



What is the Southwest Corridor Light Rail Project?

The project is a proposed 12-mile MAX line connecting downtown Portland to Tigard and Tualatin.

After several years of early planning, the project is now undergoing environmental review.

What is the purpose of the decision briefing books?

Several project decisions remain, including options for alignments, stations, maintenance facilities and station access improvements.

Through fall 2017, individual decision briefing books will be released to inform conversations about the key considerations for each major decision. Because the environmental impact analysis is ongoing, briefing books will be updated as new information becomes available.

When will the decisions be made?

The steering committee is anticipated to narrow down the remaining options to a "Preferred Alternative" in early 2018.

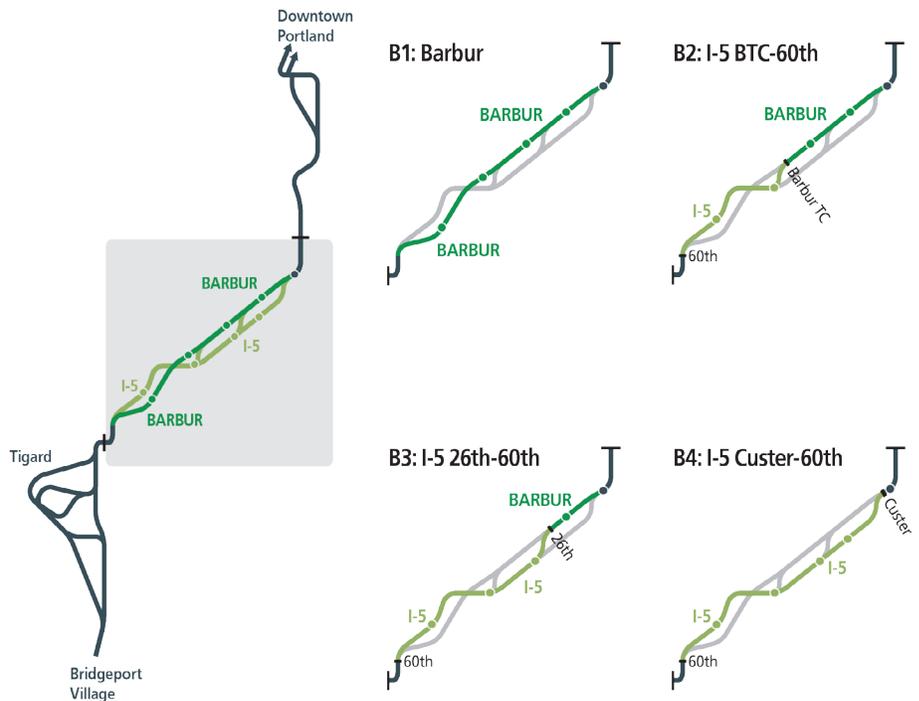
Further outreach, design and environmental analysis will occur before a final decision on what to construct.

Decision Overview

South of the Burlingame area in Portland, the light rail line could operate either center-running in the middle of SW Barbur Boulevard or adjacent to I-5, generally about 200 to 275 feet from Barbur.

Light rail could transition to run adjacent to I-5 at three locations, which results in four individual alignment options in this segment of the project to be studied in the environmental review. All three adjacent to I-5 options would continue alongside the freeway until SW 60th Avenue, where the light rail would cross into the Tigard Triangle. The four individual alignment options are:

- **B1: Barbur** (remains entirely center-running in Barbur)
- **B2: I-5 Barbur TC to 60th** (transitions to I-5 at Barbur Transit Center)
- **B3: I-5 26th to 60th** (transitions to I-5 at SW 26th Avenue)
- **B4: I-5 Custer to 60th** (transitions to I-5 at SW Custer Street)



More detailed maps of these four alignments are provided in the *Light Rail Alternatives for Environmental Review* document, available on the project website: www.swcorridorplan.org/light-rail-study.

This document, which is the first iteration of the *On Barbur or Along I-5?* decision briefing book, will primarily focus on the differences between **center-running** and **adjacent to I-5** in general. The next version will include more information on the four individual alignment options.

CONNECT

www.swcorridorplan.org

swcorridorplan@oregonmetro.gov

[@SWCorridor](https://twitter.com/SWCorridor)

503-813-7535

Alignments Considered and Removed

In June 2014, the Southwest Corridor Steering Committee removed from consideration a long tunnel under Marquam Hill, Hillsdale, and Multnomah Village with portals near SW Barbur Boulevard and SW Hooker Street to the north and near the Crossroads intersection (I-5, Barbur, and SW Capitol Highway) to the south. The tunnel was removed because of cost, severe construction impacts, and inability to support the Barbur Concept Plan since the alignment bypassed the historic section of Barbur. Also removed were two light rail tunnels in the vicinity of the Portland Community College (PCC) Sylvania Campus: one via Barbur and one via Capitol Highway. These tunnels were removed because they were expensive compared to a remaining tunnel option without providing significantly more benefit.

Further study on the remaining PCC-Sylvania tunnel option resulted in the development of two additional tunnel options, but all three were removed by the steering committee in May 2016 due to high construction costs that would exceed the project's ability to reach Bridgeport Village within projected funding levels, and construction impacts to surrounding neighborhoods, including displacement of residents.

In December 2016, the steering committee removed an option of a transition of light rail from adjacent to I-5 to Barbur at the Crossroads intersection. The grade change between the light rail bridge over the intersection and the surface would require a long retained fill structure in the center of Barbur that would create property and visual impacts. As a result of the decision, an adjacent to I-5 alignment from any transition point would continue to SW 60th Avenue.

More information on options considered and removed is provided in the *Project Background and Alternatives Considered* document, available on the project website: www.swcorridorplan.org/light-rail-study.

Existing Roadway Character

SW Barbur Boulevard was originally completed in 1936 as the main auto highway connecting Portland to the south. It has long since been replaced by I-5 as the principal highway in and out of Portland, and neighborhoods have developed along much of its length. While the road has been modified and modernized over the years, Barbur still has gaps in sidewalks and bike lanes, and spacing of protected pedestrian crossings is insufficient for a pedestrian corridor. The roadway width varies from as much as 100 feet between the outside edges of the sidewalk where they occur along with bike lanes and center-turn lanes, to as little as 55 feet on bridges that carry travel lanes, bike lanes and sidewalks that all do not meet current Oregon Department of Transportation (ODOT) or City of Portland width guidelines.



Considerations

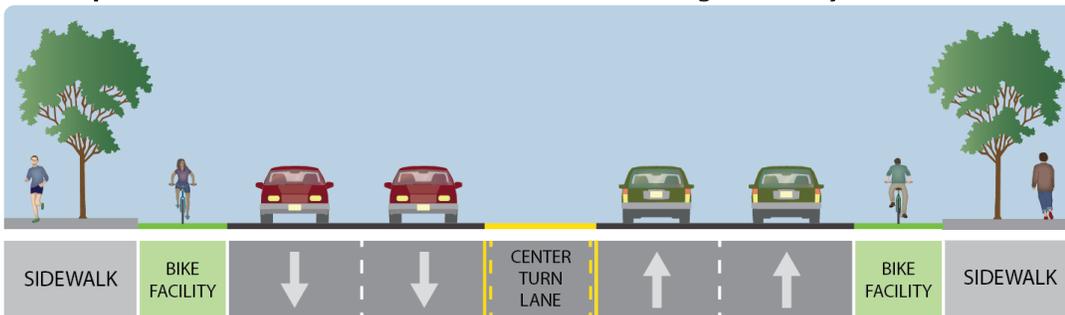
Based on currently available information, considerations in the decision between center-running light rail in Barbur and light rail adjacent to I-5 include auto operations, light rail reliability and travel times, the pedestrian and biking environment, quality of stations, redevelopment opportunities and support of local plans, property impacts, ridership, capital costs and visual impacts.

These considerations are examined individually on the following pages. This document may be updated to include new relevant information resulting from the ongoing environmental analysis.

Roadway character

With an **adjacent to I-5 alignment**, **auto lanes on Barbur would remain as they are today**. Some improvements to Barbur are planned and would be pursued, though it is less certain that they would receive federal funding as part of the light rail project without the alignment incorporated into the street. Those improvements include the **addition of some crosswalks** to provide access to light rail stations and widening of some bridges (cantilevered) to accommodate bike and pedestrian facilities. **Bike lanes and sidewalks would be added to specific locations along Barbur to fill existing gaps**, but improvements would not include corridor-length upgrades to bike lanes, sidewalks, streetlights and tree planting. The new bike lanes and sidewalks would be constructed to match adjoining existing ones and to avoid property acquisitions along the roadway. While **localized stormwater treatment could be added** along with the sidewalks, Barbur would not receive a corridor-length treatment system. As a result, portions of Barbur would still not meet current ODOT or City of Portland guidelines.

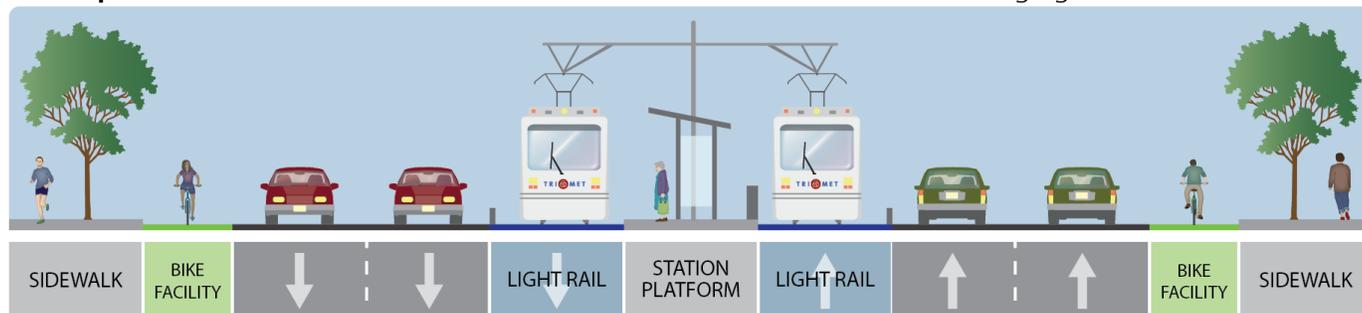
Conceptual cross-section: Barbur Boulevard with light rail adjacent to I-5



Note: this cross-section represents the current conceptual understanding of Barbur Boulevard with an adjacent to I-5 alignment. The drawings are not exactly to scale. Designs are subject to change through the environmental review process.

Current plans for a **center-running alignment would rebuild Barbur** to accommodate tracks, station platforms and **two auto lanes in each direction, along with wider bike lanes, wider sidewalks, street trees, updated illumination and stormwater facilities along the entire corridor** to meet existing jurisdictional guidelines. The wider profile would result in more impacts to adjacent properties than an adjacent to I-5 alignment. With agreement, design widths of new auto lanes, bike lanes and sidewalks could be narrowed to reduce or avoid impacts. The Barbur rebuild would replace several existing bridges and **add new signalized intersections, enhanced pedestrian crossings** (signalized pedestrian crossings not at signalized intersections) **and standard crosswalks** (unsignalized or at signalized intersections).

Conceptual cross-section at station: Barbur Boulevard with center-running light rail



Note: this cross-section represents the current conceptual understanding of Barbur Boulevard with a center-running alignment. The drawings are not exactly to scale. Designs are subject to change through the environmental review process.

A center-running alignment through the intersection of Barbur, I-5 and SW Capitol Highway (Crossroads) would require complete reconstruction of the intersection and existing bridge over I-5, whereas an adjacent to I-5 alignment would cross over I-5, Capitol Highway and Barbur on a new light rail structure and the existing Crossroads bridge would remain in place.

Auto operations

Because it would operate in the roadway and cross more intersections at grade, **the center-running alignment could cause more disruptions to auto operations** than the adjacent to I-5 alignment. The environmental analysis will identify any significant impacts either alignment could have on auto traffic and potential strategies to mitigate those impacts.

With **adjacent to I-5 alignment**, light rail operations would be separated from SW Barbur Boulevard. Consequently, auto travel lanes, intersections and signals would be **largely unchanged from current conditions**, though some **additional crosswalks** would be added to provide bicycle and pedestrian access to stations. Adjacent to I-5 options would also include a **gated crossing** across the northbound lanes of Barbur for light rail to transition from Barbur to I-5. Traffic on Barbur would operate much like it would without light rail. Some local auto circulation would be impacted on streets between Barbur and I-5, such as SW Multnomah Boulevard between SW Custer Street and SW 19th Avenue, which would be converted to light rail right of way, and SW Spring Garden Street, which would be modified to accommodate an adjacent station.

The **center-running alignment** would **preserve two through travel lanes in each direction**. It would **remove two-way center turn lanes** where they exist, and autos accessing businesses on the opposite side of Barbur would make **U-turns at signalized intersections to reverse direction**. Autos leaving businesses would only be able to make right turns onto Barbur and could reverse direction at U-turns. One to eight new traffic signals could potentially be added depending on alignment decisions. Signal timing at existing signals would be adjusted to allow for the addition of U-turns in left turn lanes and pedestrian crossings and new signalized intersections would be added at some stations. Designs for center-running light rail also include **signalized pedestrian crossings at stations**, which would be coordinated with nearby traffic signals to minimize disruptions to through traffic. More information will be available when the traffic analysis completes assessment of the impacts of signal timing changes and addition of pedestrian crossings on auto travel on Barbur.

Detailed maps showing the signalized intersections, gated intersections and enhanced pedestrian crossings for each of the four individual alignments are included in the *Project Background and Alternatives Considered* document, available on the project website: www.swcorridorplan.org/light-rail-study.

Light rail operations: Reliability

The **adjacent to I-5 alignment would generally be more reliable** than the center-running alignment because it would interact less with auto traffic. **Both alignments would be more reliable than transit operating in mixed traffic.** The exclusive right of way for light rail would allow the trains to avoid auto congestion.

Since **adjacent to I-5 alignments would be separated from the roadway**, light rail on those alignments would not be affected by traffic signals (except at the SW Spring Garden Street crossing, where a signal and a gate would stop traffic).

With a center-running alignment, traffic signals would be timed to provide light rail priority over autos, but in some cases light rail might have to wait at stations for crossing pedestrians or congested movements from I-5 ramps to clear. In addition, a widened Barbur may require **longer traffic signal cycle lengths** to allow pedestrians to cross, and signals would also need to devote more time to the left-turn lanes that are handling additional volumes from the increase in autos performing U-turn movements. Though these impacts are not precisely known at this stage of the project, **center-running trains could experience anywhere from zero to 80 seconds of potential average travel time delay** for the section of Barbur between SW Terwilliger Boulevard and Barbur Transit Center, depending on final design and time of day.

Light rail operations: Travel time

Considering the full travel time between downtown Portland and Bridgeport Village, the **travel time differences are relatively small** between the center-running and adjacent to I-5 alignments.

The table below shows estimated travel times between Portland State University (PSU) and Bridgeport Village by alternative, including up to 80 seconds of variance between Terwilliger and 60th to reflect potential average signal delay depending on the length of operation in Barbur.

Alignment Option <i>(refer to maps in Decision Overview section)</i>	Travel time (PSU to Bridgeport) <i>in minutes (m) and seconds (s)</i>
B1: Barbur	31m10s – 32m30s
B2: I-5 Barbur TC to 60th	32m20s – 33m30s
B3: I-5 26th to 60th	32m50s – 33m50s
B4: I-5 Custer to 60th	31m40s – 32m20s

Between SW Custer Street and SW 26th Avenue, an adjacent to I-5 alignment would be faster than a Barbur center-running alignment, but between 26th and SW 60th Avenue a Barbur center-running alignment would be faster than an adjacent to I-5 alignment. An adjacent to I-5 alignment would include curves to transition between Barbur and adjacent to I-5 and vertical curves to avoid I-5 ramps, which both limit light rail speeds.

Pedestrian and biking environment

Both alignments would improve the pedestrian and biking environment along SW Barbur Boulevard, but the **center-running alignment would provide better facilities** by completely rebuilding the street as opposed to filling in existing gaps.

The **wider sidewalks and bike lanes currently included in plans for a center-running alignment** would meet ODOT and Portland guidelines and create a safer, more comfortable environment for both pedestrians and bikers. Assuming the improvements with an adjacent to I-5 alignment receive federal transit funding, sidewalk and bike lane gaps would be filled, though their widths would be inconsistent and would in places remain sub-standard under both ODOT and City of Portland specifications. A center-running alignment would also provide more crossings on SW Barbur Boulevard than an adjacent to I-5 alignment.

With a center-running alignment's wider roadway width, pedestrian crossings on Barbur would be slightly longer compared to adjacent to I-5 alignment. However, with station platforms in the middle of Barbur, pedestrians would only cross half of the traffic lanes to access stations.

Quality of stations

The **adjacent to I-5 alignment's station locations would be more constrained**, and the **stations would be more isolated**. The **center-running alignment stations would be more accessible to the concentration of households and employment** along the side of Barbur opposite of I-5.

With a center-running alignment, stations would be located in the center of SW Barbur Boulevard at SW Custer Street, SW 19th Avenue, SW 30th Avenue (with an alternate location at SW 26th Avenue), Barbur Transit Center and SW 53rd Avenue. With an adjacent to I-5 alignment, the stations would be between Barbur and I-5 at the same locations, except for a Spring Garden station substituting for the 19th station because of grade constraints. This would affect station spacing, making the Spring Garden station closer to 30th and further from Custer with an adjacent to I-5 alignment. The adjacent to I-5 alignment's Spring Garden station would be further from the node of development at Barbur, SW Capitol Hill Road and 19th.

Center-running alignment stations would be more accessible to households and employment on the side of Barbur opposite I-5, while adjacent to I-5 alignment stations would be more accessible to households and employment between Barbur and I-5, and across I-5 where bridges exist. More people and jobs exist and are forecast to be along Barbur opposite of I-5, so **center-running alignment station platforms in the middle of Barbur would be more accessible and visible to more people** than adjacent to I-5 stations.

Adjacent to I-5 stations would be more isolated than center-running stations, and as described in the Redevelopment/Barbur Concept Plan section, development next to stations with the adjacent to I-5 alignment could further reduce visibility of stations. As a result, **center-running stations would be more accessible to emergency responders**, and would better adhere to Crime Prevention Through Environmental Design (CPTED) principles compared to adjacent to I-5 stations. **Station users may perceive center-running stations to be safer.**

Redevelopment and the Barbur Concept Plan

With more visible and easier-to-reach stations, **the center-running alignment would be more likely to promote redevelopment to support local land use goals** compared to adjacent to I-5 alignments.

The center-running alignment stations would be closer to the focus areas identified in the Barbur Concept Plan. The Barbur Concept Plan identifies seven focus areas that correspond to Southwest Corridor light rail station locations, four of which would be served by stations located differently between center-running and adjacent to I-5 alignments.

The Plan envisions most of the development in the Capitol Hill and 26th Avenue Focus Areas to occur on the northwest side of Barbur. With an adjacent to I-5 alignment, the station serving the 26th Avenue focus area would be on the opposite side of the street, 200 to 300 feet away. The nearest station to the Capitol Hill Focus Area would be at SW Spring Garden Road, about a 1,200-foot walk from SW Capitol Hill Road. Redevelopment around the stations on one side could obscure their visibility from Barbur and the majority of the focus areas, and would be prevented on the other side by I-5.

The Crossroads and 53rd Avenue Focus Areas would be served by the Barbur Transit Center and 53rd Avenue stations, respectively. The Crossroads area constitutes a large part of the West Portland Town Center, which is prioritized for increased level of urban development. Both light rail alignments could support redevelopment of the transit center to a mixed use district, depending on the degree to which it retains or expands park and ride and bus transfer functions, but a center-running alignment would more likely promote the active pedestrian and retail streetfront along Barbur Boulevard envisioned by the Barbur Concept Plan.

The Plan envisions the 53rd Ave focus area for potential redevelopment, including services and potentially housing for PCC students. Both the center-running and adjacent to I-5 alignments could support these uses, but as with other areas along Barbur the Concept Plan would suggest that center-running stations would be preferred to encourage new development.

Considering distance from envisioned redevelopment, accessibility to users and visibility, **center-running alignment stations at 19th and 30th would better support redevelopment in general and the Barbur Concept Plan specifically, compared to the equivalent adjacent to I-5 stations.** For stations at Barbur Transit Center and 53rd, the distinction is less clear due to the planned park and ride lots.

Property impacts

All options include multiple property acquisitions and relocations. Relocation benefits would be provided to residents and businesses. The environmental analysis will assess the displacement of residents and businesses, including consideration of environmental justice and socioeconomic issues that could result from each alignment.

Visual impacts

The **center-running alignment would change the character of SW Barbur Boulevard**, with light rail as an integral component. As described earlier, the Barbur Concept Plan encourages that type of transformation and envisions high capacity transit as the catalyst. The environmental analysis will consider the visual impacts of each alignment.

The **adjacent to I-5 alignment would require a series of bridges** for light rail to avoid I-5 ramps, especially between the Custer and 30th stations, which could have adverse visual impacts. The adjacent to I-5 structure over the Crossroads intersection would also be visually prominent. Lighting of stations platforms may also be considered a visual impact with adjacent to I-5 alignments, as the stations and lighting would occur in otherwise less-trafficked areas. Center-running stations, meanwhile, would already be located in well-lit locations in the middle of Barbur. The environmental analysis will provide more information on the visual impacts associated with each alignment.

Pending information

Because the environmental analysis is ongoing, some information that may be relevant to the decision between the center-running and adjacent to I-5 alignments is still being developed. In particular, property impacts, capital costs, and projected ridership are likely to be important considerations. While this version of the briefing book provides an overview of the general trade-offs between a center-running and adjacent to I-5 alignment, the next version will provide more detailed information comparing the four individual alignment options.

Summary Table

A summary table will be added to the next version of this briefing book with more information comparing the four individual alignment options.