

## PCC Sylvania Connection Options for Scoping

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October 13, 2016

### Overview

The Southwest Corridor Light Rail Project is a proposed 12-mile Metropolitan Area Express (MAX) light rail line connecting Southwest Portland, Tigard and Tualatin. After several years of early planning and refinement, project partners have compiled a package of investments proposed for federal environmental review, known as the “proposed range of alternatives.” The proposed range of alternatives includes options for the light rail line itself, as well as complementary investments such as sidewalks or bikeways that would improve access to the line. Public and agency input on the proposed range of alternatives will be solicited during the “scoping” period in September 2016. To learn more or share your comments, visit the project website at [www.swcorridorplan.org](http://www.swcorridorplan.org).

The purpose of this document is to provide additional information on the concepts under development for improving transit access to the Portland Community College (PCC) Sylvania campus. Project partners – notably TriMet, the City of Portland and Metro – worked with PCC staff to identify the most promising options for linking the proposed light rail line to the Sylvania campus. This document is an update of the original version published on September 1, 2016.

### Background

Several previous reports document the development of connection options:

- *Key Issues: PCC Sylvania (updated)*, May 5, 2015 – introduces bus rapid transit and light rail options serving PCC Sylvania, including a light rail cut-and-cover tunnel, and the enhanced bicycle and pedestrian connection along SW 53rd Ave.
- *PCC Sylvania Light Rail Connection Options Technical Memo*, August 14, 2015 – describes additional tunnel designs, including bored tunnels, and introduces alternative mechanized connection options along 53rd Ave.
- *PCC Sylvania Enhanced Connection Options Technical Memo*, December 31, 2015 – introduces various options for improved local bus connections to campus to supplement light rail on Barbur; compares alternative connections to tunneled light rail.
- *Technical evaluation: Direct and Indirect Connection options to PCC Sylvania Campus*, March 11, 2016 – provides an evaluation of campus connections based on criteria including projected ridership, costs, and impacts.

- *PCC Sylvania Connection Options for Scoping, September 1, 2016* – is the original version of this document, before updates resulting from information obtained during the scoping period.

### **Next steps**

Public input on the PCC Sylvania connection options will be reviewed by project partner staff, and will inform staff's recommendation on which options to study further in the Draft EIS.

### **PCC Sylvania connection options**

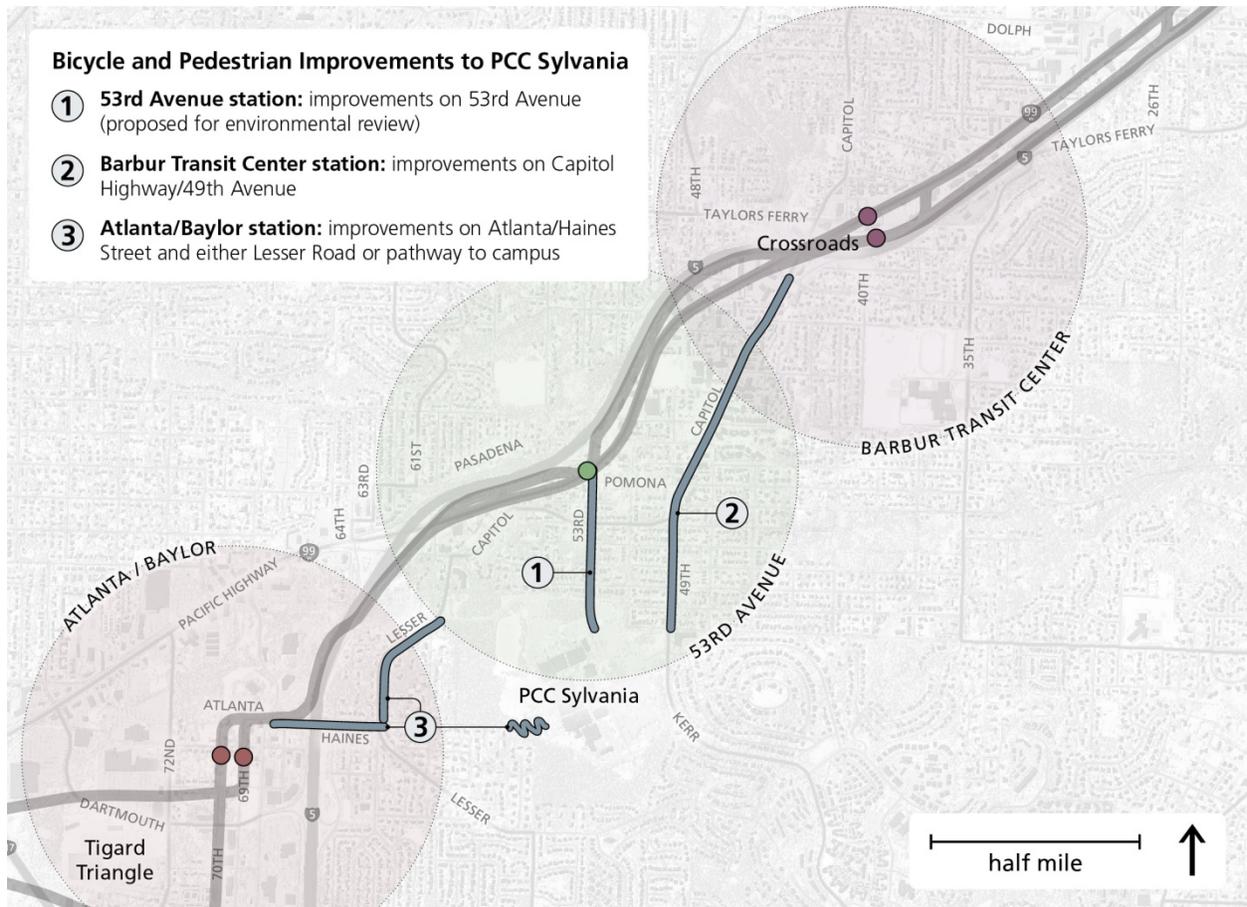
There are three general approaches to improving transit access to PCC Sylvania under consideration, with multiple options for each:

- **Bicycle and pedestrian improvements** to connect the campus to the three nearest proposed light rail stations.
- **53rd Avenue mechanized connection** to provide a faster and more accessible link to the nearest proposed light rail station at Barbur Boulevard and 53rd Avenue
- **Enhanced bus service**, including new or revised bus routes with potential capital investments to provide improved travel times and reliability

Because students, faculty, and staff access the Sylvania campus from all directions at various times of day, a combination of multiple approaches and options may be necessary.

## Bicycle and pedestrian improvements

Several projects are under consideration to improve walking and biking access between the PCC Sylvania campus and the three nearest proposed light rail stations: 53rd Avenue, Barbur Transit Center and Atlanta/Baylor in the northern Tigard Triangle (see map below). Because the 53rd Avenue station would provide the shortest route to the campus, walking and biking improvements on 53rd Avenue have already been recommended for study in the Draft EIS and are anticipated to be part of the light rail project regardless of decisions on other connection options.



### **Barbur Transit Center station**

The Draft EIS could potentially include improvements on SW Capitol Highway and SW 49th Avenue to improve walking and biking access to the PCC Sylvania campus from the Barbur Transit Center and other points north of campus. For more information, see the “Outer Capitol Highway pedestrian improvements” project in the *Analysis of Additional Roadway, Bicycle and Pedestrian Projects*.

### **Atlanta/Baylor station**

The Draft EIS could potentially include projects to improve access to the PCC Sylvania campus from the Tigard Triangle, providing sidewalks and bike facilities to connect the campus to the Atlanta/Baylor station in the Tigard Triangle via the SW Haines Street overcrossing of I-5. For more information, see the “Walk/bike connection between PCC Sylvania and the Tigard Triangle” project in the *Analysis of Additional Roadway, Bicycle and Pedestrian Projects*.

### **Mechanized connections to light rail stations**

The half mile distance from a light rail station at Barbur Boulevard and SW 53rd Avenue to the Sylvania campus roughly equates to a 10 to 15 minute walk, depending on an individual's ability. In addition to the pedestrian and bicycle street improvements discussed above, project staff considered mechanized connections to reduce the time and effort needed to travel between the campus and station area. In the March 2016 *Direct and Indirect Connection Options to PCC Sylvania* memo, the aerial tram concept served as an example of a mechanized connection option on 53rd Avenue. Since then, several mechanized connection options have been developed further for consideration during scoping.

Appendix A includes a map of the shuttle option. Appendix B includes maps, cross-sections and elevation drawings showing each of the 53rd Avenue mechanized connection options. Appendix C includes a matrix comparing all of the PCC Sylvania connection options.

#### ***Electric bike share***

The electric bike share option would supplement the 53rd Avenue walking and biking improvements with easy access to electric bikes for people not taking their own bikes on board the light rail vehicles. Multiple bike share stations on campus would allow students, faculty and staff to pick up and drop off bikes close to their destinations.

#### ***Park shuttle: small shuttles in mixed traffic on 53rd Avenue***

The park shuttle option would include small autonomous shuttles operating on 53rd Avenue. Approximately ten shuttles would be necessary, each with an estimated capacity of ten people. Stations and storage areas would be located at the light rail station at Barbur and 53rd Avenue and on campus. At the 53rd Avenue station, the shuttles could either cross Barbur Boulevard at grade or on the proposed pedestrian/bicycle bridge over Barbur (with additional cost to widen the structure). At the south end of 53rd Avenue, a gated ramp would allow the shuttles to access the campus without providing access for other vehicles.

#### ***Personal rapid transit: small shuttles on an elevated guideway along 53rd Avenue***

The personal rapid transit option is similar to the park shuttle, except that the vehicles would operate on an elevated guideway above 53rd Avenue instead of in mixed traffic on the street. The guideway could be aligned either in the center of 53rd or along the east side of the street. The guideway itself would be about 12 feet wide and at least 25 feet above the ground level of 53rd Avenue, with support columns located approximately every 50 feet.

#### ***Aerial tram along 53rd Avenue***

The aerial tram option is similar to the existing aerial tram connecting the two Oregon Health Science University's campuses on the South Waterfront and Marquam Hill. Current assumptions include two large tram cars with an estimated capacity of 80 people each, elevated stations at Barbur and 53rd Avenue and on campus, and one or two cable towers between the stations. The trams would travel 65 to 165 feet above the ground level of 53rd Avenue.

**Skyway: gondola lift along 53rd Avenue**

The skyway option, which would construct a gondola lift over 53rd Avenue, would include more cars, more cable tower supports and a lower profile than the aerial tram. Current assumptions include several enclosed gondola cars with an estimated capacity of 15-20 people each, elevated stations at Barbur and 53rd Avenue and on campus, and six cable tower supports. The gondola cars would travel between 25 and 40 feet above the ground level of 53rd Avenue. For the skyway option, the station on campus could be at grade instead of elevated, but this would result in more parking loss and a less desirable connection to the existing ADA-accessible routes on campus.

**Enhanced bus service**

Because people access the PCC Sylvania campus from many directions, project partners considered transit enhancements that could improve access to campus from north, south, east and west. Bus route changes, new routes or a shuttle service could be supplemented with capital investments to improve travel times and reliability. Appendix A includes maps showing several of the enhanced bus service options.



**Line 44 frequent service and extension to Tualatin**

TriMet’s Southwest Service Enhancement Plan includes a recommendation to improve bus service to PCC Sylvania by upgrading the Line 44 to frequent service (15 minute service or better) and extending the route to Tualatin via Lake Grove.

**Light rail to campus shuttle (refer to map in Appendix A)**

This option would include shuttle buses running between PCC Sylvania and the light rail stations at Barbur Transit Center and in the Tigard Triangle. Unlike the bus hub option, the shuttle would only need to run when the campus is in session and could be timed with light rail train arrivals in order to minimize waiting time.

**Bus hub (refer to map in Appendix A)**

The bus hub option explores a combination of extending existing local bus lines through the campus with a shared transitway segment and new crossings over I-5 and OR-217, in order to improve connections to PCC Sylvania from communities to the north, east, west and south.

**Note:** *This scenario provides an example of a combination of bus routes that could contribute to a PCC Sylvania bus hub connection. There are several existing bus lines in the Southwest Corridor. Changes to the route or level of service of these lines as part of the light rail project would require extensive community outreach and input.*

To facilitate the proposed bus connection improvements, the following new structures and transitway segments are under consideration:

- **A busway through campus.** The busway would connect SW 49th Avenue to Lesser Road and provide a designated path through campus for buses, with a central station located within campus to support current PCC Sylvania activities as well as future expansion plans.
- **A new bridge over I-5.** This bus-only bridge would connect the busway at Lesser Road to a new section of shared transitway, directly to the west of the campus on the west side of I-5. The bridge would be required to address steep grades west of Lesser Road and to provide an overpass over I-5.
- **A new segment of shared transitway.** This shared transitway segment would be located on a structure proposed as part of the Barbur or adjacent to I-5 light rail alignments. The shared transitway would run from the bridge connection point to SW 70th Avenue and Atlanta Street in the Tigard Triangle. Buses would exit the shared transitway at SW 70th Ave to continue south through the Tigard Triangle in mixed traffic.
- **A new bridge over Highway 217.** Certain light rail alignments could include a new crossing over Highway 217 from Beveland Street to Hunziker Street, northwest of the existing SW 72nd Avenue crossing. This bridge is not included as part of the bus hub option, but it is mentioned here to note that if this feature was constructed as part of downtown Tigard HCT project, buses could use this crossing to decrease the distance traveled between the Tigard Transit Center and the Tigard Triangle and allow buses to avoid existing congestion at the SW 72nd Avenue crossing.

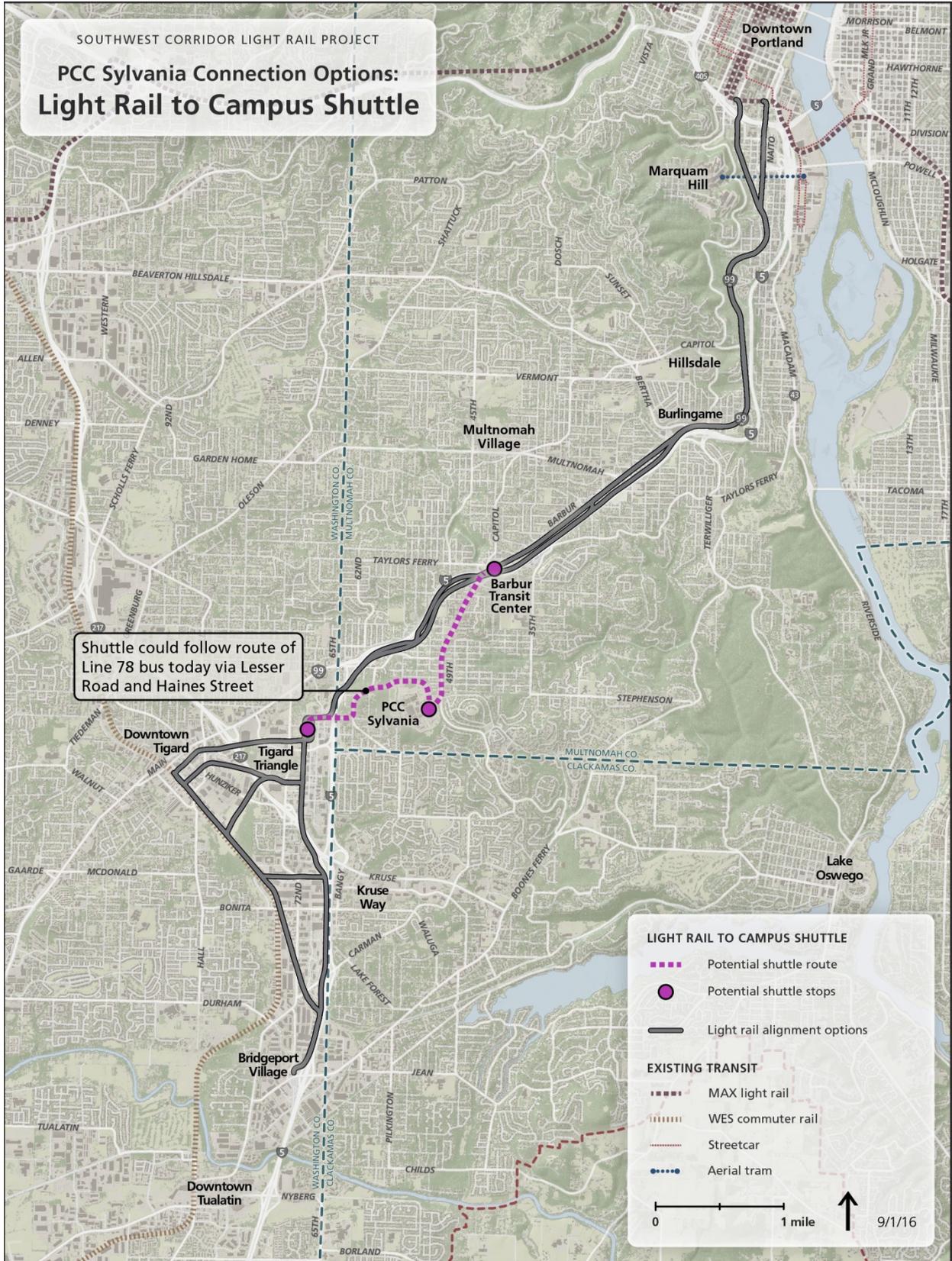
The addition of these features would improve travel times for buses by providing a dedicated travel lane that would be a more direct route than is currently allowed on existing streets.

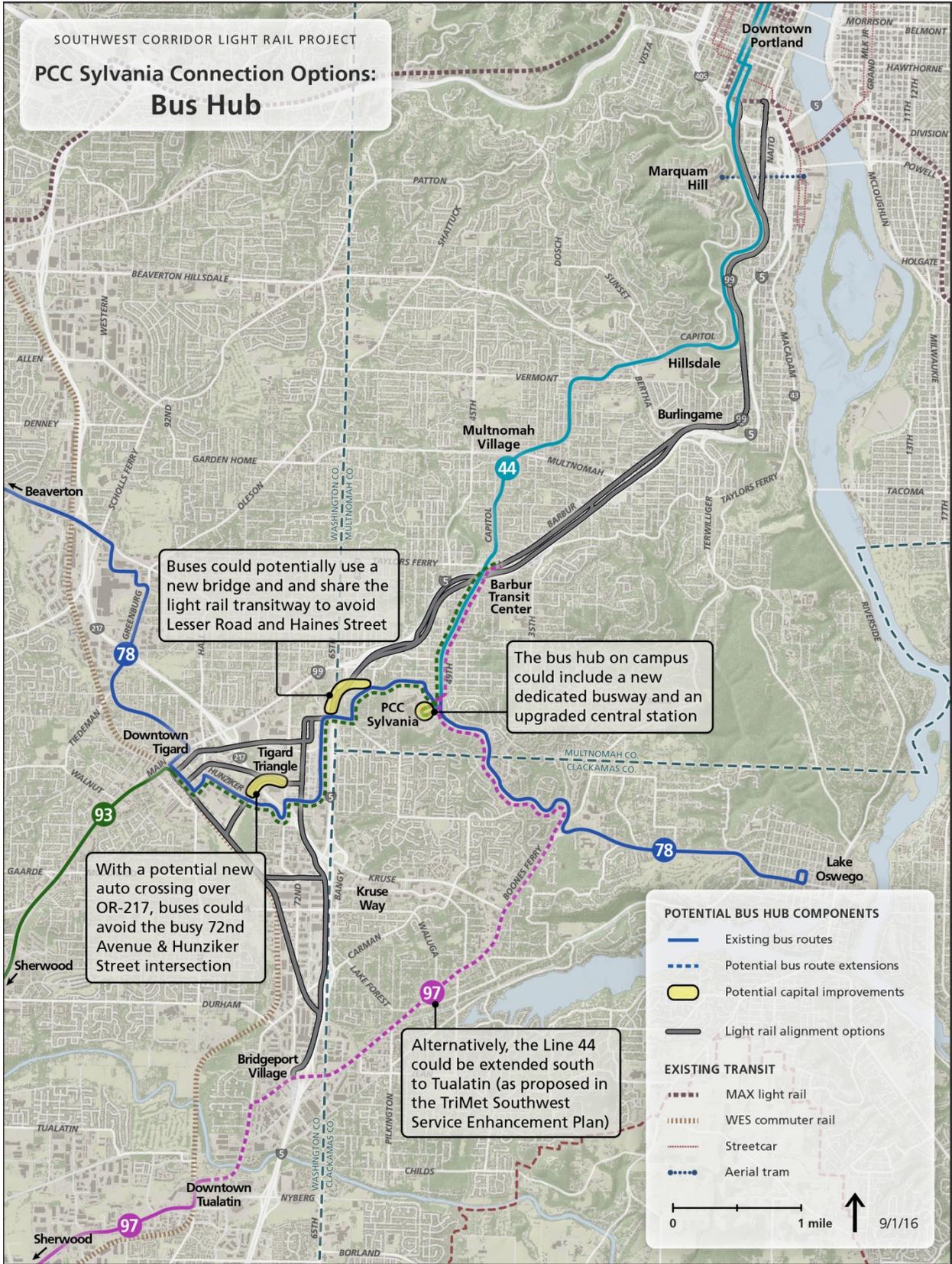
***Barbur shared transitway for TriMet bus or PCC shuttle (refer to map in Appendix A)***

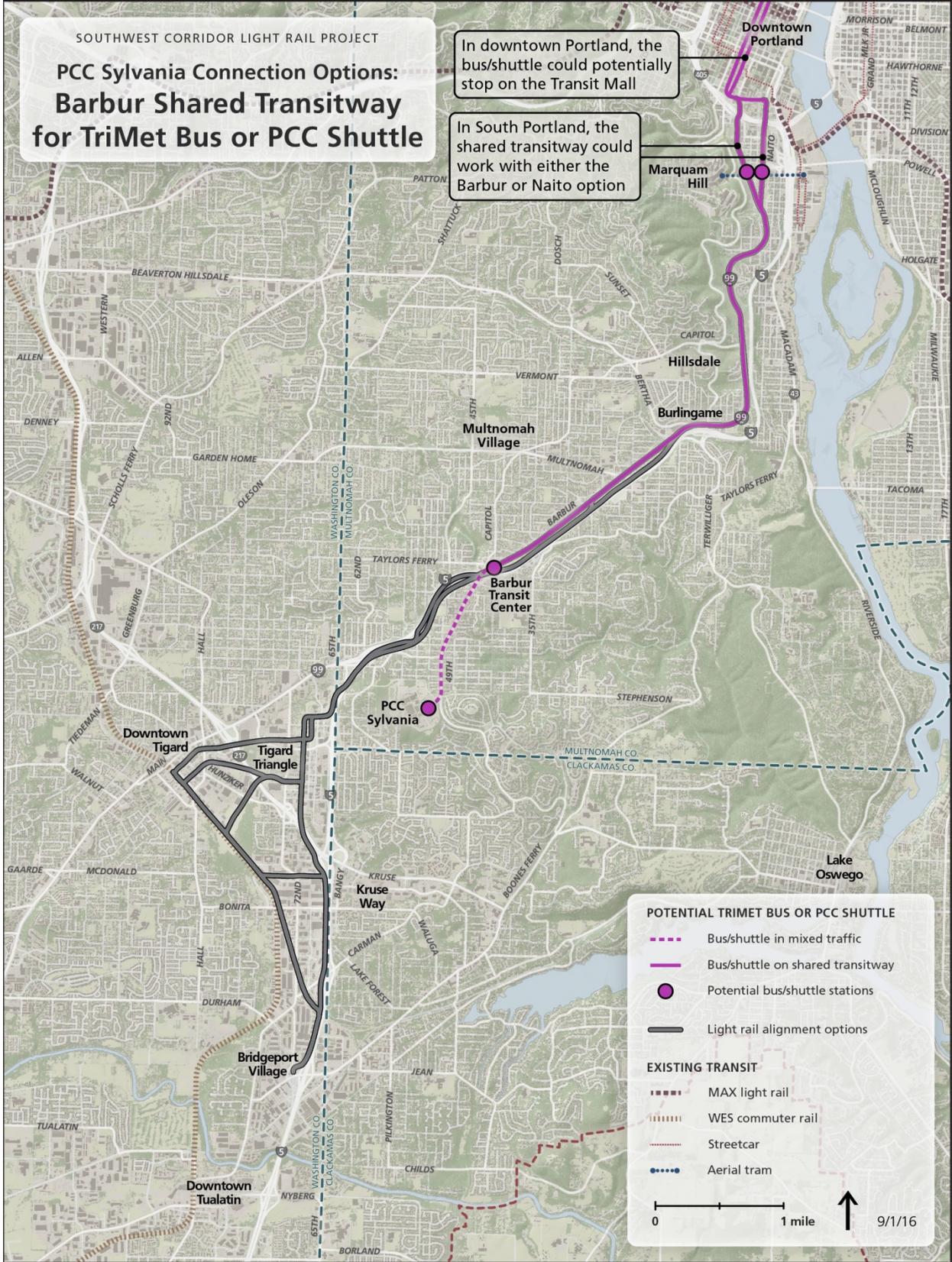
This option would improve access to PCC Sylvania from the north and east through a new bus line to the campus via Barbur Boulevard. The buses would operate in a shared transitway with light rail north of the Barbur Transit Center to downtown Portland. The shared transitway configuration would function similar to transit operations on the Tilikum Crossing, with bus and light rail vehicles sharing the same transitway. The intent is to allow the PCC bus connection to avoid traffic congestion in the Barbur corridor, resulting in greater reliability and shorter travel times.

Current assumptions include buses running at the same frequency as the existing PCC shuttle between Portland State University and the Sylvania campus, with additional stops at the Barbur Transit Center and in South Portland (to serve Marquam Hill).

# Appendix A: Enhanced bus service options graphics







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# Appendix B: 53rd Avenue mechanized connection options graphics

All graphics prepared by Mayer/Reed

## Electric Bike Share



1 Electric Bike Share Concept Plan - North



2 Electric Bike Share Concept Plan - South

- 1 Bike Share Station (25 docks)\*
- 2 Pedestrian Stair and Ramp
- 3 Top of Ramp El. +619
- 4 Ramp Bottom El. +612
- 5 Campus Plan, See Next Page
- 6 Bike Share Station (20 docks)\*
- 7 Option 2: move east side station to west side, remove parking stalls

- Path of Travel
  - Bike Share Station
  - X Tree Impact
- \* Assumes system size = 50 bikes



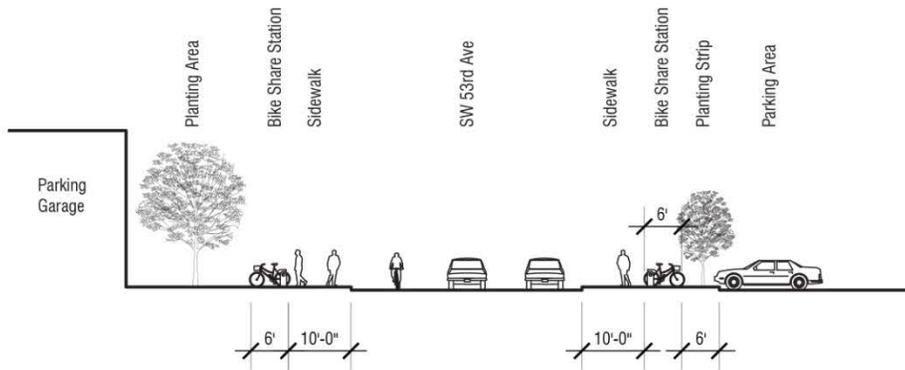
# Electric Bike Share



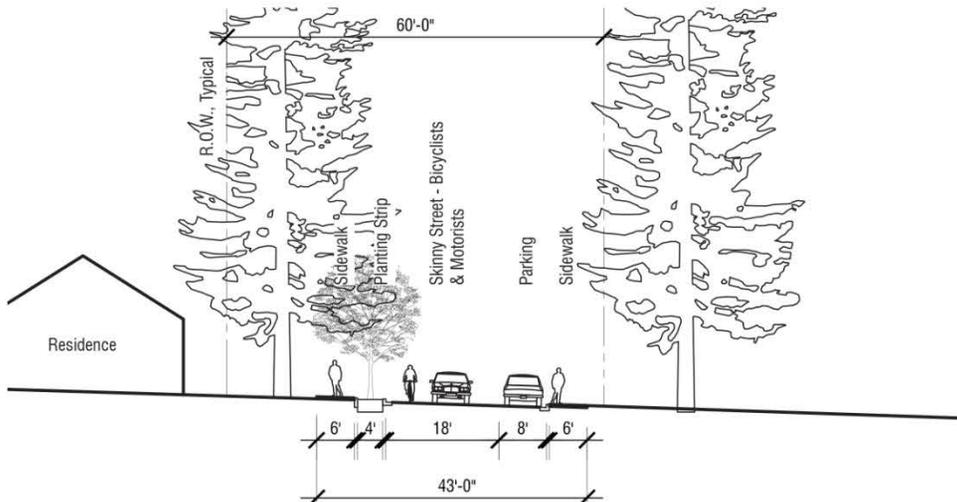
① Electric Bike Share Concept Plan - Campus



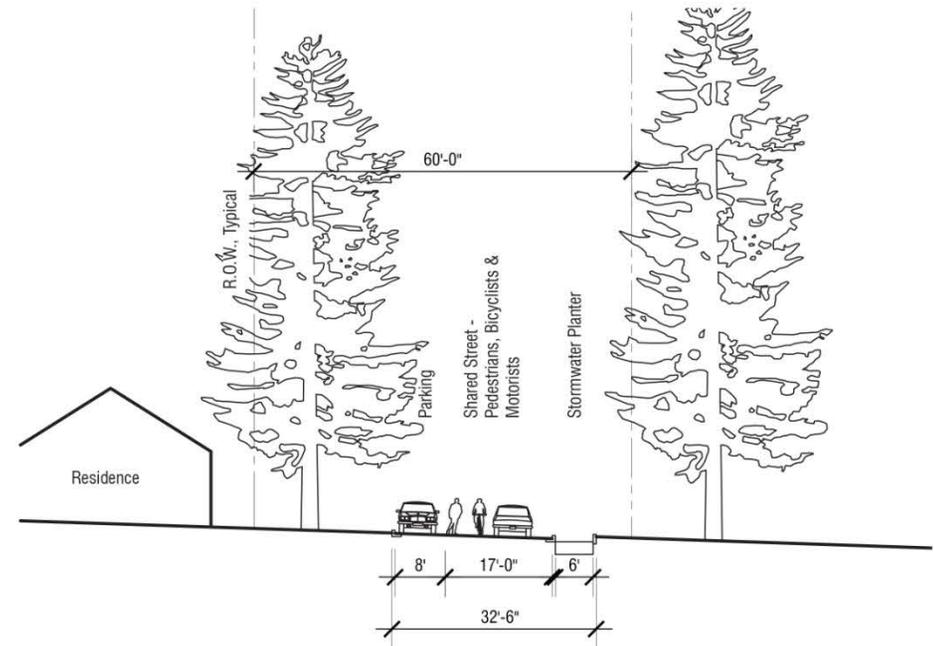
# Electric Bike Share



1 Section - Electric Bike Share at MAX Stop



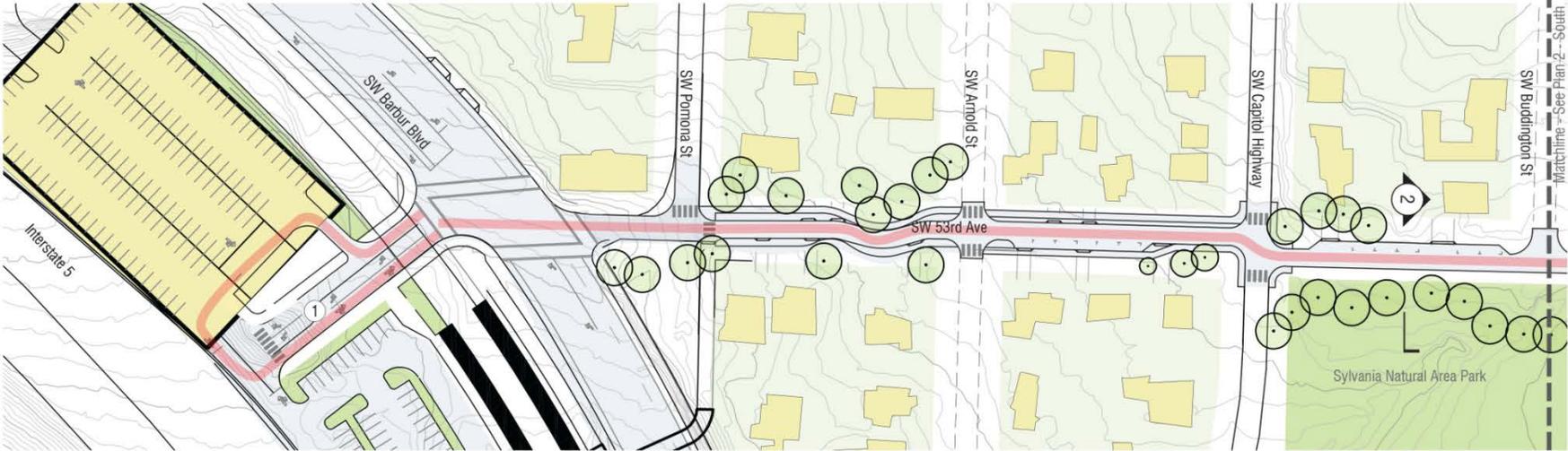
2 Section - Electric Bike Share Skinny Street With Sidewalks



3 Section - Electric Bike Share Shared Street Section



# Park Shuttle



- ① Shuttle Drop-Off Options, See Detail Next Page
- ② Gate Controlled Access Transit Only One Lane Ramp, 11.5% Slope
- ③ Pedestrian Stair and Ramp
- ④ Shuttle Drop - Off
- ⑤ Create more space for adjacent property owner driveways

— Path of Travel  
 X Tree Impact

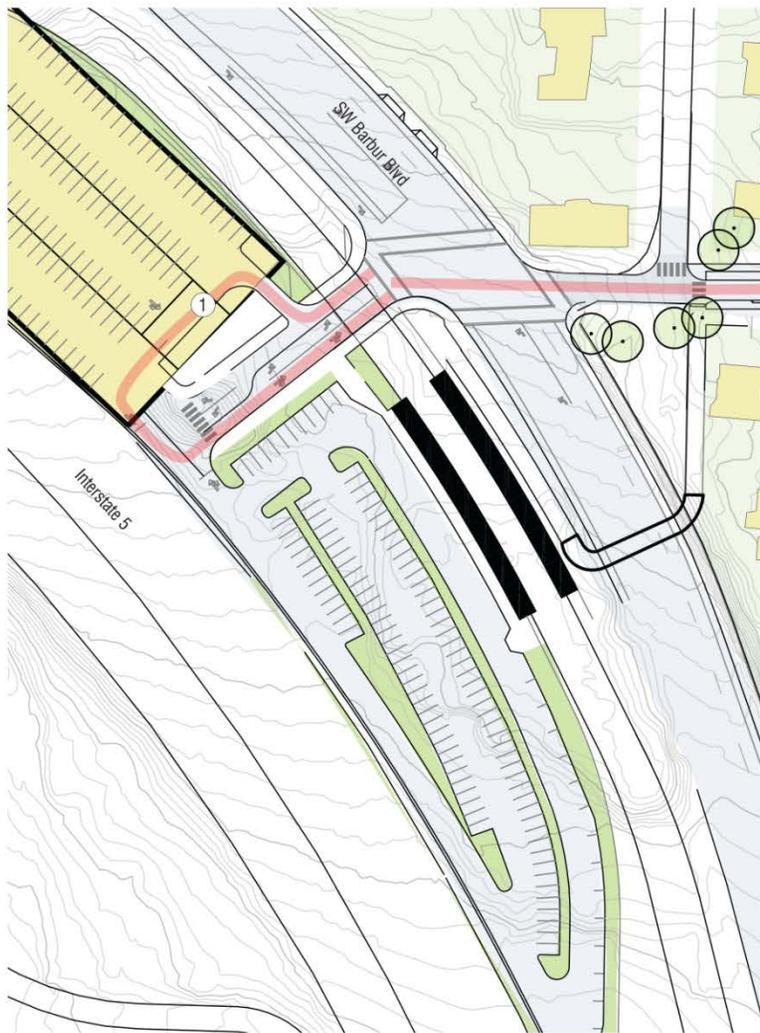
1 Park Shuttle Plan - North



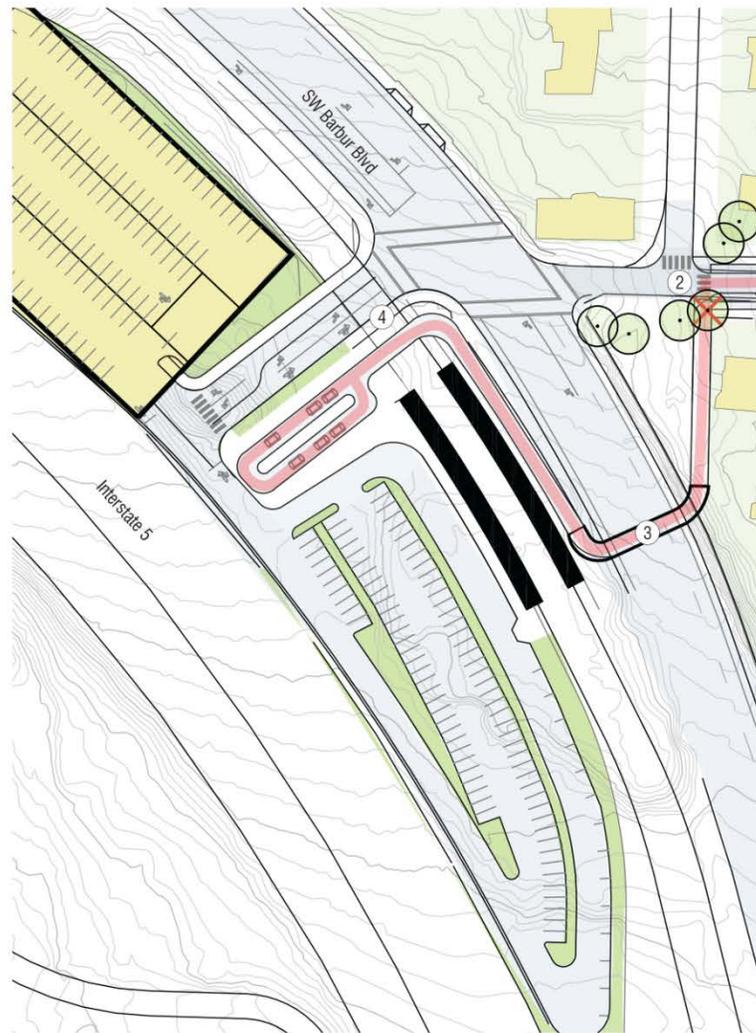
2 Park Shuttle Plan - South



# Park Shuttle



1 Park Shuttle Drop-Off Option 1

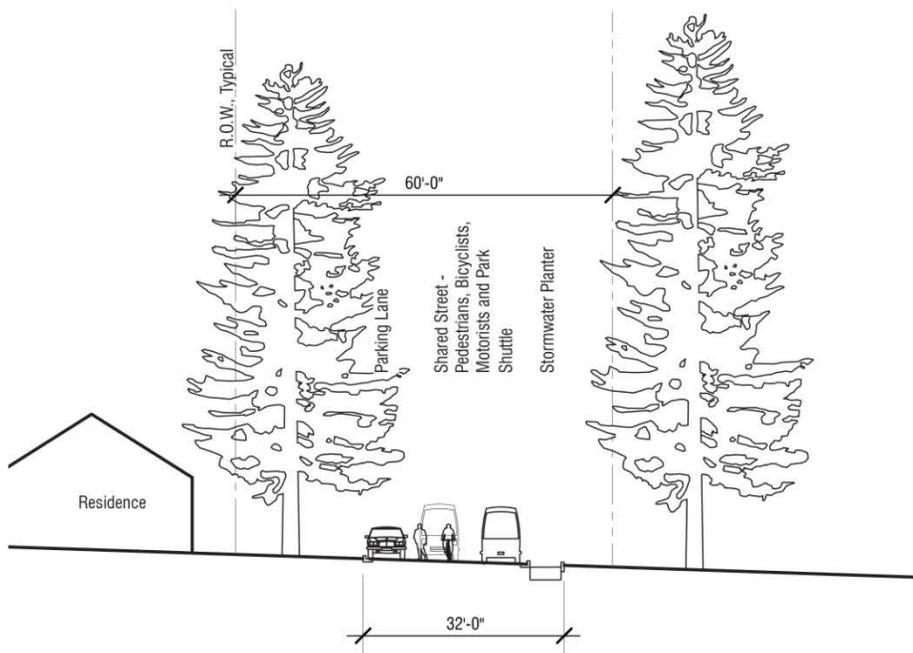


2 Park Shuttle Drop-Off Option 2

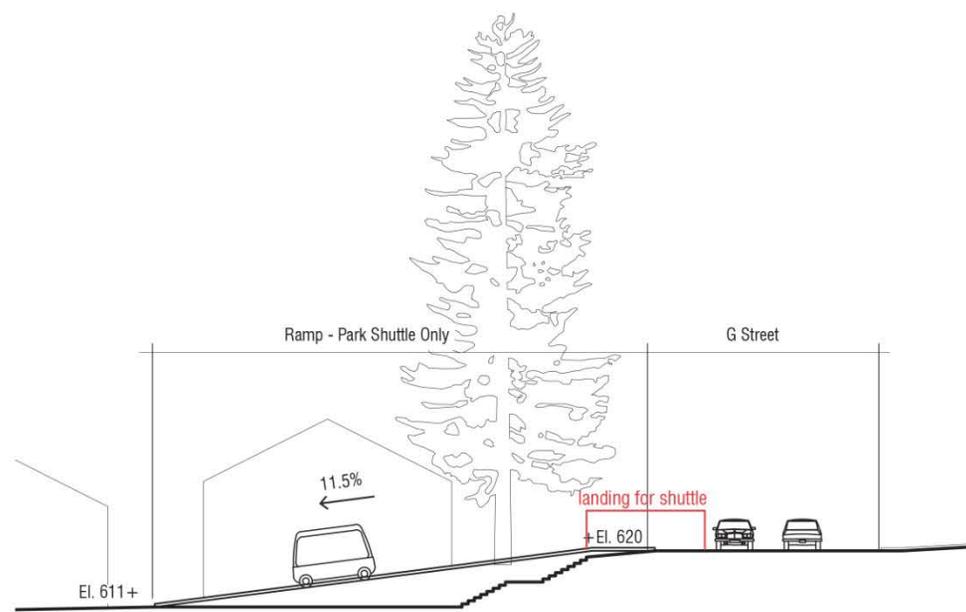
- 1 Shuttle pick-up and drop-off in garage
- 2 Improve pedestrian circulation at bridge approach
- 3 Widen overpass for shuttle, bike and pedestrian use
- 4 More space needed to accommodate clearances for shuttle access; station platforms may need to shift west



# Park Shuttle



2 Section - Park Shuttle Typical Street Section



3 Section - Park Shuttle at PCC



# Personal Rapid Transit



1 Personal Rapid Transit Plan - North

- 1 PRT Station
- 2 Stair / Elevator, Typical
- 3 Elevated Guideway, 18' Clear, Typical
- 4 Guideway Support Column, 50' O.C., Typ
- 5 Pedestrian Stairs and Ramp
- 6 Consider aligning guideway on east side of roadway (avoids utility poles on west side)
- 7 Consider station in parking garage for vehicle servicing

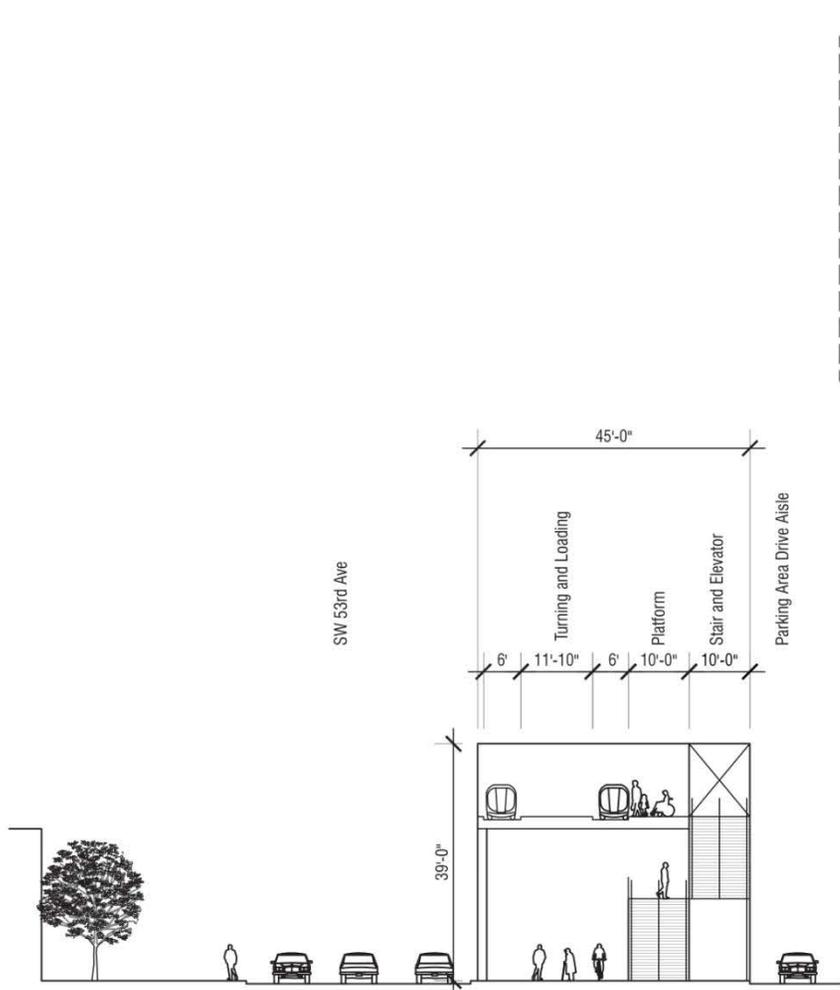
✗ Tree Impact



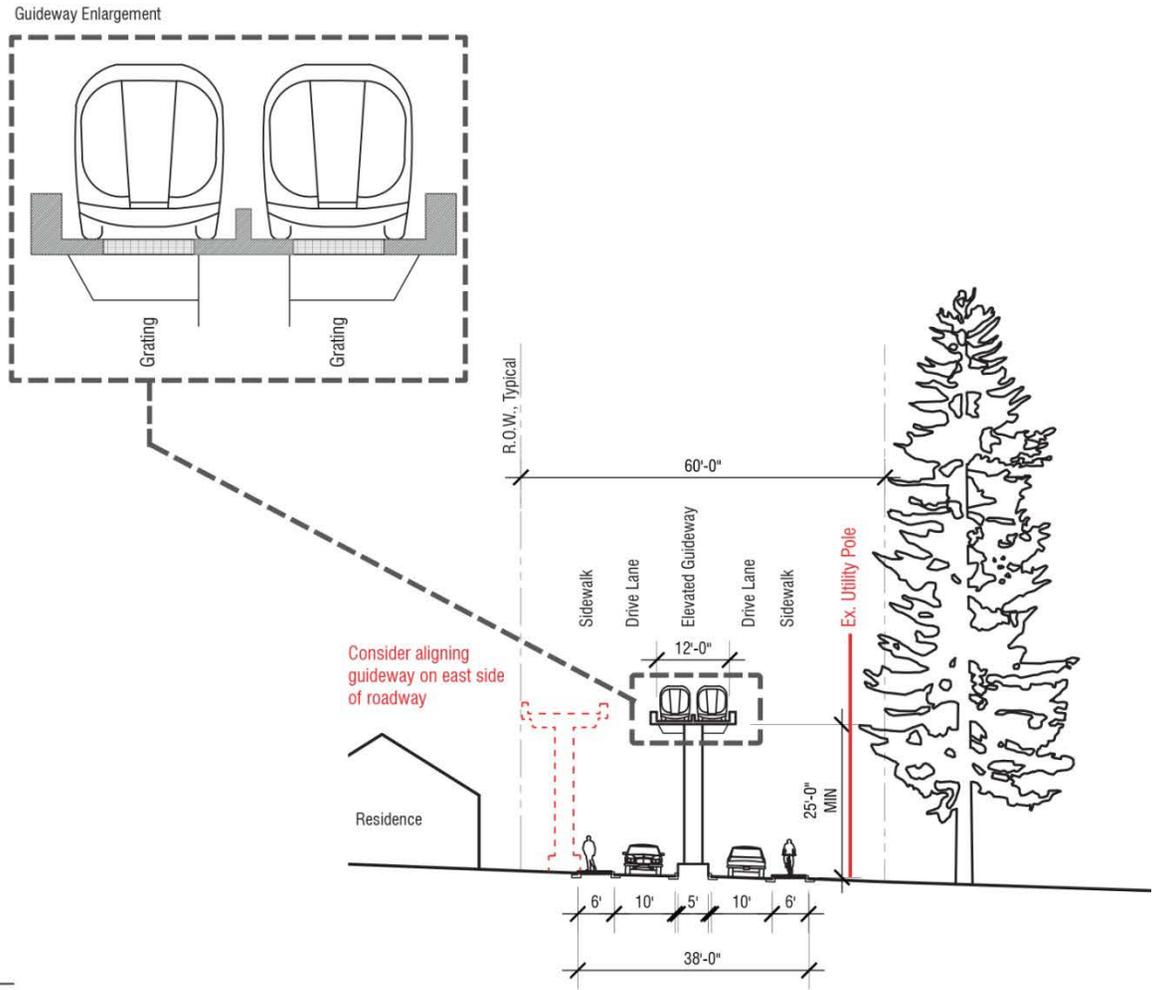
2 Personal Rapid Transit Plan - South



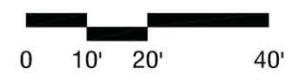
# Personal Rapid Transit



1 Section - PRT at MAX Stop



2 Section - PRT Typical Street Section



# Aerial Tram

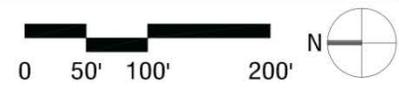


1 Aerial Tram Plan - North

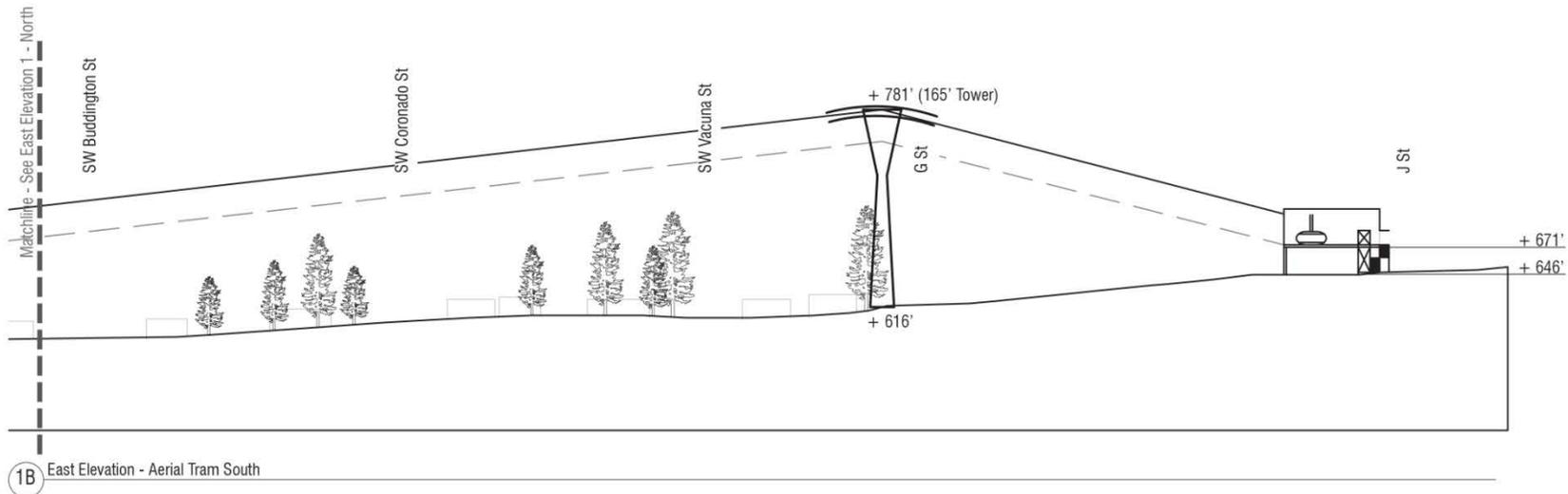
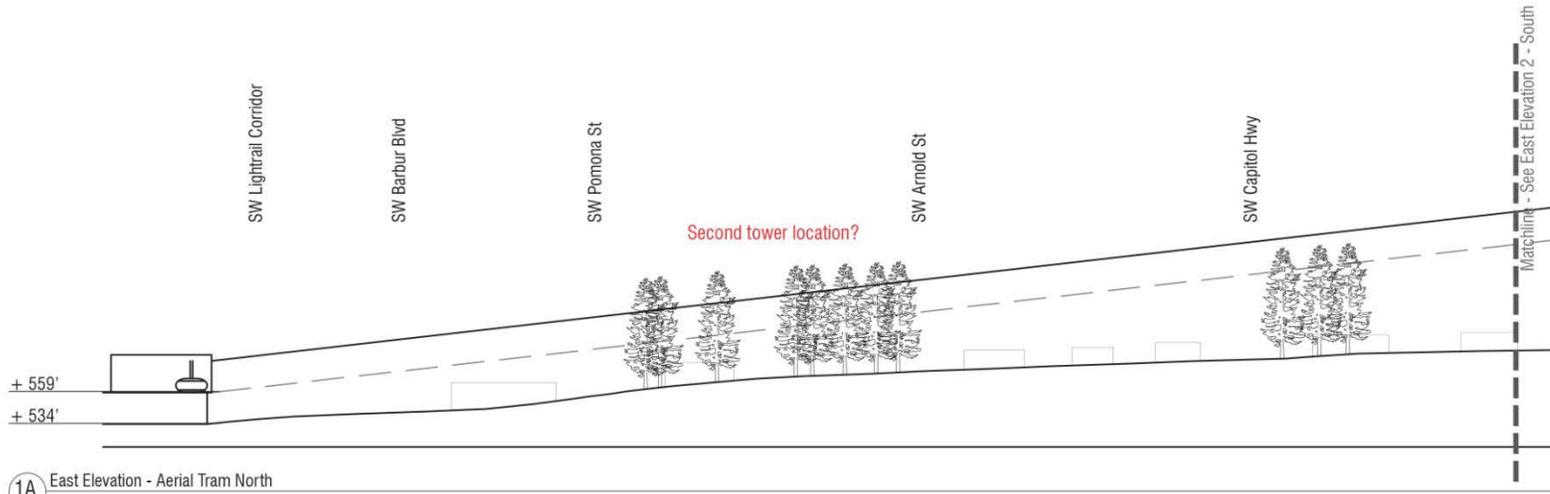
- ① Aerial Tram Station
  - ② Stair / Elevator
  - ③ Elevated Walkway
  - ④ Aerial Tram Car, Typical
  - ⑤ Cables, Typical
  - ⑥ Cable Tower
  - ⑦ Consider second tower location to mitigate tree impacts
- ✗ Tree Impact



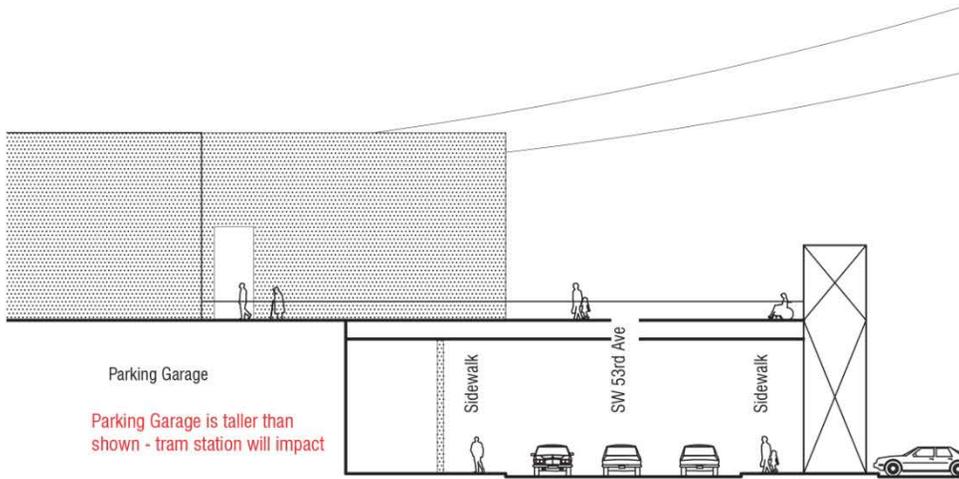
2 Aerial Tram Plan - South



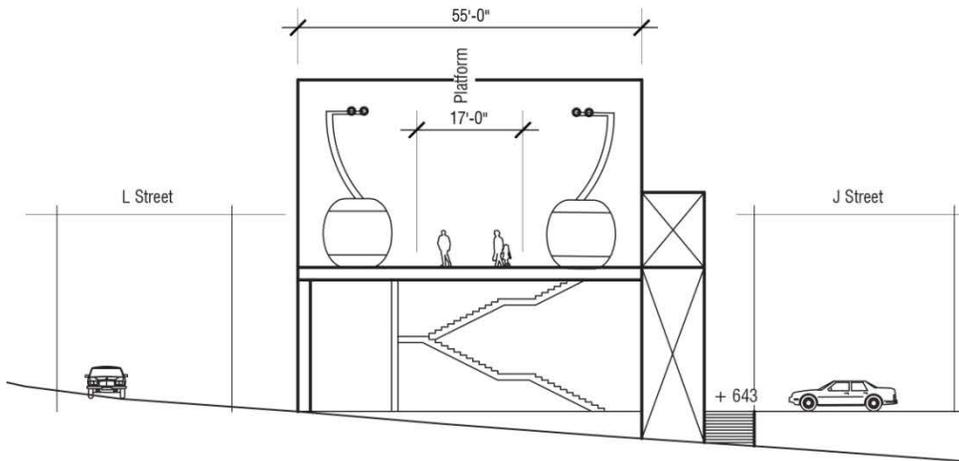
# Aerial Tram



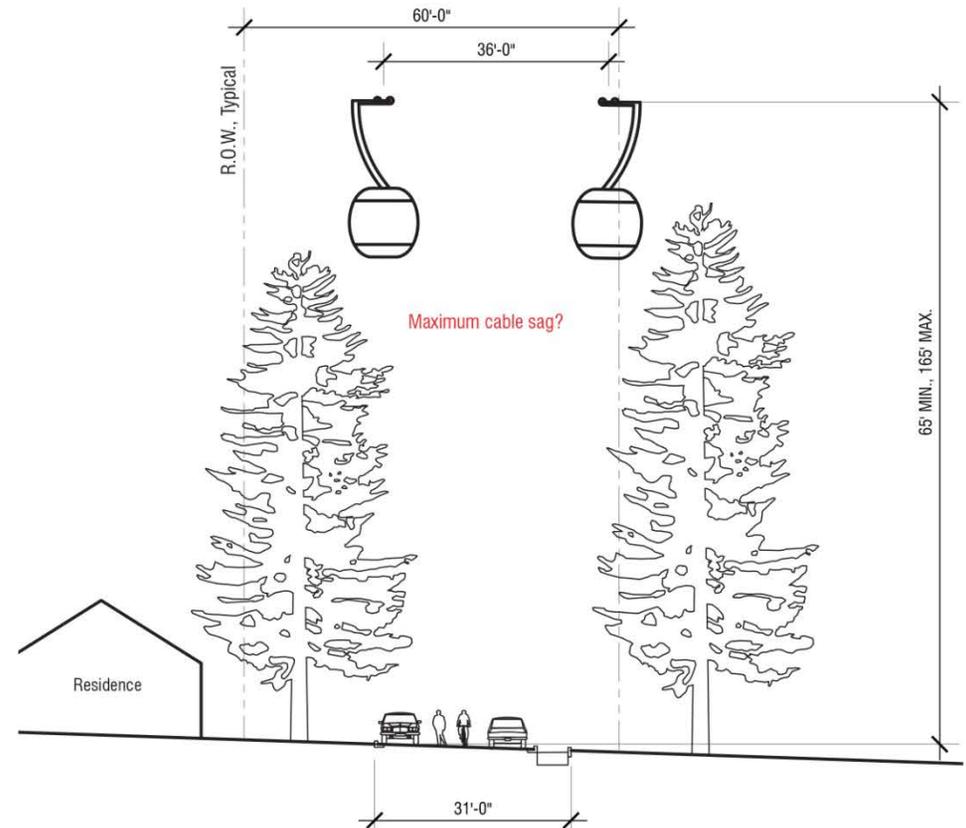
# Aerial Tram



2 Elevation - Aerial Tram Station at MAX Stop



3 Elevation - Aerial Tram Station at PCC



4 Section - Aerial Tram Typical Street Section

# Skyway



1 Skyway Plan - North

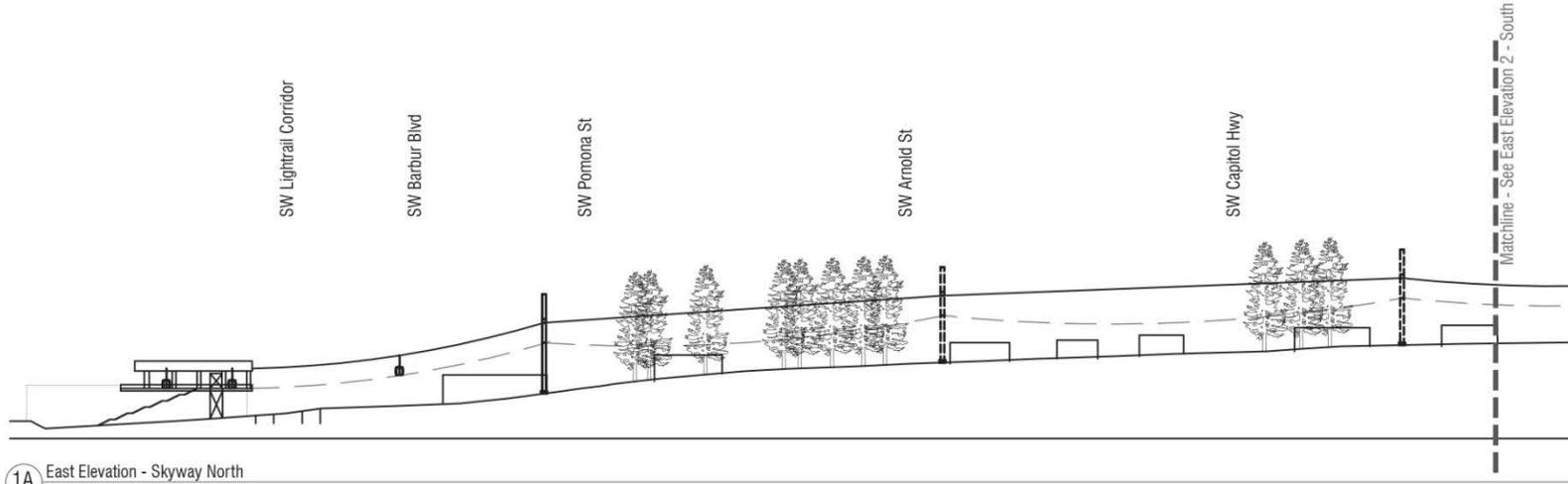
- 1 Skyway Station
- 2 Stair / Elevator, Typical
- 3 Skyway Car, Typical
- 4 Cable Tower, Typ. (370' O.C. Max.)
- 5 Cables, Typical
- 6 Pedestrian Stairs and Ramp
- 7 Station Location Option 2
- X Tree Impact



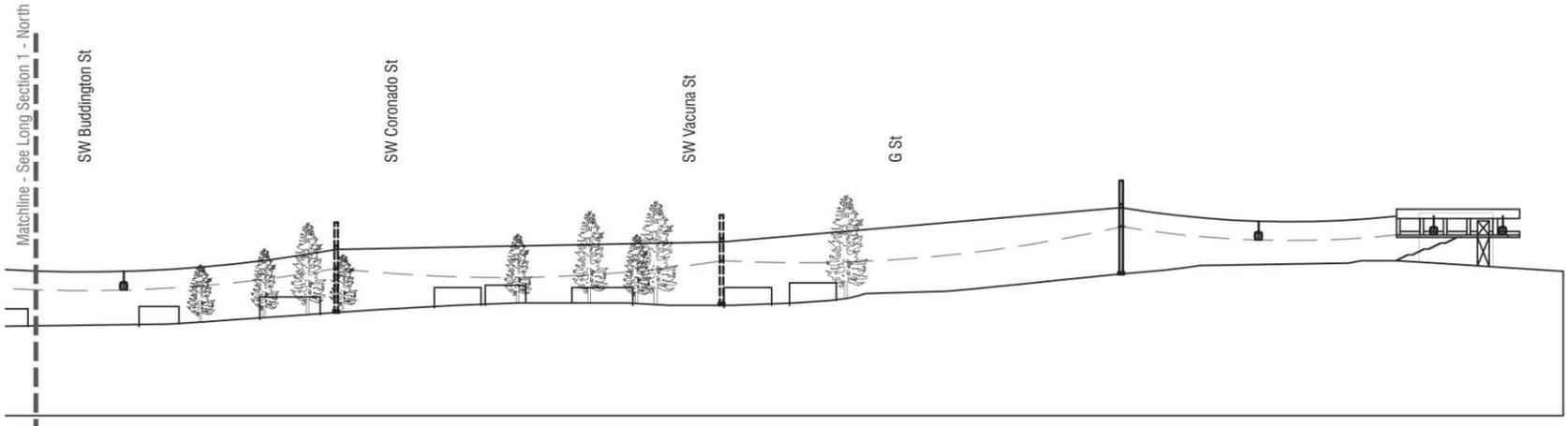
2 Skyway Plan - South



# Skyway



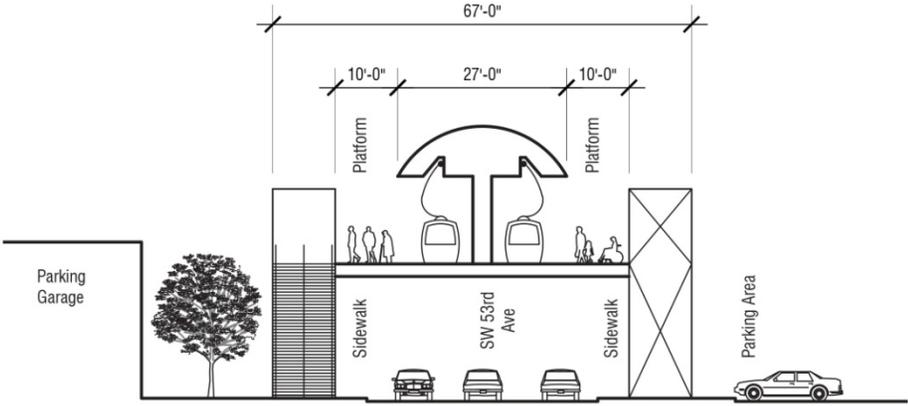
1A East Elevation - Skyway North



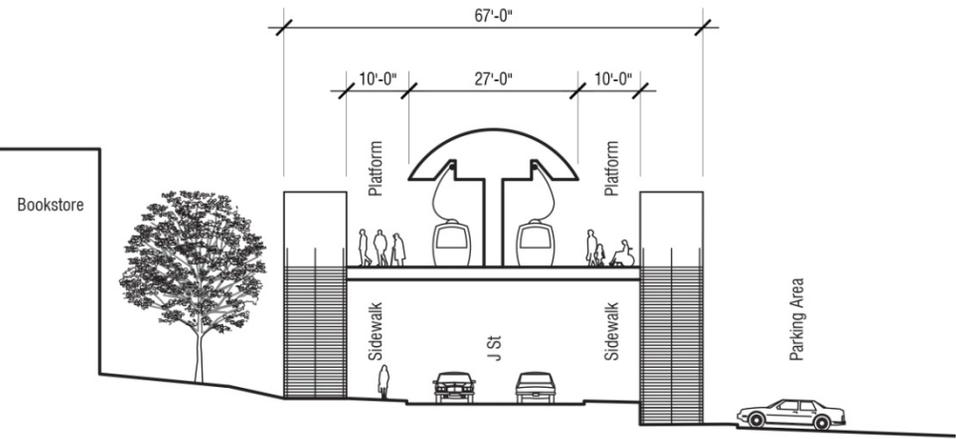
2A East Elevation - Skyway South



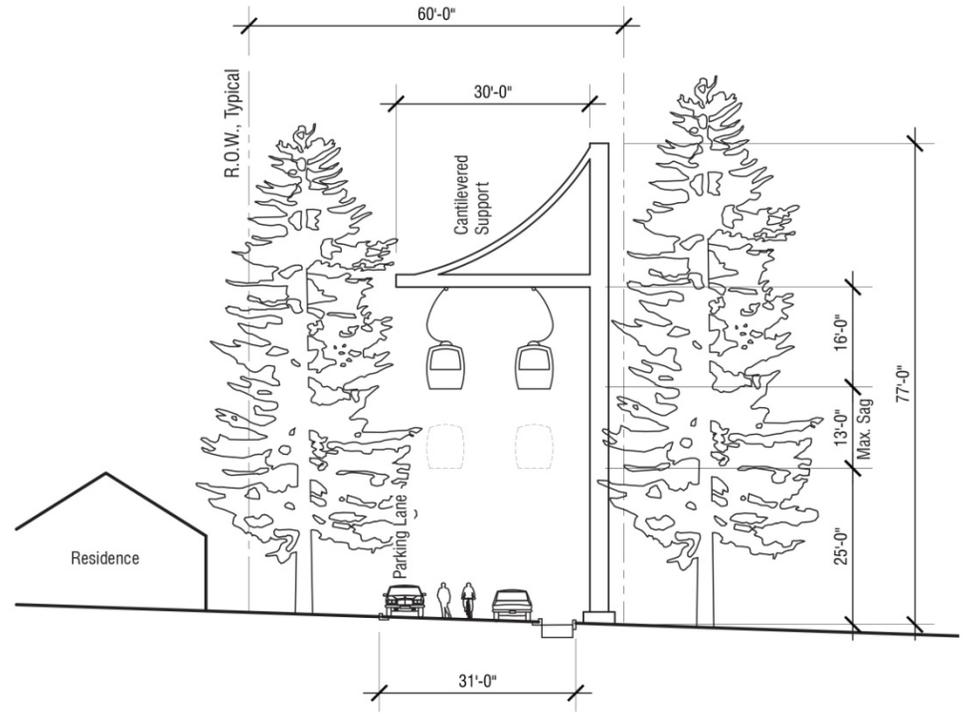
# Skyway



2 Section - Skyway Station at MAX Stop



3 Section - Skyway Station at PCC



4 Section - Skyway Typical Street Section



		BUS IMPROVEMENT OPTIONS			LIGHT RAIL STATION CONNECTION OPTIONS			
		Line 44 improvements: frequent service + extension	bus hub: routing changes plus other improvement options	shared transitway: shuttle bus to Transit Mall	Barbur TC and Tigard Triangle: Capitol/Lesser shuttle bus	53rd Ave: electric bike share	53rd Ave mixed traffic option: park shuttle	53rd Ave elevated options: personal rapid transit (PRT), tram and gondola
CONVENIENCE & RIDERSHIP	travel time savings to PCC Sylvania	<i>compared to base transit network with light rail</i> <b>from north:</b> reduced wait time for a one-seat ride to campus <b>from south:</b> faster and more direct transit access to campus from Tualatin, Bridgeport Village and Lake Grove	<b>bus routing:</b> could improve travel times to campus from Sherwood, Tualatin, Tigard, and Lake Grove <b>bridge over I-5:</b> little to no travel time advantage over Lesser/Haines route <b>Highway 217 crossing:</b> potential travel time savings	<b>from north:</b> in-vehicle time similar to shuttle option without need to transfer at Barbur Transit Center, but much longer wait time at PSU/Transit Mall <b>from south:</b> no travel time benefit	about 3-8 minutes faster <i>than walking from 53rd Avenue station (most advantageous from the south)</i>	about 3 minutes faster <i>than walking from 53rd Avenue station</i>	about 2-4 minutes faster <i>than walking from 53rd Avenue station</i>	<i>compared to walking from 53rd Avenue station:</i> <b>PRT:</b> 3-5 minutes faster <b>tram:</b> 1-3 minutes faster <b>gondola:</b> 2-4 minutes faster
	transfer characteristics <i>based on distance/elevation between stations and wait time</i>	N/A	N/A	N/A	<b>to campus:</b> short walk to cross-platform timed transfer <b>from campus:</b> short walk to cross-platform transfer, wait time based on light rail service frequency	short walk to bike share hub on-demand bike checkout	short walk to autonomous shuttle on-demand service	<b>all:</b> elevator or stairs to connection station <b>PRT:</b> on-demand service <b>tram:</b> about 2 minute average wait <b>gondola:</b> about 1 minute average wait
	anticipated ridership changes <i>exact projections are unknown, but qualitative analysis provided</i>	improved frequency and new service in Lake Grove could increase system transit trips and slightly increase transit ridership to campus	<b>bus routing:</b> could increase system transit trips and slightly increase transit ridership to campus <b>bridge over I-5:</b> ridership gains unclear	very slight increase in transit ridership to campus assuming similar service frequency to PCC shuttle today likely decrease in light rail line ridership because of competing service and reduced vehicle speeds on shared transitway	slight increase in light rail line ridership and transit ridership to campus	very slight increase in light rail line ridership and transit ridership to campus	slight increase in light rail line ridership and transit ridership to campus	slight increase in light rail line ridership and transit ridership to campus
LOGISTICS	vehicle type and considerations	existing TriMet buses	existing TriMet buses	existing TriMet buses or PCC shuttle buses	existing TriMet buses	bike share concept may be more effective as part of larger system, but Biketown system does not currently use electric bikes	technology for automated shuttles in mixed traffic is still under development and testing	<b>PRT:</b> autonomous shuttles on exclusive guideways have been used elsewhere <b>tram/gondola:</b> existing technologies used locally and elsewhere
	operating flexibility	less flexible <i>service also informed by other ridership along the route</i>	less flexible <i>service also informed by other ridership along the route</i>	more flexible <i>service can be adjusted to accommodate PCC travel demand</i>	more flexible <i>service can be adjusted to accommodate PCC travel demand</i>	somewhat flexible <i>on-demand service, but likely distribution challenges</i>	more flexible <i>service can be adjusted to accommodate PCC travel demand</i>	more flexible <i>service can be adjusted to accommodate PCC travel demand</i>
	owner/operator	TriMet	TriMet	TriMet or PCC	likely TriMet	unclear	unclear	unclear
COSTS & IMPACTS	capital cost <i>2014\$, not including finance costs</i>	<i>not available</i>	\$6.5 million	\$53 million	\$6.5 million	\$2.5 million	\$9 million	<b>PRT:</b> \$64 million <b>tram:</b> \$59 million <b>gondola:</b> \$14 million
	operating cost <i>annual</i>	<i>not available</i>	\$3.9 million	\$5 million	\$2 million	<i>not available</i>	<i>not available</i>	<b>tram:</b> for comparison, OHSU tram costs \$2.2 million annually <b>others:</b> not available
	neighborhood impacts <i>including acquisitions, vegetation removal and visual impacts</i>	none	<b>bus routing:</b> none <b>bridge over I-5 option:</b> property impacts and vegetation removal	none	none	none	minor vegetation removal visual impact of vehicles during operations	moderate vegetation removal high visual impact of elevated structures
OTHER	other considerations	improvements proposed as part of TriMet's Southwest Service Enhancement Plan	modeling showed most of the benefit of the bus hub was a result of the line 44 improvements	light rail would likely need to operate at reduced speeds on the shared transitway shuttle buses would likely run faster in mixed traffic during off-peak periods (in the transitway, they would be slowed by light rail vehicles stopping at stations)	eventually could be modified to use autonomous shuttles as technology is further developed	not all people would be willing or able to ride the bikes would not provide weather protection	investment could support campus redevelopment	investment and visibility could support campus redevelopment