

## Southwest Corridor Plan

# Terminus Options Memo

November 13, 2015

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## Overview

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In December 2015, the Southwest Corridor Steering Committee is scheduled to decide which terminus options are most promising and should advance into the Draft Environment Impact Statement (DEIS) for further analysis. This memo summarizes the key factors for decision-makers to consider in their evaluation of terminus options and qualitatively compares the current terminus options. The memo includes an assessment of whether any terminus options do not meet the project's Purpose and Need or the criteria for a viable terminus location.

### North Terminus

If light rail is chosen as the travel mode, the HCT system would “interline” with an existing MAX line, such as the Green line. If BRT is chosen as the travel mode, the HCT system would run through downtown Portland and terminate at the northern edge of the city center. Details about the HCT alignment into and through downtown Portland will be determined during the DEIS process.

### South Terminus

There are currently two terminus options under consideration: downtown Tualatin and Bridgeport Village. In December 2015, the Southwest Corridor Steering Committee has the opportunity to eliminate a terminus option that is not viable or which is notably less promising than the other option.

At its October 12, 2015 meeting, the Steering Committee passed a motion stating that it is their belief that the Tualatin station does not appear to be a viable option for LRT mode, based partly on funding capacity.

Before beginning the DEIS analysis, the steering committee will identify one or more minimum operating segments (MOS) for evaluation. Each MOS will incorporate a shorter alignment than defined in the Preferred Package. Project staff will assess terminus options for these MOS segments prior to that decision.

## Terminus Options Memo – 11/13/2015

### Termini in the Portland region

The existing HCT network in the Portland area includes eight termini on the light rail MAX system, listed in the table below. These termini tend to share the following characteristics:

- Most are located at major destinations that pre-existed the light rail station.
- Most include a large park-and-ride facility. The exceptions are located at major transportation hubs.
- Most are not served directly by local bus lines. The exceptions are the two termini that are also transit centers. The other termini, except for on the Orange Line, are within 3 stops of a transit center or the transit mall.

Note that Yellow line MAX trains “interline” with Orange line MAX trains, switching lines but not vehicles. Previously the PSU South stations served as the Yellow line terminal.

<i>Terminus</i>	<i>Line</i>	<i>Adjacent destinations</i>	<i>Park and Ride spaces</i>	<i>Transit connections</i>
Beaverton Transit Center	Red	regional retail	-	Transit Center – 10 bus lines, WES, Blue line
Portland Airport	Red	airport	-	none (Parkrose/Sumner TC is 3 stops away)
Expo Center (Portland)	Yellow	Portland Expo Center	300	C-Tran bus lines (N Lombard TC is 3 stops away)
SE Park Avenue (Clackamas County)	Orange	-	401	1 bus line
PSU South	Green	Portland State University	-	Yellow/Orange line, Portland streetcar, near 5 bus lines
Clackamas Town Center	Green	Shopping mall	750	Transit Center – 10 bus lines
Hatfield Government Center (Hillsboro)	Blue	government offices	250	none (Hillsboro Central/SE 3rd Ave TC is 1 stop away)
Cleveland Avenue (Gresham)	Blue	-	392	None (Gresham Central TC is one stop away)

## Key Factors to Consider

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Based on the profile of HCT termini in the Portland region and other areas (see shaded boxes), it would be desirable for the southern terminus to include a moderate-to-large park-and-ride facility, to serve as a transit center or be located within three stops of a transit center. An existing major regional destination at the terminus is also desirable but not necessary.

There are many factors to consider in selecting a terminus, including:

- **Logistics** – Does the location have adequate space and a proper configuration for vehicle turnaround and storage for dwell time? Can it be easily served by local buses? Is there adequate room for a parking facility or transit center, or both? Is there space for a driver break facility? Would the resulting alignment provide adequate access to a TriMet maintenance facility?
- **Existing/future transit connections** – Is the location currently served by local bus service? Could it serve as a transit center, with adequate space, proper configuration and a location near multiple transit lines? If not, is it located within three stops of an existing or future transit center?
- **Accessibility** – Is the location easy to access by pedestrians, bicyclists, and drivers? Are there trails, bike paths, or similar non-motorized linkages to this location?
- **Ridership** – How much current and future ridership is modeled for this station and those to the north and south? How many are new system riders?
- **Cost effectiveness** – What are the construction and operating costs of extending HCT to this location? Are enough additional riders gained to improve the cost effectiveness of the Plan?
- **Total cost** – Would there be adequate local and federal funds to build HCT to this terminus?
- **HCT performance** – How would a terminus in this location affect travel time and reliability? In general, a shorter HCT alignment will perform better against these metrics compared to a longer alignment.
- **Equity** – Does the location result in an overall HCT alignment that provides improved access to transit for underserved communities and/or equivalent transit service to those communities?
- **Local community** – How well would a terminus in this location serve the local community? Is a terminus or any station in this location desired by nearby residents and businesses?
- **Local traffic** – What affect would a terminus in this location have on local traffic patterns, both at the station and en route to it? A terminus is may generate a higher level of drop-off/pick-up traffic during peak travel periods than a regular station.
- **Freeway congestion** – How would the location affect traffic congestion on I-5 and/or OR-217? Is it easy to access from the freeway? Would it divert traffic off the freeway? Would it generate traffic that impacts freeway interchanges?
- **Redevelopment potential** – What future land uses would be encouraged by a terminal station in this location?

- **Potential for future HCT extension** – Does the location provide the ability to extend HCT service in the future? Does the location lie on a desirable alignment for a longer HCT system?
- **Relationship with project goals** – How well does the location serve the Purpose and Need?
- **Viable alternatives** – Is there another potential terminus location that would provide a better option, in light of these factors?

This memo focuses on those factors for which data exists, or which are inherently qualitative. As a result, the downtown Tualatin and Bridgeport Village termini are not evaluated against equity, local community, local traffic, or redevelopment potential.

#### Termini in other regions

HCT termini in two Western US metro areas of comparable size as Portland—Denver and Salt Lake City—have many similarities to those of the MAX system.

Denver’s RTD light rail system is somewhat similar to MAX, with six lines which terminate in an outlying community and in the regional commercial center. However, the RTD outer termini are generally not located near a major destination but instead sited for maximum vehicle access, and include large parking facilities of 700 to 1,700 spaces. In addition, multiple large parking garages are located at stations along the lines, ranging from 400 up to 1,900 spaces, similar to the Green MAX line. The outlying RTD termini are served by multiple bus lines (ranging from two to eleven lines). There are also two separate central city termini plus two lines use a loop instead of a terminus.

Salt Lake City’s TRAX light rail system has three lines that serve both the center city and outlying communities. Similar to MAX, two of the lines pass through downtown with termini on the outer edge of the rail network; the third line terminates in downtown Salt Lake City. Of the six TRAX termini, four serve major destinations (airport, university, town center, Amtrak station) and a fifth is located within a large planned residential community under development. Also similar to MAX, the outer termini include moderately sized parking structures. Two of the three TRAX lines also include significant amounts of parking at almost every station, like the Blue MAX line. Half of the TRAX termini are transit centers (served by 8 to 13 bus lines) with the other half only served by 1 to 3 bus lines.

## Downtown Tualatin

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The downtown Tualatin station is the southernmost terminus option currently under consideration. The location would be on the north side of Boones Ferry Road, south of the Tualatin River and directly adjacent to the Tualatin central retail district.

### Logistics

The station area is relatively small. It would be sited in an existing city parking lot and would have minimal space for vehicle storage or driver facilities, which could be a concern with BRT in particular due to the need to layover a considerable number of buses.

### Existing/future transit connections

The location is served by the 76 bus and is a several minute walk from the 96 bus and WES. The current bus routing and small site make it an unlikely candidate for a transit center. This terminus would be located one stop from Bridgeport Village, which would likely become a future transit center.

### Accessibility

The site could accommodate the existing city-owned 75-space parking lot, but no additional park-and-ride capacity is planned for the station site. The location is well developed with sidewalks and bike lanes and could be readily accessed on foot or by bike. The Tualatin River Greenway links to a larger network of trails via the Fanno Creek Greenway and is being extended to the east of I-5, providing off-road access from residential areas for bicyclists and pedestrians.

### Ridership

According to 2035 LRT projections, an alignment terminating in downtown Tualatin would attract about 43,500 daily line riders. About 3,800 daily trips would start or end at the downtown Tualatin station, well over one-third of which would transfer to or from local buses. Since all buses providing transfers at the Tualatin station would also connect to the Bridgeport station, most of these local bus transfers would still access HCT by transferring at the Bridgeport station if the line terminated there instead of in downtown Tualatin. In addition, many of the riders who would walk to HCT at the Tualatin station would instead ride local bus to transfer to HCT in Bridgeport. As a result an alignment terminating in Tualatin would increase of about 1,500 daily line riders, only a 3.5% increase compared to a shortened alignment terminating at Bridgeport.

### Cost Effectiveness

Compared to an alignment with a terminus at Bridgeport, a longer line with a terminus in downtown Tualatin would cost an additional \$105 million for BRT and \$135 million for LRT in 2014 dollars. This equates to about 9% to 12% of the entire project cost for BRT and 7% to 8% of the project cost for LRT. As result, the cost of a segment extending from Bridgeport to downtown Tualatin would be proportionally greater than its gain in ridership.

### Total cost

Initial evaluation of local and federal funding capacity suggests that the total capital cost of reaching downtown Tualatin exceeds the expected maximum budget for building the Southwest Corridor Plan.

### HCT performance

A terminus in downtown Tualatin would add 3 minutes to BRT travel time beyond the preceding station (Bridgeport Village) and 2.7 minutes to light rail travel time. There would be three large curves in the route between Bridgeport Village and downtown Tualatin, which would slow down HCT vehicles. The BRT and light rail alignments would be in a separated transitway, so these travel times would be consistent and reliable.

### Freeway Congestion

There would be very little difference in auto volumes on I-5 between Bridgeport and Tualatin with a Tualatin HCT terminus compared to a Bridgeport terminus. Because there would be no designated park and ride lot at the Tualatin station, park and riders would utilize the Bridgeport station or alternative park and ride lot with or without the existence of a Tualatin station. As a result, 2035 projected I-5 and Lower Boones Ferry Road volumes between downtown Tualatin and Bridgeport in the PM 2-hour peak are virtually identical with or without a Tualatin terminus, with less than a 1% change in auto volumes on each facility.

### Potential for future HCT expansion

Any HCT expansion from this location would likely continue southwest toward Sherwood. An HCT extension from the Tualatin station may be feasible in the future, but would require considerable reconstruction of the station and potentially of the crossing of the Tualatin River to allow an LRT extension to cross above the Portland & Western Railroad and WES alignment. BRT could avoid an elevated station or structure for future expansion, but would then run in mixed traffic and subject to congestion and increased travel times and reduced reliability.

### Relationship with project goals

This location would support some of the Project Goals by increasing multimodal transportation options, transit service reliability, transit frequency and travel times for downtown Tualatin. It would provide HCT access to the Tualatin River Greenway and linked trails, and may thereby increase physical activity.

### Viable alternatives

A terminus at Bridgeport Village would be located just over a mile northeast of this location. Modeling shows that nearly 40% of the riders using a downtown Tualatin terminus in 2035 would transfer to or from local buses that also travel to Bridgeport Village, a five minute trip away. Some people who would walk to a Tualatin station would access Bridgeport Village by bus to transfer to HCT. As a result, a terminus at Bridgeport Village would serve many of the same riders who would use downtown Tualatin.

WES riders wishing to access the HCT line are not dependent on a downtown Tualatin station; they could transfer directly at Tigard Transit Center instead.

### Summary of pros and cons

A downtown Tualatin station would provide excellent accessibility from regional trails, would be an attractive location for transit-oriented development, would support a number of the project goals, and would serve a regional destination.

A downtown Tualatin terminus would not notably improve on a terminus located at Bridgeport Village and appears to be beyond the feasible project budget. The station site would not include a moderate-to-large park and ride or a transit center. Under current land use projections an HCT segment between Bridgeport and downtown Tualatin would increase construction costs proportionally more than it would improve ridership, and would not improve freeway conditions between the two station locations.

## Bridgeport Village

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The Bridgeport Village station would be located in the existing park-and-ride lots between Lower Boones Ferry Road/72<sup>nd</sup> Avenue and I-5, on either side of Bridgeport Road. The alignment crosses over Boones Ferry Road, with a station sited on top of two multi-story parking garages linked by a vehicular connection, which would replace the existing surface parking lots. Alternatively, an at-grade station could be located on the northern parking lot to remove the need for an HCT bridge structure over Boones Ferry Road, with the two parking structures linked by a pedestrian connection.

### Logistics

The station area is large and ample space would be available for vehicle turnaround and storage and driver facilities. The size of the park and ride lot could remain as it exists today or expanded to allow up to 700- to 900 spaces. The location is already served by local buses (including lines that would serve a downtown Tualatin station); the station would need to be designed to enable easy transfer between local buses and HCT.

### Existing/future transit connections

The location is served by the 36, 37, 38, 76, and 96 TriMet buses, as well as a SMART bus line. These buses link to the Lake Oswego, Barbur and Beaverton transit centers and provide express service to downtown Portland. The site has adequate capacity to handle more bus lines.

### Accessibility

The location is sited on two major roadways—Lower Boones ferry Road/72<sup>nd</sup> Avenue and Bridgeport Road—and at a freeway interchange with I-5. As a result, it is easily accessible by car. Bike lanes and sidewalks exist on the roads that serve the location, although bike lanes do not extend far northward on 72<sup>nd</sup> Avenue. The width of Bridgeport Road, however, makes it an undesirable walking and biking environment, so non-motorized access to the location should be considered limited.

### Ridership

According to initial projections, an LRT alignment terminating in Bridgeport Village would attract about 42,000 daily line riders in 2035, with about 7,300 daily ons and offs at the station. BRT model runs are in development.

### Total cost

Initial evaluation of local and federal funding capacity suggests that the total capital cost of reaching Bridgeport Village would be at the top end of the expected maximum budget for building the Southwest Corridor Plan.



### HCT performance

A terminus at Bridgeport Village would add 3.4 minutes to BRT travel time beyond the preceding station (Upper Boones Ferry) and 3.2 minutes to light rail travel time. Travel between these stations would be on a separate right-of-way along I-5 and potentially freight rail tracks, resulting in consistent and reliable travel times. The adjacent to freight rail alignment may need to pass through a signalized at-grade road crossing, which would slightly impact travel time and reliability if this alignment is utilized.

### Potential for future HCT expansion

This station location would allow for future extension southward toward downtown Tualatin and beyond. Current plans include options for the terminus to be entirely north of Bridgeport Road and options in which the park and ride lots north and south of Bridgeport Road are expanded to include several levels, with HCT traveling on structure over the roadway. An extension south of Bridgeport would likely require such a bridge.

### Relationship with project goals

A terminus in this location would support most of the Project Goals, in particular:

- Improving multimodal access to a range of housing types and business in a growing community,
- Improving the potential for housing and commercial development in the corridor, and
- Encouraging development in centers and transit-oriented development at stations along the corridor.

### Viable alternatives

Bridgeport Village would offer the combination of several factors desired in a terminus: a major regional destination, strong transit connections, and capacity for a large park-and-ride. A downtown Tualatin terminus would not offer these same benefits.

### Summary of pros and cons

Bridgeport Village provides one of the most viable terminus locations in the Southwest Corridor. The location has ample room for terminus logistics and additional park-and-ride capacity, is well served by transit and located at a major regional destination, can be reached directly off major roadways and I-5, and supports a number of project goals.

Bridgeport Village does not have good bicycle and pedestrian connections, especially compared to downtown Tualatin.

## Recommendation

Based on the facts and analysis described in this memo, project staff recommends that a terminus in downtown Tualatin be removed from further consideration. A terminus at Bridgeport Village would result in a more cost-effective project and would have logistic advantages compared to a project terminating in downtown Tualatin. It would serve many of the projected Tualatin station users equally well.

Because of its proximity to employment and opportunities for future transit-oriented development, and because of its good bike and pedestrian connections, downtown Tualatin could serve as a good station location in a future expansion.

### Summary Table: Terminus Options Considerations

	Bridgeport Village terminus	Downtown Tualatin terminus
Terminus logistics	Large area convenient for bus transfers, vehicle turnaround and storage, and park and ride lot	Small station area difficult for bus transfers, vehicle turnaround and storage. No designated park and ride lot
Number of connecting bus lines (today)	6 direct	1 direct; 2 indirect
Accessibility	By auto – very good; by bike/ped – poor	By auto – OK; by bike/ped – good
Ridership/Cost	42,000 daily line riders; 7,300 daily station ons and offs	3.5% increase in line ridership and 7%-12% increase in costs compared to Bridgeport; 3,800 daily station ons and offs terminus.
Affordability	Appears within funding capacity	Appears to exceed funding capacity

## Next Steps

In December 2015, the Southwest Corridor Steering Committee will make a decision on this recommendation.

In April 2016, the steering committee is scheduled to adopt the Final Preferred Package for the Southwest Corridor Plan. The steering committee will take into account any further analysis on terminus options and the February 2016 decision on mode, and use this information to identify the preferred northern and southern termini for the HCT system.