

Sound Transit 3
Compliance with HCT System Planning Requirements

**DRAFT Options Assessment and
Analysis Methods Technical
Memorandum**



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Acronyms and Abbreviations

BRT	bus rapid transit
EIS	environmental impact statement
FTA	Federal Transit Administration
HCT	high-capacity transportation
HOV	high-occupancy vehicle
HVAC	Heating, ventilation, and air conditioning
LRP	long-range plan
MTP	Metropolitan Transportation Plan
NEPA	National Environmental Policy Act
O&M	operations and maintenance
PSCOG	Puget Sound Council of Governments
PSRC	Puget Sound Regional Council
RCW	Revised Code of Washington
RTA	Regional Transit Authority
RTP	Regional Transit Project
SCC	Standard Cost Category
SEIS	supplemental environmental impact statement
ST2	Sound Transit 2
ST3	Sound Transit 3
TOD	transit-oriented development
WSDOT	Washington State Department of Transportation

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1 Introduction

1.1 Historical Overview

The development of high capacity transportation (HCT) systems within the central Puget Sound region has been guided over the years by federal and state legislation, as well as by state, regional, and local plans and policies. The purpose of this legislation is to guide development of an integrated HCT system that increases the people-carrying capacity of the region's most congested travel corridors, supports the region's growth management policies, ensures a vital economy, and protects the region's environment.

Beginning in 1990, the Washington State Legislature began adopting legislation for the development of high capacity transportation systems to be deployed in the state's major urban areas. The primary references can be found under Revised Code of Washington (RCW) Chapter 81.104, also known as the High Capacity Transportation Systems Act. Under RCW 81.104.010, the purpose of the HCT legislation is defined as follows:

Increasing congestion on Washington's roadways calls for identification and implementation of high capacity transportation system alternatives. The legislature believes that local jurisdictions should coordinate and be responsible for high capacity transportation policy development, program planning, and implementation.

The Legislature defined a HCT system in RCW 81.104.015 (1) as:

“a system of public transportation services within an urbanized region operating principally on exclusive rights of way, and the supporting services and facilities necessary to implement such a system, including interim express services and high occupancy vehicle lanes, which taken as a whole, provides a substantially higher level of passenger capacity, speed, and service frequency than traditional public transportation systems operating principally in general purpose roadways.”

Along with the authority to prepare plans for the development of high capacity transit systems, the Legislature also prescribed specific components of the planning process and requirements for how that planning process was to occur (RCW 81.104.100).

The intended result of the HCT planning process detailed in RCW 81.104.100(2) in urbanized areas was to be a system plan to be submitted to the voters for financing approval under RCW 81.104.100(2)(d) and RCW 81.104.140. After a successful vote, a process for project planning was described in RCW 81.104.100(3).

For the third phase capital program—Sound Transit 3 (ST3)—Sound Transit prepared the same technical analysis as was prepared for *Sound Move* and Sound Transit 2 (ST2) and worked to ensure that the ST3 plan complies with the system planning elements in Chapters 81.104 and 81.112 RCW as explained below.

Technical analysis for *Sound Move* and ST2 was documented in two technical memoranda: *Sound Transit 2 Compliance with HCT System Planning Requirement: Technical Memorandum on Options Assessment and Analysis Methods* (2008) and *Sound Transit 2 Compliance with HCT System Planning Requirement: Technical Memorandum on Public Involvement and Outreach* (2008). Along with

authorization of additional revenue authority for Sound Transit, the 2015 legislature added requirements for development of a regional equitable transit-oriented development (TOD) strategy.

Figure 1 provides a brief chronology of HCT planning and implementation in the central Puget Sound region since 1990.

1.2 Purpose and Intent of Technical Memorandum

This technical memorandum addresses state system planning requirements for the Central Puget Sound Regional Transit Authority, or Sound Transit. This memorandum addresses specifically how Sound Transit meets the requirements in RCW 81.104.100 (2), which reads in part as follows:

High capacity transportation system planning is the detailed evaluation of a range of high capacity system options, including: Do nothing, low capital, and ranges of higher capital facilities.

The RCW citation (2) (b & c) further goes on to state that:

Development of Options. Options to be studied shall be developed to ensure an appropriate range of technologies and service policies can be evaluated. A do-nothing option and a low capital option that maximizes the current system shall be developed. Several higher capital options that consider a range of capital expenditures for several candidate technologies shall be developed.

Analysis Methods. The local transit agency shall develop reports describing the analysis and assumptions for the estimation of capital costs, operating and maintenance costs, methods for travel forecasting, a financial plan and an evaluation methodology.

This technical memorandum describes how the current system planning process leading up to the development of the ST3 plan, anticipated to go before voters in November 2016, meets these requirements, as it has included evaluation of do-nothing, low-cost, and high-cost options throughout the planning process, as well as meeting the other system planning requirements.

Detailed information on the analysis methods is documented in individual methodology reports prepared for each of the following:

- Capital Cost Estimates—*System Plan Development (ST3): Capital Cost Estimating Methodology*, Draft, February 2016
- Operations and Maintenance Cost Estimates—*ST3 Regional High-Capacity Transit System Plan: Operations and Maintenance Cost Methodology*, Draft, April 2015

- 1990 ----- The Washington State Growth Management Act (Chapter 36.70A RCW) and High Capacity Transportation (HCT) Act (Chapter 81.104 RCW)** are approved, enabling the creation of a regional rapid transit system for the central Puget Sound region. The HCT Act calls for transit agencies to plan, build, and operate an HCT system within the region's most heavily used travel corridors.
- **The Puget Sound Regional Council (PSRC) adopted VISION 2020**, the region's growth and transportation strategy. Transportation policy recommendations include references to the development of an HCT system.
- 1991 ----- The Joint Regional Policy Committee formed** as a mandate of the HCT Act.
- 1992 ----- The State Legislature enabled the formation of a Regional Transit Authority** with the approval of RCW Chapter 81.112, which provided the legal basis for the Puget Sound region to create one local agency for planning and implementing an HCT system.
- 1993 ----- King, Pierce, and Snohomish Counties formed the Central Puget Sound Regional Transit Authority (RTA).**
- 1995 ----- Voters in King, Snohomish, and Pierce Counties rejected the RTA's \$6.7 billion plan** (1995 dollars) to create a regional transportation system made up of commuter rail, light rail, express buses, and bus facilities.
- The PSRC adopted the 1995 Update to VISION 2020 and the Metropolitan Transportation Plan (MTP) in compliance with the requirements of the federal Intermodal Surface Transportation Efficiency Act, the Clean Air Act Amendments of 1990, and the state Growth Management Act. HCT remains a major component of the MTP.
- 1996 ----- The revised Sound Move plan was approved by King, Snohomish, and Pierce County voters** with a price tag of \$3.9 billion (1995 dollars). This comprehensive regional transit plan contained nearly 100 separate but interrelated capital and service projects that included: high-occupancy vehicle system improvements, ST Express bus routes, Sounder commuter rail, and Link light rail. *Sound Move* was the first implementation phase of a larger, long-range system.
- **Concurrent with the adoption of *Sound Move*, the Sound Transit Board adopted the Regional Transit Long-Range Vision** to keep the broader regional system in the public's eye. The Vision provided a general blueprint for reaching the region's long-term high capacity transit goals. The Vision addressed the opportunity for additional HCT investments, including rail extensions in future phases, and it identified possible additional HCT corridors and potential rail lines.
- 2001 ----- The PSRC adopted Destination 2030 as the transportation element of VISION 2020** to serve as the region's MTP. Sound Transit's Long-Range Vision and the *Sound Move* plan are key components of the PSRC's MTP.
- 2005 ----- Sound Transit released the Final Supplemental Environmental Impact Statement (SEIS) and unanimously adopted the updated Regional Transit Long-Range Plan (LRP).** The 1996 Vision (now Long-Range Plan) was updated to reflect extensive analysis of the region's future growth, and it details how a regional transit system might best accommodate that growth.
- **Sound Transit engages in the ST2 system planning process.**
- 2007 ----- Voters in the Sound Transit District reject Proposition 1, also known as the Roads & Transit Plan.** The plan would have added 50 miles of new light rail and made improvements to major roadways throughout the region. The measure is defeated 56 percent to 44 percent.
- 2008 ----- Voters in the Sound Transit District approve Proposition 1, also known as the Mass Transit Expansion Plan.** The 15-year mass transit package increases express bus and commuter rail services and creates a 53-mile regional light rail system throughout the region. The measure is approved 57 percent to 43 percent.
- 2010 ----- The PSRC adopted Transportation 2040** as the transportation element of VISION 2040 and as the region's MTP.
- 2014 ----- The PSRC updated Transportation 2040** as the transportation element of VISION 2040 and as the region's MTP.
- **Sound Transit released the Final SEIS and unanimously adopted the updated Regional Transit LRP.** The LRP was updated to reflect extensive analysis of the region's future growth, and it details how a regional transit system might best accommodate that growth.
- 2015 ----- The State Legislature authorized additional revenue authority** for Sound Transit and created new requirements for equitable TOD.
- 2016 ----- Sound Transit released the ST3 Draft System Plan.** The Draft System Plan was released for public and agency comment.

Figure 1. High Capacity Transit in the Central Puget Sound Region—Development Chronology

- Transit Ridership Forecasting—*ST3 Regional High-Capacity Transit System Plan: Transit Ridership Forecasting Methodology Report*, March 2015
- Financial Plan—*Sound Transit 3, The Regional Transit System Plan, Appendices A (Detailed Description of Facilities and Estimated Costs)* and *B (Financial Policies)*, June 2016
- Project and System Evaluation—*ST3 Regional High-Capacity Transit System Plan: Evaluation Methodology Report*, Draft, July 2015

An additional technical memorandum has been prepared to summarize the public involvement and outreach process conducted for ST3.

2 Setting the Stage for HCT: Legislative Mandates and Initial Plan Development

2.1 Legal Overview

2.1.1 Goals and Context

In order to manage increased congestion on Washington's roadways, the state legislature mandated a planning process that regional planning and transit agencies must follow to develop high capacity transit system alternatives (RCW 81.104.010).

In recognition of the 1990 Growth Management Act, state law required that regional planning agencies "address the relationship between urban growth and an effective high capacity transportation system plan, and provide for cooperation between local jurisdictions and transit agencies" (RCW 81.104.080). The law also required that high capacity transit system analyses be included in regional transportation plan reviews. The investigation and implementation of such systems must then follow a process that includes a "detailed evaluation of a range of high capacity transportation system options" (RCW 81.104.100 (2) (b)). Such an appraisal must ensure that a range of technologies and service policies are assessed according to the following scenarios:

- Do-Nothing option
- Low Capital option that maximizes the current system
- Ranges of Higher Capital options that consider a range of expenditures for several candidate technologies

2.1.2 Planning Approach

On February 28, 2013, the Sound Transit Board passed Motion No. M2013-11, approving a planning approach for the next phase of the Regional Transit System Plan in order to meet the requirements for a potential public vote to fund the next phase. The work plan laid out in the Board motion included the following three-stage approach to develop the next phase of investments by 2016:

- HCT corridor studies (2013-2014)
- Long-Range Plan Update with environmental review (2013-2014)
- Next phase of the Regional HCT System Plan (ST3) (2015-2016)

2.1.3 Conformance to Adopted Regional Transportation Plan

Sound Transit's high capacity transportation implementation program, which includes the system plan, project plans, and financing plan, is required to conform to the region's adopted long-range transportation plan (RCW 81.104.040). Conformance with the Puget Sound Regional Council's VISION 2040 and Transportation 2040 will be documented in a separate document.

2.2 2015 Washington Legislative Session

The 2015 state legislature authorized additional revenue authority for Sound Transit.

The legislature also added a new section to Sound Transit’s enabling legislation which directs the agency to include as part of its system plan “a regional equitable TOD strategy for diverse, vibrant, mixed-use and mixed-income communities consistent with TOD plans developed with community input by any regional transportation planning organization within the regional transit authority boundaries.” RCW 81.112.350.

The Puget Sound Regional Council is the applicable regional transportation planning organization within the Sound Transit service area, and it adopted the Growing Transit Communities Strategy in 2013 to implement the region’s adopted growth plan, VISION 2040. Sound Transit has joined other local and regional government agencies in supporting the implementation of this strategy.

Among other things, RCW 81.112.350 requires that Sound Transit first offer at least 80% of surplus TOD properties suitable for development as housing to local governments, housing authorities, or non-profit developers, of which Sound Transit shall require that at least 80% of constructed units be affordable to those earning no more than 80% of area median income. The legislation authorizes Sound Transit to offer the property for no cost, where allowed under law and applicable regulations, in certain conditions.

3 Updating the Regional Transit Long-Range Plan

3.1 HCT Corridor Studies

3.1.1 Corridors Studied

To help inform decisions on the next phase of HCT system improvements, Sound Transit completed five high-capacity transit corridor studies to evaluate potential future HCT options in ten travel corridors across the region. These corridors were all included in Sound Transit's 2005 Long-Range Plan (with the exception of downtown Seattle to West Seattle) and planning level studies for these corridors were funded under the ST2 plan:

- Ballard to Downtown Transit Expansion Study (May 2014)
- Central and East Corridor Study (September 2014)
 - Ballard to University District
 - University District to Kirkland to Redmond
 - Kirkland to Bellevue to Issaquah
 - I-405 Bus Rapid Transit (BRT)
 - Eastside Rail Corridor
- Federal Way to Tacoma HCT Corridor Study (July 2014)
- Lynnwood to Everett HCT Corridor Study (July 2014)
- South King County HCT Corridor Study (August 2014)
 - Downtown Seattle to West Seattle to Burien
 - Burien to SeaTac to Renton to Tukwila

The HCT corridor studies evaluated a variety of alternative alignments and mode options within corridors, and they considered potential ridership for those alignments and mode options. Preferred alignments were not identified as part of the HCT corridor study process.

All of the corridors listed above were also evaluated in the Regional Transit Long-Range Plan SEIS, as described below. It should be noted that the HCT corridor studies and the SEIS evaluated potential improvements at a different scale. The HCT corridor studies evaluated options within a more localized area and in greater detail than the SEIS, which generally identified its plan-level alternatives and evaluated their impacts at a broader regional level.

3.2 2014 SEIS

3.2.1 Elements Contained in SEIS

The 2014 SEIS was part of a phased environmental review process. It supplemented and built on the *Regional Transit System Plan Final EIS* of 1993 and the *Final Supplemental Environmental Impact Statement on the Regional Transit Long-Range Plan* of 2005, which were prepared to support Sound Transit's previous long-range planning efforts. The 2014 SEIS supported the decisions of the Sound Transit Board to

- Ensure that the Long-Range Plan continued to meet Sound Transit's goals
- Make revisions to update the Long-Range Plan
- Adopt an HCT system plan identifying the next phase of capital investments and improvements

Three primary HCT transit technologies and supporting services were studied in the SEIS—light rail, commuter rail, and regional express bus/BRT. In addition, streetcar services were reviewed. The SEIS evaluated the potential transportation and environmental effects of implementing the following two alternatives:

- The Current Plan Alternative (No Action Alternative), which consisted of the 2005 Long-Range Plan plus the Sound Transit Board actions taken as part of the development and implementation of the ST2 program.
- Potential Plan Modifications Alternative (Action Alternative), which assumed implementation of all the elements of the Current Plan Alternative and added HCT corridors and services that were potential modifications to the Current Plan. These corridors represented a menu of options that the Sound Transit Board could choose from when updating the Long-Range Plan.

The SEIS incorporated comments of agencies and the public. In the fall of 2013, Sound Transit invited federal, regional, state, and local agencies and jurisdictions, and members of the public to submit scoping comments on preparation of the SEIS. Public scoping meetings were held in November 2013 to submit comments on the scope of the SEIS. More than 5,000 comments were received that helped Sound Transit determine which alternatives and environmental issues would be studied in the SEIS. *The Regional Transit Long-Range Plan Update Scoping Summary Report* (February 2014) presents more detailed information about comments received.

Many suggestions made during scoping were related to corridors and specific services or facilities within HCT corridors already in the Current Plan Alternative. These corridors and “representative projects” were presumed to be covered under the Current Plan Alternative. Suggestions for new transit corridors were put through a screening process in order to develop the Potential Plan Modifications Alternative. The screening criteria used during this process were based on the purpose and need for the Long-Range Plan Update and the goals and objectives of the plan.

Sound Transit published the Draft SEIS on June 13, 2014, and provided a public review and comment period of 45 days (June 13 to July 28, 2014). During this time, a series of six open houses/public hearings were held in July 2014. Suggestions for new or revised transit corridors received during the Draft SEIS comment period were put through the same screening process as suggestions received during scoping. Suggestions that met the screening criteria were added to the Potential Plan Modifications Alternative and were evaluated in the Final SEIS.

Appendix A of the 2014 SEIS provided a list of the HCT corridors that made up the Current Plan Alternative and Potential Plan Modifications Alternative. The appendix also included a list of representative projects associated with these corridors for purposes of modeling and impact analysis. Representative projects are potential projects that could be built along any existing or future transit corridors included in the Long-Range Plan. These include potential stations, operations and maintenance facilities, transit centers, pedestrian bridges, high-occupancy vehicle (HOV) access ramps, etc. Specific projects, locations, operating characteristics, and levels of service would be evaluated and determined during future system planning and project-level reviews.

The projects evaluated in the 2014 SEIS covered a range of low capital cost options (ST Express bus and streetcar projects) and high capital cost options (Link light rail and commuter rail). The range of options included in the 2014 SEIS is shown in Appendix B of this memorandum (Candidate Project Summary Sheets).

3.3 Long-Range Plan Issue Papers

3.3.1 Description

The Long-Range Plan (LRP) Issue Papers were drafted at the request of the Sound Transit Board and the public to provide further analysis to inform the Long-Range Plan update and ST3 decisions.

LRP issue papers:

- *Assess/Evaluate New Regional and Local Revenue Sources* (Draft, June 2014)—This issue paper identified a variety of potential revenue sources used by peer transit agencies along with the potential revenue amounts which could be generated by each source.
- *Transportation Planning and NEPA Linkages Technical Memorandum* (May 2014)—This issue paper reviewed the relationship between federal planning and environmental guidelines and elements of the current planning process.
- *High-Capacity Transit Technologies Issue Paper* (October 2014)—This issue paper provided a review and qualitative assessment of what constitutes an HCT technology, definitions of current transit technologies, and issues for the update of Sound Transit's Long-Range Plan and for the next phase of HCT system planning.
- *System Access Issue Paper* (December 2014)—This issue paper provided strategies to improve planning and programming for access to transit facilities by pedestrians, bicyclists, connecting buses, and private vehicles.
- *Issue Paper on Regional Land Use and Transit Planning* (December 2014)—This issue paper considers transit-supportive land use, and in particular focuses on how Sound Transit could consider transit-supportive densities when implementing HCT.
- *Issue Paper on Innovation Fund* (December 2014)—This issue paper identifies a number of ways in which Sound Transit could improve its Technology/Innovation Fund to better meet the needs of its riders, while using its resources most efficiently.
- *Sustainability Issue Paper* (Draft, December 2014)—This issue paper reviews existing sustainability policies, goals, and objectives at the local, regional, and state level, and describes how

Sound Transit supports those goals; provides recommendations for revisions to the text of the Long-Range Plan to better address sustainability; and presents recommendations on the most appropriate actions to be undertaken during Sound Transit's early planning efforts.

- *Transit Markets Issue Paper* (Draft, February 2015)—This issue paper examines the demographic and growth trends in the region and identifies considerations in planning for future HCT ridership. Major topics discussed include transit services and ridership, population, and employment trends in the Sound Transit District, ridership in existing transit corridors, markets, and system access.

3.4 2014 Regional Transit Long-Range Plan

3.4.1 Description

Sound Transit's 2014 updated Regional Transit LRP (adopted December 18, 2014 by Resolution No. R2014-31) (Figure 2) provided a revised framework for the development of the regional transit system. The Long-Range Plan identified proposed transit service technologies in major corridors throughout the region to guide future phases of voter-approved transit projects. Sound Transit then used the updated plan as a blueprint for developing the next phase of investments—ST3.

The 2014 plan updated the 2005 document to reflect new information about regional demographics and to show how the regional transit system might best accommodate projected growth. The original 1996 Long-Range Vision was adopted when the Sound Transit Board adopted *Sound Move*—the first phase Regional Transit System plan. The Vision was updated in 2005 prior to the ST2 system plan.

The 2014 LRP notes that long term goals of Sound Transit should include the following:

- Provide a public transportation system that helps ensure long-term mobility, connectivity, and convenience for citizens of the Puget Sound region for generations to come
 - Provide reliable, convenient, and safe public transportation services between regional growth centers and create an integrated system of transit services and fares
 - Create a regional transit system that provides measurable economic, environmental, and community benefits
- Preserve communities and open space
 - Support communities' ability to develop—consistent with state and regional laws and growth management policies—in ways that keep our neighborhoods livable and protect our natural resources and open space
- Contribute to the region's economic vitality
 - Increase access to jobs, education, and other community resources; enhance the region's ability to move goods and services
- Preserve our environment
 - Conserve land and energy resources, and reduce greenhouse gas emissions, other air pollutants, and vehicle miles traveled

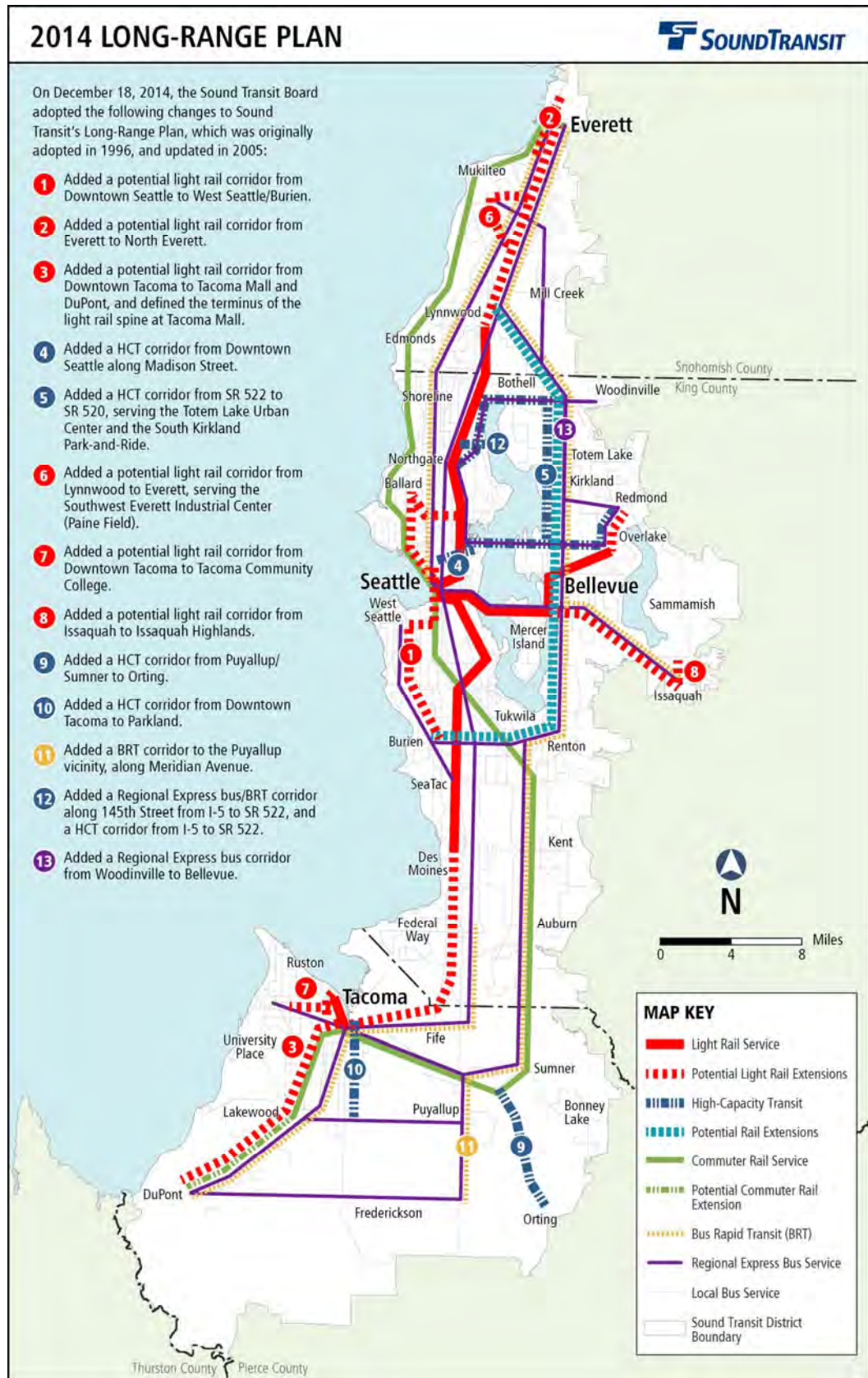


Figure 2. 2014 Long-Range Plan Update

- Strengthen communities' use of the regional transit network
 - Encourage the development, or redevelopment, of areas around transit stations, transit centers, and park-and-ride lots with a mix of transit-oriented activities at a pedestrian scale and orientation to enhance current and future transit use

The objectives of the plan are as follows:

- Keep the region moving
 - Increase the percentage of people using public transportation throughout the region for all trips, not just trips to work
 - Increase the percentage of people using transit for their trips to work and the percentage using transit to reach major regional employment centers
 - Increase public transportation ridership at a rate faster than the population is growing
 - Reduce the average time it takes to make a trip by transit
 - Increase transit speeds and improve the reliability of transit service
 - Make it easier to use transit to reach jobs, schools, medical facilities, recreation, and shopping throughout the region
 - Support ridesharing, vanpooling, and other commute trip reduction programs that complement the regional transit system
- Offer cost-effective and efficient transportation solutions
 - Offer the most efficient and effective services and facilities possible within available resources
- Create a sustainable regional transit system that provides community, social, economic, and environmental benefits
 - Help limit urban sprawl, maintain open space, and protect natural resources
 - Support creation of communities that are easy to reach and use on foot, by bicycle, on transit, and by people with disabilities
 - Support vibrant, walkable communities and place-making around HCT stations
 - Increase transportation options that use less energy and consume less land resources
 - Reduce greenhouse gas emissions and other pollutants
 - Plan and implement HCT services consistent with the Puget Sound Regional Council's long-range growth management, environmental, economic, and transportation strategy
 - Support a regional transit system that helps contribute to the health of people in the region

- Develop equitable transportation solutions
 - Offer transit projects and services that benefit subareas consistent with the agency’s adopted definition of equity
 - Support efficient, high-frequency, and accessible transit service to low-income and minority populations
- Create a financially feasible system
 - Develop a system that is affordable to build, run, and use
- Offer regional services that work well with other transportation services
 - Work with local public transportation providers and the state Department of Transportation to coordinate services and continue to provide a single-fare card

Consistent with the 2005 LRP and the 1996 Long-Range Vision before it, the 2014 LRP recommends a mixture of rail and bus services, with north and south extensions of the light rail spine as well as new east and west connections. In addition to the expansion of Sounder commuter rail and Link light rail, ST Express bus, and bus capital projects, Sound Transit is continuing to investigate a BRT system. Sound Transit will also continue to pursue a greater focus on system access, transit-oriented development, innovation and technology, and sustainability as it relates to future investments.

4 ST3 Planning Process

4.1 Description

ST3 is being developed as the next stage of high capacity transit implementation for the central Puget Sound region. The plan will expand on Sound Transit's system of regional express buses, commuter rail, and light rail facilities and services in the Sound Transit district.

4.2 Core Priorities

At the February 26, 2015, Board Meeting, at the start of system planning, the Sound Transit Board reviewed core priorities for developing a system plan based on the goals and objectives in the LRP as follows:

- Complete the Link light rail spine (North Everett to Tacoma Mall, and from downtown Seattle to downtown Redmond)
- Increase ridership
- Connect the region's designated centers with HCT
- Promote transit-friendly land uses and supporting TOD
- Advance "Logical Next Steps" projects beyond the spine within financial capacity
- Promote socioeconomic equity
- Integrate with other transit operators/transportation systems
- Improve multi-modal access

4.3 Development of Conceptual Scenarios

As part of the process of developing a plan to submit to the voters, Sound Transit staff developed conceptual system expansion scenarios to highlight the trade-offs between different overall levels of investment and different areas of concentration within the context of the Board's priorities for the system plan.

One of the key issues the scenarios helped the board consider was, for various cost assumptions, how much of the light rail spine could be completed versus completing other corridors. To provide insight into that and other trade-offs under different funding levels, the following nine conceptual system expansion scenarios were developed and presented to the Board on March 26, 2015:

- **Incremental Expansion**—Using Existing Revenue Authority. This is the "Do Nothing" scenario required by RCW 81.104.100(2)
- **Low Cost**—Minor Progress Toward Completing the Spine
- **2a: Medium Cost**—Some Progress Toward Completing the Spine, Modest Investment in Additional Corridors
- **2b: Medium Cost**—Progress Toward Completing the Spine, No Additional Corridors
- **3a: Higher Cost**—Modest Spine Extension, Emphasis on Additional Corridors

- **3b: Higher Cost**—Less Spine, More Additional Corridors
- **3c: Higher Cost**—Most of the Spine, Some Additional Corridors
- **3d: Higher Cost**—Maximized Spine, Limited Additional Corridors
- **4: Highest Cost**—Maximized Spine, Additional Corridor Investments

These scenarios did not consider subarea allocation. Figure 3 shows the capital projects included in each of the system expansion scenarios as well as a summary of the evaluation results based on the core priorities described above.

As would be expected, scenarios developed to support higher funding levels perform better against the core priorities. With higher funding levels, the scenarios are able to complete more miles of the LRT spine, reach more designated centers and low income and minority residents, provide greater opportunity for integration with transit partners and generate higher ridership. A system that serves the LRT spine termini of Everett, Tacoma, and downtown Redmond will attract 400,000 to 500,000 boardings per day by providing stations within 1 mile of over 1 million people and jobs.

ST3 System Expansion Scenarios Evaluation Results Summary

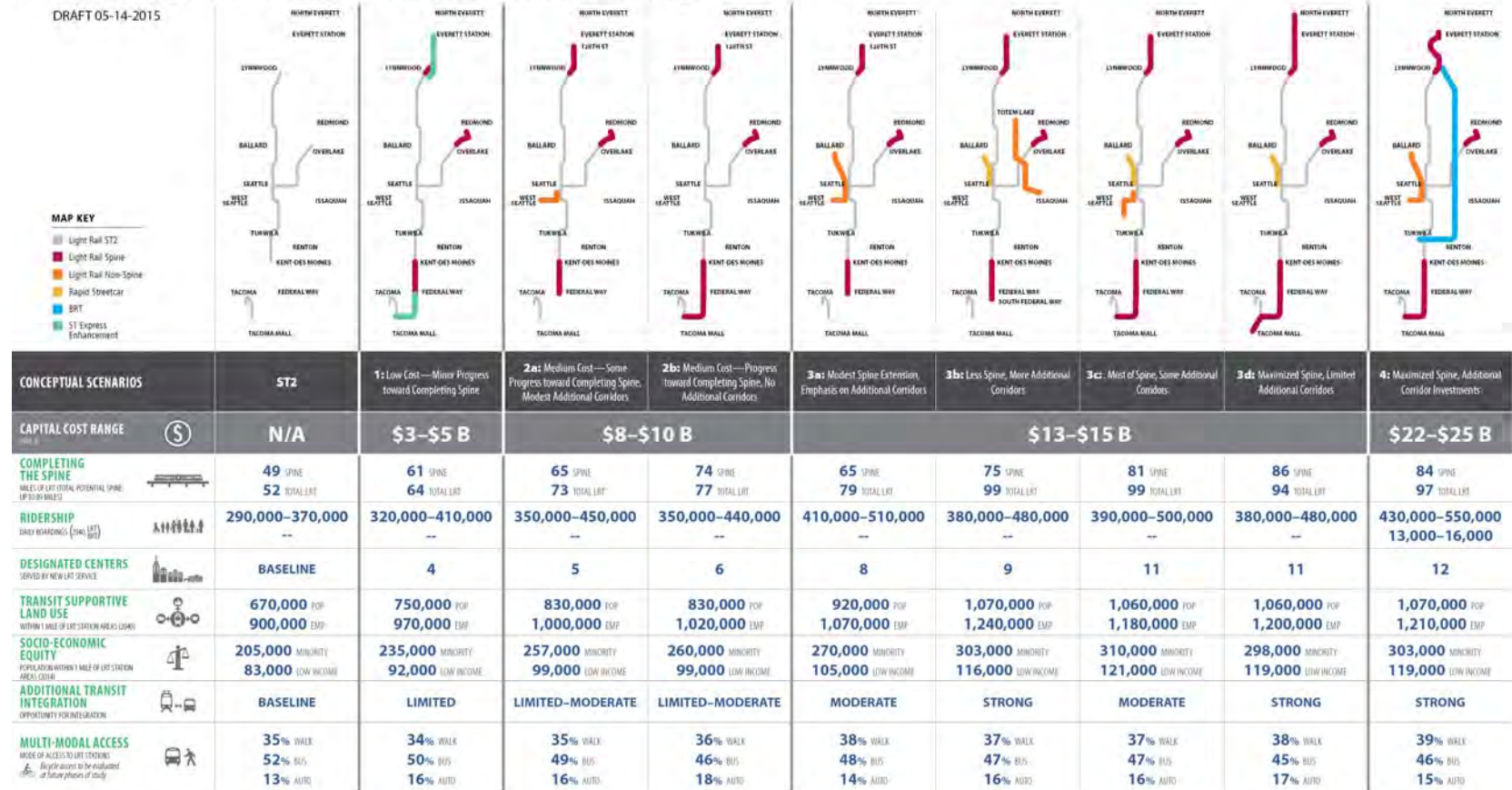


Figure 3. ST3 System Expansion Scenarios

4.4 Priority Project Identification

4.4.1 Project Identification

As discussed above, the Sound Transit Board adopted the updated LRP based on the *Regional Transit Long-Range Plan Update—Final Supplemental Environmental Impact Statement* and a series of high-capacity transit corridor studies and issue papers. The LRP was updated to include a number of new high-capacity transit corridors and supporting services. The LRP is fiscally unconstrained, which means that the transit options contained in the plan are not limited by funding availability. In contrast, the system plan is fiscally constrained, with funding subject to voter approval.

In order to develop a draft list of priority projects to study as candidate projects for potential inclusion in the system plan, Sound Transit first established a “universe of projects” to consider. The 2014 LRP was used as a starting point, including the HCT corridors as well as representative projects described below. Projects that met the initial considerations (Table 1) for projects identified below were included in the “universe of projects” to consider.

Table 1. Initial Considerations for Projects

Initial Considerations for Projects	Inclusion in “Universe of Projects”
1. Has this project already been eliminated by ST Board action or implemented or constructed?	If the answer is “Yes,” not included in “universe of projects”
2. Is this project separate from another project that is being implemented or carried forward?	If the answer is “Yes,” can be included in “universe of projects” if also a “Yes” to Question 3.
3. Is it included or consistent with the LRP?	If the answer is “Yes,” can be included in “universe of projects” if also a “Yes” to Question 2.

HCT Corridor Projects

The corridor projects that were studied during system planning were based on the HCT corridors included in the updated LRP. Corridors included in the LRP include those already implemented under previous system plans (*Sound Move* and ST2), and potential extensions that are not currently funded (e.g., Ballard to downtown Seattle, Kirkland to Bellevue to Issaquah, and Federal Way to Tacoma). The LRP also includes new corridors added during the update, such as light rail from Everett to North Everett, BRT along Madison Street from downtown Seattle to Capitol Hill, and light rail from Downtown Tacoma to Tacoma Community College. HCT corridors in the LRP are representative in nature, intended to broadly represent an area for planning purposes only. Specific alignments for HCT corridors would be identified during any future project-level environmental reviews.

Representative Projects (e.g., supporting projects and services)

Representative projects are potential projects that could be built along any existing or future transit corridors included in the Long-Range Plan. These include potential stations, operations and maintenance facilities, transit centers, pedestrian bridges, HOV access ramps, etc. Specific projects, locations, operating characteristics, and levels of service would be evaluated and determined during future system planning and project-level reviews. A list of possible representative projects was included in Appendix A of the *Regional Transit Long-Range Plan Update—Final Supplemental Environmental Impact Statement*.

4.4.2 Draft Priority Project List

Once the “universe of projects” was compiled, screening was done using criteria based on the core priorities to identify a Draft Priority Project List. Approximately 50 representative projects on this list were grouped into several categories:

- Existing system enhancements—Projects that can provide opportunities for improved or additional service along existing HCT corridors such as longer platforms for longer Sounder trains
- Realigned projects—Projects that were voter-approved in *Sound Move* or ST2 but were deferred due to funding limitations that emerged during the Great Recession
- Corridors from the ST2 HCT corridor studies
- Studies and system-wide programs from the 2014 LRP. (The LRP listed three future HCT studies and programs to fund system-wide enhancements for access, innovations, and planning for TOD.)
- Enhancements supporting system expansion—Facilities and services needed to support the Sound Transit system as it expands, such as vehicle purchases and operation and maintenance facilities

The Draft Priority Project list was presented at the June 2015 Board meeting and is shown in Table 2.

Table 2. Draft Priority Project List

No.	Mode	Project Name
North Corridor		
N-01	Light Rail	Everett Station to North Everett
N-02a	Light Rail	Lynnwood Transit Center to Everett Station via the Southwest Everett Industrial Center (Paine Field)
N-02b	Light Rail	Lynnwood Transit Center to Everett Station via I-5 and SR 99/Evergreen Way
N-02c	Light Rail	Lynnwood Transit Center to Everett via I-5
N-03	Commuter Rail	Edmonds Permanent Station
N-04	Light Rail	Infill Light Rail Station: 130th Street (Lynnwood Link)
N-05	Light Rail	Infill Light Rail Station: 220th Street (Lynnwood Link)
P-03	Other	HCT Study: Access and connection on NE 145th Street from State Route 522 to Link Light Rail
P-04	Other	HCT Study: Northern Lake Washington Crossing
Central Corridor		
C-01a	Light Rail	Downtown Seattle to Ballard (Market Street vicinity), primarily at-grade along Elliott and 15th Avenue
C-01b	Light Rail	Downtown Seattle to Ballard (Market Street vicinity), primarily elevated along Elliott and 15th Avenue with tunnel options
C-01c	Light Rail	Downtown Seattle to Ballard (Market Street vicinity), primarily elevated/tunnel options
C-01d	Light Rail	Downtown Seattle to Ballard (Market Street vicinity), primarily at-grade along Westlake Avenue
C-02	Light Rail	Ballard to University District

No.	Mode	Project Name
C-03a	Light Rail	Downtown Seattle to West Seattle/Junction, elevated
C-03b	Light Rail	Downtown Seattle to West Seattle/Junction, at-grade
C-03c	Light Rail	Downtown Seattle to Delridge/White Center
C-04	Light Rail	New Downtown Seattle Light Rail Tunnel Connection
C-05	Light Rail	New Downtown Seattle Light Rail Surface Connection: At-grade
C-06	Light Rail	Downtown Seattle Transit Tunnel existing station passenger capacity improvements
C-07	Light Rail	Transit Tunnel (International District to Northgate) improvements enabling increases in system frequency
C-08	Light Rail	Infill Light Rail Station: Graham Street
C-09	Light Rail	Infill Light Rail station: Boeing Access Road
C-10	Commuter Rail	Infill Sounder Station: Boeing Access Road
C-11	Bus Rapid Transit	Madison Street BRT
East Corridor		
E-01	Light Rail	Overlake Transit Center to SE Redmond to Downtown Redmond (East Link)
E-03	Light Rail	Totem Lake to Issaquah via Bellevue
E-04	Bus	Renton HOV Direct Access/N 8th
P-02	HCT	HCT Study: Issaquah Highlands to Overlake via Sammamish, Redmond
South Corridor		
S-01	Light Rail	Kent/Des Moines to Redondo/Star Lake (272nd) (Federal Way Link)
S-02	Light Rail	Redondo/Star Lake (272nd) to Federal Way (Federal Way Link)
S-03	Light Rail	Federal Way to Tacoma Dome Station via I-5
S-04	Light Rail	Federal Way to Tacoma Dome Station via 99
S-05	Light Rail	Tacoma Dome Station to Tacoma Mall
S-06	Commuter Rail	Expand Sounder South Train Platforms to 8 cars
S-07	Commuter Rail	Additional South Sounder platform extensions (Beyond 8-car extension included in S-06)
S-08	Commuter Rail	Additional South Sounder service
S-09	Commuter Rail	Auburn Station access improvements
S-10	Commuter Rail	Kent Station access improvements
S-11	Light Rail	Tacoma Link Extension
Regionwide/Multi-Corridor		
E-02	Bus Rapid Transit	I-405 BRT: Lynnwood to SeaTac in HOV/managed lanes (North, East, and South corridors)
P-01	Other	Future System Planning (ST4)
R-01	Express Bus	ST Express Service
R-02	Other	Vehicle Purchases
R-03	Other	Maintenance and Storage Facilities
R-04	Other	System Repair and Enhancement
R-05	Other	System Access Program (ped, bike and parking)
R-06	Other	Innovation and Technology Program
R-07	Other	Transit Oriented Development Program
R-08	Other	Agency administration, insurance and reserves

The draft priority project list was available for review by the public, jurisdictions, and stakeholders. Public comment was solicited from June 4, 2015 until July 8, 2015 through an online survey. A flyer was mailed to all households in the Sound Transit district. Public meetings were held in each sub-area and comments from local jurisdictions were solicited through July 15, 2015. More than 70 local governments and organizations submitted comment letters. Almost 25,000 people completed the online survey. More than 4,000 responses were received on the open-ended question on the survey. Additionally, over 1,000 letters and emails were received regarding the draft priority project list.

4.5 Candidate Project List

Several representative project suggestions were received from jurisdictions and the public during the June/July 2015 public outreach process. Those suggestions were examined to see if they had previously been included in the “universe of projects” and screened out. New project suggestions consistent with the LRP and not already screened out were then screened based the core priorities. Representative projects remaining after screening were added to a candidate project list (Table 3).

Table 3. Candidate Project List

No.	Mode	Project Name
North Corridor		
N-01	Light Rail	Everett Station to North Everett
N-02a	Light Rail	Lynnwood Transit Center to Everett Station via the Southwest Everett Industrial Center (Paine Field)
N-02b	Light Rail	Lynnwood Transit Center to Everett Station via I-5 and SR 99/Evergreen Way
N-02c	Light Rail	Lynnwood Transit Center to Everett via I-5
N-03	Commuter Rail	Edmonds Permanent Station
N-04	Light Rail	Infill Light Rail Station: 130th Street (Lynnwood Link)
N-05	Light Rail	Infill Light Rail Station: 220th Street (Lynnwood Link)
N-06	Light Rail	Parking structure for 236th Street aerial station in Mountlake Terrace
N-07	Light Rail	Additional I-5 crossing to the 164th potential future light rail station area
N-08	Light Rail	Additional I-5 crossings to the 128th potential future light rail station area
N-09	Bus Rapid Transit	BRT on SR 523/N.E. 145th St. to connect to Link Station
N-10	Bus Rapid Transit	BRT on SR 522 to the vicinity of UW Bothell
P-03	Other	HCT Study: Access and connection on NE 145th Street from State Route 522 to Link Light Rail
P-04	Other	HCT Study: Northern Lake Washington Crossing
P-08	Light Rail	Study: Light rail on SR 522
Central Corridor		
C-01a	Light Rail	Downtown Seattle to Ballard (Market Street vicinity), primarily at-grade along Elliott and 15th Avenue
C-01b	Light Rail	Downtown Seattle to Ballard (Market Street vicinity), primarily elevated along Elliott and 15th Avenue with tunnel options
C-01c	Light Rail	Downtown Seattle to Ballard (Market Street vicinity), primarily elevated/tunnel options
C-01d	Light Rail	Downtown Seattle to Ballard (Market Street vicinity), primarily at-grade along Westlake Avenue
C-01e	Light Rail	Additional potential station in the vicinity of SR 99 and Harrison St.
C-01f	Light Rail	Additional potential station in Interbay
C-01g	Light Rail	Additional extension and potential station to the Ballard High School/65th St. vicinity

No.	Mode	Project Name
C-01h	Light Rail	Ballard Bridge replacement with Light Rail and bicycle/pedestrian improvements
C-02	Light Rail	Ballard to University District
C-03a	Light Rail	Downtown Seattle to West Seattle/Junction, elevated
C-03b	Light Rail	Downtown Seattle to West Seattle/Junction, at-grade
C-03c	Light Rail	Downtown Seattle to Delridge/White Center
C-04	Light Rail	New Downtown Seattle Light Rail Tunnel Connection
C-05	Light Rail	New Downtown Seattle Light Rail Surface Connection: At-grade
C-06	Light Rail	Downtown Seattle Transit Tunnel existing station passenger capacity improvements
C-07	Light Rail	Transit Tunnel (International District to Northgate) improvements enabling increases in system frequency
C-08	Light Rail	Infill Light Rail Station: Graham Street
C-09	Light Rail	Infill Light Rail station: Boeing Access Road
C-10	Commuter Rail	Infill Sounder Station: Boeing Access Road
C-11	Bus Rapid Transit	Madison Street BRT
C-12	Light Rail	Additional parking at Tukwila International Boulevard (TIB) Station
C-13	Light Rail	West Seattle/Junction to Burien Transit Center
P-05	Light Rail	Study: Light rail extending from West Seattle to Burien and connecting to the spine serving SeaTac/Airport Station
P-06	Light Rail	Study: Light Rail directly linking Burien to Tukwila and Renton.
P-07	Light Rail	Study: Light Rail to Crown Hill from Ballard
P-09	Light Rail	Study: Light Rail from Ballard to Bothell via Greenwood, North Seattle, and Lake City
East Corridor		
E-01	Light Rail	Overlake Transit Center to SE Redmond to Downtown Redmond (East Link)
E-03	Light Rail	Totem Lake to Issaquah via Bellevue
E-04	Bus	Renton HOV Direct Access/N 8th
E-05	Bus	North Sammamish Park and Ride
E-06	Bus Rapid Transit	Bus Rapid Transit/ST Express Bus on the Eastside Rail Corridor from Kirkland to Bellevue
P-02	HCT	HCT Study: Issaquah Highlands to Overlake via Sammamish, Redmond
South Corridor		
S-01	Light Rail	Kent/Des Moines to Redondo/Star Lake (272nd) (Federal Way Link)
S-02	Light Rail	Redondo/Star Lake (272nd) to Federal Way (Federal Way Link)
S-03	Light Rail	Federal Way to Tacoma Dome Station via I-5
S-04	Light Rail	Federal Way to Tacoma Dome Station via 99
S-05	Light Rail	Tacoma Dome Station to Tacoma Mall
S-06	Commuter Rail	Expand Sounder South Train Platforms to 8 cars
S-07	Commuter Rail	Additional South Sounder platform extensions (Beyond 8-car extension included in S-06)
S-08	Commuter Rail	Additional South Sounder service
S-09	Commuter Rail	Auburn Station access improvements
S-10	Commuter Rail	Kent Station access improvements
S-11	Light Rail	Tacoma Link Extension
S-12	Bus	Bus capital enhancements for speed, reliability, convenience along Pacific Avenue (Tacoma)
S-13	Bus	Bus capital enhancements for speed, reliability, convenience along Meridian/SR 161 (Puyallup)

No.	Mode	Project Name
S-14	Bus	Capital enhancements to improve speed and reliability on Traffic Ave. or SR 162 for potential bus connections between east Pierce County cities (Bonney Lake and Orting) and Sounder stations
S-15	Commuter Rail	South Sounder Access Improvements
S-16	Commuter Rail	Commuter rail station and service expansion from McMillan (near Orting) to either Sumner or Puyallup Sounder stations
S-17	Commuter Rail	Sounder expansion to DuPont including a station in the Tillicum neighborhood of Lakewood
Regionwide/Multi-Corridor		
E-02	Bus Rapid Transit	I-405 BRT: Lynnwood to SeaTac /Burien in HOV/managed lanes (North, East, and South corridors)
P-01	Other	Future System Planning (ST4)
R-01	Express Bus	ST Express Service
R-02	Other	Vehicle Purchases
R-03	Other	Maintenance and Storage Facilities
R-04	Other	System Repair and Enhancement
R-05	Other	System Access Program (ped, bike and parking)
R-06	Other	Innovation and Technology Program
R-07	Other	Transit Oriented Development Program
R-08	Other	Agency administration, insurance and reserves

At its August 2015 meeting, the Board passed Motion No. M2015-80 identifying a ST3 candidate project list of representative projects to be considered in the development of a ST3 System Plan and directed staff to complete evaluation of projects on the list.

As stated in the Board motion, evaluation of these representative candidate projects is documented in project templates. The project templates include information about capital and operating costs, maintenance costs, ridership, travel time and reliability, system integration and access, connectivity and mobility, socio-economic benefits and potential risks. The information included in the project templates informed the Board in the development of the ST3 System Plan.

Project templates for candidate projects containing detailed project scope and evaluation results discussed above were presented at the December 4, 2015 Board Workshop. In addition, project summary sheets (see Appendix B) were also prepared to highlight and summarize the results. This information was made available to the public through the Sound Transit 3 website.

Following the workshop, letters were sent to jurisdictions/agencies requesting acknowledgement of project scopes and comments, with responses due back by January 21, 2016. Board members considered this feedback along with all of the information presented at the workshop as they formulated the ST3 Draft Plan.

4.6 ST3 Draft Plan

At its March 24, 2016, meeting the Sound Transit Board identified a ST3 Draft Plan and directed staff to distribute it for public and agency review.

Figure 4 shows the capital projects included in the ST3 Draft Plan. As indicated on the project list (Table 4), the draft plan also includes allocations for planning and engineering studies, various

programmatic or system-wide activities, and funding for existing facilities and services. Summary sheets for projects in the Draft Plan can be found in Appendix C.



Figure 4. ST3 Draft Plan

Table 4. ST3 Draft Plan

Mode	Project Description
North Corridor	
Light Rail	Lynnwood to Everett
Bus Rapid Transit	145th and SR 522 Bus Rapid Transit
Light Rail	HCT Study: Connections from Everett to North Everett
Commuter Rail	North Sounder Parking
Central Corridor	
Light Rail	Ballard to Downtown Seattle
Light Rail	West Seattle to Downtown Seattle
Light Rail	Infill Light Rail Station: Boeing Access Road
Light Rail	Infill Light Rail Station: Graham Street
Light Rail	Infill Light Rail Provisional Station: 130th Street
Bus	King County Metro Rapid Ride C and D Capital Improvements
Light Rail	HCT Study: Light Rail Extending from West Seattle to Burien and extending to the Light Rail Spine
East Corridor	
Light Rail	Redmond Technology Center to SE Redmond to Downtown Redmond (East Link))
Light Rail	Bellevue to Central Issaquah
South Corridor	
Light Rail	Ken/Des Moines to Federal Way Transit Center
Light Rail	Federal Way Transit Center to Tacoma Dome
Light Rail	Tacoma Link Extension to Tacoma Community College
Bus	Bus Capital Enhancements for Speed, Reliability and Convenience along Pacific Avenue (Tacoma)
Bus	Bus Capital Enhancements to Improve Bus Speed and Reliability between East Pierce County and Sumner Sounder Station
Commuter Rail	South Sounder Capital Improvements Program
Commuter Rail	Sounder Expansion to DuPont
Commuter Rail	HCT Study: Commuter Rail to Orting
Regionwide/Multi-Corridor	
Bus Rapid Transit	I-405 Bus Rapid Transit
Bus	Proposed Bus on Shoulder Program: Opportunities along I-5, I-405, SR 518, and SR 167
Express Bus	ST Express Service
Light Rail	HCT Study: Northern Lake Washington
HCT	HCT Environmental Study: Bothell to Bellevue via Kirkland
HCT	Improved Passenger Amenities at Stations and Stops
Policies and Programs	System Access Program (Pedestrian and bicycle access, bicycle parking, transit)
Policies and Programs	Transit-Oriented Development Planning Program
Policies and Programs	Innovation and Technology Program
Policies and Programs	Future System Planning (ST4)

4.7 ST3 Plan

[Placeholder] With approval of Resolution R2016-XX on June 23, 2016, the Sound Transit Board adopted the Sound Transit 3 Regional Transit System Plan for the Central Puget Sound Region (the ST3 Plan). As listed below, the Board approved the ST3 plan narrative, system map, and a set of related appendices as part of Resolution R2016-XX:

- Sound Transit 3, The Regional Transit System Plan for Central Puget Sound (ST3 Plan narrative and system map)
- Appendix A: Detailed Description of Facilities and Estimated Costs
- Appendix B: Financial Policies
- Appendix C: Benefits, Costs, Revenues, Capacity, Reliability, and Performance Characteristics by Mode
- Appendix D: Social, Economic and Environmental Impacts, and Integration with Regional Land Use

The ST3 Plan system map is shown in Figure 5. The projects that were included in the ST3 Plan are identified in Table 5.

<<insert ST3 System Plan map>>

Figure 5. ST3 Plan [Placeholder]

Table 5. ST3 Plan Projects [Placeholder]

Mode	Project Description

4.7.1 ST3 Plan Conformance to the Metropolitan Transportation Plan

[Placeholder] The PSRC found that the ST3 Plan conformed to the current Metropolitan Transportation Plan (also known as *Transportation 2040*) and VISION 2040. Conformance is documented in this report: “[Placeholder].”

4.7.2 Commuter Rail Analysis

[Placeholder: Description of how the requirements of RCW 81.104.120 were met for the Sounder extension from Lakewood to DuPont.]

5 Capital Cost Estimates

This section summarizes the methodology used for developing capital cost estimates for ST3 projects, which is documented in detail in the report: *System Plan Development (ST3): Capital Cost Estimating Methodology, Draft, February 2016*.

5.1 Purpose

The purpose of the cost estimation phase of ST3 is to identify the likely capital and operations and maintenance costs of projects such that an adequate funding plan can be developed for the project/program implementation. This report documents the approach to capital cost estimation. The capital cost estimating methodology described in this document acknowledges the varying degrees of design available for potential ST3 projects, takes advantage of ST experience in estimating and building similar facilities, and focuses cost estimating resources on the largest projects with the greatest potential to impact the overall cost estimate for the ST3 program.

5.2 Cost Categories

The capital cost estimating methodology is structured to comply with the Federal Transit Administration (FTA) Standard Cost Categories (SCC) for Major Capital Projects. Use of the FTA SCC format has the benefit of presenting the capital cost estimates in an industry-recognized format that requires consideration of all project components known to drive costs.

The general cost categories defined in the FTA SCC are as follows:

- 10 Guideway and Track Elements
- 20 Stations, Stops, Terminals, Intermodal
- 30 Support Facilities: Yards, Shops, Administration Buildings
- 40 Sitework and Special Conditions
- 50 Systems
- 60 Right-of-Way, Land, Existing Improvements
- 70 Vehicles
- 80 Professional Services
- 90 Unallocated Contingency
- 100 Finance Charges

5.3 General Approach to Estimating Capital Costs

Each project developed for system planning had conceptual alignment drawings, potential station locations, and/or written descriptions prepared that provided needed definition for each of the major cost components. These documents form the basis for identifying various composite cost elements used to prepare the capital cost estimates.

These facility elements can be classified into one of two broad groups, either non-typical, unique facilities or typical composite cost elements. A unique facility cost was developed based on specific conceptual engineering and design of the facility under consideration. One example is the operations and maintenance facility. The cost of such a facility is highly dependent on the operational and maintenance requirements for that particular location in addition to the site's geographical

constraints. The number of vehicles to be stored, type of maintenance to be performed, and the topographical conditions of a particular location do not lend itself to a “typical” per-square-foot cost approach.

Typical facility costs are developed for elements that can be reasonably defined by a typical cross-section and applied over a given length of an alignment. The typical facility composite unit cost is developed by combining the costs for all of the individual construction elements applicable to a given typical section or facility and then creating a representative composite unit cost. Typical sections or facilities composite unit costs have been developed for other recent Sound Transit corridor studies. These unit costs were reviewed and updated to 4th quarter 2014 dollars and can be found in the Unit Cost Library.

In some cases a typical facility was based on a conceptual scope of work developed as appropriate for a specific type of facility that is not linear, for example a typical parking garage. The cost for a typical parking garage would be developed and then translated into a unit cost per stall.

After quantities are prepared for both typical and non-typical facilities and the cost data is developed, it was put into the cost estimate based on the stationing of the alignment for each alternative. This format relates the cost directly to the alignment drawings and assists in summarizing costs, as well as in the analysis of various alignment alternatives.

The following describes the process used to develop scope, quantity, and cost parameters for each composite cost item used (for SCC 10 through 50) in the estimate:

- **Scope**—For most cost items, the scope was determined by an evaluation of the discrete construction items or activities that could reasonably be associated with that cost item based on a review of the system planning drawings prepared for identified projects.
- **Quantities**—Construction items and their related quantities were developed from the system planning drawings and/or associated technical reports. Direct measurements from drawings and mathematical calculations used in the technical reports were used to prepare quantities for significant construction items in the cost estimates. Some quantities were estimated by the use of allowances or other indirect means for items where there is not sufficient detail to perform a direct quantity takeoff at the system planning level.
- **Cost**—Unit prices for each of the construction items or activities were developed utilizing the commercial cost estimating database software Timberline. Unit prices were then applied to the unit quantities identified for each cost item to produce an overall unit price for each element. For some minor lump sum items or items where the scope of work cannot be readily determined, an allowance cost was used.
- **Contingencies**—Design Allowance markups, typically greater than 20 percent, were added to the estimate based on direction from Sound Transit.
- **Reserve**—A reserve, established at 7% by Sound Transit, is applied to the fully marked up project cost. The project cost with reserve establishes the high end of the cost estimate range reported for the project.

5.4 Exclusions

The following are not included in the Capital Cost Estimates:

- Specific project mitigation measures, unless identified in SCC 10 through 50 by Sound Transit
- Escalation to Year of Expenditure
- Operations and maintenance costs (O&M) (see next section)

6 Operations and Maintenance Cost Estimates

This section summarizes the methodology used for developing O&M cost estimates for ST3 projects and services, which is documented in detail in the report: *ST3 Regional High-Capacity Transit System Plan: Operations and Maintenance Cost Methodology, Draft, April 2015*.

6.1 General Approach

6.1.1 Sound Transit O&M Cost Models

Sound Transit's finance staff maintains detailed capital and O&M cost models that are consistent with FTA New Starts guidance on cost allocation. These cost build-up models are updated at least once per year based on actual experience. Sound Transit staff uses these cost models to estimate long-term annual O&M costs for Sound Transit's four current transit technologies (e.g., ST Express bus, Sounder commuter rail, and Tacoma Link and Central Link light rail). Model inputs (or "drivers") are those variables that are most influential in projecting the incremental changes to the future costs of different-sized systems. An example of a variable that drives rail operator labor costs is train-hours.

This report does not provide detail on the ST cost model itself. However, Appendix A provides copies of the input-output sheets for each transit technology that is included in the cost model.

6.1.2 O&M Cost Estimates for HCT Corridor Studies

In 2013 and 2014, Sound Transit estimated annual O&M costs for eight conceptual-level HCT corridor studies to inform the December 2014 update of the agency's Long-Range Plan. These costs were estimated by a supplemental planning model that was based on the agency's O&M cost model.

ST finance staff developed costs for each representative alignment carried into Level 2 of evaluation, except for earlier work on the Federal Way to Tacoma study, which used estimates based on the Lynnwood Link and Federal Way extensions. Estimated annual O&M costs were based on existing Sound Transit light rail, commuter rail, and express bus operating costs.

Staff and corridor study consultants agreed upon key service assumptions, such as headways and layover time. Costs were reported in 2013 or 2014 constant dollars depending on reporting dates for each study.

6.1.3 O&M Cost Development for ST3

The ST3 process identified and evaluated a wide range of projects for potential funding. The annual O&M cost for each project was developed by ST finance staff through the use of its O&M cost model and supplemental planning model, depending on the project. The cost estimate for a particular project was, in part, based on estimated input quantities (e.g., estimated service hours) for that project.

As described in the following sections, the O&M costs for ST3 system planning were developed using a planning-level methodology similar to the HCT corridor studies.

6.2 Light Rail and Rapid Streetcar

6.2.1 Light Rail

Light rail O&M cost estimates were based on existing Link service costs. Inputs are listed below. Major cost drivers can be organized by the profile of the alignment (elevated, at-grade, or below-grade) and include the labor costs of O&M; fuel and electricity; parts; heating, ventilation, and air conditioning (HVAC) where needed; security and fare enforcement; insurance; and operating the O&M facilities themselves.

6.2.2 Rapid Streetcar

The *Ballard to Downtown HCT Corridor Study* was performed during 2013-2014 in conjunction with the City of Seattle. The city's Transit Master Plan recommends rapid streetcar for this corridor. This is generally defined as a streetcar vehicle using exclusive guideway segments and transit signal priority to achieve faster running speeds and more reliable service than that typically achieved by streetcars. ST finance staff used costs for operating Tacoma Link as a proxy for this type of service using the same inputs as for other rail modes. This methodology was also used for additional rapid streetcar project concepts.

6.2.3 Inputs for Rail Modes

Based on the planning-level assumptions for each project, O&M cost inputs for commuter rail, light rail, and rapid streetcar were based on the characteristics listed below. ST finance staff has identified these as the key cost drivers for annual O&M costs. From the inputs below, Sound Transit is able to determine estimated labor costs, fuel/electricity, insurance, and other major drivers using its existing cost build-up models for Central Link, Tacoma Link, and Sounder service:

- Track miles, by profile (elevated, at-grade, and below-grade)
- Number of stations, by profile (elevated, at-grade, and below-grade)
- Number of anticipated support facilities, such as maintenance facilities
- Operating statistics, including:
 - Headways, in minutes
 - Number of vehicles in peak service
 - Number of vehicles in reserve
 - Annual platform vehicle hours
 - Number of vehicles per train
 - Annual platform train hours
 - Ridership (annual boardings by station)

6.3 Commuter Rail

Sound Transit finance staff based costs for commuter rail on those for the agency's active Sounder lines and current contracts with BNSF Railway and Amtrak for operations and maintenance, respectively. Depending on the corridor and project, all-day and/or peak-only 30-minute service were generally evaluated. The resulting annual O&M cost estimates should bookend the cost of providing a new service operated by Sound Transit. A list of O&M cost drivers for all rail modes is provided in the Section 6.2.3.

6.4 BRT and Regional Express Bus

6.4.1 BRT and Regional Express Bus Service

ST finance staff used an estimated cost per service hour of \$155 (2014\$) to estimate BRT and regional express bus fleet O&M. This hourly rate is based on existing contracts with King County Metro. This figure, consistent with Sound Transit's financial plan, was assumed to be a conservative measure that incorporates security and other expenses not readily apparent from the operating characteristics of each line.

6.4.2 O&M Costs for BRT Facilities

Where applicable, ST3 O&M cost estimates include costs for maintaining elevated guideways suitable for high-end BRT, which Sound Transit does not currently operate. The costs incorporate the additional cost of maintaining other new structures and stations for fully exclusive rights-of-way. During the HCT Corridor Study phase, ST finance staff evaluated the costs of stations and BRT guideways by profile (elevated, at-grade, and below-grade) to identify these associated costs, including maintenance of way, vertical circulation, HVAC, etc., where necessary. Along with off-board fare collection and fare inspection costs, these facilities costs were added to the cost-per-service-hour calculation to estimate the full cost of an ST3 BRT system that would provide a higher quality of service and exclusivity than ST's regional express buses.

7 Transit Ridership Forecasting

This section summarizes the methodology used for transit ridership forecasting for ST3. The methodology is documented in detail in the *Transit Ridership Forecasting Methodology Report, March 2015*. The current version of the ST ridership model was developed using analytical ridership forecasting procedures refined over two decades of incremental methods applications. Over this time period, the methods have been subjected to substantial external review, including two independent Expert Review Panels, and three cycles of review by the FTA over the course of New Starts grant applications for Link light rail projects. The third review cycle was in support of the proposed New Starts grant for the Lynnwood Link Extension.

These reviews have included comments FTA provided with respect to the ST incremental modeling procedures and assumptions described in earlier versions of the methodology report. The report incorporates changes reflecting all of FTA's comments. The following presents a brief history of ST transit ridership forecasting.

7.1 History of Transit Forecasting at Sound Transit

The history of transit forecasting analysis at ST began at Seattle Metro (now King County Metro) in 1986. Work by Brand and Benham¹ led to Metro's consideration of "a quick-responsive incremental travel demand forecasting method" based on the concept of staged forecasting analysis. In 1986, Metro developed and applied "logit mode-choice equations for pivot-point analysis"² (as described by Ben-Akiva and Atherton³; Koppelman⁴; Nickesen, Meyburg and Turnquist⁵; and many others) on EMME software. In 1988, Metro staff highlighted the relationship⁶ between Metro's transit forecasting methods and the Puget Sound Council of Governments (PSCOG) regional model.

The Regional Transit Project (RTP), incorporated as Sound Transit in 1993, further developed forecasting analysis procedures using incremental methods in the early 1990s, prior to the November 1996 voter approval of financing for *Sound Move: The Ten-Year Regional Transit Plan*. An Expert Review Panel—formed in 1990 under the auspices of the Legislative Transportation Committee, the Secretary of Transportation, and the Governor—oversaw development of the first generation of the ST incremental model. This model is described in the November 1993 *Travel Forecasting Methodology Report* published by the RTP.

The ST model was updated in the late 1990s in support of the *Central Link Light Rail Transit Project EIS* and the *North Link Light Rail Transit Project Supplemental EIS*, including respective Full Funding Grant Agreements with FTA. The underlying ST model procedures used to perform transit ridership forecasting analysis in support of the North Link Light Rail Projects were documented in the *Transit Ridership Forecasting Technical Report*, issued in November 2003 by ST.

¹ Brand, D., and J.L. Benham, "Elasticity-Based Method for Forecasting Travel on Current Urban Transportation Alternatives," Transportation Research Record No. 895, 1982.

² Harvey, R., "Pivot-Point Analysis of Transit Demand Using EMME/2," an Internal Paper, Municipality of Metropolitan Seattle, May 1986.

³ Ben-Akiva, M. and T. Atherton, "Methodology for Short-Range Travel Demand Predictions," Transportation Economics and Policy, v.7, 1977.

⁴ Koppelman, F., "Predicting Transit Ridership in Response to Transit Service Changes," ASCE 109, 1983.

⁵ Nickesen A., A. Meyburg, and M. Turnquist, "Ridership Estimation for Short-Range Transit Planning," Transportation Research B, v.17B, 1983.

⁶ Harvey, R., "Comparison of Metro and PSCOG Modeling" a Memorandum to File, March 7, 1988.

The ST model was further updated in the mid-2000s in support of the ST Phase 2 expansion program and subsequently in 2012 for the EIS phases of the Lynnwood Link Extension.

The ST model was updated again in 2015 in support of the ST3 Regional High-Capacity Transit System Plan. The methodology report cited above describes this latest update.

7.2 Sound Transit Incremental Planning Model

For ST3 system planning, the ST incremental model was updated to a new base year (2014). Development of the base-year transit-trip tables involved a rigorous analysis of actual ridership volumes along each transit route and a realistic simulation of observed transit service characteristics for peak and off-peak periods.

For future year forecasts, external changes in demographics, highway travel time, and costs are distinctly incorporated into the process in stages, prior to estimating the impacts of incremental changes in transit service.

In the first stage of ridership forecasting analysis, only changes in PSRC land use forecasts are considered. In the second stage, other external non-transit changes, such as highway travel time (congestion), costs (including parking costs), and household income, are taken into consideration. For forecasts of external changes, the ST model relies on the version of the PSRC regional model in current use by the Washington State Department of Transportation (WSDOT) on major highway projects. The first two stages of ridership forecasting analysis result in a forecast of future year zone-to-zone transit trips within the RTA district boundaries, absent any changes in the transit system itself. For current year analyses, these first two stages are not necessary.

In the third and final stage, incremental changes in the transit level of service (e.g., access, wait, and ride travel times) and user costs (e.g., fares) are considered, resulting in final transit demand estimates for each transit network alternative under consideration.

Like all travel forecasting models, the ST model has some limitations. Because it uses average daily ridership, it is not particularly strong at assessing the effects of weekend special events, such as sports games or major festivals. Furthermore, the ST model is not well-suited for analyzing structural changes in regional land use beyond those already included in PSRC demographic forecasts or for forecasting in outlying areas of the three-county region where there is minimal existing transit service. Finally, the model does not explicitly take into account any differences in safety, comfort, or user friendliness among various public transportation modes.

7.3 Summary Comparisons of the ST and PSRC Models

PSRC maintains a four-step conventional synthetic travel-demand modeling system consisting of trip generation, trip distribution, mode choice, and trip assignment models.⁷ Zonal trip ends are estimated using a set of trip rates classified by home-based work, home-based college, home-based shop, home-based other, home-based school, non-home-based work, non-home-based other, and three truck types. Trip distributions are estimated using a traditional “gravity” model. The PSRC mode-choice model structure is a logit-based model comprised of two transit modes, three auto modes, and two non-vehicle modes.

⁷ Puget Sound Regional Council “4K Model Version 4.03,” Draft Model Documentation, June 2015.

The ST and PSRC modeling procedures are closely inter-related and highly complementary. The ST model uses measures of regional change in travel demand and highway congestion derived from the PSRC model. Summary comparisons and interrelationships of the PSRC and ST modeling procedures are highlighted below:

- The PSRC model is a four-county synthetic modeling system comprising land use, trip generation, trip distribution, modal split, and assignment models. It also includes several feedback loops based on intra-regional accessibility.
- The ST model is a three-county, three-stage, fully incremental system purposely designed for detailed corridor-level transit planning and transit ridership forecasting.
- PSRC's regional population and employment forecasts are used to predict travel demand growth for future years.
- ST uses PSRC's time and cost coefficients for its mode choice model.
- The current PSRC model version used by WSDOT for travel and toll forecasting in support of major highway projects is adopted for interface with the ST model. This highway model has been recently refined and validated for use on several WSDOT tolling analyses.

7.4 Considerations and Constraints

There are certain considerations and constraints to be taken into account in travel forecasting methods. Most of these are derived from many years of FTA guidelines on transit project planning that culminated in the current policy guidance.⁸ The following considerations reemphasize the use of best professional practice:

- Careful standards for validation
- Consistent application of policy assumptions across alternatives
- Use of identical land use plans and constant overall travel demand patterns across alternatives
- Generic attributes of modes
- Analysis of service levels and travel forecasts for reasonableness
- Weakness of future year forecasts relying on inputs that are themselves forecasts

Sound Transit has taken these considerations and constraints into account in developing the ST3 system plan.

⁸ New and Small Starts Evaluation and Rating Process—Final Policy Guidance, August 2013.

8 Financial Plan

[Placeholder] This section briefly summarizes the financial plan for the ST3 Plan, which is described in detail in two of the Plan appendices, namely *Appendix A: Detailed Description of Facilities and Estimated Costs, June 2016* and in *Appendix B: Financial Policies, June 2016*. Along with the Plan, the Board approved the Plan appendices by Resolution R2016-XX on June 23, 2016. These appendices identify the estimated costs for the projects and programs included in the ST3 Plan and describe the agency’s financial policies. The appendices also describe the sources and uses of funds for the Plan.

8.1 Methodology for Financial Plan—Sources and Uses Summary for ST3

[Placeholder] [Body Text]

9 Candidate Project and System Plan Evaluation

This section summarizes the candidate project and system plan evaluation methodology for ST3. This methodology is documented in the report: *Evaluation Methodology Report, July 2015* and further refined in the *Evaluation Results Memorandum, April 2016*.

9.1 Summary of Overall Evaluation and Screening Process

The grouping and evaluation of projects to be included in ST3 has occurred within the context of Sound Transit's overall Long-Range Plan. During the development and adoption of the agency's Long-Range Plan (including the 2014 update), Sound Transit made a number of strategic decisions regarding topics such as the addition of new corridors, technology choices for critical corridors, and the role of supporting facilities and projects. These decisions shape the number and types of projects that were carried forward into the ST3 evaluation process. During ST3, this initial list of projects was narrowed down to a set of new and enhanced existing facilities and services that meet the overall principles, goals and objectives of the agency.

The ST3 evaluation methodology serves the following purposes:

- Provides structure to the evaluation process
- Documents the process for determining the draft priority project and candidate project lists
- Establishes the method for evaluating projects and comparing different groups of projects
- Develops a systematic process for organizing information regarding potential benefits, impacts and costs
- Identifies a systematic process for organizing information regarding potential benefits, effects, and costs
- Provides decision makers with a procedure for identifying key differences among packages of projects
- Ensures consistency in the evaluation of packages of projects

9.2 Core Priorities for Development of the System Plan

Core priorities identified by the Sound Transit Board for development of the system plan are listed below. These core priorities are based on the LRP goals and objectives and provide a policy basis for the project and system evaluation. The ST3 planning process must:

- Complete the Link light rail spine (North Everett to Tacoma Mall, and from downtown Seattle to downtown Redmond)
- Increase ridership
- Connect the region's designated centers with HCT
- Promote transit-friendly land uses and supporting TOD
- Advance "Logical Next Steps" projects beyond the spine within financial capacity

- Promote socioeconomic equity
- Integrate with other transit operators/transportation systems
- Improve multi-modal access

9.3 Process of Candidate Project and Draft System Plan Project Evaluation

Following the update of the Long-Range Plan in December 2014, Sound Transit began working to identify specific projects and services to evaluate for ST3. After development of a draft priority project list and an extensive public involvement process with local jurisdictions and members of the public, in August 2015, the Sound Transit Board identified a list of 75 candidate projects for further study. As Sound Transit began developing the projects' scopes and other information required for the evaluation process, it also began detailing the evaluation framework, described below.

Candidate Project Evaluation: Sound Transit evaluated 75 candidate projects as part of the ST3 development process between August 2015 and December 2015. Project evaluation was completed using the following 12 measures based on the Core Priorities:

- Regional Light Rail Spine
- Ridership
- Capital Cost
- Annual O&M Cost
- Travel Time
- Reliability
- System Integration
- Ease of Non-motorized Access
- Percent of Non-motorized Mode of Access
- Connections to PSRC-designated Regional Centers
- Land Use and Development/TOD Potential
- Socioeconomic Benefits

The results of candidate project evaluation are documented in the *Evaluation Results Memorandum, April 2016* as well as the individual candidate project templates on the ST3 website.

Draft System Plan Project Evaluation: Following the presentation of candidate project evaluation results at the December 2015 Board meeting, the Sound Transit Board selected 31 projects for inclusion in the Draft ST3 System Plan. These projects were evaluated using the same 12 measures used to evaluate the candidate projects.

The results of draft plan project evaluation are documented in the *Evaluation Results Memorandum, April 2016* as well as the individual draft plan project templates on the ST3 website. ST3 project evaluation continued until adoption of the updated ST3 Plan in [Placeholder].

10 Conclusions

As this document has illustrated, Sound Transit has followed the state-mandated requirements for system planning in developing the regional high-capacity transportation system plan ST3. Sound Transit developed and evaluated a range of service policies and options, including Do-Nothing, Low Capital, and High Capital options. Sound Transit developed reports describing the analysis methods, assumptions, and results for the estimation of capital costs, O&M costs, methods for travel forecasting, a financial plan, and an evaluation methodology. Sound Transit therefore meets the provisions as detailed in RCW 81.104.100. Sound Transit also completed the planning and analysis requirements for additional commuter rail service, as set out in RCW 81.104.120.

Implementation of the voter-approved ST3 system plan over the next 25 years will expand regional HCT services that conform to and support the region's adopted growth and transportation goals and objectives.

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Appendix A: Expert Review Panel—Documentation of 2015-16 ST3 System Plan Review

<insert ERP letter(s)>

Appendix B: Candidate Project Summary Sheets

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ST3 CANDIDATE PROJECT:

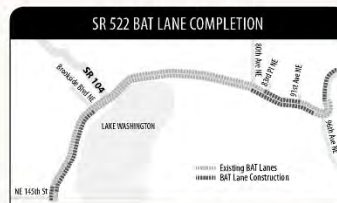
145TH ST & SR 522 BUS RAPID TRANSIT

Corridor Options

- Bus operates in Business Access Transit (BAT) lanes



Date Last Modified: 11-25-2015



OPTION 1	OPTION 2
Length: 8.0 Miles	Length: 8.0 Miles
ST3 Candidate Project N-09a + N-10	ST3 Candidate Project N-09b + N-10
NO	NO
7,000—8,000	7,000—8,000
\$360—\$386	\$416—\$446
\$12.16	\$12.24
28	27
MEDIUM	MEDIUM
MEDIUM	MEDIUM
MEDIUM-LOW	MEDIUM-LOW
25—35%	25—35%
0 CENTERS	0 CENTERS
MEDIUM-LOW	MEDIUM-LOW
MEDIUM	MEDIUM
7 / 9	7 / 9
2 / 3	2 / 3
9 / 12	9 / 12
33% / 12%	33% / 12%
23,700 / 29,800	23,700 / 29,900
6,800 / 10,100	6,900 / 10,200

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

ST3 CANDIDATE PROJECT:

LYNNWOOD TO EVERETT LIGHT RAIL

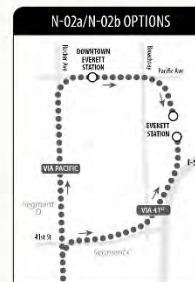
Corridor Options



MAP KEY
 — AT GRADE
 ELEVATED
 ○ STATION AREA
 — LIGHT RAIL ST2
 ● ST2 LRT STATION



Alignments and stations shown are representative and are identified for purposes of cost estimating, ridership forecasting and other evaluation measures.



REGIONAL LIGHT RAIL SPINE

RIDERSHIP (DAILY PROJECT RIDERS)

CAPITAL COST (2014 \$ M)

ANNUAL O&M COST (2014 \$ M)

TRAVEL TIME (MIN)

RELIABILITY

SYSTEM INTEGRATION

EASE OF NON-MOTORIZED ACCESS

PERCENT OF NON-MOTORIZED ACCESS

CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS

PLANS AND POLICIES

MARKET SUPPORT

LAND USE AND DEVELOPMENT/TOD POTENTIAL

POP PER ACRE (2014/2040)

ACTIVITY UNITS EMP PER ACRE (2014/2040)

POP + EMP PER ACRE (2014/2040)

MINORITY/LOW-INCOME

SOCIOECONOMIC BENEFITS

POPULATION (2014/2040)

EMPLOYMENT (2014/2040)

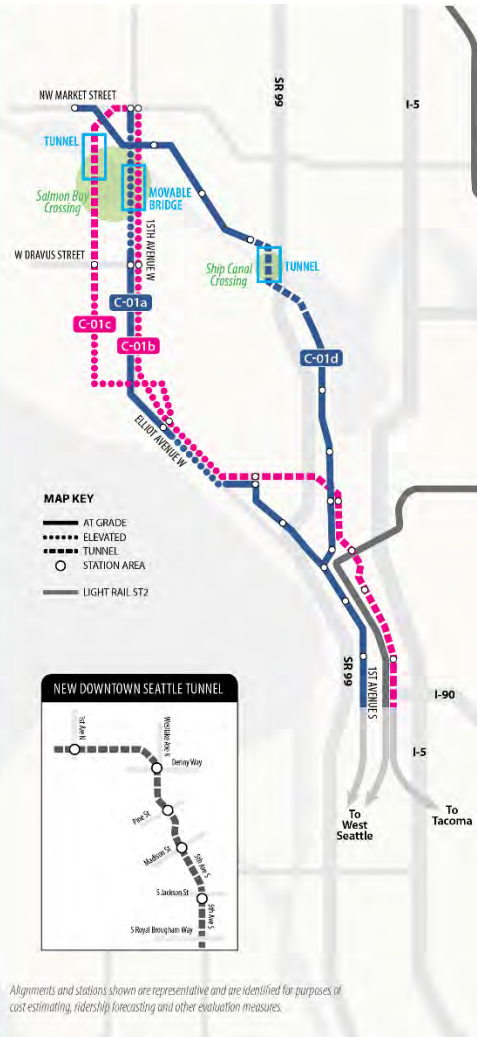
OPTION 1		OPTION 2		OPTION 3
Via SW Everett Industrial Center		Via SR 99 / Evergreen Way		Via I-5
ST3 Candidate Project N-02a		ST3 Candidate Project N-02b		ST3 Candidate Project N-02c
Length: 15.7 Miles	Length: 15.1 Miles	Length: 14.0 Miles	Length: 13.5 Miles	Length: 12.6 Miles
Via Pacific Avenue	Via 41st Street	Via Pacific Avenue	Via 41st Street	---
YES	YES	YES	YES	YES
43,000—58,000	43,000—58,000	42,000—54,000	42,000—54,000	42,000—56,000
\$4,643—\$4,969	\$4,460—\$4,773	\$4,266—\$4,566	\$3,987—\$4,267	\$2,902—\$3,104
\$83.42	\$77.93	\$75.57	\$70.21	\$58.07
38	35	34	31	25
HIGH	HIGH	HIGH	HIGH	HIGH
MEDIUM	MEDIUM	MEDIUM-HIGH	MEDIUM-HIGH	MEDIUM-HIGH
MEDIUM-LOW	MEDIUM-LOW	MEDIUM-LOW	MEDIUM-LOW	MEDIUM-LOW
20—80%	20—80%	20—80%	20—80%	20—80%
3 CENTERS	3 CENTERS	2 CENTERS	2 CENTERS	2 CENTERS
MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM
MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM
8 / 13	8 / 12	9 / 16	9 / 14	7 / 13
6 / 11	5 / 10	6 / 12	5 / 10	6 / 12
14 / 24	13 / 22	15 / 28	14 / 24	13 / 25
40% / 18%	41% / 17%	42% / 18%	43% / 18%	40% / 15%
41,500 / 70,300	38,100 / 59,600	44,300 / 73,800	41,800 / 64,200	21,900 / 38,300
31,100 / 58,600	25,800 / 47,300	29,000 / 55,400	23,700 / 44,300	17,900 / 34,000

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

Date Last Modified: 11-25-2015

Release Date: 12-04-2015

ST3 CANDIDATE PROJECT: BALLARD TO DOWNTOWN SEATTLE LIGHT RAIL Corridor Options



* APPROXIMATELY HALF OF RIDERSHIP SHOWN FOR C-01b AND C-01c TRAVEL SOLELY WITHIN THE BALLARD-IDS SEGMENT

** ENTIRE ALIGNMENT OF C-01b IN EXCLUSIVE RIGHT-OF-WAY. RELIABILITY COULD BE AFFECTED BY MOVABLE BRIDGE OVER SALMON BAY.

REGIONAL LIGHT RAIL SPINE		OPTION 1	OPTION 2	OPTION 3	OPTION 4
RIDERSHIP (DAILY PROJECT RIDERS)		NO	NO	NO	NO
CAPITAL COST (2014 \$ M)		44,000—54,000	102,000—133,000*	102,000—133,000*	39,000—48,000
ANNUAL O&M COST (2014 \$ M)		\$1,827—\$1,955	\$4,391—\$4,699	\$4,960—\$5,307	\$1,725—\$1,846
TRAVEL TIME (MIN)		23	18	19	25
RELIABILITY		MEDIUM-HIGH	MEDIUM-HIGH**	HIGH	MEDIUM-HIGH
SYSTEM INTEGRATION		MEDIUM-HIGH	HIGH	HIGH	MEDIUM-HIGH
EASE OF NON-MOTORIZED ACCESS		MEDIUM-HIGH	MEDIUM-HIGH	MEDIUM-HIGH	MEDIUM-HIGH
PERCENT OF NON-MOTORIZED ACCESS		75—85%	75—85%	75—85%	75—85%
CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS		3 CENTERS	4 CENTERS	4 CENTERS	3 CENTERS
PLANS AND POLICIES		MEDIUM	MEDIUM-HIGH	MEDIUM-HIGH	MEDIUM-HIGH
MARKET SUPPORT		HIGH	HIGH	HIGH	HIGH
POP PER ACRE (2014/2040)		21 / 30	22 / 33	22 / 33	22 / 30
EMP PER ACRE (2014/2040)		64 / 94	65 / 98	65 / 97	62 / 94
POP+EMP PER ACRE (2014/2040)		85 / 124	87 / 131	87 / 130	84 / 124
MINORITY/LOW-INCOME		30% / 17%	32% / 17%	32% / 17%	28% / 16%
POPULATION (2014/2040)		55,600 / 78,300	69,600 / 105,900	69,500 / 105,900	64,500 / 90,000
EMPLOYMENT (2014/2040)		170,500 / 249,800	206,400 / 310,300	205,300 / 308,500	183,200 / 277,100

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

Date Last Modified: 11-25-2015

Release Date: 12-04-2015

ST3 CANDIDATE PROJECT:

WEST SEATTLE TO DOWNTOWN SEATTLE LIGHT RAIL

Corridor Options



	REGIONAL LIGHT RAIL SPINE
	RIDERSHIP (DAILY PROJECT RIDERS)
	CAPITAL COST (2014 \$ M)
	ANNUAL O&M COST (2014 \$ M)
	TRAVEL TIME (MIN)
	RELIABILITY
	SYSTEM INTEGRATION
	EASE OF NON-MOTORIZED ACCESS
	PERCENT OF NON-MOTORIZED ACCESS
	CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS
PLANS AND POLICIES	
MARKET SUPPORT	
	POP PER ACRE (2014/2040)
	ACTIVITY UNITS EMP PER ACRE (2014/2040)
	POP+EMP PER ACRE (2014/2040)
	MINORITY/LOW-INCOME
	POPULATION (2014/2040)
	EMPLOYMENT (2014/2040)

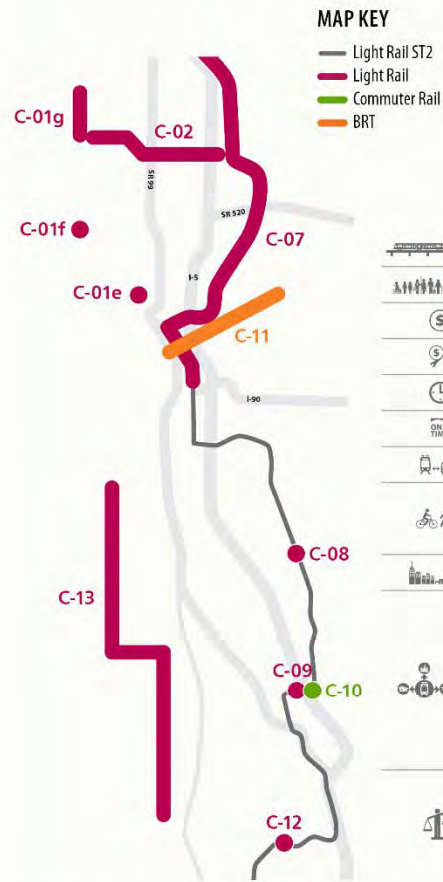
OPTION 1	OPTION 2	OPTION 3
Tunnel thru Downtown Elevated to West Seattle Junction	At-Grade thru Downtown Elevated to West Seattle Junction	Tunnel thru Downtown Elevated to Delridge/At-Grade to White Center
Length: 4.7 Miles	Length: 4.4 Miles	Length: 6.5 Miles
ST3 Candidate Project C-03a	ST3 Candidate Project C-03b	ST3 Candidate Project C-03c
NO	NO	NO
39,000—50,000	20,000—24,000	34,000—40,000
\$1,740—\$1,862	\$1,851—\$1,980	\$1,913—\$2,047
\$24.48	\$20.81	\$33.54
11	11	18
HIGH	MEDIUM-HIGH	MEDIUM-HIGH
MEDIUM-HIGH	MEDIUM	MEDIUM
MEDIUM-LOW	MEDIUM-LOW	MEDIUM-LOW
75—85%	70—80%	70—80%
2 CENTERS	2 CENTERS	2 CENTERS
MEDIUM-LOW	MEDIUM-LOW	MEDIUM-LOW
MEDIUM	MEDIUM	MEDIUM
7 / 10	7 / 9	7 / 10
13 / 19	13 / 19	11 / 17
20 / 29	20 / 28	18 / 27
28% / 12%	27% / 13%	54% / 18%
14,900 / 21,300	13,500 / 19,600	16,700 / 22,900
27,300 / 39,400	27,200 / 38,600	25,900 / 37,800

Date Last Modified: 12-03-2015

Release Date: 12-04-2015

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

ADDITIONAL CENTRAL ST3 CANDIDATE PROJECTS SHEET 1 OF 2



Alignments and stations shown are representative and are identified for purposes of cost estimating, ridership forecasting and other evaluation measures.

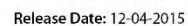
ST3 Candidate Project C-01e	ST3 Candidate Project C-01f	ST3 Candidate Project C-01g	ST3 Candidate Project C-02	ST3 Candidate Project C-07	ST3 Candidate Project C-08
Additional potential light rail station in the vicinity of SR 99 and Harrison Street	Additional potential light rail station in Interbay	Additional LRT extension and potential station to the Ballard High School/65th Vicinity	Ballard to University District LRT	Transit Tunnel (International District to Northgate) improvements enabling increases in system frequency	Infill Light Rail Station: Graham Street
NO	NO	NO	NO	YES	NO
2,500—3,500	< 1,000	4,000—5,000	19,000—24,000	N/A	3,000—4,000
\$367—\$393	\$90—\$97	\$351—\$375	\$2,939—\$3,145	\$20—\$21	\$66—\$71
\$2.37	\$1.30	\$2.53	\$17.16	N/A	\$1.63
0.7	0.7	2	7	N/A	0.7
N/A	N/A	HIGH	HIGH	N/A	N/A
MEDIUM-HIGH	LOW	MEDIUM	MEDIUM-HIGH	N/A	MEDIUM-LOW
MEDIUM	MEDIUM-LOW	MEDIUM-HIGH	MEDIUM-HIGH	N/A	MEDIUM
70—80%	70—80%	70—80%	70—80%	N/A	70—80%
2 CENTERS	1 CENTER	0 CENTERS	2 CENTERS	N/A	0 CENTERS
HIGH	MEDIUM-LOW	MEDIUM	MEDIUM-HIGH	N/A	MEDIUM
HIGH	MEDIUM	MEDIUM	MEDIUM-HIGH	N/A	MEDIUM
20 / 30	9 / 11	20 / 26	21 / 27	N/A	16 / 20
45 / 77	7 / 10	9 / 13	15 / 23	N/A	3 / 4
81 / 122	17 / 21	29 / 38	36 / 50	N/A	19 / 24
32% / 15%	17% / 7%	15% / 7%	28% / 23%	N/A	81% / 25%
9,800 / 14,800	4,500 / 5,200	10,000 / 13,000	39,800 / 51,000	N/A	8,200 / 10,200
21,900 / 37,900	3,600 / 5,000	4,800 / 6,300	29,400 / 44,300	N/A	1,300 / 1,900

Date Last Modified: 12-02-2015

Release Date: 12-04-2015

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

Date Last Modified: 12-02-2015

 SOCIOECONOMIC BENEFITS

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

ST3 CANDIDATE
PROJECT:OVERLAKE
TO
DOWNTOWN
REDMOND
LIGHT RAIL

Corridor Summary



Date Last Modified: 11-25-2015

Release Date: 12-04-2015

MAP KEY

- AT GRADE
- ELEVATED
- STATION AREA
- LIGHT RAIL ST2
- ST2 LRT STATION



Alignments and stations shown are representative and are identified for purposes of cost estimating, ridership forecasting and other evaluation measures.

OVERLAKE TO
DOWNTOWN
REDMOND

Length: 3.7 Miles

ST3 Candidate Project
E-01

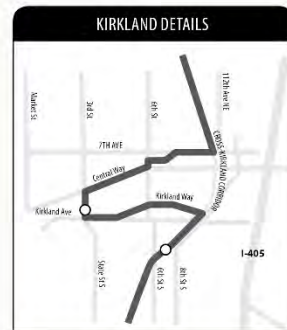
	REGIONAL LIGHT RAIL SPINE	YES
	RIDERSHIP (DAILY PROJECT RIDERS)	8,000—10,000
	CAPITAL COST (2014 \$ M)	\$1,041—\$1,114
	ANNUAL O&M COST (2014 \$ M)	\$11.83
	TRAVEL TIME (MIN)	8
	RELIABILITY	HIGH
	SYSTEM INTEGRATION	MEDIUM
	EASE OF NON-MOTORIZED ACCESS	MEDIUM-LOW
	PERCENT OF NON-MOTORIZED ACCESS	50—60%
	CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS	2 CENTERS
	PLANS AND POLICIES	MEDIUM-HIGH
	MARKET SUPPORT	MEDIUM-HIGH
	LAND USE AND DEVELOPMENT/TOD POTENTIAL	
	POP PER ACRE (2014/2040)	3 / 9
	ACTIVITY UNITS	
	EMP PER ACRE (2014/2040)	11 / 20
	POP+EMP PER ACRE (2014/2040)	14 / 29
	MINORITY/LOW-INCOME	46% / 9%
	SOCIOECONOMIC BENEFITS	
	POPULATION (2014/2040)	3,200 / 8,700
	EMPLOYMENT (2014/2040)	10,200 / 18,900

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

ST3 CANDIDATE PROJECT:

KIRKLAND-TOTEM LAKE TO BELLEVUE BUS RAPID TRANSIT

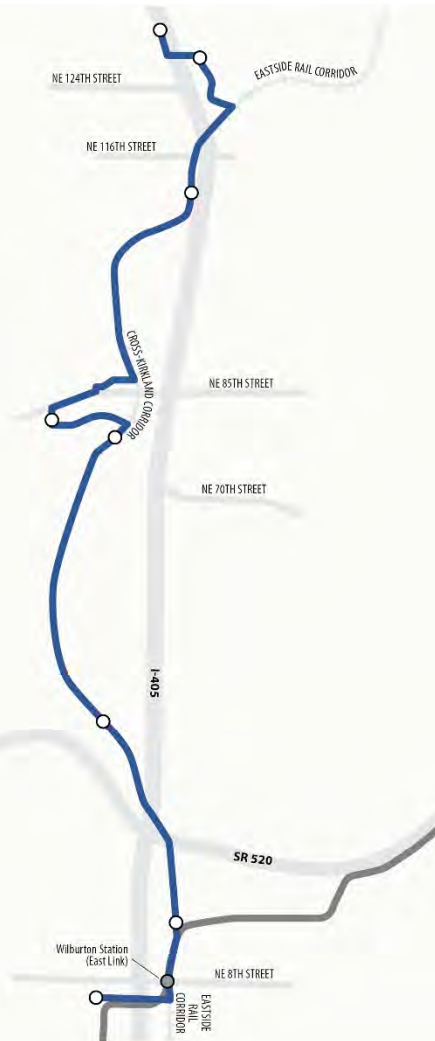
Corridor Summary



MAP KEY

- LIGHT RAIL ST2
- ST2 LRT STATION
- BRT STATION

Alignments and stations shown are representative and are identified for purposes of cost estimating, ridership forecasting and other evaluation measures.















TOTEM LAKE TO BELLEVUE BRT

Length: 10 Miles

ST3 Candidate Project E-06



	REGIONAL LIGHT RAIL SPINE	NO	
	RIDERSHIP (DAILY PROJECT RIDERS)	2,500—3,500	
	CAPITAL COST (2014 \$M)	\$698—\$747	
	ANNUAL O&M COST (2014 \$M)	\$14.72	
	TRAVEL TIME (MIN)	35	
	RELIABILITY	MEDIUM-HIGH	
	SYSTEM INTEGRATION	MEDIUM	
	EASE OF NON-MOTORIZED ACCESS	MEDIUM-LOW	
	PERCENT OF NON-MOTORIZED ACCESS	35—45%	
	CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS	2 CENTERS	
	PLANS AND POLICIES	MEDIUM	
	MARKET SUPPORT	MEDIUM-HIGH	
	LAND USE AND DEVELOPMENT/ TOD POTENTIAL	POP PER ACRE (2014/2040)	8 / 12
	ACTIVITY UNITS	EMP PER ACRE (2014/2040)	19 / 34
		POP+EMP PER ACRE (2014/2040)	27 / 46
	MINORITY/LOW-INCOME		30% / 8%
	SOCIOECONOMIC BENEFITS	POPULATION (2014/2040)	27,200 / 43,400
		EMPLOYMENT (2014/2040)	68,600 / 119,300

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

Date Last Modified: 11-25-2015

Release Date: 12-04-2015

ST3 CANDIDATE PROJECT:

TOTEM LAKE TO ISSAQUAH LIGHT RAIL

Corridor Summary



Alignments and stations shown are representative and are identified for purposes of cost estimating, ridership forecasting and other evaluation measures.

TOTEM LAKE TO ISSAQUAH

Length: 17.5 Miles

ST3 Candidate Project E-03

REGIONAL LIGHT RAIL SPINE	NO
RIDERSHIP (DAILY PROJECT RIDERS)	12,000—15,000
CAPITAL COST (2014 \$ M)	\$3,157—\$3,379
ANNUAL O&M COST (2014 \$ M)	\$42.18
TRAVEL TIME (MIN)	31
RELIABILITY	MEDIUM-HIGH
SYSTEM INTEGRATION	MEDIUM-LOW
EASE OF NON-MOTORIZED ACCESS	MEDIUM-LOW
PERCENT OF NON-MOTORIZED ACCESS	25—35%
CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS	2+ CENTERS
PLANS AND POLICIES	MEDIUM
MARKET SUPPORT	MEDIUM
LAND USE AND DEVELOPMENT/TOD POTENTIAL	
POP PER ACRE (2014/2040)	6 / 8
ACTIVITY UNITS	
EMP PER ACRE (2014/2040)	7 / 13
POP+EMP PER ACRE (2014/2040)	13 / 21
MINORITY/LOW-INCOME	29% / 7%
SOCIOECONOMIC BENEFITS	
POPULATION (2014/2040)	24,100 / 29,400
EMPLOYMENT (2014/2040)	28,300 / 50,900

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

Date Last Modified: 11-25-2015

Release Date: 12-04-2015

ADDITIONAL EAST ST3 CANDIDATE PROJECT

MAP KEY

— Light Rail ST2
— BRT



Alignments and stations shown are representative and are identified for purposes of cost estimating, ridership forecasting and other evaluation measures.

ST3 Candidate Project E-05 North Sammamish Park-and-Ride		
 REGIONAL LIGHT RAIL SPINE	NO	
 RIDERSHIP (DAILY PROJECT RIDERS)	N/A	
 CAPITAL COST (2014 \$ M)	\$11—\$12	
 ANNUAL O&M COST (2014 \$ M)	\$0.43	
 TRAVEL TIME (MIN)	N/A	
 RELIABILITY	N/A	
 SYSTEM INTEGRATION	N/A	
 EASE OF NON-MOTORIZED ACCESS	N/A	
 PERCENT OF NON-MOTORIZED ACCESS	N/A	
 CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS	0 CENTERS	
 LAND USE AND DEVELOPMENT/ TOD POTENTIAL	PLANS AND POLICIES	N/A
	MARKET SUPPORT	N/A
	POP PER ACRE (2014/2040)	N/A
 SOCIOECONOMIC BENEFITS	ACTIVITY UNITS	N/A
	POP+EMP PER ACRE (2014/2040)	N/A
	MINORITY/LOW-INCOME	N/A
	POPULATION (2014/2040)	N/A
	EMPLOYMENT (2014/2040)	N/A

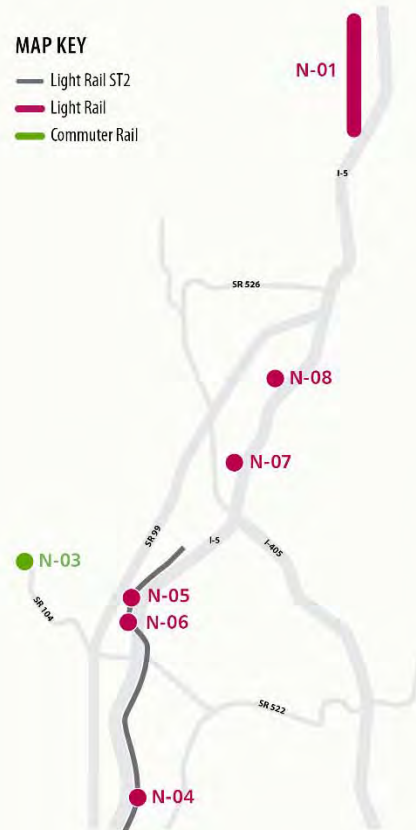
Date Last Modified: 11-25-2015

Release Date: 12-04-2015

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

ADDITIONAL NORTH ST3 CANDIDATE PROJECTS

SHEET 1 OF 2



Alignments and stations shown are representative and are identified for purposes of cost estimating, ridership forecasting and other evaluation measures.

		ST3 Candidate Project N-01	ST3 Candidate Project N-03	ST3 Candidate Project N-04	ST3 Candidate Project N-05
		Everett Station to North Everett LRT	Edmonds Permanent Station	Infill Light Rail Station: 130th Street (Lynnwood Link)	Infill Light Rail Station: 220th Street (Lynnwood Link)
REGIONAL LIGHT RAIL SPINE RIDERSHIP (DAILY PROJECT RIDERS) CAPITAL COST (2014 \$ M) ANNUAL O&M COST (2014 \$ M) TRAVEL TIME (MIN) RELIABILITY SYSTEM INTEGRATION EASE OF NON-MOTORIZED ACCESS PERCENT OF NON-MOTORIZED ACCESS CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS	REGIONAL LIGHT RAIL SPINE	YES	NO	NO	NO
	RIDERSHIP (DAILY PROJECT RIDERS)	6,000—7,000	N/A	< 1,000	< 1,000
	CAPITAL COST (2014 \$ M)	\$714—\$764	\$54—\$57	\$79—\$85	\$86—\$92
	ANNUAL O&M COST (2014 \$ M)	\$11.11	\$0.69	\$1.96	\$2.32
	TRAVEL TIME (MIN)	8	N/A	0.7	0.7
	RELIABILITY	HIGH	N/A	N/A	N/A
	SYSTEM INTEGRATION	MEDIUM	MEDIUM-LOW	MEDIUM	LOW
	EASE OF NON-MOTORIZED ACCESS	MEDIUM	MEDIUM-LOW	MEDIUM-LOW	MEDIUM-LOW
	PERCENT OF NON-MOTORIZED ACCESS	70—80%	20—30%	70—80%	25—35%
	CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS	1 CENTER	0 CENTERS	0 CENTERS	0 CENTERS
LAND USE AND DEVELOPMENT/TOD POTENTIAL ACTIVITY UNITS SOCIOECONOMIC BENEFITS	PLANS AND POLICIES	MEDIUM	LOW	MEDIUM-LOW	LOW
	MARKET SUPPORT	MEDIUM-LOW	MEDIUM	MEDIUM-LOW	MEDIUM
	POP PER ACRE (2014/2040)	9 / 19	6 / 7	9 / 10	6 / 7
	EMP PER ACRE (2014/2040)	8 / 16	3 / 4	3 / 3	4 / 5
	POP+EMP PER ACRE (2014/2040)	17 / 35	9 / 11	12 / 14	9 / 12
	MINORITY/LOW-INCOME	25% / 21%	16% / 9%	34% / 11%	34% / 14%
	POPULATION (2014/2040)	12,900 / 27,100	1,800 / 2,100	4,600 / 5,300	2,800 / 3,400
	EMPLOYMENT (2014/2040)	11,800 / 22,800	800 / 1,000	1,300 / 1,600	1,000 / 2,700

Date Last Modified: 12-02-2015













Release Date: 12-04-2015

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

SHEET 2 OF 2



Alignments and stations shown are representative and are identified for purposes of cost estimating, ridership forecasting and other evaluation measures.

	ST3 Candidate Project N-06	ST3 Candidate Project N-07	ST3 Candidate Project N-08
 REGIONAL LIGHT RAIL SPINE	NO	NO	NO
 RIDERSHIP (DAILY PROJECT RIDERS)	N/A	N/A	NA
 CAPITAL COST (2014 \$ M)	\$31—\$33	\$32	\$56
 ANNUAL O&M COST (2014 \$ M)	\$0.47	N/A	N/A
 TRAVEL TIME (MIN)	N/A	N/A	N/A
 RELIABILITY	N/A	N/A	N/A
 SYSTEM INTEGRATION	N/A	MEDIUM	MEDIUM
 EASE OF NON-MOTORIZED ACCESS	N/A	N/A	N/A
 PERCENT OF NON-MOTORIZED ACCESS	N/A	N/A	N/A
 CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS	N/A	N/A	N/A
 LAND USE AND DEVELOPMENT/ TOD POTENTIAL	PLANS AND POLICIES	N/A	N/A
	MARKET SUPPORT	N/A	N/A
	POP PER ACRE (2014/2040)	N/A	N/A
	ACTIVITY UNITS (2014/2040)	N/A	N/A
	POP+EMP PER ACRE (2014/2040)	N/A	N/A
 SOCIOECONOMIC BENEFITS	MINORITY/LOW-INCOME	N/A	N/A
	POPULATION (2014/2040)	N/A	N/A
	EMPLOYMENT (2014/2040)	N/A	N/A

Date Last Modified: 12-02-2015

Release Date: 12-04-2015

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

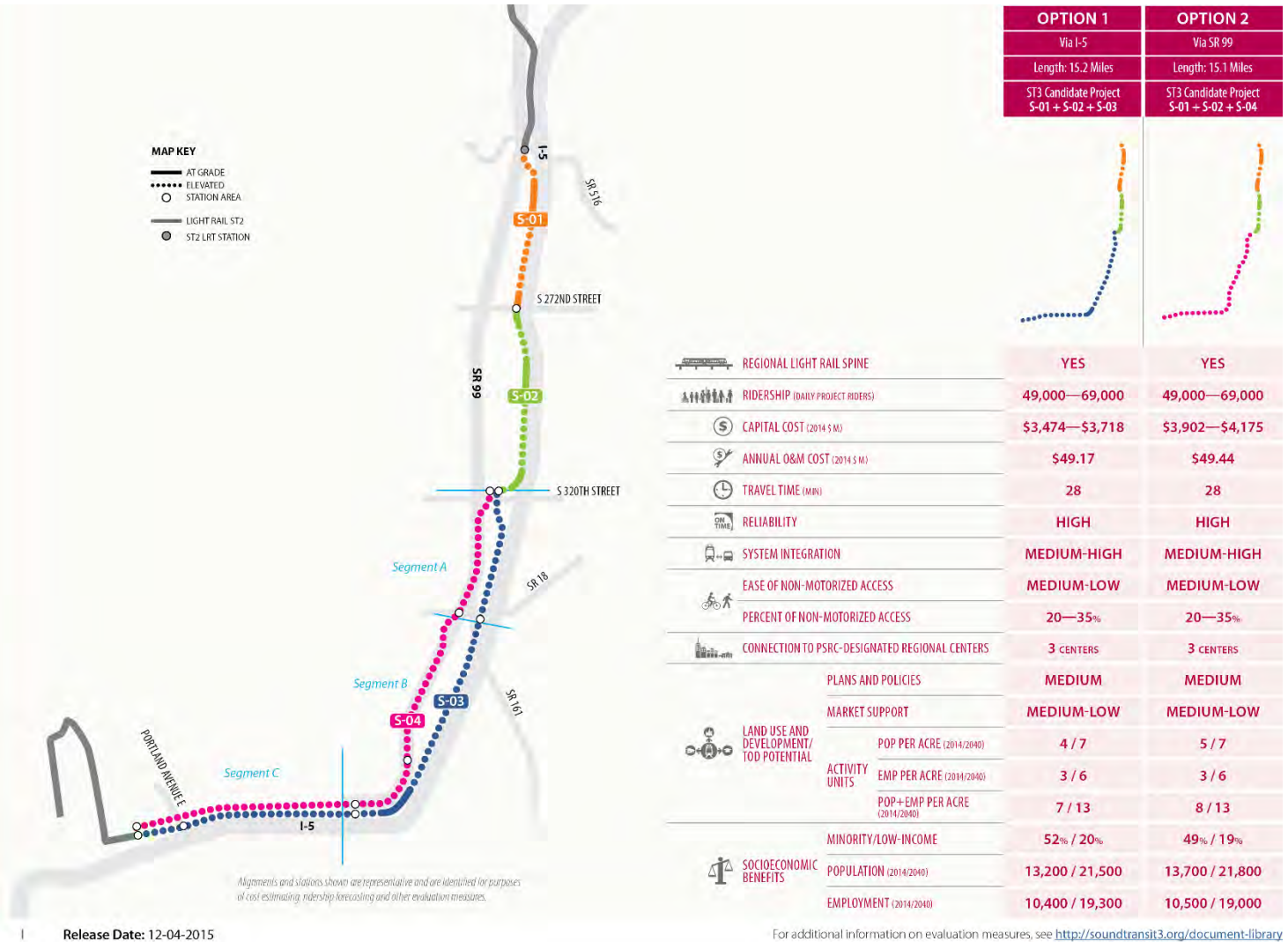
ST3 CANDIDATE PROJECT:

KENT-DES MOINES TO TACOMA DOME LIGHT RAIL

Corridor Options

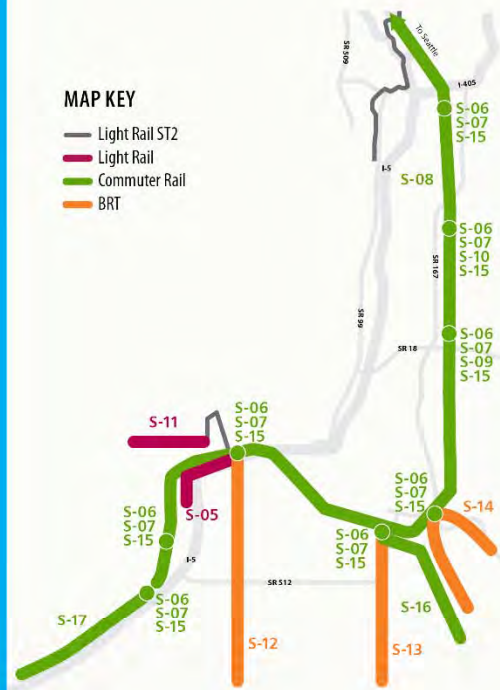


Date Last Modified: 11-25-2015



Release Date: 12-04-2015

ADDITIONAL SOUTH ST3 CANDIDATE PROJECTS SHEET 1 OF 3



Alignments and Stations shown are representative and are identified for purposes of cost estimating, ridership forecasting and other evaluation measures.

REGIONAL LIGHT RAIL SPINE

RIDERSHIP (DAILY PROJECT RIDERS)

CAPITAL COST (2014 \$ M)

ANNUAL O&M COST (2014 \$ M)

TRAVEL TIME (MIN)

RELIABILITY

SYSTEM INTEGRATION

EASE OF NON-MOTORIZED ACCESS

PERCENT OF NON-MOTORIZED ACCESS

CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS

PLANS AND POLICIES

MARKET SUPPORT

LAND USE AND DEVELOPMENT/ TOD POTENTIAL

ACTIVITY UNITS

POP+EMP PER ACRE (2014/2040)

MINORITY/LOW-INCOME

SOCIOECONOMIC BENEFITS

POPULATION (2014/2040)

EMPLOYMENT (2014/2040)

ST3 Candidate Project S-05	ST3 Candidate Project S-06	ST3 Candidate Project S-07	ST3 Candidate Project S-08	ST3 Candidate Project S-09
Tacoma Dome Station to Tacoma Mail LRT	Expand Sounder South Train Platforms to 8 cars	Additional South Sounder Platform Extensions (beyond 8-car extension included in S-06)	Additional Sounder Service	Auburn Station Access Improvements
YES	NO	NO	NO	NO
12,000—16,000	< 1,000	<1,000	TBD	N/A
\$975—\$1,043	\$98—\$105	\$133—\$142	TBD	\$41—\$44
\$11.80	\$2.49	\$4.53	TBD	\$0.42
8	N/A	N/A	TBD	NA
MEDIUM-HIGH	N/A	N/A	MEDIUM-HIGH	NA
MEDIUM	N/A	N/A	N/A	N/A
MEDIUM	N/A	N/A	N/A	N/A
50—60%	30—40%	30—40%	N/A	N/A
3 CENTERS	10 CENTERS	10 CENTERS	10 CENTERS	1 CENTER
MEDIUM-HIGH	N/A	N/A	N/A	N/A
MEDIUM	N/A	N/A	N/A	N/A
4 / 13	N/A	N/A	N/A	N/A
11 / 19	N/A	N/A	N/A	N/A
15 / 32	N/A	N/A	N/A	N/A
43% / 24%	N/A	N/A	N/A	N/A
3,300 / 10,400	N/A	N/A	N/A	N/A
8,400 / 14,700	N/A	N/A	N/A	N/A

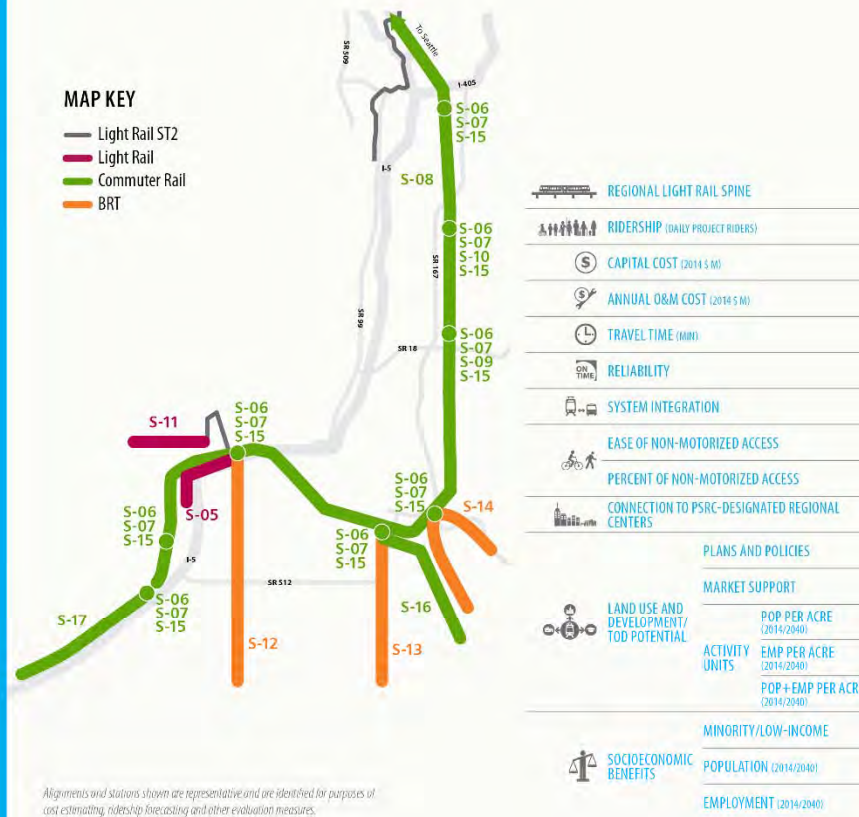
Date Last Modified: 11-30-2015

Release Date: 12-04-2015

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

ADDITIONAL SOUTH ST3 CANDIDATE PROJECTS

SHEET 2 OF 3



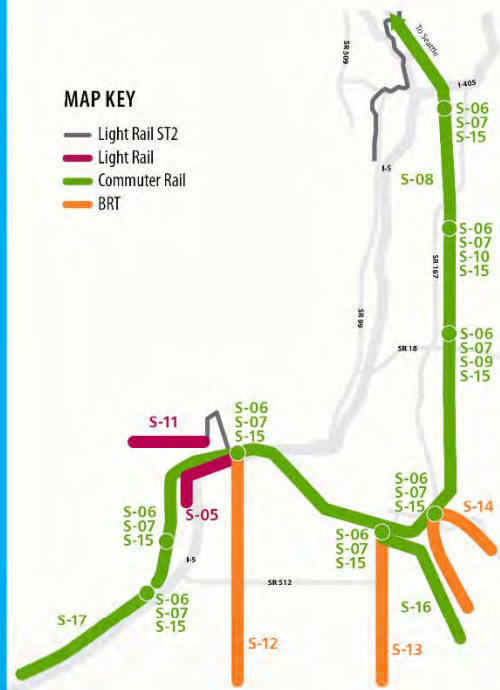
ST3 Candidate Project S-10	ST3 Candidate Project S-11	ST3 Candidate Project S-12	ST3 Candidate Project S-13	ST3 Candidate Project S-14
Kent Station Access Improvements	Tacoma Link Extension to Tacoma Community College	Bus Capital Enhancements for Speed, Reliability, Convenience along Pacific Avenue (Tacoma)	Bus Capital Enhancements for Speed, Reliability, Convenience along Meridian Avenue/SR 161 (Puyallup)	Capital Enhancements to Improve Bus Speed and Reliability between East Pierce County cities and Sumner-Souder Station
NO	NO	NO	NO	NO
NA	10,000—14,000	N/A	N/A	<1,000
\$36—\$39	\$642—\$687	\$270—\$289	\$61—\$66	\$31—\$33
\$0.42	\$11.16	N/A	N/A	N/A
NA	16	N/A	N/A	N/A
NA	MEDIUM-HIGH	MEDIUM	MEDIUM-LOW	LOW
N/A	MEDIUM-LOW	N/A	N/A	N/A
N/A	MEDIUM-LOW	N/A	N/A	N/A
N/A	70—80%	N/A	N/A	N/A
1 CENTER	2 CENTERS	1 CENTER	2 CENTERS	0 CENTERS
N/A	MEDIUM	N/A	N/A	N/A
N/A	MEDIUM	N/A	N/A	N/A
N/A	7 / 11	N/A	N/A	N/A
N/A	6 / 10	N/A	N/A	N/A
N/A	13 / 21	N/A	N/A	N/A
N/A	38% / 17%	N/A	N/A	N/A
N/A	17,000 / 25,400	N/A	N/A	N/A
N/A	13,000 / 23,200	N/A	N/A	N/A

Date Last Modified: 11-30-2015

Release Date: 12-04-2015

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

ADDITIONAL SOUTH ST3 CANDIDATE PROJECTS SHEET 3 OF 3



Alignments and stations shown are representative and are identified for purposes of cost estimating, ridership forecasting and other evaluation measures.

ST3 Candidate Project		ST3 Candidate Project	ST3 Candidate Project
S-15		S-16	S-17
South Sounder Access Program		Sounder Rail Extension from Puyallup to Orting	Sounder Expansion to DuPont
REGIONAL LIGHT RAIL SPINE		NO	NO
RIDERSHIP (DAILY PROJECT RIDERS)		N/A	<1,000
CAPITAL COST (2014 \$ M)		\$291—\$311	\$207—\$222
ANNUAL O&M COST (2014 \$ M)		N/A	\$4.44
TRAVEL TIME (MIN)		N/A	11
RELIABILITY		N/A	MEDIUM-HIGH
SYSTEM INTEGRATION		N/A	LOW
EASE OF NON-MOTORIZED ACCESS		N/A	MEDIUM
PERCENT OF NON-MOTORIZED ACCESS		N/A	25—35%
CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS		10 CENTERS	1 CENTER
PLANS AND POLICIES		N/A	LOW
MARKET SUPPORT		N/A	LOW
POP PER ACRE (2014/2040)		N/A	2 / 2
EMP PER ACRE (2014/2040)		N/A	0 / 0
POP+EMP PER ACRE (2014/2040)		N/A	3 / 3
MINORITY/LOW-INCOME		N/A	19% / 3%
POPULATION (2014/2040)		N/A	1,100 / 1,100
EMPLOYMENT (2014/2040)		N/A	200 / 200

Date Last Modified: 11-30-2015

Release Date: 12-04-2015

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

ST3 CANDIDATE PROJECT:

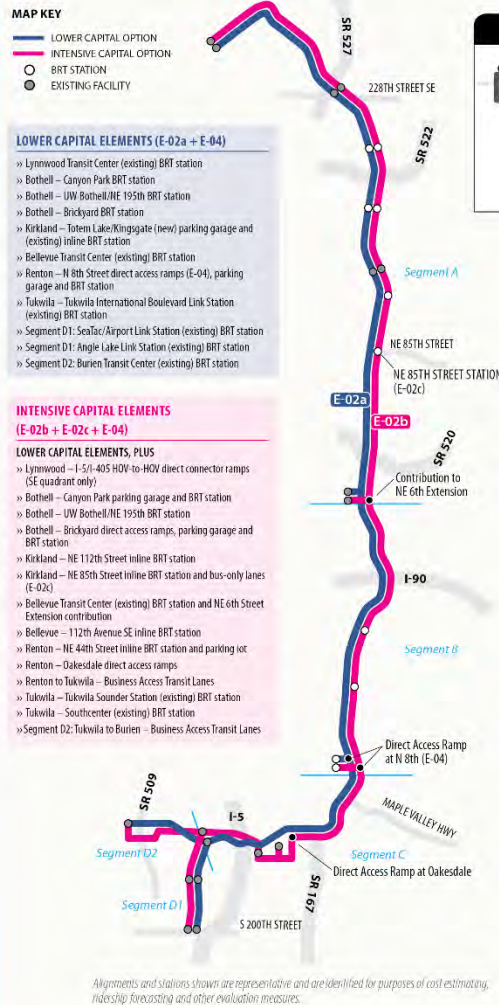
I-405
BUS RAPID
TRANSIT

Corridor Options

- Bus operates in I-405 Express Toll Lanes



Date Last Modified: 12-02-2015



Alignments and stations shown are representative and are identified for purposes of cost estimating, ridership forecasting and other evaluation measures.

Release Date: 12-04-2015

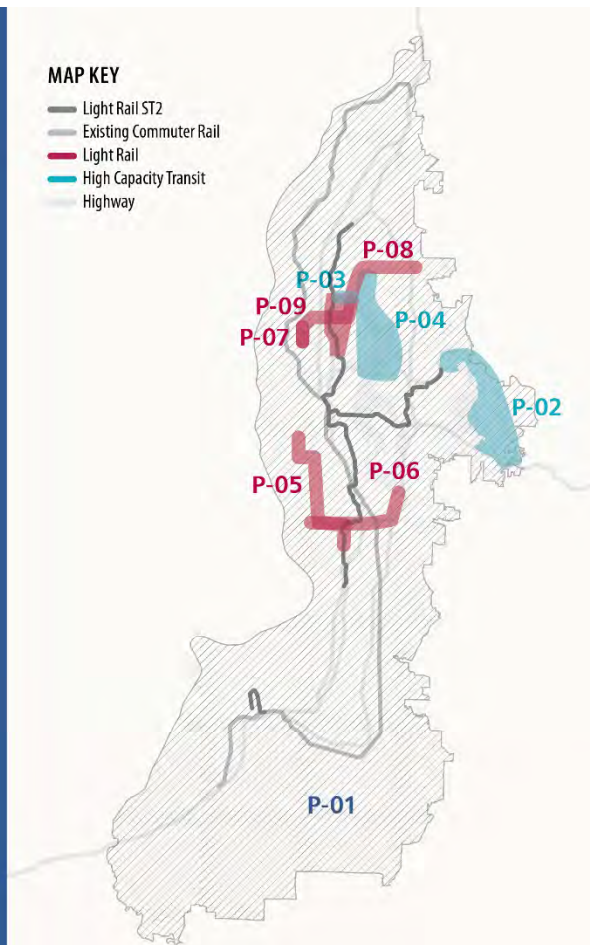
LOWER CAPITAL OPTION		INTENSIVE CAPITAL OPTION	
ST3 Candidate Project E-02a + E-04		ST3 Candidate Project E-02b + E-02c + E-04	
Length: 37.1 Miles	Length: 37.9 Miles	Length: 40.4 Miles	Length: 40.6 Miles
To Burien TC	To Angle Lake	To Burien TC	To Angle Lake
NO	NO	NO	NO
13,000—18,000	13,000—18,000	13,000—18,000	13,000—18,000
\$317—\$341	\$323—\$348	\$2,174—\$2,326	\$1,961—\$2,099
\$43.02	\$45.58	\$45.68	\$48.24
100	105	105	110
MEDIUM	MEDIUM	MEDIUM-HIGH	MEDIUM-HIGH
MEDIUM	MEDIUM	MEDIUM	MEDIUM
MEDIUM-LOW	MEDIUM-LOW	MEDIUM-LOW	MEDIUM-LOW
20—80%	20—80%	20—80%	20—80%
7 CENTERS	7 CENTERS	7 CENTERS	7 CENTERS
MEDIUM-HIGH	MEDIUM-HIGH	MEDIUM	MEDIUM
MEDIUM	MEDIUM	MEDIUM	MEDIUM
8 / 13	7 / 12	6 / 10	6 / 10
13 / 22	13 / 22	11 / 18	11 / 18
21 / 35	20 / 34	17 / 28	17 / 28
39% / 13%	42% / 14%	37% / 11%	40% / 12%
34,800 / 57,300	35,700 / 59,600	46,000 / 73,100	46,900 / 75,400
60,000 / 99,200	63,800 / 109,200	78,100 / 127,400	81,900 / 137,400

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

ST3 CANDIDATE PROJECTS: REGION WIDE PROGRAMS + HCT PLANNING STUDIES


MAP KEY

- Light Rail ST2
- Existing Commuter Rail
- Light Rail
- High Capacity Transit
- Highway



*Alignments shown are representative and are identified for purposes of cost estimating.
Study scopes may change or be combined.*

	R-05	R-06	R-07
	System Access Program (Pedestrian and bicycle access, bicycle parking, transit)	Innovation and Technology Fund	Transit Oriented Development Program
⑤ CAPITAL COST (2014 \$ M)	\$170—\$181	\$123—\$132	\$16—\$17

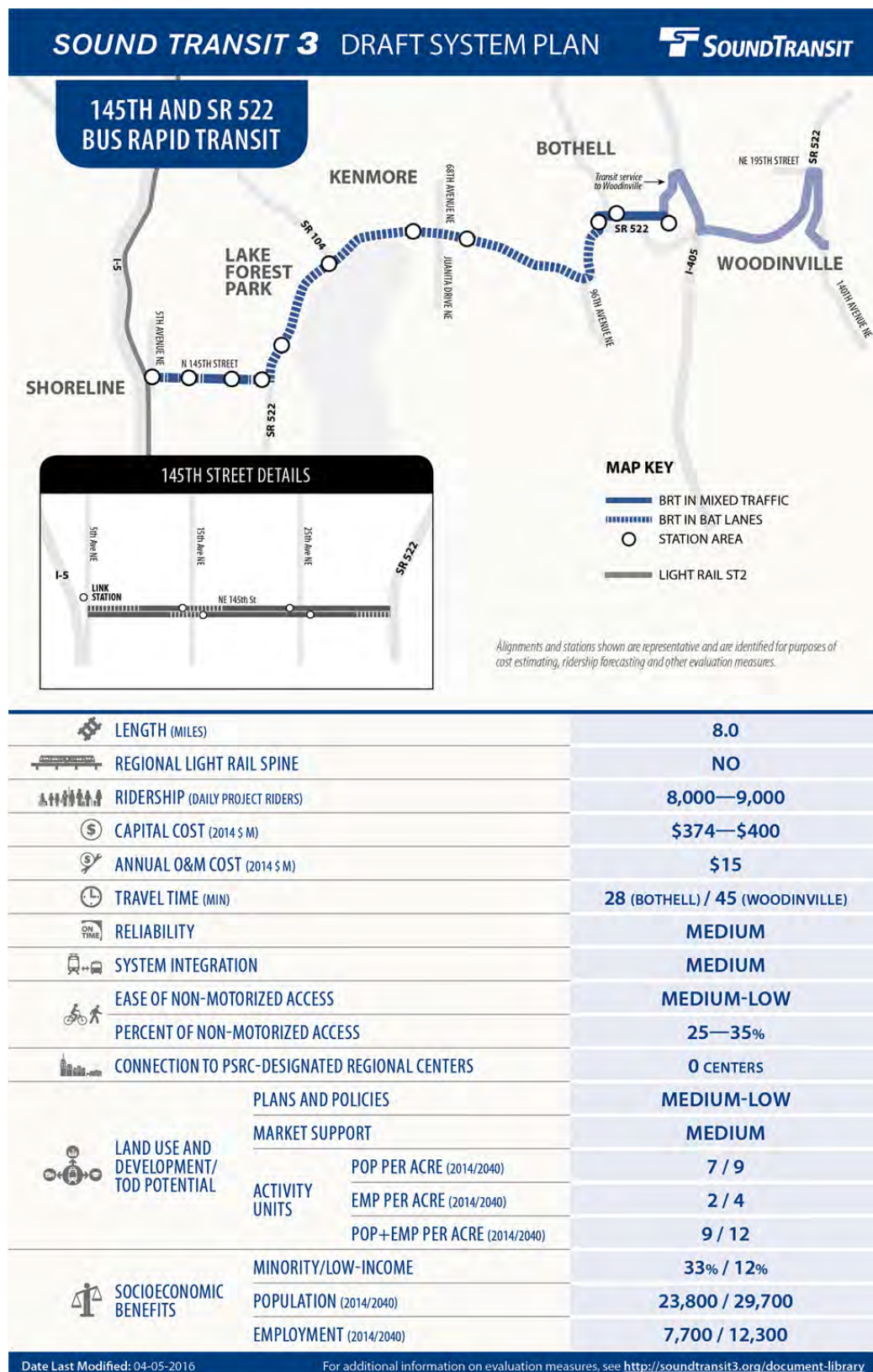
	P-01	P-02—P-09
	Future System Planning (ST4)	P-02: HCT Study: Issaquah Highlands to Overlake via Sammamish, Redmond P-03: HCT Study: Access and Connection on NE 145th from State Route 522 to Link Light Rail P-04: HCT Study: Northern Lake Washington Crossing P-05: HCT Study: Light Rail Extending from West Seattle to Burien and SeaTac Airport Station P-06: HCT Study: Light Rail directly linking Burien to Tukwila and Renton P-07: HCT Study: Light Rail from Ballard to Crown Hill P-08: HCT Study: Light Rail on SR 522 P-09: HCT Study: Light Rail from Ballard to Bothell via Greenwood, North Seattle, and Lake City
 CAPITAL COST (2014 \$ M)	\$60—\$64	\$26—\$28

Date Last Modified: 12-09-2015

Release Date: 12-04-2015

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>

Appendix C: ST3 Draft System Plan Project Summary Sheets



SOUND TRANSIT 3 DRAFT SYSTEM PLAN

LYNNWOOD
TO EVERETT
LIGHT RAIL

MAP KEY

- AT GRADE
- ELEVATED
- STATION AREA
- PROVISIONAL STATION AREA
- LIGHT RAIL ST2
- ST2 LRT STATION

Alignments and stations shown are representative and are identified for purposes of cost estimating, ridership forecasting and other evaluation measures.

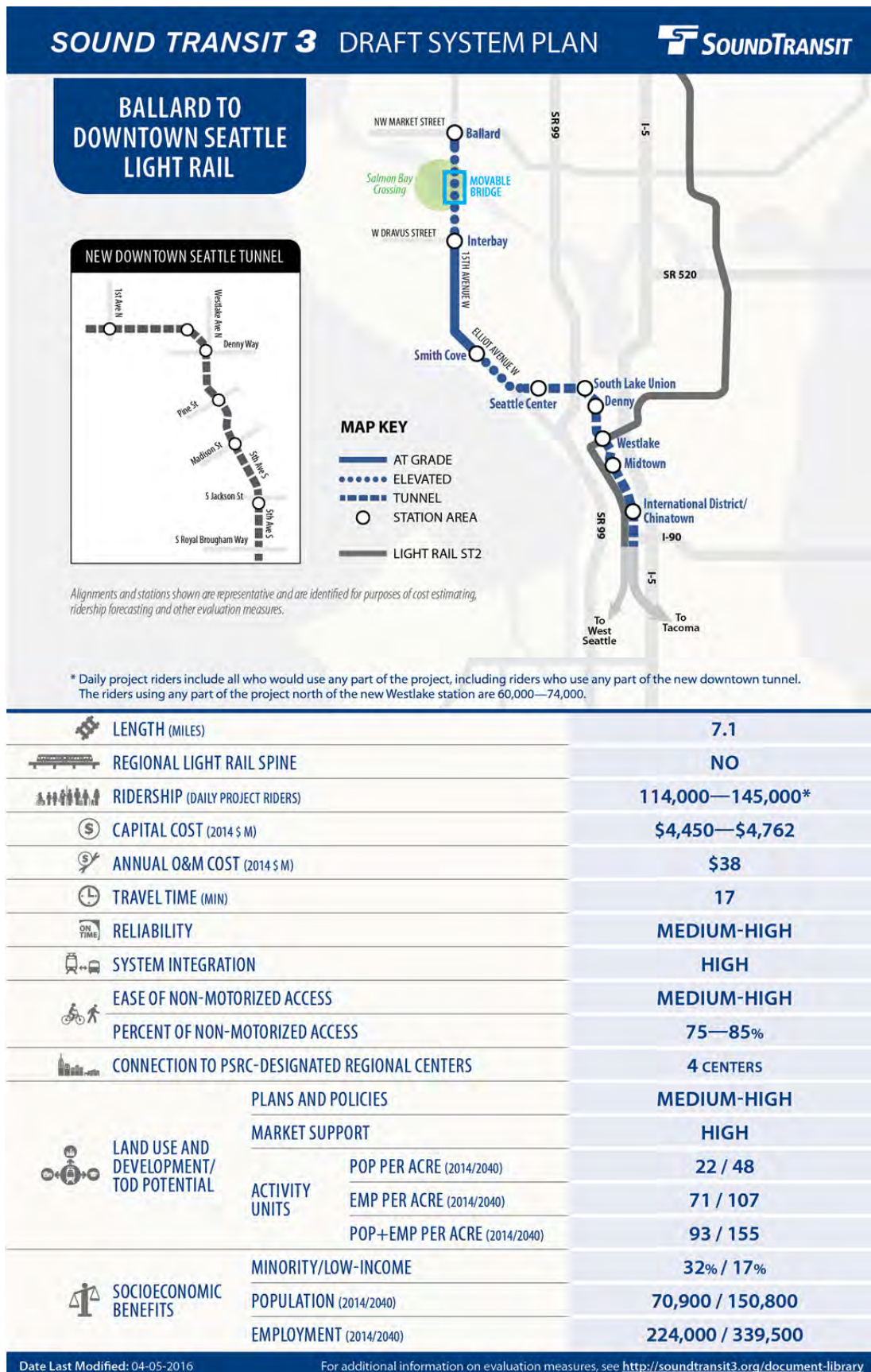
* Does not include provisional stations.
Costs undergoing refinement.



	LENGTH (MILES)	15.4
	REGIONAL LIGHT RAIL SPINE	YES
	RIDERSHIP (DAILY PROJECT RIDERS)	35,000—43,000
	CAPITAL COST (2014 \$ M)	\$4,041—\$4,324*
	ANNUAL O&M COST (2014 \$ M)	\$53*
	TRAVEL TIME (MIN)	31
	RELIABILITY	HIGH
	SYSTEM INTEGRATION	MEDIUM
	EASE OF NON-MOTORIZED ACCESS	MEDIUM-LOW
	PERCENT OF NON-MOTORIZED ACCESS	20—35%
	CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS	3 CENTERS
	PLANS AND POLICIES	MEDIUM
	MARKET SUPPORT	MEDIUM
	POP PER ACRE (2014/2040)	8 / 13
	ACTIVITY UNITS EMP PER ACRE (2014/2040)	7 / 12
	POP+EMP PER ACRE (2014/2040)	15 / 25
	MINORITY/LOW-INCOME	42% / 17%
	POPULATION (2014/2040)	24,100 / 38,900
	EMPLOYMENT (2014/2040)	21,300 / 37,000

Date Last Modified: 04-05-2016

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>



SOUND TRANSIT 3 DRAFT SYSTEM PLAN

WEST SEATTLE TO
DOWNTOWN SEATTLE
LIGHT RAIL

MAP KEY

- AT GRADE
- ELEVATED
- STATION AREA
- LIGHT RAIL ST2

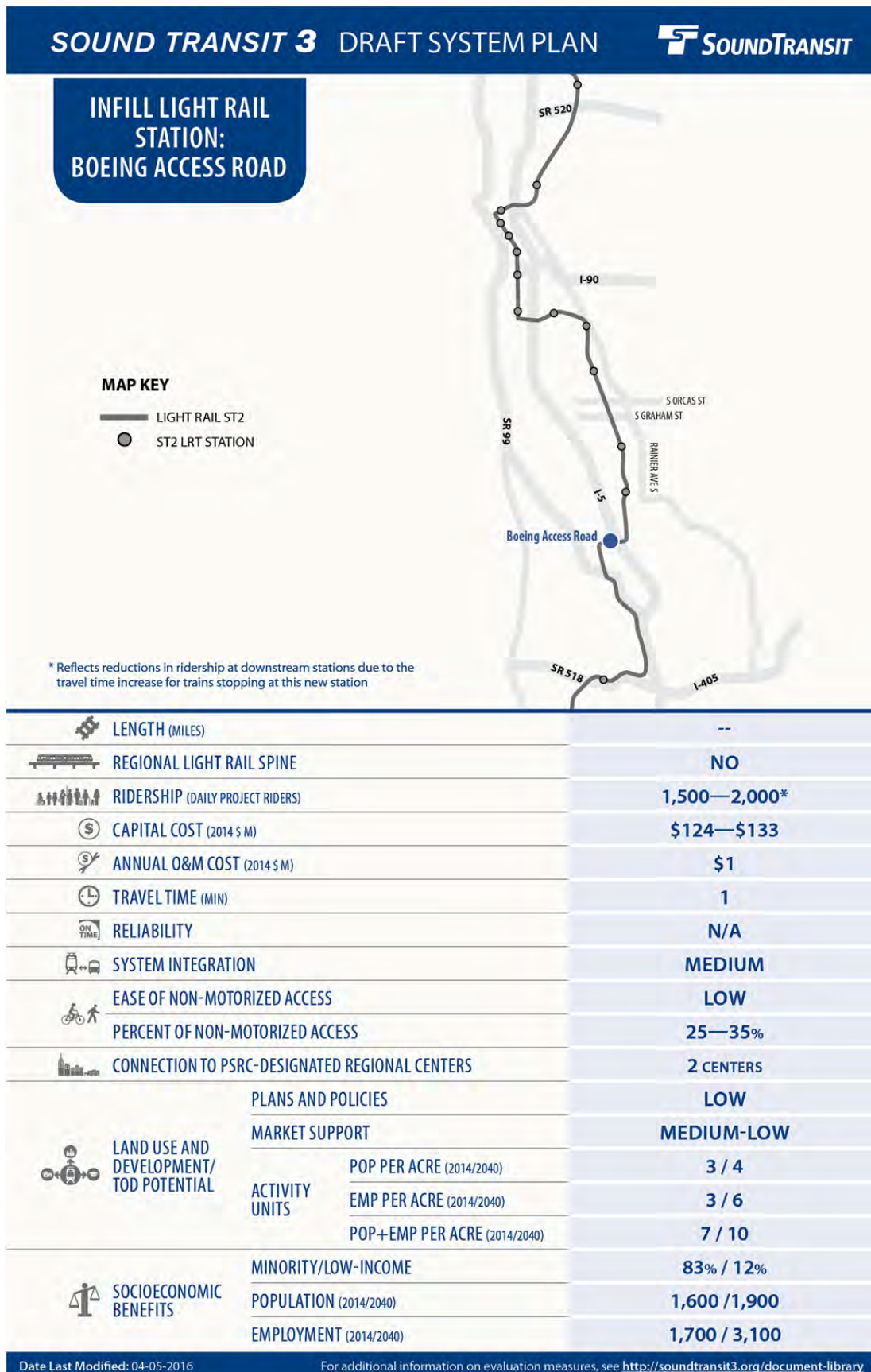


Alignments and stations shown are representative and are identified for purposes of cost estimating, ridership forecasting and other evaluation measures.

	LENGTH (MILES)	4.7
	REGIONAL LIGHT RAIL SPINE	NO
	RIDERSHIP (DAILY PROJECT RIDERS)	31,000—36,000
	CAPITAL COST (2014 \$ M)	\$1,886—\$2,018
	ANNUAL O&M COST (2014 \$ M)	\$22
	TRAVEL TIME (MIN)	12
	RELIABILITY	HIGH
	SYSTEM INTEGRATION	MEDIUM-HIGH
	EASE OF NON-MOTORIZED ACCESS	MEDIUM-LOW
	PERCENT OF NON-MOTORIZED ACCESS	70—80%
	CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS	2 CENTERS
	PLANS AND POLICIES	MEDIUM-LOW
	MARKET SUPPORT	MEDIUM
	POP PER ACRE (2014/2040)	6 / 9
	EMP PER ACRE (2014/2040)	15 / 17
	POP+EMP PER ACRE (2014/2040)	21 / 25
	MINORITY/LOW-INCOME	28% / 12%
	POPULATION (2014/2040)	13,400 / 18,300
	EMPLOYMENT (2014/2040)	31,500 / 35,200

Date Last Modified: 04-05-2016

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>



SOUND TRANSIT 3 DRAFT SYSTEM PLAN
**INFILL LIGHT RAIL
STATION:
GRAHAM STREET**
MAP KEY

- LIGHT RAIL ST2
● ST2 LRT STATION

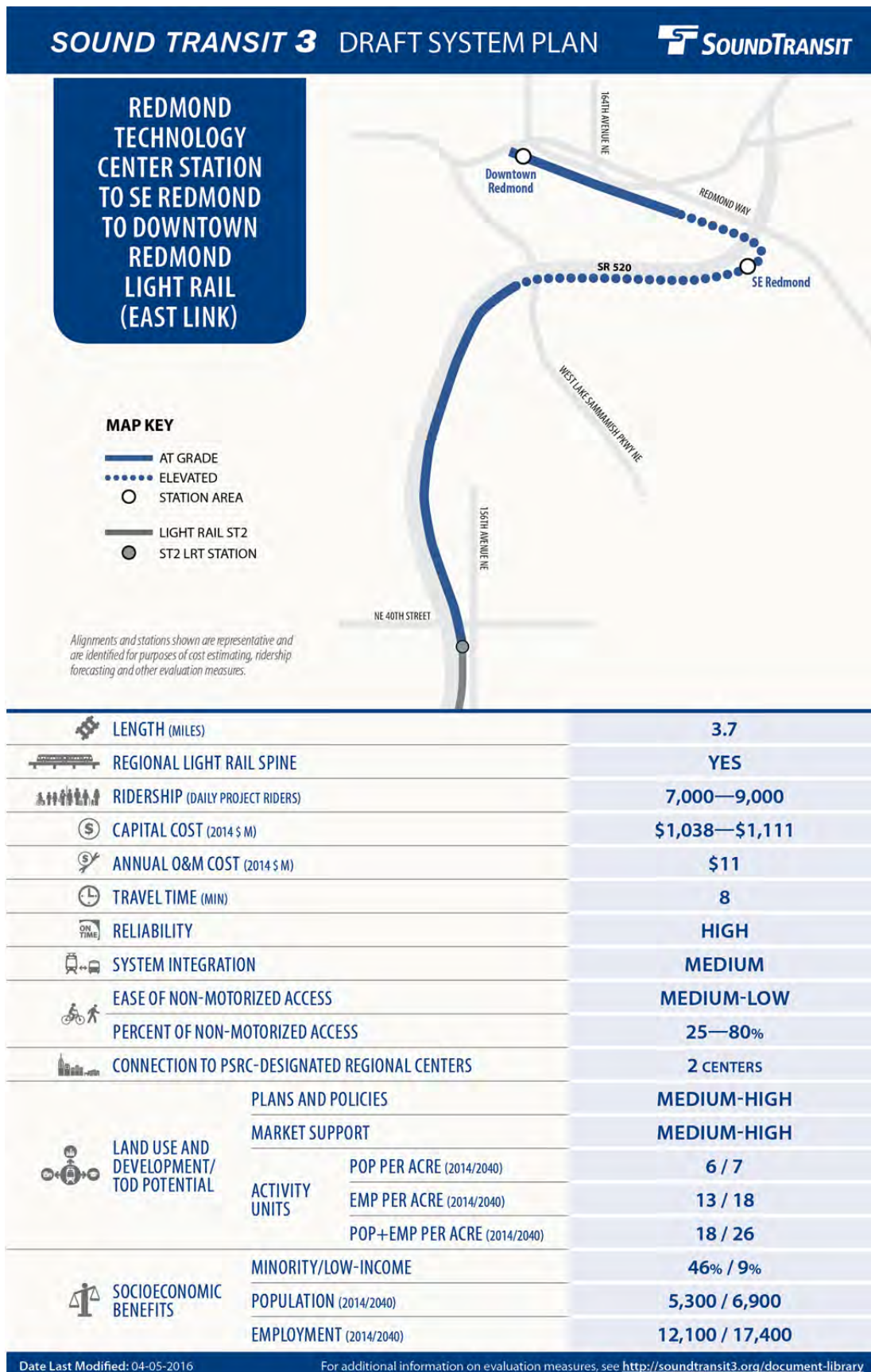
* Reflects reductions in ridership at nearby stations due to overlapping ridership catchment areas, and reductions in ridership at downstream stations due to the travel time increase for trains stopping at this new station



	LENGTH (MILES)	--
	REGIONAL LIGHT RAIL SPINE	NO
	RIDERSHIP (DAILY PROJECT RIDERS)	1,500—2,500*
	CAPITAL COST (2014 \$ M)	\$71—\$76
	ANNUAL O&M COST (2014 \$ M)	\$1
	TRAVEL TIME (MIN)	1
	RELIABILITY	N/A
	SYSTEM INTEGRATION	MEDIUM-HIGH
	EASE OF NON-MOTORIZED ACCESS	MEDIUM
	PERCENT OF NON-MOTORIZED ACCESS	70—80%
	CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS	0 CENTERS
	PLANS AND POLICIES	MEDIUM
	MARKET SUPPORT	MEDIUM
	POP PER ACRE (2014/2040)	17 / 16
	ACTIVITY UNITS EMP PER ACRE (2014/2040)	3 / 3
	POP+EMP PER ACRE (2014/2040)	20 / 19
	MINORITY/LOW-INCOME	81% / 25%
	POPULATION (2014/2040)	8,500 / 7,900
	EMPLOYMENT (2014/2040)	1,500 / 1,600

Date Last Modified: 04-05-2016

For additional information on evaluation measures, see <http://soundtransit3.org/document-library>



SOUND TRANSIT 3 DRAFT SYSTEM PLAN














**BELLEVUE
TO ISSAQUAH
LIGHT RAIL**
MAP KEY

- AT GRADE
- ELEVATED
- STATION AREA
- PROVISIONAL STATION AREA
- LIGHT RAIL ST2
- ST2 LRT STATION

Alignments and stations shown are representative and are identified for purposes of cost estimating, ridership forecasting and other evaluation measures.

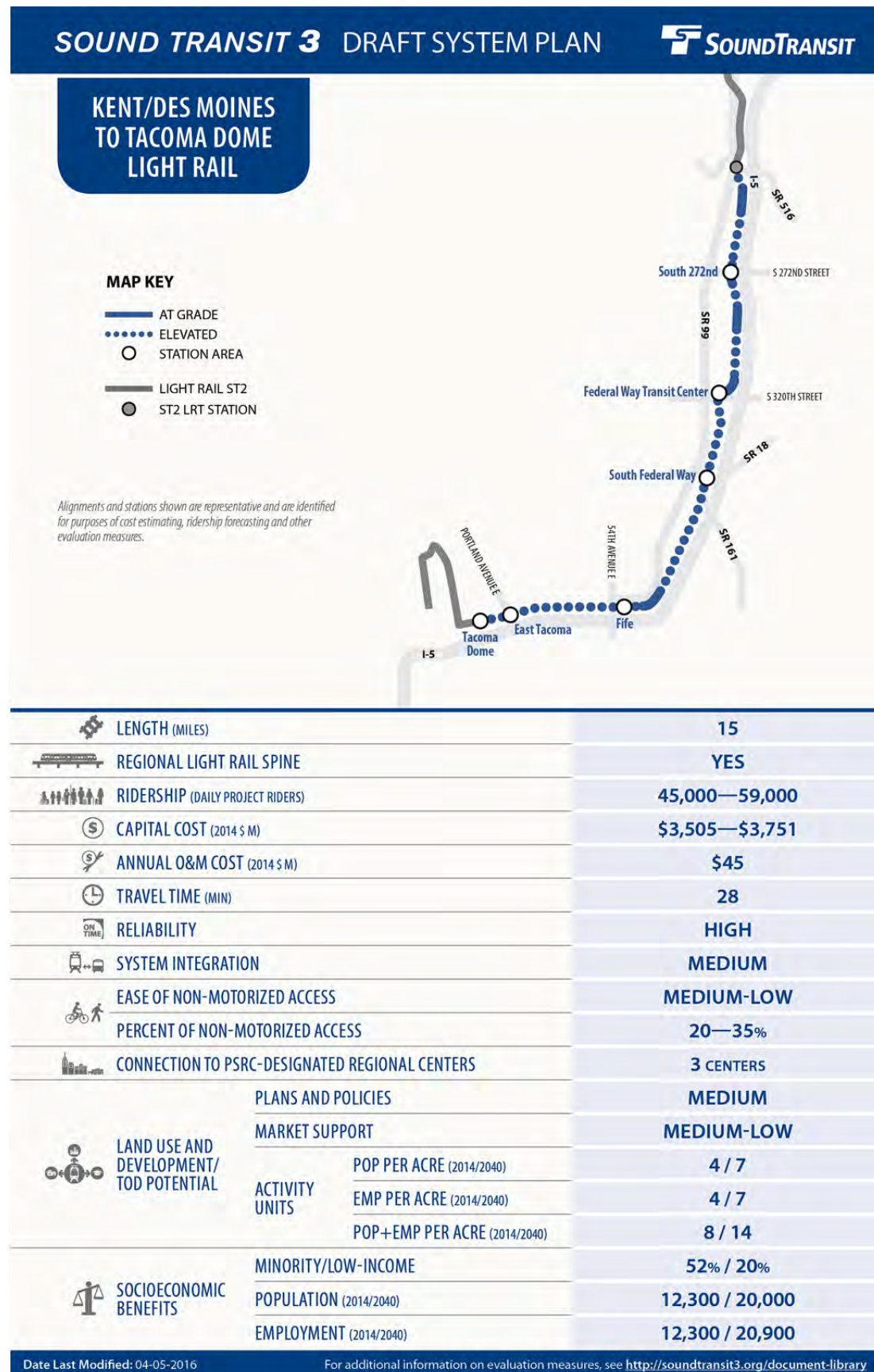
* Does not include provisional station.



	LENGTH (MILES)	9	
	REGIONAL LIGHT RAIL SPINE	NO	
	RIDERSHIP (DAILY PROJECT RIDERS)	11,000—15,000	
	CAPITAL COST (2014 \$ M)	\$1,594—\$1,706*	
	ANNUAL O&M COST (2014 \$ M)	\$30*	
	TRAVEL TIME (MIN)	25	
	RELIABILITY	MEDIUM-HIGH	
	SYSTEM INTEGRATION	MEDIUM-LOW	
	EASE OF NON-MOTORIZED ACCESS	MEDIUM-LOW	
	PERCENT OF NON-MOTORIZED ACCESS	25—35%	
	CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS	2 CENTERS	
	LAND USE AND DEVELOPMENT/ TOD POTENTIAL	PLANS AND POLICIES	MEDIUM
		MARKET SUPPORT	MEDIUM-LOW
		POP PER ACRE (2014/2040)	4 / 5
	ACTIVITY UNITS	EMP PER ACRE (2014/2040)	10 / 13
		POP+EMP PER ACRE (2014/2040)	14 / 18
	SOCIOECONOMIC BENEFITS	MINORITY/LOW-INCOME	37% / 9%
		POPULATION (2014/2040)	6,000 / 7,400
		EMPLOYMENT (2014/2040)	14,000 / 19,200

Date Last Modified: 04-05-2016

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SOUND TRANSIT 3 DRAFT SYSTEM PLAN



TACOMA LINK EXTENSION TO TACOMA COMMUNITY COLLEGE



	LENGTH (MILES)	4.4
	REGIONAL LIGHT RAIL SPINE	NO
	RIDERSHIP (DAILY PROJECT RIDERS)	13,000—17,000
	CAPITAL COST (2014 \$ M)	\$447—\$478
	ANNUAL O&M COST (2014 \$ M)	\$13
	TRAVEL TIME (MIN)	14
	RELIABILITY	MEDIUM-HIGH
	SYSTEM INTEGRATION	MEDIUM-LOW
	EASE OF NON-MOTORIZED ACCESS	MEDIUM-LOW
	PERCENT OF NON-MOTORIZED ACCESS	70—80%
	CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS	2 CENTERS
	PLANS AND POLICIES	MEDIUM-LOW
	MARKET SUPPORT	MEDIUM
	POP PER ACRE (2014/2040)	7 / 11
	ACTIVITY UNITS EMP PER ACRE (2014/2040)	5 / 8
	POP+EMP PER ACRE (2014/2040)	12 / 19
	MINORITY/LOW-INCOME	38% / 17%
	POPULATION (2014/2040)	15,700 / 25,700
	EMPLOYMENT (2014/2040)	12,100 / 19,100

Date Last Modified: 04-05-2016

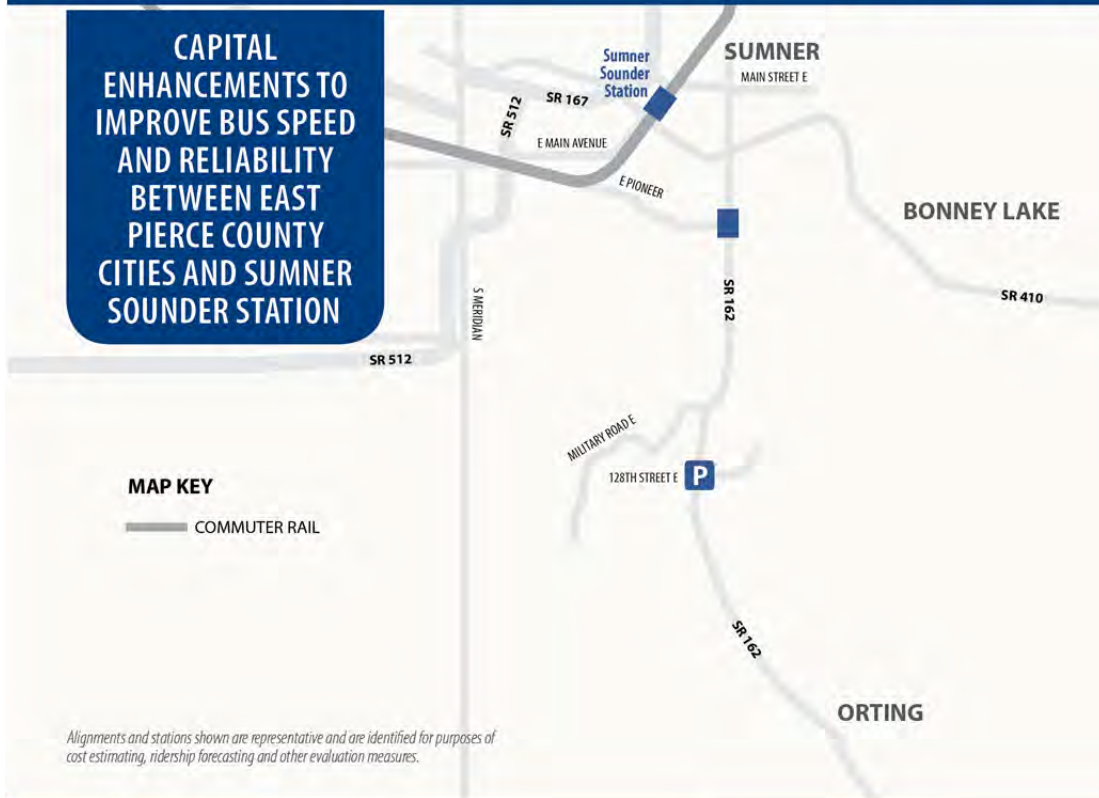
For additional information on evaluation measures, see <http://soundtransit3.org/document-library>



SOUND TRANSIT 3 DRAFT SYSTEM PLAN



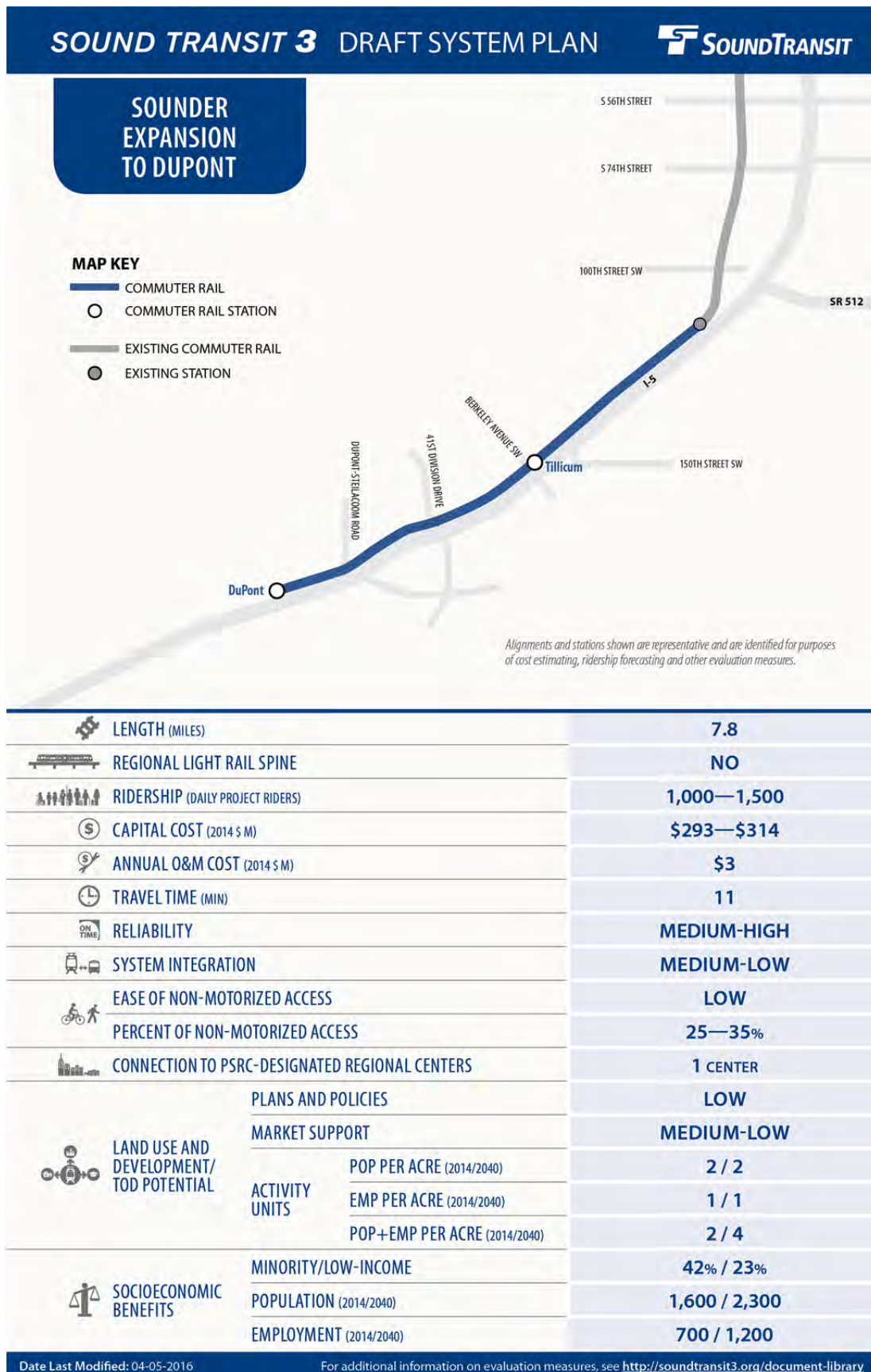
CAPITAL ENHANCEMENTS TO IMPROVE BUS SPEED AND RELIABILITY BETWEEN EAST PIERCE COUNTY CITIES AND SUMNER SOUNDER STATION



	LENGTH (MILES)	--
	REGIONAL LIGHT RAIL SPINE	NO
	RIDERSHIP (DAILY PROJECT RIDERS)	<1,000
	CAPITAL COST (2014 \$ M)	\$31—\$33
	ANNUAL O&M COST (2014 \$ M)	N/A
	TRAVEL TIME (MIN)	N/A
	RELIABILITY	LOW
	SYSTEM INTEGRATION	N/A
	EASE OF NON-MOTORIZED ACCESS	N/A
	PERCENT OF NON-MOTORIZED ACCESS	N/A
	CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS	0 CENTERS
	PLANS AND POLICIES	N/A
	MARKET SUPPORT	N/A
	POP PER ACRE (2014/2040)	N/A
	EMP PER ACRE (2014/2040)	N/A
	POP+EMP PER ACRE (2014/2040)	N/A
	MINORITY/LOW-INCOME	N/A
	POPULATION (2014/2040)	N/A
	EMPLOYMENT (2014/2040)	N/A

Date Last Modified: 04-05-2016

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SOUND TRANSIT 3 DRAFT SYSTEM PLAN



I-405 BUS RAPID TRANSIT

I-405 BRT ELEMENTS

- » Lynnwood Transit Center (existing) BRT station
- » Bothell – Canyon Park BRT station
- » Bothell – UW Bothell/NE 195th BRT station
- » Bothell – Brickyard BRT station
- » Kirkland – Totem Lake/Kingsgate (new) parking garage and (existing) inline BRT station
- » Kirkland – Central Kirkland BRT station (NE 85th Street)
- » Kirkland – Bus-only lanes on NE 85th Street from I-405 to 6th Street
- » Bellevue Transit Center (existing) BRT station
- » Renton – South Renton BRT station with transit center and (new) parking garage
- » Tukwila – Tukwila International Boulevard Link Station (existing) BRT station
- » Tukwila to Burien – Bus-only lanes on SR 518 and other transit priority treatments
- » Burien – BRT Station

MAP KEY

- BRT STATION
- EXISTING FACILITY



Alignments and stations shown are representative and are identified for purposes of cost estimating, ridership forecasting and other evaluation measures.

	LENGTH (MILES)	37
	REGIONAL LIGHT RAIL SPINE	NO
	RIDERSHIP (DAILY PROJECT RIDERS)	11,000—13,000
	CAPITAL COST (2014 \$ M)	\$687—\$735
	ANNUAL O&M COST (2014 \$ M)	\$27
	TRAVEL TIME (MIN)	87
	RELIABILITY	MEDIUM
	SYSTEM INTEGRATION	MEDIUM-HIGH
	EASE OF NON-MOTORIZED ACCESS	MEDIUM-LOW
	PERCENT OF NON-MOTORIZED ACCESS	20—85%
	CONNECTION TO PSRC-DESIGNATED REGIONAL CENTERS	7 CENTERS
	PLANS AND POLICIES	MEDIUM
	MARKET SUPPORT	MEDIUM
	POP PER ACRE (2014/2040)	7 / 13
	ACTIVITY UNITS EMP PER ACRE (2014/2040)	13 / 22
	POP+EMP PER ACRE (2014/2040)	20 / 34
	MINORITY/LOW-INCOME	39% / 13%
	POPULATION (2014/2040)	35,500 / 63,400
	EMPLOYMENT (2014/2040)	65,300 / 109,900

Date Last Modified: 04-05-2016

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