22 West of SR 900	Low additional demand	C Light rail between Bellevue and Issaquah along I-90 O BRT between Bellevue and Issaquah along I-90	Does not increase ridership notably along Bellevue-Issaquah corridor, which is served by express bus service provided in ST2 Light rail from Issaquah Highlands would operate along the Eastside Rail Corridor and would directly serve downtown Bellevue

Listed by greatest increase to lowest increase.

Further analysis of the results is described below by thresholds of relative increases in daily transit ridership of the Current Plan Alternative compared to ST2.

- 15,000 or more daily riders
- Greater than 10,000 daily riders
- Greater than 5,000 daily riders
- Less than 3,000 daily riders

Screenlines with increases of 15,000 or more daily riders

The greatest transit ridership increases (approximately 15,000) would occur at:

- **King/Pierce Line West (screenline 16)—**The increases in ridership associated with the Current Plan Alternative would result from light rail from Federal Way to downtown Tacoma (corridor A) and BRT on I-5 between DuPont and Federal Way (corridor M).
- **Wallingford (screenline 20)—**The increases in ridership associated with the Current Plan Alternative would result from light rail between Ballard and the University District (corridor G).

Screenlines with increases greater than 10,000 daily riders

Increases in daily screenline volumes of approximately 10,000 transit trips associated with the Current Plan Alternative would occur at the following locations:

- **Ship Canal (screenline 1)—**The increase in transit rider volumes at this screenline is primarily associated with a new direct light rail connection between downtown Seattle and Ballard (corridor F) and a light rail connection between Lynnwood and Everett (corridor H). Also, to a smaller degree, the added transit ridership would be affected by BRT between Seattle and Everett on SR 99 (corridor R).
- **King/Snohomish Line West (screenline 6)—**The increase in rider volumes at this screenline is primarily associated with light rail extension between Lynnwood and Everett (corridor H) and BRT on SR 99 between Seattle and Everett (corridor R).
- **West of SR 167/Rainier Avenue (screenline 14)—**The increase in rider volumes at this screenline is associated with light rail between Burien and Renton (corridor B). Added ridership at screenline 14 would also be influenced by highly developed mixed land uses as well as connection to other HCT services.
- **North of S 128th Street (screenline 24)—**The increase in rider volumes at this screenline is associated with light rail from Federal Way to downtown Tacoma (corridor A) and light rail between Burien and Renton (corridor B) due to its effect on the rail network at this screenline. Ridership increases would also be attributable to BRT on I-5 between Federal Way and DuPont (corridor M).

Screenlines with increases greater than 5,000 daily riders

Increases in daily screenline volumes of approximately 5,000 transit trips associated with the Current Plan Alternative would occur at the following locations:

- **King/Snohomish Line East (screenline 4)—**The increase in ridership associated with the Current Plan Alternative would result from light rail between Renton and Lynnwood (corridor D) and BRT along I-405 between Renton and Lynnwood (corridor Q).

- **North of SR 526 (screenline 5)—**The increase in ridership associated with the Current Plan Alternative would result from several items, including light rail extension from Lynnwood to Everett (corridor H), BRT along SR 99 between Seattle and Everett (corridor R), BRT between Lynnwood and Everett along I-5 (corridor S), and regional express bus between North Bothell, Mill Creek, and Mukilteo (corridor Y).
- **North Kirkland/Woodinville (screenline 10)—**The increase in ridership associated with the Current Plan Alternative would result from several items, including light rail between Renton and Lynnwood along I-405 (corridor D), light rail between Renton and Woodinville along Eastside Rail Corridor (corridor E), rail extension (assumed commuter rail) between Renton and Woodinville along Eastside Rail Corridor (corridor J), BRT between Renton and, Woodinville along Eastside Rail Corridor (corridor P), and BRT between Renton and Lynnwood along I-405 (corridor Q).
- **North of Renton (screenline 12)—**The increase in transit ridership would be attributable to light rail between Renton and Lynnwood along I-405 (corridor D), light rail between Renton and Woodinville along Eastside Rail Corridor (corridor E), rail extension (commuter rail) between Renton and Woodinville along Eastside Rail Corridor (corridor J), BRT between Renton and, Woodinville along Eastside Rail Corridor (corridor P), and BRT on I-405 between Renton and Lynnwood (corridor Q).
- **West of S Yakima Avenue (screenline 23)—**The increase in transit ridership would be attributable to a rail extension (assumed commuter rail) between DuPont and Lakewood (corridor I) and BRT between Federal Way and DuPont (corridor M).

Screenlines with increases less than 3,000 daily riders

For several screenlines, there would be a relatively small number of additional transit riders between the Current Plan Alternative and ST2. The number of additional transit trips at these locations would be at a level that would likely fall within a statistical margin of error for the ridership forecast model. Locations with small numbers of ridership increases are:

- **North of Spokane Street (screenline 2)—**The relatively slight increase in ridership associated with the Current Plan Alternative would result from light rail extending from Tacoma to Federal Way (corridor A).
- **West Seattle Bridge (screenline 3)—**No major HCT services would affect this corridor under the Current Plan Alternative.
- **SR 522, West of 68th Ave NE (screenline 7)—**Under the Current Plan Alternative, HCT between Northgate and Bothell (corridor L) would replace regional express bus service.
- **Across Lake Washington (screenline 8)—**Ridership at this screenline would be affected by the light rail extension between Bellevue and Issaquah along I-90 (corridor C) and HCT between the UW and Redmond via SR 520 (corridor K). However, ridership would not increase significantly beyond service already provided along the Bellevue-Issaquah corridor, for example, express bus service provided in ST2 between the UW and Redmond and light rail along the I-90 corridor.
- **West of 148th Avenue NE (screenline 9)—**Several corridors would contribute to ridership across this screenline such as the light rail extension between Bellevue and Issaquah along I-90 (corridor C) and University District to Redmond HCT (corridor K). BRT between Bellevue and Issaquah along

I-90 (corridor O) and regional express bus between Redmond and Kirkland (corridor X) also would contribute. However, these corridors would not increase ridership notably beyond service already provided along Bellevue-Issaquah corridor, which is served by express bus service provided in ST2. HCT between the UW and Redmond does not increase ridership notably beyond existing express bus service.

- **Sammamish (screenline 11)—**No major HCT services would affect this corridor under the Current Plan Alternative
- **North of SeaTac (screenline 13)—**The relatively slight increase in ridership associated with the Current Plan Alternative would result from regional express bus between SeaTac and West Seattle (corridor W).
- **South of Renton (screenline 15)—**BRT between Renton and Puyallup along SR 167 (corridor N) replaces several regional express routes.
- **King/Pierce Line East (screenline 17)—**BRT between Renton and Puyallup along SR 167 (corridor N) replaces server regional express routes. Also, the low-density land use in this market would affect potential transit demand growth.
- **North of S 72nd Street (screenline 18)—**The slight increase in transit ridership would be attributable to a rail extension (assumed commuter rail) between DuPont and Lakewood (corridor I) and BRT between Federal Way and DuPont (corridor M). Federal Way to DuPont BRT (corridor M) would replace several regional express routes. Also, the low-density land use in this market would affect potential transit demand growth.
- **East of Canyon Road E (screenline 19)—**The minor increase in transit ridership would be attributable to regional express bus between Puyallup and DuPont via Cross Base Highway (corridor T), regional express bus between Puyallup and Lakewood (corridor U), and regional express bus between Puyallup and Tacoma (corridor V). The effect of operating BRT and regional express bus across this screenline generates relatively low travel increases due to the limited market potential and the nature of travel patterns in the area.
- **Bellevue (screenline 21)—**Several HCT corridors (D, E, J, P, and Q) would replace regional express service. The added service would not result in major increases in transit ridership at screenline 21.
- **West of SR 900 (screenline 22)—**Bellevue to Issaquah light rail along I-90 (corridor C) and BRT between Bellevue and Issaquah along I 90 (corridor O) would not increase ridership notably beyond the express bus service provided in ST2.

Corridor effects on transit ridership changes

The estimated changes in Year 2040 daily transit ridership at selected screenlines would be attributable to corridors included in the Current Plan Alternative. The following sections summarize the relative effectiveness of notable individual corridors (shown in Figure 2-1) in influencing transit ridership changes. The effectiveness of any corridor would be particularly high if it has one or more of the following characteristics: (1) it is resulting in a relatively high increase in daily transit ridership (5,000 or greater) at one or more screenlines, (2) it results in transit ridership increases at more than one screenline,

or (3) if it is the only corridor affecting transit ridership at a screenline. At most screenlines, multiple corridors are affecting transit ridership changes.

- **Corridor A—Light rail between Tacoma and Federal Way:** Corridor A would contribute to a major increase in daily transit ridership (15,000) at the King/Pierce Line West (screenline 16). Corridor A also would increase ridership (10,000) at North of S 128th Street (screenline 24).
- **Corridor B—Light rail between Burien and Renton:** Corridor B would result in the relatively large increase in daily transit ridership (10,000) at West of SR 167/Rainier Avenue (screenline 14) and at North of S. 128th Street (screenline 24).
- **Corridor D—Light rail from Renton to Lynnwood along I-405:** Corridor D would contribute to transit ridership increases (5,000) at King/Snohomish Line East (screenline 4), North Kirkland/Woodinville (screenline 10), and North of Renton (screenline 12).
- **Corridor E—Light rail between Renton and Woodinville along Eastside Rail Corridor:** Corridor E would contribute to transit ridership increases (5,000) at North Kirkland/Woodinville (screenline 10) and North of Renton (screenline 12).
- **Corridor F—Light rail between downtown Seattle and Ballard:** Corridor F would contribute to substantial increases of approximately 10,000 riders crossing the Ship Canal (screenline 1).
- **Corridor G—Light rail extension between Ballard and UW:** Corridor G would result in a substantial increase of approximately 15,000 riders across the Wallingford screenline (screenline 20).
- **Corridor H—Light rail transit extension from Lynnwood to Everett:** Corridor H would contribute to relatively large increases in transit ridership (10,000) at the Ship Canal (screenline 1) and at the King/Snohomish Line West (screenline 6). In addition, corridor H would contribute to transit ridership increases (5,000) at North of SR 526 south of Everett (screenline 5).
- **Corridor I—Potential rail extension (assumed commuter rail) between DuPont and Lakewood:** Corridor I would contribute to transit ridership increases (5,000) at West of S Yakima Avenue (screenline 23)
- **Corridor M—BRT between Federal Way and DuPont on I-5:** Corridor M would contribute to transit ridership increases (15,000) at King/Pierce Line West (screenline 16), (10,000) at North of S 128th Street (screenline 24) and (5,000) West of S Yakima Avenue (screenline 23).

For other transit corridors in the Current Plan Alternative, several would contribute to ridership increases at a single screenline. Other corridors would be contributing to ridership increases at screenlines affected by the corridors described above.

The remaining transit corridors in the Current Plan Alternative would result in relatively low transit ridership increases (less than 3,000) at the selected screenlines and would not contribute to transit ridership increases at more than one screenline. These corridors are as follows:

- Corridor T—Regional express bus between Puyallup and DuPont via Cross Base Highway
- Corridor U—Regional express bus between Puyallup and Lakewood
- Corridor V—Regional express bus between Puyallup and Tacoma
- Corridor X—Regional express bus between Redmond and Kirkland

Ridership changes—Potential Plan Modifications Alternative compared to Current Plan Alternative

Ridership increases shown in Table 4-6 represent daily transit ridership increases resulting from the Potential Plan Modifications Alternative compared to the Current Plan Alternative.

The changes in transit ridership at screenlines are influenced by a variety of factors, including reduced transit travel times, market conditions influencing transit ridership, and the potential for multiple HCT facilities crossing a single screenline. The discussion of results is organized into four groups of relative thresholds for transit ridership increases. Table 4-7 summarizes the daily transit ridership increased growth, related corridor impacting the amount of volume growth, and some key factors affecting the change in transit volumes.

- Greater than 20,000 daily riders
- Greater than 15,000 daily riders
- Greater than 10,000 daily riders
- Greater than 5,000 daily riders
- Less than 3,000 daily riders

In addition to organizing the screenlines by volume growth, the following sections describe in more detail how the corridors included in the Potential Plan Modifications Alternative are contributing to the transit ridership changes.

Table 4-6. Difference in daily screenline transit rider volumes—2040 Current Plan Alternative and 2040 Potential Plan Modifications Alternative

Location number	Screenline	Direction of travel	2040 Current Plan Alternative	2040 Potential Plan Modifications Alternative relative to 2040 Current Plan Alternative	
				Change[1]	Percent change[2]
1	Ship Canal	North/South	172,000–228,000	+ 10,000	5%
2	North of Spokane Street	North/South	162,000–207,000	+ 20,000	10%
3	West Seattle Bridge	East/West	24,000–29,000	+ 20,000	85%
4	King/Snohomish Line: East	North/South	7,000–10,000	*	*
5	North of SR 526	North/South	24,000–36,000	*	*
6	King/Snohomish Line: West	North/South	65,000–92,000	*	*
7	SR 522, West of 68th Ave NE	North/South	5,000	+ 5,000	100%
8	Across Lake Washington	East/West	52,000–62,000	+ 10,000	20%
9	West of 148th Ave NE	East/West	38,000–51,000	+ 5,000	5%
10	North Kirkland/Woodinville	North/South	8,000–13,000	+ 5,000	40%
11	Sammamish	North/South	< 1,000	*	*
12	North of Renton: East	North/South	11,000–16,000	*	*
13	North of SeaTac	North/South	6,000–10,000	+ 15,000	160%
14	West of SR 167/Rainier Avenue	East/West	18,000–27,000	+ 10,000	40%
15	South of Renton	North/South	39,000–49,000	+ 5,000	15%
16	King/Pierce Line: West	North/South	32,000–47,000	+ 10,000	20%
17	King/Pierce Line: East	North/South	28,000–34,000	*	*
18	North of S 72nd Street	North/South	18,000–24,000	+ 10,000	50%
19	East of Canyon Road E	East/West	18,000–26,000	*	*
20	Wallingford	East/West	21,000–32,000	*	*
21	Bellevue	North/South	12,000–18,000	+ 5,000	25%
22	West of SR 900	North/South	7,000–8,000	*	*
23	West of S Yakima Avenue	North/South	26,000–39,000	+ 15,000	40%
24	North of S 128th Street	East/West	102,000–140,000	+ 5,000	5%

[1] Calculated absolute change using midpoints of ranges then rounded to the nearest 5,000

[2] Calculated percent change using absolute change prior to rounding; then rounded the percent change to the nearest 5%

* Change is less than 3,000 daily transit riders

Table 4-7. Estimated added screenline transit volumes and key contributing elements of the Potential Plan Modifications Alternative ordered by largest increase in transit volume

Screenline		Added transit volumes	Related corridors in the Potential Plan Modifications Alternative (Chapter 2, Figures 2-9 and 2-10)		Key factors affecting relative changes in transit volumes
2	North of Spokane Street	20,000	2 9 23 36	Light rail between downtown Seattle, West Seattle, and Burien, potentially including a new tunnel under downtown Seattle Light rail from Tukwila to SODO via Duwamish industrial area HCT between Tukwila Sounder station and downtown Seattle via Sea-Tac Airport, Burien, and West Seattle Regional express bus between Renton and downtown Seattle	Lower transit travel times More connections with three light rail/HCT elements serving one screenline High-density travel corridors
3	West Seattle Bridge	20,000	2 23	Light rail between downtown Seattle, West Seattle, and Burien, potentially including a new tunnel under downtown Seattle HCT between Tukwila Sounder station and downtown Seattle via Sea-Tac Airport, Burien, and West Seattle	Lower transit travel times More connections with two light rail/HCT elements at one screenline High-density corridors
13	North of SeaTac	15,000	2 7 23	Light rail between downtown Seattle, West Seattle, and Burien, potentially including a new tunnel under downtown Seattle Light rail between Puyallup/Sumner and Renton via SR 167 HCT between Tukwila Sounder station and downtown Seattle via Sea-Tac Airport, Burien, and West Seattle	Lower transit travel times More connections with three light rail/HCT elements at one screenline High-density corridors
23	West of S Yakima Avenue	15,000	6 15 16	Light rail between DuPont and downtown Tacoma via Lakewood and Tacoma Mall Light rail between Downtown Tacoma and Tacoma Community College Light rail between Tacoma Mall and University Place	Lower transit travel times in a congested corridor More connections with three light rail/HCT elements at one screenline
1	Ship Canal	10,000	1 11 24	Light rail from downtown Seattle to Magnolia/Ballard to Shoreline Community College Light rail between Ballard and Bothell via Northgate HCT between downtown Seattle and Edmonds via Ballard and Shoreline Community College	Lower travel times More connections with two light rail/HCT elements at one screenline High-density corridors
8	Across Lake Washington	10,000	14 41	Light rail from UW to Sand Point to Kirkland to Redmond Regional express bus between North Kirkland and downtown Seattle via SR 520	Lower travel times More connections with one light rail line and one regional express route at one screenline High-density corridors
14	West of SR 167/ Rainier Avenue	10,000	2 7 23 29 33	Light rail between downtown Seattle, West Seattle, and Burien, potentially including a new tunnel under downtown Seattle Light rail between Puyallup/Sumner and Renton via SR 167 HCT between Tukwila Sounder station and downtown Seattle via Sea-Tac Airport, Burien, and West Seattle BRT between Kent and Sea-Tac Airport Regional express bus/BRT between Puyallup and downtown Seattle via Kent and Rainier Valley	Lower transit travel times High-density travel corridor

Table 4-7. Estimated added screenline transit volumes and key contributing elements of the Potential Plan Modifications Alternative ordered by largest increase in transit volume (continued)

Screenline	Added transit volumes	Related corridors in the Potential Plan Modifications Alternative (Chapter 2, Figures 2-9 and 2-10)	Key factors affecting relative changes in transit volumes
16 King/Pierce Line West	10,000	6 Light rail between DuPont and downtown Tacoma via Lakewood and Tacoma Mall 15 Light rail between Downtown Tacoma and Tacoma Community College 32 Regional express bus/BRT between Tacoma and Bellevue	Shifts in demand from Sounder to light rail operating in Pierce County. The spine has more connections and more frequent service. Added regional express bus/BRT would provide better connections
18 North of S 72nd Street	10,000	5 Light rail from Lakewood to Spanaway to Frederickson to South Hill to Puyallup 6 Light rail between DuPont and downtown Tacoma via Lakewood and Tacoma Mall 21 Rail extension (assumed commuter rail) between Tacoma and Frederickson 22 HCT between downtown Tacoma and Parkland	Lower travel times More connections with two light rail/HCT elements at one screenline
7 SR 522, West of 68th Ave NE	5,000	10 Light rail from North Kirkland or UW Bothell to Northgate via SR 522 11 Light rail between Ballard and Bothell via Northgate 40 Regional express bus on 145th Street from I-5 to SR 522	Lower travel times More connections with two light rail/HCT elements at one screenline High-density corridors
9 West of 148th Avenue NE	5,000	14 Light rail from UW to Sand Point to Kirkland to Redmond 37 Regional express bus between UW Bothell and Sammamish via Redmond	Lower travel times More connections with one light rail and one regional express HCT element at one screenline High-density corridors
10 North Kirkland/Woodinville	5,000	10 Light rail from North Kirkland or UW Bothell to Northgate via SR 522 12 Light rail between Mill Creek and Bothell, connecting to Eastside Rail Corridor 37 Regional express bus between UW Bothell and Sammamish via Redmond 41 Regional express bus between North Kirkland and downtown Seattle via SR 520 42 Regional express bus between Woodinville and Bellevue	More connections with two light rail/HCT elements at one screenline Lower travel times
15 South of Renton	5,000	7 Light rail between Puyallup/Sumner and Renton via SR 167 29 BRT between Kent and Sea-Tac Airport 33 Regional express bus/BRT between Puyallup and downtown Seattle via Kent and Rainier Valley	Lower transit travel times Expanded availability of service with light rail vs. commuter rail
21 Bellevue	5,000	12 Light rail between Mill Creek and Bothell, connecting to Eastside Rail Corridor 14 Light rail from UW to Sand Point to Kirkland to Redmond	Effect on network of light rail from UW to Redmond Riders would have multiple locations to transfer between lines operating across Lake Washington and within the Eastside

Table 4-7. Estimated added screenline transit volumes and key contributing elements of the Potential Plan Modifications Alternative ordered by largest increase in transit volume (continued)

Screenline	Added transit volumes	Related corridors in the Potential Plan Modifications Alternative (Chapter 2, Figures 2-9 and 2-10)	Key factors affecting relative changes in transit volumes
24 North of S 128th Street	5,000	7 Light rail between Puyallup/Sumner and Renton via SR 167 36 Regional express bus between Renton and downtown Seattle	Lower travel times along corridor
4 King/Snohomish Line East	Low additional demand	12 Light rail between Mill Creek and Bothell, connecting to Eastside Rail Corridor 43 Regional express bus between Woodinville and Everett	Lower transit travel times
5 North of SR 526	Low additional demand	3 Light rail from Ballard to Everett Station via Aurora Village, Lynnwood 4 Light rail between Everett and North Everett 13 Light rail between Lynnwood and Everett serving Southwest Everett Industrial Area (Paine Field, Boeing) 43 Regional express bus between Woodinville and Everett	New light rail on SR 99 would not increase ridership notably beyond the rail service between downtown Seattle and Everett in the Current Plan Alternative Light rail service via Paine Field (corridor 15) substituted for the Lynnwood to Everett light rail service in the Current Plan Alternative would slow transit travel times for some O/D pairs
6 King/Snohomish Line West	Low additional demand	3 Light rail from Ballard to Everett Station via Aurora Village, Lynnwood 13 Light rail between Lynnwood and Everett serving Southwest Everett Industrial Area (Paine Field, Boeing) 24 HCT between downtown Seattle and Edmonds via Ballard and Shoreline Community College	New light rail would not increase ridership notably beyond the rail service between downtown Seattle and Everett in the Current Plan Alternative. Without substantial improvement in transit service, there would not be major increases in transit ridership Light rail service via Paine Field (corridor 15) substituted for the Lynnwood to Everett light rail service in the Current Plan Alternative would slow transit travel times for some O/D pairs
11 Sammamish	Low additional demand	31 Regional express bus/BRT between Issaquah Highlands and Overlake via Sammamish and Redmond	Low-density development along corridor
12 North of Renton: East	Low additional demand	32 Regional express bus/BRT between Tacoma and Bellevue 39 Regional express bus between Renton (Fairwood) and Eastgate via Factoria	Does not increase ridership notably beyond rail lines in Current Plan Alternative
17 King/Pierce Line East	Low additional demand	5 Light rail from Lakewood to Spanaway to Frederickson to South Hill to Puyallup 6 Light rail between DuPont and downtown Tacoma via Lakewood and Tacoma Mall 7 Light rail between Puyallup/Sumner and Renton via SR 167 27 Regional express bus/BRT in Puyallup vicinity, notably along Meridian Avenue 32 Regional express bus/BRT between Tacoma and Bellevue	Relatively small increases in demand with these corridors beyond rail lines in Current Plan. While there will be some shift in demand from commuter rail to corridor 6, it would be offset by faster times in the SR 161 and SR 167 travel corridors

Table 4-7. Estimated added screenline transit volumes and key contributing elements of the Potential Plan Modifications Alternative ordered by largest increase in transit volume (continued)

Screenline	Added transit volumes	Related corridors in the Potential Plan Modifications Alternative (Chapter 2, Figures 2-9 and 2-10)	Key factors affecting relative changes in transit volumes
19 East of Canyon Road E	Low additional demand	5 Light rail from Lakewood to Spanaway to Frederickson to South Hill to Puyallup 44 Regional express bus connection to Joint Base Lewis-McChord	Relatively small increases in demand with these corridors
20 Wallingford	Low additional demand	11 Light rail between Ballard and Bothell via Northgate 14 Light rail from UW to Sand Point to Kirkland to Redmond	Increase in transit demand due to corridor 14 but it would be partially offset by corridor 11
22 West of SR 900	Low additional demand	18 Light rail from Issaquah to Issaquah Highlands	Relatively small increases in demand with this corridor

Screenlines with increases greater than 20,000 daily riders

The highest levels of transit ridership increases (approximately 20,000) associated with the Potential Plan Modifications Alternative would occur at the following two locations:

- **North of Spokane Street (screenline 2)—**The increase in transit rider volumes at this screenline is primarily associated with corridor 2—a new direct light rail connection between downtown Seattle, West Seattle, and Burien; corridor 9—a direct light rail line from Tukwila to the SODO area of Seattle via the Duwamish Industrial Area (only affects screenline 2); and corridor 23—an HCT line between the Tukwila Sounder station and SeaTac, Burien, West Seattle, and downtown Seattle. Corridors 2 and 23 overlap along that portion of their lines located between downtown Seattle and West Seattle. In addition, regional express bus between Renton and downtown Seattle (corridor 36) would contribute to riders at this screenline.

  Corridor 9—a direct light rail line from Tukwila to the SODO area of Seattle via the Duwamish Industrial Area—would provide a shorter rail connection between downtown Seattle and Tukwila than the existing Central Link route. However, this corridor could require a reduction in service through Rainier Valley, or an additional transfer, since the lines would join before entering the DSTT. Overall, the modeling analysis indicates that the addition of the light rail connection from Tukwila to SODO via the Duwamish Industrial Area (corridor 9) would likely have little effect on overall transit usage to and from downtown Seattle.

  Also, when modeled with the corridor 2—light rail connection between downtown Seattle, West Seattle, and Burien—corridor 9 would increase daily light rail volumes by approximately 3,000 but have no effect on total transit ridership crossing screenline 2 east of Fourth Avenue South. For Fourth Avenue South and westward (including First Avenue South, SR 99 and the light rail corridor), the daily transit volume increase is estimated at over 20,000, reflecting transit ridership increases primarily from West Seattle, White Center, and Burien.

- **West Seattle Bridge (screenline 3)—**The increase in transit rider volumes at this screenline is primarily associated with corridor 2—a new direct light rail connection between downtown Seattle, West Seattle, and Burien, and corridor 23—an HCT line between the Tukwila Sounder Station and SeaTac, Burien, West Seattle, and downtown Seattle. Corridors 2 and 23 overlap along that portion of their lines located between downtown Seattle and West Seattle.

Screenlines with increases greater than 15,000 daily riders

- **North of SeaTac (screenline 13)—**The increase in transit rider volumes at this screenline is primarily associated with light rail between downtown Seattle, West Seattle, and Burien (corridor 2), light rail line between Renton, Sumner, and Puyallup via SR 167 (corridor 7), and an HCT line from Tukwila Sounder station to Sea-Tac Airport to Burien to downtown Seattle via West Seattle (corridor 23).

- **West of S Yakima Avenue (screenline 23)—**The increase in transit rider volumes at this screenline is primarily associated with light rail between DuPont and downtown Tacoma via Lakewood and Tacoma Mall (corridor 6), downtown Tacoma to Tacoma Community College (corridor 15), and Tacoma Mall to University Place (corridor 16).

Screenlines with increases greater than 10,000 daily riders

Increases in daily ridership at screenlines of approximately 10,000 transit trips associated with the Potential Plan Modifications Alternative would occur at the following locations:

- **Ship Canal (screenline 1)—**This increase in ridership would result from light rail service from downtown Seattle to Magnolia/Ballard to Shoreline Community College (corridor 1), light rail from Ballard to Bothell via Northgate (corridor 11), and HCT between downtown Seattle and Edmonds via Ballard and Shoreline Community College (corridor 24).
- **Across Lake Washington (screenline 8)—**The increase in rider volumes at this screenline is primarily associated with an additional light rail connection from UW to Sand Point to Kirkland to Redmond (corridor 14). Regional express bus between North Kirkland and downtown Seattle via SR 520 (corridor 41) also would contribute riders at this screenline.
- **West of SR 167/Rainier Avenue (screenline 14)—**The increase in rider volumes at this screenline is primarily associated with additional potential connection between the proposed light rail between downtown Seattle, West Seattle and Burien (corridor 2), light rail between Puyallup/Sumner and Renton via SR 167 (corridor 7), HCT from Tukwila Sounder station and downtown Seattle via Sea-Tac Airport, Burien, and West Seattle (corridor 23), BRT between Kent and Sea-Tac Airport (corridor 29), regional express bus/BRT between Puyallup and downtown Seattle via Kent and Rainier Valley (corridor 33), and the potential rail extension between Renton and Burien included in the Current Plan Alternative.
- **King/Pierce Line (West) (screenline 16)—**Additional ridership would result from the light rail line from DuPont to downtown Tacoma via Lakewood, Tacoma Mall (corridor 6), downtown Tacoma to Tacoma Community College (corridor, and from regional express bus/BRT service between Tacoma and Bellevue (corridor 32).
- **North of S 72nd Street (screenline 18)—**The large light rail networks proposed as corridor 5 from Lakewood to Spanaway to Frederickson to South Hill to Puyallup) and corridor 6 between DuPont and downtown Tacoma via Lakewood and Tacoma Mall would generate ridership increases through (1) travel time savings afforded by transit and (2) more opportunities for connections. The proposed rail extension (assumed commuter rail) between Tacoma and Frederickson (corridor 21) and HCT between downtown Tacoma and Parkland (corridor 22) also would contribute riders at this screenline.

Screenlines with increases greater than 5,000 daily riders

Approximately 5,000 additional transit trips per day would occur under the Potential Plan Modifications Alternative at six screenline locations: one in North King County, three in East King County, and two in South King County, as follows:

- **SR 522, West of 68th Ave NE (screenline 7)—**The combined effect of operating proposed corridors 10 (light rail between North Kirkland or University of Washington Bothell and Northgate via SR 522), 11 (light rail between Ballard and Bothell via Northgate), and 40 (regional express bus between 145th Street from I-5 to SR 522) provides some upgrade in service and coverage that results in a modest increase in forecasted ridership when compared to the network in the Current Plan Alternative. This network includes a potential rail extension from Northgate to Bothell and North Kirkland.

- **West of 148th Avenue NE (screenline 9)—**The combined effect of operating proposed corridors 14 (light rail from UW to Sandpoint to Kirkland to Redmond) and 37 (regional express bus route connecting UW Bothell to Sammamish via Redmond) provides a modest increase in ridership.
- **North Kirkland/Woodinville (screenline 10)—**The combined effect of operating proposed corridors 10 (light rail between North Kirkland or University of Washington Bothell and Northgate via SR 522) and 12 (light rail from Mill Creek connecting to the Eastside Rail Corridor) provides a modest increase in service and coverage when compared to services on the north I-405 corridor assumed in the Current Plan Alternative. Other factors would include regional express bus between UW Bothell and Sammamish via Redmond (corridor 37), regional express bus between North Kirkland and downtown Seattle via SR 520 (corridor 41), and regional express bus between Woodinville and Bellevue (corridor 42).
- **South of Renton (screenline 15)—**The proposed light rail line between Renton, Sumner, and Puyallup via SR 167 (corridor 7) provides the primary source of new riders for this screenline. Although Sumner and Puyallup are currently served by commuter rail, light rail would provide more frequent service and additional connections. The new BRT corridor between Kent and Sea-Tac Airport (corridor 29) and regional express bus/BRT between Puyallup and downtown Seattle via Kent and Rainier Valley (corridor 33) would also be factors, but the added ridership would be low.
- **Bellevue (screenline 21)—**The ridership increase would result from effects on the transit network resulting from light rail between Mill Creek and Bothell, connecting to Eastside Rail Corridor (corridor 12) and light rail from UW to Sandpoint to Kirkland to Redmond (corridor 14). Ridership increases would also be affected by an available transfer to Bellevue via the Eastside Rail Corridor.
- **North of S 128th Street (screenline 24)—**The ridership increase would result from light rail from Puyallup/Sumner to Renton via SR 167 (corridor 7), and regional express bus from Renton to downtown Seattle (corridor 36).

Screenline with increases less than 3,000 daily riders

For several screenlines, there would be a relatively small number of additional transit riders between the Potential Plan Modifications Alternative and the Current Plan Alternative. The number of additional transit trips at these locations would be at a level that would likely fall within a statistical margin of error for the ridership forecasting model. Locations with small numbers of ridership increases are:

- **King/Snohomish Line (East) (screenline 4)—**In the Potential Plan Modifications Alternative, a new light rail connecting Mill Creek with the Eastside Rail Corridor (corridor 12) and a new regional express bus route between Woodinville and Everett (corridor 43) would result in reduced transit travel times. But these reduced travel times would not substantially affect transit ridership as compared to light rail service in the Current Plan Alternative between Renton and Lynnwood along I-405 (corridor D) and BRT between Renton and Lynnwood via I-405 (corridor Q).
- **North of SR 526 (screenline 5)—**The new light rail on SR 99 would not increase ridership notably beyond the rail service between downtown Seattle and Everett in the Current Plan Alternative. Light rail between Lynnwood and Everett (corridor 13) that serves the Southwest Everett Industrial Area (Paine Field, Boeing) represents an alternative corridor compared to the Current Plan Alternative corridor H between Lynnwood and Everett. While this line provides a new rail connection to a major employment center, it also increases travel time between Everett and Seattle by about 5 to 8 minutes.

Other factors are light rail between Ballard and Everett Station via Aurora Village, Lynnwood (corridor 3), light rail between Everett and North Everett (corridor 4) and regional express bus between Woodinville and Everett (corridor 43).

- **King/Snohomish Line (West) (screenline 6)—**The new light rail on SR 99 would not increase ridership notably beyond the rail service between downtown Seattle and Everett in the Current Plan Alternative. In addition, the alternative light rail corridor via Paine Field (corridor 13) would slow transit travel time for some higher-ridership origin-destination pairs. Light rail from Ballard to Everett Station via Shoreline Community College, Aurora Village and Lynnwood (corridor 3) is in close proximity to the planned line contained in the Current Plan Alternative. HCT between downtown Seattle and Edmonds via Ballard and Shoreline Community College (corridor 24) would not increase ridership notably beyond the existing Sounder service connecting downtown Seattle and Edmonds.

- **Sammamish (screenline 11)—**This screenline's volumes primarily reflect a single regional express route/BRT service option between Issaquah Highlands and Overlake via Sammamish and Redmond (corridor 31). In addition, the land use in these corridors is characterized by low-density development, which is not conducive to high transit ridership.

- **North of Renton (East) (screenline 12)—**The Potential Plan Modifications Alternative would not increase ridership notably beyond the rail lines in the Current Plan Alternative, such as light rail service between Tacoma and Seattle with connections to East Link. Only two corridors are counted in this screenline for the Potential Plan Modifications Alternative, the regional express bus between Renton (Fairwood) and Eastgate via Factoria (corridor 39) and regional express bus/BRT service between Tacoma and Bellevue (corridor 32). These proposed corridors do not provide enough of a difference from the services assumed in the Current Plan Alternative to generate significant ridership increases.

- **King/Pierce Line (East) (screenline 17)—**The added HCT corridors affecting this screenline would not result in major increases in daily transit ridership. Light rail from Lakewood to Spanaway to Frederickson to South Hill to Puyallup (corridor 5) and DuPont to downtown Tacoma via Lakewood and Tacoma Mall (corridor 6) would attract riders but some riders would come from commuter rail service. Other factors include light rail between Puyallup/Sumner and Renton via SR 167 (corridor 7), regional express bus/BRT in Puyallup vicinity, notably along Meridian Avenue (corridor 27), and regional express bus/BRT between Tacoma and Bellevue (corridor 32).

- **East of Canyon Road E (screenline 19)—**The effect of operating corridor 5 (light rail from Lakewood to Spanaway to Frederickson to South Hill to Puyallup) and corridor 44 (regional express bus connection to Joint Base Lewis-McChord) would generate relatively minor travel increases due to the limited market potential of the area and the nature of travel patterns in the area.

- **Wallingford (screenline 20)—**Ridership would increase due to light rail from UW to Sandpoint to Kirkland to Redmond (corridor 14). However, this plan modification would not increase ridership notably beyond the light rail between Ballard and Bothell via Northgate (corridor 11).

- **West of SR 900 (screenline 22)—**The added HCT corridors, including light rail from Issaquah to Issaquah Highlands (corridor 18), affecting this corridor would not result in major increases in daily transit ridership.

Corridor effects on transit ridership changes

As described in the previous sections, estimated changes in Year 2040 daily transit ridership at selected screenlines would be attributable to corridors included in the Potential Plan Modifications Alternative. The following sections summarize the relative effectiveness of corridors in the Potential Plan Modifications Alternative (shown in Figure 2-2 and Figure 2-3) in increasing transit ridership. As is the case with corridors included in the Current Plan Alternative, the effectiveness of any corridor would be particularly high if it has one or more of the following characteristics: (1) it is resulting in a relatively high increase in daily transit ridership (5,000 or greater) at one or more screenlines, (2) it is resulting in transit ridership increases at more than one screenline and (3) it is the only corridor affecting transit ridership at a screenline (at most screenlines, multiple corridors are affecting transit ridership changes).

- **Corridor 1—Light rail from downtown Seattle to Magnolia/Ballard to Shoreline Community College:** Corridor 1 would contribute to transit ridership increases at the Ship Canal (screenline 1), which would experience daily transit ridership increases of approximately 10,000.
- **Corridor 2—Light rail between downtown Seattle, West Seattle, and Burien:** Corridor 2 would contribute to transit ridership increases at four locations, North of Spokane Street (screenline 2), West Seattle Bridge (screenline 3), North of SeaTac (screenline 13), and West of SR 167/Rainier Avenue (screenline 14). The extent of ridership changes is relatively high—between 10,000 and 20,000 per location.
- **Corridor 5—Light rail from Lakewood to Spanaway to Frederickson to South Hill to Puyallup:** Corridor 5 would contribute to transit ridership increases at North of S 72nd Street (screenline 18), which would experience daily transit ridership increases of approximately 10,000.
- **Corridor 6—Light rail from DuPont to downtown Tacoma via Lakewood and Tacoma Mall:** Corridor 6 would result in relatively high increases in daily transit ridership—15,000 at West of S Yakima Avenue (screenline 23) and 10,000 at King/Pierce Line West (screenline 16) and North of S 72nd Street (screenline 18). As a result of corridor 6, there would be faster transit travel times to Tacoma Mall and more frequent rail service along the entire corridor as compared to the Current Plan Alternative.
- **Corridor 7—Light rail from Puyallup/Sumner to Renton via SR 167:** Corridor 7 would contribute to ridership increases North of SeaTac (screenline 13) and West of SR 167/Rainier Avenue (screenline 14). Corridor 7 also would contribute to ridership increases at two other locations: South of Renton (screenline 15) and North of S 128th Street (screenline 24).
- **Corridor 9—Light rail from Tukwila to SODO via Duwamish industrial area:** Corridor 9 would contribute to some ridership increases at North of Spokane Street (screenline 2). However, most of the daily transit ridership increases of approximately 20,000 would be attributable to corridors 2 and 23.
- **Corridor 10—Light rail from North Kirkland or UW Bothell to Northgate via SR 522:** Corridor 10 would increase ridership at SR 522 (screenline 7) and North Kirkland/Woodinville (screenline 10). Daily transit ridership increases at each screenline would be approximately 5,000.
- **Corridor 11—Light rail from Ballard to Bothell via Northgate:** Corridor 11 would contribute to transit ridership increases at two locations, Ship Canal (screenline 1) and SR 522 (screenline 7). Daily transit ridership increases at each screenline would be approximately 5,000 to 10,000.

- **Corridor 12—Light rail between Mill Creek and Bothell, connecting to Eastside Rail Corridor:** Corridor 12 would increase ridership at North of Kirkland/Woodinville (screenline 10) and Bellevue (screenline 21). Daily transit ridership increases at each screenline would be approximately 5,000.
- **Corridor 14—Light rail from UW to Sand Point to Kirkland to Redmond**: Corridor 14 would contribute to the relatively high daily transit ridership increases at Across Lake Washington (screenline 8), west of 148th Avenue NE (screenline 9) and Bellevue (screenline 21). Estimated transit ridership increases at these locations would be relatively high—10,000 at screenline 8 and 5,000 at screenlines 9 and 21 respectively.
- **Corridor 15—Light rail between downtown Tacoma and Tacoma Community College:** Corridor 15 would contribute to relatively high transit ridership increases at West of S Yakima Avenue (screenline 23), which would experience an increase of 15,000 riders. In addition, corridor 15 would contribute to ridership at the King/Pierce Line West (screenline 16), which would experience an increase of 10,000 riders.
- **Corridor 16—Light rail between Tacoma Mall and University Place:** Corridor 16, along with several other light rail corridors, would contribute to transit ridership increases at West of S Yakima Avenue (screenline 23), which would experience daily transit ridership increases of approximately 15,000.
- **Corridor 21—Potential rail extension, assumed commuter rail between Tacoma and Frederickson:** Corridor 21, along with several other rail corridors, would contribute to transit ridership increases North of S 72nd Street (screenline 18), which would experience daily transit ridership increases of approximately 10,000.
- **Corridor 22—HCT between downtown Tacoma and Parkland:** Corridor 22, along with several other rail corridors, would contribute to transit ridership increases North of S 72nd Street (screenline 18), which would experience daily transit ridership increases of approximately 10,000.
- **Corridor 23—HCT line from Tukwila Sounder Station to downtown Seattle via Sea-Tac Airport, Burien, and West Seattle:** Corridor 23 would contribute to the relatively high transit ridership increases (20,000) at North of Spokane Street (screenline 2) and West Seattle Bridge (screenline 3). Corridor 23 also would contribute to ridership increases (15,000) North of SeaTac (screenline 13) and (10,000) at West of SR 167/Rainier Avenue (screenline 14).
- **Corridor 24—HCT line from downtown Seattle to Edmonds via Ballard and Shoreline Community College:** Corridor 24 would contribute to transit ridership increases at the Ship Canal (screenline 1), which would experience daily transit ridership increases of approximately 10,000.

For other transit corridors in the Potential Plan Modifications Alternative, several would contribute to ridership increases at a single screenline. Other corridors would be contributing to ridership increases at screenlines affected by the corridors described above. Several corridors in the Potential Plan Modifications Alternative would result in relatively low transit ridership increases (less than 3,000) at the selected screenlines.

Ridership changes—Potential Plan Modifications Alternative compared to ST2

Ridership increases shown in Figure 4-7 represent net increases in the volume of daily transit ridership at screenlines that would result from the Potential Plan Modifications Alternative compared to ST2. Figure 4-7 shows the location of the screenlines and the associated changes in transit ridership at each location. The Potential Plan Modifications Alternative would include HCT corridors that are in addition to those in the Current Plan Alternative, and the Current Plan Alternative has corridors in addition to ST2. Therefore, substantial changes in daily transit ridership would occur at several screenlines.

The largest increase in daily transit ridership (approximately 25,000) would occur at North of Spokane Street (screenline 2). Other major increases in transit ridership (approximately 20,000) would occur at the Ship Canal (screenline 1), the West Seattle Bridge (screenline 3), west of SR 167/Rainier Avenue (screenline 14), King/Pierce Line-West (screenline 16), and west of S Yakima Avenue (screenline 23). Ridership would increase by over 15,000 north of SeaTac (screenline 13), Wallingford (screenline 20), and north of S 128th Street (screenline 24).

Ridership would increase by approximately 10,000 north of Kirkland/Woodinville (screenline 10), north of Renton (screenline 12), and north of 72nd Street E (screenline 18). All but five of the remaining screenlines would experience increases of more than 5,000 riders.

4.1.3 Access to transit

The travel forecasting carried out for the Final SEIS identified variations in auto access in 2040 between ST2, the Current Plan Alternative, and the Potential Plan Modifications Alternative. Other access modes would include a combination of walking or biking to reach regional transit service, or using local bus service to access to the regional transit services.

As indicated in Table 4-8, there would be little to no change in the extent of auto access between the three scenarios. This would be attributable to large networks under each alternative of existing park-and-ride facilities and lack of available local bus/walk access.

Further information on access mode cannot be determined under the plan-level impact analysis addressed in the Final SEIS. For example, because locations of rail stations have not yet been determined, access mode by local transit cannot be determined.

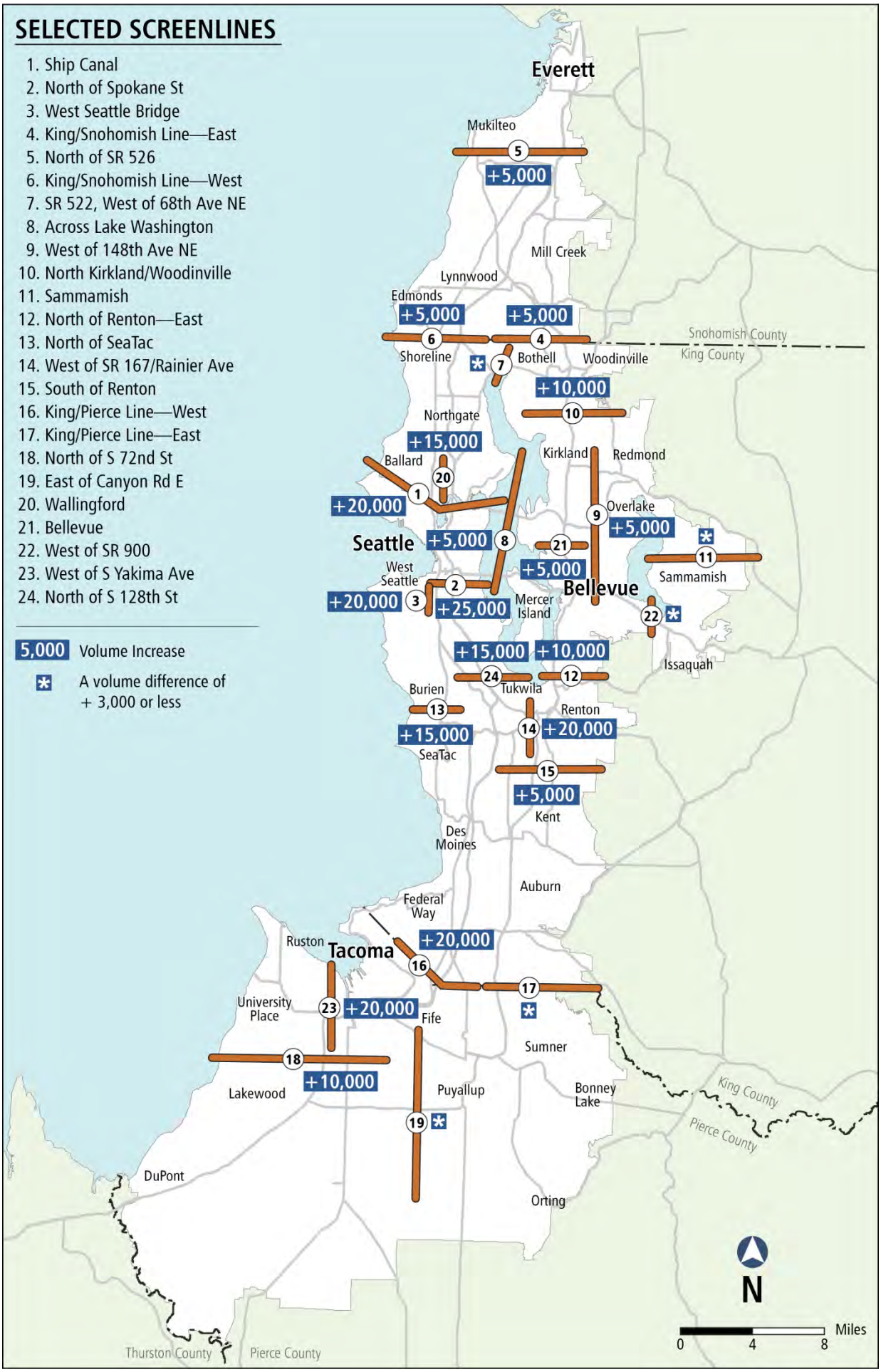


Figure 4-7. Daily transit ridership changes at selected screenlines—Potential Plan Modifications Alternative vs. ST2

Table 4-8. Peak auto access share estimates for transit trips, 2040

Subarea	ST2	Current Plan Alternative	Potential Plan Modifications Alternative
Snohomish County	30%	31%	29%
North King County	5%	5%	4%
East King County	32%	33%	32%
South King County	29%	30%	29%
Pierce County	28%	27%	26%
Systemwide	19%	19%	18%

Source: Sound Transit Ridership Forecasting Model

4.2 Regional transportation system

While the previous section described effects relating to transit ridership, the following section presents information on how implementation of the Current Plan and Potential Plan Modifications Alternatives would impact physical components of the multi-modal regional transportation system.

This assessment of potential impacts is a high level overview of what could occur. No specific alignments have been selected for any transit mode, and there is no determination as to corridor profile (whether any particular element would be underground, at grade, or elevated).

4.2.1 Light rail operations and facilities

Operating conditions of the Potential Plan Modifications Alternative are similar to the Current Plan Alternative but with greater coverage of service throughout the region. In each alternative, the average speed for light rail service would be 30 to 35 mph, with a top speed of 55 mph. For Tacoma Link, the current maximum allowed operating speed is 25 mph, with an average speed of 11 mph.

Expansion of light rail service would impact the capacity of Sound Transit operations and maintenance facilities. The extent of potential service expansion and the associated expansion of the fleet would likely require operations and maintenance facility capacity expansion.

4.2.2 Commuter rail operations and facilities

The Sound Transit commuter rail system would operate every 20 to 30 minutes during peak commute periods (and potentially up to a similar frequency during non-commute periods), with an average speed of 35 to 40 mph and a top speed of 79 mph. On the Eastside Rail Corridor, speeds would be slower than the average speed due to curves. In addition, extensions of commuter rail lines with the Potential Plan Modifications Alternative, as well as resulting additional ridership and service, could require negotiations for easements with freight railroads that own and use the tracks.

Expansion of commuter rail service would increase operations and maintenance activities. This additional demand for operations and maintenance support could be obtained through modifications to agreements with Sound Transit's current service providers or through the development of new operations and maintenance facilities.

4.2.3 Regional express bus/bus rapid transit operations and facilities

The Current Plan Alternative and the Potential Plan Modifications Alternative would add BRT and regional express bus routes throughout the Sound Transit service area. The average speed for regional express bus service on arterials would be approximately 15 to 25 mph. For buses operating on freeways, the modeling assumptions are consistent with *Transportation 2040*, which includes tolling of all lanes on limited-access facilities and operation of limited-access facilities as managed lanes. For modeling purposes bus operations on

bus/BAT lanes would be 60 to 70 percent of posted speeds and, for bus operations on freeways, buses would operate 20 percent slower than general-purpose traffic. This variation reflects potential operating conditions faced by bus operators that would result in slower speeds as compared to speeds by general-purpose.

Expansion of regional express bus service would impact the capacity of operations and maintenance facilities. The extent of potential service expansion and the associated expansion of the fleet would likely require some level of operations and maintenance base capacity expansion.

4.2.4 Streetcar operations and facilities

Streetcars usually operate in mixed traffic and at-grade on surface streets. The travel speed of streetcars, as with buses in general-purpose lanes, would be affected by the number of stops as well as roadway operations if they are in mixed traffic. The existing South Lake Union Streetcar has a maximum operating speed of 35 miles per hour, while the average operating speed is 5.3 miles per hour (FTA 2012). However, the streetcar's level platform and multiple doors offer more efficient boarding and alighting than standard buses with steps.

Expansion of streetcar service would impact the capacity of streetcar operations and maintenance facilities. The extent of potential service expansion and the associated expansion of the fleet would require some level of streetcar operations and maintenance base capacity expansion.

4.2.5 Local bus service

New BRT and regional express bus service included in the Potential Plan Modifications Alternative would result in more restructuring of express bus service provided by local transit agencies than would the Current Plan Alternative. Regional express bus/BRT could replace some transit services provided by local transit agencies, freeing service hours for the local transit provider to use elsewhere. Service would be restructured bus services. The replacement of express routes with regional express/BRT could also have a net effect of reduced transit ridership levels by the local transit system. However, if transit ridership is reduced, transit agencies may adjust service levels and focus on other travel markets.

Demand could increase for local bus service to connect to new light rail and commuter rail stations and regional express bus/BRT services. Potential modifications to specific bus routes would be identified and coordinated with local transit agencies upon implementation of the Current Plan Alternative or the Potential Plan Modifications Alternative.

New light rail service with the Current Plan Alternative and Potential Plan Modifications Alternative could result in new bus transit centers, which would be major transit hubs at new light rail and other HCT stations. Also, with the Long-Range Plan alternatives, there could be the need for new or expanded bus transit centers and park-and-ride facilities at existing light rail and other HCT stations. The need for these transit centers would result from transit ridership at the stations that would potentially require access by local bus service. New bus transit centers and bus stops would be developed with enhancements to pedestrian and bicycle access, which would result in a net benefit to pedestrian and bicycle mobility.

Expansion of local bus service would impact capacity of operations and maintenance facilities. The extent of potential service expansion and the associated expansion of the fleet would likely require some level of operations and maintenance base capacity expansion.

4.3 Highway and roadway operations

The Current Plan Alternative and the Potential Plan Modifications Alternative in 2040 include changes to the roadway system as adopted in the PSRC *Transportation 2040* plan using the financially constrained system. In general, the Current Plan Alternative and the Potential Plan Modifications Alternative would help remove vehicles from roadways by providing alternatives to driving. Increasing transit ridership benefits the regional transportation system through improved travel time and reliability and by providing an alternative to driving on congested roadways.

4.3.1 Vehicle miles of travel

A relatively small decrease in VMT would occur with the Current Plan Alternative as compared to ST2 and the Potential Plan Modifications Alternative as compared to the Current Plan Alternative. With ST2, there would be approximately 99.9 million VMT per day by 2040. With the Current Plan Alternative, there would be approximately 99.0 million VMT per day in 2040. With the Potential Plan Modifications Alternative, there would be approximately 98.3 million VMT per day in 2040. These VMT estimates are for the four-county region.

4.3.2 Highway system

The relatively small decrease in regional VMT with the Potential Plan Modifications Alternative would result in comparably small reductions in congestion on regional and local roadways compared to the Current Plan Alternative. In the Current Plan Alternative and the Potential Plan Modifications Alternative, systemwide tolling would be implemented on all limited access facilities (freeways), consistent with Transportation 2040. All lanes on limited access facilities, including HOV lanes would be converted to managed lanes and operate like the other lanes on these facilities. With these potential changes, the assumption used for the travel demand forecasting analysis is that all lanes would be managed for volume and speed, and buses (regional and local) would travel with the flow of traffic. Current WSDOT policy with managed lanes is to maintain a 45 mph operating speed at least 90 percent of the time during the morning and afternoon peak periods.

The effect of tolled managed lanes is the same for the Current Plan Alternative and the Potential Plan Modifications Alternative where regional express bus service is operated within limited-access facilities. Bus operations, like general-purpose traffic, are modeled to operate consistent with this policy. However, if implementation is delayed or these lanes are not managed as planned, speeds for buses on freeways could be much lower in some cases.

With increase in regional traffic congestion in the forecast year, bus operating speeds are expected to continue to deteriorate under the Current Plan Alternative and the Potential Plan Modifications Alternative where buses operate in mixed traffic. Buses operating on managed facilities would not necessarily have decreases in speed, as would be seen on arterials.

4.3.3 Local street system

Although specific alignments and designs have not been identified, the Current Plan Alternative and Potential Plan Modifications Alternative include new rail and bus lines, depending on the alignment and design, could impact local streets. These impacts could include use of lane capacity for high-capacity transit guideways, at-grade crossings for rail or BRT, and increased congestion around stations and park-and-ride facilities. At-grade and elevated light rail alignments could result in arterial modifications, such as permanently eliminating two-way left-turn lanes, and changes or limitations to local access.

New light rail and commuter rail stations could result in local traffic impacts associated with access, including transit riders using park-and-ride facilities at the stations. The additional traffic that would be generated by new rail stations with park-and-ride facilities and expansion of park-and-ride capacity with the Potential Plan Modifications Alternative could impact local traffic.

The addition of streetcar rail lines on local roads could result in limiting left-turn movements and could remove parking on one or both sides of the street to provide for the streetcar right-of-way and connect to the station platforms.

4.3.4 Travel time reliability

The implementation of regional tolling, a powerful traffic management tool, causes freeway speeds to be consistent between each of the alternatives because the goal of systemwide tolling is to maintain speeds of 45 miles per hour. This strategy also means that there would no longer be HOV lanes because the traffic flow management occurs across all lanes. For all vehicles, travel time reliability on freeways would be improved for both the Current Plan Alternative and the Potential Plan Modifications Alternative, but would continue to be impacted by incidents, disabled vehicles, and weather and these will be magnified by increasing traffic volumes in the future.

If tolled lanes are managed as indicated in Transportation 2040, there would be improved reliability for all modes, including transit. As a result, the comparatively better reliability afforded by a transit system operating in its own ROW may not occur. On the other hand, with tolling and the resultant added cost to users, long-distance travelers are more likely to use transit and alternative travel modes to driving. Also, current travel reliability issues affecting HOV users as described in Section 3.2.2 may be reduced with tolling. Finally, if the tolling system is not implemented fully, managed fully, or if it negatively affects travel time reliability, results would be different.

4.4 Parking

Future project-level planning and environmental reviews would assess parking needs at facilities and mitigate potential impacts. Sound Transit's System Access Policy states that parking provided by Sound Transit is intended for and restricted to customers of transit services at the facility, although exceptions may be allowed in some cases. Sound Transit may implement parking management tools such as designated parking for HOVs, parking fees, and parking management systems to increase ridership and increase efficiency in the parking facilities.

If park-and-ride facilities are not sized large enough under the Current Plan Alternative and Potential Plan Modifications Alternative to accommodate demand, parking facilities may reach full capacity earlier each morning and increased traffic could result in parking spillover onto residential streets. With the expanded rail service under each alternative, decreased on-street parking in some corridors could occur due to displacement of roadway capacity to accommodate new guideways and stations. Impacts such as these could be mitigated as part of future project-level planning.

4.5 Safety

Rail and BRT facilities could create safety impacts for at-grade crossings or where operating in mixed traffic. Projects include safety features and often upgrades for unprotected pedestrian crossings on commuter rail lines.

With the Current Plan Alternative and Potential Plan Modifications Alternative, there would be a higher level of service frequency involving light rail and streetcar operations that could include at-grade crossings of intersections. These at-grade crossings could increase traffic congestion and the risk of accidents between trains and other modes of transportation.

With new or expanded transit service, there would be increased vehicular, walk, and bike activity in station areas, potentially impacting the safety of roadway and non-motorized systems.

4.6 Non-motorized transportation

Sound Transit is committed to encouraging and providing pedestrian and bicycle access and has a formal policy of investing in access infrastructure and providing access on transit vehicles, consistent with passenger safety and service quality standards. With expanded transit operations under each alternative, there could be potential impacts on pedestrian and bicycle facilities, as well as opportunities to improve multi-modal access.

Both the Current Plan Alternative and the Potential Plan Modifications Alternative include potential pedestrian and bicycle facilities that improve access to transit facilities. Sound Transit could add new or improved sidewalks in the immediate vicinity of new transit facilities to link activity centers to transit. Transit facilities that require a substantial change in grade between access and boarding areas generally include ramps, elevators, or escalators.

The Current Plan Alternative and the Potential Plan Modifications Alternative likely would allow bicycles to continue to be carried on streetcars, local bus, regional express bus, commuter rail, and light rail. Sound Transit may support bicycle usage at its stations and facilities through bicycle-related infrastructure, equipment, services usage fees and agreements with outside parties. Transit centers, stations, and parking facilities would include safe and convenient bicycle parking/storage; in many cases, such facilities would be weather-protected. Transit facilities would be designed to enhance current pedestrian and bicycle access across rights-of-way.

These improvements would facilitate the use of bicycles for regional trips. Additional services offering on-board bicycle access and new transit facilities with bicycle and pedestrian improvements also could add riders to the system and remove some additional single-occupant vehicle trips from the region's roadways. Accommodating bicycles on-board would allow transit riders to use their bicycle on both ends of their trip. However, increased demand for on-board capacity may present challenges—for example, if demand for bicycle storage on vehicles exceeds capacity. Sound Transit's Bicycle Policy includes language on bicycle storage for its bus and rail vehicles, including the maximum number of bicycles that can be stored per each vehicle type (Sound Transit 2010).

4.7 Freight movement

Changes associated with the Current Plan Alternative and Potential Plan Modifications Alternative that could affect the movement of freight include changes in usage of the BNSF railway, guideway or station construction which could reduce access to driveways or businesses, rail development which could displace on-street loading capacity for truck delivery, and potential additional stations/station expansion. Commuter and light rail could affect freight mobility if trains impede truck routes, particularly in urban industrial areas. Depending on the frequency, speed and station stops, trains could temporarily block truck routes at at-grade crossings more frequently and for a longer duration than under current conditions.

Both the Current Plan Alternative and Potential Plan Modifications Alternative include increased service levels within and beyond the current commuter-oriented services (up to all day). In addition, both alternatives could include additional stations, improved station facilities, and related parking and transit transfer facilities. Increasing the frequency or extending commuter rail service hours could require additional investments in rail infrastructure, such as operations and maintenance facilities, control and communication systems, and expanded rights-of-way for safety and operating efficiency. This could include adding storage tracks or other track capacity improvements such as line extensions to connect to or upgrade existing rail lines. Future project-level planning and environmental reviews would assess freight access needs and identify potential mitigation for impacts.

5 Construction Impacts

This section discusses the potential construction impacts of the Current Plan Alternative and the Potential Plan Modifications Alternative. These impacts involve construction impacts to freeways, local streets, transit, non-motorized facilities, freight, and parking.

5.1 Local bus service

Local bus service could be temporarily affected by the increase in congestion, reduced lane widths, and construction activity. Buses that use streets or freeways undergoing construction could travel more slowly or be detoured to adjacent streets. Detours during lane closures and roadway closures could require revised bus routes that could increase transit, walking, or bicycling travel times. Existing bus stop locations could be moved to temporary locations.

5.2 Freeways

Construction of HCT could occur on or adjacent to the freeway system in several different locations, which could temporarily close freeway lanes for short or long durations reducing lane capacity, lower speeds, increase congestion, and require detours diverting traffic from the freeway system to alternative routes. Freeway operations and operations at interchanges could be affected by HCT construction along freeway segments or in the median, or if the HCT alignment crosses freeway lanes. Freeway interchanges or overcrossings could be closed for short or long durations.

Construction activities that reduce lane or shoulder widths or alter freeway lanes could impact freeway traffic operations. Shoulders could be closed to provide space for construction activities and construction access points. Access to construction areas could be from the freeway shoulder or nearby access points.

Some construction activities, such as in locations where HCT crosses the freeway, could result in nighttime closures in each direction of the freeway mainline with traffic detours to adjacent streets. Haul routes for construction activities would be identified during project-level analysis and environmental review. These haul routes could impact freeway and interchange operations.

5.3 Local streets

In addition to freeway congestion, freeway construction or construction adjacent to freeways could temporarily increase congestion on arterials and the local street system as some trips are diverted from freeways to these roadways. Local street overcrossings and interchange ramps could be realigned or reconfigured to accommodate HCT.

HCT construction along arterials and local streets, at-grade or above grade (aerial), could affect traffic operations with temporary or long-term lane closures. Building at-grade alignments could also temporarily or permanently block access from intersecting streets. Aerial structures could have temporary impacts during construction where they block lanes or turning movements. Local street overcrossings and interchange ramps could be realigned or reconfigured to accommodate light rail or BRT. Lane closures and construction activities could result in congestion on the street where construction occurs, as well as on nearby streets. Access to residents and businesses would be maintained as much as practical.

Construction of transit stations could result in short-term construction within the sidewalk, in the inside lane(s), or the right lane.

Transit stations, park and ride lots, and transit stops constructed for new HCT could have localized and temporary construction impacts. Construction activities for transit stations and park and ride lots would occur on-site with potential temporary closures nearby/adjacent impacting local residents and businesses. Station improvements would result in construction activity on-site with possible nearby construction staging areas. On-site activities could impact transit passengers as a result of having longer walking distances or a lower quality walking environment. Construction of transit stops could result in short-term construction within the sidewalk and/or general purpose travel lanes. Expansion of park-and-rides could temporarily displace existing park-and-ride spaces, which could result in spill over parking on local streets where unrestricted. Existing bus stop locations could be moved to temporary locations. Pedestrian and bicycle travel routes would be affected by construction activities resulting in increased travel time and lower quality walking and biking facilities.

Existing freight rail lines may require some upgrade or improvements that would lead to construction activity in the railroad right-of-way. Access to construction areas would be from adjacent streets and within the railroad right-of-way. Temporary access or haul roads could be constructed.

Construction of rail or BRT could require utility relocations along the alignment and near stations. Utility relocations could require temporary lane closures and traffic control plans to maintain property access and circulation.

Tunnel construction could generate more spoils (excavated rock or dirt) than at- or above-grade construction and could require increased truck traffic to dispose of earth. Construction could also require temporary arterial lane closures if cut-and-cover construction is used. In areas where tunnels are constructed by boring, disruption would be limited to portal and station areas. Impacts such as increased traffic, congestion, and impaired access to businesses could be greater where cut-and-cover methods are used, some corridors could require tunnel construction. Although specific alignments and designs for corridors (shown in Figure 2-1, Figure 2-2 and Figure 2-3) would be identified during future project-level planning and environmental reviews, examples of corridors that could involve tunnel construction include corridor C (Bellevue to Issaquah), corridor F (Ballard to downtown Seattle), corridor G (Ballard to UW), and corridor K (UW to Redmond) from the Current Plan Alternative, and corridor 2 (downtown Seattle, West Seattle, and Burien) in the Potential Plan Modifications Alternative. The Potential Plan Modifications Alternative also could include a new tunnel in downtown Seattle. In addition, particular constraints for other corridors, such as hills, could require tunneling.

Haul routes for construction activities would be identified during project-level environmental review and permitting. These haul routes could impact local streets. Construction access could use local streets to access the freeway system. Portions of the light rail alignment could have construction access from local streets. Peak truck trips are expected to occur during earthwork operations and during concrete delivery for both guideway and station construction.

Multiple work zones could be used during peak construction operations that would result in higher total project peak truck trips; however, these trips would generally not overlap with each other on the same local streets.

5.4 Parking

Parking by construction workers would be provided on-site where possible. This parking could occur on local streets where parking is unrestricted.

Loss of parking on-street and at park-and-ride facilities could be expected during guideway and station construction and where new or expanded park-and-ride facilities occur. Temporarily displaced existing park-and-ride spaces could result in reduced access for patrons, increased travel times, shifted demand to other park-and-ride facilities, or increase spillover parking on other locations in the vicinity including local streets where unrestricted.

5.5 Non-motorized facilities

Construction could temporarily close or restrict pedestrian and bicycle facilities such as sidewalks, bike lanes, and trails. Construction also would temporarily result in other localized impacts such as increased congestion, restricted access to facilities, and a lower quality pedestrian and bicycle environment.

Sound Transit would minimize potential impacts on pedestrian and bicycle facilities by providing detours or clearly delineated routes through construction areas, such as protected walkways. Pedestrians would be accommodated on the existing street where possible, at times on one side only, and the pedestrian environment would be of lower quality during construction. Out-of-direction travel, such as crossing to the opposite side of the street to avoid construction, then later crossing back to the original side, may be required in some cases. Although bicyclists could be allowed to use the same accommodations made for vehicular traffic during construction, they could be required or encouraged to detour.

On-site activities could impact transit passengers as a result of having longer walking or biking distances or a lower quality walking and bicycling environment. Pedestrians and bicyclists would be affected by the increase in congestion, reduced lane widths, and construction activity.

Detours during construction could require revised sidewalk and bicycle facilities that could result in longer than normal walking and bicycling travel times.

5.6 Freight movements

With the Current Plan Alternative and Potential Plan Modifications Alternative, streetcar and light rail construction could result in temporary disruptions to freight movements along local streets. Also regional express and BRT development could temporarily disrupt freight movement along arterials and highways in the Plan area.

For commuter rail construction, such as new service and stations, existing freight rail lines could require some upgrade or improvements that would lead to construction activity in the railroad right-of-way or adjacent areas. Access to construction areas could be from adjacent streets and within the railroad right-of-way. Construction activities involving tracks or within the railroad right-of-way could potentially affect freight operations.

6 Cumulative Impacts

The transportation analysis is predicting future transportation conditions that are inherently cumulative because they already reflect past trends, current transportation conditions, as well as future actions such as planned transportation projects, land use changes, and population growth through 2040 in order to predict future transportation conditions. Appendix I of the Final SEIS lists the projects identified as funded in Transportation 2040, which, along with regionally adopted land use and population targets, are the basis of the transportation forecasts reported in the Final SEIS.

There is the potential for different cumulative transportation effects if some of the other planned actions in the region do not occur as expected. For example, the region's new tolling policy assumed in PSRC's Transportation 2040 plan is to toll all limited access (freeway) facilities in the region. While this action is assumed, it is not yet in place. If tolling does not occur regionally or if it affects a more limited set of facilities, this could affect future levels of congestion, the amount of vehicle miles traveled, and the use of other modes such as transit. Similarly, the actual changes in land use patterns or the amount and distribution of population growth may be different than what is now regionally planned, and this could alter transportation conditions locally or regionally.

In any case, the Current Plan Alternative and the Potential Plan Modifications Alternative would support improved mobility over the long-term because each would help reduce the use of automobiles, improve transit travel times and levels of service, with positive effects on regional transportation conditions. Therefore, even if other projects and actions occur differently than expected, the implementation of the Long-Range Plan would likely be a benefit and would not worsen transportation conditions.

More localized differences in cumulative effects could occur where other developments and actions would be in close proximity to the Long Range Plan's corridors. However, these differences would generally be further identified at a project-level review as compared to the plan-level of analysis used for this Final SEIS. This is also true of the construction-related transportation impacts that could occur with Long-Range Plan projects or the projects of others. These activities could cumulatively affect traffic levels, parking supply, or other localized transportation conditions.

Localized and regional cumulative benefits could also be expected as other parties provide links to transit service, create new connections for bicycle and pedestrian travel, or develop transit-oriented or transit-supportive projects near HCT corridors.

7 Potential Mitigation Measures

7.1 Long-term mitigation

Mitigation would be required to address impacts to local transit service, local roadway facilities, parking, safety, non-motorized facilities in station areas, and freight movement. The types of mitigation measures that could be implemented are discussed below. More specific measures would be identified during future project-level environmental reviews.

7.1.1 Local bus service

To address potential impacts on local bus service, Sound Transit could include transit partners in the planning and design process for HCT stations. This process would include identification of bus operations and required design features at the station that would accommodate local bus access. These bus services could serve as feeder access to HCT stations.

7.1.2 Local street system/level-of-service

Mitigation could include street enhancements to keep park-and-ride or station traffic out of neighborhoods. Intersection improvements could be made near stations and park-and-ride facilities to maintain acceptable traffic conditions, and also where at-grade rail or BRT crossings occur.

7.1.3 Parking

Parking impacts in station areas could be addressed through a station area parking management strategy developed during project-level planning. Sound Transit would work with the local jurisdiction to assess available on-street parking supplies, evaluate potential environmental impacts, and determine whether parking management and enforcement such as the use of residential parking zones or other strategies could be implemented to minimize impacts.

Some jurisdictions could choose to limit parking supply as a strategy to encourage station access by transit, walking, and bicycling, as well as reduce the negative impacts of traffic to and from a park-and-ride facility. Potential parking-related impacts would also recognize Sound Transit efforts in parking management, including the current pilot program relating to parking management strategies at some park-and-ride facilities.

Increasing park-and-ride capacity would be considered during more detailed project-level reviews. However, a number of representative projects (listed in Appendix A, Tables A-6 and A-11) include access features as well as increasing parking capacity.

7.1.4 Non-motorized system—pedestrian and bicycle facilities

Mitigation for the non-motorized system could include improving pedestrian and bicycle facilities on streets in station areas and discouraging automobile access at stations. Mitigation efforts could also include coordination of Sound Transit rail and bus station design efforts with design of non-motorized facilities by local jurisdictions in affected station areas.

7.1.5 Safety

Implementation of improvements such as new sidewalks, improved traffic signals, crossing refuges, and other pedestrian amenities, would mitigate potential pedestrian safety impacts and could provide an improvement over existing conditions. Special message signing, advance information, and safety plans for pedestrians and bicyclists could be prepared by Sound Transit and local agencies. Traffic safety mitigation may include grade-separated crossings, restricting turning movements, intersection design, and signal improvements.

7.1.6 Freight movement

Potential mitigation for impacts to freight movement could include alternative access points and potential consolidation of multiple access locations. In some cases, grade-separated crossings may be considered on truck routes that would experience increased delays due to commuter or light rail train crossings. Mitigation would be coordinated with local jurisdictions, and affected businesses and operators could be consulted.

Mitigation for impacts to rail freight from commuter rail service could include track improvements such as additional track, track rehabilitation, new high speed turnouts, updates to existing signals, construction of new signals, and widening existing bridge crossings. Freight mitigation improvements would be developed in coordination with BNSF and Union Pacific railroads and in consultation with the ports, including the Port of Seattle, Port of Tacoma, and Port of Everett.

7.2 Construction mitigation

Mitigation of construction impacts would be the same for the Current Plan Alternative and the Potential Plan Modifications Alternative, except that there would be more construction activity with the Potential Plan Modifications Alternative.

For construction activities affecting freeways, Sound Transit would work with WSDOT to develop a plan to coordinate construction with incident management, construction staging, and traffic control where the construction could affect freeway traffic. Sound Transit would also coordinate with WSDOT to disseminate construction closure information to the public as needed. Access points from the freeway would be identified to provide adequate acceleration and deceleration for trucks and to minimize impacts on freeway and interchange operations.

Mitigation for traffic impacts would comply with local regulations governing construction traffic control and truck routing.

Mitigation for traffic impacts would comply with local regulations governing construction traffic control and truck routing. Mitigation measures for traffic impacts due to construction of transit facilities could include the following:

- Develop a construction traffic management plan that would reduce the need for, or duration of, shoulder closures and lane reductions to minimize impacts.
- Develop a plan to communicate public information through tools such as print, radio, posted signs, websites, social media, and email to provide information regarding street closures, hours of construction, business access, trail closures, and parking impacts.
- Post truck prohibition signs on streets with a high likelihood of cut-through truck traffic.
- Coordinate access closures in person with affected businesses and residents.
- Encourage patronage of affected businesses by including signage for businesses announcing that they are open for business during construction and encouraging workers to eat locally while on the construction site.
- Provide parking areas for construction workers, where necessary. In some cases, construction worker parking could be the responsibility of the contractor, with Sound Transit maintaining approval authority over the construction worker parking plan. Construction worker parking strategies could include

providing remote parking with shuttle service to and from the construction site if sufficient on-site parking cannot be provided.

- Post advance notice signs prior to construction in areas where surface construction activities would affect access to surrounding businesses.
- Provide signed detour routes for pedestrians and bicycles through construction areas.
- Keep multiuse trails that could be affected by construction open for use, if possible, but detours would be provided if trails are closed unless they are closed for short durations or in areas where a detour option is not feasible.

Mitigation measures could also be applied to transit service, parking, freight rail service, and construction site safety:

- Impacts to transit service would also be mitigated by working with local transit agencies to prepare a construction mitigation plan. Transit service could be rerouted, transit stops relocated, and—where warranted—a transit center could be temporarily relocated or modified during construction. In addition, in some cases, additional transit service may be considered as mitigation for impacts. The temporary loss of park-and-ride spaces could be mitigated through leasing of nearby off-site spaces or developing temporary replacement parking.
- Sound Transit would coordinate with railroad owners to mitigate construction impacts on freight operations.
- To address safety-related construction impacts, contractors would be required to follow Sound Transit policies regarding safety in construction zones.

8 Significant Unavoidable Adverse Impacts

Even with the mitigation measures described above, there could be unavoidable adverse transportation impacts primarily during construction of the corridors and facilities included in the Current Plan Alternative or the Potential Plan Modifications Alternative. Construction impacts could include temporary lane or roadway closures, loss of parking, increased truck traffic and congestion, and reduced access to business.

9 References

APTA (American Public Transportation Association). 2013. *Public Transportation Ridership Report,* Fourth Quarter 2013.

FTA (Federal Transit Administration). 2012. *National Transit Database Table 20: Transit Operating Statistics: Service Supplied and Consumed - Train Statistics—Rail.*

FTA (Federal Transit Administration). 2013. *New and Small Starts Evaluation and Rating Process: Final Policy Guidance.*

FTA (Federal Transit Administration). March 2014. *National Transit Database: Monthly Module Adjusted Data Release.* www.ntdprogram.gov/ntdprogram/data.htm

King County Department of Transportation. 2014. *King County Executive Order ACO-9-1: Directing the King County Department of Transportation to Develop an Integrated Transit Service Plan in Coordination with Sound Transit and Partner Agencies to Ensure that Service is Delivered As Efficiently and Effectively as Possible.*

PSRC (Puget Sound Regional Council). 2009. *VISION 2040.*

PSRC (Puget Sound Regional Council). 2010. *Transportation 2040: Toward a sustainable transportation system.*

PSRC (Puget Sound Regional Council). 2013a. *2013 Forecast Products Package: Land Use Baseline.*

PSRC (Puget Sound Regional Council). 2013b. *2013 Forecast Products Package: Land Use Targets.*

PSRC (Puget Sound Regional Council). 2013c. *Puget Sound Transportation Trends.*

PSRC (Puget Sound Regional Council). 2014. *Transportation 2040 Update, Appendix O: Active Transportation Plan.*

RCW (Revised Code of Washington). 2011. RCW 47.56.880. *Interstate 405 Corridor, Tolls Authorized, Eligible Toll Facility, Toll Rate Schedule, Capacity Improvements, Performance Measures, Violation.*

Sound Transit. 2008. *The Regional Transit System for Central Puget Sound.*

Sound Transit. 2010. *Sound Transit Board Motion #M2009-36 Attachment A - Sound Transit Bicycle Policy.*

Sound Transit. 2014a. *Transit Ridership Forecasting Methodology Report.*

Sound Transit. 2014b. *Sound Transit Board Motion #2014-44: Coordination with Partner Agencies to Study and Develop Proposals for Bus-Rail Integration.*

Sound Transit and King County Metro Transit. 2014. *Getting There Together Transit Integration Report.*

WSDOT (Washington State Department of Transportation). 2010, 2012. *Freeway HOV and HOT Lane System.* Information available at www.wsdot.wa.gov/hov/projects.htm

WSDOT (Washington State Department of Transportation. 2013a. *Park and Ride Inventory: Capacity and typical use at publicly owned or leased lots.*

WSDOT (Washington State Department of Transportation). 2013b. *Tolling Program and Study Map.* www.wsdot.wa.gov/Tolling/planningmap.htm

WSDOT (Washington State Department of Transportation). 2014. *Corridor Capacity Report.*

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