



November 2016 Staff Recommendation:

Revisions to the Proposed Range of Alternatives and Purpose and Need

November 9, 2016

Overview

This document presents the staff recommendation to the Southwest Corridor Steering Committee based on additional analysis and public input received during the project's scoping period, held from September 2 through October 3, 2016. The recommendation further refines the options described in the *Proposed Range of Alternatives for Environmental Review*, which was published on September 1, 2016 and defines the initial set of investments proposed to be studied in the project's Draft Environmental Impact Statement (EIS). That report is available on the project website: http://www.oregonmetro.gov/sites/default/files/AttachmentE_ProposedRangeOfAlternativesForEnvironmentalReview.pdf

In addition, the recommendation includes proposed revisions to the Southwest Corridor Light Rail Project Purpose and Need statement, which was distributed for public and agency comment during the scoping period. The updated Purpose and Need adopted in June 2016 is available on the project website: http://www.oregonmetro.gov/sites/default/files/AttachmentD_PurposeAndNeed.pdf

The recommendations contained in this document apply to the following project elements:

1. Marquam Hill connection options
2. Portland Community College (PCC) Sylvania connection options
3. Light rail alignment and station options
4. Roadway, bicycle, and pedestrian projects
5. Purpose and Need

Next Steps

After steering committee consideration of and action on these recommendations, which is scheduled for December 12, 2016, Metro, TriMet and the Federal Transit Administration (FTA) will begin assessing the impacts and benefits of the proposed alternatives as required under the National Environmental Policy Act (NEPA).

Consideration of how to fund and implement transportation and "green" investments for the SW Corridor that are identified in the Shared Investment Strategy but not studied in the Draft EIS will continue as part of the overall Southwest Corridor Plan dialogue. Additional roadway, bicycle and pedestrian projects proposed during the EIS scoping process may also be included in that discussion. Staff will release an update on the Shared Investment Strategy in the upcoming months.

Marquam Hill connection options

Full background and descriptions of the Marquam Hill connection concepts and analysis are included in the *Marquam Hill Connection Options* document published on September 1, 2016, and updated on October 13, 2016, and available on the project website:

<http://www.oregonmetro.gov/sites/default/files/SWCorridor-Marquam-Hill-Connection-Options-20161013.pdf>

Four separate design concepts were initially considered:

- Multiple elevator and bridge
- Escalator, stair and inclined elevator
- Elevator and bridge with a covered walkway/tunnel above Terwilliger
- Pedestrian tunnel with elevators

Recommendation

Staff recommends the following options be studied in the Draft EIS:

- **Elevator and bridge with on-grade walkway:** A walkway, elevator and bridge between SW Barbur Boulevard and SW Terwilliger Boulevard; either an underpass or an at-grade crossing of Terwilliger; and an on-grade path with an elevator and bridge connecting to the 3rd floor of the Kohler Pavilion.
- **Elevator and bridge with trench or tunnel:** A walkway, elevator and bridge between Barbur and Terwilliger; either an underpass or at-grade crossing of Terwilliger; and a combination of on-grade path, trench or tunnel from Terwilliger to below Campus Drive with an elevator to the 3rd or 7th floor of the Kohler Pavilion.
- **Pedestrian tunnel with elevators:** A pedestrian tunnel from Barbur to Campus Drive, with an elevator to the 3rd or 7th floor of the Kohler Pavilion.

Because a direct light rail tunnel connection to Marquam Hill was removed from further study by the steering committee in 2015 due to adverse construction impacts and high costs relative to the projected ridership gains, a connection between a light rail station in the vicinity of SW Gibbs Street on either SW Barbur Boulevard or SW Naito Parkway and the major employment, health and educational center on Marquam Hill will be provided by an accessible pedestrian and bicycle connection. All options under consideration would provide a connection with high projected use.

The **elevator and bridge concept with on-grade walkway** would be the least complex of the options to construct, maintain and operate. It would have relatively fewer impacts to trees in the park between SW Barbur Boulevard and SW Terwilliger Boulevard compared to the full tunnel option, but could also have both temporary and permanent Section 4(f) impacts in the vicinity of Terwilliger Parkway and near Barbur.¹ The **elevator and bridge concept with a trench or tunnel** west of Terwilliger would introduce complexities with excavation required for a pedestrian trench or tunnel in the hillside. A trench or tunnel could reduce risks of permanent Section 4(f) impacts,

¹ Section 4(f) refers to the original section within the U.S. Department of Transportation Act of 1966 which established the requirement for consideration of park and recreational lands, wildlife and waterfowl refuges, and historic sites in transportation project development.

but would increase the risks of temporary impacts during construction. Both options are recommended for study in the Draft EIS.

Also recommended is the full-length **pedestrian tunnel with elevators** option. It could potentially avoid some Section 4(f) impacts by tunneling under the parkway and providing elevator access SW Campus Drive near the Kohler Pavilion; Section 4(f) impacts during construction could be significant due to access requirements and staging needs for the mining operations, however. Similar to the previously removed light rail tunnel under Marquam Hill, the pedestrian tunnel would likely be challenging to construct due its proximity to sensitive medical equipment and could have construction impacts to Terwilliger Parkway at the portal west of Barbur Boulevard.

The **escalator with inclined elevator** is not recommended for advancement because of its anticipated significant long term impacts to the park. An escalator would not be fully accessible to all users without an inclined elevator to accommodate wheelchairs and strollers. The resulting 24-foot wide structure along the hillside would require removal of many trees and would create a significant permanent visual impact to the parkway between SW Barbur Boulevard and SW Terwilliger Boulevard and up to the Kohler Pavilion.

PCC Sylvania connection options

More complete background, descriptions and analysis of the PCC Sylvania connection options are included in the *PCC Sylvania Connection Options* document published on September 1, 2016, and updated on October 13, 2016, and available on the project website:

http://www.oregonmetro.gov/sites/default/files/AttachmentH_PCC-SylvaniaConnectionOptionsForScoping_0.pdf

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 nearest proposed light rail stations
- SW 53rd Avenue mechanized connections between the campus and the SW 53rd Avenue light rail station
- Enhanced bus service, including new or revised bus routes with potential capital investments

Recommendation

Staff recommends the following options be studied in the Draft EIS:

- Bicycle and pedestrian improvements between campus and light rail stations
- Bus shuttle: TriMet shuttle bus between campus and light rail stations at Barbur Transit Center and SW Baylor Street
- Park shuttle: small shuttles in mixed traffic on SW 53rd Avenue

A key goal of the PCC Sylvania connection is to provide convenient, fast, and reliable access between the campus and the light rail alignment. The most basic element of this goal is to provide safe and attractive **pedestrian and bicycle access** to the campus from stations, so several projects are recommended to be studied in the Draft EIS. Improvements to SW 53rd Avenue between the proposed station at SW Barbur Boulevard and the Sylvania campus, including paving and lighting, were previously identified in the *Proposed Range of Alternatives for Environmental Review*. This recommendation adds improvements to SW Capitol Highway and SW 49th Avenue, and to SW Haines Street and SW Lesser Road, to enhance connections to the Barbur Transit Center and SW Baylor Street stations, respectively. These connections are also included in the “roadway, bicycle, and pedestrian projects” section of this document.

While support for potential campus redevelopment is a welcome result of the project, the uncertainty of future campus plans, the level of projected demand for a connection at the time of opening, lack of public support and the comparable performance of less expensive bus connection options make a large investment in a mechanized connection unnecessarily impactful and risky. Mechanized options would connect the campus to light rail via a transfer at the SW 53rd Avenue station. The **personal rapid transit, aerial tram** and **gondola** options would be expensive to construct and would result in property and visual impacts to the SW 53rd Avenue neighborhood. While the permanence of the investment could support campus growth, service capacity would exceed the projected demand for the campus connection at the time of opening and for the

foreseeable future. These options are not recommended for study in the Draft EIS, but could be viable options in the future when campus growth generates travel demand that would warrant such large-scale investment. Therefore, staff recommends that designs for the SW 53rd Avenue station not preclude future implementation of these mechanized options.

The **park shuttle** would operate in mixed traffic on SW 53rd Avenue with small vehicles with capacities of approximately ten people. This option would not produce the physical impacts of the other mechanized connections described previously, and could have lower operating costs. Therefore, staff recommends the park shuttle for further study in the Draft EIS to facilitate further analysis and discussion.

While an **electric bike share** program would be less expensive to implement than the other mechanized connection options, it would not be weatherproof, would not serve all transit riders and could experience challenges in redistributing bikes, potentially resulting in problems with bike availability. A campus bike share program would most likely be successful as part of a larger bike share program. Therefore, staff recommends that the electric bike share program be pursued outside of the Draft EIS and that designs for the SW 53rd Avenue station should not preclude construction of a bike share station in relatively close proximity to the light rail platforms.

Compared to mechanized options, some of the bus service improvement options could be implemented with relatively little risk. They would require little to no additional capital investment and would result in few property impacts.

Among bus options, the most promising is the TriMet-operated **bus shuttle** with potential timed connections to light rail at Barbur Transit Center and at the SW Baylor Street station in the Tigard Triangle. With this option, service would be scaled to demand and travel time to campus would be similar to, if not better than, the mechanized connection options on SW 53rd Avenue. Staff recommends further study of the bus shuttle option in the Draft EIS because it would provide simple, fast, and effective access to campus from light rail with little capital investment.

Model projections show that most of the benefit of the **bus hub** option would be due to the extension and improved frequency of the Line 44, improvements that could be implemented separate from the broader bus hub concept and optional capital improvements. The new opportunities for one-seat rides to campus proposed by the bus hub would improve access from more directions than other connection options, and could be optimized with further analysis. Most of the capital elements of the bus hub concept, however, showed little promise of improving travel times and reliability in preliminary analysis. Specifically, the on-campus dedicated busway, new bridge over I-5 at SW G Street and segment of shared transitway in the Tigard Triangle showed little to no travel time gains relative to the current Line 78 bus route on SW Lesser Road and SW Haines Street. Staff recommends that TriMet further consider opportunities to route new or existing bus lines to the Sylvania campus, but that this effort should be pursued as part of the general bus route planning to support light rail service, and not as an element of the Draft EIS. Staff does not recommend further study of an on-campus dedicated transitway, a bus bridge over I-5 at SW G Street or a segment of shared transitway in the Tigard Triangle. The *Proposed Range of Alternatives for Environmental Review* includes a new auto crossing over Highway 217 connecting

downtown Tigard and the Tigard Triangle, which could improve travel times and reliability for buses serving the campus.

The **shared transitway** between the Barbur Transit Center and downtown Portland would provide a one-seat ride from Portland State University, but would require an estimated investment of over \$53 million (2014\$) in paved trackway over a long distance to allow buses to travel on the light rail's exclusive right-of-way. Buses and light rail would likely need to adhere to a 25 miles per hour speed limit, which is the operating limitation on the shared transitway portion of the Orange Line, and in other locations including downtown Seattle. Finally, the introduction of a bus line on the light rail right-of-way would duplicate service of the light rail and of the Line 44, using operating resources that could be allocated to other routes in the corridor. These issues do not justify the sole benefit of avoiding a transfer between light rail and bus to reach the PCC campus. As a result, staff recommends not studying the shared transitway from the Barbur Transit Center in the Draft EIS. The *Proposed Range of Alternatives for Environmental Review* already includes a shorter segment of shared transitway between the downtown Portland Transit Mall and SW Capitol Highway in "The Woods" section of SW Barbur Boulevard, which could improve travel times and reliability for the Line 44 bus to PCC Sylvania.

Light rail alignment, station, and park-and-ride options

The *Proposed Range of Alternatives for Environmental Review*, published on September 1, 2016, defines the initial set of investments proposed to be studied in the project's Draft EIS. Based on analysis and public comment during the scoping period, modifications are recommended for three alignment options and two stations with park and ride facilities.

Recommendations

- Remove the Clinton branched alignment from further consideration
- Only consider SW 70th Avenue, and not SW 69th Avenue, as the route for the Clinton through-routed alignment
- Remove the option of an alignment adjacent to I-5 at the Barbur Transit Center transitioning to center-running in Barbur south of Crossroads
- Remove the Hunziker station and park-and-ride lot from further consideration
- Increase the Bridgeport station park-and-ride lot capacity range to be studied to include a higher maximum number of spaces

These recommended changes to the light rail alignments, stations and park and ride facilities are illustrated on the map on the following page.

The **Clinton alignment** is an option to connect downtown Tigard and the Tigard Triangle that is currently under consideration for both the through-routed and branched operating configurations. Because the Clinton alignment would include a long structure crossing over Highway 217 and parking lots between the Tigard Triangle and downtown Tigard, it would be a more expensive option compared to alternative options. For the through-routed configuration, the Clinton alignment would cost approximately \$25 million more to construct than the Ash alignment (2014\$, not including finance costs). For the branched route configuration, the Clinton alignment would be at least \$70 million more expensive than the Ash alignment. The cost difference would be greater for the branched configuration because the through-routed Clinton option would avoid the cost of the constructing new segments of the 70th Avenue roadway in the Triangle, while all branched route options would include this cost.

The Clinton alignment was initially introduced as a through-routed option to provide a more direct route through downtown Tigard relative to other through options, saving approximately 1.5 minutes for riders accessing the Tigard Transit Center, Bonita, Upper Boones Ferry, and Bridgeport Village stations (compared to the Ash through-routed option). As a branched option terminating in downtown Tigard, however, only riders at the Tigard Triangle station would benefit from the faster travel time. Staff recommends removing the option of the Clinton alignment with the branched operating configuration from further consideration while retaining the Clinton through-routed alignment for further study in the Draft EIS.

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**Light Rail Alignments, Stations
and Park and Ride Facilities**



The *Proposed Range of Alternatives for Environmental Review* identifies both SW 69th and SW 70th Avenues in the Tigard Triangle as possible routes for the **Clinton crossing** option between SW Atlanta Street and SW Clinton Street. The 70th Avenue option would increase roadway capacity, result in fewer traffic impacts and cost less to construct. Further, it would better support the Tigard Triangle Strategic Plan's goal of creating a more connected street network in the area. As a result, staff recommends removing SW 69th Avenue as an option for the Clinton crossing through-alignment.

As described in the *Proposed Range of Alternatives for Environmental Review*, current concepts for an **adjacent to I-5 alignment** at the Barbur Transit Center include options to either transition back to Barbur at the "Crossroads" intersection (SW Capitol Highway, Barbur and I-5), or continue adjacent to I-5 to 60th Avenue. Either option would include a light rail bridge from the southeast side of the Barbur Transit Center over I-5 and SW Capitol Highway. Preliminary design shows that if this bridge were to land on Barbur as part of a center-running Barbur alignment, the grade change would require a retained fill structure to carry the light rail in the center of Barbur that would measure 620 feet long and up to 23 feet high. South of Crossroads, the retained fill walls would extend to just north of the Public Storage building. This walled structure would generate property and visual impacts. Staff recommends removing this transition from adjacent to I-5 to center-running Barbur, leaving two alignment options through the Crossroads area: center-running Barbur both north and south of Crossroads, and adjacent to I-5 both north and south of Crossroads. This recommendation results in three adjacent to I-5 alignment options to be studied in the Draft EIS: SW 13th Avenue to SW 60th Avenue, SW 26th Avenue to 60th, and Barbur Transit Center to 60th.

The **Hunziker Street station** near downtown Tigard would be located between the Tigard Transit Center station and the Beveland Street station in the Tigard Triangle for the Wall Branch option. Original plans for branched route configuration identified the Hunziker station as the location where the two branches would diverge, and where riders traveling between downtown Tigard and points south could transfer. Current plans, however, identify either the Beveland or Baylor station as the point where the branches would split, so the Hunziker station would no longer serve as a transfer point between branches. In addition, the station would be located in an industrial area, with a proposed 350- to 400-space surface park and ride lot under the light rail structure crossing over Highway 217. While some development is planned in the area, employment density is likely to remain low relative to other station areas. The park and ride lot would not be easily accessed by autos because of limited roadway connectivity and proximity to congested intersections, and security at the lot could be complicated by the lack of sight lines and lack of activity in the industrial landscape. The station and park-and-ride lot are therefore recommended to be removed from consideration.

The *Proposed Range of Alternatives for Environmental Review* includes a capacity range of 400 to 600 spaces for the **Bridgeport station park-and-ride lot**. Model projections show significantly higher demand for spaces at the lot. Staff recommends increasing the maximum capacity in the range to be studied in the Draft EIS to 1,000 spaces.

Roadway, bicycle, and pedestrian projects

The Southwest Corridor Light Rail Project includes roadway, bicycle, and pedestrian projects that could improve safety and connectivity throughout the corridor and support the light rail and the communities' land use visions. Some of these projects were already been endorsed for environmental review by the steering committee in June 2016, because they are integrally connected to the designs of at least one of the light rail alignments that will be studied in the Draft EIS; those projects are described in the *Proposed Range of Alternatives for Environmental Review*.

Several dozen additional projects identified by staff and by public comment were also considered for inclusion in the Draft EIS, primarily to provide adjoining neighborhoods with pedestrian and bicycle access to transit stations. These projects were analyzed based on access, safety, existence in adopted plans, construction costs, and construction challenges to inform the recommendation. More complete background, descriptions and analysis of the additional options are included in the *Analysis of Additional Roadway, Bicycle and Pedestrian Projects* document published on September 1, 2016, and updated on October 13 and October 21, 2016, and available on the project website: <http://www.oregonmetro.gov/sites/default/files/Analysis%20of%20Additional%20Roadway%20Bicycle%20and%20Pedestrian%20Projects%20-%20102116.pdf>.

Recommendations

In addition to the projects already endorsed for environmental review in the scoping materials, staff recommends adding the following projects for study in the Draft EIS:

- 1st Avenue bikeway
- Naito Parkway to Hooley Bridge bikeway
- Hamilton Street/Terrace bikeway and sidewalks
- Terwilliger Parkway bikeway gap
- Chestnut Street bikeway
- Custer Drive sidewalks
- Pedestrian/bicycle bridge over I-5 near Custer Street
- Capitol Hill Road sidewalks and bikeway
- 19th Avenue bikeway
- Troy Street bikeway
- Spring Garden Street and Dolph Court sidewalks and bikeway
- 24th Avenue sidewalks and bikeway
- 26th Avenue sidewalks and bikeway
- 30th Avenue/Hume Street/31st Avenue sidewalks
- Capitol Highway sidewalks and bike lanes
- Taylors Ferry Road sidewalks and bikeway
- 40th Avenue sidewalks
- Outer Capitol Highway pedestrian improvements
- Pedestrian/bicycle bridge over I-5 near Luradel Street or 53rd Avenue
- Pomona Street sidewalks and bike lanes
- Pasadena Drive sidewalks and bike lanes

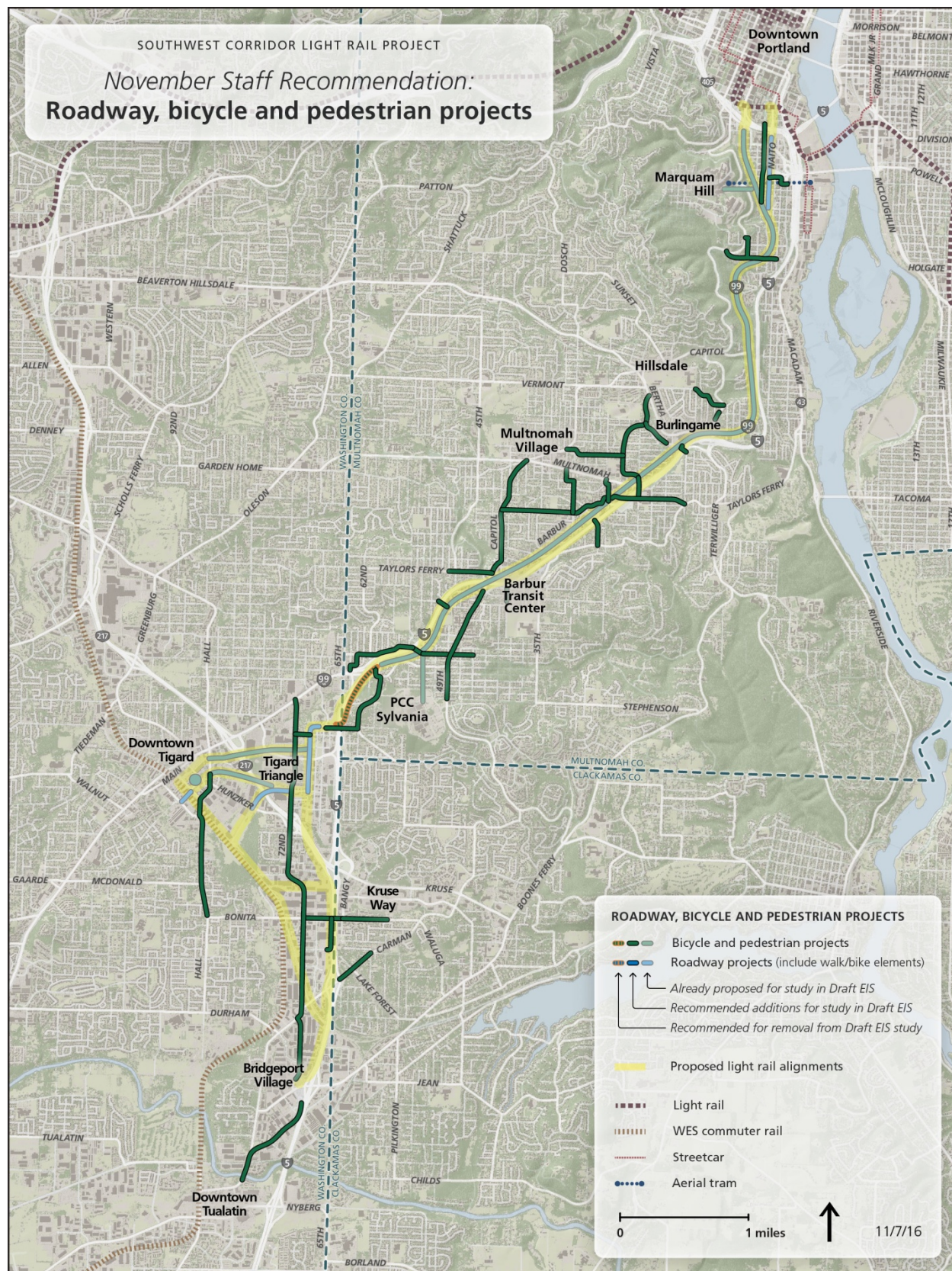
- Baylor Street sidewalks and bikeway
- 72nd Avenue sidewalks and bikeway: 99W to Lower Boones Ferry Road
- Hall Boulevard sidewalk infill: Knoll Drive to Bonita Road
- Bonita Road bikeway: 72nd Avenue to I-5
- Bonita Road sidewalks and bikeway: I-5 to Windfield Way
- Pedestrian/bicycle path along I-5 between Bonita Road and Cardinal Lane
- Carman Drive sidewalks and bikeway
- Walk/bike improvements on Lower Boones Ferry Road and Boones Ferry Road

Staff also recommends adjustments to the walking and biking connection proposed between Barbur Boulevard and the Tigard Triangle. This project was already endorsed for environmental review, but included four options for achieving this connection. Staff recommends studying an on-street route via 60th Avenue, Capitol Highway, Lesser Road, Haines Street and Atlanta Street. Improvements would include the addition of sidewalks, bike lanes and in-street bikeway markings. Staff recommends removing the off-street connection options from further consideration in favor of the on-street connection because the on-street connection would also improve access to PCC Sylvania from both the Tigard Triangle and Barbur Boulevard. The off-street paths recommended for removal include::

- Bicycle/pedestrian path on light rail structure over I-5
- Bicycle /pedestrian path along east side of I-5 with new bridge parallel to Haines Street bridge
- Bicycle /pedestrian path along east side of I-5 with connection to Haines Street and sidewalk and bikeway improvements on Haines Street and Atlanta Street

The map on the following page illustrates the location of roadway, bicycle and pedestrian projects already recommended for environmental review prior to the scoping period, additional projects proposed for study in the Draft EIS based on further analysis and input during scoping, and projects recommended for removal from consideration in the Draft EIS.

Project partners will continue to seek funding for other roadway, bicycle and pedestrian improvements in the Southwest Corridor that are more appropriate to pursue separately from the light rail project.



Purpose and Need

The public and agency comments received during scoping did not suggest changes to the Purpose and Need statement. So that all stated purposes are supported by an expressed need, however, staff recommends adding language to explain the need for the following purpose: “Ensure benefits and impacts promote community equity.” The recommended edits are underlined in the following excerpt from the preliminary Purpose & Need adopted by the steering committee in June 2016:

There is a limited supply and range of housing options in the Southwest Corridor with good access to multimodal transportation networks, and jobs and services are not located near residences.

The Southwest Corridor is projected to add around 41,000 households from 2010 to 2035, an increase of 48 percent. Presently, the majority of housing in the project area consists of low density, single family housing and little affordable housing is available. As the region grows, providing a variety of housing options and increased housing supply in the corridor will be necessary to accommodate the additional residents. Concentrated development around light rail stations can provide a range of additional housing options, including affordable housing, with transit and walk access to jobs and other amenities that can reduce the reliance on automobile travel and reduce transportation costs for households. Providing light rail transit will allow development of affordable and higher density housing, which is not currently possible due to State of Oregon Transportation Planning Rules related to capacity on state road facilities.

In addition, many of the major employment areas in the corridor have developed far away from the area’s housing, requiring workers to commute over long distances. For example, 93% of workers in Tualatin and 92% of workers in Tigard live outside the city of their employment. With the transit service limitations described previously, driving on congested roadways is often the only choice for people to access their jobs. In addition, the incomplete sidewalk and bicycle networks in the corridor require riders to access transit by car and, as a result, park and ride lots in downtown Tigard and near Bridgeport Village are often full. The limited access of those who reside outside the corridor to its jobs, health services and educational opportunities is also an equity concern for the regional community.

As the region grows, implementation of light rail will be critical to improve transit connections between jobs and residences. A well-distributed park and ride system combined with place making principles will allow disconnected users to access light rail without impacting livability.

While providing opportunities for additional housing and jobs near transit is important, that outcome needs to be balanced against impacts on the existing community in the corridor. The region’s population growth and economic improvement have elicited concerns about increasing housing costs and displacement of residents and businesses, especially resulting from major public investments. *Therefore, the project needs to strive for equitable distribution of benefits and impacts.*