The Seattle Department of Transportation

Seattle Center City Connector Transit Study

Locally Preferred Alternative (LPA) Report

May 2014
D R A F T

SDOT
Seattle Department of Transportation

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Seattle Center City Connector Transit Study

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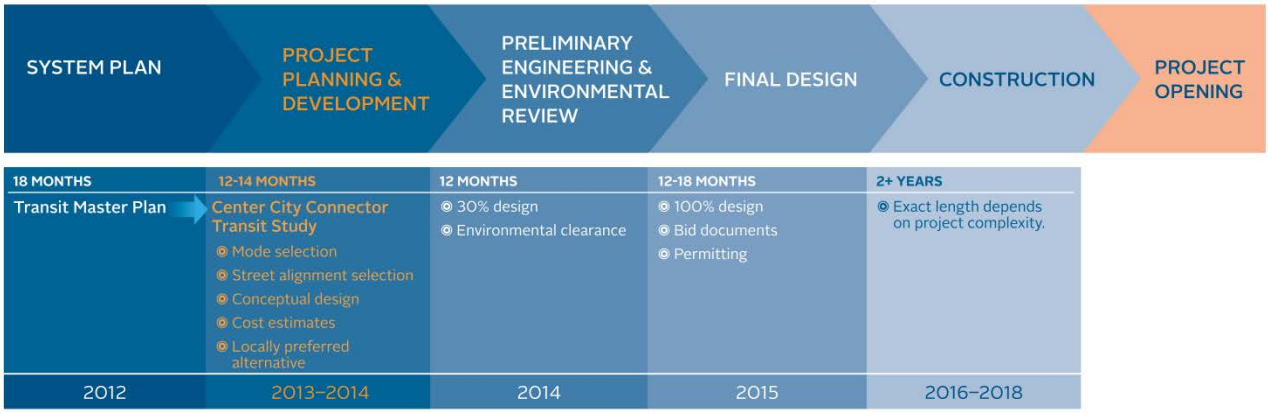
1 PROJECT OVERVIEW

Introduction

The City of Seattle's Transit Master Plan, adopted in 2012, identified four corridors with the highest ridership potential and the greatest need for higher capacity transit service. One of these corridors was the Center City Connector, which runs through downtown Seattle and connects the South Lake Union and First Hill Streetcar lines. The planning and project development timeline for the Connector is shown in Figure 1-1.

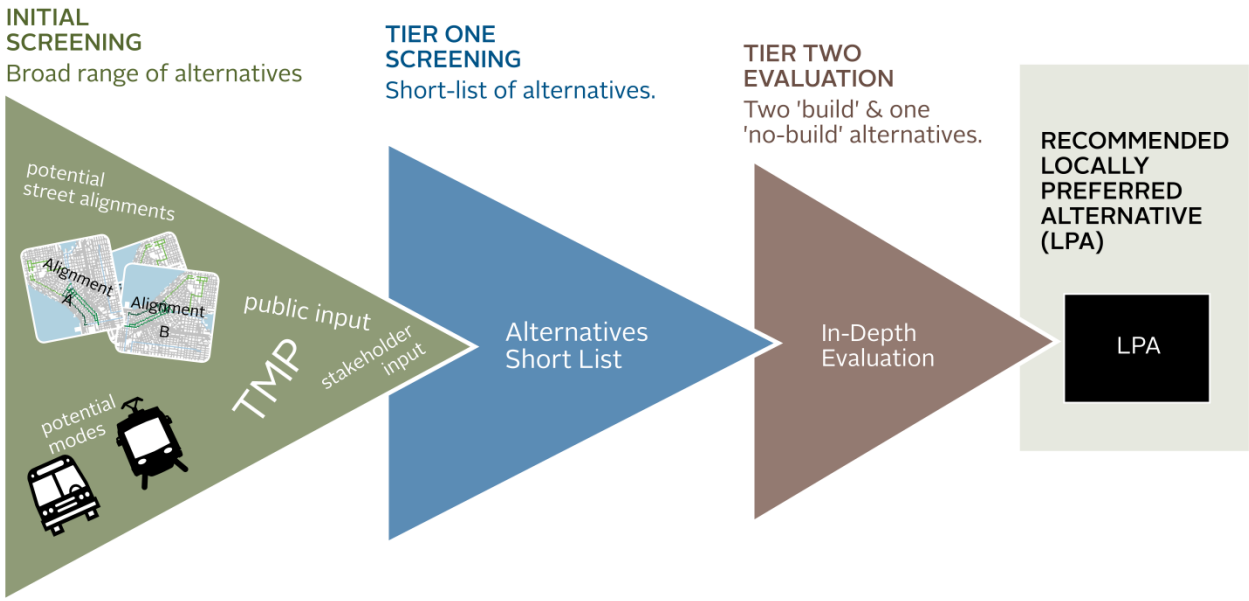
Figure 1-1 Project Development Timeline



The purpose of the Center City Connector Transit Study is to evaluate potential modes and alignments for the study corridor and select a Locally Preferred Alternative (LPA) with high community benefit, strong stakeholder support, and a viable financial strategy. Figure 1-2 illustrates the evaluation process that narrowed mode and alignment options and led to an LPA recommendation. The process included an initial screening of a broad range of alternatives, "Tier 1" screening of a short-list of alternatives, and "Tier 2" evaluation of two "build" alternatives.

The study was completed largely during 2013 and represents project planning and early development phases of the Project. This report describes the LPA and the technical and outreach steps taken to arrive at an LPA selection. The Center City Connector Transit Study Detailed Evaluation Report (Volume II) provides a more in-depth overview of the study, its technical evaluation, and the community outreach process.

Figure 1-2 Study Evaluation Process



Study Corridor Description

Seattle's Center City area encompasses 10 neighborhoods – Uptown, South Lake Union, Capitol Hill, Belltown, Denny Triangle, Pike/Pine, Downtown Commercial Core, First Hill, Pioneer Square, and the Chinatown/International District. Figure 1-3 provides a map of the Center City, including the study area. The core of Seattle's Center City resembles an hourglass where a limited set of north-south arterial corridors carry people and goods through the downtown core—the narrow neck of the hourglass. There is limited ability to enhance surface street capacity through the downtown core. Several of the north-south arterials (2nd, 3rd, 4th, and 5th Avenues), and the Downtown Seattle Transit Tunnel (DSTT) carry transit through downtown, but high utilization, limited expansion capacity, and increased future demand limit the ability of existing transit modes to provide access between key Center City employment centers, retail, attractions, and residential populations.

The Center City Connector Transit Study evaluated potential north-south transit alignments west of I-5 between the Lower Queen Anne, Uptown, and South Lake Union neighborhoods to the north, and the Chinatown- International District and South Downtown area including the King Street Intermodal Hub to the south. The study focused on leveraging existing City and regional partner investment in Center City streetcar lines by connecting existing termini at the north and south ends of downtown.

Figure 1-3 Center City Area Map

Policy Framework

High-quality, high-capacity transit connections between the downtown commercial core and other Center City neighborhoods provide residents, workers, and visitors access to goods, services, and cultural amenities. Further, sustainable transportation options will help Seattle's Center City continue to grow in a highly competitive global economy, while encouraging development that supports the human and environmental health of the region.

The transportation system in Seattle's Center City faces some of the most challenging geographic and topographic constraints of any city of its size in North America. To address these constraints, achieve City policy objectives, and allow for sustainable Center City growth, Seattle has developed a series of transportation planning and policy documents that help support sustained growth in the Center City. These documents include:

- Seattle Comprehensive Plan (2005)
- Transit Master Plan (2012) and Seattle Transit Plan (2005)
- Recommended Bicycle Master Plan (City Council to deliberate adoption in the 2nd quarter of 2014) and Bicycle Master Plan (2007)
- Pedestrian Master Plan (2009)
- Action Agenda (2012)
- Seattle Center City Circulation Study (2003)
- Seattle Center City Access Strategy (2004)
- Streetcar Network Plan (2008)
- Urban Mobility Plan (2008) (Alaskan Way Viaduct and Seawall Central Waterfront process)
- Central Waterfront Concept Design and Framework Plan (2012)
- Seattle Jobs Plan (2012)
- Climate Action Plan (2013)

In addition to the plans listed above, the City of Seattle is moving forward with planning and design of the proposed Broadway extension of the First Hill Streetcar, north of the First Hill line's planned terminus at Denny Way. Several other corridors recommended in the Transit Master Plan are currently funded for initial study, including the Madison Street Corridor Bus Rapid Transit, University District-South Lake Union-Downtown Corridor, and Ballard-to-Downtown Corridor[1].

Further detail on the plans and projects described in this section can be found in Appendix A, which contains the full Project Purpose and Need statement.

[1] The Ballard-to-Downtown High Capacity Transit study, a partnership between the City of Seattle and Sound Transit, examines potential high-capacity transit alignments and station locations in the Ballard to downtown Seattle corridor, and was coordinated with the Center City Connector study regarding transit connections in downtown Seattle.

Public Involvement

Public and stakeholder input was integral to decision making at each stage of the alternatives evaluation. Outreach strategies included a series of stakeholder interviews, three public open houses, comment cards, online materials and surveys, media events and briefings with community organizations. Interviews were conducted with 40 stakeholders over the course of more than two dozen meetings between November 28 and November 30, 2012. Stakeholders included representatives from numerous local and citywide bodies such as community councils, chambers of commerce, major institutions, human service and housing organizations, local business leaders, and other cultural and community organizations. City staff distributed project materials and information to residents and businesses within the core study area. Open house invitations were translated into multiple languages (Chinese, Vietnamese, and Spanish), and targeted distribution of these materials included drop-offs at social service agencies and affordable housing sites and offices throughout downtown.

Figure 1-4 Project Timeline

Project open houses were held in a range of locations to attract participation from a diverse array of stakeholders. Feedback from public involvement activities informed development of the initial screening alternatives and was considered as a criteria in the evaluation of each of the alternatives in the initial screening, Tier 1, and Tier 2 phases of analysis. SDOT briefed the Seattle City Council Transportation Committee on July 9, 2013 following the completion of the Tier 1 screening.

Open House #1: February 2013

The first open house for the Center City Connector Transit Study was held on February 6, 2013 at Seattle City Hall. The purpose of the first open house was to introduce the Project to the public; collect comments on the Project purpose, need, goals, objectives, and evaluation process; and gather input on initial alignment and mode alternatives. Table-top maps were provided and participants were encouraged to draw new alignments and to indicate their support for both newly drawn and previously identified alignments. A total of 101 people signed in to the meeting. Meeting participants received a handout that described the Project and provided an opportunity for specific and open-ended comments. Participants could also comment by leaving post-it notes on the display

boards and maps. In total, there were 75 comments placed directly on the project boards/maps and 30 completed comment cards.

Open House #2: June 2013

The second open house for the Center City Connector was held on June 6, 2013 at the South Lake Union Discovery Center. The Open House presented findings from the initial screening and Tier 1 screening and solicited input on Mixed-Traffic and Exclusive Streetcar alternatives on 1st Avenue and 4th/5th Avenues. A total of 61 people signed in to the meeting. Participants received a handout, which provided a summary of the Tier 1 screening results and provided an opportunity for participants to rank and comment on the four alternatives and to rank the importance of specific evaluation criteria in their preference (see Figure 1-8).

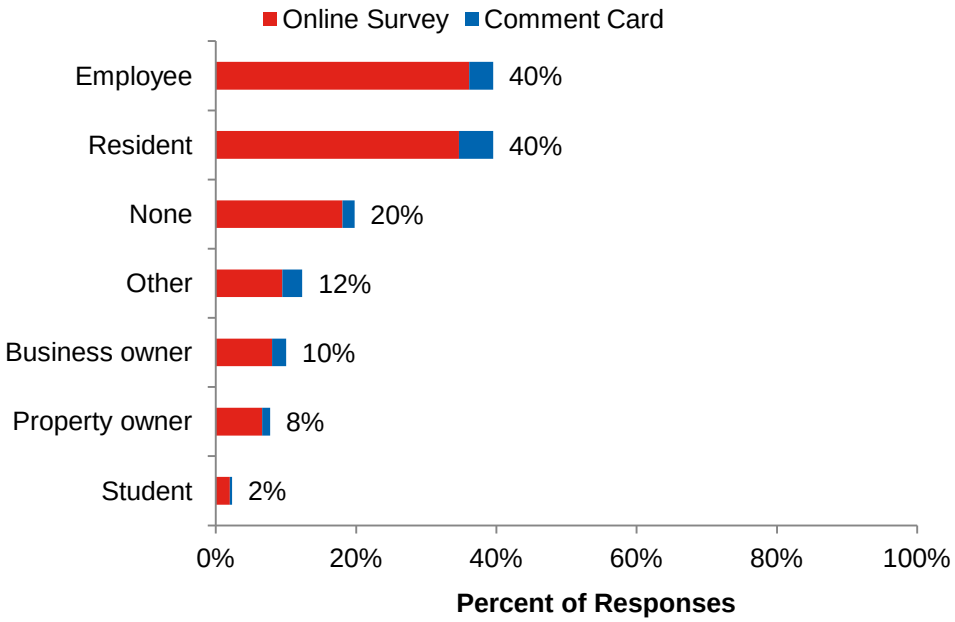
Figure 1-5 Open House #2 Participants

Open House #3: October 2013

The third Project open house was held on October 29, 2013 at Pike Place Market. This open house presented findings from the Tier 2 analysis and solicited feedback on the Mixed-Traffic and Exclusive Streetcar alternatives on 1st Avenue. A total of 89 people signed in to the meeting, and 40 attendees completed comment cards.

Participants self-identified as a mix of residents, employees, and business or property owners (Figure 1-6). The comment cards asked respondents to select their preferred alternative from the two mode and alignment alternatives evaluated in Tier 2 and rank the Tier 2 evaluation measures based on their importance to their preference. An online survey that asked similar questions to the comment card was made available for several weeks following the open house and received a total of 309 responses. Figure 1-9 provides sample graphics presented in the online survey.

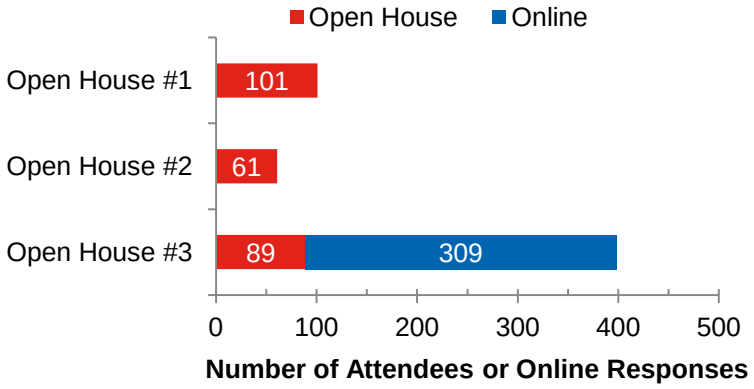
Figure 1-6 Open House #3 and Online Survey Participant Relationship to Center City Connector Study Area



Note: Respondents could select as many categories as applied; n=349

Figure 1-7 summarizes the number of open house attendees who signed in and the number of online survey responses submitted in the approximately four week period following the third open house, a total of 560 participants.

Figure 1-7 Open House and Online Survey Participants and Comment Cards/Surveys



The Detailed Evaluation Report and its Appendices N, P, and Q provide more details on public and stakeholder input received.

Figure 1-8 Sample Handout from Open House #2

SEATTLE CENTER CITY CONNECTOR TRANSIT STUDY

OPEN HOUSE #2

JUNE 6, 2013

SDOT Seattle Department of Transportation

Please return this handout with your comments

We need your input to select alternatives for further study! The evaluation results presented tonight, along with your input, will be used to narrow the four "Tier 1" alternatives for the Center City Connector to the alternative(s) that will be studied in more detail in the "Tier 2" evaluation.

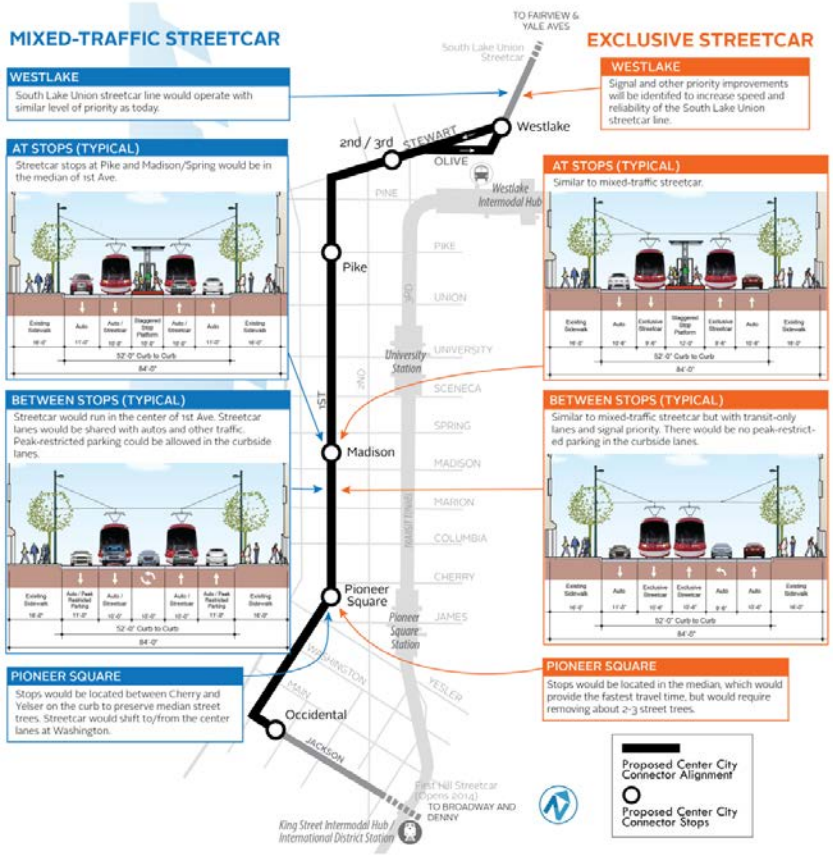
1. Please rank the alternatives from 1 (best) to 4 based on how well you think they meet the project purpose, goals, and objectives:

	4TH/5TH AVENUES		1ST AVENUE	
	Mixed-Traffic Streetcar	Exclusive Streetcar	Mixed-Traffic Streetcar	Exclusive Streetcar
Please rank from 1 to 4				

2. Please check up to FIVE evaluation measures that were most influential in ranking the alternatives.

	Evaluation Measures	Check up to 5	Comments and/or Key Considerations
ENHANCE	Streetcar Travel Times	☐	
	Auto Travel Times / Relative Traffic Diversion Impacts	☐	
	Bus Travel Time and Reliability Impacts: Aggregate Bus and Bus Passenger Delay	☐	
CONNECT	Multimodal Conflicts (Bike, Pedestrian, Bus, and Freight)	☐	
	Ridership Potential	☐	
	Annual Operating & Maintenance Costs	☐	
	Capital Costs	☐	
DEVELOP	On-Street Parking Impacts	☐	
	Economic Development Opportunities	☐	
THRIVE	Access to Jobs	☐	
	Access for Vulnerable Residents and to Social Services and Affordable Housing	☐	
	Access to Tourist Destinations, Civic and Cultural Assets, and Open Spaces	☐	
	Public Support (based on first Open House) and Stakeholder Support	☐	
SUSTAIN	Urban Form and Placemaking Opportunities and Improvement Potential	☐	

Figure 1-9 Sample Graphics from Online Survey (Conducted Following Open House #3)



MIXED-TRAFFIC STREETCAR	EVALUATION MEASURES	EXCLUSIVE STREETCAR
11.5 minutes	**Streetcar Travel Time, PM Peak** (Jackson/Occidental - Stewart/Westlake, average north/southbound, including stops, 2018)	7.5 minutes
26%	**Streetcar Travel Time Reliability, PM Peak** (Variance between streetcar travel times, 2018)	12%
28,000 daily riders	**Forecasted Weekday Daily Riders** (Integrated CCC, First Hill, and SLU lines, 2018)	31,000 daily riders
$17.5 million/year	**Annual Operating & Maintenance Costs** (Integrated CCC, First Hill, and SLU lines, 2013 $)	$15.8 million/year
$110-$119 million	**Total Capital Costs** (Center City Connector, including vehicles, 2013 $)	$104-$111 million
6.5 minutes	**Auto Travel Time, PM Peak** (Jackson/Occidental - Stewart/Westlake, avg. north/southbound, 2018; "No-Build" travel time: 5.7 min)	8.0 minutes
Diversion: < 10% Avg. Delay Increase: 2 sec	**Traffic Delay from Diversion, PM Peak** (% diversion of vehicles from 1st Avenue and increase in average intersection delay on parallel streets, 2035)	Diversion: up to 50% Avg. Delay Increase: 3.5 sec
Peak-restricted: 80 All-day: 15 Loading: 45	**On-Street Parking and Loading Impacts** (Approx. number parking stalls and loading zone spaces retained. No-Build: about 145 peak-restricted, 25 all-day parking stalls; 80 general/passenger loading spaces)	Peak-restricted: 5 All-day: 20 Loading: 15

RATING SCALE: Highly Favorable ← → Greatest Impact

Note: Full-size versions of the above graphics are provided in Figure 4-7 and Figure 5-8

2 PURPOSE AND NEED

This chapter states the Purpose and Need for the Center City Connector.

Project Purpose

The purpose of the Seattle Center City Transit Connector Project is to serve the growing demand for Center City circulation trips[2] with a mode and alignment that is highly legible, easy-to-use for a variety of trip purposes, and that provides continuity of travel between the downtown commercial core and Center City neighborhoods served by the South Lake Union Streetcar and the First Hill Streetcar. The Seattle Transit Master Plan (TMP) identified improved Center City transit as a top priority—increasing transit capacity, enhancing transit service quality and reliability, and improving transit options for residents, workers, and visitors traveling between and within Center City neighborhoods and attractions. Figure 2-1 illustrates potential Center City Connector street alignment options that were identified as part of the TMP.

Project Need

The need for the Center City Connector Project is based on:

- **Significant existing population and employment and projected growth in the Seattle Center City**. Seattle's Center City neighborhoods have a significant concentration of households and employment, and are forecast to see employment growth of 60% and residential population growth of 97% by 2030.
- **Growth in demand for Center City circulation trips.** Recent analysis found high demand for trips between Center City neighborhoods and for accommodating "last mile" connections for trips using existing and planned local and regional transit services.
- **Constraints on expansion of Center City transportation capacity.** There is a limited number of north-south through streets available for transit and existing and planned transit will utilize much of the available capacity.
- **Special mobility needs of tourists, visitors, and casual users in the Center City.** Approximately nine million annual tourists visit Seattle each year, many seeking to use public transit as their primary means of mobility.
- **Affordable transportation access to key social and human services located in the Center City.** A large concentration of social service agencies in the Center City relies on good transit connections.

[2] For the purposes of this study, Center City circulation trips include (1) trips between and/or within Center City neighborhoods, (2) trips connecting major attractions and destinations in the Center City, and (3) last-mile connections from other local and regional transit services to jobs, human/social service centers, etc.

- **Connections for low-income workers who live in the Center City to jobs in the Center City.** There is a growing concentration of affordable housing and low- and moderate-income jobs in the Center City.
- **Reduction in greenhouse gas (GhG) emissions from private vehicle travel and traffic congestion.** Seattle's Climate Action Plan to reduce GhG emissions relies on providing higher-capacity transit to support dense mixed-use neighborhoods in the Center City.

The full Purpose and Need statement, including background information, is provided in Appendix A of this document.

Figure 2-1 Center City Connector Initial Transit Corridor Alignment Options (Seattle TMP Concept)

Source: Map adapted from Seattle Transit Master Plan Summary Report, 2012, Figure 3-16

3 EVALUATION FRAMEWORK

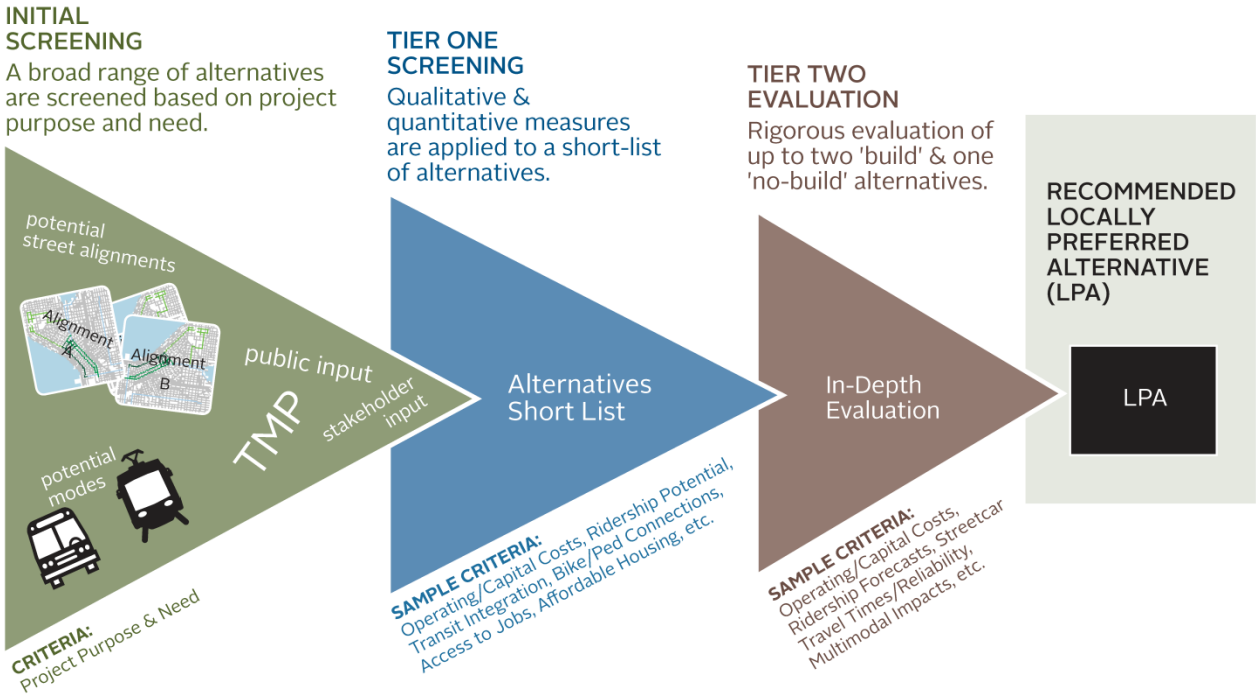
This chapter provides an overview of the evaluation process used to assess Project alternatives. In addition to technical analysis conducted in the Initial, Tier 1, and Tier 2 stages of evaluation, the evaluation process included extensive consultation and input from the public, stakeholders, and local, regional, and federal agencies.

The Detailed Evaluation Report describes the Project evaluation framework in more detail.

Evaluation Process

Figure 3-1 illustrates the evaluation process that was defined for studying and narrowing all reasonable alignment and mode options into a Locally Preferred Alternative, consistent with Federal Transit Administration (FTA) guidance.

Figure 3-1 Evaluation Process Overview



Note: In the initial evaluation process design, the use of the terms “screening” (Initial and Tier 1 screening) and “evaluation” (Tier 2 evaluation) was intended to differentiate the increasingly rigorous level of analysis planned at each stage of evaluation.

Goals and Objectives

The Project goals and objectives are shown in Figure 3-2. The screening and evaluation process builds on the Purpose and Need Statement and Goals and Objectives by focusing on the five themes and Project goals identified based on the Project Purpose and Need:

- **Enhance:** Enhance the customer experience on transit
- **Connect:** Enhance connections between and access to Center City neighborhoods
- **Develop:** Support local and regional economic development goals
- **Thrive:** Strengthen downtown and Center City neighborhoods
- **Sustain:** Improve and sustain human and ecological health

The Project Goal statement includes a series of objectives. Draft Tier 1 and Tier 2 criteria were developed to address each of the objectives. The criteria are intended to further define each objective and support evaluation of the alignments against the stated goals in a transparent and understandable manner.

Figure 3-2 Goals and Objectives

ENHANCE *Enhance the customer experience on transit*

Objectives:

- Provide comfortable, visible, and easy to use transit services and facilities for all riders
- Ensure reliable, frequent transit service

CONNECT *Connect neighborhoods and improve local circulation*

Objectives:

- Improve connections between Center City neighborhoods, the regional transit system, and major attractions and destinations
- Support walkable neighborhoods and multimodal transportation choices
- Maximize transit ridership
- Enhance the value of existing transit investments

DEVELOP *Support local and regional economic development goals*

Objectives:

- Provide transit capacity to support and attract residential and commercial growth
- Support small and local businesses in Center City business and retail districts
- Support local and regional goals to foster compact, mixed-used development

THRIVE *Strengthen downtown and Center City neighborhoods*

Objectives:

- Enhance access to jobs
- Increase access to affordable housing and social services
- Enhance access and mobility to tourist destinations, civic and cultural assets, and open spaces
- Improve transportation options for Seattle's most vulnerable residents
- Incorporate public and stakeholder input

SUSTAIN *Improve and sustain human and ecological health*

Objectives:

- Reduce greenhouse gas emissions
- Minimize impacts to natural, historical, and cultural resources
- Maximize placemaking opportunities
- Provide people with healthy travel options
- Enhance the safety of all roadway users

4 EVALUATION OF ALTERNATIVES

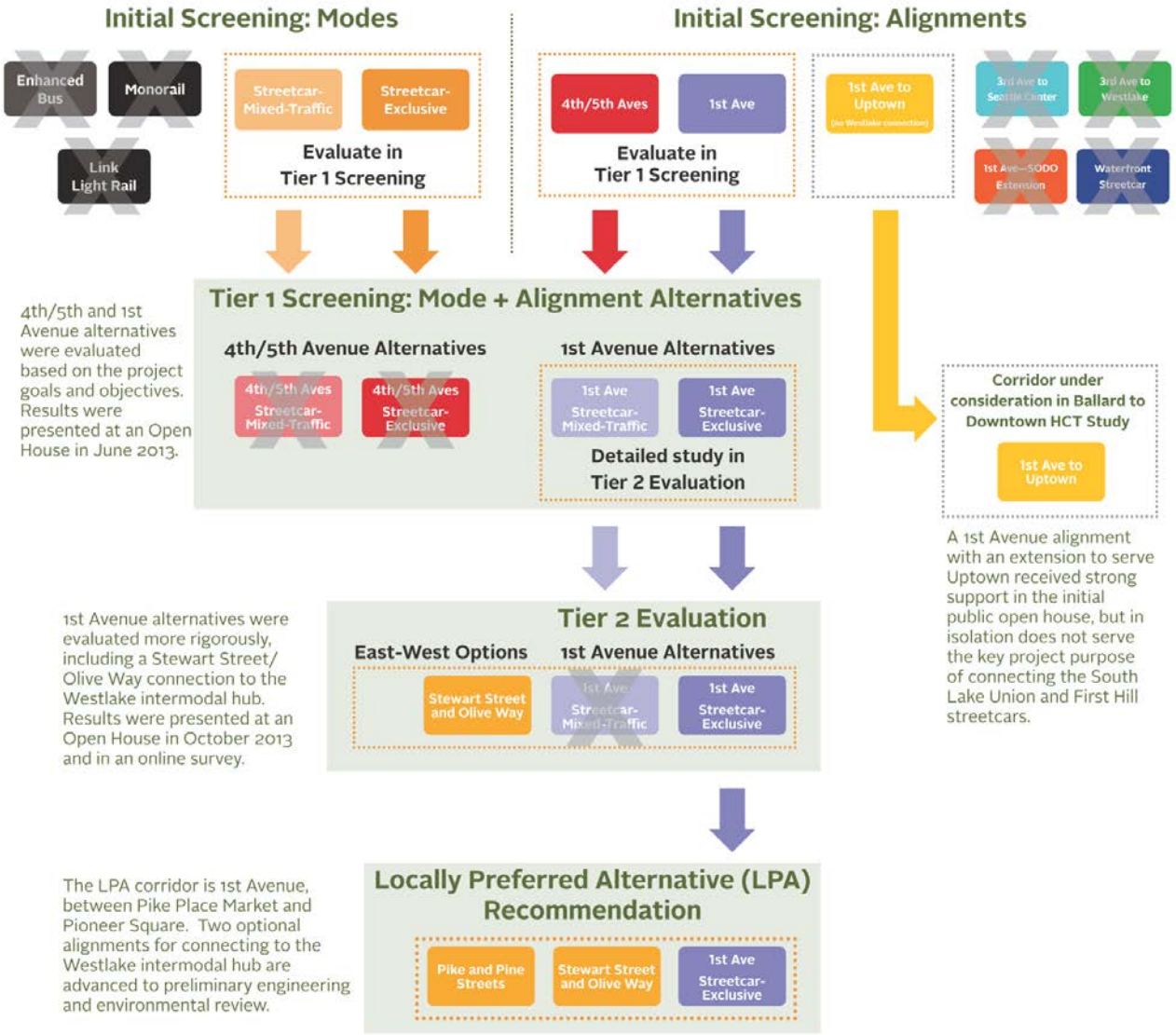
This chapter summarizes the screening process used to evaluate a range of potential modes and alignments to identify a Locally Preferred Alternative. Chapter 5 provides results and ratings for the evaluation measures.

The screening process was structured into three progressively more detailed phases of evaluation, as illustrated in Figure 3-1 (above). Each phase of evaluation was conducted concurrently with a set of public involvement strategies, including a public open house meeting at the outset of the initial screening to obtain public input on the wide range of options that should be considered in the study and open house meetings at the conclusion of both the Tier 1 screening and Tier 2 evaluation.

Figure 4-1 below summarizes the evaluation of alternatives at each stage. Each stage is described in more detail in the following sections.

The Detailed Evaluation Report and its appendices provide a more comprehensive discussion of each evaluation stage.

Figure 4-1 Center City Alternatives Screening Process and Outcomes



Modes

Initial Screening of Modes (Purpose and Need)

The Transit Master Plan proposed that both enhanced bus and streetcar (with a range of transit priority improvements) be considered for the Center City Connector. Based on input received at the February 6, 2013 open house and through stakeholder interviews, mixed-traffic and exclusive streetcar, enhanced bus, light rail (Sound Transit Link), and monorail modes were screened against the Project Purpose and Need (see Chapter 2). These modes are shown in Figure 4-2. The Mixed-Traffic and Exclusive Streetcar modes were differentiated primarily through the use of a shared or exclusive lane and the level of signal priority provided.

Figure 4-2 Modes Screened in Initial Screening Evaluation

The criteria used to evaluate each of these five modes in the initial screening process included the following:

- Consistent with local/regional plans
- Meets identified needs (mobility/connectivity)
- Level of public/stakeholder support
- Potential right-of-way impacts

Public and stakeholder comments emphasized the importance of selecting a mode that enables a seamless connection to both the South Lake Union Streetcar and First Hill Streetcar lines, which was stated in the Project purpose. Public input also emphasized the importance of speed and reliability in order to make the Center City Connector attractive and competitive with other modes. Although there was a small amount of support for an enhanced bus alternative due to the lower Project cost, the majority of respondents indicated that the benefits of modern streetcar outweigh potential downsides.

Based on public input and a screening of modes against the above criteria, the project team recommended that all modes other than streetcar be eliminated from further study and that both Mixed-Traffic and Exclusive streetcar modes be analyzed in the Tier 1 screening.

The Detailed Evaluation Report, Chapter 3 and Appendix M, provides an in-depth description of the initial screening.

Tier 1 and 2 Evaluation of Modes: Mixed-Traffic and Exclusive Streetcar

Mixed-Traffic and Exclusive Streetcar modes were carried through both the Tier 1 and Tier 2 stages of evaluation. Figure 4-3 identifies the distinctions between Mixed-Traffic and Exclusive Streetcar modes as defined for this Project.

Figure 4-3 Mixed-Traffic and Exclusive Streetcar Mode Characteristics

Feature	Mixed-Traffic Streetcar	Exclusive Streetcar
Right-of-way design	Operates primarily in mixed traffic	Operates primarily in transit-only or exclusive streetcar lanes
Signal priority	Limited signal priority	Extensive signal priority
Stop spacing	Shorter stop spacing	Longer stop spacing
Travel speeds	Slower travel speeds	Faster travel speeds due to transit priority features and longer stop spacing
Vehicle capacity	Typical modern streetcar vehicles, although higher capacity vehicles could be used	Higher passenger capacity if longer articulated or coupled vehicles are implemented
Station amenities	Lower volume shelters; typical amenities include real-time passenger information, level boarding, and off-board fare payment	Enhanced station amenities and access including high volume shelters, real-time passenger information, level boarding, and off-board fare payment

The evaluation of these modes in the Tier 1 screening was intended to illustrate the tradeoffs between potential travel time and capacity benefits for streetcar and impacts on other travel modes. These benefits and impacts were quantified through traffic analysis (Synchro) and other quantitative and qualitative analysis; these results are detailed in Chapter 5.

Both modes were carried into the Tier 2 evaluation, a detailed analysis of the Mixed-Traffic and Exclusive Streetcar alternatives including traffic analysis in Synchro and VISSIM. The Tier 2 evaluation considered seamless connections with existing and planned transit investments in the Center City area, passenger-carrying capacity needed to support projected ridership, and the ability to ensure competitive and reliable travel speeds impacts on other modes. The evaluation results are described in Chapter 5.

Chapter 4 and Appendix N of the Detailed Evaluation Report describe the Tier 1 screening; Chapters 6 to 9 describe the Tier 2 evaluation.

Alignments

Initial Screening of Alignments (Purpose and Need)

The Transit Master Plan proposed potential Center City Connector alignments on 1st and 4th/5th Avenues. The project team solicited public input on these and other potential alignments at the February 6, 2013 open house and additional alignments identified by the public were included in the range of alignments considered (described in the Detailed Evaluation Report). These alignments were screened against the Project Purpose and Need using the same set of evaluation criteria that was used to evaluate modes:

- Consistent with local/regional plans
- Meets identified needs (mobility/connectivity)
- Level of public/stakeholder support
- Potential right-of-way impacts

The alignments on 1st Avenue and on 4th/5th Avenues received the most support from the public in attendance at the open house. There was some public interest in alignments that could serve as extensions of the Center City corridor connecting the First Hill and South Lake Union Streetcars, but that do not directly meet the Purpose and Need for the Center City Connector. These include alignments south of the Jackson Street to SODO, the TMP-identified alignment extending north towards Uptown/Seattle Center, and a Waterfront alignment. Several other potential alignments received relatively weak support, including 3rd Avenue. Other participants noted particular drawbacks to two of these alignments, including the impacts of a 3rd Avenue alignment on existing transit and the distance and grade between a waterfront alignment to the downtown core, which impact this alignment's ability to meet the Project Purpose and Need.

Based on the public input and screening results, the project team recommended that the 4th/5th Avenue couplet (Jackson Street to Westlake Hub) and 1st Avenue (Jackson to Stewart Streets) alignments be analyzed in the Tier 1 screening. An extension of the 1st Avenue alignment to Uptown was initially deferred to the Tier 2 evaluation, but it was ultimately determined that this alignment did not meet the Purpose and Need for the Center City Connector Project. This uptown corridor is being evaluated for rapid streetcar and light rail modes in the Ballard-to-Downtown High Capacity Transit Study being jointly managed by Sound Transit and SDOT. The waterfront streetcar alignment was studied as part of the Central Waterfront Project concurrent with this study.

Chapter 3 and Appendix M of the Detailed Evaluation Report provide additional detail on the initial screening.

Tier 1 Evaluation of Alignments

The Tier 1 screening evaluated two alignments connecting the southern terminus of the South Lake Union Streetcar on Westlake with the First Hill Streetcar along Jackson Street, as illustrated in Figure 4-4:

- 4th/5th Avenues (couplet).
- 1st Avenue, including an east-west connection using Stewart Street and Olive Way between 1st Avenue and Westlake; a more detailed screening of east-west options was conducted following the completion of the Tier 1 process (see "East-West Connections Screening" on page 4-8).

The alignments were evaluated as part of both Mixed-Traffic and Exclusive Streetcar alternatives using criteria supporting each of the five goal themes: Enhance, Connect, Develop, Thrive, and Sustain. Both the Mixed-Traffic and Exclusive alternatives on 4th/5th Avenues fared poorly on measures of travel time and impacts to current bus service, as 4th Avenue is heavily used by regional transit routes and the street right-of-way would provide limited opportunity to expand exclusive transit operations, particularly given bike facilities identified in the City's Bike Master Plan. The 1st Avenue alignment had stronger stakeholder support, better served tourist and visitor mobility needs, and had lower impacts on other transportation modes including transit, bicyclists, and automobiles. The results of this evaluation, detailed further in Chapter 5, led the project team to recommend that 1st Avenue be carried forward into the Tier 2 evaluation.

The Tier 1 screening is described in greater depth in the Detailed Evaluation Report, Chapter 4. The Tier 1 Screening Report is included in Appendix N of the Detailed Evaluation Report.

Figure 4-4 Tier 1 Alignment Alternatives

Screening of East-West Connections

The study also screened several alignment alternatives for connecting from 1st Avenue to the South Lake Streetcar and the Westlake Transportation Hub. This screening took place in the initial stages of the Tier 2 evaluation. The five alignments evaluated are shown in Figure 4-5 and Figure 4-6. With the exception of 6th Avenue, these alignments were identified in the Transit Master Plan; input from the first Project open house that solicited input on potential alignments was also considered.

Figure 4-5 East-West Alignments A, B, and C

Figure 4-6 East-West Alignments D and E

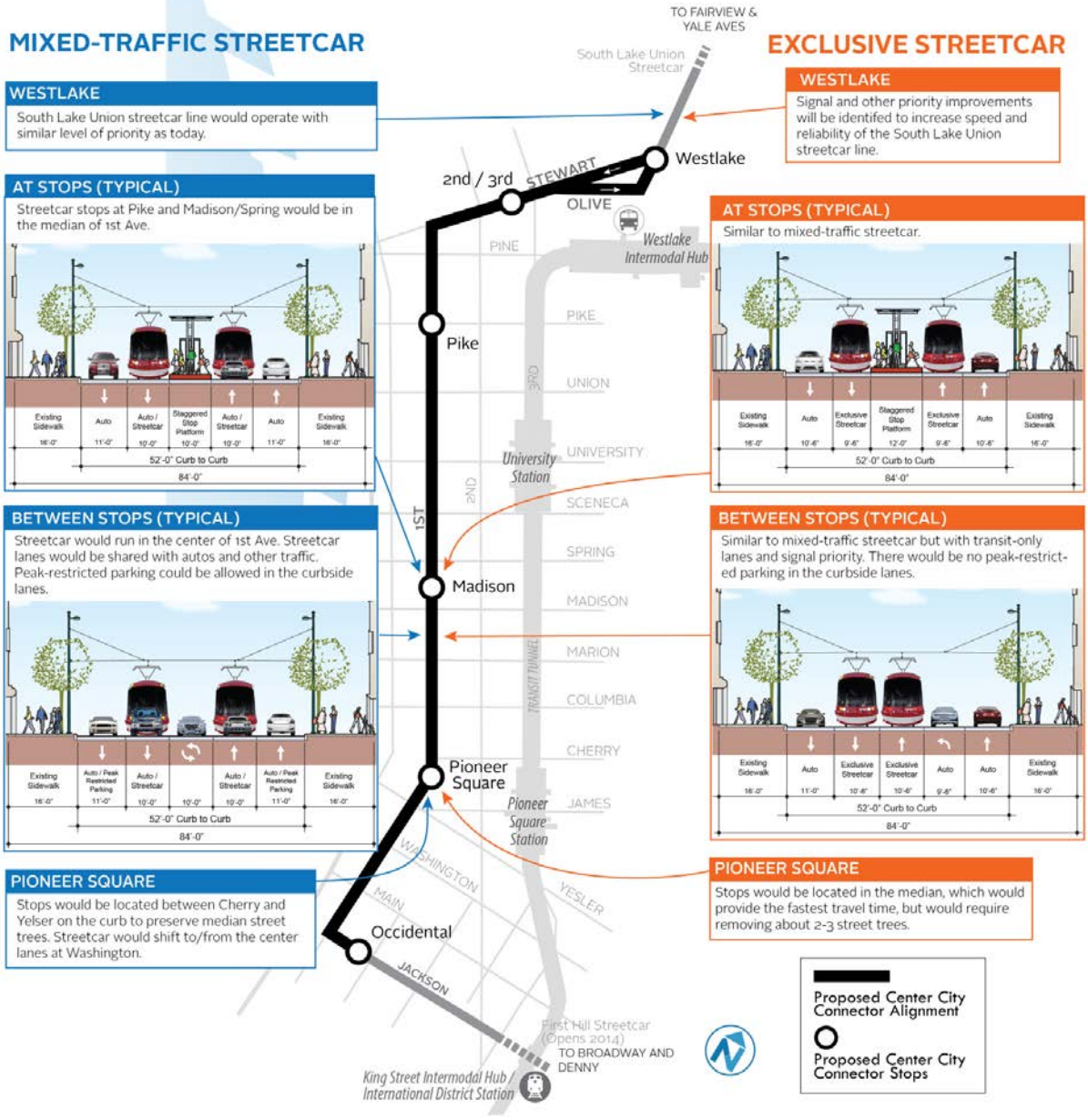
The east-west alignment options were evaluated using a simplified set of criteria including bike and pedestrian conflicts, transit conflicts, Westlake Hub operations, access to the Downtown Seattle Transit Tunnel (DSTT), traffic operations, parking and access impacts, design risks and feasibility, legibility, and stakeholder support. All of the alignment options except for Stewart/Olive fared poorly on the design risk and feasibility criteria for reasons including risk of impacting the DSTT waterproofing membrane and impacts to brick intersections along Pine. The Stewart/Olive alignment also had several drawbacks, including less direct connections to the Westlake Hub and potential conflicts with regional transit routes that use Stewart Street and Olive Way. However, Stewart/Olive scored highly on other metrics and had the lowest design risk. The Stewart/Olive alignment was evaluated in both the Tier 1 screening and Tier 2 evaluation, however the Pike/Pine alignment had strong stakeholder support and the best connections to Westlake Hub. Both the Stewart/Olive and Pike/Pine/4th/5th alignments (A and C in Figure 4-5) were recommended for inclusion in the LPA, and both will be evaluated in the subsequent environmental review process.

Additional detail on the screening of east-west connections is provided in the Detailed Evaluation report, Chapter 5 and Appendix O.

Tier 2 Alignments

The Tier 2 evaluation analyzed 1st Avenue with Mixed-Traffic and Exclusive Streetcar alternatives, as shown in Figure 4-7 including representative cross-sections. The analysis assumed an east-west connection using Stewart Street and Olive Way between 1st Avenue and Westlake as described on page 4-8. Although a northern extension of the 1st Avenue alignment to Uptown received strong public support, this segment did not meet the project Purpose and Need and is being analyzed as part of the Ballard-to-Downtown High Capacity Transit Study. The Tier 2 evaluation results are summarized in the next chapter.

Figure 4-7 Tier 2 Alternatives



5 SUMMARY OF TIER 1 SCREENING AND TIER 2 EVALUATION RESULTS AND PUBLIC INPUT

This chapter summarizes the Tier 1 screening and Tier 2 evaluation results in addition to stakeholder input received throughout the process. The Detailed Evaluation Report and Appendices present the evaluation results in more detail.

Summary of Tier 1 Screening Results and Input

Each Tier 1 alternative was evaluated based on a set of measures corresponding to the Project goals and objectives, and rated on a relative scale for each measure. Figure 5-1 and Figure 5-2 summarize the evaluation measures and qualitative ratings for the Tier 1 alternatives.

Figure 5-1 Tier 1 Screening Results

4TH/5TH AVENUES		EVALUATION MEASURES	1ST AVENUE	
MIXED-TRAFFIC STREETCAR	EXCLUSIVE STREETCAR		MIXED-TRAFFIC STREETCAR	EXCLUSIVE STREETCAR
12.8 minutes	8.9 minutes	**Streetcar Travel Time, PM Peak** Jackson - Westlake, average north/south-bound, including stops, 2030	11.6 minutes	6.1 minutes
4th: +60% 5th: +40%	4th: -25% 5th: +5%	**% Change in Aggregate Bus Passenger Delay, 5-6 PM** Daily Hours Compared to No-Build	N/A	N/A
13.2 minutes	12.9 minutes	**Auto Travel Time, PM Peak** Jackson - Westlake, avg. north/southbound, 2030; "No-Build": 4th/5th 11.6 min; 1st 9.0 min.	8.8 minutes	11.8 minutes
$12.3 million/year	$12.0 million/year	**Annual Operating & Maintenance Costs** Integrated CCC, First Hill, SLU lines, 2013$	$12.3 million/year	$11.2 million/year
$54-$66 million	$58-$71 million	**Total Capital Costs** Center City Connector, including vehicles (with end-to-end operating plan), 2013 $	$60-$73 million	$63-$77 million
100%	58%	**On-Street Parking Impacts** % of Block Faces that Retain On-Street Parking	71%	42%
132,000		**Number of Employees, 2030** Within 1/8 mile	93,000	
7,500		**Population, 2030** Within 1/8 mile	10,700	
6,595		**Number of Hotel Rooms, 2012** Within 1/8 mile	4,260	
1.3 million		**Number of Annual Visitors, 2011** Within 1/8 mile	12.6 million	

RATING SCALE: Highly Favorable → Greatest Impact

Figure 5-2 Tier 1 Screening Summary Matrix

	Evaluation Measures	4th/5th Avenues		1st Avenue	
		Mixed-Traffic	Exclusive	Mixed-Traffic	Exclusive
ENHANCE	Streetcar Travel Times	Fair	Good	Fair	Best
	Auto Travel Times / Relative Traffic Diversion Impacts	Fair	Fair	Best	Fair
	Bus Travel Time and Reliability Impacts: Aggregate Bus Delay	Poor	Fair	Best	Best
	Bus Travel Time and Reliability Impacts: Aggregate Bus Passenger Delay	Poor	Fair	Best	Best
CONNECT	Multimodal Conflicts (Bike, Pedestrian, Bus, and Freight)	Fair	Poor	Best	Best
	Ridership Potential	Good	Best	Good	Best
	Annual Operating & Maintenance Costs	Fair	Good	Fair	Best
	Capital Costs	Best	Good	Good	Fair
DEVELOP	On-Street Parking Impacts	Best	Fair	Good	Fair
	Economic Development Opportunities	Good	Good	Best	Best
THRIVE	Access to Jobs	Good	Good	Good	Good
	Access for Vulnerable Residents and to Social Services and Affordable Housing	Good	Good	Good	Good
	Access to Tourist Destinations, Civic and Cultural Assets, and Open Spaces	Good	Good	Best	Best
	Public Support (based on first Open House) and Stakeholder Support	Fair	Fair	Best	Best
SUSTAIN	Urban Form and Placemaking Opportunities and Improvement Potential	Good	Good	Best	Best

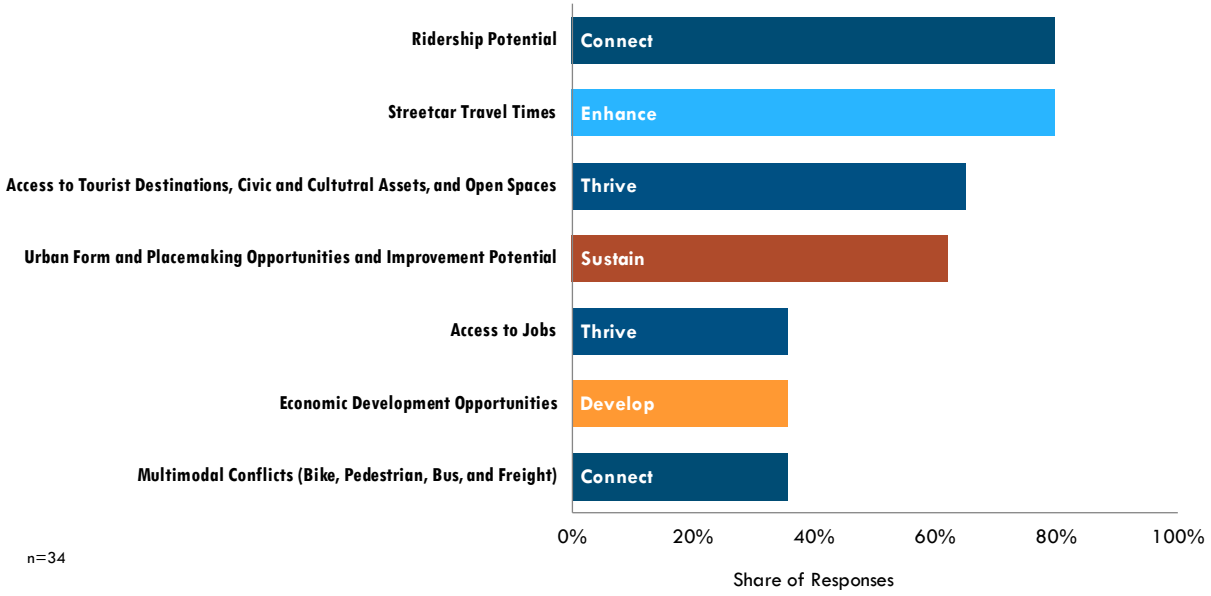
Overall, the 1st Avenue Exclusive Streetcar alternative rated "best" on the most evaluation measures compared to the other alternatives, including streetcar travel time. The 1st Avenue Mixed-Traffic Streetcar alternative rated "best" on the next highest number of evaluation measures, including the lowest impact to auto travel times. The 4th/5th Exclusive and Mixed-Traffic Streetcar alternatives scored "best" on fewer measures and "fair" or "poor" on more measures than the 1st Avenue alternatives.

Both of the Exclusive Streetcar alternatives (1st or 4th/5th Avenues) performed better than either Mixed-Traffic Streetcar alternative on measures of streetcar travel time, ridership potential, and annual operating and maintenance costs.

Figure 5-3 illustrates the most important of the criteria presented at the second open house as identified by open house participants. The evaluation measures identified by Open House participants as most important represent all five goal and objective themes (Enhance, Connect, Develop, Thrive, and Sustain). Related to these measures:

- High-level, peer-based ridership estimates for the Mixed-Traffic and Exclusive alternatives at this stage of evaluation indicated that ridership is comparable for the 4th/5th Avenue and 1st Avenue alignments, but that the faster and more reliable travel times in the Exclusive alternatives attract more riders. Detailed ridership estimates were prepared in the Tier 2 evaluation.
- Results for streetcar travel time, which participants identified as one of the most important criteria, are shown in Figure 5-4 and Figure 5-5 in relation to No-Build auto travel times. The 1st Avenue Exclusive Streetcar alternative had the fastest streetcar travel time.
- As shown in Figure 5-3 (above), the 1st Avenue corridor has higher annual visitation to major attractions and a higher residential population, while the 4th/5th Avenue corridor serves a greater employment and hotel room density.
- 1st Avenue presents greater placemaking/urban form improvement opportunities and greater economic development potential than 4th/5th Avenues. Stakeholders emphasized throughout the process that their preference was for streetcar to support economic success for small and local businesses in existing, established business districts rather than large-scale development or redevelopment.
- The 4th/5th Avenue alternatives rated "Fair" or "Poor" in terms of modal conflicts. Introduction of a streetcar increases peak-hour delay for passengers traveling on regional bus routes that use 4th or 5th Avenues. Cycle tracks are proposed for the 4th/5th Avenue corridor in the City's Bicycle Master Plan update, and with the one-way cycle tracks included in the high-level right-of-way design for each street, there were limited opportunities to provide exclusive streetcar right-of-way particularly on 5th Avenue. The intensity of streetcar, bus, bike, and pedestrian use increases modal conflicts on 4th/5th Avenues.

Figure 5-3 Ranking of Evaluation Measures by Importance, Open House #2



Note: Participants were asked to rate the five most influential criteria.

Figure 5-4 and Figure 5-5 provide a sample of the graphics used to present the data from the analysis.

Figure 5-4 Average One-Way Travel Time, 4th/5th Ave

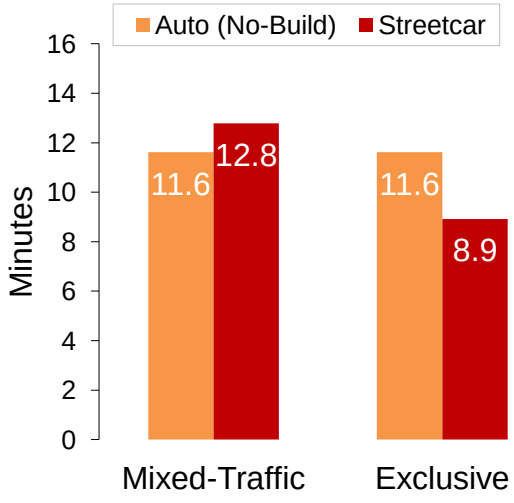
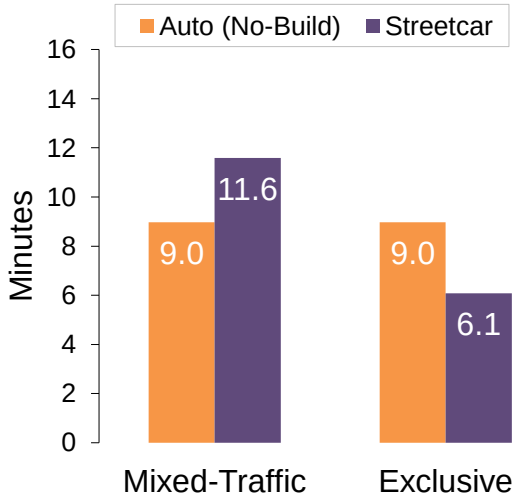


Figure 5-5 Average One-Way Travel Time, 1st Ave

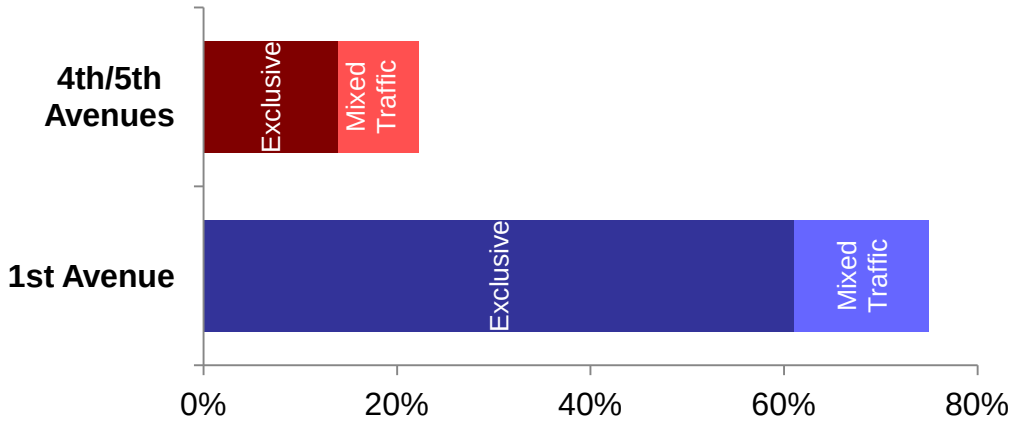


Note: Based on Synchro analysis for 2030 PM Peak period.

Summary of Public Input on Tier 1 Alternatives (Open House #2)

Open house attendees were asked to rank the four Tier 1 alignment alternatives according to preference. Figure 5-6 shows the outcome of the ranking exercise. The 1st Avenue Exclusive Streetcar alternative was by far the most popular alternative. The 1st Avenue Mixed-Traffic and 4th/5th Avenue Exclusive Streetcar alternatives received similar levels of support, while the 4th/5th Mixed-Traffic alternative received very little support. Additional feedback from the open house indicated that for those who preferred the 1st Avenue Exclusive Streetcar alternative, streetcar speed and reliability were the most important evaluation criteria.

Figure 5-6 Public Support for Tier 1 Alternatives



Tier 1 Recommendation

Based on the technical evaluation and strong stakeholder and public support in favor of 1st Avenue, the project team recommended to City Council that both the 1st Avenue Exclusive and 1st Avenue Mixed-Traffic Streetcar alternatives be advanced for more detailed study in the Tier 2 evaluation. This recommendation was presented to the Seattle City Council Transportation Committee at an informational briefing on July 9, 2013. Council comments were supportive. No action was taken.

Appendix N of the Detailed Evaluation Report includes the full Tier 1 Screening Report.

Summary of Tier 2 Evaluation Results and Input

Similar to Tier 1, the Tier 2 alternatives (1st Avenue Mixed-Traffic Streetcar and 1st Avenue Exclusive Streetcar) were evaluated based on measures corresponding to the Project goals and objectives, and rated on a relative scale for each measure. Figure 5-7 and Figure 5-8 summarize the evaluation measures and qualitative ratings for the Tier 2 alternatives.

Figure 5-7 Tier 2 Evaluation Results

MIXED-TRAFFIC STREETCAR	EVALUATION MEASURES	EXCLUSIVE STREETCAR
11.5 minutes	**Streetcar Travel Time, PM Peak** (Jackson/Occidental - Stewart/Westlake, average north/southbound, including stops, 2018)	7.5 minutes
26%	**Streetcar Travel Time Reliability, PM Peak** (Variance between streetcar travel times, 2018)	12%
20,000 - 27,000 daily riders	**Forecasted Weekday Daily Riders** (Integrated CCC, First Hill, and SLU lines, 2018)	23,000 - 30,000 daily riders
$16.5 million/year	**Annual Operating & Maintenance Costs** (Integrated CCC, First Hill, and SLU lines, 2018 $)	$15.0 million/year
$110-$119 million	**Total Capital Costs** (Center City Connector, including vehicles, 2013 $)	$104-$111 million
6.5 minutes	**Auto Travel Time, PM Peak** (Jackson/Occidental - Stewart/Westlake, avg. north/southbound, 2018; "No-Build" travel time: 5.7 min)	8.0 minutes
Diversion: < 10% Avg. Delay Increase: 2 sec	**Traffic Delay from Diversion, PM Peak** (% diversion of vehicles from 1st Avenue and increase in average intersection delay on parallel streets, 2035)	Diversion: up to 50% Avg. Delay Increase: 3.5 sec
Peak-restricted: 80 All-day: 15 Loading: 45	**On-Street Parking and Loading Impacts** (Approx. number parking stalls and loading zone spaces retained. No-Build: about 145 peak-restricted, 25 all-day parking stalls; 80 general/passenger loading spaces)	Peak-restricted: 5 All-day: 20 Loading: 15

RATING SCALE

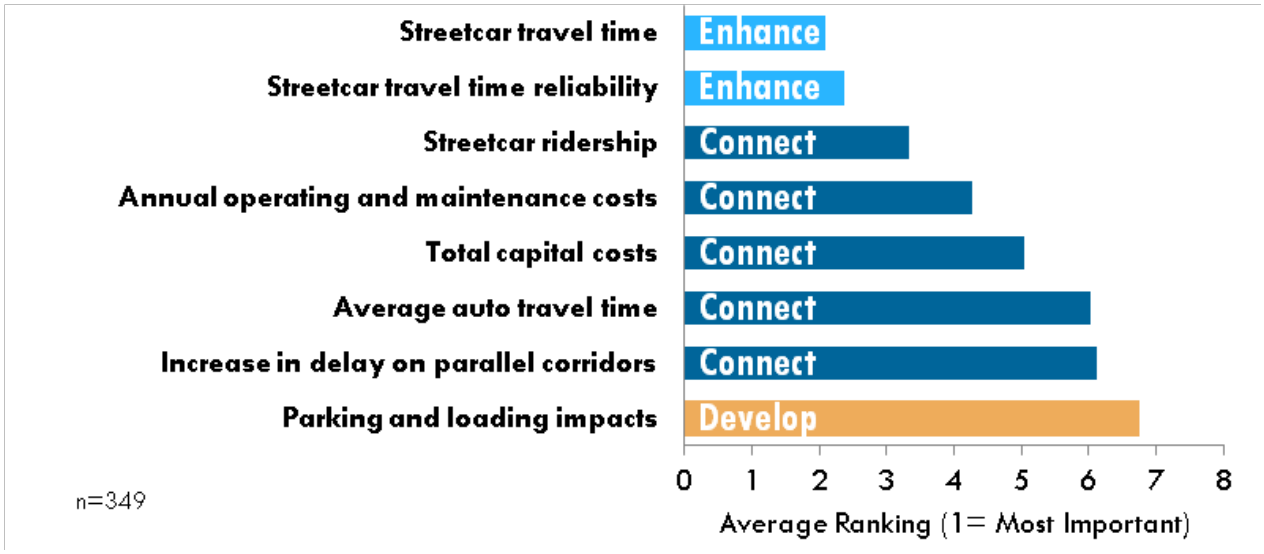
Figure 5-8 Tier 2 Evaluation Summary Matrix

	Evaluation Measures	1st Avenue	
		Mixed-Traffic Streetcar	Exclusive Streetcar
ENHANCE	Streetcar Travel Time	Fair	Best
	Streetcar Travel Time Reliability	Fair	Good
	Bus Travel Time and Reliability Impacts: Aggregate Bus Delay	Fair	Best
CONNECT	Auto Travel Time	Good	Fair
	Traffic Diversion Impacts	Good	Fair
	Projected Ridership	Good	Best
	Annual Operating & Maintenance Costs	Good	Best
	Capital Costs	Good	Best
DEVELOP	On-Street Parking and Loading Impacts	Fair	Poor
	Economic Development Opportunities (from Tier 1 Evaluation)	Best	Best
THRIVE	Public Support (Open House and Online Survey Feedback) and Stakeholder Support	Fair	Best
	Access to Jobs (from Tier 1 Evaluation)	Good	Good
	Access to Social Services and Affordable Housing (from Tier 1 Evaluation)	Good	Good
	Access to Tourist Destinations, Civic and Cultural Assets, and Open Spaces (from Tier 1 Evaluation)	Best	Best

The Exclusive Streetcar alternative rates better than the Mixed-Traffic alternative on the streetcar travel time and reliability criteria. As a result, the Exclusive alternative is less expensive to operate, since fewer service hours are required to provide the same level of service. Capital costs are also lower in this alternative since vehicles travel through the corridor faster and more reliably, allowing peak operations with fewer vehicles (vehicles are included in Project capital costs). The Exclusive Streetcar alternative also has higher projected ridership. However, this requires converting lanes currently used for parking and in some cases for general purpose traffic to transit-only lanes. The Mixed-Traffic Streetcar alternative has less impact on auto travel times on 1st Avenue and traffic diversion to other streets. On-street parking impacts, while still rated "Fair," are less significant in the Mixed-Traffic Streetcar alternative compared to the Exclusive Streetcar alternative.

Figure 5-9 identifies the relative importance of the eight evaluation criteria presented in Figure 5-7, as ranked by online survey respondents and open house participants. Evaluation measures were ranked from 1 (most important) to 8 (least important).

Figure 5-9 Ranking of Evaluation Measures by Importance, Open House #3 and Online Survey

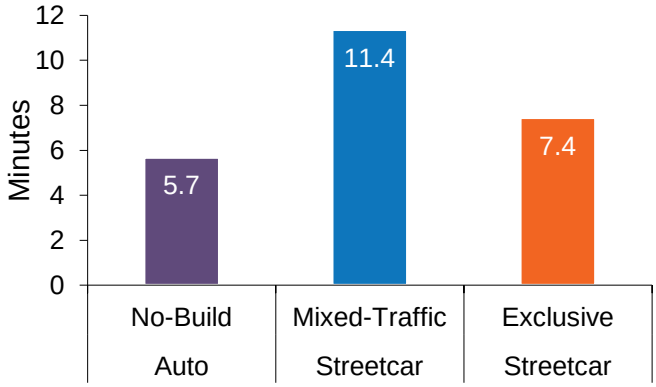


The following graphics present analysis results supporting the measures identified by open house participants and online survey respondents as the most important:

Streetcar Travel Time

- The Exclusive Streetcar alternative has faster travel times (by four minutes in the PM peak) and is more reliable than a Mixed-Traffic Streetcar alternative. Streetcar travel times for 2018 are shown in Figure 5-10.

Figure 5-10 Average One-Way Travel Times, Streetcar vs. No-Build Auto, 2018, PM Peak



Notes: The Tier 2 travel time results were developed for a 2018 opening year using the VISSIM traffic simulation software to model traffic signal operations, streetcar operating conditions, and multimodal traffic flows. These results are not directly comparable to the Tier 1 travel time results (page 5-4), which were developed for a 2030 horizon year using the Synchro traffic analysis software.

Streetcar Ridership

- Weekday daily ridership (Figure 5-11) was projected for No-Build (South Lake Union and First Hill Streetcars), Mixed-Traffic, and Exclusive Streetcar alternatives using the FTA STOPS ridership model.
- Approximately 23,000 to 30,000 weekday daily boardings are projected for the integrated streetcar system with the Center City Connector Exclusive Streetcar alternative, an increase of about 14,500 to 23,000 boardings above the No-Build alternative.
- In part due to higher average speed and better reliability, the Exclusive Streetcar alternative is projected to have approximately 3,000 more daily boardings than the Mixed-Traffic Streetcar alternative.
- Figure 5-12 shows projected linked streetcar trips utilizing the Center City Connector stations and/or segment, including through trips traveling between stations along the South Lake Union and First Hill Streetcar lines.

Figure 5-11 Projected Weekday Daily Streetcar Boardings, 2018

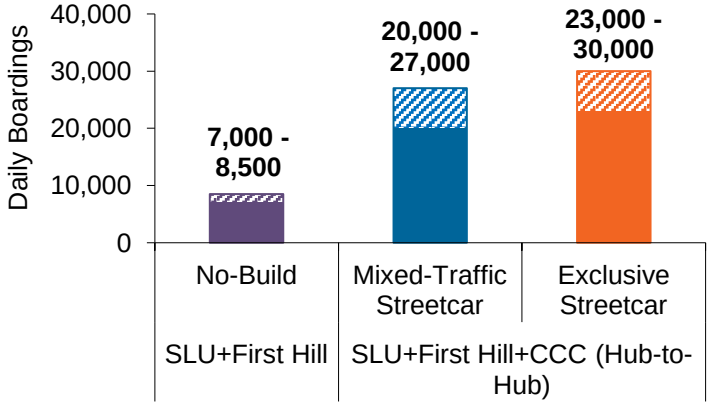
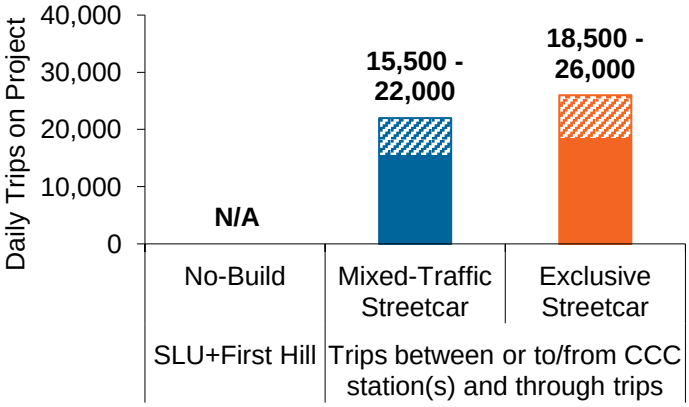


Figure 5-12 Projected Weekday Daily Trips on Project, 2018

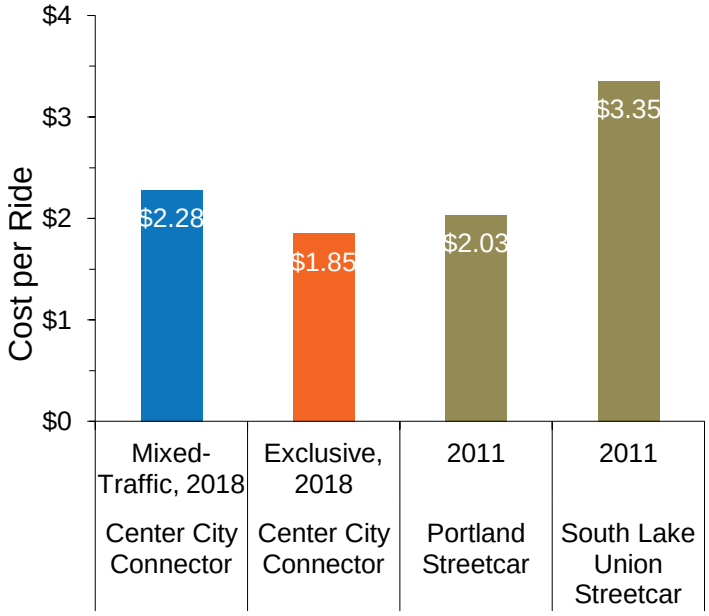


Note: The low-end of each range is based on a STOPS model run calibrated to current characteristics of the South Lake Union Streetcar, which do not fully reflect anticipated use of the Center City Connector by visitors and for non-work purposes. Although STOPS is not designed to fully capture such trips, the high-end STOPS model projection is intended to more fully account for these new ridership markets. For example, a separate analysis indicated that 3,500 daily visitors (mid-range estimate) would utilize the streetcar system with the Center City Connector in place. Additional investigation of these new markets is needed to further refine the estimate of their ridership potential.
Appendices A and B of the Detailed Evaluation Report provide additional detail on the ridership analysis.

Operating and Maintenance and Capital Costs

- Operating and capital costs are lower for the Exclusive Streetcar alternative due to efficiency enabled by faster and more reliable travel times; the same frequency is provided with fewer vehicles and shorter operating trip times. Figure 5-13 illustrates the estimated operating and maintenance cost per passenger trip for the integrated streetcar system compared to the existing South Lake Union Streetcar and the Portland Streetcar.

Figure 5-13 Estimated Operating and Maintenance Costs per Passenger Trip

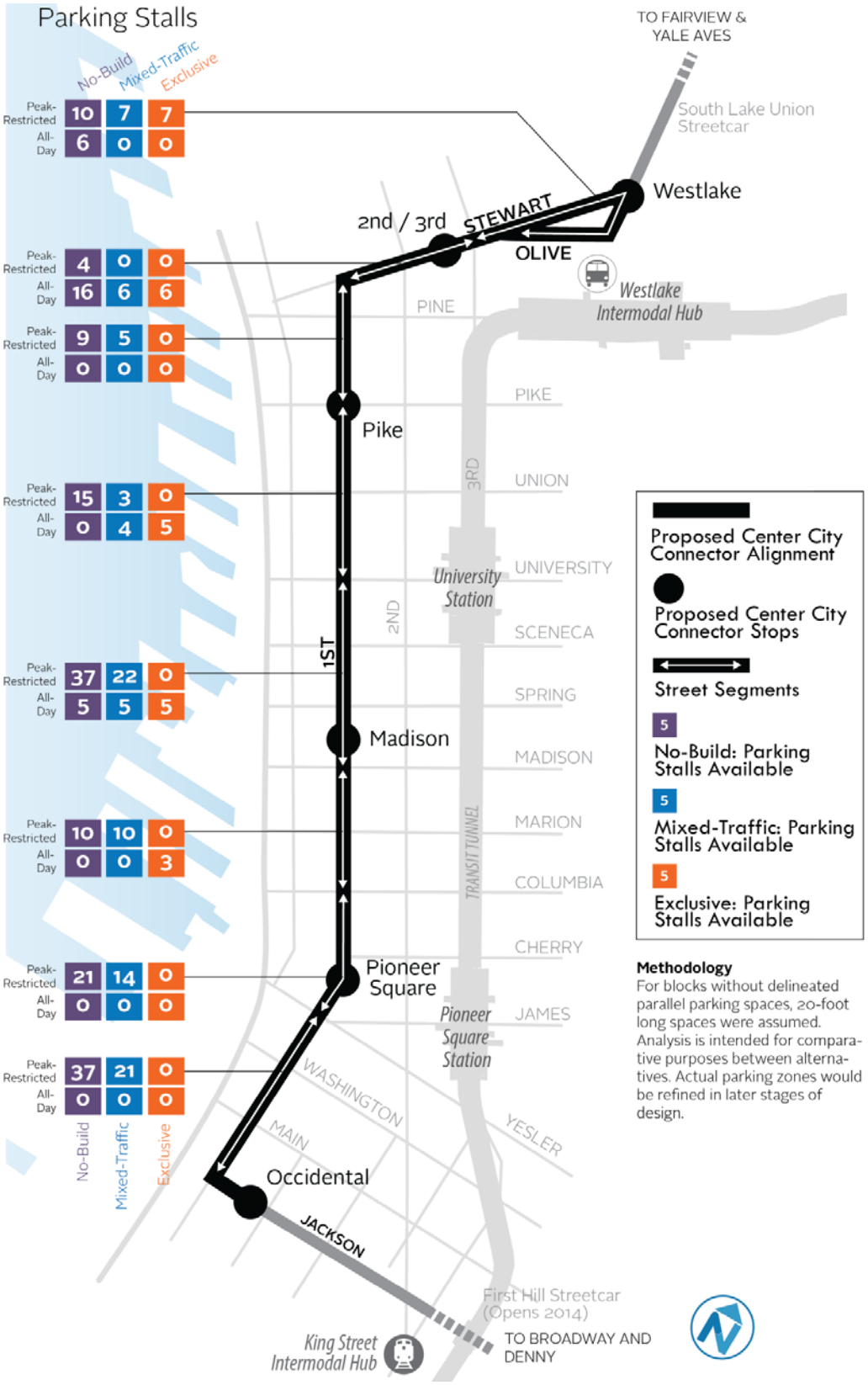


Note: Based on average of low and high ridership projections for each alternative. Center City Connector ridership and operating and maintenance (O&M) costs are for 2018 in 2018$. Portland Streetcar and South Lake Union Streetcar ridership and O&M costs are for 2011 in 2011$.

On-Street Parking Impacts

- On-street parking impacts are more severe in the Exclusive Streetcar Alternative compared to the Mixed-Traffic Streetcar alternative.
- Figure 5-14 illustrates these impacts for peak-restricted and all-day on-street parking stalls by segment of the alignment. The Exclusive Streetcar alternative also has higher impacts on auto travel times on 1st Avenue and on parallel streets.

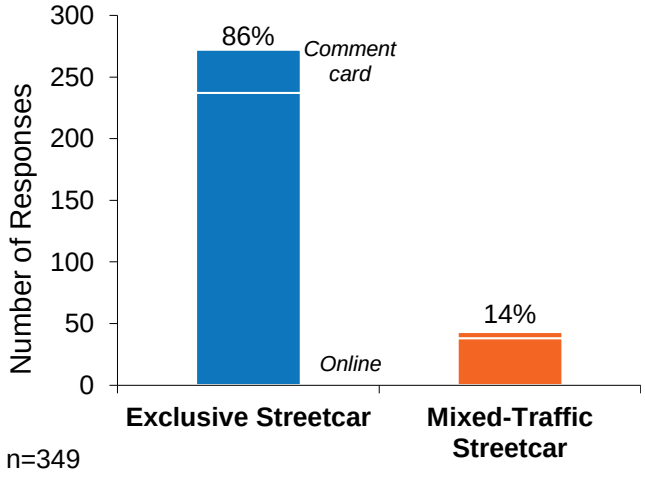
Figure 5-14 On-Street Parking Impacts (Comparative Analysis)



Summary of Public Input on Tier 2 Alternatives (Open House #3) and Online Survey

In addition to the elements of the technical evaluation described above, stakeholder input strongly favored the Exclusive Streetcar alternative. Figure 5-12 shows stakeholder input on the Tier 2 alternatives based on completed comment cards at the third Project open house and online survey responses. In total, 86% of respondents favored the Exclusive Streetcar alternative compared to 14% who favored the Mixed-Traffic Streetcar alternative. Respondents who favored the Exclusive Streetcar alternative cited better performance in terms of speed, reliability, ridership, and costs as important factors in their evaluation. Those who supported a Mixed-Traffic Streetcar alternative cited the reduction of parking and loading zones, impacts to automobile travel on 1st Avenue, and the removal of several median street trees in the Pioneer Square neighborhood as concerns.

Figure 5-15 Public Support for Tier 2 Alternatives



Tier 2 Recommendation

Based on stronger performance against the Project evaluation criteria and the level of public support, the project team recommended 1st Avenue Exclusive Streetcar as the Locally Preferred Alternative. Both Stewart/Olive and Pike/Pine/4th/5th east-west connections between 1st Avenue and the South Lake Union Streetcar were recommended for inclusion in the LPA.

The Detailed Evaluation Report, Chapters 6 to 9, provides additional detail on the Tier 2 evaluation.

6 RECOMMENDED LOCALLY PREFERRED ALTERNATIVE

LPA Decision Process

The Center City Connector Transit Study is a local planning process, supported in part by Federal Transit Administration grant funds, to evaluate mode and street alignment alternatives for connecting the South Lake Union and First Hill Streetcar lines and enhance transit mobility in Seattle's Center City. At the commencement of the planning process, a management decision-making body was established within the Seattle Department of Transportation (SDOT) to advance key Project decisions within the agency. This Steering Committee was comprised of the Department Director, the Deputy Director, Lead City Council Liaison, and directors of SDOT Policy and Planning, Traffic Management, Major Projects, and Capital Projects and Roadway Structures divisions. The Steering Committee was responsible for approving key decisions, such as screening out mode and alignment options, and endorsing the final draft Locally Preferred Alternative (LPA) recommendation. In addition, key SDOT technical staff provided input and consultation throughout the planning process.

Approval of the LPA by the Mayor and Seattle City Council is required to advance the Project. Following review and approval by the Office of the Mayor and the City Council Transportation Committee, a resolution describing the LPA will advance to the full City Council for adoption. The LPA Report will be updated once the full Council has voted on the resolution.

The Center City Connector Transit Study also involved key agency partners including King County Metro Transit, Sound Transit, and Community Transit. In addition to staff-level coordination, which occurred throughout the study process, the SDOT Director convened a High Capacity Transit Executive Working Group (including Sound Transit, City of Seattle and King County Metro) that met twice during the process and allowed agency partners to exchange information on progress of major City and regional transit initiatives.

LPA Project Description

The LPA is a key policy document that provides a description of the Center City Connector Project that the City of the Seattle is planning to construct and operate. This section describes the roadway and transit capital improvements and operating characteristics of the recommended LPA.

The following pages describe key elements of the recommended LPA for the Center City Connector.

Figure 6-1 LPA Alignment Detail

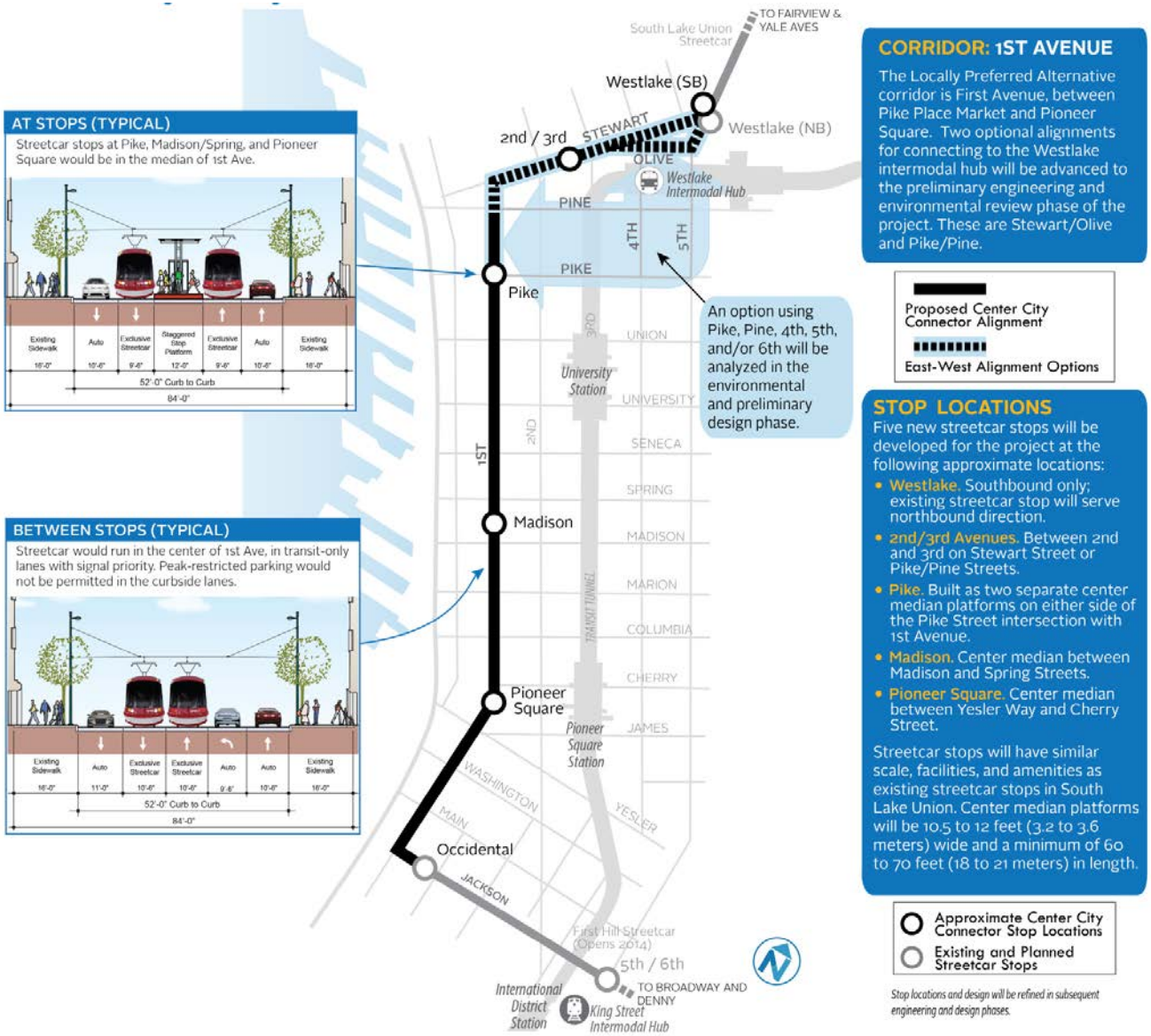
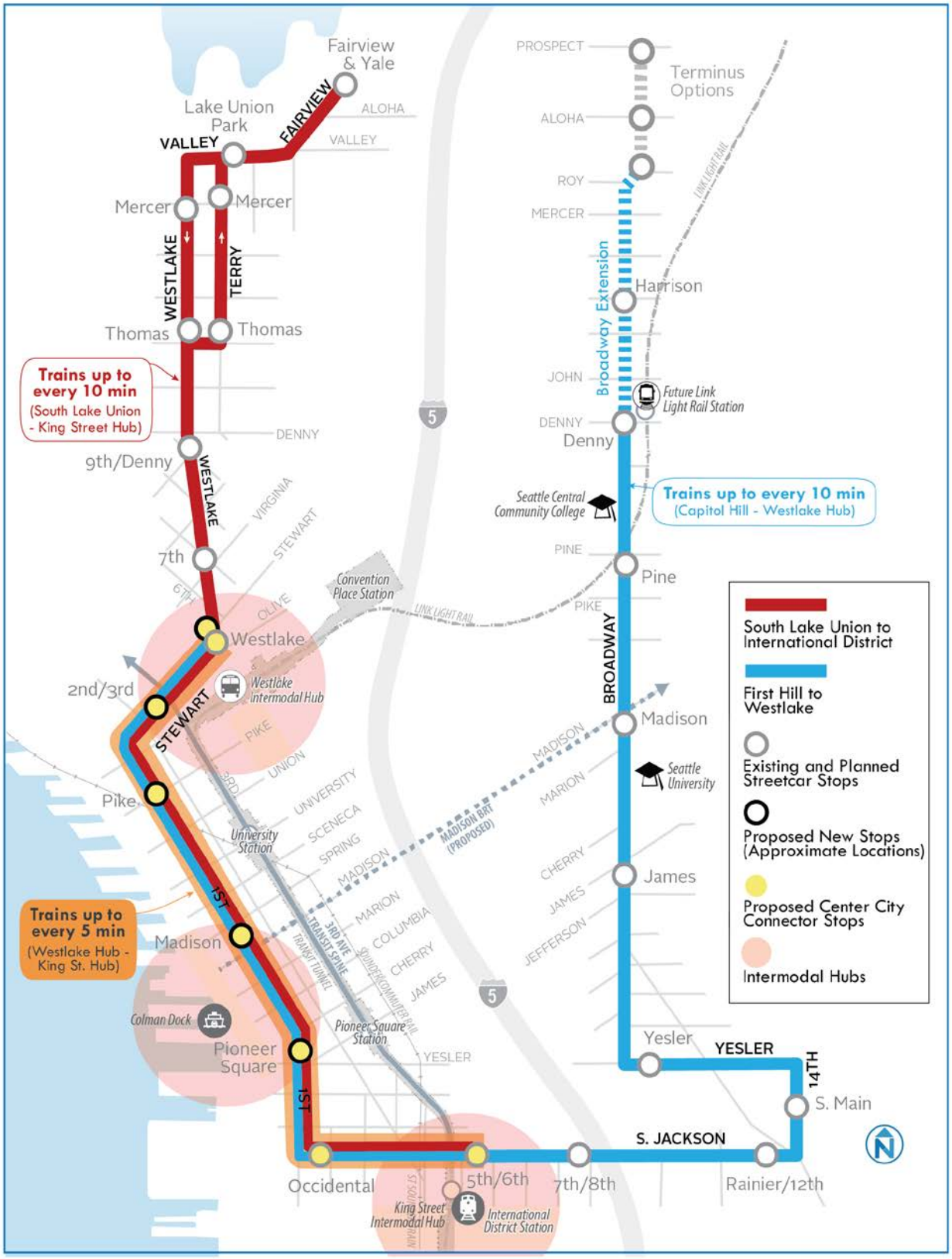


Figure 6-2 LPA Preferred Operating Scenario



Mode and Vehicles

The Center City Connector will operate modern streetcar vehicles compatible with operations on the South Lake Union and First Hill Streetcar lines.

The LPA includes the purchase of nine modern streetcar vehicles for the City of Seattle's streetcar fleet. Three of the new vehicles will replace vehicles in the existing South Lake Union fleet with vehicles that have the capacity to run off-wire as will be required on the First Hill portion of the alignment. These nine vehicles will supplement the seven off-wire capable vehicles currently owned or on-order. The total streetcar fleet will include 16 modern streetcar vehicles that will be able to operate on all segments of the combined streetcar lines.

MODE: MODERN STREETCAR

Modern streetcar vehicles[1]

[1] Modern streetcar vehicles are known as double-ended trams or light rail vehicles and are commonly used in European Cities; 2.46 meter width, operating at 750V dc.

Projected revenue from the sale of the three used streetcar vehicles is subtracted from the vehicle element of the Project capital cost.

Alignment

The LPA corridor is 1st Avenue between Pike Place Market and the planned terminus of the First Hill Streetcar at S. Jackson Street and Occidental Avenue S. Two optional alignments for connecting to the Westlake intermodal hub will be advanced to the preliminary engineering and environmental review phase of the Project. These are Stewart Street/Olive Way and Pike Street/Pine Street/4th Avenue/5th Avenue Streets.

Transit Priority

The Center City Connector Project will feature exclusive streetcar lanes (may be shared with bus transit in certain segments). Exclusive transit running way is a core component of the Project providing a high level of operational reliability and a transit travel time through the Downtown area that is highly competitive with auto travel and other modes of travel.

In addition to running in exclusive transit lanes for the full length of the Project, the Center City Connector will employ transit signal priority (TSP) treatments at all signalized corridor intersections. Signal priority will be used to hold lights green for approaching streetcars and shorten red times for streetcars stopped at intersections. Separate

TRANSIT PRIORITY

EXCLUSIVE TRANSIT RUNNING WAY

Streetcar would operate in exclusive streetcar lanes (or shared with bus) throughout the Center City Connector alignment.

TRANSIT SIGNAL PRIORITY

The Center City Connector will run in exclusive transit lanes for the full length of the project and employ transit signal priority treatments (TSP) at corridor intersections. Signal priority will be used to hold lights green for approaching streetcars and shorten red times for streetcars stopped at intersections. Separate streetcar signal phases will be employed where streetcars will need to operate across general purpose travel lanes. Details of signal design will be developed as the design is advanced.

streetcar signal phases will be employed where streetcars will need to operate across general purpose travel lanes.

Operation and Service Characteristics

The Center City Connector will allow Seattle's streetcar investments to operate as a system, increasing the mobility value provided by previous investments as well as providing service to the densest neighborhoods in the city. The Connector allows the Seattle Streetcar network to operate as two independent, overlapping lines. These two lines will provide overlapping service between Westlake Intermodal Hub and King Street Intermodal Hub, with a stop near the City's third intermodal hub at Colman Dock. This overlapping portion of the line will have five minute headways between 7 AM and 7 PM on weekdays and Saturdays and between 8 AM and 7 PM on Sundays. The two operating lines illustrated in Figure 6-2 (page 6-3) are:

- **SLU-King Street ("Red"):** one line between South Lake Union (Fairview & Yale Aves) and King Street intermodal hub
- **Capitol Hill-Westlake ("Blue"):** one line between Capitol Hill (Broadway & Denny Way) and Westlake Intermodal Hub

Daily span of service proposed for each of the two lines is:

- Monday through Saturday up to 20 hours (5 AM to 1 AM)
- Sundays/Holidays up to 17 hours (6 AM to 11 PM)

Proposed headways for the two lines are:

- Every 10 minutes between 7 AM and 7 PM on weekdays and Saturdays and between 8 AM and 7 PM on Sundays
- Every 15 minutes to 20 minutes during all other hours of operation

The LPA does not require (or anticipate) service changes to any local bus routes operated by King County Metro or bus services that other regional transit providers operate in the downtown.

Stops

Five new streetcar stops will be built for the Project at the following approximate locations:

- **Westlake (Southbound only)**: the existing streetcar stop in McGraw Square will serve northbound direction
- **2nd /3 rd Avenues:** between 2nd and 3rd on Stewart Street or Pike/Pine Streets
- **Pike**: built as two separate center median platforms on either side of the Pike Street intersection with 1st Avenue
- **Madison**: center median between Madison and Spring Streets
- **Pioneer Square:** center median between Yesler Way and Cherry Street

Streetcar stops will have similar scale, facilities, and amenities as South Lake Union and First Hill Streetcar stops. Center median platforms will be 10.5 to 12 feet (3.2 to 3.6 meters) wide and a minimum of 60 to 70 feet (18 to 21 meters) in length.

Connectivity

The Center City Connector will link over a dozen Seattle neighborhoods with a Seattle Streetcar system that stretches from Capitol Hill and First Hill, to the International District and South Downtown, and north to the Denny Triangle and South Lake Union, passing through the heart of downtown. By linking existing streetcar investments, the Connector will provide a streetcar system that is highly legible, easy-to-use for a variety of trip purposes, and that serves areas where the City is experiencing intense urban development.

The Center City Connector will serve the City of Seattle's three Intermodal Hub Areas including, Westlake Intermodal Hub, Colman Dock Intermodal Hub, and King Street Intermodal Hub. The Connector will provide convenient transfers to the 3rd Avenue Transit Spine at both ends of Downtown, to Link Light Rail via multiple Downtown Seattle Transit Tunnel station entries, and to Sounder Commuter Rail at King Street Station. Future transit investments such as the proposed Madison Street Bus Rapid Transit would bisect the Center City Connector.

The Center City Connector will be highly accessible to pedestrians using Seattle's well developed downtown sidewalk system. The Pike Street stop will be accessible from all points of the intersection via the current "all-walk" intersection design. All streetcar platforms will be accessed at signalized intersections or marked mid-block crossings and will be ADA accessible.

Typical Cross Section

On the 1st Avenue segments of the Center City Connector alignment, the streetcar will operate in parallel 10.5-foot transit-only lanes located in the center of the roadway. Streetcar stops in this segment of the alignment will be center median located and will range in width from 10 to 12 feet. Platforms in Pioneer Square and between Madison and Marion will provide boarding for both directions of streetcar travel. At Pike Street, a split station will be developed with passenger boarding on the far side of the intersection. The split platform will increase passenger capacity in the relatively narrow 1st Avenue right-of-way and will allow pedestrians to enter the platforms from all points on the intersection as Pike and 1st Avenue operates as an all-walk intersection. Figure 6-1 (page 6-2) provides cross sectional illustrations of the typical street design at mid-block locations with and without a platform.

Right-of-way design and track placement for the east-west portion of the line will be further refined during the environmental phase of the Project.

Operations and Maintenance Facilities

The Center City Connector will require storage capacity for six additional streetcar vehicles. The City of Seattle owns streetcar operations and maintenance bases in South Lake Union (right) and in the Chinatown/International District.

Source: Nelson\Nygaard

The Center City Connector will provide all vehicles on both lines access to either O&M facility. Expansion of both sites was assessed as part of this study. It was determined that there is existing capacity for two additional vehicles between both sites and that it is feasible to expand either or both sites to accommodate the remaining four additional vehicles required for the Center City Connector. Maintenance activities could be handled by the existing investments. New costs are primarily for the development of additional vehicle storage capacity. Costs for land purchase, design, and construction are included in the overall Project capital cost. The specific site will be selected in the next phase of Project development.

Fare Collection

FARE COLLECTION

Seattle Streetcar system will be fully integrated with ORCA, the regional transit fare system. ORCA card readers will be installed at stop platforms and on trains. Other fare media will be available for purchase at each streetcar stop.

Source: Nelson\Nygaard

The LPA assumes that by the time of Project opening, the Seattle streetcar system will be fully integrated into the regional transit fare collection system. Central Puget Sound Transit agencies have developed a coordinated fare payment system. This partnership led to the 2009 launch of the ORCA ("One Regional Card for All") card, which is a contactless, stored value smart card used for payment of public transport fares for eight separate transit providers in the Puget Sound area. Seattle Streetcar is not currently integrated with the regional system; however, ORCA cardholders can show their cards to ticket inspectors as proof of payment on the streetcar.

ORCA uses modern RDFI technology to store value on personal cards that function as an E-purse. ORCA-equipped stations and vehicles use an RDFI card reader on board or at the stop/station to track personal trips. Fare revenues are allocated using card data to the respective agencies providing recorded trips.

Further exploration of the fare payment options will be conducted during Project development and will be a key element of the operations finance plan development.

Roadway Operational Changes

The Exclusive Streetcar alternative included new restrictions on left turns at several intersections along 1st Avenue as identified in Figure 6-3. Northbound and southbound left-turns are currently restricted at Madison, but northbound left-turns will be allowed in the Exclusive Streetcar alternative.

Figure 6-3 Changes in Intersection Treatments from No-Build Condition

Through Street	Cross Street	Lefts on 1st Allowed?	
		No-Build	**Exclusive Streetcar**
1st Ave	Stewart St	Northbound Allowed	Restricted
1st Ave	Pike St	Northbound Allowed	Restricted
1st Ave	Union St	Northbound Allowed	Restricted
1st Ave	Madison St	Northbound & Southbound Restricted	Northbound Allowed; Southbound Restricted
1st Ave	Marion St	Southbound Allowed	Restricted
1st Ave	Columbia St	Northbound Allowed	Restricted
1st Ave	Jackson St	Northbound & Southbound Allowed	Northbound Restricted; Southbound Allowed

Additional detail is provided in the Detailed Evaluation Report, Appendix G.

LPA Capital Improvement Summary

Figure 6-4 provides a summary of transit capital improvements for the No-Build and Locally Preferred Alternatives. The No-Build Alternative includes the existing South Lake Union and funded First Hill Streetcar lines. The unfunded Broadway Extension of the First Hill Streetcar line is not included in the No-Build Alternative.

Figure 6-4 Transit Capital Improvements

Attribute	No-Build		LPA
	South Lake Union	First Hill	
Trackway			
Streetcar Track Miles (one way)	2.6	5.0	1.2
Storage Tracks / Turnbacks	2	2	2 [a]
Fleet			
Modern Streetcar Vehicles (no off-wire capability)	3		
Modern Streetcar Vehicles (hybrid)	1	6	9 [b]
Stops			
Independent Platforms/Stops	11	10	6 [c]
Operating and Maintenance Facilities			
Facilities (number of facilities)	1	1	0
Existing Vehicle Storage Capacity	6	7	-
New Vehicle Storage Capacity (number of revenue vehicles)	-	-	4

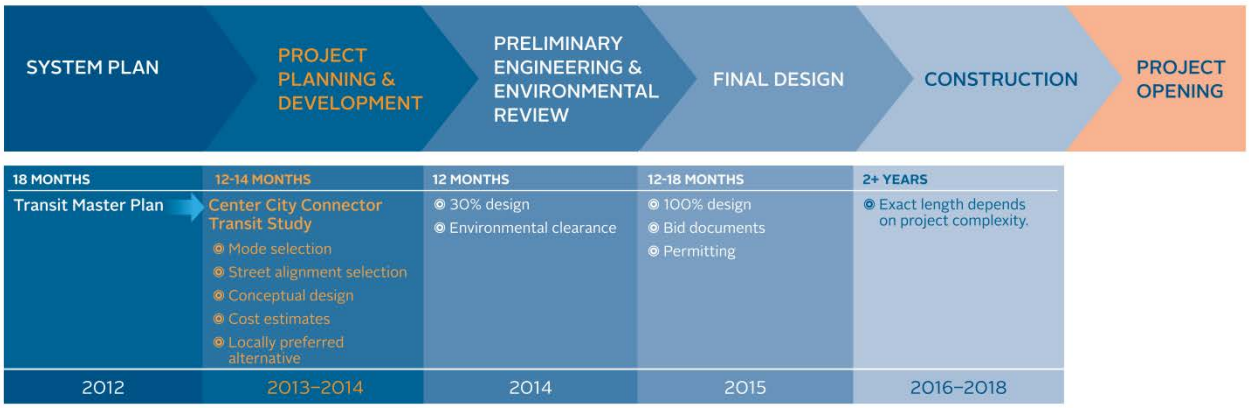
Notes: (a) Assumed to be north of the Westlake stop and east of the 10th/Jackson stop. (b) Vehicles include replacement of three existing South Lake Union vehicles without off-wire capabilities, bringing total streetcar fleet to 16 vehicles. Up to 14 of these vehicles would be in service and two would be spares. (c) Includes a new southbound platform at Westlake and modifications to the Occidental/Jackson stop.

7 NEXT STEPS

The adoption by the Seattle City Council of a Locally Preferred Alternative is a critical step for the Center City Connector Project and represents completion of an important local planning phase. Throughout the Center City Connector Transit Study process, the City of Seattle has coordinated closely with the Federal Transit Administration (FTA). The City submitted a project development letter to the FTA on March 11, 2014, formally requesting to enter the Project into the Project Development stage, and submitted a revised letter on May 15, 2014 based on initial FTA feedback. City Council adoption of the LPA and the FTA's approval to enter Project Development will enable the City to commence preliminary engineering and required environmental analyses.

Figure 7-1 illustrates the progression of the Project from identification in the Transit Master Plan to construction and completion. The current identified year of opening is 2018.

Figure 7-1 Center City Connector Project Development Timeline



The City of Seattle has budgeted funds to continue Project development and design in 2014 and 2015. Funding has been identified to complete the preliminary engineering and environmental review and final design phases of the Project.

The following are key next steps in advancement of the Center City Connector Project.

- **FTA Project Development Status.** Once the FTA approves the City's request to advance into Project Development, the project sponsor has two years to complete the National Environmental Policy Act (NEPA) process and submit sufficient information on the cost, financial commitments, and project rating to qualify for a Project Construction Grant Agreement (PCGA).
- **City Council Adoption of the LPA.** The Seattle City Council is expected to formally adopt the LPA in the June 2014 time frame.
- **Finalize alignment decision for east to west connection between 1st Avenue and Westlake Intermodal Hub/McGraw Square.** Two alignment sub-alternatives are carried forward in the LPA: (1) Olive and Stewart and (2) Pike and Pine connecting to McGraw Square and the South Lake Union alignment via some combination of 4th, 5th, and 6th

Avenues. Further technical analysis and stakeholder outreach is required to confirm this alignment and will be completed concurrent with the Project's environmental analysis.

- **Conduct an evaluation of the Project against Small Starts project evaluation criteria**, which were recently updated as part of MAP-21. The FTA has requested that the City of Seattle submit sufficient information related to Project ranking against Small Starts criteria by August 2014 to allow them to include the Project in their New Starts Report to Congress and be in a position to recommend funding in the President's FY2016 Budget. Fifty percent of the Project rating is based on the strength of the City's capacity to finance and deliver the Project, the remaining 50% is based on an assessment against the following six criteria (each valued equally).
  - **Land Use.** Criterion includes existing density and zoned development capacity.
  - **Economic Development.** Criterion includes the potential for economic development to occur as part of the transit development. Project sponsors are allowed to submit economic development scenarios that project specific development for a mode investment like streetcar.
  - **Cost Effectiveness.** The criterion for cost effectiveness for Small Starts projects is the cost/ride for the federal share of the Project. To achieve a high rating, the cost per ride must be below $1.00.
  - **Mobility Benefits.** Mobility benefits are determined by the number of people served or benefitted by the investment.
  - **Environmental Benefits**. Environmental benefits are determined by the use of the mode and the effectiveness in reducing environmental impacts. The benefits of the development are not included in this criterion which is limited to evaluating the mode being utilized.
  - **Congestion Relief**. No rules or guidelines have been established as this criterion was added in MAP-21 late in the process and were not included in preliminary notice of the rule making. FTA intends to issue special guidance on this criterion.
- **Conduct NEPA/SEPA analysis and documentation of Project impacts**. An initial step in this process will be formal agreement with FTA regarding the class of action or type of NEPA evaluation required. Based on conversations with the FTA, the City expects that an Environmental Assessment level of NEPA documentation will be appropriate for this project and that a full EIS will not be required. Once that formal decision has been made and documented, the Project will advance through required environmental analysis, documentation and public findings, and assuming all impacts can be mitigated, develop the documentation of a Finding of No Significant Impact (FONSI).
- **Develop finance plan**. FTA evaluates projects on the local capacity to finance and build the Project and the level of commitment for the local sources of funding. The project sponsor's financial commitment to the Project includes capital and operations. Formal financial commitments are not necessary to advance into Project Development. During Project Development, the project sponsor must produce formal commitments of the local capital

funds and funding for 20 years of operation for the system. The local sponsors commit to operate the Project for 20 years as part of the PCGA. Concurrent with environmental documentation and preliminary engineering and final design, the City will develop capital and operating plans that commit local funds to match federal capital grant funds and support service operations.

The City has begun to evaluate local capital and operating funding options. Capital financing scenarios assume that a portion of the Project cost will be funded through an FTA Small Starts grant, which provides grants up to $75 million for transit projects with a total project cost not exceeding $250 million. A number of local, regional, and state sources are being evaluated to provide local match. FTA's Section 5309 funding program, which includes Small Starts, allows for federal grants covering up to 80% of the project cost (not to exceed $75 million).

- **Commence Preliminary Engineering and Final Design.** Once the Center City Connector Project has been advanced by the FTA to project development status, the City of Seattle will begin work on preliminary engineering and final design.
- **Develop urban design guidelines for guideway and overhead catenary systems, stations and adjacent pedestrian areas, streets, landscaping, lighting, and security.** The Center City Connector alignment travels through Seattle's oldest and most historically significant neighborhood. The LPA also includes streetcar/transit only lanes on streets that have traditionally operated general purpose traffic lanes. Operating transit vehicles at street grade and in lanes where travelers are accustomed to driving will require proper demarcation of these new facilities to ensure safe travel for all road users. The City plans to develop urban design guidance to ensure capital elements of the Project (guideway, stations, etc.) are responsive to localized urban design conditions and enhance street and neighborhood quality. The urban design guidelines will also inform and direct operational functionality of the right-of-way as it relates to loading zones, event management and pedestrian access, wayfinding, lighting, and security.
- **Develop a construction phasing plan.** Private development and a number of large public infrastructure projects (i.e., Seawall Replacement, Alaskan Way Viaduct Replacement, Central Waterfront Project) and a number of other planned street projects are underway or to be completed in the next 5 to 10 years. It will be critical to understand how the Center City Connector construction can be phased and implemented to limit impacts on downtown travelers and downtown businesses and to limit conflicts with other construction projects.

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5.23.2014