Lynnwood City Center Extension Study

Technical Memorandum

Extension of Light Rail to Lynnwood City Center

SOUND TRANSIT
401 South Jackson Street
Seattle, WA 98104-2826

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North Corridor Transit Partners
PARAMETRIX + PARSONS BRINCKERHOFF

This analysis is a starting point for continued discussions on how ST2 relates to the Lynnwood City Center and how LRT service may best be located to support the City Center and achieve transit-oriented development as envisioned in the adopted City of Lynnwood City Center Sub-Area Plan.

The City of Lynnwood and Puget Sound Regional Council have long recognized the importance of the development of both Lynnwood's City Center and the larger Sub-Regional Center that includes City Center plus the greater Alderwood Mall area and the Transition Area that links them. At build out, the area will be the largest concentration of urban development between Seattle and Everett. It will accommodate thousands of residents, tens of thousands of jobs and millions of square feet of office, retail, and housing development.

Multi-modal access support of bi-directional commuting is clearly required to meet local and regional development goals. While the Lynnwood Transit Center and existing local and express bus service represent a good start, much more support is required. Extension of Light Rail Transit (LRT) service to the Transit Center approved by the voters in ST2 represents a major element but by itself will not be sufficient to achieve PSRC policy objectives and support transit-oriented development. The Transit Center is located at the periphery of City Center, is focused almost entirely on commuters to points outside of Lynnwood and is already at or near capacity. LRT is needed to effectively serve the City Center area.

The City's initial evaluation of City Center LRT station site alternatives were included in the City of Lynnwood Mode Split for City Center Street Master Plan (December 2009, Perteet, Project Number 28035). This analysis studied how station placement may be designed to meet both the needs of commuters to the Lynnwood Transit Center, as well as those who live, work and do business in the City Center. This study and a related analysis hosted by the Urban Land Institute, determined that the Transit Center service for the City Center was problematic for pedestrians and proposed development due to the distances involved and barriers to access by major thoroughfares.

After learning that Sound Transit was receptive to shorter station spacing in the Bel-Red Corridor to serve planned urban scale development, the City of Lynnwood began to explore options to serve City Center proper. While fully understanding that funding for such an extension does not currently exist, the City wanted to achieve the following goals:

- *Analyze the potential opportunities and constraints for a future City Center station including likely routing, cost and ridership,*
- *Gain the knowledge required to ensure that the approved Transit Center station routing and design facilitates the eventual extension of the LRT line to City Center and points north in and past Lynnwood to Everett,*

LYNNWOOD
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COMMUNITY DEVELOPMENT

- *Provide guidance to refine City Center planning and facilitate the eventual extension of the LRT line, and*
- *Serve as the basis for proposals to extend the LRT to a City Center station under ST2 should funding become available or as part of a future ST3 program that would need to be approved by the voters.*

The City also wishes to restate our support for the voter-approved ST2 project terminating LRT at the Lynnwood Transit Center. Our City Council has adopted resolutions supporting the project. The City is also represented on several groups working cooperatively with Sound Transit to realize the goals of ST2 to bring LRT service to Lynnwood by 2023 or earlier, if possible.

Paul Krauss AICP *Community*
Development Director

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Acronyms and Abbreviations

EIS	Environmental Impact Statement
FTA	Federal Transit Administration
GIS	geographic information system
GMA	Growth Management Act
HOV	high-occupancy vehicle
I-5	Interstate 5
mph	miles per hour
O&M	operation and maintenance
PSRC	Puget Sound Regional Council
PUD	Public Utility District
Sound Transit	Central Puget Sound Regional Transit Authority
ST2	Sound Transit 2
WSDOT	Washington State Department of Transportation

1 INTRODUCTION

This technical memorandum summarizes the results of the Lynnwood City Center Extension Study, examining a potential light rail extension from the Lynnwood Transit Center to a station within the City of Lynnwood's City Center area. The extension is not part of Sound Transit's voter-approved Northgate to Lynnwood Transit Center extension project (North Corridor Transit Project) and is not included in either the NEPA/SEPA environmental review or Federal Transit Administration (FTA) 'New Starts' grant processes being undertaken by Sound Transit and FTA for that project. Sound Transit performed the Lynnwood City Center Extension Study at Lynnwood's request and cost to provide information about the potential costs and benefits of a representative light rail extension for the city's planning purposes only.

1.1 Project Background

The Central Puget Sound Regional Transit Authority (Sound Transit) intends to improve the regional mass transit system in the North Corridor by extending mass transit from the planned interim terminus of Link light rail at Northgate in the city of Seattle to the Lynnwood Transit Center in the city of Lynnwood in southern Snohomish County, as shown in Figure 1-1. These project limits were approved by voters in the region with the passage of the Sound Transit 2 (ST2) ballot measure in 2008. The 2008 vote provides the local funding for the extension as part of the larger ST2 program, and Sound Transit intends to seek federal funding through the Federal Transit Administration (FTA) New Starts Program. The Northgate to Lynnwood project is currently known as the North Corridor Transit Project. As part of the federal regulations and guidelines leading to application for New Starts grant funds, Sound Transit completed an Alternatives Analysis (Sound Transit 2011a) that evaluated several options for addressing mobility needs in the North Corridor.

Washington State's Growth Management Act (GMA) requires state and local governments to manage growth by identifying and protecting critical areas and natural resource lands, designating urban growth areas, and preparing comprehensive plans supported by capital investments and development regulations. The Puget Sound region has a coordinated series of regional, county, and local plans and policies that guide how the region manages its growth, consistent with Washington State's GMA. The primary plans at the regional level are the Puget Sound Regional Council's (PSRC) *VISION 2040* (PSRC 2009) and *Transportation 2040* (PSRC 2010). These plans share land use, growth management, and transportation policies that assume the regional high-capacity transit system will link the urban centers where the region's growth will be focused. PSRC-designated Regional Growth Centers in the North Corridor—those areas projected to accommodate a substantial amount of future development—include Everett, Lynnwood, Northgate, and downtown Seattle.

Figure 1-1. North Corridor Project Area and Relation to Link Light Rail System

To accommodate future growth as projected by PSRC, the City of Lynnwood adopted a City Center Sub-Area Plan in March 2005 and amended in September 2007 (City of Lynnwood 2005, 2007). The City Center Sub-Area is located in the southwest portion of the Lynnwood Urban Growth Center adopted by Lynnwood in 1995 and recognized by PSRC. This plan is shown in Figure 1-2. The plan seeks to create a central focus for the community by concentrating future development into a compact, mixed-use, pedestrian-friendly, and transit-supportive center that will become a regional destination. The existing Lynnwood Transit Center, currently served only by bus, is located on the southwestern edge of the City Center approximately a half-mile from the heart of the sub-area, and a mile from the northeastern boundary of the growth area. A subsequent study, City of Lynnwood Mode Split for City Center Street Master Plan (City of Lynnwood, 2009) indicated that a light rail station located farther to the northeast would be more accessible to the employees forecasted to work in the City Center, potentially increasing transit's overall share of commuter travel. Section 3.2 of this Technical Memorandum outlines additional factors that could affect future ridership that were not included in this analysis.

After performing further analysis subsequent to the adoption of the City Center Sub-Area plan, the City is reviewing amendments to the development regulations which would reduce the number of required grid streets as shown in Figure 1-3, and provide added flexibility to achieve the desired development and densities. Also under consideration are zoning changes to the Transition Area between City Center and Alderwood Mall that would provide for mixed-use development between the City Center and the Alderwood Mall within the designated PSRC Urban Growth Center.

Figure 1-2. Adopted City Center Conceptual Plan, 2005, amended 2007

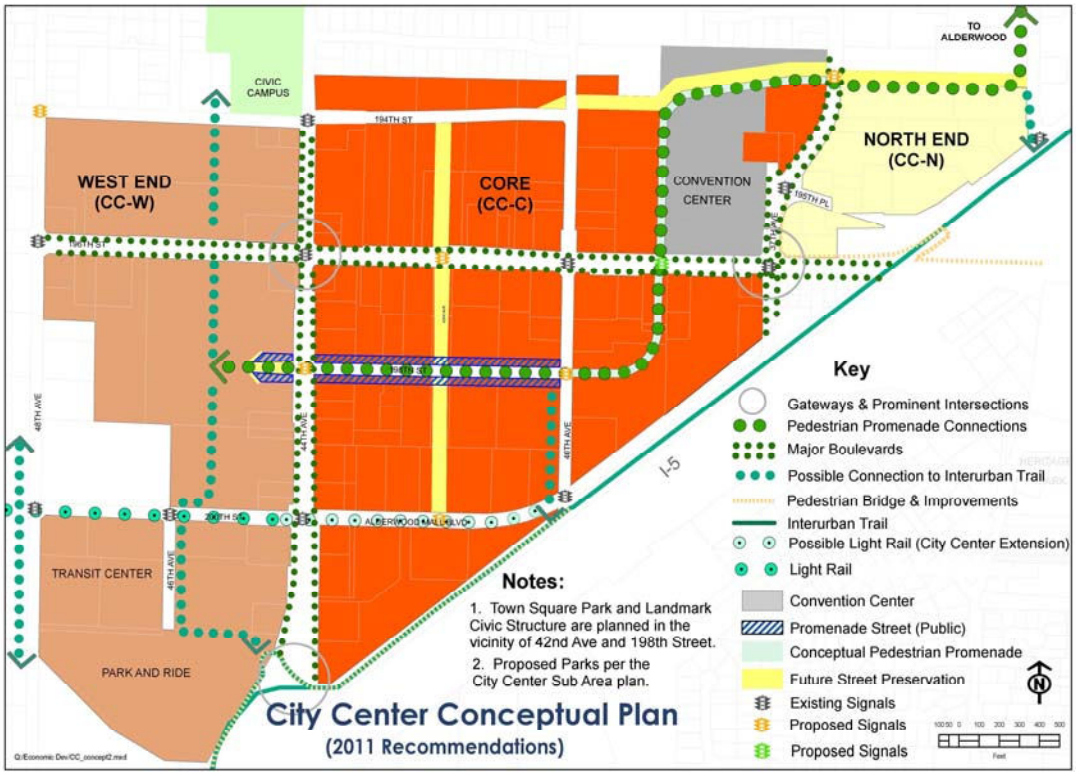


Figure 1-3. Proposed 2011 City Center Conceptual Plan

1.2 Study Purpose

The purpose of this study is to develop a representative concept for a more centrally located station within the core of Lynnwood's proposed City Center and a representative light rail alignment to connect the City Center Station to the planned Lynnwood Transit Center Link Station. The purpose of the City Center Station is to provide more convenient walk access for the employees and residents of the growing center, encouraging a higher level of transit use and aiding economic development of the City Center. The representative light rail alignment will be used to gain a better understanding of an alignment and configuration for the guideway extension as well as the additional station, develop estimates of costs and ridership, and assess general environmental issues. The representative alignment and station do not reflect a preferred project, but one that can reasonably represent several options that are possible for this segment.

1.3 Summary Conclusions

The study began with the development of a number of concepts for the addition of a Lynnwood City Center Station based on the work completed to date in the North Corridor Transit Project Alternatives Analysis (Sound Transit 2011a). The most promising concept

proved to be an extension from the Lynnwood Transit Center to the north and east parallel to Interstate 5 (I-5) and along the edge of the Public Utility District (PUD) right-of-way and Alderwood Mall Boulevard. Following internal review and discussions with City of Lynnwood staff, an all aerial alignment to a new aerial station near Alderwood Mall Boulevard and 36th Avenue West was chosen for analysis. While many other alignments are possible, depending on the configuration of the Lynnwood Transit Center Station, based on consultation with City of Lynnwood staff this option was considered the most representative and provided the best concept to analyze to meet study objectives.

Table 1-1 provides a summary of key features of this alignment and the station. Specific parameters of the conceptual station, platform, cross-over tracks and tail tracks were identified as representative for the purposes of this analysis; however, these parameters would be subject to further evaluation and environmental review if further study were to be undertaken. The extension consists of roughly 3,400 feet of new dual trackway including the center platform station, as well as cross-over tracks and tail tracks beyond the station to provide for end-of-the-line train storage and turnback. The total cost of the extension and station is estimated to range from $194 to $233 million (mid-2010 dollars) inclusive of right-of-way and five additional light rail vehicles.

The new station is estimated to generate a total of 2,800 daily boardings in the year 2030, of which 400 would be new boardings with the remainder shifting from the Lynnwood Transit Center Station. The ridership forecasts are based on the current adopted PSRC land use forecasts for this area, which are the same with or without the new rail station. Thus, boarding estimates do not take into account additional riders that might result from economic development around the City Center Station and the proposed "Transition Area" between the City Center and Alderwood Mall. If the light rail extension and new station prove a catalyst for significant new economic development in the Lynnwood City Center and Transition Area then new rail ridership at the City Center Station and total rail ridership on the extension could be higher. Community Transit's possible implementation of BRT service along 196th Street was also not considered in the rail ridership forecasts. If implemented this line would provide feeder connections to light rail from Edmonds and Mill Creek, including a connection to *Swift* service on SR 99, and could result in some increased rail ridership.

Finally, although the extension is not anticipated to have any notable environmental effects, the extension alignment is located on predominantly new transportation right-of-way and would displace some commercial uses, including possibly a hotel.

Table 1-1. Summary Characteristics of Lynnwood Transit Center to Lynnwood City Center Extension

Alignment/Station Configuration and Cost Characteristics	Specifications
Added Route Length	3,400 feet
Station Configuration	Center Platform Aerial
Added One-Way Travel Time	2 minutes
Additional Light Rail Vehicles Required	5
Capital Costs (mid-2010 dollars)	$194 to $233 million
Annual Operating and Maintenance Costs (mid-2010 dollars)	$1.1 to 1.7 million
Year 2030 Daily Boardings at Lynnwood City Center Station	2,800
Year 2030 Total New Daily Boardings in Lynnwood	400

1.4 Organization of Technical Memorandum

This memorandum is organized into four sections in addition to the introduction:

- Concept Definition
- Land Use, Access, and Ridership Considerations
- Environmental Considerations
- Capital and Operating Cost Estimates

2 CONCEPT DEFINITION

A representative route has been developed to extend the light rail system from the Lynnwood Transit Center to the vicinity of the Lynnwood Convention Center located within the proposed Lynnwood City Center. The potential guideway alignment, station concept, and associated transit operations are described in this section, and illustrated in Figure 2-1. Several guideway alignment and station configurations were studied for the Lynnwood Transit Center Station as part of the North Corridor Alternatives Analysis. Additional alternatives will be explored in the next phase of conceptual design supporting the development of a Draft Environmental Impact Statement (EIS) for the project. Although all the options share a common approach from the south along I-5, there could be significantly different locations and orientations for the station and guideway connecting the Lynnwood Transit Center to I-5. These, in turn, provide a number of options for the extension to the Lynnwood City Center. Thus, the guideway alignment and station concepts developed and assessed in this study are representative only for the purposes of understanding potential ridership, costs, and impacts.

At the Lynnwood Transit Center, light rail stations running west to east and south to north were explored as part of the Alternatives Analysis. The west-to-east-oriented station was located south of the transit center and north of the park-and-ride lot, while the south-to-north-oriented station was located parallel to the 46th Avenue West direct access ramp to the I-5 high-occupancy vehicle (HOV) lanes. Other Lynnwood Transit Center Station orientations and locations are possible and will be studied further during the project's EIS. For the purposes of developing a representative alignment for the Lynnwood City Center station, the west-to-east configuration was assumed for the Lynnwood Transit Center Station as shown in Figure 2-1 and in the detailed drawings included in Appendix A. Several factors establish the basis for the extension from the transit center. The North Corridor Transit Project terminates the light rail line at the Transit Center where tail tracks and cross-over tracks are required beyond the station platform to allow trains to efficiently reverse direction and is operationally required to maintain projected future system headways of four minutes. The tail tracks and cross-over tracks require a straight alignment approximately 1,000 feet long. In combination with the station platform, this produces the requirement for a straight alignment segment of nearly 1,500 feet, which becomes a major factor limiting the options for station placement. If an extension to the City Center is included upon startup of the project, then the cross-over tracks and tail tracks would be shifted to a location beyond the City Center station, which places similar limitations on the location of that station.

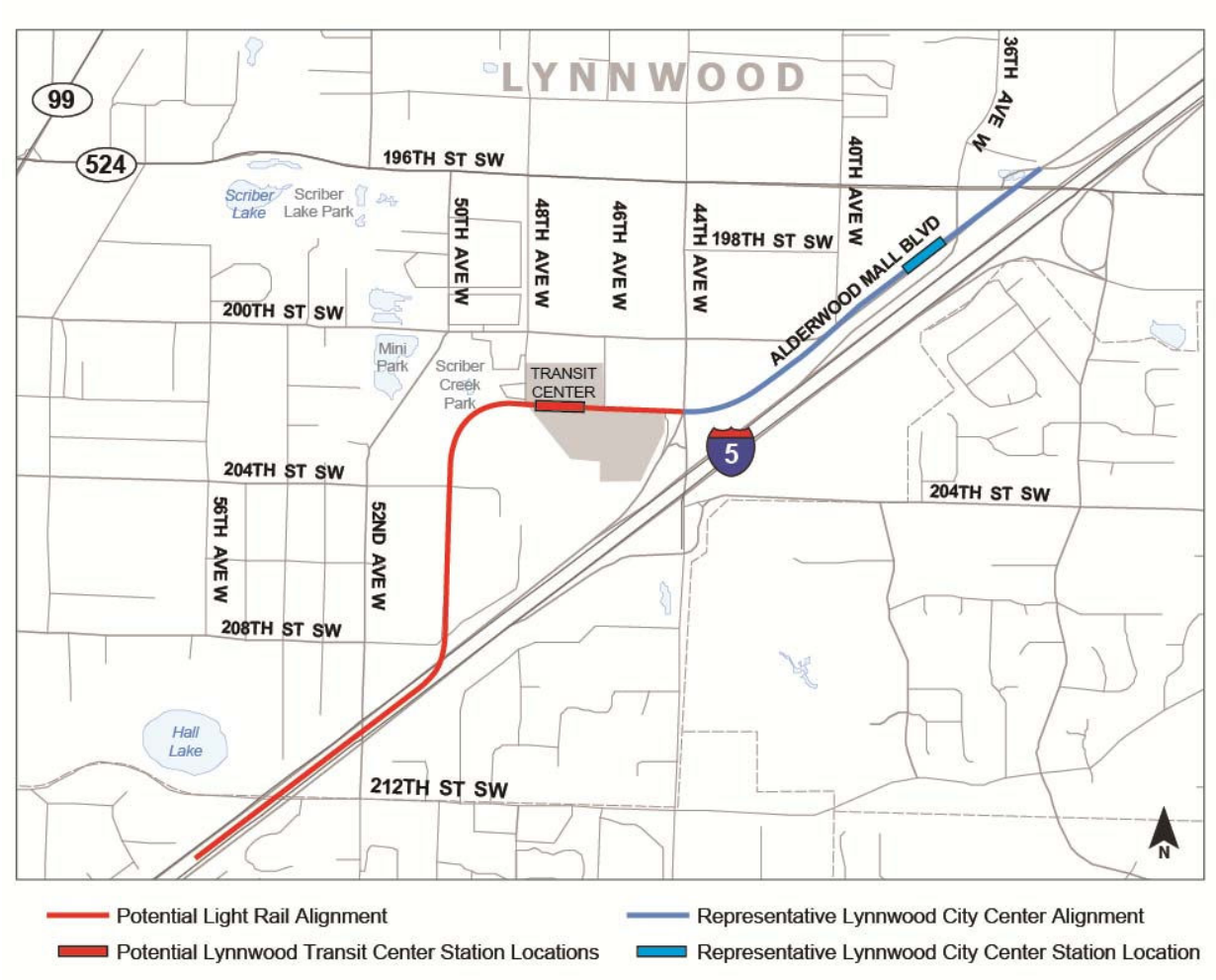


Figure 2-1. Lynnwood Transit Center Station Options and Representative Extension to Lynnwood City Center

Under the assumed configuration for the Transit Center light rail station platform and tail tracks, the alignment extension to the City Center was placed to the north and west of the PUD right-of-way parallel to I-5 and then along the north and west side of Alderwood Mall Boulevard. This proposed route would locate the City Center light rail station adjacent to Alderwood Mall Boulevard near the southbound on-ramp to I-5. Other alignments were explored for the extension; however, the representative alignment described in the following section was chosen because it is consistent with the North Corridor Alternatives Analysis (Sound Transit 2011a) and the Lynnwood City Center Sub-Area Plan (City of Lynnwood 2005a). It also provides the option for the trail track and cross-over operation at both the Transit Center and the City Center location, although only one location is assumed in the cost analysis. This route is described in more detail in the following section.

2.1 Route Alignment

The representative alignment of the extension to the City Center Station begins at the end of the elevated guideway tail tracks planned for the Lynnwood Transit Center Station as defined in the North Corridor Transit Project Alternatives Analysis (Sound Transit 2011a). The alignment would continue in an elevated profile to the east across 44th Avenue West, after which it would begin to curve to the northeast, following the west side of the PUD utility corridor and Alderwood Mall Boulevard to an elevated station at 36th Avenue West, just south of 196th Street SW. The City Center Station is approximately two-thirds of a mile from the Lynnwood Transit Center Station along this alignment. A tail track of approximately 1,000 feet in length would extend north of the station, crossing over 196th Street SW. A drawing of the conceptual alignment is provided in Attachment A. The entire alignment was assumed to be on elevated guideway because an initial analysis concluded that opportunities to reduce costs by bringing the alignment to grade level were not possible in this short section.

2.2 Station Concept

2.2.1 Station Program

The proposed location for the representative City Center Station developed for this study is on the east end of the City Center Core "district" within the City of Lynnwood's planned City Center sub-area. As such, it is in proximity to the highest density areas within the City Center as designated in the City Center Sub-Area Plan (City of Lynnwood 2007a), providing convenient access to this future development as well as to the Lynnwood Convention Center and, to a lesser degree, the Alderwood Mall area. Primary access to the station is anticipated to be by walking, although bicycle and local bus service access is also likely. No park-and-ride facilities will be provided at the station and designated passenger pick-up/drop-off facilities have not been provided; hence, access by automobile is expected to be minimal. The concept is an elevated station with a center platform and a plaza linking the station to adjacent pedestrian connections. If implemented as part of the North Corridor Transit Project, this station would serve as the terminus for the North Corridor light rail line, and would be designed with a tail track of approximately 1,000 feet beyond the station to accommodate train storage and turn-back capabilities.

2.2.2 Conceptual Station Layout

Conceptual drawings of the City Center station are provided in Attachment B. The representative station is located at the intersection of 36th Avenue West and Alderwood Mall Boulevard, with the guideway and station both parallel to I-5 and Alderwood Mall Boulevard. The existing topography of the site places the plaza about 20 feet above adjacent pedestrian connections, which can be accessed via elevator and stairs. The northeast end of the station

is linked to a broad pedestrian path connecting to the Convention Center and 196th Street SW. A buffer along the east edge of the path could screen it from the adjacent I-5 on-ramp traffic. The southwest end of the station is designed so as to provide a future connection to a planned pedestrian promenade connecting to the west and north.

Existing automobile access from Alderwood Mall Boulevard to the station is also maintained for future consideration. A connection could also be provided between the Interurban Trail, located southeast of and parallel to Alderwood Mall Boulevard, and the pedestrian path leading to the station and Convention Center. The plaza of the station itself could serve as a pedestrian connection as well, between the future pedestrian promenade and the Convention Center. The station platform is approximately 23 feet above the plaza and would be connected via escalators, elevators, and stairs. The visual impact of the station would be minimized by its proximity to I-5 and the physical impact on the site minimized by its location at the property edge.

2.3 Service Plan

2.3.1 Rail Operations

The conceptual alignment of the extension would be fully double-tracked and rail service would be operated as part of the full system. The City Center Station would serve as the terminus of the system until further extensions are built. A tail track would be constructed beyond the station to facilitate turn-back and storage for trains.

The existing Sound Transit Long-range Operations Plan (Sound Transit 2011b) and Sound Transit Fleet Management Plan (Sound Transit 2011c) for the light rail system operating from Kent/Des Moines to Lynnwood and Overlake to Lynnwood through 2030 were the basis for the fleet requirements for all North Corridor light rail alternatives.

Operating plans for the North Corridor light rail alternative between Northgate and Lynnwood Transit Center call for peak operating headways (the time between successive train movements in a given direction) of 4 minutes to meet the travel demand forecasts. The added "cycle time" (round trip from Lynnwood Transit Center to Lynnwood City Center and back to Lynnwood Transit Center) that results from the extension of the line is approximately 4 minutes. Determining the number of trains required to provide service is defined by the equation: "Trains = Total Cycle Time/Headway" (with Trains always an integer). This extension would require one additional train set consisting of four light rail vehicles because the added cycle time is approximately 4 minutes, with a required headway of 4 minutes. It is also Sound Transit policy to account for spare vehicles at the rate of 15 percent of the total fleet required to operate the line. Based on this calculation, a total of five light rail vehicles would be required for this extension.

2.3.2 Bus Integration

No changes to local transit operations from those documented in the North Corridor Transit Project Alternatives Analysis (Sound Transit 2011a) are assumed in association with the extension to the City Center Station, although Community Transit may choose to make schedule or route changes to better serve the station.

The east/west corridor from Edmonds to Mill Creek along 196th through the Lynnwood City Center is one of several corridors being considered by Community Transit for new BRT service. Should this route be implemented, it would connect the City Center station to existing *Swift* BRT service on SR 99, as well as provide light rail feeder service to the larger market extending west to downtown Edmonds and east to Mill Creek.

3 LAND USE, ACCESS, AND RIDERSHIP CONSIDERATIONS

3.1 Land Use

Connecting Lynnwood to other designated Regional Growth Centers such as Northgate and downtown Seattle and eventually Everett is a Sound Transit goal, as well as an integral component of PSRC's *VISION 2040* (PSRC 2009). Consistent with its designation as a Regional Growth Center, Lynnwood has developed a vision, and has adopted plans and policies to achieve regional growth targets with a specific focus in the City Center as illustrated in Figure 1-2. A City Center Sub-Area Plan was adopted in 2005 and amended in 2007 with the objective "to create within 20 years, a compact, intense and lively city center that offers Lynnwood new opportunities for culture, commerce and habitation." Strategies to implement this vision include a parking management program, creation of a Business Improvement District, and a Multi-Family Residential Property Tax Exemption Program adopted in 2007. This effort recognizes the Lynnwood Transit Center and its importance as a major transit facility, as well as the value of transit-supportive and mixed-use land uses in the City Center sub-area.

The City Center Station and the Lynnwood Transit Center Station are both located within the designated City Center sub-area, as illustrated in Figure 3-1. The City Center Sub-Area Plan, adopted in 2005, provides the framework for the future vision of a mixed-use urban core. The plan includes establishing a compact street grid within the core and a series of parks and plazas connected by boulevards and pedestrian promenades. Included in the plan are also zoning regulations and design guidelines to support a high-density neighborhood with mixed use residential development in City Center "districts". The ratio of the uses within each district varies. The proposed City Center Station is located on the east end of the City Center Core district, adjacent to Alderwood Mall Boulevard. This district is envisioned to include a mix of office, retail, service, and residential uses with building heights up to 350 feet. To the

north of this proposed station is the Transition Area, with the intent of providing a transition between Alderwood Mall and City Center. A mix of uses at a lower intensity is planned for this area. The Lynnwood Transit Center Station is located in the City Center West district, with similar proposed uses but at less density with a 140-foot height limit.

Other transit-supportive plans and policies adopted by the City of Lynnwood include Lynnwood Comprehensive Plan (revised 2010); City Center Design Guidelines (2005); Local Improvement District Feasibility Study (2008); Market Analysis and Absorption Study (2007); and a Multi-Family Residential Property Tax Exemption Program.

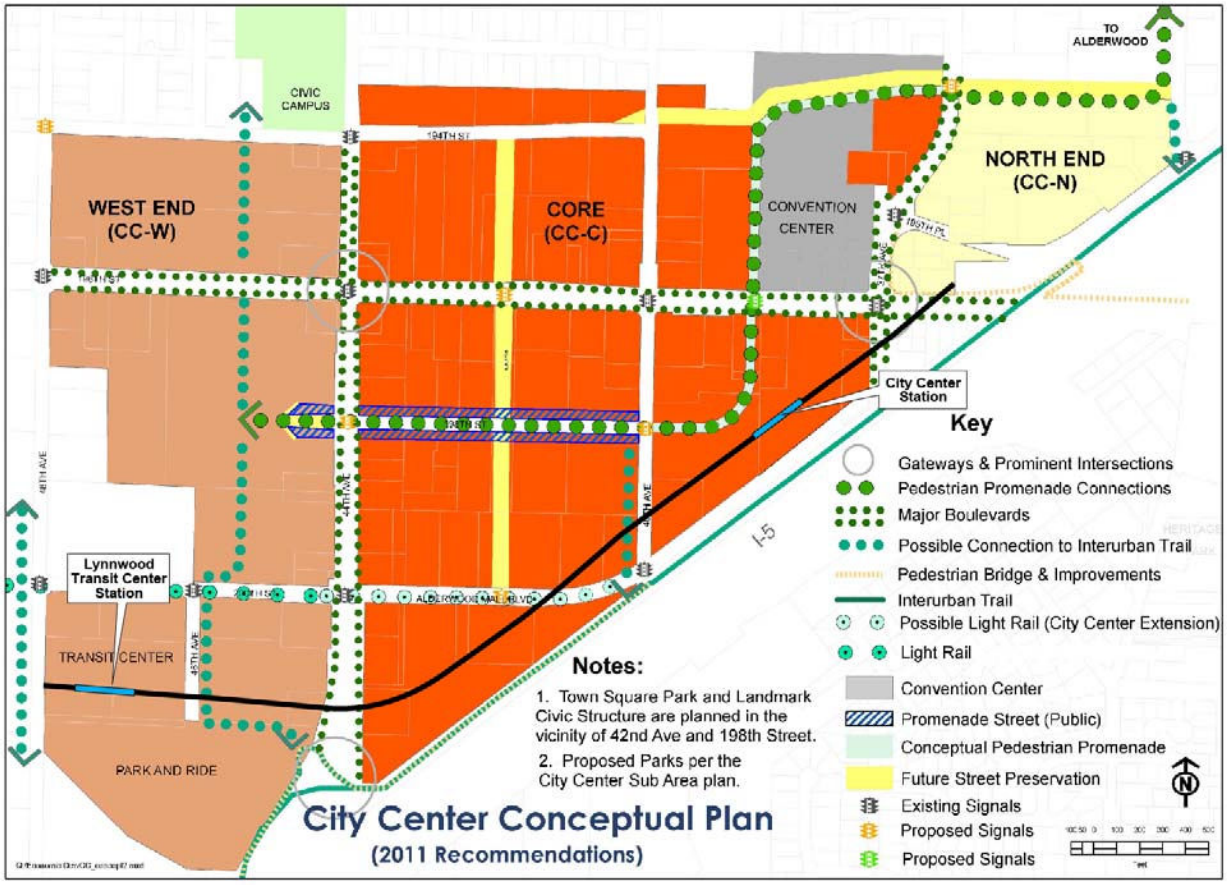


Figure 3-1 City Center Conceptual Plan with Representative Light Rail Alignment and Station

The existing conditions surrounding the City Center Station differ from what is proposed in the adopted planning documents. Currently, the area around the station is not designed for pedestrians; automobile-dependent businesses are set back from the street frontage and surrounded by surface parking lots. The block sizes are large, 1,200 feet long in the City Center area. Sidewalks without a buffer exist within most of the area with no defined pedestrian paths between the sidewalk and building entrances. Buildings range in size from

small single businesses to "big-box" retail and strip malls. A few motels and hotels are within the station area. Existing housing within the station area but outside of the City Center area is located to the northeast and southwest of the station in a mix of low-rise multi-family developments and single-family neighborhoods.

3.2 Access and Ridership

With two light rail stations located two-thirds of a mile apart, both within the proposed Lynnwood City Center, it is likely some overlap will occur in markets served. The Lynnwood Transit Center Station is targeted to serve those riders transferring from buses or utilizing the adjacent parking facility. The City Center Station is planned to serve riders who live and work within the City Center. How the City Center develops in the future may be influenced by the two stations and the different markets they serve. Table 3-1 shows existing and year 2030 forecasted population and employment within a half-mile of the Lynnwood Transit Center and City Center stations. Adjusting for the overlap of the two market areas, the Lynnwood City Center Station results in an estimated net additional population of approximately 2,300, and 4,400 net additional jobs within a half-mile of the two stations combined in year 2030.

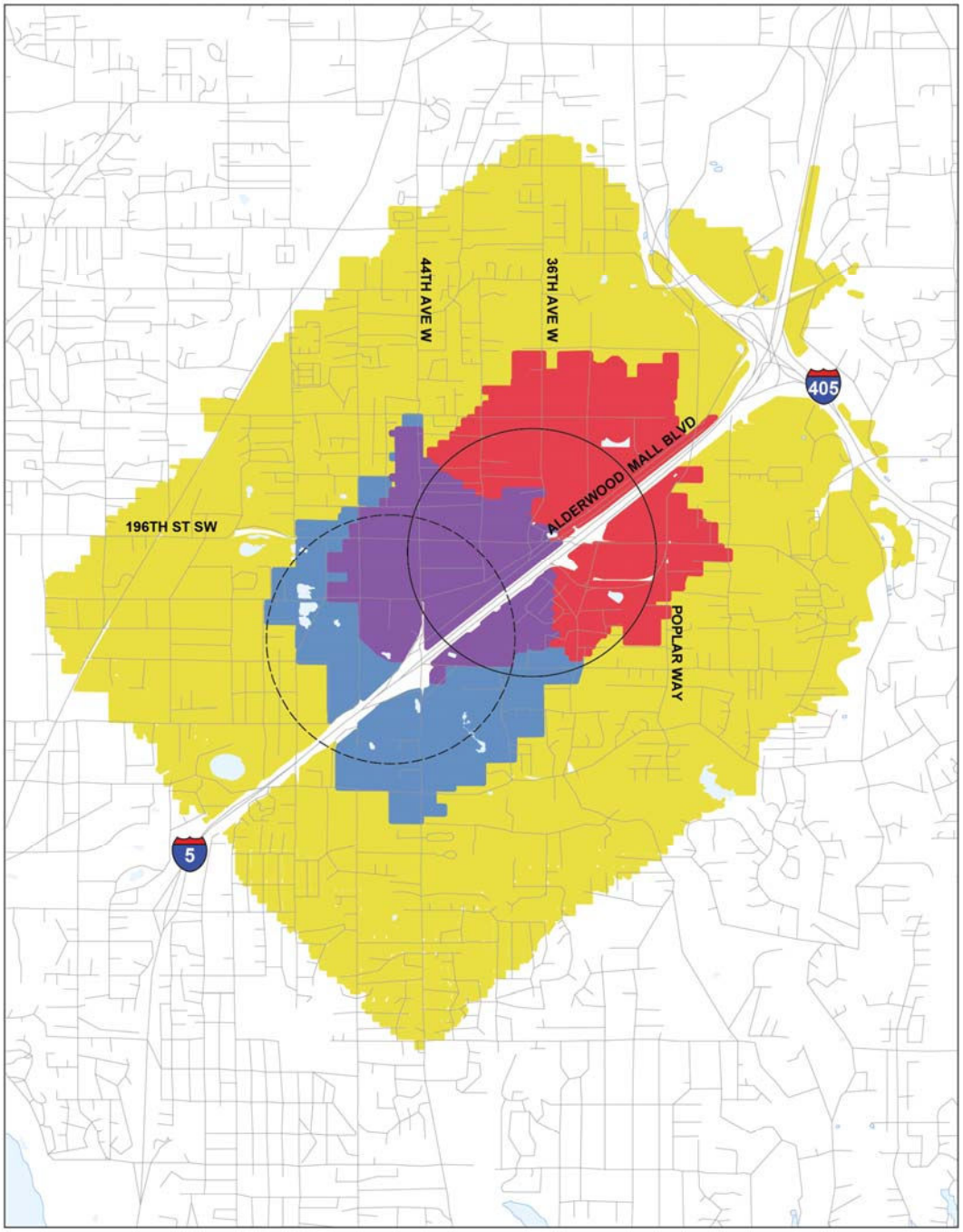
Table 3-1. Population and Employment within Half Mile of Lynnwood Stations*

	Transit Center Station		City Center Station		Total Combined**	
Measure	Existing (2009)	Forecast (2030)	Existing (2009)	Forecast (2030)	Existing (2009)	Forecast (2030)
Population	2,800	3,500	1,800	2,400	4,600	5,800
Employment	3,300	4,700	3,900	6,200	6,100	9,100

* Source: Based on PSRC Regional Forecasts

** Totals for both stations combined are less than the sum for the individual stations because of the overlap in the half mile catchment areas as shown in Figure 3-2.

Figure 3-2 illustrates a 15-minute travel shed for each station. For pedestrians, the 15-minute walk is based on a 3-mile-per-hour (mph) walking speed, or a distance of approximately 4,000 feet from a station location. For bicycles, the 15-minute travel shed is based on an average bicycling speed of 7 mph, or a distance of 1.75 miles. For the purposes of this study, neither the pedestrian nor bicycle speeds were adjusted for



15-minute Walk Shed from Lynnwood Transit Center Station
15-minute Walk Shed from City Center Station
15-minute Walk Shed from either station (Walk Shed overlap)
15-minute Bike Shed from either station (Bike Sheds combined)

Walk speed = 3 Miles per hour
Bike speed = 7 Miles per hour
0.5 Mile Lynnwood Transit Center Station Area
0.5 Mile City Center Station Area

Figure 3-2. 15-Minute Pedestrian and Bicycle Travel Sheds at the Lynnwood Transit Center and Lynnwood City Center Stations.

topography. The travel distance was determined from geographic information system (GIS) mapping along public roadways and walking/cycling paths, and was measured from station locations up to a parcel edge. The travel shed diagrams show the overlap in the markets for the two stations.

Ridership forecasts for the proposed City Center Station were developed by first estimating the number of riders currently projected to use the Lynnwood Transit Center Station (as estimated in the Alternatives Analysis [Sound Transit 2011a]) who would instead use the City Center Station. In addition, an estimate was made of how many new light rail riders would be attracted by the City Center Station, based on the travel shed diagrams. Because there will be no park-and-ride capacity at the City Center Station, no trips were assumed to arrive by automobile. Also, because the bus transit hub is assumed to remain at the Transit Center (which is served by direct access ramps from I-5), only a small percentage of riders arriving by bus was assumed for the additional City Center Station. The resulting ridership estimate for the City Center Station is 2,800 daily boardings as shown in Table 3-2. Note that the effect of the City Center Station on previously estimated ridership at the Lynnwood Transit Center Station is a reduction of approximately 2,400 daily boardings, from 16,500 to 14,100.

Table 3-2. Estimated 2030 Ridership

Station	Estimated Daily Boardings
Lynnwood Transit Center (without City Center Station)	16,500
Lynnwood Transit Center (with City Center Station)	14,100
Lynnwood City Center	2,800*

* Addition of the City Center Station results in a net increase of 400 boardings.

Thus, the addition of the Lynnwood City Center Station results in a net increase of 400 riders in 2030 over the ridership forecast without the extension and only the Lynnwood Transit Center Station. A number of factors contribute to this result. Because no additional park-and-ride capacity would be provided at the City Center Station, access would be limited to walking, bicycling, drop-off, and local bus service. As shown in Figure 3-2, a significant portion of the travel shed for the City Center Station overlaps with the travel shed for the Lynnwood Transit Center Station, so many of the riders at the City Center Station would otherwise use the Transit Center Station. Also, the Lynnwood Transit Center would continue to be a major focal point for bus service in south Snohomish County, and hence the primary regional location for interface between bus and rail. Therefore, while some local bus service

would be expected to serve the City Center Station, overall bus access to rail at that location is anticipated to be small in comparison to the transit center station. A BRT line along 196th Street SW, should it occur, may contribute some additional bus access trips to the City Center Station. Finally, the same land use (population and employment) was assumed with or without the extension and new station.

An analysis of the potential for such economic development and the resulting change in ridership is beyond the scope of this study. However, there are some considerations that could influence the ridership at the City Center Station and potentially the Lynnwood Transit Center Station as well. These include:

- Community Transit's consideration of a BRT corridor along 196th Street, potentially providing an east-west connection to BRT on SR 99, as well as feeder service from Edmonds and Mill Creek. This is not explicitly accounted for in the analysis and could result in some increased ridership.
- Adoption of new plans and regulations for the "Transition Area" located between City Center and Alderwood Mall. This could impact zoning and land use regulations and increase the population and employment near the station and hence the number of riders using the station.
- If the extension and new station prove a catalyst for significant new economic development in the Lynnwood City Center, then new rail ridership at the new station and total rail ridership on the extension line could be higher.

4 ENVIRONMENTAL CONSIDERATIONS

This section discusses the potential environmental considerations for the light rail extension and new station in the Lynnwood City Center. In general, the impacts of the extension would be low, although there is the potential for property impacts affecting several businesses.

4.1 Right-of-way Effects

For right-of-way effects, the project team considered the conceptual layout of the alignment, including a conceptual station configuration and elevated guideway alignment, which would require property outside of existing street or highway rights-of-way.

An elevated guideway for light rail typically requires a continuous right-of-way of at least 30 feet in width, which would widen at the stations. Because much of the alignment is outside of existing public rights-of-way, about 20 properties would be crossed and full acquisition of three properties is likely to be required, including the displacement of a hotel. The three properties likely to be affected are commercial businesses.

4.2 Effects on Communities and Neighborhoods

The alignment would have a fairly low potential to affect neighborhoods or low-income and minority communities. There are no residential neighborhoods immediately adjacent, and the acquisitions do not remove residences or community facilities. The alignment is generally along a freeway, roadway corridor and electric transmission corridor, and would not be likely to greatly alter the existing noise, visual, or traffic conditions in the area. There would be at least one noise-sensitive property nearby (one to two hotels, depending on acquisitions). There are also houses of worship in the area, but no impacts are expected. A portion of the representative alignment would be located near the Interurban Trail, but the representative alignment is not expected to affect the function of the trail.

4.3 Effects on Sensitive Resources

This measure examines the potential for effects on sensitive resources, including parks, historic sites, streams/lakes/wetlands, or endangered species habitat. Given the conceptual nature of the alignment, this is a qualitative measure based on the general location of the alignment and the likely impacts of right-of-way needs as well as related construction and operation impacts.

The Lynnwood City Center extension would have a low potential for effects on sensitive resources because it is located in a developed urban environment and would avoid intruding on the few nearby natural or recreational resources. A stream and wetland complex is located to the south, and the Interurban Trail is to the east. There are no properties listed on or

previously determined eligible for listing on the National Register of Historic Places. There is a low potential for impacts on historic-era properties because most properties were developed after 1970. The alignment could place columns within a stormwater pond, but potential impacts would be low and could be mitigated.

4.4 Air Quality and Greenhouse Gas Emissions

A light rail extension and new station in the Lynnwood City Center could result in a modest reduction in regional air pollutants and greenhouse gas emissions compared to the North Corridor Transit Project's extension from Northgate to the Lynnwood Transit Center. The anticipated ridership for a rail line with this station would be similar to the ridership line terminating at the Lynnwood Transit Center; therefore, similar effects from regional emissions are expected due to transportation.

4.5 Effects on Transportation System

4.5.1 General Purpose Traffic Operations

It is anticipated that the majority of users would access the City Center Station by foot or bicycle. The station would not include any additional park-and-ride capacity or bus interface facilities. Additional traffic at or near the station would likely be minimal and only related to passenger pick-up and drop-off trips (although specific short-term parking for these trips would not be provided either). Therefore, it is anticipated that the extension would have little to no effect on roadway operations, intersection operations, or property access in the immediate area around the station.

4.5.2 Transit Operations

No changes to local transit operations are assumed in association with the extension to the City Center Station, although Community Transit may choose to make schedule or route changes to better serve the station[1]. No impacts or benefits to transit are anticipated, other than a potential increase in ridership on local routes operating near the station. The City Center station in proximity to 196th St SW would complement future BRT service from Highway 99 along 196th St should it occur.

[1] The City's 2009 mode-split study recommended some bus route restructuring with the advent of light rail service to the City Center that would shift local routes 112/113, 114/115/116, and 118 from congested 44th Avenue West and 196th Street SW to 40th Avenue West and 200th Street SW to better serve the center. Other route changes would provide more one-seat rides to the City Center from downtown Everett, Stevens Hospital, Mukilteo Ferry, Marysville, and Stanwood.

4.5.3 Pedestrian and Bicycle Accessibility and Mobility

The conceptual alignment of the extension is fully elevated; therefore, no impacts on pedestrian and bicycle accessibility and mobility are anticipated by the built structures. Specific project elements to provide pedestrian and bicycle access to the station are yet to be determined, but would likely improve non-motorized circulation in the vicinity of the station.

4.5.4 Safety

Because the conceptual alignment of the extension is fully elevated and thus grade-separated, no conflicts would occur between light rail vehicles and other modes. Therefore, no safety impacts are anticipated.

5 CAPITAL AND OPERATING COST ESTIMATES

5.1 Capital Costs

Capital costs are based on the capital cost estimating methodology and data documented in the *North Corridor Transit Project Level 2 Alternatives Capital and Operations Cost Estimating Methodology and Results* report (Sound Transit 2011d) and the *North Corridor Transit Project Unit Cost Library and Composite Section Costs* report (Sound Transit 2011e). Both of these documents have been reviewed by the FTA's Project Management Oversight Consultant, who has determined that the methodology and data are sound and in accordance with current estimating practices.

The general approach for the capital cost estimating methodology consisted of four steps:

- Define the scope of the extension
- Identify unit costs according to the methodology described in Sound Transit (2011b)
- Estimate quantities from the alternative described in this report
- Calculate the costs

Significant capital cost data have been included in the Unit Cost Library for the North Corridor Transit Project. In addition to available data from Sound Transit, cost data from other transit agencies, project databases, Washington State Department of Transportation (WSDOT), and other local industry sources are included in the project database. The database provides information from the following types of projects:

- Projects that are complete or currently under construction
- Projects that are well into final design phases and have advanced engineer's estimates
- Projects for which preliminary engineering has been completed and anticipated costs have been reviewed and verified by independent reviews (e.g., FTA's Project Management Oversight Consultant)
- Projects for which planning and/or environmental assessment has been completed and costs have been reviewed and verified

To be consistent with the estimated costs for the North Corridor Transit Project, all costs stated are in mid-2010 dollars.

5.1.1 Capital Cost Categories

Project capital costs are developed and categorized in accordance with the FTA current standard cost categories.

Construction costs were calculated for the following FTA cost categories:

10. Guideway and Track Elements
20. Stations, Stops, Terminals, Intermodals
30. Yards, Shop, Administration/Support Facilities
40. Sitework and Special Conditions
50. Systems

Total construction costs are stated as the sum of categories 10 through 50.

To complete the project-wide capital cost estimate, the following FTA standard cost categories were also included:

60. Right-of-Way, Land, Existing Improvements
70. Vehicles
80. Soft Costs
90. Unallocated Contingency

Standard Cost Category 100, Finance Charges, is not included in the project-wide capital cost estimate.

Categories 10, 20, 40, and 50

Unit prices for items included in these categories were taken from the reports noted above. The unit prices were then applied to the specific quantities estimated for this extension.

Contingencies were applied to the quantity for each line item. The amount of contingency varied between 15 and 30 percent by line item based on the information in the Unit Cost Library and the level of detail included in the determination of the composite cost for a specific item. In addition to the contingency applied to each line item quantity, an additional contingency of 10 percent to account for potential change orders was added to the total construction amount.

Category 30: Support Facilities: Yards, Shops, Administration Buildings

The ST2 Plan, developed prior to the region's vote in 2008, included representative system-wide projects (and associated costs) for development and construction of light rail maintenance and storage facilities to serve the long-term needs of the Sound Transit vehicle fleet. It was assumed that system-wide maintenance needs for light rail vehicles would be accommodated by a combination of the Central Link Forest Street base and a new maintenance facility in south King County.

Although the North Corridor Transit Project Alternatives Analysis does not include the development of project-specific maintenance facility for light rail, an estimated "share" of the system-wide maintenance facility is included in the capital cost estimate described in this technical memorandum. The capital cost (including right-of-way cost) of the system-wide Link light rail maintenance facility was divided by the facility's capacity to develop a "per vehicle" capital cost for the maintenance facility. The per vehicle cost for the light rail maintenance facility was multiplied by the number of additional light rail vehicles required for this extension. This amount is included in the capital cost of the extension.

Category 60: Right-of-Way, Land, Existing Improvements

Anticipated property impacts for the extension were based on overlaying the conceptual alignment on right-of-way information and GIS data included in aerial maps. Sound Transit real estate staff and consultants provided estimates of property valuations (in 2010 dollars) for parcels, including City of Lynnwood and WSDOT property, which could be affected by the project.

Right-of-way cost estimates include costs associated with property acquisition, relocation, project administration (e.g., title review and appraisal costs), and 33 percent contingency.

Category 60 costs also include right-of-way costs for the estimated "share" of vehicle maintenance and storage facility capacity. Similar to Category 30 costs, right-of-way costs for the maintenance and storage facilities were pro-rated on a per vehicle basis.

Category 70: Vehicles

Unit costs for light rail vehicles were based on Sound Transit information from previous procurements. The unit costs include vehicle-related design and administration costs, as well as spare parts, training, testing, and commissioning expenditures. According to the service plan, an additional five light rail vehicles are required.

Category 80: Professional Services

Professional services costs were developed based on information available from various departments of Sound Transit.

Category 90: Unallocated Contingency

Contingencies were included to address unknown issues and the level of risk associated with a project at any given stage. Allowances for design and construction contingency (allocated) are included in the individual line items in Categories 10 through 50. Project reserves, often referred to as unallocated contingencies, were included in this section for the Level 2

alternatives at a rate of 10 percent. This is consistent with Sound Transit's practice throughout the development of the *Sound Move* (Sound Transit 1996) and ST2 programs.

5.1.2 Ranges of Estimated Project-wide Capital Costs

Total project-wide costs are stated as ranges, which is appropriate for this conceptual level of design. Based on a risk analysis performed during the ST2 planning efforts, it was determined that the high end of the range would be 15 percent higher than the estimated low end. At that time, the risk analysis and ranges of costs were reviewed by a state-appointed Expert Review Panel. This panel concluded that the range of 15 percent between the high and low end of the estimated costs is sound and in accordance with current planning and estimating practices.

5.1.3 Capital Costs Required at the Line Terminus NOT Included in this Estimate

In the current North Corridor Transit Project Alternatives Analysis, the line from Northgate to Lynnwood would terminate at the Lynnwood Transit Center Station. At this location, passengers would exit the northbound trains, the trains would then move forward and, through a series of switches, cross over to the southbound tracks, move to the southbound station platform, and continue the return trip to the Northgate Station. To accomplish this turnback operation, approximately 1,000 feet of additional guideway is required beyond the end of the station. This additional 1,000 feet of guideway would include all of the special trackwork, switches, machinery, controls, and communications, as well as a wider guideway structure than normal.

This same turnback operation would be required at the Lynnwood City Center Station. However, because the costs for the turnback operation at the Lynnwood Transit Center Station are included in the current Alternatives Analysis capital costs, the costs of the special trackwork, switches, machinery, controls, communications, and wider-than-normal guideway structure beyond the end of the Lynnwood City Center Station are NOT included in the estimate for the extension. However, this exclusion requires that the extension to Lynnwood City Center be built with the remainder of the line to Northgate and that the entire line from Northgate to Lynnwood City Center be opened at the same time.

5.1.4 Summary of Project-wide Costs

A summary of project-wide costs is provided in Table 5-1. The total estimated project-wide cost of the 3,600-foot extension from the Lynnwood Transit Center Station to the Lynnwood City Center Station ranges from $194 million to $223 million. Details of the estimated costs are included in Attachment C.

Table 5-1. Project-wide Costs

Standard Cost Category	Description	Total Cost (2010 Dollars in Millions)
10 through 50	Construction Total	$87
60	Right-of-Way	$44
70	Light Rail Vehicles	$21
80	Professional Services	$33
90	Unallocated Contingency	$9
Total Project Cost – Low		**$194**
Total Project Cost – High		**$223**

5.2 Operation and Maintenance Costs

The additional operation and maintenance (O&M) costs attributed to the extension from the Lynnwood Transit Center Station to the Lynnwood City Center Station are primarily attributed to three items:

- The added physical length of the transit facility
- The added travel time (and therefore the added fleet requirements for light rail vehicles)
- The added passenger station

Using the I-5 light rail alignment alternative as a comparison, Table 5-2 summarizes the differences between a Northgate to Lynnwood Transit Center segment and a Northgate to Lynnwood City Center segment:

Table 5-2. Operating Cost Factor Differences

Item	Northgate to Lynnwood Transit Center	Northgate to Lynnwood City Center	Percent Increase
Route Length (miles)	8.4	9.1	8%
Travel Time (minutes)	14	16	14%
Number of Stations	4	5	25%
Fleet Size (number of light rail vehicles)	32	37	16%

As shown above, the percentage increase varies from 8 to 25 percent, with the average of the four items being 15 percent. The actual range of the increase in O&M costs due to this extension may be between 10 and 15 percent.

As stated in reports previously published for this project, the estimated annual O&M cost, in mid-2010 dollars, for the light rail alternative from Northgate to the Lynnwood Transit Center Station along the I-5 corridor is $11 million. Applying a 10 to 15 percent increase to the previously estimated O&M cost would indicate that the additional O&M for the extension to the Lynnwood City Center Station would be between $1.1 million and $1.7 million per year.

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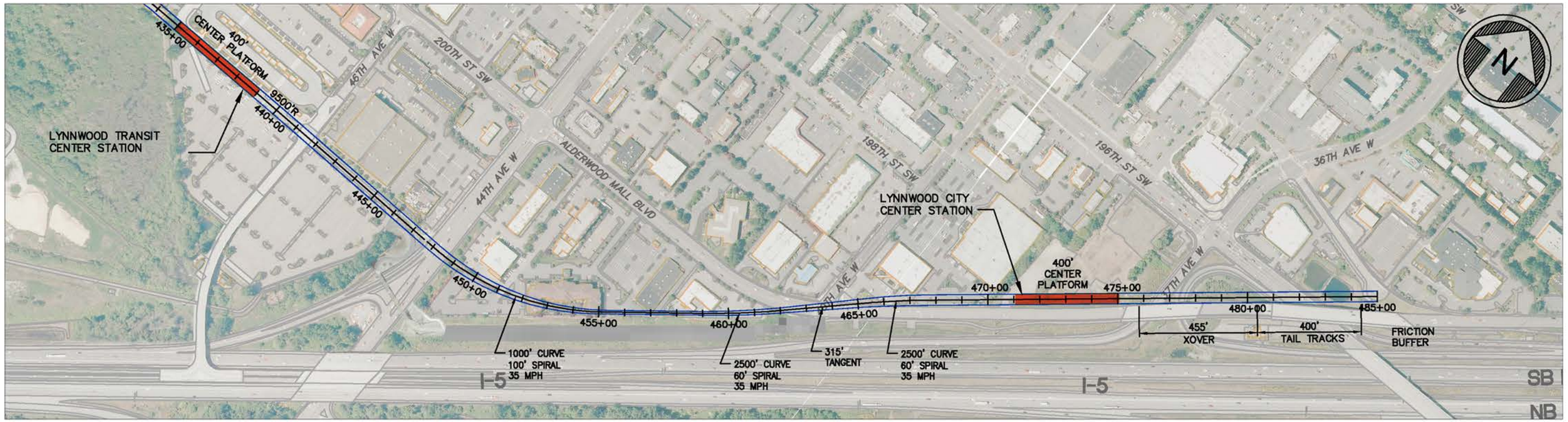
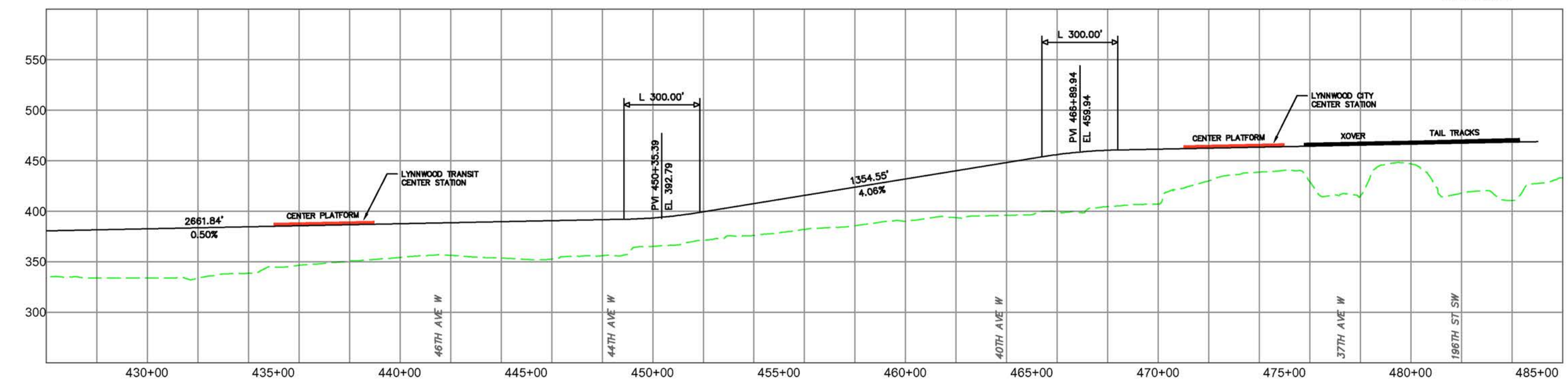
ATTACHMENT A

Conceptual Alignment

SOUND TRANSIT NORTH CORRIDOR TRANSIT PROJECT





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SOUNDTRANSIT

North Corridor Transit Partners
PARAMETRIX + PARSONS BRINCKERHOFF

LYNNWOOD CITY CENTER EXTENSION STUDY

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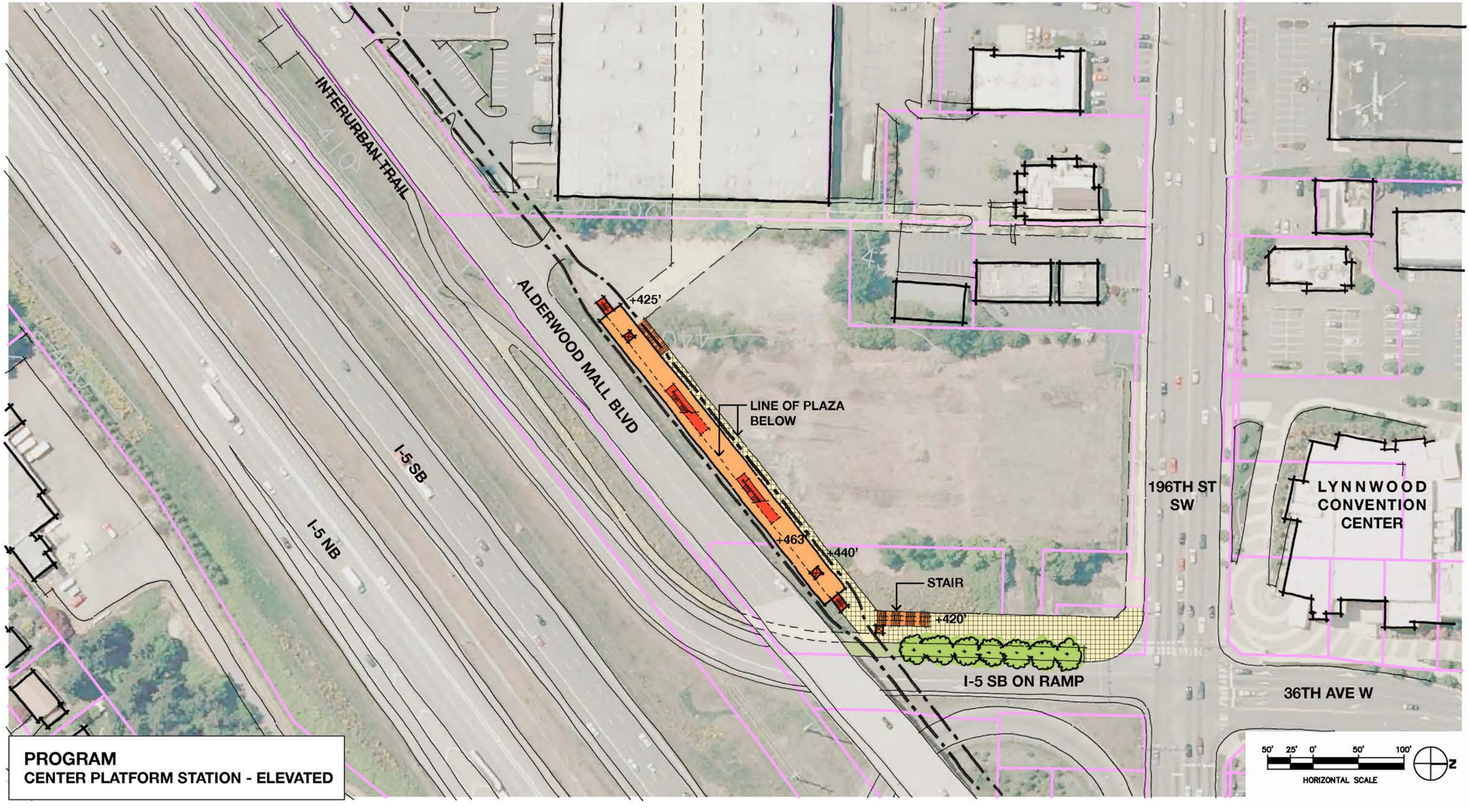
SHEET 1 OF 1

REV. NO. 0

ATTACHMENT B

Conceptual Station Layout

SOUND TRANSIT NORTH CORRIDOR TRANSIT PROJECT



PROGRAM
CENTER PLATFORM STATION - ELEVATED

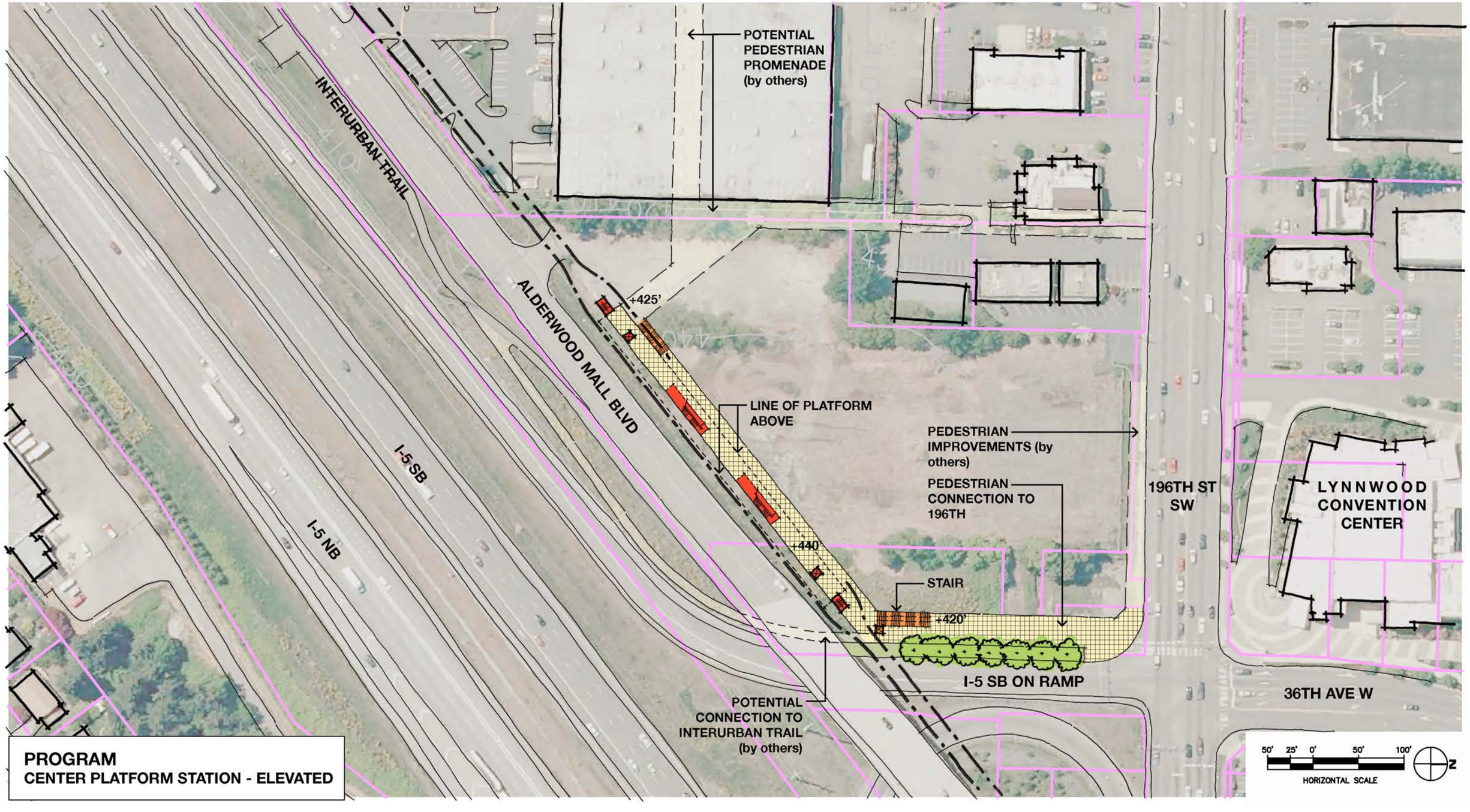
SOUNDTRANSIT

North Corridor Transit Partners
PARAMETRIX + PARSONS BRINCKERHOFF

LYNNWOOD CITY CENTER STATION
PLAN
PLATFORM LEVEL - EL. 463'

DWG NO. XXX
SHEET X OF X
REV. NO. X

SOUND TRANSIT NORTH CORRIDOR TRANSIT PROJECT



PROGRAM
CENTER PLATFORM STATION - ELEVATED

SOUNDTRANSIT

North Corridor Transit Partners
PARAMETRIX + PARSONS BRINCKERHOFF

LYNNWOOD CITY CENTER STATION
PLAN
PLAZA LEVEL - EL. 440'

DWG NO. XXX
SHEET X OF X
REV. NO. X

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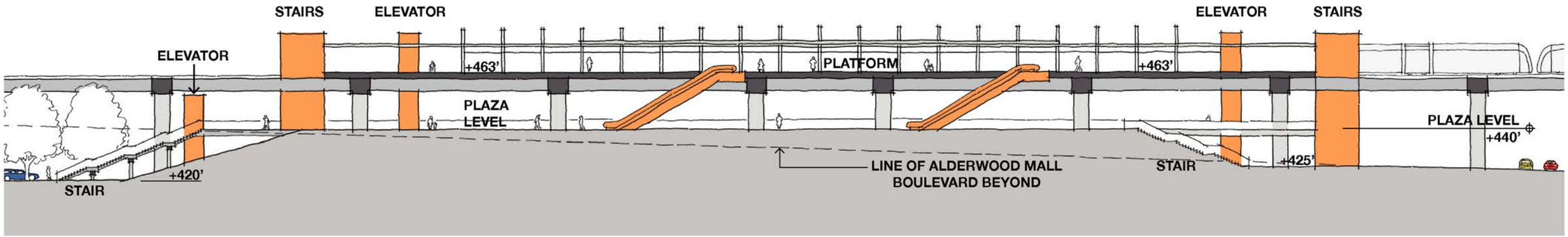

20' 10' 0' 20' 40'
HORIZONTAL SCALE

20' 10' 0' 20' 40'
VERTICAL SCALE

SOUNDTRANSIT

North Corridor Transit Partners
PARAMETRIX + PARSONS BRINCKERHOFF

LYNNWOOD CITY CENTER STATION
SECTION

DWG NO. X
SHEET X OF X
REV. NO. X

ATTACHMENT C

Conceptual Capital Cost Estimate

SOUND TRANSIT

North Corridor HCT Project

Lynnwood Extension along I-5

Capital Cost Estimate

(2010 Dollars in Millions)

	Description	I5-5 Lynnwood TC Station to City Ctr Station	Artwork	MSF	Vehicles	Alignment Total
	Length (Mile):	0.7				0.7
	Number of Stations:	1				1
	Number of Revenue Vehicles:				5	5
10	**GUIDEWAY & TRACK ELEMENTS**	$36.34				$36.34
20	**STATIONS, STOPS, TERMINALS, INTERMODAL**	$21.58				$21.58
30	**SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS**	$0.00		$11.32		$11.32
40	**SITEWORK & SPECIAL CONDITIONS**	$4.34	$0.60			$4.94
50	**SYSTEMS**	$5.37				$5.37
	Construction Subtotal (Sum Categories 10 - 50)	$67.63	$0.60	$11.32		$79.55
	Change Order Contengency	$6.76	$0.06	$1.13		$7.95
	Construction Total	**$74.39**	**$0.66**	**$12.45**	**$0.00**	**$87.50**
60	**ROW, LAND, EXISTING IMPROVEMENTS**	$38.49		$5.44		$43.93
70	**VEHICLES**				$20.77	$20.77
80	**PROFESSIONAL SERVICES**					
	Construction Management	$6.32	$0.06	$1.06		$7.44
	Environmental Clearance and PE	$3.72	$0.03	$0.62		$4.38
	Final Design, Specs, Permitting	$9.30	$0.08	$1.56		$10.94
	Agency Admin (Calculated on subtotal of all items above)	$7.93	$0.05	$1.27	$1.25	$10.50
90	**UNALLOCATED CONTINGENCY**	$7.44	$0.07	$1.25		$8.75
	Total Project Cost - Low	**$147.59**	**$0.95**	**$23.65**	**$22.01**	**$194.20**
	Total Project Cost - High	**$169.73**	**$1.09**	**$27.20**	**$25.31**	**$223.33**

SOUND TRANSIT
North Corridor HCT Project
I5-5
Lynnwood TC Station to City Ctr Station

TRANSIT MODE: LRT

CAT NO.	STATIONING BEGIN	STATIONING END	DESCRIPTION	COST ID	QTY	UNIT	UNIT COST	BASE COST	ALLCTD CONTGY	TOTAL COST
10	**GUIDEWAY & TRACK ELEMENTS**									
10.01	Guideway: At-grade exclusive right-of-way									
			At-Grade Double Ballasted Track	AG02	0	RF	$566	$0	25%	$0
			Element Total		0	RF		$0		$0
10.02	Guideway: At-grade semi-exclusive (allows cross-traffic)									
			N/A							
			Element Total		0	RF		$0		$0
10.03	Guideway: At-grade in mixed traffic									
			N/A							
			Element Total		0	RF		$0		$0
10.04	Guideway: Aerial structure									
			Precast Segmental Box Girder (Avg. Pier 20' Ht.)	EL22	500	RF	$6,842	$3,421,000	25%	$4,276,250
			Precast Segmental Box Girder (Avg. Pier 30' Ht.)	EL23	1,700	RF	$6,990	$11,883,000	25%	$14,853,750
			Precast Segmental Box Girder (Avg. Pier 40' Ht.)	EL24	800	RF	$7,163	$5,730,400	25%	$7,163,000
			Precast Segmental Box Girder (Avg. Pier 50' Ht.)	EL25	600	RF	$7,364	$4,418,400	25%	$5,523,000
			Precast Segmental Box Girder (Avg. Pier 60' Ht.)	EL26	0	RF	$7,603	$0	25%	$0
			Precast Segmental Box Girder (Avg. Pier 80' Ht.)	EL28	0	RF	$8,736	$0	25%	$0
			Precast Segmental Box Girder, Long Span (Avg. Pier 40' Ht.)	EL44	0	RF	$7,530	$0	25%	$0
			Precast Segmental Box Girder, Crossover (Avg. Pier 40' Ht.)	EL54	0	RF	$8,120	$0	25%	$0
			Element Total		3,600	RF		$25,452,800		$31,816,000
10.05	Guideway: Built-up fill									
			N/A							
			Element Total		0	RF		$0		$0
10.06	Guideway: Underground cut & cover									
			N/A							
			Element Total		0	RF		$0		$0
10.07	Guideway: Underground tunnel									
			N/A							
			Element Total		0	RF		$0		$0
10.08	Guideway: Retained cut or fill									
			Retained Cut - One Side (Avg. 10' Depth)	RC01	0	RF	$1,779	$0	25%	$0
			Retained Fill - Two Sides (Avg. 10' Height)	RF21	0	RF	$1,604	$0	25%	$0
			Element Total		0	RF		$0		$0
10.09	Track: Direct fixation									
			Direct Fixation - Double Track	TK21	3,600	RF	$1,093	$3,936,557	15%	$4,527,040
			Element Total		3,600	RF		$3,936,557		$4,527,040
10.10	Track: Embedded									
			N/A							
			Element Total		0	RF		$0		$0
10.11	Track: Ballasted									
			Ballasted - Double Track	TK02	0	RF	$688	$0	15%	$0
			Element Total		0	RF		$0		$0
10.12	Track: Special (switches, turnouts)									
			Direct Fixation - Double Cross-over	SP18	0	EA	$672,495	$0	15%	$0
			Element Total		0	LS		$0		$0
10.13	Track: Vibration and noise dampening									
			N/A							
			Element Total		1	LS		$0		$0

SOUND TRANSIT
North Corridor HCT Project
I5-5
Lynnwood TC Station to City Ctr Station

TRANSIT MODE: LRT

CAT NO.	STATIONING BEGIN	STATIONING END	DESCRIPTION	COST ID	QTY	UNIT	UNIT COST	BASE COST	ALLCTD CONTGY	TOTAL COST
20	**STATIONS, STOPS, TERMINALS, INTERMODAL**									
20.01	At-grade station, stop, shelter, mall, terminal, platform									
			N/A							
			Element Total		1	LS		$0		$0
20.02	Aerial station, stop, shelter, mall, terminal, platform									
	Lynnwood Transit Center		Aerial - 28' Center Platform - 4 Vehicle without Mezz.	ST20	1	LS	$17,243,984	$17,243,984	20%	$20,692,781
			Allowance for Terminal Station		0%			$0	20%	$0
			Element Total		1	LS		$17,243,984		$20,692,781
20.03	Underground station, stop, shelter, mall, terminal, platform									
			N/A							
			Element Total		1	LS		$0		$0
20.04	Other stations, landings, terminals: Intermodal, ferry, trolley, etc.									
			N/A							
			Element Total		1	LS		$0		$0
20.05	Joint development									
			N/A							
			Element Total		1	LS		$0		$0
20.06	Automobile parking multi-story structure									
			Station Site Facilities - Parking Garage	SF20	0	SP	$23,038	$0	20%	$0
			Element Total		1	LS		$0		$0
20.07	Elevators, escalators									
			Pedestrian Vertical Access - Elevator, 25ft.	PA30	1	EA	$203,662	$203,662	20%	$244,395
			Pedestrian Vertical Access - Escalator, 25ft.	PA35	2	EA	$266,538	$533,075	20%	$639,690
			Pedestrian Vertical Access - Escalator, 40ft.	PA36	0	EA	$363,585	$0	20%	$0
			Element Total		1	LS		$736,738		$884,085
40	**SITEWORK & SPECIAL CONDITIONS**									
40.01	Demolition, Clearing, Earthwork									
			Demolition Allow. - Existing Building	DM06	185,110	SF	$12	$2,215,434	30%	$2,880,064
			Element Total		1	LS		$2,215,434		$2,880,064
40.02	Site Utilities, Utility Relocation									
			Utility Modifications Allow. - Level 1	UM01	500	RF	$205	$102,515	30%	$133,269
			Utility Modifications Allow. - Level 3	UM03	0	RF	$847	$0	30%	$0
			Storm Water Management Allowance - Guideway	UM09	3,600	RF	$105	$378,901	30%	$492,572
			Element Total		1	LS		$481,416		$625,841
40.03	Haz. mat'l, contam'd soil removal/mitigation, ground water treatments									
			Hazardous Material Removal Allowance	HM01	500	RF	$66	$33,000	30%	$42,900
			Element Total		1	LS		$33,000		$42,900
40.04	Environmental mitigation, e.g. wetlands, historic/archeologic, parks									
			Enviromental Mitigation Allow. - Level 3	EM03	300	RF	$273	$81,900	30%	$106,470
			Element Total		1	LS		$81,900		$106,470
40.05	Site structures including retaining walls, sound walls									
			N/A							
			Element Total		1	LS		$0		$0
40.06	Pedestrian / bike access and accommodation, landscaping									
			Landscaping Allow. - Guideway	LS10	3,600	RF	$96	$344,449	30%	$447,783
			Artwork (1% of Guideway & Stations)		1%			$461,456	30%	$599,893
			Element Total		1	LS		$805,905		$1,047,676
40.07	Automobile, bus, van accessways including roads, parking lots									
			Station Site Facilities - Bus / Shuttle Bays	SF05	0	SP	$100,697	$0	30%	$0
			Element Total		1	LS		$0		$0
40.08	Temporary Facilities and other indirect costs during construction									

SOUND TRANSIT
North Corridor HCT Project
I5-5
Lynnwood TC Station to City Ctr Station

TRANSIT MODE: LRT

CAT NO.	STATIONING BEGIN	STATIONING END	DESCRIPTION	COST ID	QTY	UNIT	UNIT COST	BASE COST	ALLCTD CONTGY	TOTAL COST
			Temporary Facilities (5% of Category 40)		5.0%			$180,883	30%	$235,148
			Element Total		1	LS		$180,883		$235,148
50	**SYSTEMS**									
50.01	Train control and signals									
			Train Control - Double Track	TC02	3,600	RF	$376	$1,353,191	15%	$1,556,170
			Special Trackwork Allowance		0%			$0	15%	$0
			Element Total		3,600	RF		$1,353,191		$1,556,170
50.02	Traffic signals and crossing protection									
			Roadway Modifications Allow. - Existing Signal Mod.	RM20	0	EA	$95,680	$0	15%	$0
			Element Total		0	EA		$0		$0
50.03	Traction power supply: substations									
			Traction Power, Substation	TP03	0	EA	$1,571,889	$0	15%	$0
			Element Total		0	EA		$0		$0
50.04	Traction power distribution: catenary and third rail									
			OCS System - Standard, Double Track	TP02	3,600	RF	$351	$1,263,600	15%	$1,453,140
			Element Total		3,600	RF		$1,263,600		$1,453,140
50.05	Communications									
			Communication, Line - Double	CM02	3,600	RF	$301	$1,082,553	15%	$1,244,936
			Communication, Station	CM05	1	EA	$683,430	$683,430	15%	$785,945
			Element Total		1	LS		$1,765,983		$2,030,881
50.06	Fare collection system and equipment									
			Fare Collection - 1 Entrance	FC01	1	EA	$284,307	$284,307	15%	$326,953
			Element Total		1	LS		$284,307		$326,953
50.07	Central Control									
			N/A							
			Element Total		1	LS		$0		$0

SOUND TRANSIT
North Corridor HCT Project
SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS

TRANSIT MODE: LRT

STATIONING BEGIN	STATIONING END	DESCRIPTION	COST ID	QTY	UNIT	UNIT COST	BASE COST	ALLCTD CONTGY	TOTAL COST
30		**SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS**							
30.01		Administration Building: Office, sales, storage, revenue counting							
		N/A							
		Element Total		1	LS		$0		$0
30.02		Light Maintenance Facility							
		N/A							
		Element Total		1	LS		$0		$0
30.03		Heavy Maintenance Facility							
		Allowance for MSF		5	EA	$1,470,106	$7,350,530	20%	$8,820,636
		Element Total		1	LS		$7,350,530		$8,820,636
30.04		Storage or Maintenance of Way Building							
		N/A							
		Element Total		1	LS		$0		$0
30.05		Yard and Yard Track							
		Allowance for MSF		5	EA	$417,007	$2,085,035	20%	$2,502,042
		Element Total		1	LS		$2,085,035		$2,502,042

SOUND TRANSIT ST2
HCT Planning
Right of Way

TRANSIT MODE: LRT

	STATIONING BEGIN	STATIONING END	DESCRIPTION	COST ID	QTY	UNIT	UNIT COST	BASE COST	ALLCTD CONTGY	TOTAL COST
60	**ROW, LAND, EXISTING IMPROVEMENTS**									
60.01	Purchase or lease of real estate									
	I5-5		Right-of-Way Private Prop (See cost back-up)		1	LS		$27,387,118	33%	$36,516,157
			Right-of-Way City of Lynnwood (See cost back-up)		1	LS		$1,480,554	33%	$1,974,072
			Right-of-Way Allowance MSF		5	EA	$816,400	$4,082,000	33%	$5,442,667
										$43,932,896

SOUND TRANSIT
North Corridor HCT Project
Vehicles

TRANSIT MODE: LRT

STATIONING BEGIN	STATIONING END	DESCRIPTION	COST ID	QTY	UNIT	UNIT COST	BASE COST	ALLCTD CONTGY	TOTAL COST
70 VEHICLES									
70.01 Light Rail									
		LRT Vehicle	VH01	5	EA	$3,611,520	$18,057,600	15%	$20,766,240
		Element Total		1	LS		$18,057,600		$20,766,240