



WELCOME!

Thank you for joining us at the third open house for the Center City Connector Transit study!

AGENDA

5:00-7:00 Open House

5:30 Brief remarks by Mayor McGinn and project team

What you can do:

- Review information displays
- Listen to presentation
- Ask questions
- Provide input

Please fill out a comment card before you leave

STUDY OVERVIEW

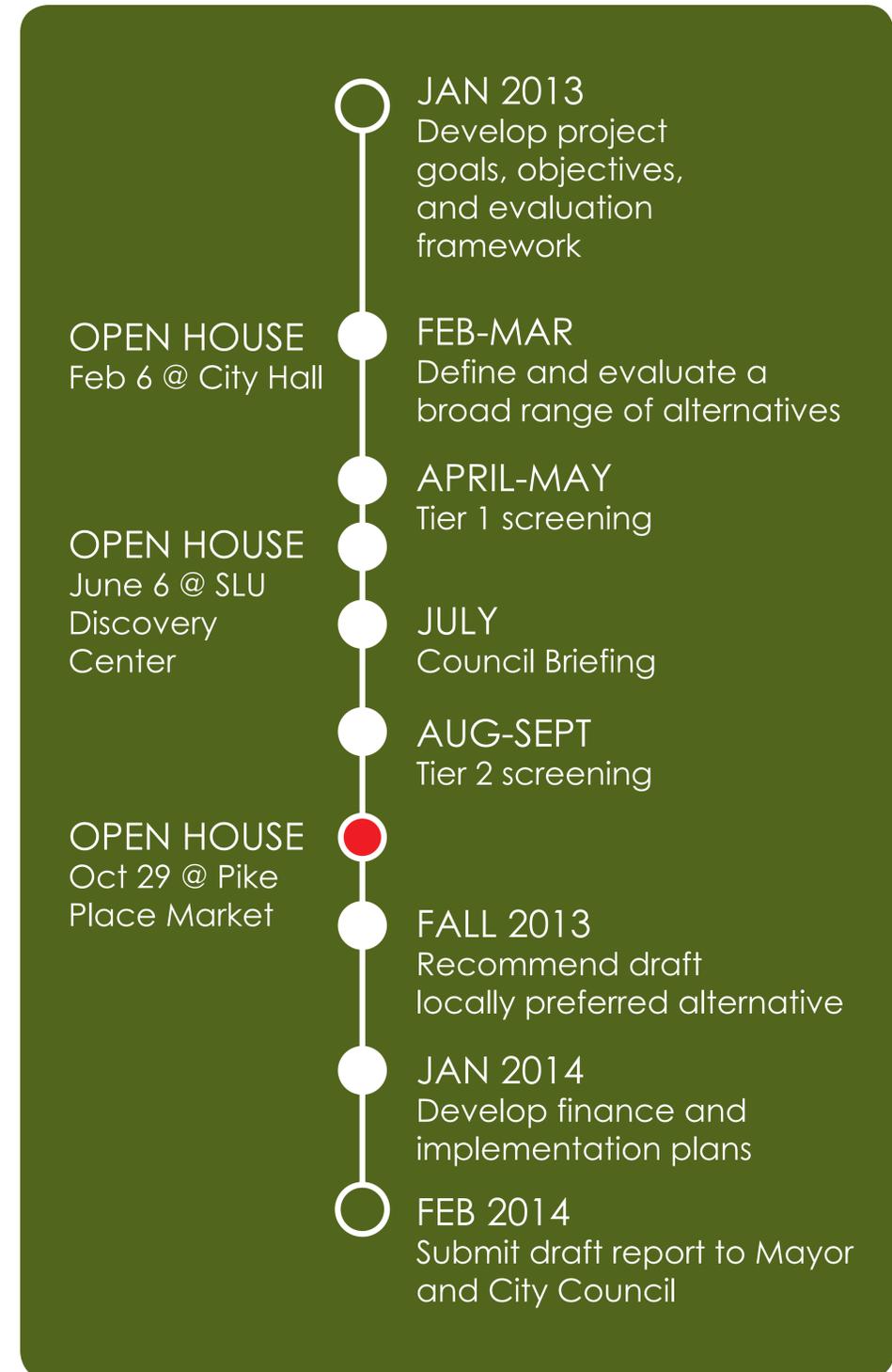


Project Overview

The goal of the Center City Connector Transit Study is to improve north-south transit mobility through downtown and link the First Hill and South Lake Union streetcars. It will:

- Look at a variety of street alignment options.
- Result in the selection of a locally preferred alternative (LPA) that:
 - Has stakeholder, public, and elected official support.
 - Is backed by a viable financial and implementation plan.
 - Positions the City for future funding opportunities to help design and build the project.

Center City Connector Transit Study Timeline



PROJECT PURPOSE AND GOALS



Project Purpose

The Center City Connector project addresses a priority in the Seattle Transit Master Plan (TMP)—to improve Seattle Center City transit services by:

- Increasing transit capacity.
- Enhancing transit service quality and reliability.
- Improving transit options for residents, workers, and visitors traveling between and within Center City neighborhoods and attractions.

The purpose of the Seattle Center City Transit Connector project is to determine a preferred mode and alignment to improve north-south transit mobility through downtown and to connect the South Lake Union Streetcar and First Hill Streetcar (currently under construction with planned opening in 2014).

Project Goals

ENHANCE

Enhance the customer experience on transit

CONNECT

Connect neighborhoods and improve local circulation

DEVELOP

Support local and regional economic development goals

THRIVE

Strengthen downtown and Center City neighborhoods

SUSTAIN

Improve and sustain human and ecological health

EVALUATION OVERVIEW

Evaluation Process Overview

INITIAL SCREENING

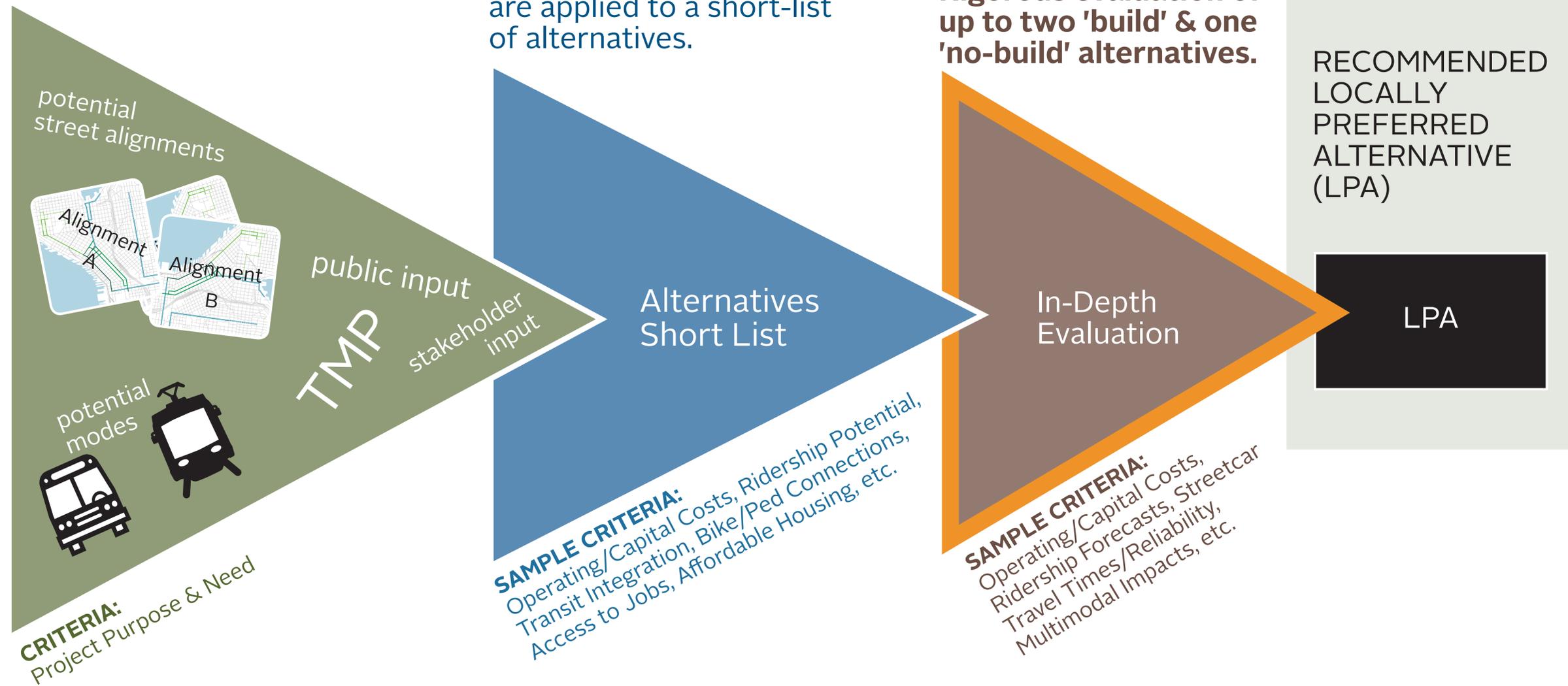
A broad range of alternatives are screened based on project purpose and need.

TIER ONE SCREENING

Qualitative & quantitative measures are applied to a short-list of alternatives.

TIER TWO EVALUATION

Rigorous evaluation of up to two 'build' & one 'no-build' alternatives.

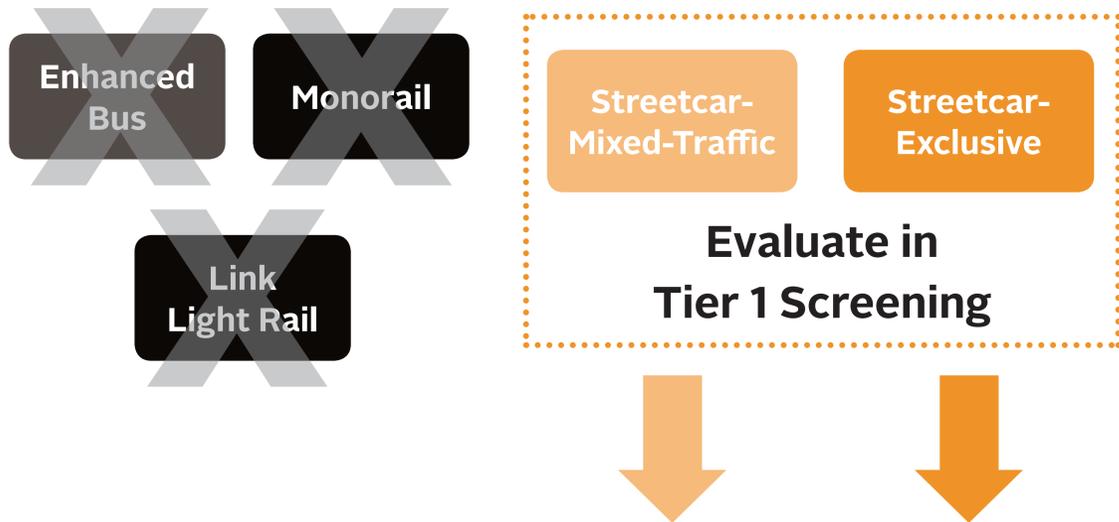


Key questions assessed in the initial screening include:

- Does the alternative serve the project purpose?
- Is the alternative consistent with local and regional plans?
- Does the alternative meet needs identified in the project purpose and need statement?
- Does the alternative serve key destinations and attractions?
- Does the alternative have public and stakeholder support?

SCREENING OF ALTERNATIVES

Initial Screening: Modes



Initial Screening: Alignments



4th/5th and 1st Avenue alternatives were evaluated based on the project goals and objectives. Results were presented at the June 2013 Open House.

Tier 1 Screening: Mode + Alignment Alternatives

4th/5th Avenue Alternatives



1st Avenue Alternatives



Considered along with Ballard to Downtown Study alignments



A 1st Avenue alignment with an extension to serve Uptown received strong support in the initial public open house, but in isolation does not serve the key project purpose of connecting the South Lake Union and First Hill streetcars.

1st Avenue alternatives were evaluated more rigorously, including a Stewart Street/Olive Way connection between 1st Avenue and Westlake.

Tier 2 Evaluation

East-West Options



SCREENING OF EAST-WEST CONNECTIONS

- The Stewart Street and Olive Way alignment has several potential benefits:
 - Direct pathway.
 - Reduces potential pedestrian conflicts.
 - Limits design risks and issues.
- Connection options using Pike and Pine have the following benefits:
 - Best penetration into downtown
 - Most direct access to Westlake Hub.
 - Greatest urban form/urban design opportunity.
- Design issues identified include:
 - Crossing the Downtown Seattle Transit Tunnel (DSTT) at 5th and Pine risks cutting the tunnel waterproofing membrane.
 - Utility conflicts include a 6” gas main on Virginia.
- Please let us know your thoughts about the east–west connection options.

	Potential East-West Connections				
Key Considerations:	A STEWART/ OLIVE	B STEWART/ PINE	C PIKE/ PINE	D VIRGINIA/ STEWART	E PIKE-6TH/ PINE
Impacts DSTT Membrane	●	●	●	●	●
Impacts Brick Intersections	●	◐	◐	●	◐
Major Utility Conflicts	◐	◐	◐	●	◐
Connects Key Visitor and Civic Destinations	○	◐	●	○	●
Urban Form/Urban Design Opportunity	○	◐	●	○	●
Multimodal Conflicts	○	○	○	○	◐

EXPLANATION OF RATINGS

Most Favorable

 Highest Impact/Design Risk

↓



STREETCAR MODES

Mixed-Traffic and Exclusive Streetcar

Mixed-traffic and exclusive streetcar modes are differentiated by the extent of exclusive right-of-way, the overall level of transit priority, and other characteristics. The evaluation scenarios are intended to illustrate a range of potential benefits and impacts.

Either option could include off-board fare payment, higher-capacity vehicles, and other features described below.

MIXED-TRAFFIC



- Primarily mixed-traffic operations.
- Limited intersection signal priority.
- Could include shorter spacing between stops.

EXCLUSIVE



- Dedicated streetcar/transit lanes where feasible.
- More extensive intersection signal priority.
- Could include longer spacing between stops.

Off-board Fare Payment



Off-board fare payment technology (ORCA card readers) increases efficiency of passenger boarding. The First Hill Streetcar will open with ORCA capabilities and the South Lake Union streetcar will be adapted to allow use of ORCA cards.

Source: Flickr User Oran Viriyincy

Transit Priority



Exclusive streetcar lanes and traffic signal priority greatly improve travel speed and reliability. Lanes can be designed so that they are visibly and physically differentiated from general purpose travel lanes.

Source: NelsonNygaard

Station Amenities



Station areas may include amenities such as high capacity shelters, varying levels of shelter from inclement weather, ticket vending machines, real-time arrival information, capacity for longer or coupled streetcar vehicles, pedestrian-oriented lighting, and other features.

Source: NelsonNygaard

High-Capacity Vehicles



The South Lake Union and First Hill streetcar vehicles have capacity for up to 140 passengers (29 seated). Articulated or coupled streetcar vehicles can be used to accommodate high passenger loads. Toronto's Flexity streetcars are 99 feet long and have capacity for 251 passengers.

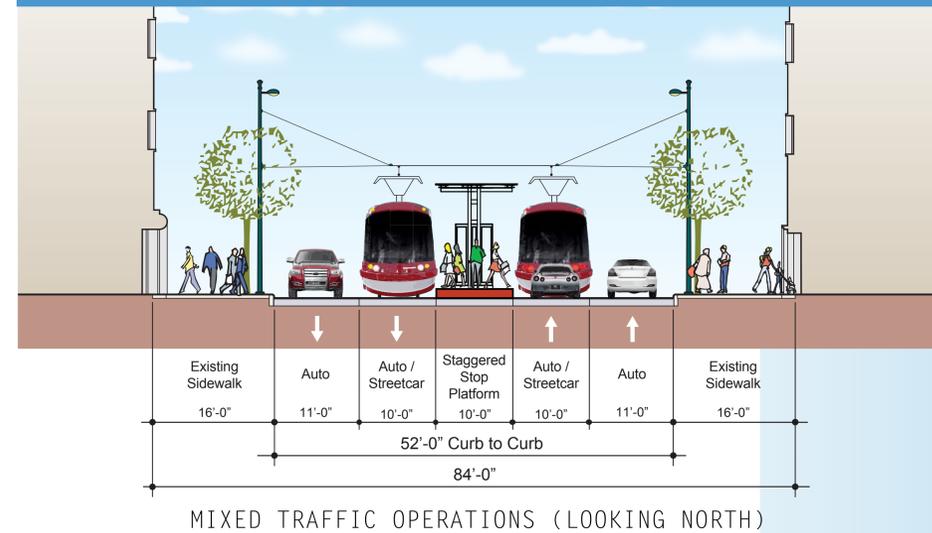
Source: Flickr User JuanCalamar

1ST AVE MIXED-TRAFFIC & EXCLUSIVE STREETCAR

Mixed-Traffic Streetcar

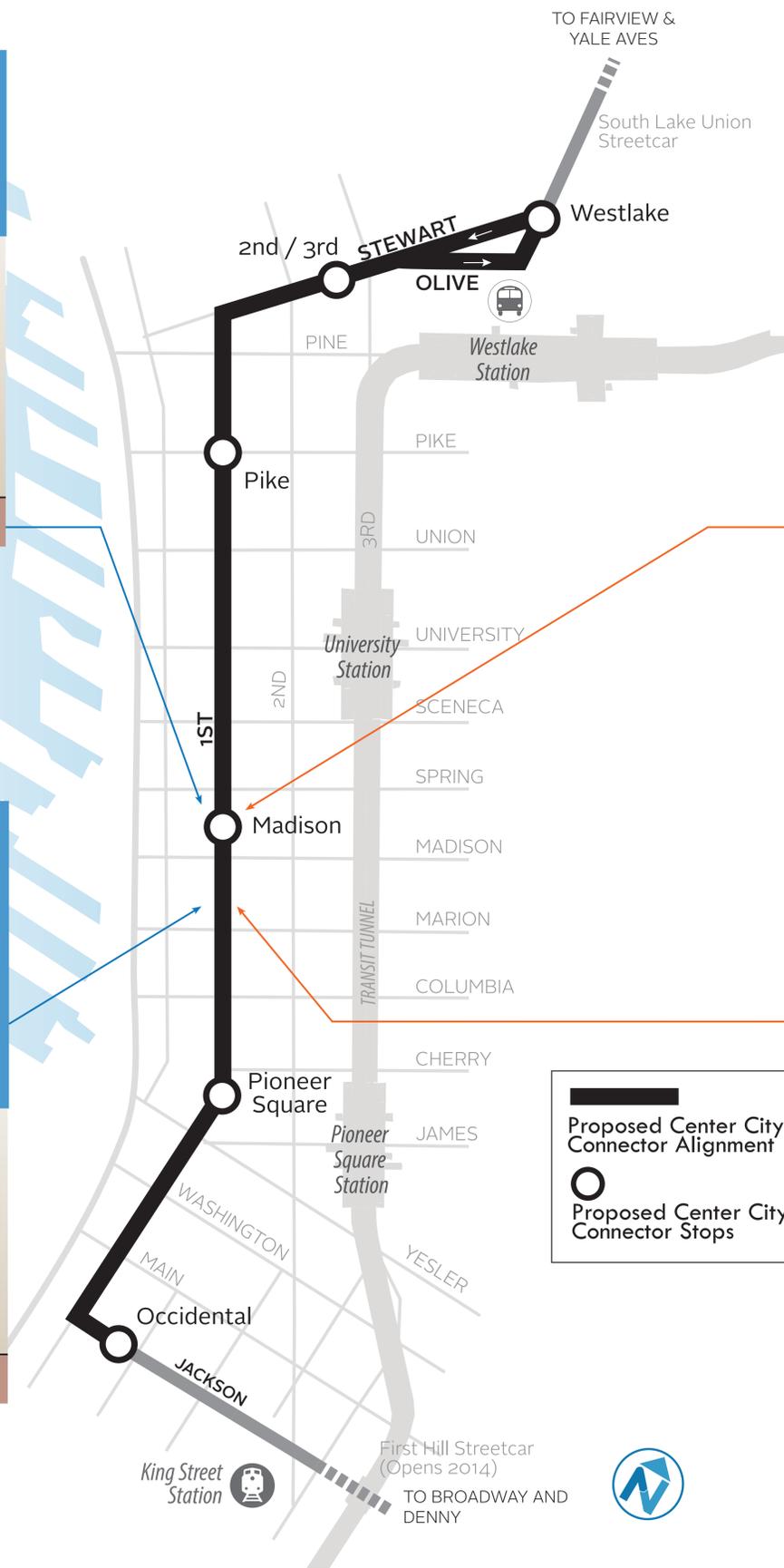
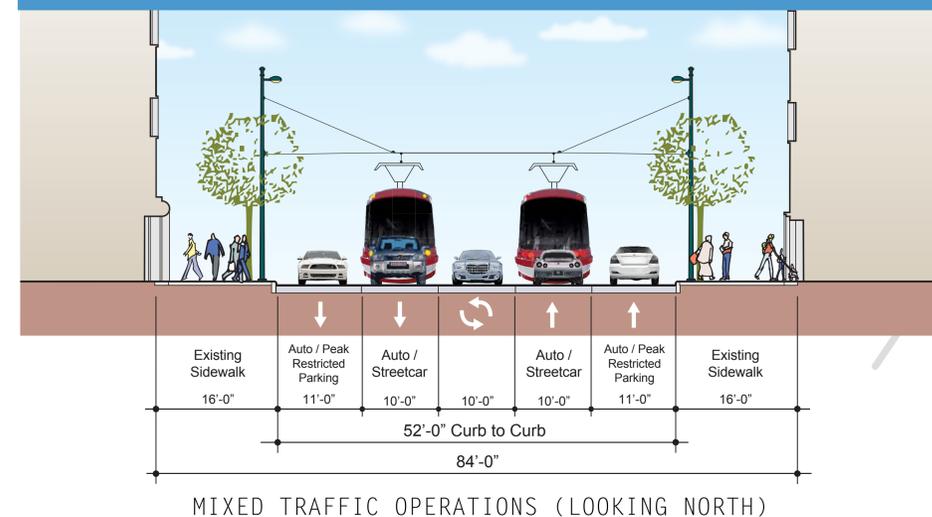
At Stops (Typical - Madison/Spring)

- Three new stops are proposed on 1st Avenue. Platforms at Pike and Madison/Spring would be located in the street median.



Between Stops (Typical - South of Madison)

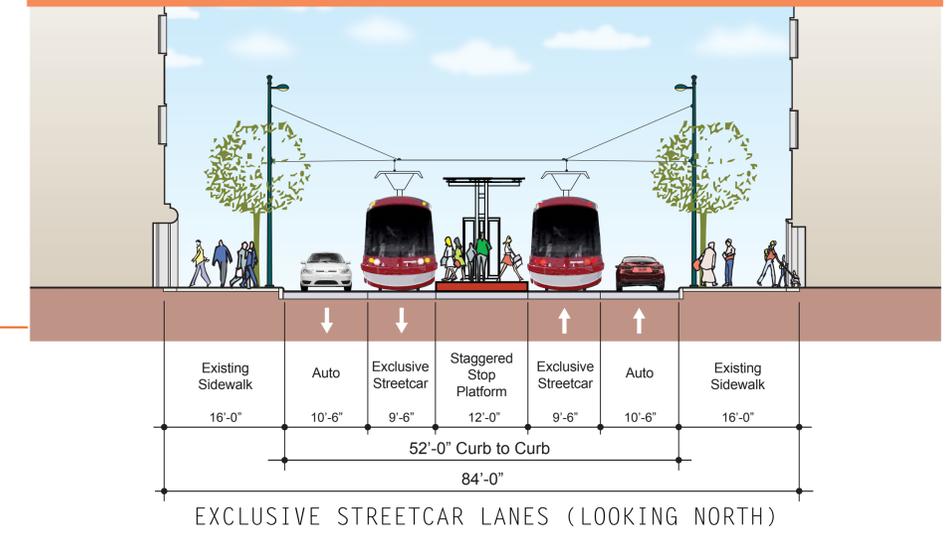
- The streetcar would run in the center of 1st Avenue, in lanes shared with autos. Turn pockets would typically be located between the streetcar/ auto lanes, in the street median. Peak-restricted parking could be allowed in the curbside lanes except on blocks with streetcar stops.



Exclusive Streetcar

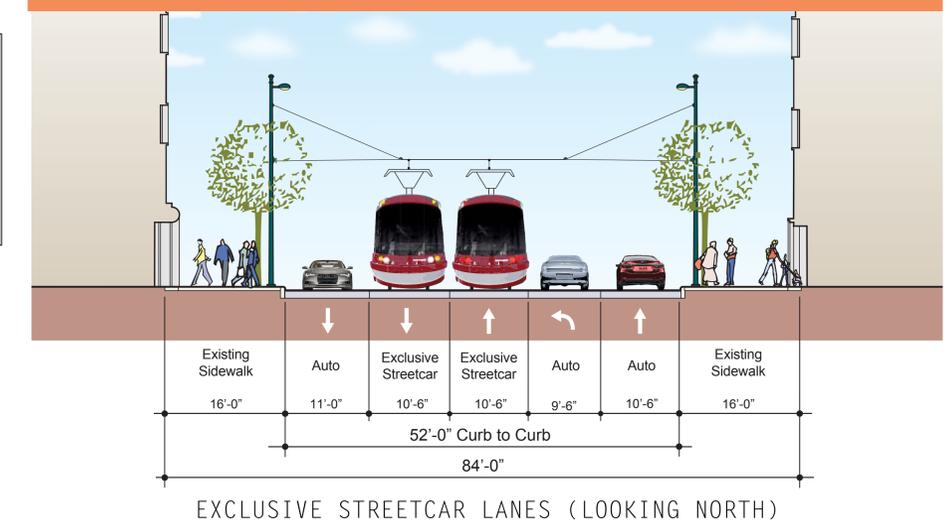
At Stops (Typical - Madison/Spring)

- The streetcar has the same proposed stop locations, but with exclusive streetcar lanes adjacent to stop platforms.



Between Stations (Typical - South of Madison)

- The streetcar would run in exclusive lanes in the center of 1st Avenue. Turn lanes would typically be located on the outside of the streetcar lanes. Pockets of parking would be provided in some blocks on the west side of 1st Avenue.

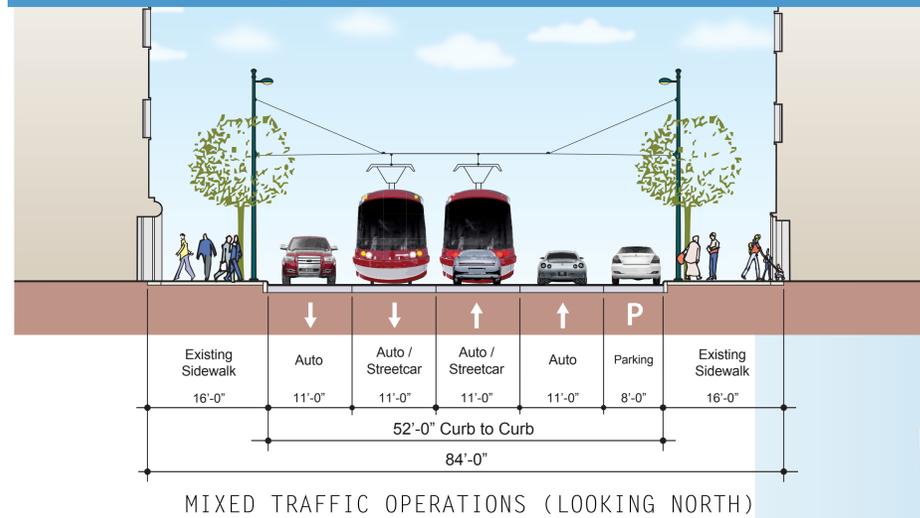


1ST AVE MIXED-TRAFFIC & EXCLUSIVE STREETCAR

Mixed-Traffic Streetcar

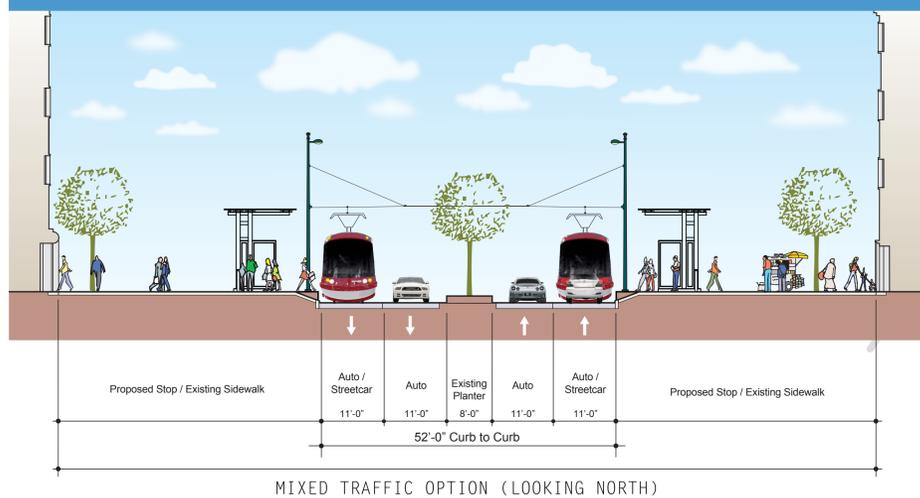
Mid-Block (Typical - South of Union)

- Peak-restricted parking could be allowed in the curbside lanes on most blocks, terminating to accommodate turn lanes and streetcar stops.



Cherry/Yesler

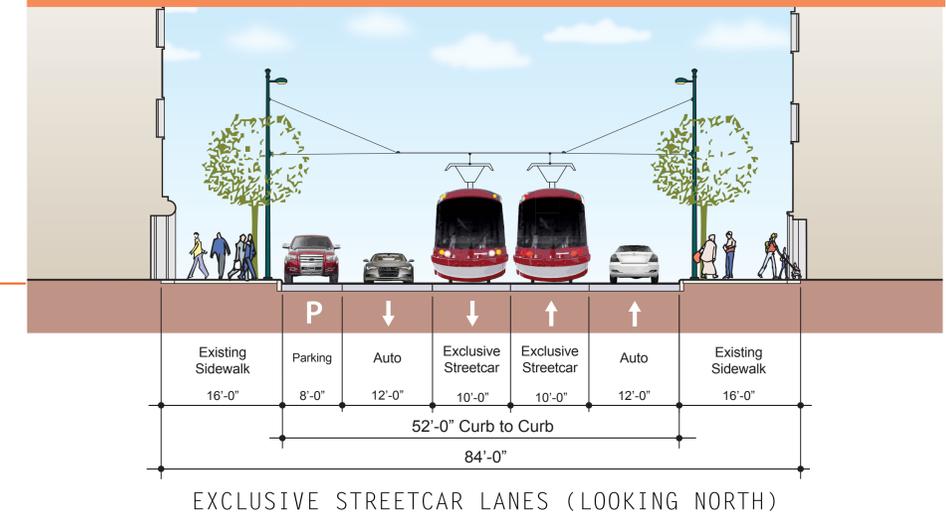
- Stops would be located on the curb, between Cherry and Yesler, to preserve median street trees. The streetcar would shift to/from the center lanes at Washington.



Exclusive Streetcar

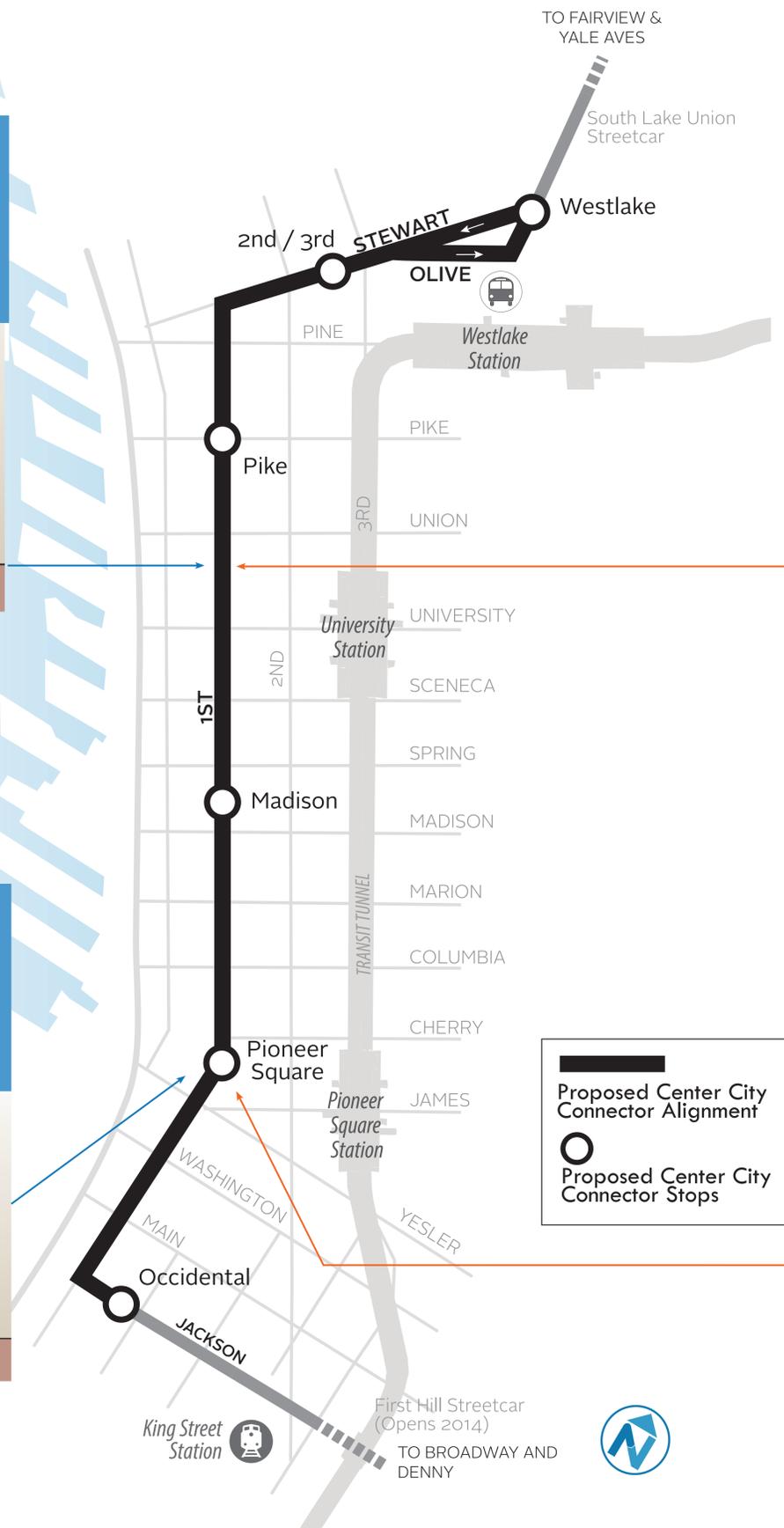
Mid-Block (Typical - South of Union)

- No peak-restricted parking would be available. All-day parking spaces would be available in several blocks on the west side of 1st Avenue.



Cherry/Yesler

- Stops would be located in the median, which would provide the fastest travel time, but would require removing about 2-3 street trees.



1ST AVE MIXED-TRAFFIC & EXCLUSIVE STREETCAR

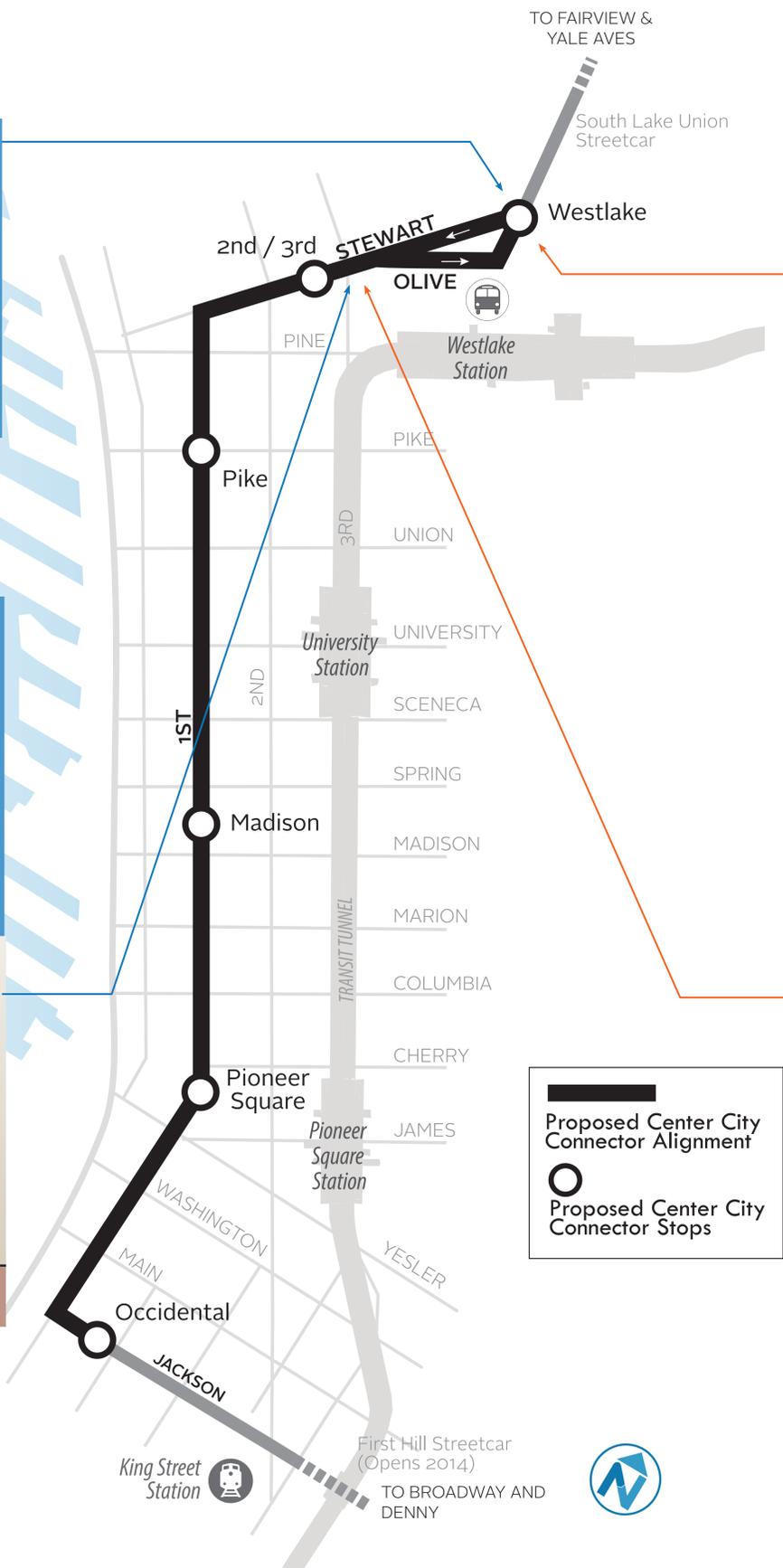
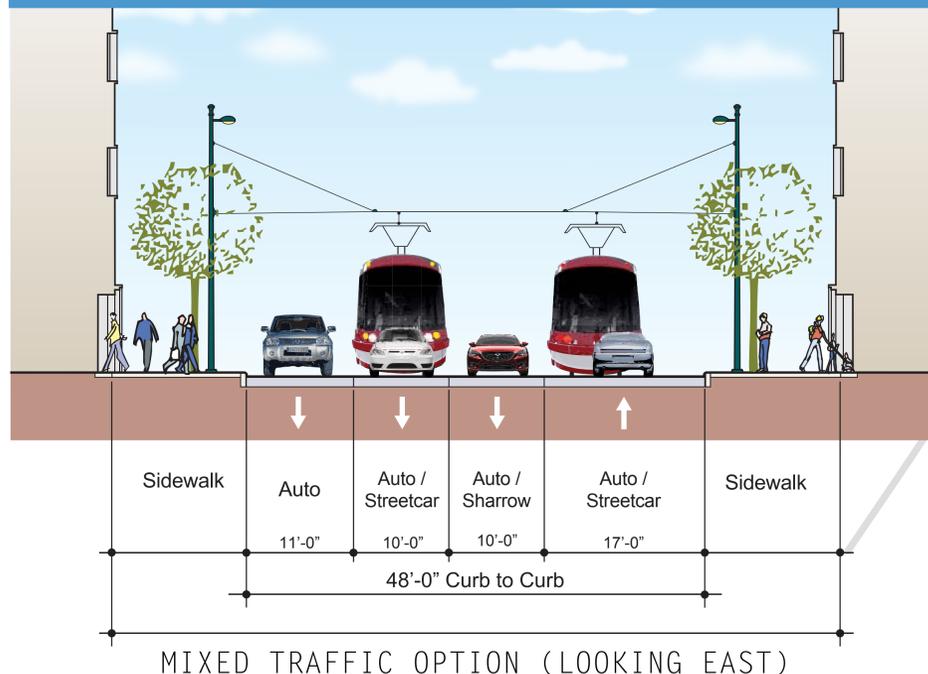
Mixed-Traffic Streetcar

Westlake

- The southbound stop would be located in the median of Westlake north of Stewart, opposite the Westin Hotel. The northbound stop would use the existing South Lake Union (SLU) streetcar stop in McGraw Square.
- The SLU streetcar line would operate with a similar level of priority as today.

Stewart Street/Olive Way (East of 3rd)

- NB/EB direction to Westlake: Streetcar would run contra-flow along Stewart with a curbside stop west of 3rd, switching to north-side along Olive at the 4th intersection.
- SB/WB direction to 1st Avenue: Streetcar would run in the center lane of Stewart, shifting to the curb lane at a curbside stop west of 3rd.



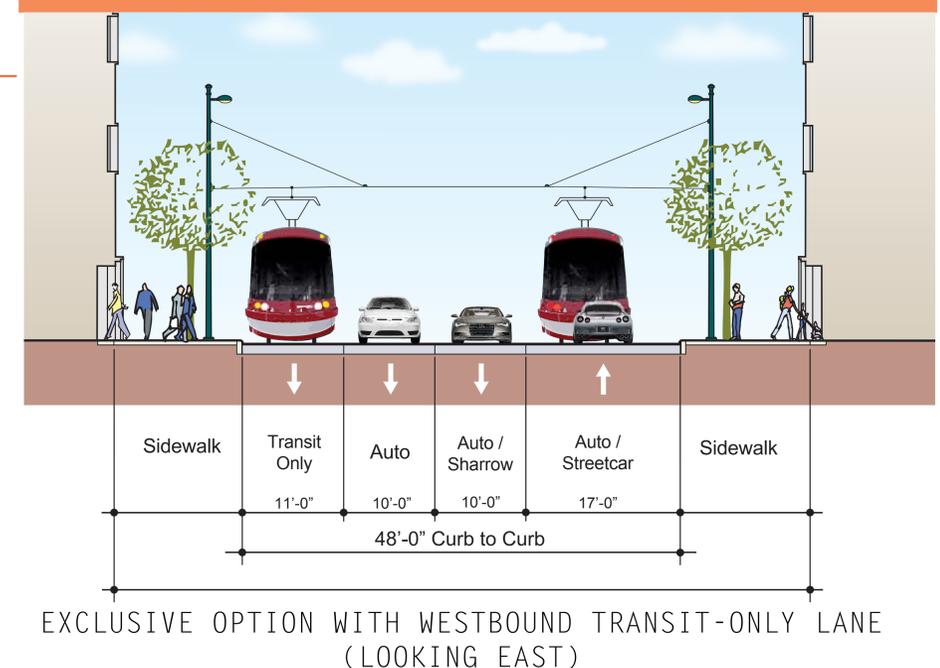
Exclusive Streetcar

Westlake

- Stop locations would be similar to the Mixed-Traffic alternative.
- Signal and other priority improvements could be identified to increase speed and reliability of the South Lake Union streetcar line.

Stewart Street/Olive Way (East. of 3rd)

- NB/EB direction to Westlake: a contra-flow lane along Stewart would be transit-only between 1st and 2nd (not shown).
- SB/WB direction to 1st Avenue: Streetcar would run in the curbside lane of Stewart, which would be transit-only (shared with buses).

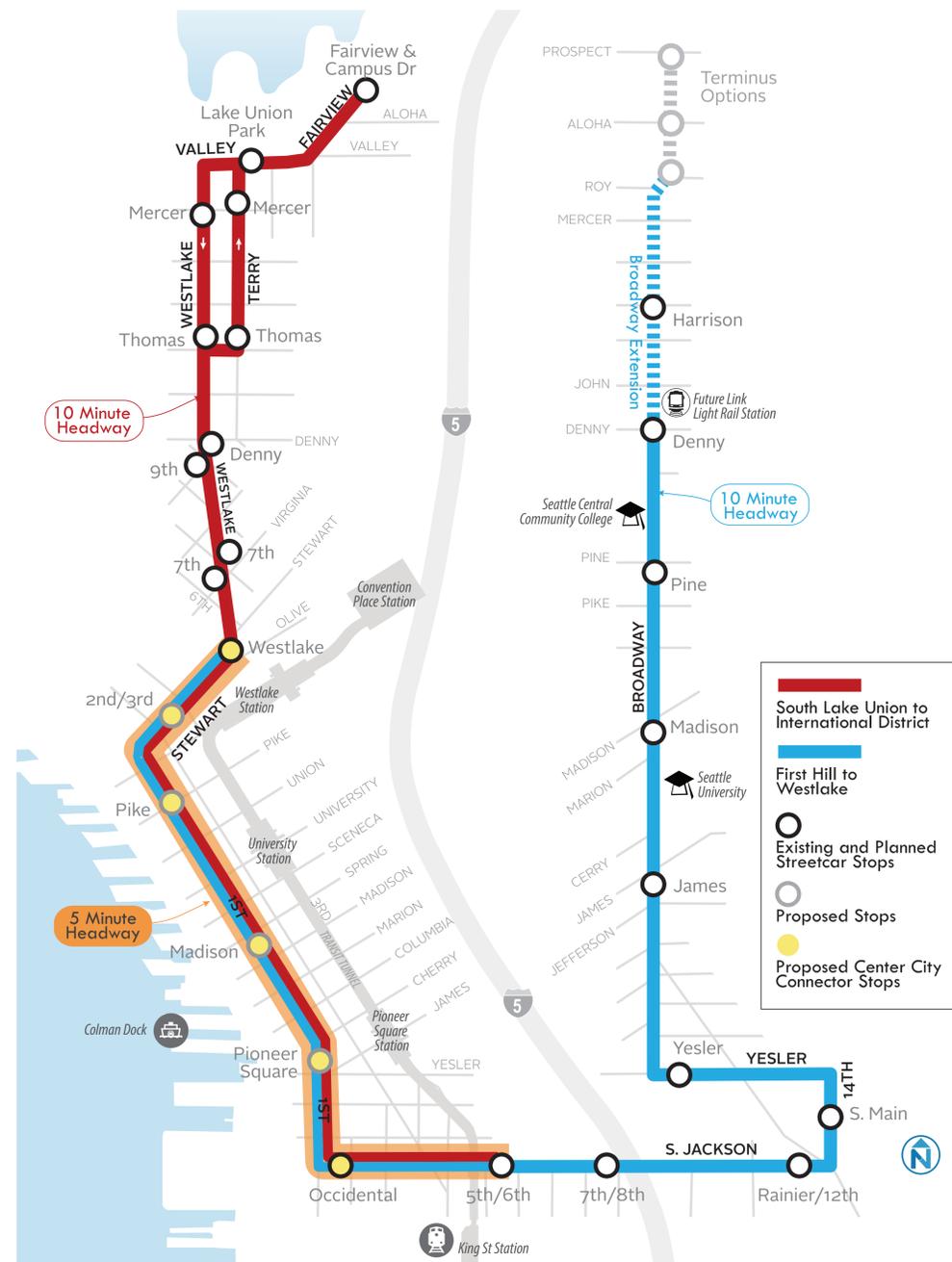


PREFERRED OPERATING SCENARIO

Preferred Scenario: Hub-to-Hub

The preferred operating scenario for the Center City Connector would connect the South Lake Union (SLU) and First Hill streetcars with a pair of lines that overlap between the Westlake and King Street hubs. This “Hub-to-Hub” segment with overlapping service is highlighted in orange on the map below and would have a streetcar arrival up to every 5 minutes. Streetcars would arrive up to every 10 minutes north of Westlake and east of King Street station.

- RED** SLU line to International District (5th/6th and Jackson)
- BLUE** First Hill line (Broadway/Roy) to Westlake



- The “Hub-to-Hub” scenario was selected as the preferred operating scenario based on higher forecasted ridership (due to more frequent service between Westlake and King Street hubs).
- Hub-to-Hub scenario operating costs and vehicle capital costs are higher than an “End-to-End” scenario (shown at right) that connects the streetcar segments with no transfers.
- The preliminary operating plan for the Center City Connector under either scenario assumes:
 - 10-minute headways on each line from 6 am to 7 pm on weekdays and from 8 am to 7 pm on weekends. This results in 5-minute headways between the hubs in the Hub-to-Hub scenario.
 - 15-minute headways all other times. This results in 7.5-minute headways between the hubs.
 - Operates 20 hours per day Monday through Saturday, and 17 hours per day on Sundays and Holidays.

Alternate Scenario: End-to-End



The End-to-End operating scenario for the Center City Connector would connect the South Lake Union (SLU) and First Hill streetcars as a single integrated line with no transfers. This scenario would have a streetcar arrival up to every 10 minutes.

FEEDBACK ON TIER 2 ALTERNATIVES



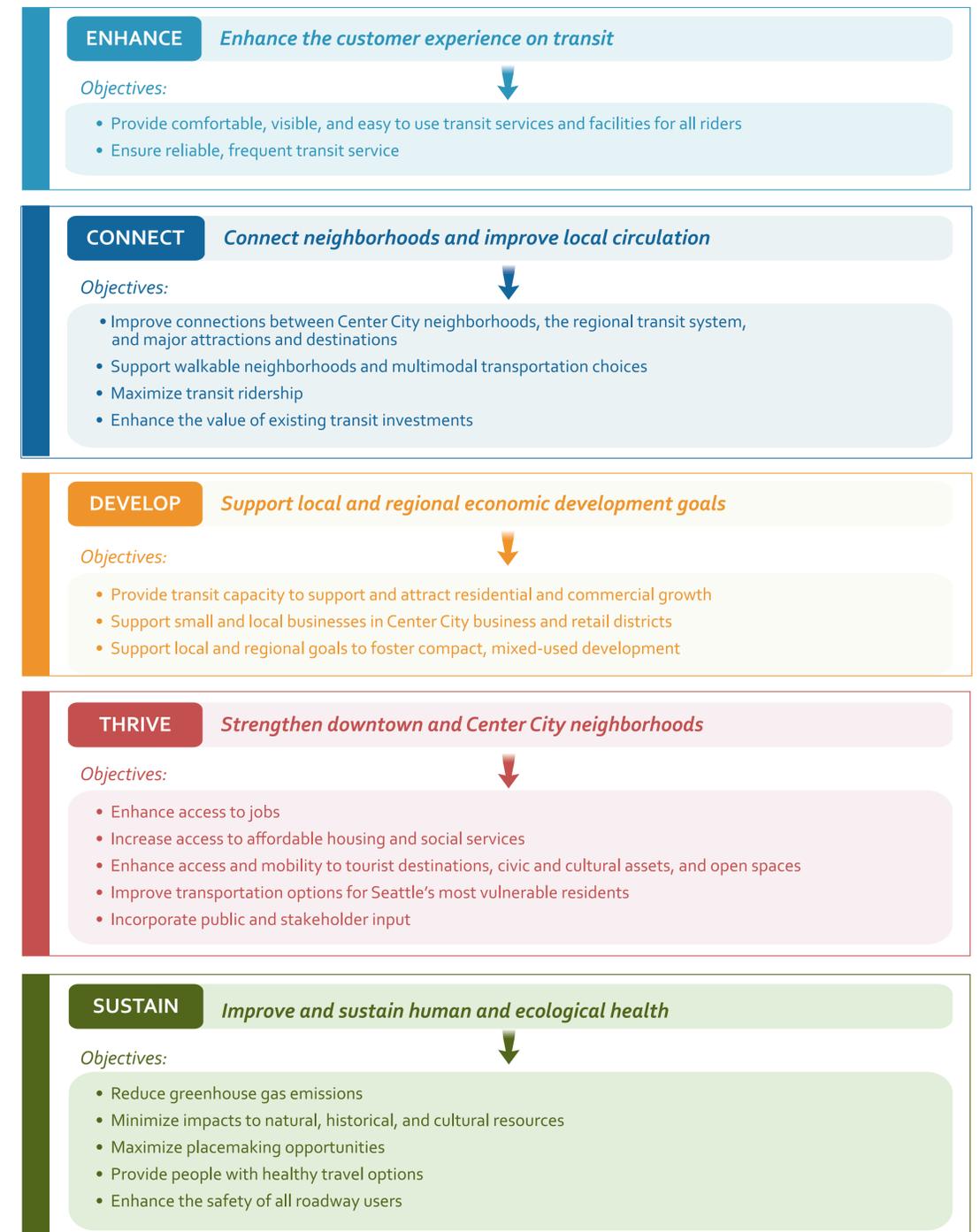
We need your input!

- Pick up a comment card.
- Tell us whether you prefer a Mixed-Traffic or Exclusive streetcar alternative and which measures were most important in deciding between the alternatives.

Goals and Objectives

The goals and objectives in the graphic below relate to the project Purpose and Need. The goals were first presented at the February open house.

Qualitative and quantitative measures related to the goals and objectives were used in the Tier 1 and 2 evaluation of alternatives. The display boards that follow present the evaluation results.



Streetcar Travel Times, 2018

- Streetcar travel times are nearly 30% faster in the Exclusive alternative, compared to the Mixed-Traffic alternative.
- Streetcar travel times are more competitive with auto travel in the Exclusive alternative—30% longer than the No-Build auto travel time, including stops, compared to 80% longer in the Mixed-Traffic alternative.

Average Streetcar Travel Times vs. Auto (No-Build), 2018, PM Peak
Jackson/Occidental to Stewart/Westlake (by segment)

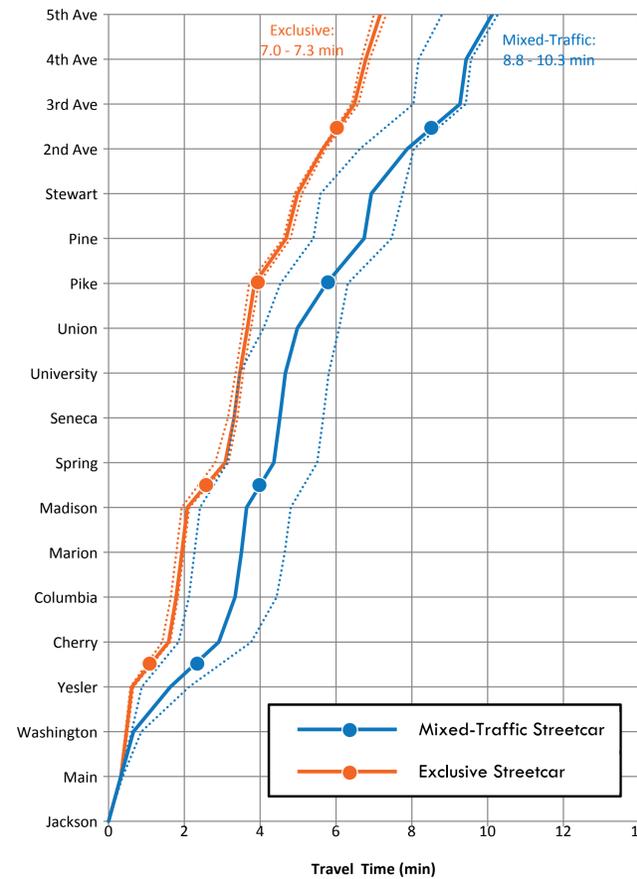


Note: Streetcar travel times include an assumed 20-second dwell time at stations. Travel times are the average of one-way northbound and southbound travel times.

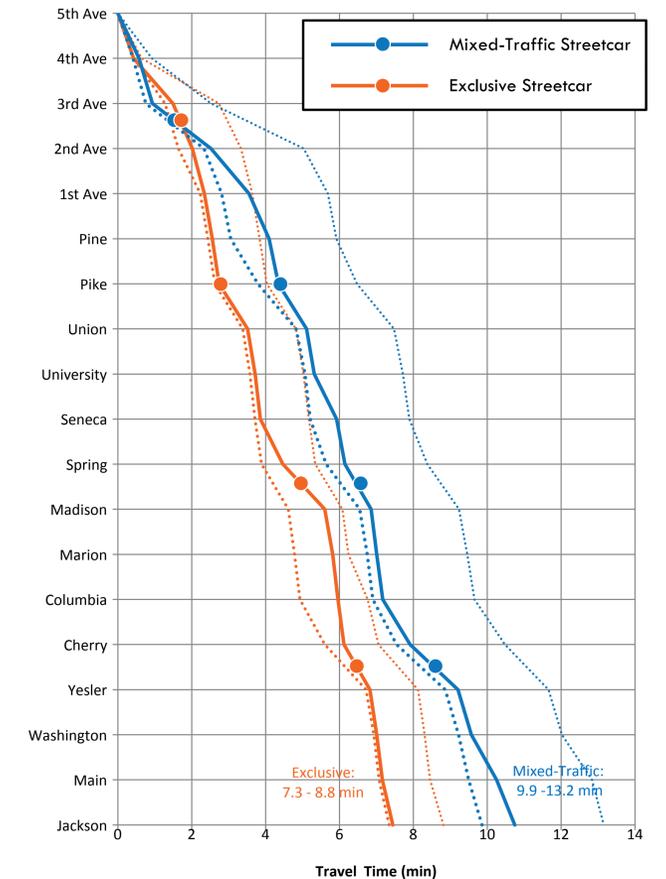
Travel Time Reliability, 2018

- Traffic congestion is projected to increase in the future. The Exclusive alternative helps ensure future reliability of streetcar travel times.
- Solid lines on the graphs below show the average streetcar travel time. Dashed lines represent the range of streetcar travel times. Dashed lines close to the solid line indicate stronger reliability.
- Travel times for the Exclusive streetcar (orange) vary by about 12% compared to about 26% for the Mixed-Traffic streetcar.

Northbound Streetcar Travel Time Reliability, 2018, PM Peak



Southbound Streetcar Travel Time Reliability, 2018, PM Peak



Auto Travel Times, 2018

- Auto travel time increases by 8% in the Mixed-Traffic alternative, compared to No-Build.
- Auto travel time increases by 35% in the Exclusive alternative, primarily on 1st Avenue where the streetcar has exclusive lanes.

Average Auto Travel Times in No-Build and Streetcar Scenarios, 2018, PM Peak Jackson/Occidental to Stewart/Westlake (by Segment)

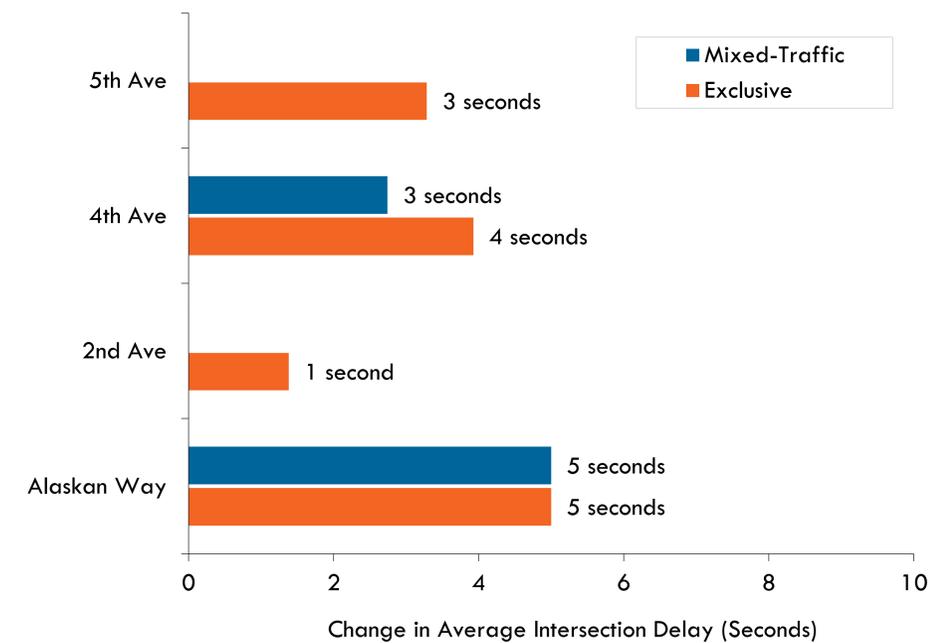


Note: Travel times are the average of one-way northbound and southbound travel times.

Traffic Delay from Diversion to Parallel Streets, 2035

- In the Mixed-Traffic alternative, there is minor traffic diversion (less than 10%) from 1st Avenue. Intersection delay on parallel streets increases by an average of about 2 seconds.
- In the Exclusive alternative, up to 50% of traffic is diverted from 1st Avenue. Intersection delay on parallel streets increases by an average of about 3.5 seconds.

Change in Traffic (Average Intersection) Delay on Parallel Corridors, 2035, PM Peak Impacts due to Traffic Diversion from 1st Avenue



Note: Based on analysis of 20 intersections on Alaskan Way and 2nd, 4th, and 5th Avenues. In the Mixed-Traffic alternative, diversion primarily affects northbound travel on parallel streets therefore the analysis did not show noticeable impacts on 2nd and 5th Avenues. Mixed-Traffic impacts represent increases of 6% on 4th Ave and 13% on Alaskan Way. Exclusive alternative impacts represent 9% to 13% increases on parallel corridors relative to No-Build.

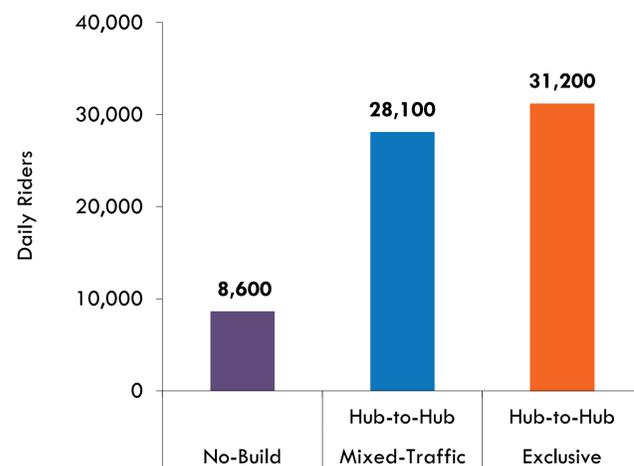
Forecasted Ridership, 2018 (Projected Opening Year)

- Faster travel times in the Exclusive alternative attract higher ridership than a streetcar running in mixed-traffic.
- High frequency service between King Street and Westlake hubs in the Hub-to-Hub operating scenario attracts higher ridership than an End-to-End operating scenario.
- A visitor ridership estimate of 3,500 average daily trips was developed using a peer model based on data from San Francisco's F-Line streetcar.

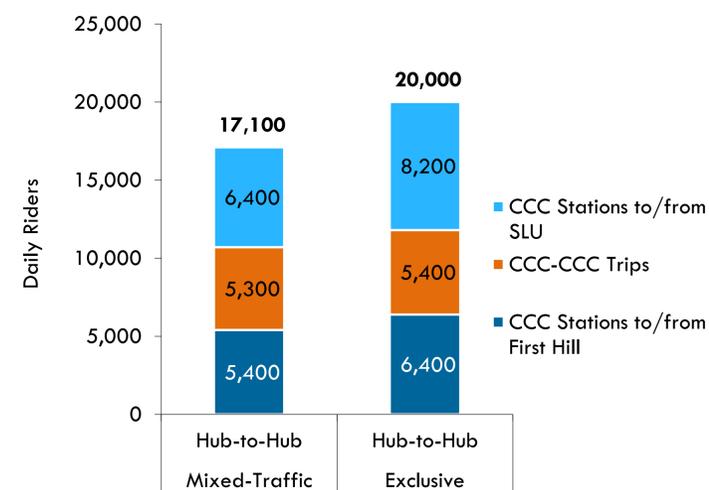


San Francisco's F-Line streetcar serves many of the city's hotels and visitor attractions, similar to the Center City Connector alignment.
Source: Flickr user kjmiller

Estimated Weekday Daily Trips, 2018 (Including Visitors)

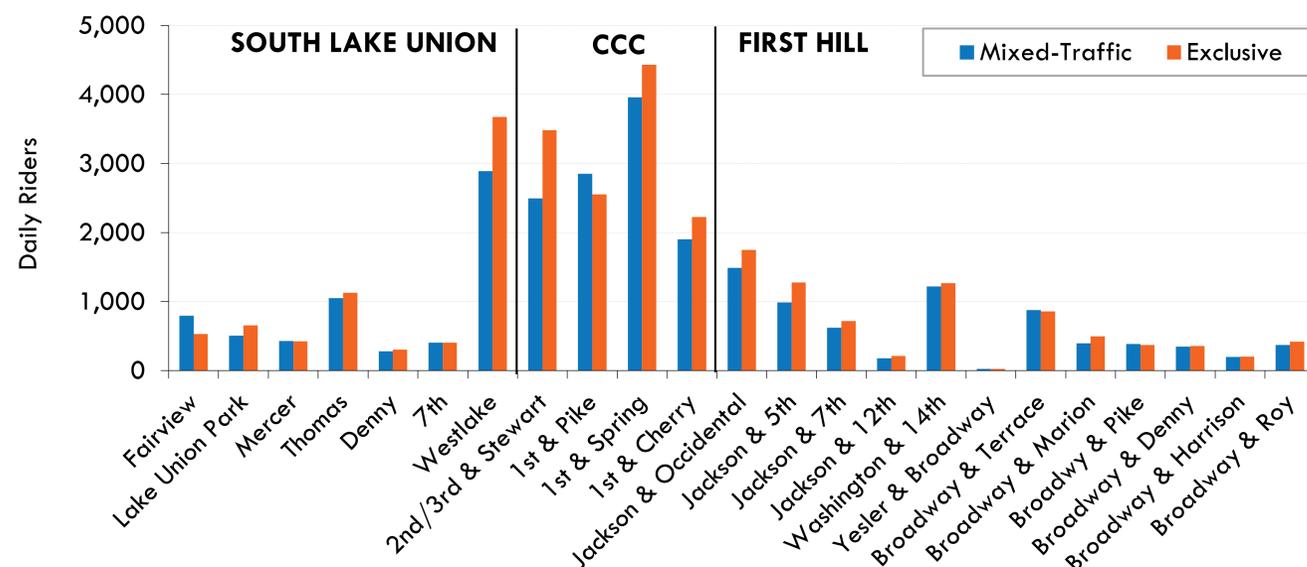


Weekday Daily Trips to/from New Center City Connector Stations by Line (First Hill with Broadway Extension, CCC, SLU), 2018 (Not including Visitors)



CCC-CCC trips have both ends at one of the four new/proposed Center City Connector stops (Stewart, Pike, Madison/Spring, and Cherry). One end of CCC-SLU and CCC-First Hill trips is at one these four stops.

Station Activity, 2018 (Not including Visitors)



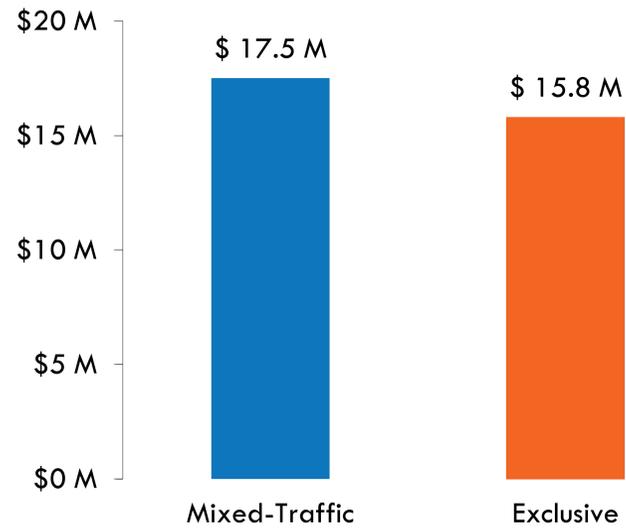
Ridership forecast prepared using FTA STOPS model. The STOPS model forecast assumed the Broadway extension with a Roy terminus. An additional 3,500 visitor trips were estimated using a peer model based on data from San Francisco and its F-line streetcar. The visitor estimate is included in the forecast of total ridership, but not in station-level estimates.

Annual Operating and Maintenance Costs

- The Hub-to-Hub Exclusive streetcar alternative requires fewer vehicles in operation, reducing operating costs compared to the Mixed-Traffic alternative.

- Faster travel speeds in the Exclusive alternative attract more riders and result in a lower operating cost per trip.
- The projected operating cost per trip for the combined streetcar system can be compared to \$3.35 per trip on the existing South Lake Union streetcar and \$2.03 per trip on the Portland Streetcar.

Annual Operating and Maintenance Costs, Hub-to-Hub Scenario, Combined Streetcar Operations



Combined SLU, Center City Connector, and First Hill streetcar operations and maintenance. Operating costs are in 2012 dollars.

Operating Cost per Trip, Hub-to-Hub Scenario, Combined Streetcar Operations



This measure divides annual operating and maintenance costs by the number of forecasted weekday daily trips on the combined streetcar system, annualized with a factor of 330 (typical of the Portland Streetcar). Portland and South Lake Union Streetcar data is from the National Transit Database, 2011, National Transit Profile Summary, and/or the streetcar websites.



Slower travel speeds in mixed-traffic require more vehicles and operators to maintain regular streetcar headways.

Source: Nelson\Nygaard

Capital Cost per Mile

- The capital cost per mile (excluding vehicles) is slightly higher for the Exclusive alternative. This is primarily due to allowances for exclusive lane treatments and upgraded stop platforms.

Capital Cost per Mile, Center City Connector Not Including Vehicles

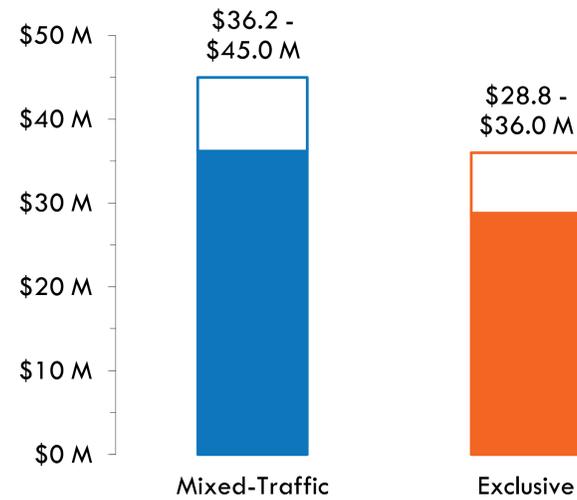


Costs are from an opinion of cost for comparative purposes and are provided in 2013 dollars. Costs include maintenance facility expansion, contingency, engineering and design, etc. Capital costs include water and sewer utility impacts. Impacts for Seattle City Light are still being assessed. Private utility impacts are not included in the cost.

Vehicle Capital Costs

- Vehicle costs are lower for the Exclusive alternative.
- The Hub-to-Hub scenario requires more vehicles than the End-to-End scenario due to higher-frequency service between King Street and Westlake hubs.

Vehicle Capital Costs, Hub-to-Hub Scenario

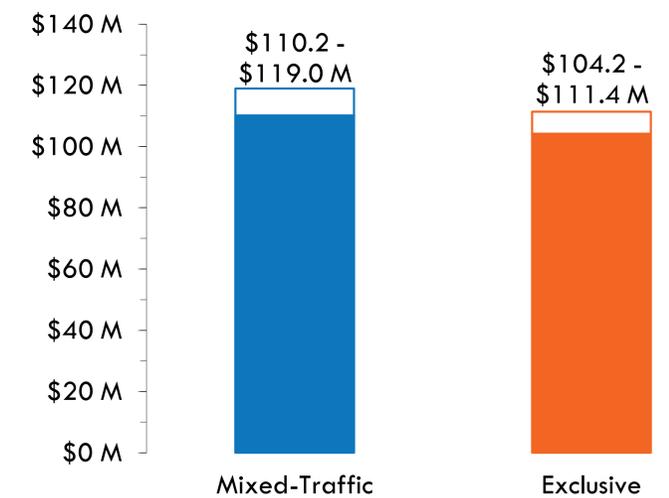


Cost of new vehicles to operate a combined SLU, Center City Connector, and First Hill streetcar in the Hub-to-Hub operating scenario. The Mixed-Traffic alternative requires 18 vehicles including spares, of which 11 new vehicles would need to be purchased. The Exclusive alternative requires two fewer total and new vehicles. A new vehicle cost of \$3.7 to \$4.5 million is assumed. Resale of three existing South Lake Union vehicles for \$1.5 million each is also assumed.

Total Capital Costs

- The total estimated cost of Exclusive alternative is lower than the Mixed-Traffic alternative when the cost of vehicles is included.

Total Capital Costs, Including Vehicles



Construction of the First Hill Streetcar southern terminus in Pioneer Square
Source: Flickr user Gordon Werner

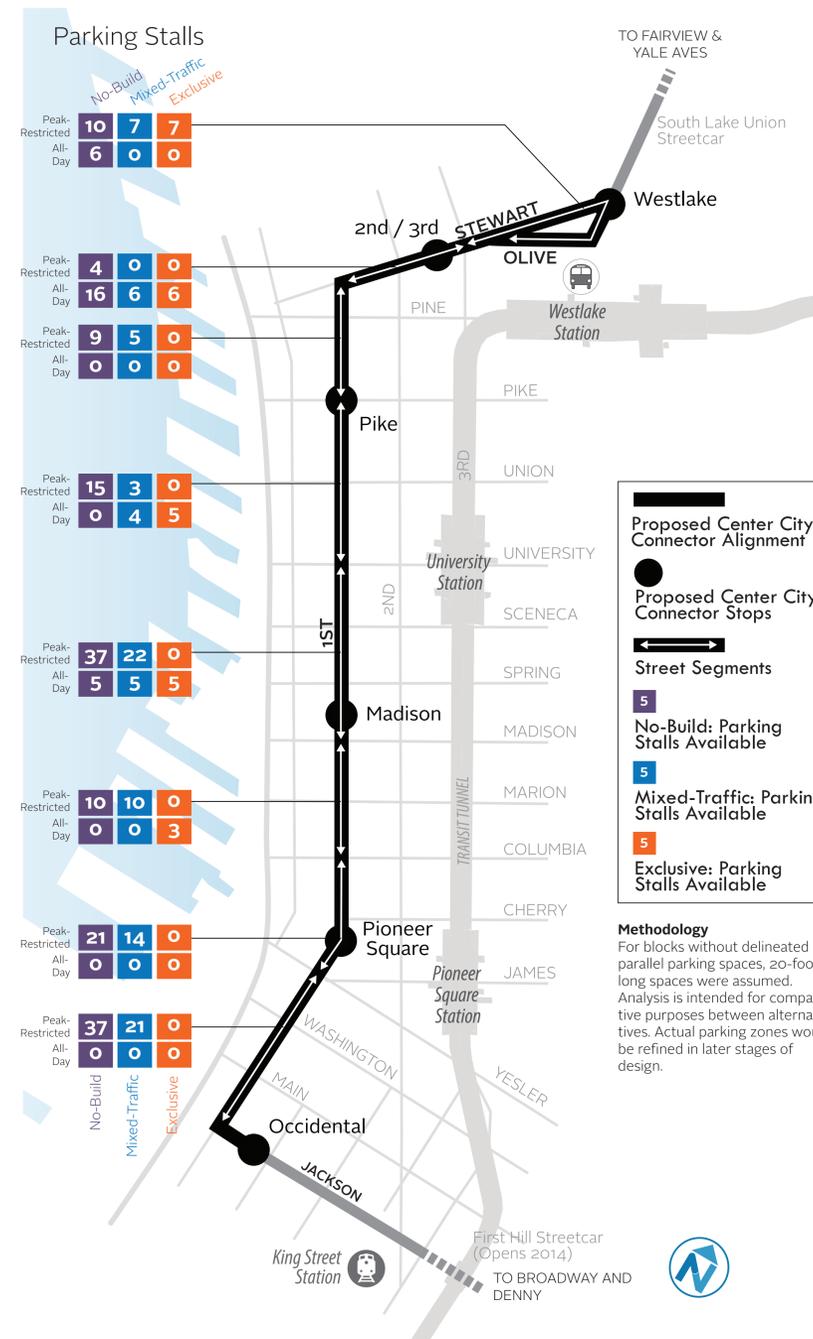
On-Street Parking and Parking Impacts

- On-street parking stalls and loading zones support small/local businesses along and around the 1st Avenue streetcar alignment.
- Peak-restricted parking is maintained in the Mixed-Traffic alternative outside of turn lanes and streetcar stops.
- All parking in the Exclusive alternative is on the west side of 1st Avenue and is not peak-restricted.
- There are 1,265 total off-street stalls within a one-block distance of 1st Avenue (Jackson-Stewart). On average only 46% are occupied between 8:30-11:30 am and 60% between 1:30-3:30 pm. (PSRC Parking Inventory, 2010)



The Exclusive alternative includes pockets of all-day on-street parking, terminating at stop platforms or turn lanes.
Source: Nelson/Nygaard

On-Street Parking Stalls



Loading Zones

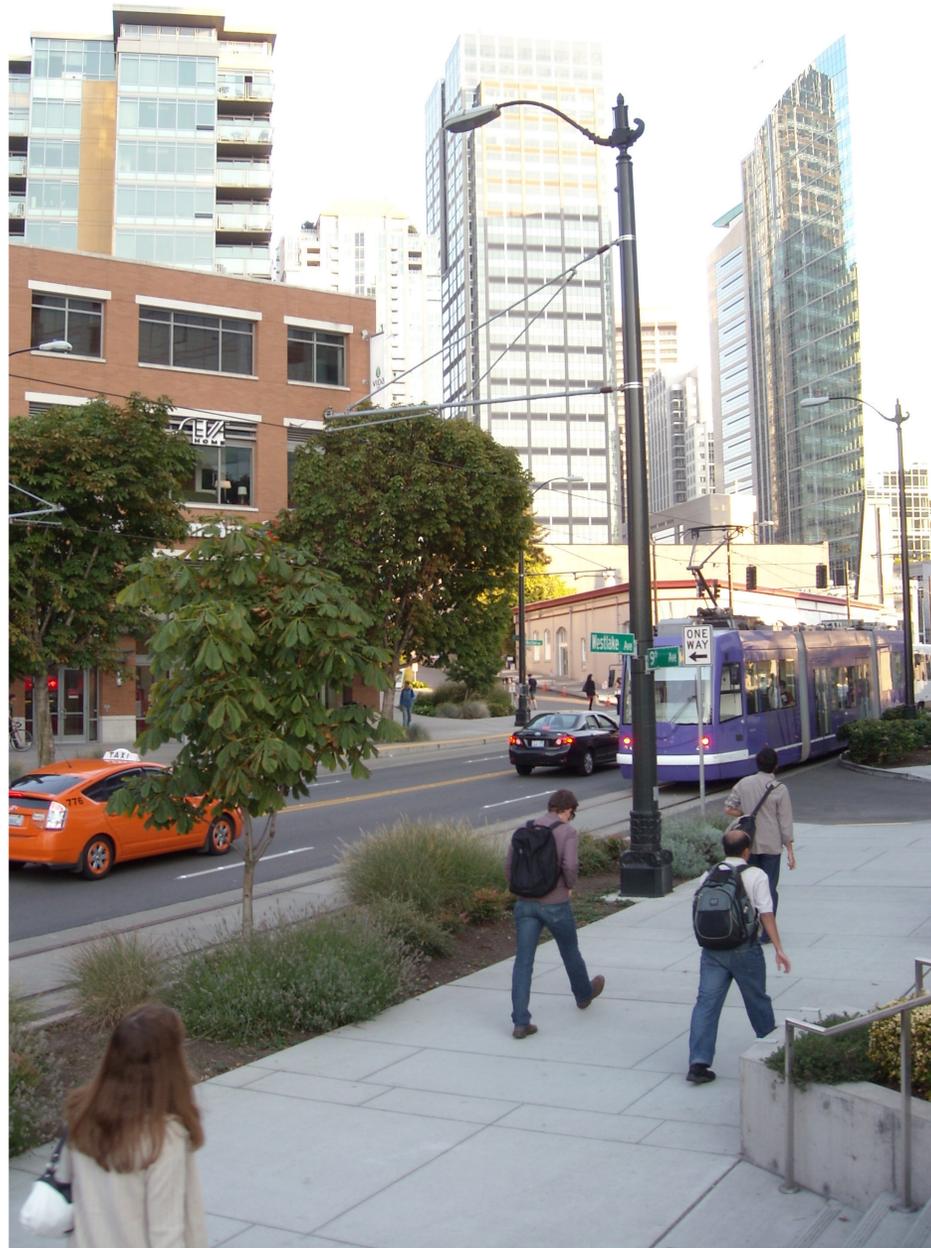


Note: Order-of-magnitude estimates for comparative purposes. Parking and loading zones would be refined in later stages of design. General or passenger loading zones that are available for parking off-peak are also included as peak-restricted on-street parking.

Public and Stakeholder Support

Based on stakeholder interviews conducted in November-December 2012 and the open houses held in February and June 2013:

- The vast majority of stakeholders interviewed and participants at the February open house preferred a streetcar mode. Reasons included a desire for a seamless connection between the two streetcars.
- A number of comments at the February open house emphasized the importance of fast and reliable service.
- Many of the stakeholders interviewed identified specific benefits from a 1st Avenue alignment, including potential for future extensions to the north and south. They also expressed concerns that other alignments would have greater conflicts between streetcar and other modes.
- In a prioritization exercise at the February open house, participants placed about 60 dots in support of 1st Avenue street alignments, nearly three times as many as any other alignment.
- About 75% of completed comment cards at the June open house favored a 1st Avenue alignment.
 - Over 60% ranked the 1st Avenue Exclusive Streetcar alternative as the top choice.
 - About 15% preferred the 1st Avenue Mixed-Traffic alternative.



The proposed Center City Connector, existing South Lake Union, and First Hill streetcars travel through the City's most intensive land use districts. Land use policies for many of these districts have been updated to help meet the policy objectives identified in the Seattle Comprehensive Plan and Neighborhood Plans.

Source: Nelson/Nygaard

FEDERAL FUNDING POTENTIAL

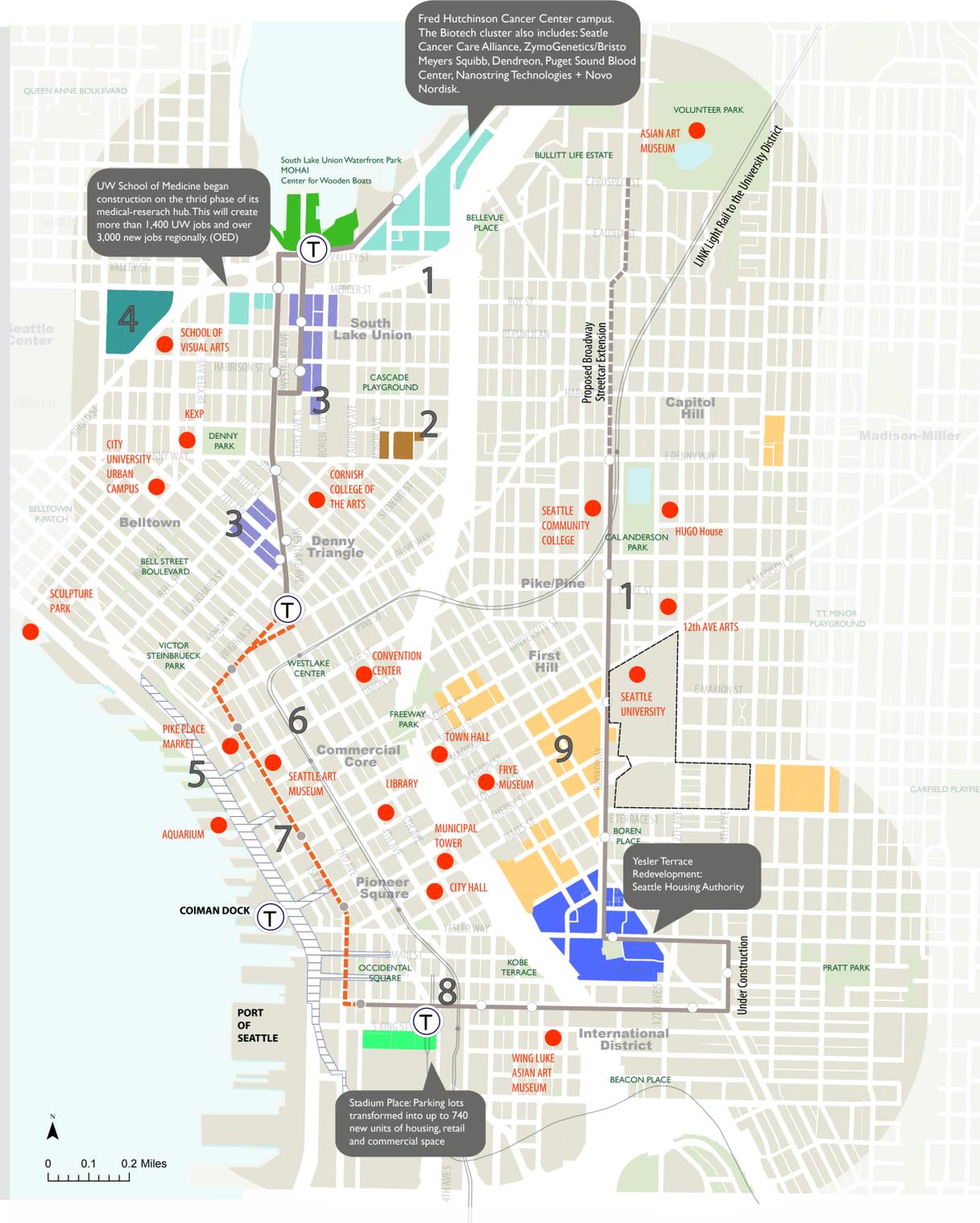
- The City of Seattle will pursue a maximum of 50% of project funding for the Center City Connector from the Federal Transit Administration (FTA).
- The New/Small Starts program is the primary Federal financial resource for transit capital investments. Funding is justified and allocated nation-wide via a rigorous competitive process.
- The FTA rates candidate projects on a “Low” to “High” scale for the following criteria:
 - Mobility Improvements
 - Environmental Benefits
 - Congestion Relief
 - Cost Effectiveness
 - Transit Supportive Land Use
 - Economic Development
- Preliminary analysis of these criteria indicates that the Center City Connector is likely to receive “High” ratings.
- The project should be highly competitive for funding because:
 - It supports local and regional goals to foster compact and mixed-use development.
 - It offers excellent connections to existing jobs and housing.
 - It has high forecasted ridership for a relatively low capital cost.
 - City policies are aligned to prioritize dollars for transit-supportive infrastructure investments.

Economic Development Opportunities

Assets and Opportunities within 1/2 Mile of the Streetcar

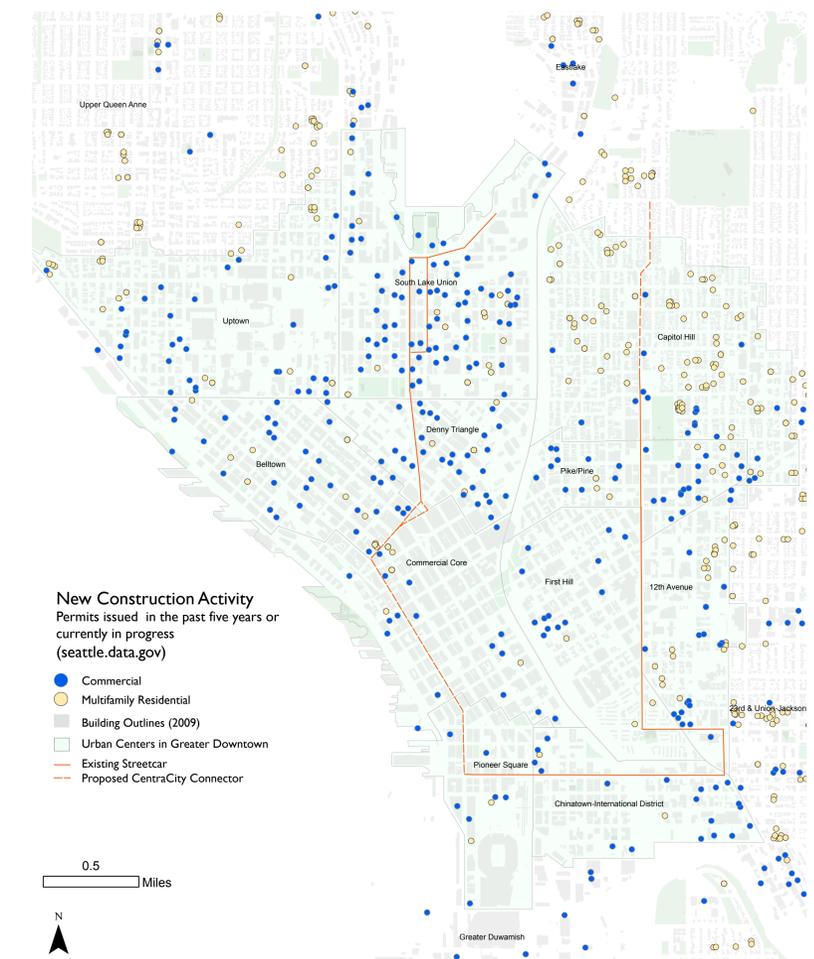
SNAPSHOT

- 1 **Mercer Corridor:** A major realignment of Mercer is underway to alleviate congestion, reduce conflict, and improve east-west connections. The initial phase of a two-way Mercer was completed in fall 2013. The next phases will re-connect the street grid between Dexter Ave. N and Fifth Ave. N, reopening John, Thomas, and Harrison streets across Aurora Ave. N.
- 2 **Not your Typical Substation:** To keep pace with the needs of high-tech and biotech businesses, Seattle is investing in reliable, clean electricity. The design of the substation will also be designed to meet community goals. Plan options are being evaluated and may include space for a park and co-development sites.
- 3 **Amazon.com Headquarters:** Amazon's planned campus shifts south into the Denny Triangle with three new high rise towers now under construction at Denny and 6th Avenue. The new towers have the capacity for an estimated 12,000 people, giving the company space for nearly 30,000 workers in Seattle.
- 4 **Gates Foundation:** With an endowment of \$38 billion, the Gates Foundation supports Seattle's high tech and biotech investments. The foundation itself brings approximately 1,200 - 2,000 jobs to the area as well as a new visitor center attraction.
- 5 **Waterfront For All:** together these plans aim to redesign and open up 26 waterfront blocks. Plans also include measures to improve surface connections between 1st avenue and the waterfront.
- 6 **3rd Ave Design Upgrades:** The City, King County and the DSA will collaborate to clean and improve 3rd Avenue. This agreement provides more outreach and support services for people in need, more officers, and enhancements to public space, and infrastructure.
- 7 **Hotels + Visitors:** The downtown contains the greatest share of Seattle's visitors and tourist attractions. There are 54 hotels within a half-mile radius from the streetcar alignment and 11,924 rooms. An estimated 15.1 million visits to local attractions take place annually.
- 8 **King Street Station Renovation:** WSDOT and Amtrak recently completed a \$55 million dollar renovation of the busiest train station in the Pacific Northwest.
- 9 **Health Care:** First Hill is home to several of Seattle's largest hospitals: Harborview Medical Center, Swedish Medical Center and Virginia Mason Medical Center. According to the DSA, seventy percent of Seattle's Health Care jobs are located on First Hill.
- 10 **Arts and Culture:** The Arts is a \$447 million dollar industry in Seattle, bringing in more than 10,000 jobs. The streetcar will connect the Arts and Cultural Districts in both Capitol Hill and Pioneer Square with major arts destinations in the Commercial Core and South Lake Union.



- Greater Downtown is the community's heart and regional mobility hub.
- The streetcar alignment offers a strong, accessible, and visible connection between existing jobs, housing, and Seattle's most highly-visited cultural assets.
- The streetcar alignment connects Seattle's most intensive land use zones, presenting an opportunity for transit investments to have a material impact on future development decisions.
- The zoning for many Center City neighborhoods has recently been updated (e.g., South Lake Union, Livable South Downtown, etc.) to better integrate and coordinate frequent transit into future development planning.
- An integrated streetcar line will be another contributing factor in an already dynamic and fast-growing downtown environment.

New Construction Activity and Building Permits



HISTORIC STREETCAR ASSESSMENT

Potential Operating Scenarios

- Three potential operating scenarios will be evaluated that could allow the historic Benson streetcars to operate on 1st Avenue and other segments of the South Lake Union and First Hill streetcar lines, as identified in the table below.
- This study will assess feasibility and estimate operating and capital costs of these scenarios.

Preliminary Assessment

- **Vehicle Capital Costs:** Vehicles would require upgrades including conversion to 750 volt DC power and dual-side, electrically-actuated doors.
- **Other Capital Costs:** Vehicles may be able to use existing turnarounds or new turnarounds may be required. Extending the historic streetcar east of the Jackson/Occidental station would require addition of overhead wire; historic vehicles do not have the capability to run on battery power.
- **ADA Aecessibility:** There are several options for providing ADA accessibility, however each presents challenges. Alternatively, in some scenarios ADA access could be provided by the modern vehicles.
 - High boarding platforms: There is insufficient space to accommodate high boarding platforms at all Center City Connector stops (modern streetcars provide level boarding at lower platforms).
 - Lifts: Providing lifts either on-board the historic streetcars or at stop platforms would add an estimated 2-3 minutes to boarding times, which is likely not compatible with 5-minute headways in the Hub-to-Hub scenario (the preferred operating scenario for the modern streetcar).
- **Maintenance Facility.** Historic streetcars would require new storage tracks with a basic, enclosed structure.

SCENARIO	SCENARIO DESCRIPTION	KEY CHALLENGES
Integrated	Replaces modern vehicles in day-to-day operation (no change in headway).	Providing sufficient passenger capacity and accommodating ADA access needs without impacting overall system reliability; capital and operating costs.
Overlay	Runs in addition to modern vehicles in day-to-day operation (increases overall headway).	Accommodating ADA access needs without impacting overall system reliability; capital and operating costs.
Limited	Runs in addition to modern vehicles on weekends, holidays, and/or special events.	Accommodating ADA access needs without impacting overall system reliability; capital and operating costs.



Historic Benson streetcar vehicles have been out of service since 2005. The Waterfront Seattle project evaluated historic streetcar along with other options for waterfront transit service. The Center City Connector project will also analyze options for operating historic streetcar vehicles on a portion of the modern streetcar system.
Source: Flickr User Oran Viriyincy

Reactivation of the Waterfront Streetcar line has also been studied together with other transit options as part of the Waterfront Seattle project. The Local Waterfront Transit Report (June 2013 - Draft) is available at <http://waterfrontseattle.org>.

WESTLAKE AND JACKSON EXCLUSIVE STREETCAR

The project team evaluated potential design and operational features that could be implemented to improve speed and reliability along the South Lake Union streetcar alignment and the Jackson segment of the First Hill Streetcar. The project team will be quantifying the potential benefits from these improvements. Preliminary results indicate that an approximately 25% travel time improvement may be possible over actual South Lake Union travel times. This would help the SLU line maintain its current scheduled travel time.

Westlake/South Lake Union

Key improvements include:

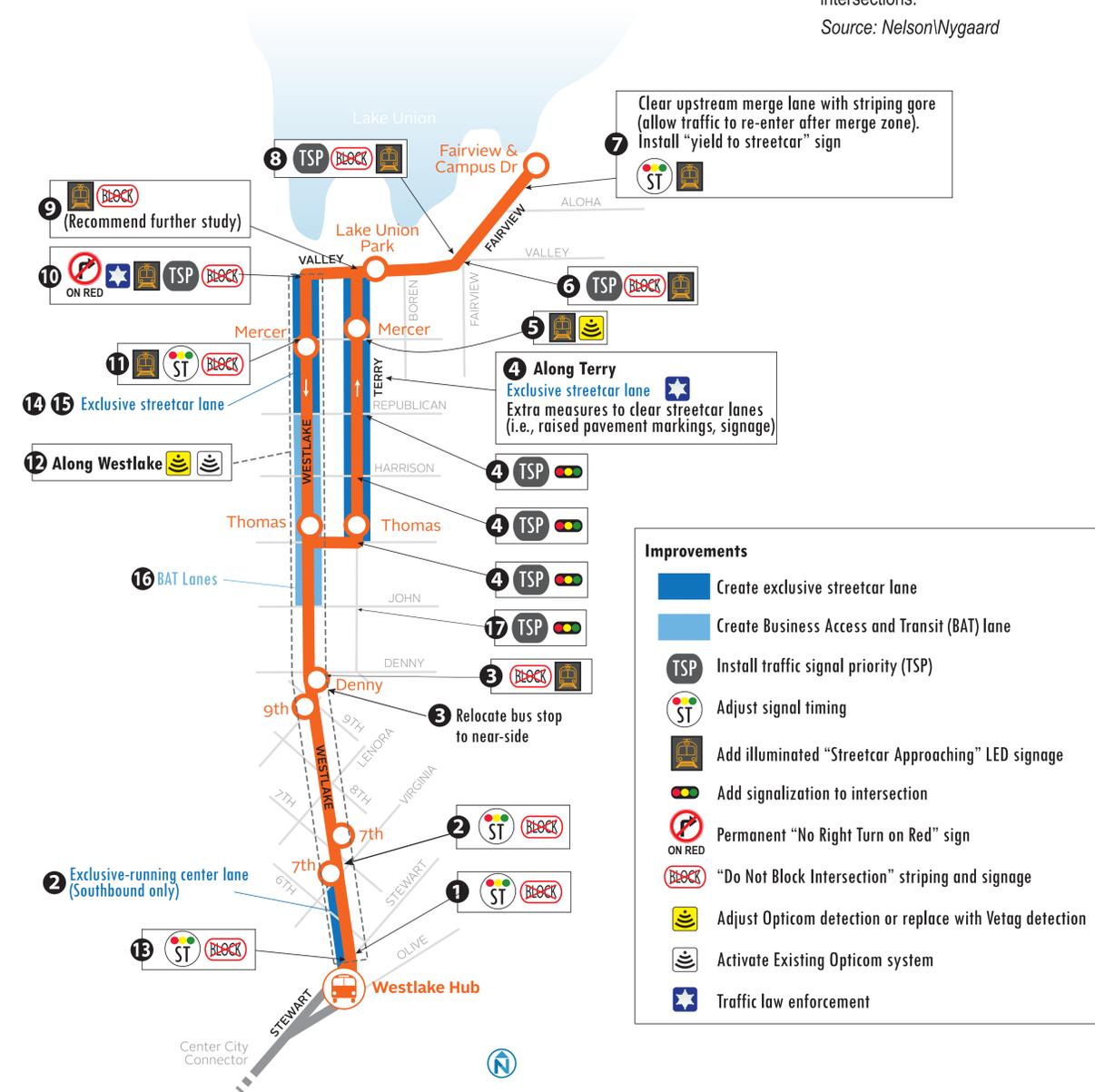
- Intersection treatments to prevent cross-street traffic from blocking intersections.
- Signal timing improvements and traffic signal priority for the streetcar.
- Exclusive or Business Access and Transit (BAT) lanes in key segments.



Signage and striping measures such as part-time illuminated "train approaching" LED indicators can alert drivers to approaching streetcars, helping prevent delays due to vehicles blocking intersections.

Source: Nelson\Nygaard

MAP NO.	LOCATION	REASON FOR DELAY TO STREETCARS
1	NB Westlake/Stewart	Traffic blocks intersection at Westlake Station.
2	NB Westlake/7th, Virginia	Traffic blocks intersections.
3	NB Westlake/Denny	Traffic blocks intersection.
4	NB Terry, Thomas to Mercer	Traffic congestion blocks travel lanes.
5	NB Terry, crossing Mercer	Potential signal detection failures
6	NB at Valley/Fairview	Traffic blocks intersection.
7	SB at Fairview Terminus	Traffic congestion prevents streetcar from entering lane.
8	SB at Valley/Fairview	Traffic blocks intersection.
9	SB Valley/Terry at parking lot access	Vehicles waiting in driveway block trackway crossing.
10	SB Valley/Westlake	Traffic blocks intersection. WB right turns wait on tracks.
11	SB Westlake/Mercer	Traffic congestion blocks travel lanes.
12	SB Westlake, Valley to Stewart	Loss of Opticom priority at intersections
13	SB Westlake/Stewart	Traffic blocks intersection at Westlake Station.
14	SB Westlake, Valley to Mercer	Shared travel lane could delay streetcar.
15	SB Westlake, Mercer to Republican	New Amazon parking lots could increase congestion.
16	SB Westlake, Republican to John	Traffic congestion blocks travel lanes.
17	SB Westlake/John	Traffic congestion blocks travel lanes.



HCT AND RAIL PROJECT TARGETS



SYSTEM PLAN	PROJECT PLANNING & DEVELOPMENT	PRELIMINARY ENGINEERING & ENVIRONMENTAL REVIEW	FINAL DESIGN	CONSTRUCTION
18 MONTHS ◎ Transit Master Plan (2012)	12-14 MONTHS ◎ Mode selection ◎ Street alignment selection ◎ Conceptual design ◎ Cost estimates	18-24 MONTHS ◎ 30% design ◎ Environmental clearance	12-18 MONTHS ◎ 100% design ◎ Bid documents ◎ Permitting	2+ YEARS ◎ Exact length depends on project complexity.
First Hill Streetcar	2009–2010	2010	2011	2012–2014
Broadway Extension		2013–2014	2014–2015	2015–2016
Center City Connector	2013–2014	2014	2015	2016–2018
Ballard to Downtown	2013–2014			
Madison BRT	2013–2014	2014	2016	2017–2018
U-District to South Lake Union	2013–2014	2015	2016	2017–2018

