2 ALTERNATIVES CONSIDERED

This chapter describes the alternatives evaluated for the TDLE Draft EIS and how they were developed. The analysis is designed to help elected officials, agency decision-makers, community leaders, and the public understand the range of environmental impacts that could result from the proposal.

The purpose and need described in Chapter 1 served as the basis for developing the project alternatives. After consideration of the Draft EIS and public comments, the Board will identify the Preferred Alternatives for evaluation in the Final EIS. The Board will select the project to be built after the completion of the Final EIS. At that time, the Board can select from any of the alternatives or design options in the EIS.

The Draft EIS evaluates multiple build alternatives in the project corridor, including different alignments and station options. The Draft EIS also evaluates a No-Build Alternative. The No-Build Alternative allows an analysis of the potential impacts of not building TDLE and provides a basis for comparing the build alternatives with a future baseline condition.

Federal Way Downtown Station

As part of the Federal Way Link Extension, the Sound Transit Board named the station located at the Federal Way Transit Center site as the Federal Way Downtown Station.

TDLE would connect with the terminus of the Federal Way Link Extension (FWLE) at the Federal Way Downtown Station and provide four stations: one in the South Federal Way Segment, one in the Fife Segment, and two in the Tacoma Segment. Sound Transit developed the TDLE alternatives through an early scoping, scoping, and alternatives development process during 2018 and 2019 that included Tribal, agency, and public input, which resulted in the Board's 2019 action that identified alternatives to study in the Draft EIS. As part of advancing the environmental analysis and conducting additional engagement activities, additional alignments and station options were identified to be studied in the Draft EIS in 2023. Section 2.4 presents additional details on this process, alternatives evaluated, and alternatives not carried forward. The Sound Transit Board identified preferred alternatives and other alternatives to study in the Draft EIS. Design options — different configurations of the route along a portion of the alignment or different configurations of a station — were also developed.

2.1 Build Alternatives

TDLE would extend from just south of the Federal Way Downtown Station to the Tacoma Dome vicinity and has been divided into four segments for purposes of this analysis (Figure 1-1):

- Federal Way.
- South Federal Way.
- Fife.
- Tacoma.

The South Federal Way, Fife, and Tacoma segments travel across ancestral and reservation lands of the Puyallup Tribe of Indians. The Puyallup Tribe of Indians is a federally recognized Tribe and, as a sovereign nation, requires government-to-government consultation.

The Draft EIS evaluates the build alternatives, which are discussed by segment in Sections 2.1.2.1 through 2.1.2.4. The light rail guideway would be primarily elevated, with stations located in south Federal Way, Fife, and the two in Tacoma (one near E Portland Avenue and one near the Tacoma Dome station area). Park-and-ride facilities are planned near the stations in the South Federal Way and Fife segments.

The Draft EIS also includes a No-Build Alternative, which is discussed in Section 2.2.

2.1.1 Components of Build Alternatives

This section describes the components common to the build alternatives and then describes in detail the alignments and the stations associated with each alternative, including park-and-ride facilities and other station access components. The build alternatives in the Draft EIS were developed through a collaborative alternatives development process that is summarized in Section 2.4 and described in detail in Appendix I, Alternatives Development Supporting Documents.

All light rail alternatives would operate on a fixed guideway in exclusive right-of-way, outside of traffic, with no at-grade street crossings. Trains would arrive at stations as often as every 5 minutes in each direction, with track speeds of up to 55 miles per hour. The transit right-of-way for the guideway would typically be 30 to 40 feet wide, with two sets of tracks — one northbound track and one southbound track. The transit right-of-way includes room for the poles and overhead catenary system needed to power the trains. In addition, the transit right-of-way would be wider in some sections to accommodate stations and station access facilities, traction power substations (TPSSs), signal bungalows, maintenance driveways, noise walls, and emergency access points, with walls or barriers to restrict other access. Emergency access points would be approximately every 2,500 feet. Alternatives along I-5 would require construction of new limited-access roads to access and maintain the guideway.

Elevated structures would require support columns or other bridging support structures. For at-grade guideway in areas with slopes, retaining walls might be needed next to an adjacent hillside to support fill material below the guideway. In some places, sound walls would be added to the guideway, to retaining walls, or at ground level to reduce noise impacts. Stormwater management features and various infrastructure realignments and improvements would also be completed as part of all alternatives. In addition to the space required for elevated structures and supporting facilities, this profile requires a zone about 15 feet wide on both sides of the guideway tracks that is free of overhanging vegetation. Depending on the profile type and site conditions, the width of this zone may vary. Sound Transit would allow limited vegetation, such as shrubs and ground cover, within this zone.

2.1.1.1 Profiles

The profile along the TDLE corridor would be primarily elevated, with at-grade sections based on topography and other features. There may be short sections of retained-cut or retained-fill depending on topography and transitions between elevated and at-grade sections. These profiles are shown in Figure 2-1.

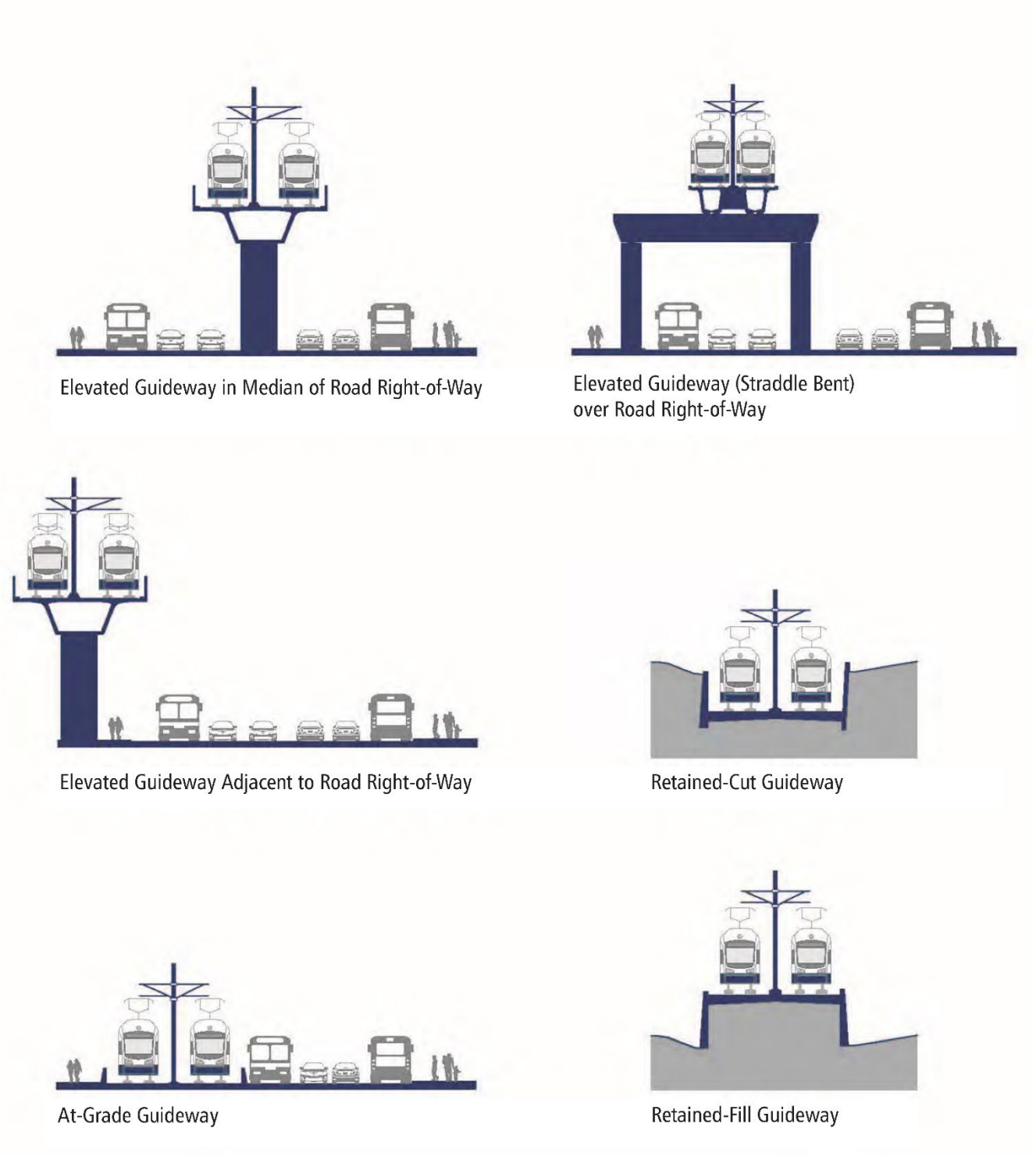


Figure 2-1 Typical Elevated, At-Grade, Retained-Cut, and Retained-Fill Guideway

Elevated

An elevated guideway must have a minimum clearance of at least 16.5 feet over roadways and 23.5 feet over railways, but topography and other considerations can result in a profile as high as 50 feet or more. Pier supports holding up the guideway are typically about 10 feet by 10 feet square at the ground; although the underground support structure may be wider. An elevated guideway can travel in the median of existing roadways, along the side of the roadway, or in off-street corridors. Typical elevated profiles are shown in Figure 2-1.

At-Grade

At-grade light rail is most appropriate for long, relatively flat sections where exclusive right-of-way is available. This project would have an at-grade profile for short sections within Washington State Department of Transportation's (WSDOT's) right-of-way in Federal Way. A typical at-grade profile is shown in Figure 2-1. There would be no proposed at-grade road crossings for any of the build alternatives.

Retained-Cut

With retained-cut profile, the guideway is cut into the ground with a retaining wall on one or both sides (Figure 2-1).

Retained-Fill

Where the guideway transitions between at-grade and elevated, or due to topography, there are often retained-fill sections. Retained-fill sections are slightly higher than ground level and supported by retaining walls (Figure 2-1).

2.1.1.2 Stations

The project includes four light rail stations; all stations would be elevated and provide entrances at each end of the station. Boarding platforms about 380 feet long would serve four-car trains with center platforms (in the center with tracks on both sides) or side platforms (on the outer side of the tracks). Escalators, elevators, and stairs would provide access to the elevated platforms. All stations would meet Americans with Disabilities Act (ADA), National Fire Protection Association (NFPA) 130, local fire code, and local building code and adhere to Sound Transit's station experience design guidelines for public access, and safety requirements.

Stations with parking facilities would provide approximately 500 parking spaces in either a garage or surface parking configuration.

Where appropriate, Sound Transit would facilitate transit oriented development (TOD) with local jurisdictions and potential development partners in accordance with Sound Transit's Equitable Transit Oriented Development Policy (Sound Transit 2018a). Additional discussion about TOD is included in Sections 4.2.3.4 and 4.3.3.4.

Access

TDLE riders could access stations by bus, automobile, bicycle, and walking. At the station near the Tacoma Dome, riders could also access the light rail station by other rail transit modes, including Sounder commuter rail, Amtrak regional and national rail, and Tacoma Link light rail. Sound Transit, King County Metro, Pierce Transit, Kitsap Transit (not presently in operation), and Intercity Transit would provide service based on the TDLE Conceptual Transit Service Plan, described in further detail in Appendix J1, Transportation Technical Report. Bus transit facilities would be provided at or near all TDLE stations. There are multiple options for bus transit facilities in the Tacoma Dome station area that could be included with any of the build alternatives. Each build alternative in the Tacoma Dome station area includes at least one bus transit option.

System Access Program

In September 2019, the Board provided $40.6 million in the Sound Transit District to award funds to local jurisdictions and agencies who will lead the design, construction, operation, and maintenance of potential access projects in broader station areas. This program, called the System Access Program, is intended to fund projects that make it easier and more convenient for people to get to Sound Transit facilities. Potential nonmotorized and station access improvement projects are being defined in consultation with local jurisdictions to safely accommodate the projected increase in pedestrian and bicycle travel with TDLE. The potential nonmotorized projects are not part of TDLE, and no funding has been awarded by the Board for any of these potential access projects at this time. This Draft EIS does not evaluate the potential environmental impacts of these access projects. Once the access projects have been identified and refined by local jurisdictions in consultation with Sound Transit, the local agency will prepare the appropriate environmental review. Some of the nonmotorized improvements may be implemented by the Puyallup Tribe of Indians, cities, or others as lead agencies and require multi-agency funding partnerships to implement.

2.1.1.3 Other Facilities and Structures

TDLE would require other facilities and structures described in this section and shown in conceptual design drawings included in Appendix F, Conceptual Design Drawings. Specific locations of these facilities and structures could be refined during final design based on project needs.

Overhead Catenary System

An overhead catenary system delivers electricity to light rail vehicles. The overhead catenary system requires two wires for each track, supported on 15- to 23-foot-high steel poles about 150 to 200 feet apart (Figure 2-2). Poles may be as close as 50 feet apart where the guideway curves. The poles are typically located between the two tracks.

Figure 2-2 Typical Overhead Catenary System

Traction Power Substation

Traction power substations (TPSSs) boost the power to the overhead catenary system. The typical TPSSs are metal buildings about 20 feet wide by 60 feet long and 10 to 12 feet high, with an additional 10 to 20 feet of clearance required around each unit, screened by a wall or fence (Figure 2-3). TPSSs would be installed at each station and throughout the corridor approximately every 8,000 feet (or 1.5 miles). Each TPSS includes parking for maintenance purposes and fencing.

Figure 2-3 Traction Power Substation

Signal Bungalows

Signal bungalows contain signal system equipment and provide power to track switch machines and track circuits for train speed control and separation. They can be a separate, prefabricated structure or a room integrated within a station building. Stand-alone signal bungalows are about 32 feet long by 10 feet wide and include parking and security fencing (Figure 2-4).

Figure 2-4 Signal Bungalow

Tail Tracks, Pocket Tracks, Turnback Tracks, and Crossovers

Special trackwork, including tail tracks, pocket tracks, turnback tracks, and crossovers, is used along alignments to serve certain operational and maintenance purposes. Wider right-of-way sections may be required to accommodate special tracks. Tail tracks are tracks that extend past a terminus or interim terminus station far enough to allow the temporary layover of one four-car train, typically extending around 500 feet beyond the end of the station platform. Tail tracks would extend beyond the Tacoma Dome station for all alternatives in this segment, which would be the terminus for Link prior to potential further extensions of light rail to the south. A pocket track (Figure 2-5) is a track that sits between two mainline tracks and is connected to both tracks at either end.

Figure 2-5 Pocket Track

They provide maximum operational flexibility to temporarily store and stage trains off mainline tracks. A pocket track, measuring approximately 850 feet, at the station in South Federal Way would be connected to the mainline tracks at each end and in the middle so that two trains can use the pocket track independent of each other. The purpose of this pocket track is to allow some trains from Seattle to South Federal Way to turn back to Seattle while other trains continue to Tacoma.

Figure 2-6 Crossover Tracks

Crossover tracks connect two parallel tracks and allow trains to change safely from one track to the other (Figure 2-6). TDLE would include crossovers adjacent to all stations to allow for maintenance that requires removing one track from service to bypass a stalled train, to turn trains in the opposite direction, or to operate in the event of emergencies or blockages. Crossover tracks and pocket tracks require special signaling control equipment under or adjacent to the guideway.

Figure 2-7 Hi-Rail Access Vehicle

Hi-Rail Access

Hi-rail vehicles used for track, guideway, and overhead catenary system inspection and maintenance can operate on both rail tracks and conventional roads (Figure 2-7). Hi-rail vehicle access would be provided in various locations along the project corridor, approximately every 2.5 miles. Generally, hi-rail access would be provided in locations where the guideway would be close to or at-grade, accessible from an adjacent access road. Where hi-rail access is needed on an elevated guideway, Sound Transit may design access that would start at-grade and transition to an elevated structure (on retained fill or columns), to reach the height of the guideway. General maintenance roads (not specific to hi-rail access) would also be provided to allow for maintenance of other elements of the project (such as bridge structures and retaining walls) as needed from public right-of-way.

Stormwater Facilities

Stormwater facilities for the project would include flow-control and water quality treatment facilities. Water quality treatment would be provided for roadway and/or station runoff where discharges flow into a storm drain. If these areas discharge to a combined sewer system, water quality treatment is not required, as the runoff collected in these systems is directed to a wastewater treatment plant. Stormwater flow control vaults or ponds would be provided for roadway improvements, the guideway, and stations. The flow-control vaults would control the volume, rate, frequency, and flow duration of stormwater runoff. Stormwater vaults consist of concrete boxes installed below ground level, with access covers or grates at the surface.

2.1.1.4 Designing for Climate Change Resilience

In order to design the project for resilience to increased localized flood risk and sea level rise due to climate change, Sound Transit developed a technical memorandum to support the agency's climate change planning and adaptation efforts, Projected Changes in Key Drivers of Climate Change for the Puget Sound Region: An Updated Overview (Sound Transit 2022). Sound Transit seeks to design projects to protect structures and station components from potential flooding. Sound Transit is also assessing how flood risk and sea level rise may affect resilience of proposed designs and design standards for the project alternatives. By assessing climate-related changes and vulnerabilities in the project planning stages, Sound Transit can prepare for them and include adaptation measures to support resilient infrastructure and operations. Examples of potential adaptations include installing sensors to monitor track temperature, including air conditioning or shading around signal boxes, and raising ground level infrastructure in flood-prone areas.

2.1.1.5 Operations and Maintenance

Vehicles and Operation

TDLE would operate 20 hours per day Monday through Saturday and 19 hours on Sundays. Train frequency would vary during the day based on ridership demand, operational capacity, and service standards. Table 2-1 shows the proposed service schedule for weekdays in 2035 and 2042. Trains would operate with four cars. Service levels are approximate and subject to change pending budget availability. A typical Link light rail train is shown in Figure 2-8. During special events at the Tacoma Dome, additional service could be provided to accommodate riders traveling to and from events.

Figure 2-8 Link Light Rail Train

Table 2-1 Weekday Service Schedule (2035 and 2042)

Service Period	Time Period	Service Level	2035 Train Headway[1] (minutes)	2042 Train Headway[1] (minutes)
Early morning	5 to 6 a.m.	Early	12	12
Morning peak	6 to 9 a.m.	Peak	6	5
Midday	9 a.m. to 2:30 p.m.	Base	10	10
Afternoon peak	2:30 to 6:30 p.m.	Peak	6	5
Evening	6:30 to 10 p.m.	Base	10	10
Evening to late night	10 p.m. to 1 a.m.	Late	15	15

Note:
(1) A headway is the amount of time between two vehicles passing the same point while traveling in the same direction on a transit route.

Maintenance

By 2032, Sound Transit plans to have three operations and maintenance facilities (OMFs) to serve the light rail system fleet storage and maintenance needs. OMF Central (Forest Street) in Seattle has been in operation since light rail service began in 2009. OMF East in Bellevue was completed in 2020 and began supporting East Link starter line operations in 2024. A third OMF facility (OMF South) is planned in the south corridor, as described further below.

In addition to the vehicle storage capacity at an OMF, trains could potentially be stored on the elevated tail tracks, on station platform areas, or on a pocket track near the end of the line at the close of service each night. Support facilities at the stations may include parking for light rail operators and office space for operator check-in facilities. They may also have space for vehicle service personnel and equipment to allow for daily vehicle inspections and interior cleaning of vehicles. Vehicle, track, and systems maintenance occurs between 1 and 5 a.m. daily, outside of normal hours of light rail service. Additionally, some infrequent system maintenance activities, such as rail grinding, occur on a periodic basis.

OMF South

OMF South would be used initially to receive, test, and commission light rail vehicles with the systemwide expansion and then to store, maintain, and dispatch about 144 light rail vehicles for daily service. FTA and Sound Transit published a Final EIS for OMF South in June 2024. Later in June 2024, the Sound Transit Board selected the Preferred South 336th Street Alternative as the project to be built, and FTA issued a Record of Decision (ROD) for the project in August 2024. These documents are available on Sound Transit's website at https://www.soundtransit.org/system-expansion/operations-maintenance-facility-south.

As shown in Figure 2-9, the OMF South project includes 1.4 miles of light rail guideway from the Federal Way Downtown Station to the OMF South site. This portion of guideway is also included as part of the TDLE alternatives in the Federal Way Segment. While the 1.4-miles of light rail guideway is planned to be constructed by the OMF South, due to the timing of the Board action selecting the OMF South project to be built in relation to writing of this TDLE Draft EIS, impacts for constructing the 1.4-mile portion of the guideway are included in this TDLE Draft EIS.

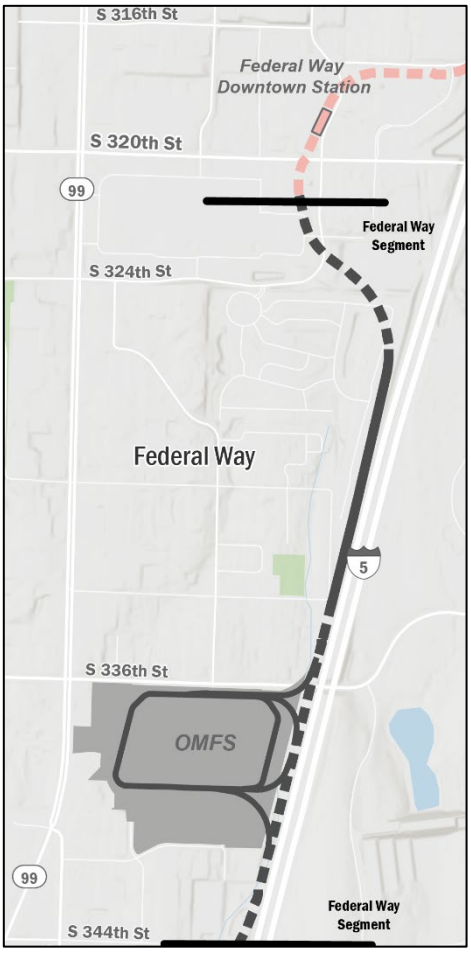


Figure 2-9 OMF South

2.1.2 Build Alternatives and Options

This section describes the build alternatives for TDLE and notes where a preferred alternative has been identified. The build alternatives were developed as described in Section 2.4 and Appendix I, Alternatives Development Supporting Documents. The build alternatives are based on the conceptual engineering design drawings included in Appendix F, Conceptual Design Drawings. Conceptual engineering reflects an approximate 10 percent level of design. The design may be refined based on additional project information, coordination with Tribes and agencies, and public input.

Table 2-2 summarizes the various alternatives and design or station options for each of the TDLE segments. Design or station options represent different configurations of the route along a portion of an alternative alignment or a different configuration of a station design that could be incorporated with the build alternatives. Depending on the alternatives or options selected, 85 to 100 percent of the TDLE guideway would be elevated. All stations would accommodate bus transit connections, passenger pickup and drop-off zones, and appropriate pedestrian and bicycle facilities. Travel time between the stations in South Federal Way and Tacoma Dome is anticipated to take approximately 20 minutes.

The build alternatives include parking facilities at the stations in South Federal Way and Fife. As identified in Sound Transit Board Resolution R2021-05, the 500-space structured or surface parking facilities could be deferred until 2038, approximately 3 years after service is forecast to begin in 2035. While the Sound Transit Board will consider options to deliver affordable parking as part the annual program review, there are two interim conditions evaluated in this Draft EIS:

- No Parking on Opening Day: Under this interim condition, no parking would be provided at the Fife and South Federal Way stations until 2038. Property acquired for construction staging and identified for future parking facilities would be retained by Sound Transit and secured for up to 3 years prior to development.
- Interim Surface Parking: Under this interim condition, some surface parking would be provided between 2035 and 2038, based on available land in each station area and subject to the Board's determination that such parking is affordable. Up to 500 surface parking spaces at the stations in South Federal Way and Fife would be provided on portions of available land sometime between 2035 and 2038 prior to constructing the 500-space structured or surface parking facilities.

Table 2-2 Summary of TDLE Alternatives and Design Options Evaluated in Draft EIS

Alternative	Station Name	Station Location
Federal Way Segment		
FW Preferred Enchanted Parkway	Not applicable	Not applicable
FW Preferred Enchanted Parkway with FW Design Option[1]	*Not applicable*	*Not applicable*

Table 2-2 Summary of TDLE Alternatives and Design Options Evaluated in Draft EIS (continued)

Alternative	Station Name	Station Location
South Federal Way Segment[2, 3]		
SF Enchanted Parkway	SF Enchanted Parkway Station	Enchanted Parkway S and S 352nd Street
	SF 352nd Span Station Option	*Enchanted Parkway S spanning S 352nd Street*
SF I-5	SF I-5 Station	I-5 and S 356th Street
SF 99-West[4]	SF 99-Enchanted Station	Enchanted Parkway S and S 352nd Street
SF 99-West[4] with Porter Way Design Option	*SF 99-Enchanted Station*	*Enchanted Parkway S and S 352nd Street*
SF 99-East[4]	SF 99-352nd Station	Between S 352nd Street and S 356th Street east of SR 99
SF 99-East[4] with Porter Way Design Option	*SF 99-352nd Station*	*Between S 352nd Street and S 356th Street east of SR 99*
Fife Segment[2]		
Fife Pacific Highway	Preferred Fife Station	59th Avenue E between 15th Street E and 12th Street E
	Fife 54th Avenue Station Option	*West of 54th Avenue E between Pacific Highway and 12th Street E*
	Fife 54th Span Station Option	*Spanning 54th Avenue between Pacific Highway and 12th Street E*
Fife Pacific Highway Median (Fife Median)	Preferred Fife Station	59th Avenue E between 15th Street E and 12th Street E
	Fife 54th Avenue Station Option	*Design option for guideway alignment would be slightly further south between 54th and 51st Avenue E, with the station option west of 54th Avenue E between Pacific Highway and 12th Street E*
	Fife 54th Span Station Option	*Design option for guideway alignment would be slightly further south between 59th and 51st Avenue E, with the station option spanning 54th Avenue between Pacific Highway and 12th Street E*
Fife I-5	Preferred Fife Station	59th Avenue E between 15th Street E and 12th Street E
	Fife 54th Avenue Station Option	*Design option for guideway alignment would be slightly further south between 54th and 52nd Avenue E, with the station option west of 54th Avenue E between Pacific Highway and 12th Street E*
	Fife 54th Span Station Option	*Design option for guideway alignment would be slightly further south between 59th and 52nd Avenue E, with the station option spanning 54th Avenue between Pacific Highway and 12th Street E*

Table 2-2 Summary of TDLE Alternatives and Design Options Evaluated in Draft EIS (continued)

Alternative	Station Name	Station Location
Tacoma Segment		
Preferred Tacoma 25th Street-West	Preferred Portland Avenue Station	E 26th Street and E Portland Avenue
	Portland Avenue Span Station Option	*Spanning E Portland Avenue north of E 26th Street*
	Preferred Tacoma 25th Street-West Station	Above E 25th Street between East G Street and East D Street
Tacoma 25th Street-East	Preferred Portland Avenue Station	E 26th Street and E Portland Avenue
	Portland Avenue Span Station Option	*Spanning E Portland Avenue north of E 26th Street*
	Tacoma 25th Street-East Station	Above E 25th Street between McKinley Avenue E and East G Street
Tacoma Close to Sounder	Preferred Portland Avenue Station	E 26th Street and E Portland Avenue
	Portland Avenue Span Station Option	*Spanning E Portland Avenue north of E 26th Street*
	Tacoma Close to Sounder Station	Adjacent to Sounder right-of-way at East G Street and E 25th Street
Tacoma 26th Street	Preferred Portland Avenue Station	E 26th Street and E Portland Avenue
	Portland Avenue Span Station Option	*Spanning E Portland Avenue north of E 26th Street*
	Tacoma 26th Street Station	Above E 26th Street at East D Street

Notes:

(1) Design and station options are shaded and shown in *italics*.

(2) Parking at the stations in South Federal Way and Fife may be deferred until 2038. Depending on funding availability, however, some amount up to 500 spaces may be provided between 2035 and 2038.

(3) SF is used as the abbreviation for South Federal Way in the alternative and station naming.

(4) The SF 99-Enchanted and SF 99-352nd station locations could be paired with either of the SF 99 alternatives.

2.1.2.1 Federal Way Segment

In the Federal Way Segment (FW), there is one build alternative and a design option (Figure 2-10). The FW Enchanted Parkway Alternative would begin at the terminus of the Federal Way Link Extension, curve east at S 324th Street to I-5, and parallel I-5 to S 344th Street. This alignment is part of the Preferred Alternative for TDLE. The FW Design Option would modify the guideway curve near S 324th Street to accommodate higher train speeds through this section.

OMF South

As described in Section 2.1.1.5, the OMF South project includes the same 1.4-mile portion of guideway from the Federal Way Downtown Station to S 344th Street as the alternatives in the TDLE Federal Way Segment. Project development and environmental review for the OMF South and TDLE projects began concurrently; however, OMF South recently completed environmental review. In June 2024 FTA and Sound Transit issued the OMF South Final EIS and the Sound Transit Board selected to build the Preferred South 336th Street Alternative. FTA issued the OMF South Record of Decision in August 2024. Based on the Sound Transit Board action, the 1.4-mile portion of guideway will be constructed as part of the OMF South project. Due to the timing of the OMF South Board Action in relation to the writing of this TDLE Draft EIS, construction and operational impacts for this portion of track are included in the TDLE Draft EIS.

2.1.2.2 South Federal Way Segment

In the South Federal Way Segment, there are four build alternatives (Figure 2-11):

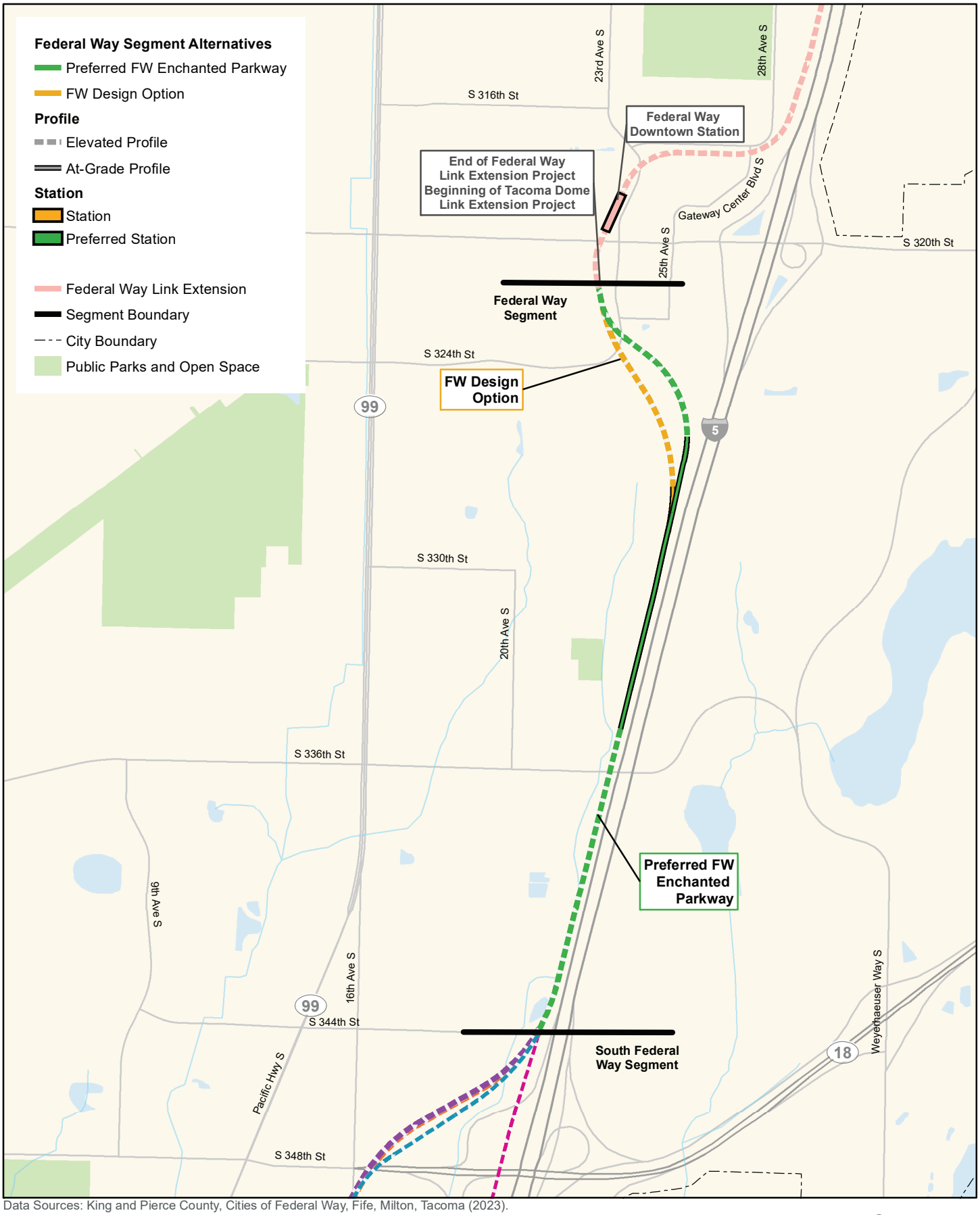
- South Federal Way (SF) Enchanted Parkway Alternative, which includes the SF Enchanted Parkway Station.
- SF I-5 Alternative, which includes the SF I-5 Station.
- SF 99-West, which includes the SF 99-Enchanted Station.
- SF 99-East, which includes the SF 99-352nd Station.

The SF Enchanted Parkway Alternative also includes a station option spanning S 352nd Street (SF 352nd Span Station Option).

An alignment design option called the Porter Way Design Option could be paired with either the SF 99-West or SF 99-East alternative. This design option would curve farther to the east. The SF 99-West and SF 99-East alternatives could be paired with either the SF 99-Enchanted Station or SF 99-352nd Station.

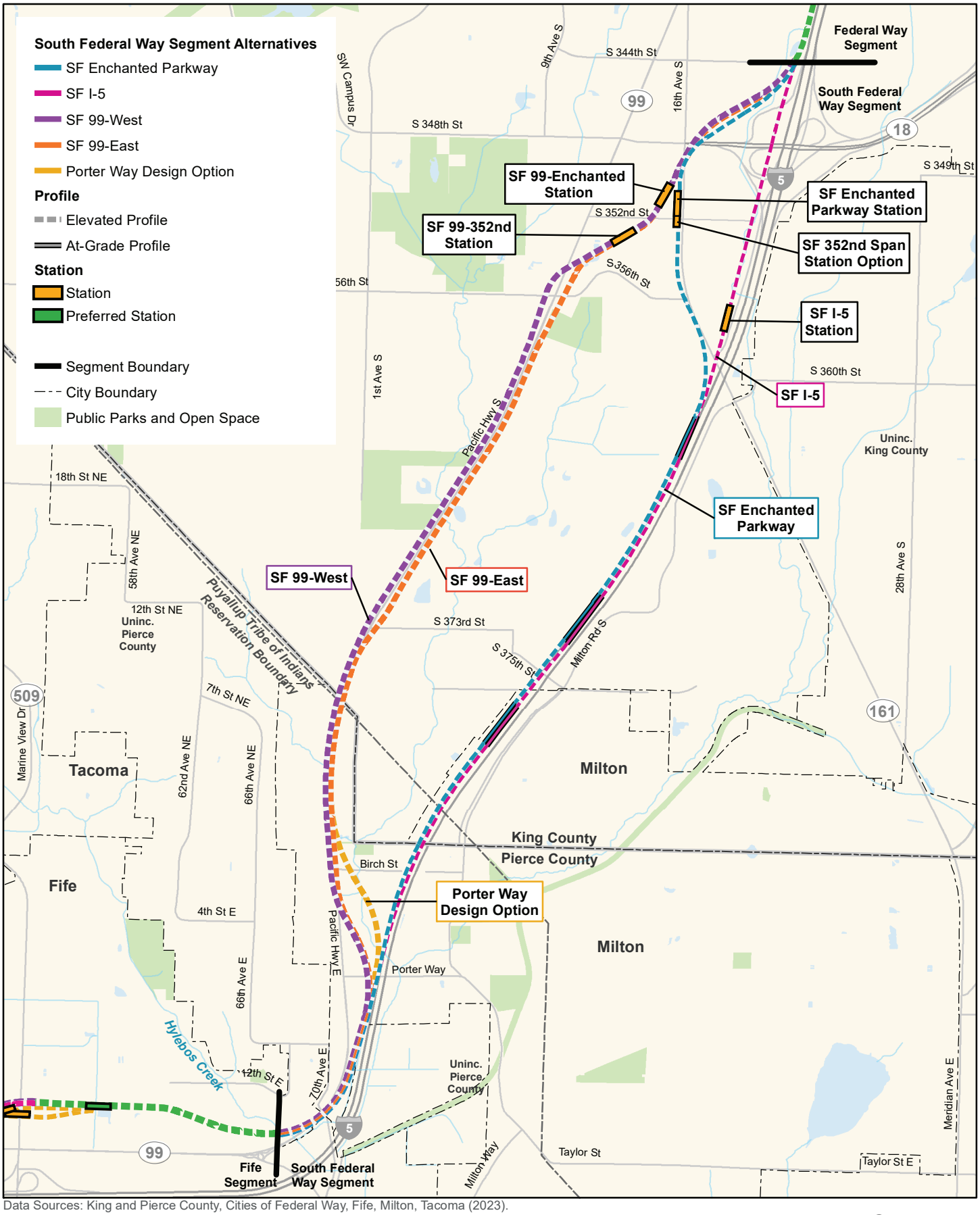
SF Enchanted Parkway Alternative

The SF Enchanted Parkway Alternative would begin at S 344th Street on the west side of I-5. It would then head southwest toward Enchanted Parkway S to an elevated station on the northwest corner of Enchanted Parkway S and S 352nd Street (SF Enchanted Parkway Station). It would continue south along Enchanted Parkway S until the alignment returns to the west side of I-5, where it would continue south along the west side of I-5 to near the Fife city limits.



Data Sources: King and Pierce County, Cities of Federal Way, Fife, Milton, Tacoma (2023).

FIGURE 2-10
Federal Way Segment Alternatives
Tacoma Dome Link Extension



Data Sources: King and Pierce County, Cities of Federal Way, Fife, Milton, Tacoma (2023).

FIGURE 2-11
South Federal Way Segment Alternatives

Tacoma Dome Link Extension

The SF Enchanted Parkway Station and its platform would be elevated and located along the west side of Enchanted Parkway S, north of S 352nd Street (Figures 2-12 and 2-13). A station option is also being considered. The SF 352nd Span Station Option would also be on the west side of Enchanted Parkway S at S 352nd Street, but the elevated station platform would span across S 352nd Street (Figures 2-14 and 2-15).

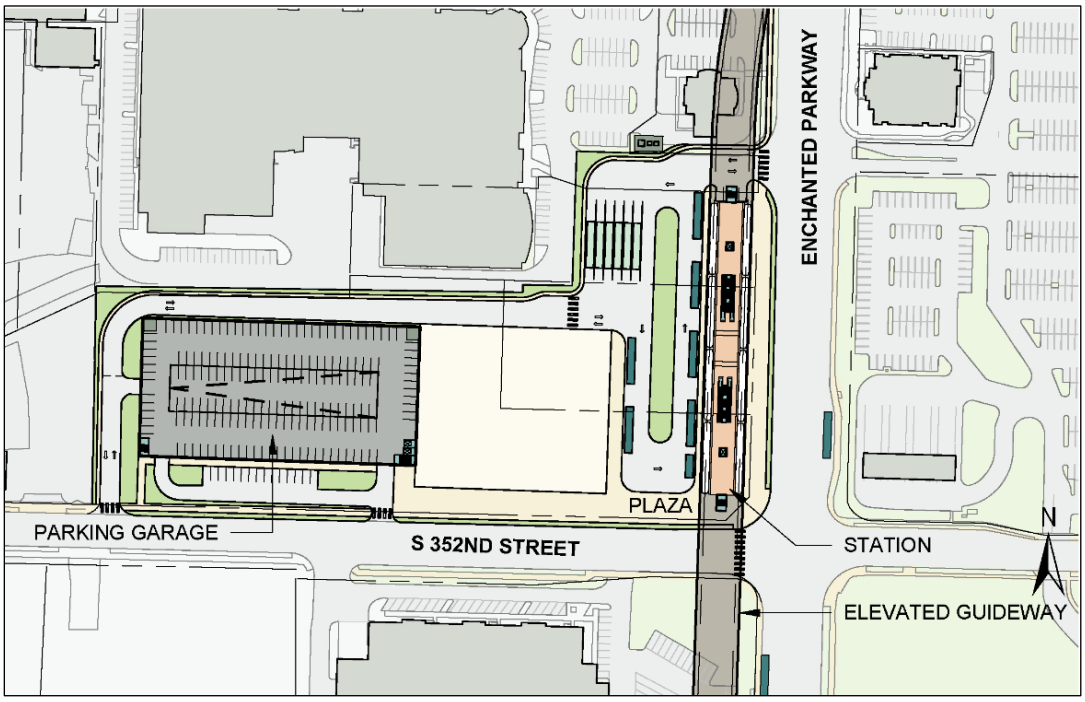


Figure 2-12 SF Enchanted Parkway Station with Parking Garage

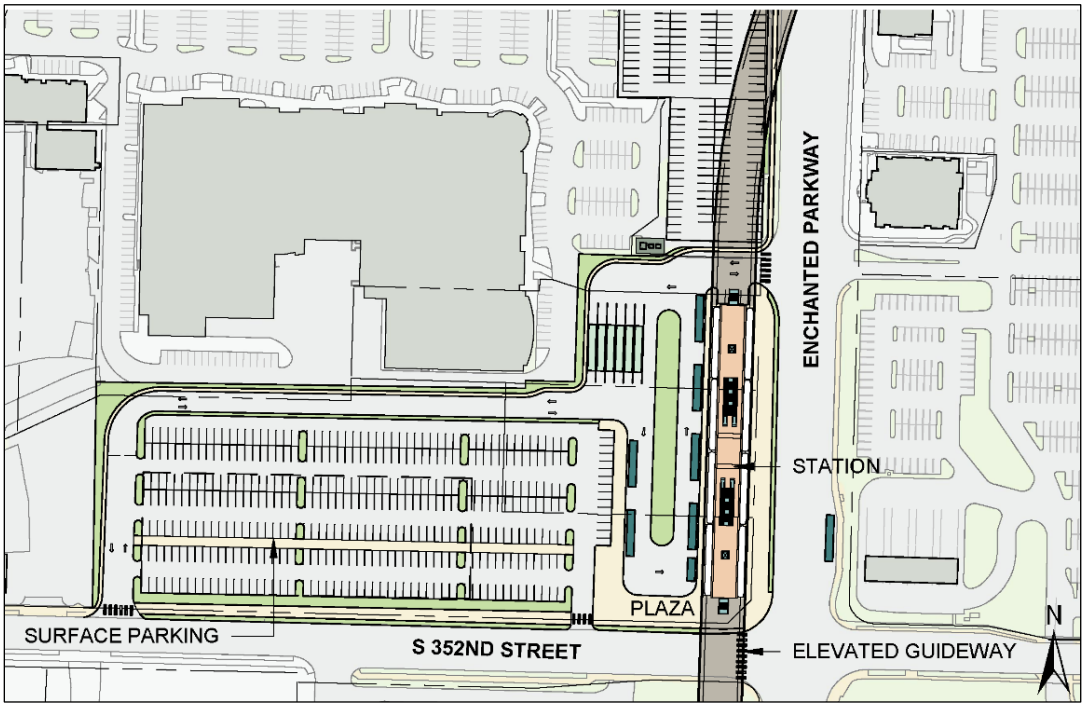


Figure 2-13 SF Enchanted Parkway Station with Surface Parking

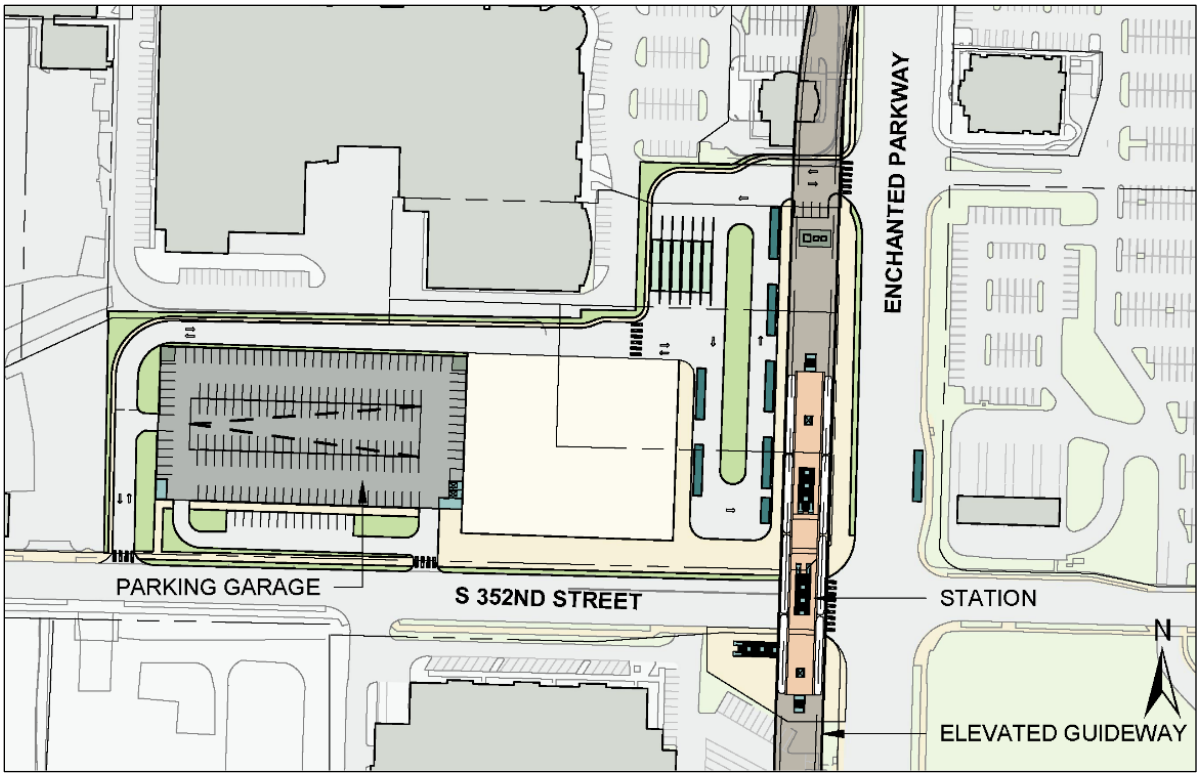


Figure 2-14 SF 352nd Span Station Option with Parking Garage

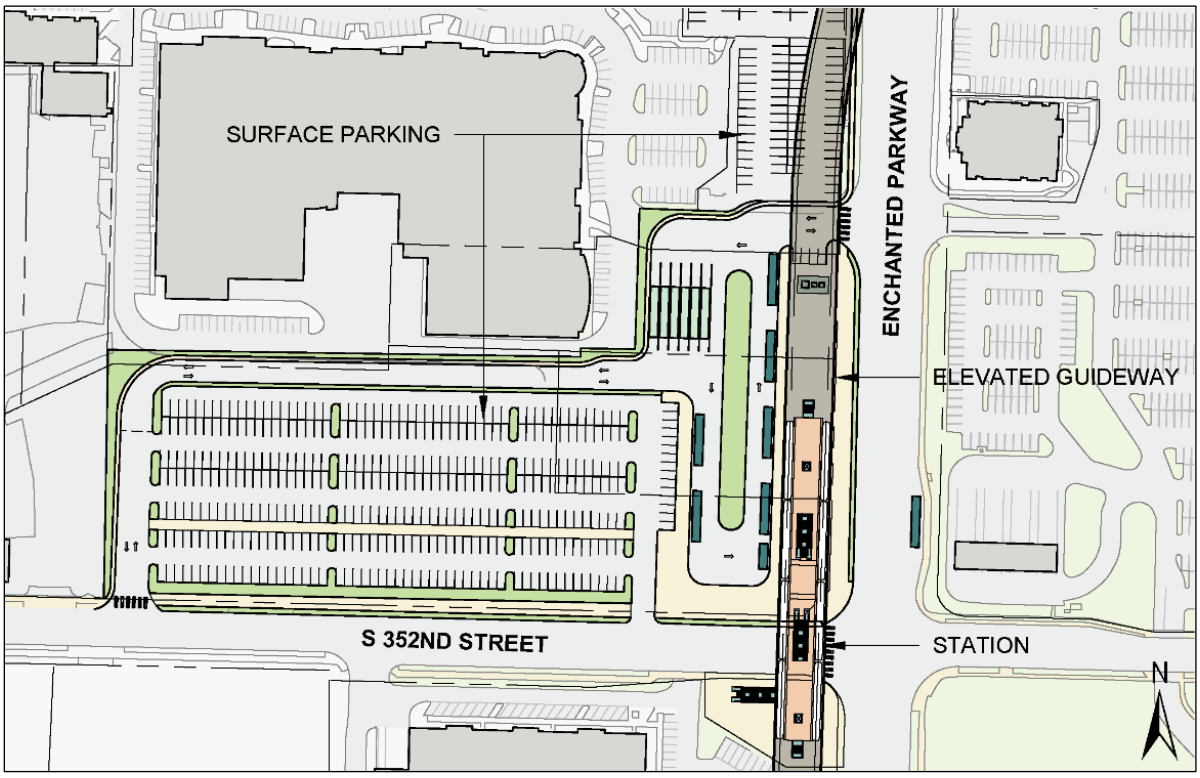


Figure 2-15 SF 352nd Span Station Option with Surface Parking

SF I-5 Alternative

The SF I-5 Alternative would begin at S 344th Street and follow the west side of I-5 to an elevated station (SF I-5 Station) adjacent to I-5, just north of where Enchanted Parkway S crosses I-5. South of the station, the alignment would continue along the west side of I-5 to near the Fife city limits.

The SF I-5 Station, shown in Figures 2-16 and 2-17, would be adjacent to a new southbound off-ramp to be constructed as part of WSDOT's I-5 SR 161/SR 18 Triangle Improvement Project (construction for this project is currently suspended by WSDOT). The station platform would be elevated, and entrances would be provided on both the north and south ends of the station. This station would also provide approximately 500 parking spaces in either a garage or surface parking configuration.

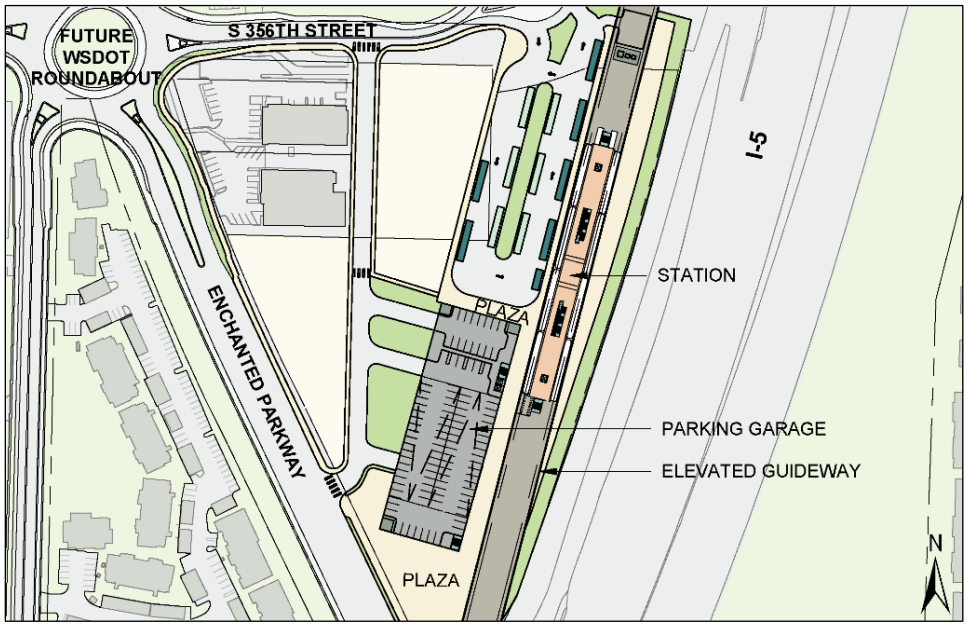


Figure 2-16 SF I-5 Station with Parking Garage

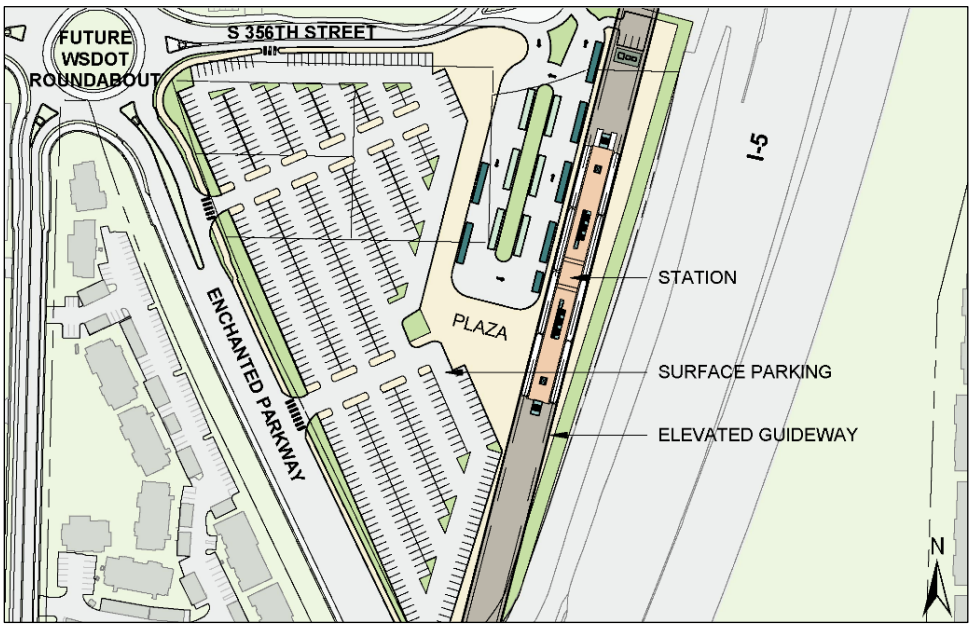


Figure 2-17 SF I-5 Station with Surface Parking

SF 99-West Alternative

The SF 99-West Alternative would begin at S 344th Street on the west side of I-5. It would then head southwest toward Enchanted Parkway S to an elevated station on the northwest corner of Enchanted Parkway S and S 352nd Street (SF 99-Enchanted Station). The alternative would continue southwest to reach Pacific Highway (SR 99) and continue along the west side of the roadway until the alignment reaches Birch Street in Milton. The alignment would then curve to return to the west side of I-5, where it would continue south to near the Fife city limits.

The SF 99-Enchanted Station and its platform would be elevated and located west of Enchanted Parkway S and north of S 352nd Street (Figures 2-18 and 2-19). Station entrances would be at both ends of the platform. The station would provide approximately 500 parking spaces in either a garage or surface parking configuration.

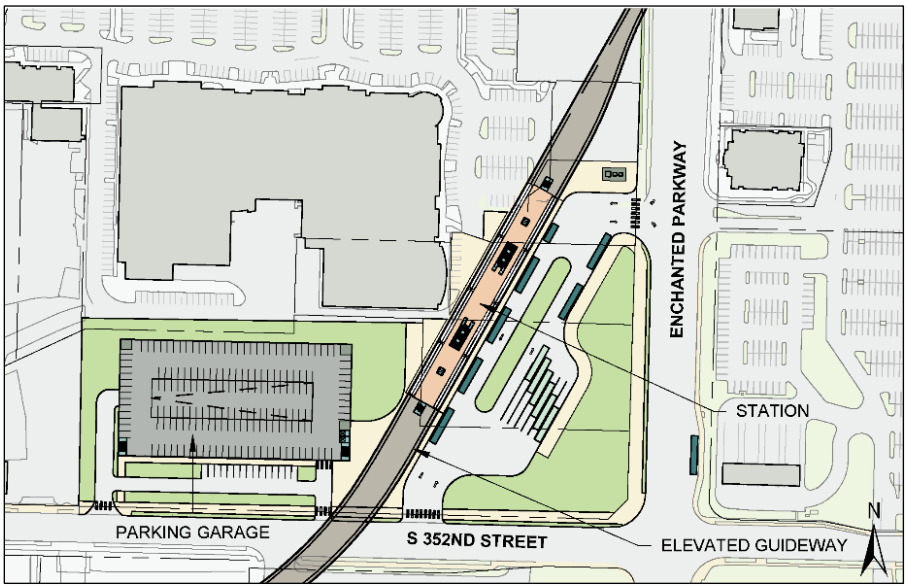


Figure 2-18 SF 99-Enchanted Station with Parking Garage

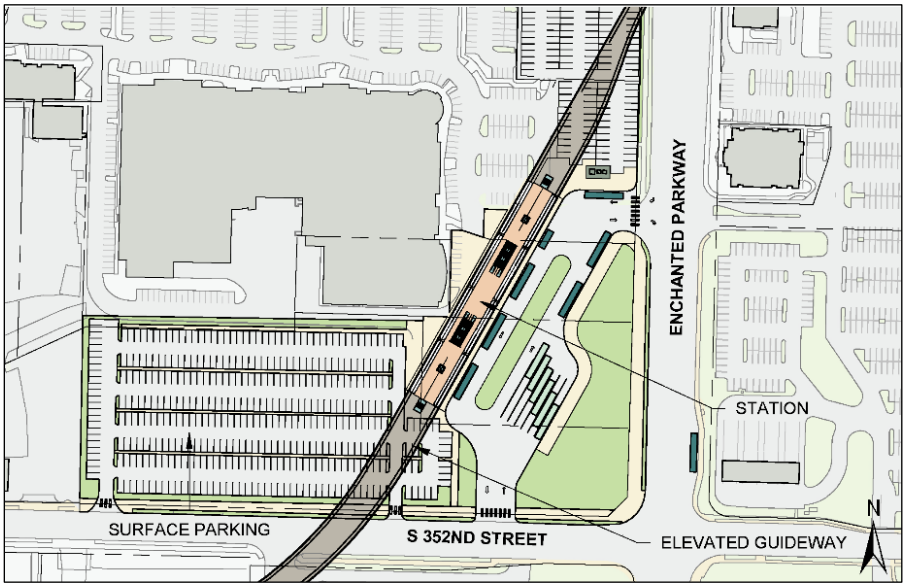


Figure 2-19 SF 99-Enchanted Station with Surface Parking

SF 99-East Alternative

The SF 99-East Alternative would begin at S 344th Street on the west side of I-5. It would then head southwest toward Enchanted Parkway S to an elevated station on the northwest corner of Enchanted Parkway S and S 352nd Street (SF 99-Enchanted Station). The alternative would continue southwest to reach SR 99 (Pacific Highway) and continue along the east side of the roadway to S 373rd Street, where the alignment would curve to run in the median of Pacific Highway until it reaches Birch Street in Milton. The alignment would then curve to return to the west side of I-5, where it would continue south to near the Fife city limits.

The SF 99-352nd Station and its platform would be elevated and located midway between Enchanted Parkway S and Pacific Highway, south of S 352nd Street (Figures 2-20 and 2-21). Station entrances would be at both ends of the platform.

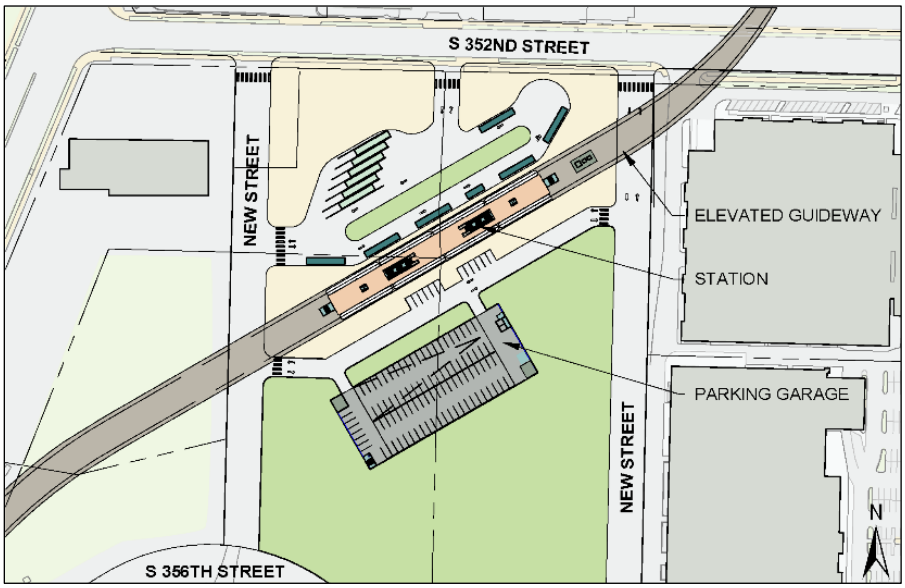


Figure 2-20 SF 99-352nd Station with Parking Garage

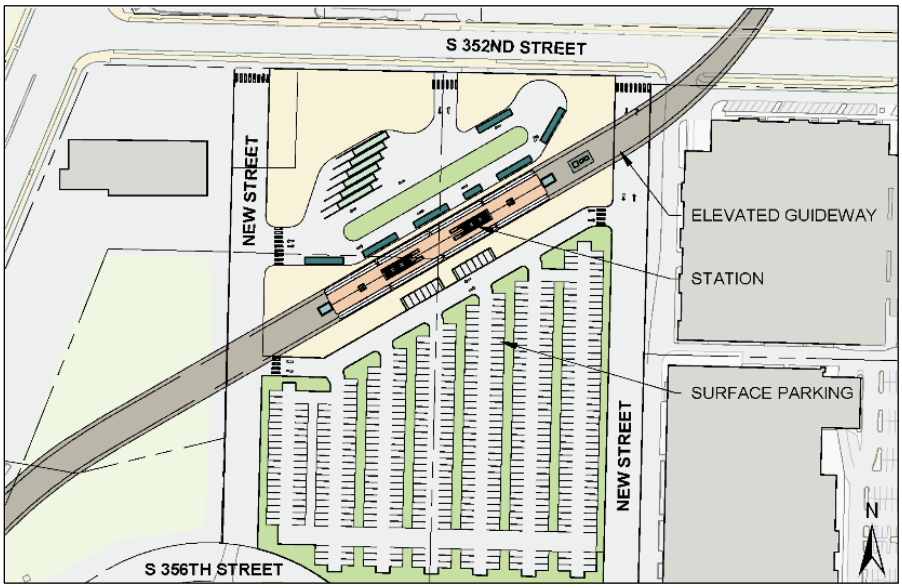


Figure 2-21 SF 99-352nd Station with Surface Parking

2.1.2.3 Fife Segment

In the Fife Segment, there are three build alternatives: Fife Pacific Highway, Fife Median, and Fife I-5 (Figure 2-22). All three of the alternatives in the Fife Segment share common sections that are identified as part of the Preferred Alternative, but no preferred alternative has been identified between the Fife Station and Port of Tacoma Road vicinity.

Preferred Alternative (common to all Fife alternatives)

The areas in the Fife Segment where a Preferred Alternative is identified are shown in Figure 2-22. The first area would extend from the Fife city limit near Wapato Way E to just west of the Fife Station. The second area would extend from just west of Port of Tacoma Road to the Fife/Tacoma city limit, where all alignments would travel on the north side of I-5.

The Fife Station is part of the Preferred Alternative and would be an elevated station, with the platform north of 15th Street E (Figures 2-23 and 2-24). The station would be on the west side of 59th Avenue E. Station entrances would be provided at both the east and west ends of the station. There would be approximately 500 parking spaces provided in either a garage to the north of the station platform or surface parking configuration to the north and east of the station platform.

Additionally, there are two station design options at 54th Avenue E in Fife that would shift the guideway slightly south:

- 54th Avenue Design Option locates the station on the west side of 54th Avenue E, south of 12th Street E (Figures 2-25 and 2-26).
- 54th Span Design Option locates the station to span over 54th Avenue E between 12th Street E and 15th Street E (Figures 2-27 and 2-28).

Fife Pacific Highway Alternative

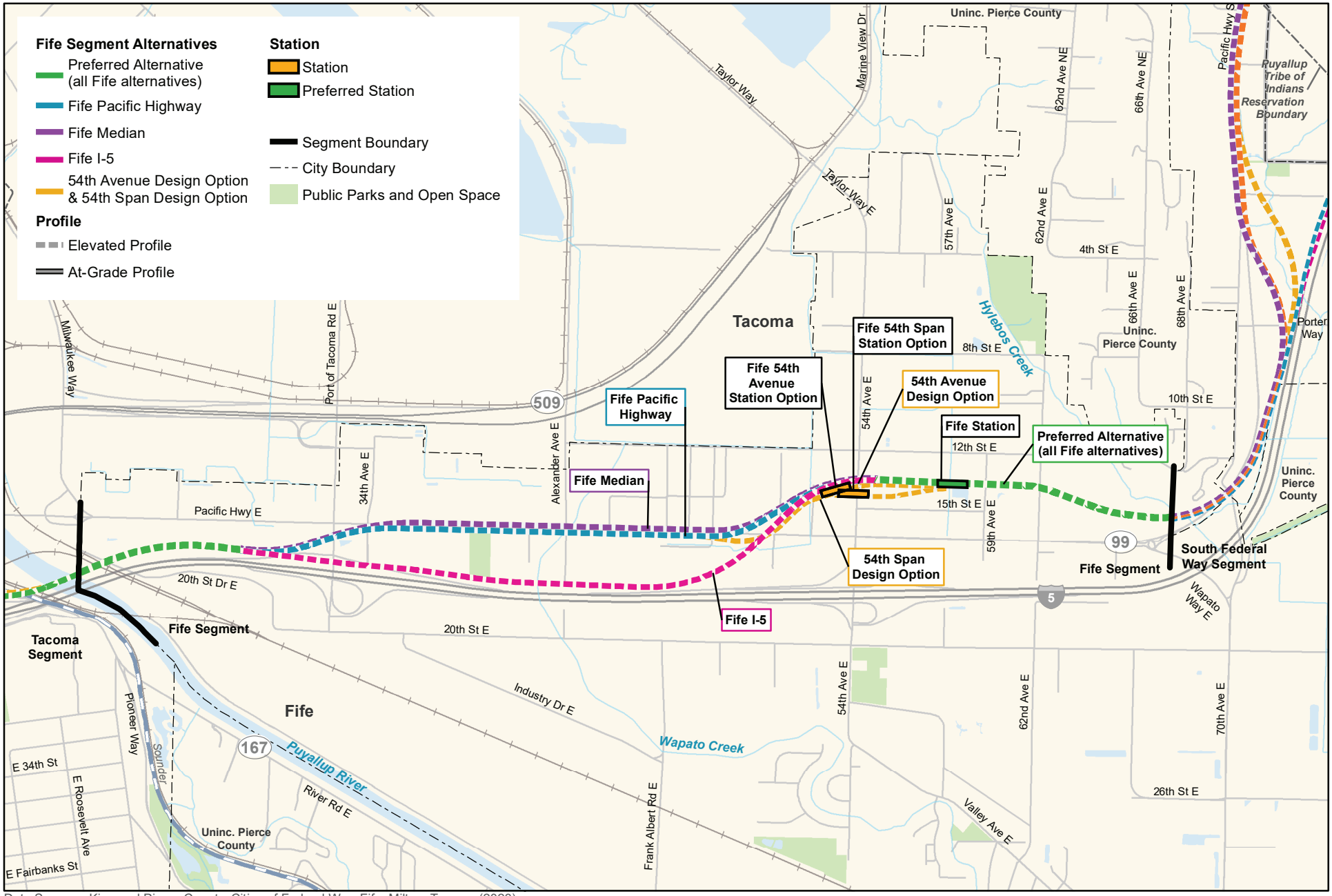
The Fife Pacific Highway Alternative would continue west from the Fife Station across 54th Avenue E and curve southwest until it crosses Pacific Highway E. The alignment would follow the south side of Pacific Highway E to just west of the Port of Tacoma Road, where it would curve to meet the north side of I-5.

Fife Median Alternative

The Fife Median Alternative would continue west from the Fife Station across 54th Avenue E and curve southwest until it meets Pacific Highway E. The Fife Median Alternative would then continue in the median of Pacific Highway E. Near Port of Tacoma Road, the alignment would curve to the southwest to follow the north side of I-5.

Fife I-5 Alternative

From the Fife Station, the Fife I-5 Alternative would continue west across 54th Avenue E and curve to the southwest to cross Pacific Highway E near 51st Avenue E. The alignment would then follow the north side of I-5.



Data Sources: King and Pierce County, Cities of Federal Way, Fife, Milton, Tacoma (2023).

N

0 0.5 1 Mile

FIGURE 2-22
Fife Segment Alternatives

Tacoma Dome Link Extension

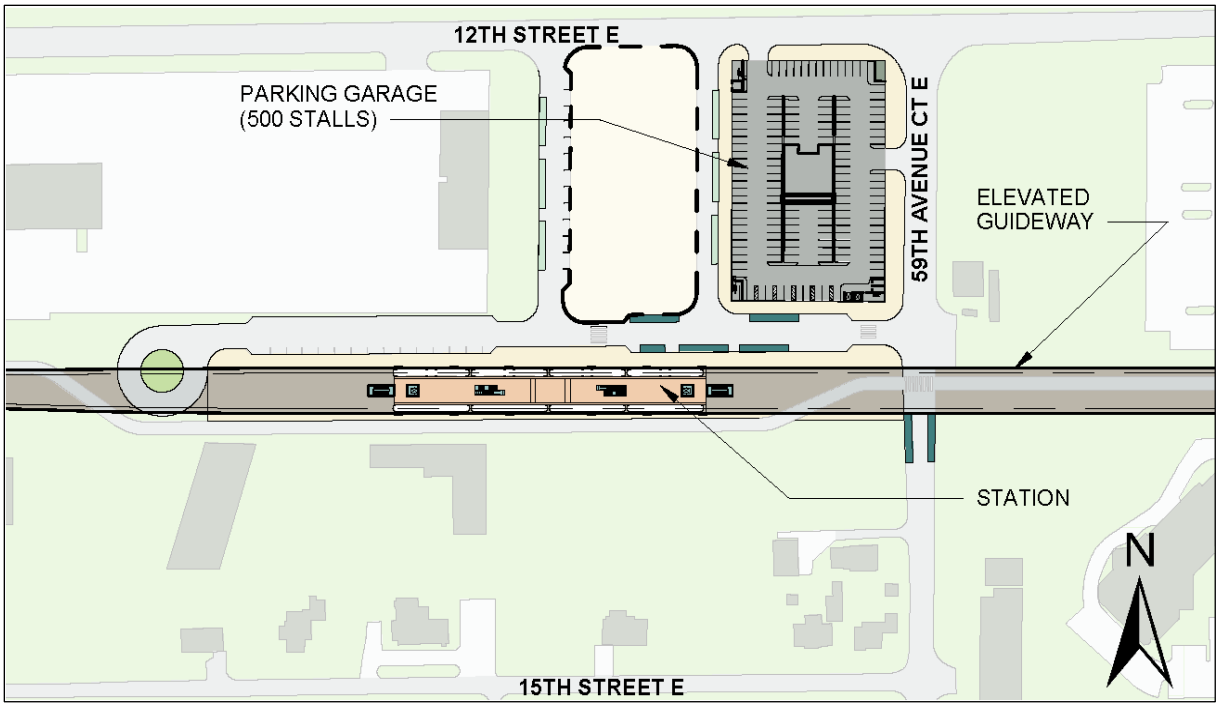


Figure 2-23 Fife Station with Parking Garage

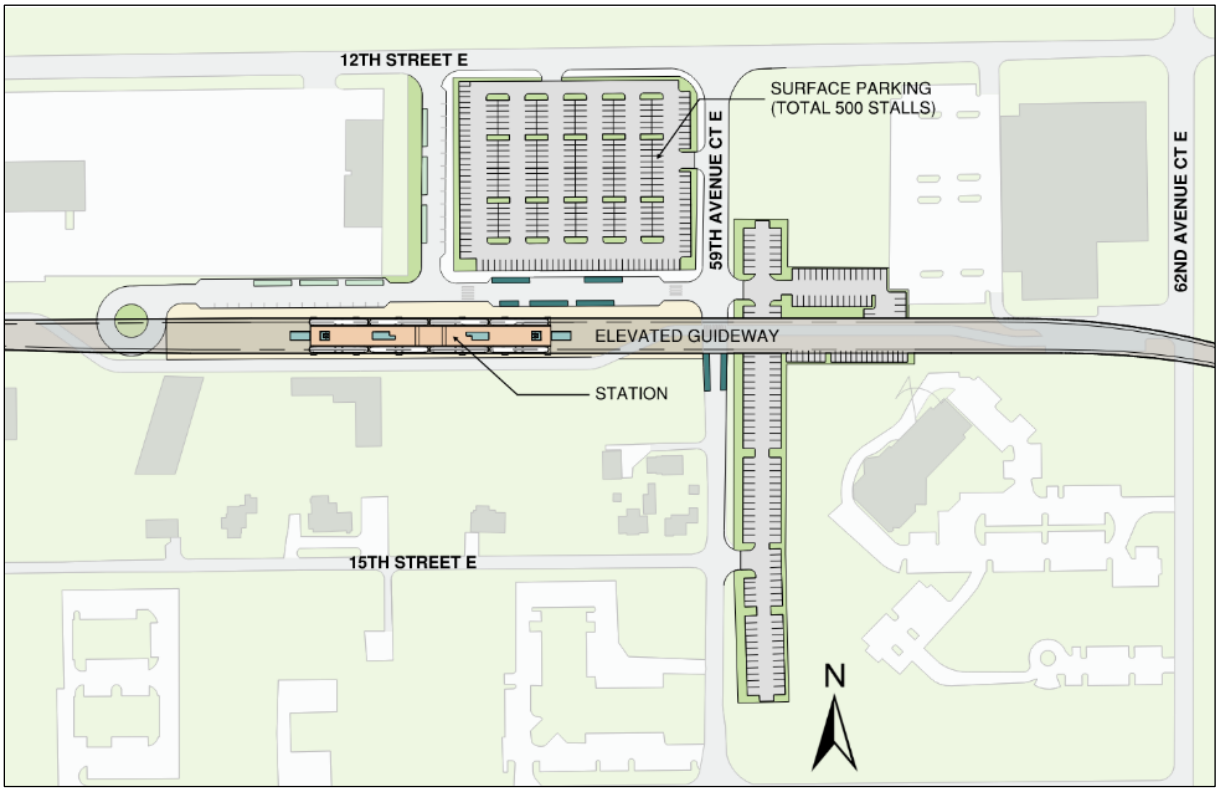


Figure 2-24 Fife Station with Surface Parking

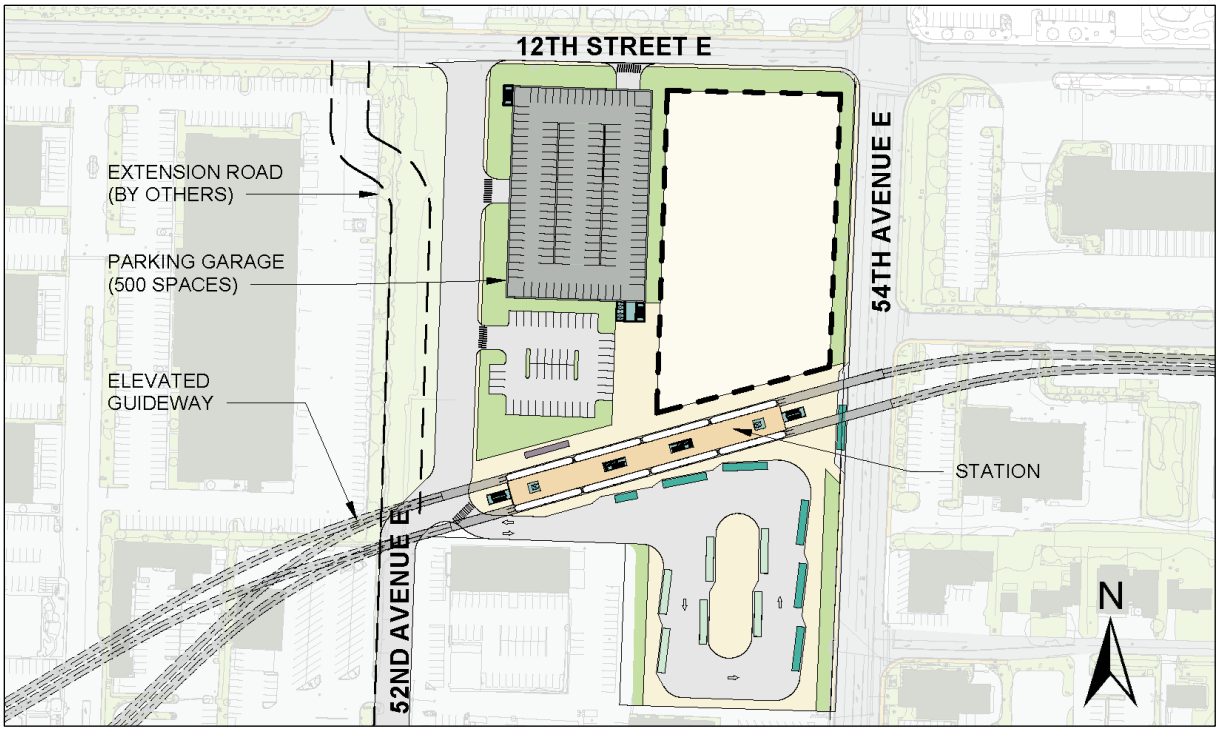


Figure 2-25 Fife 54th Avenue Station Option with Parking Garage

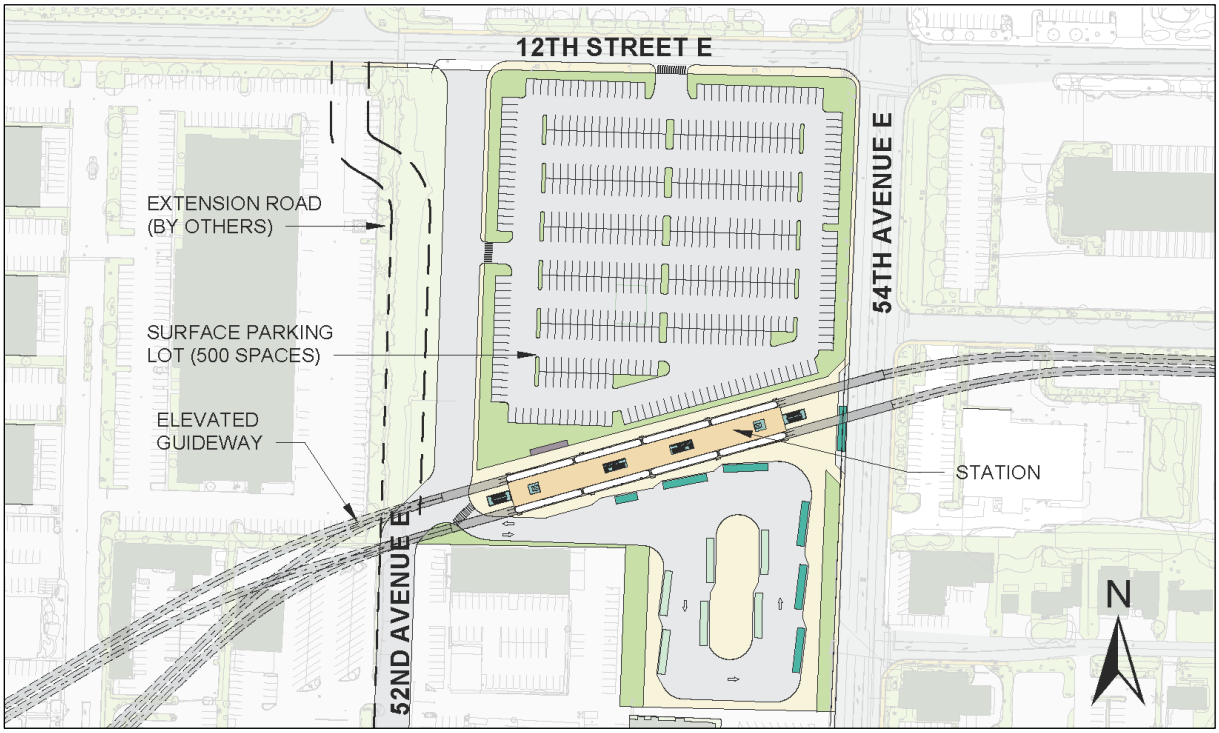


Figure 2-26 Fife 54th Avenue Station Option with Surface Parking

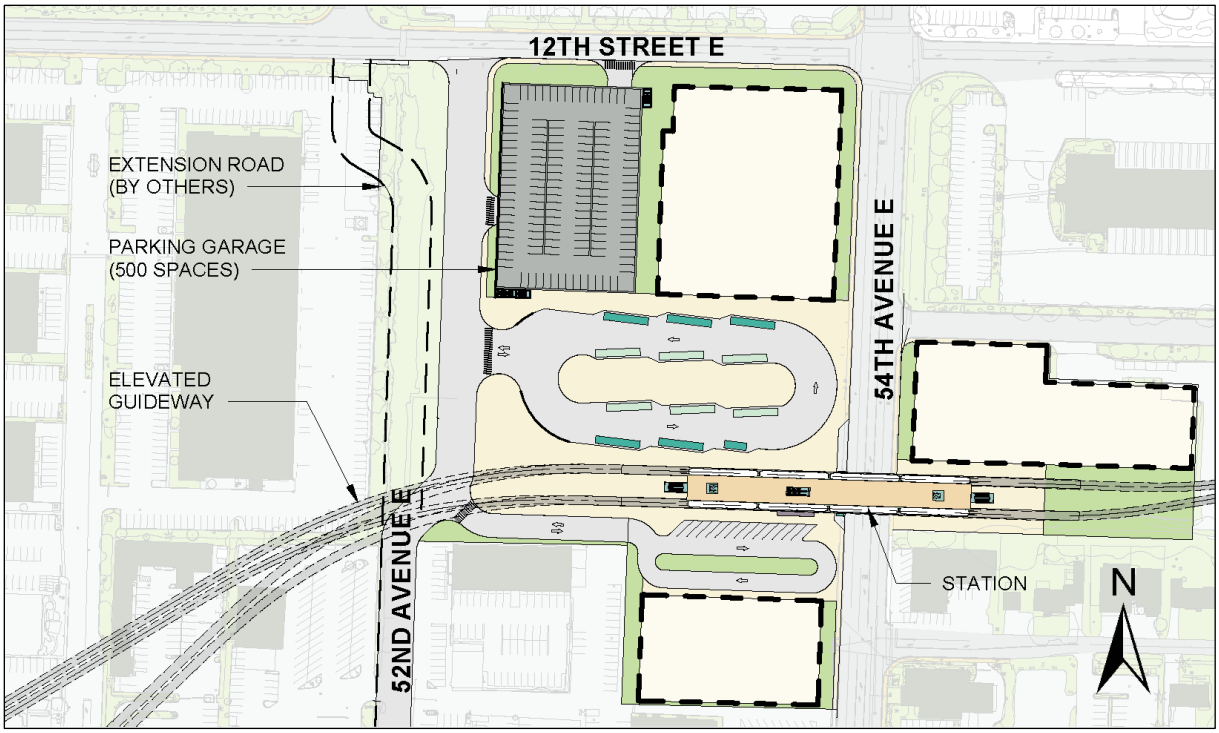


Figure 2-27 Fife 54th Span Station Option with Parking Garage

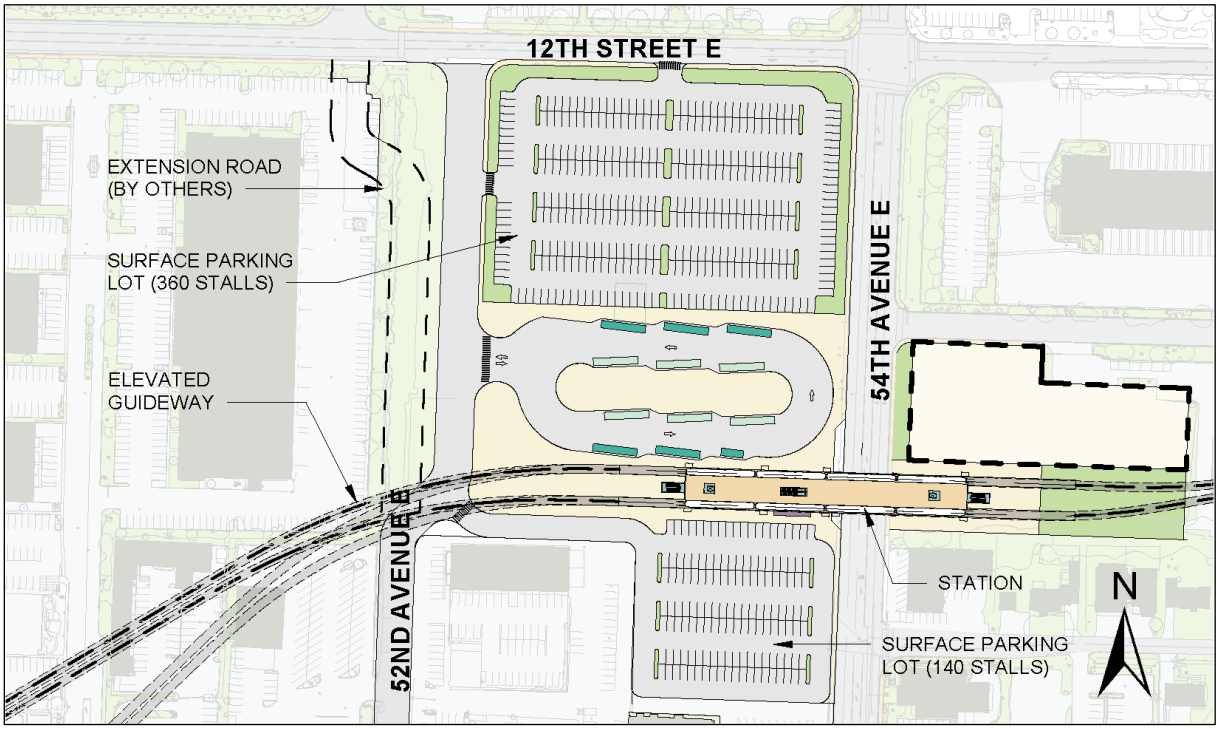
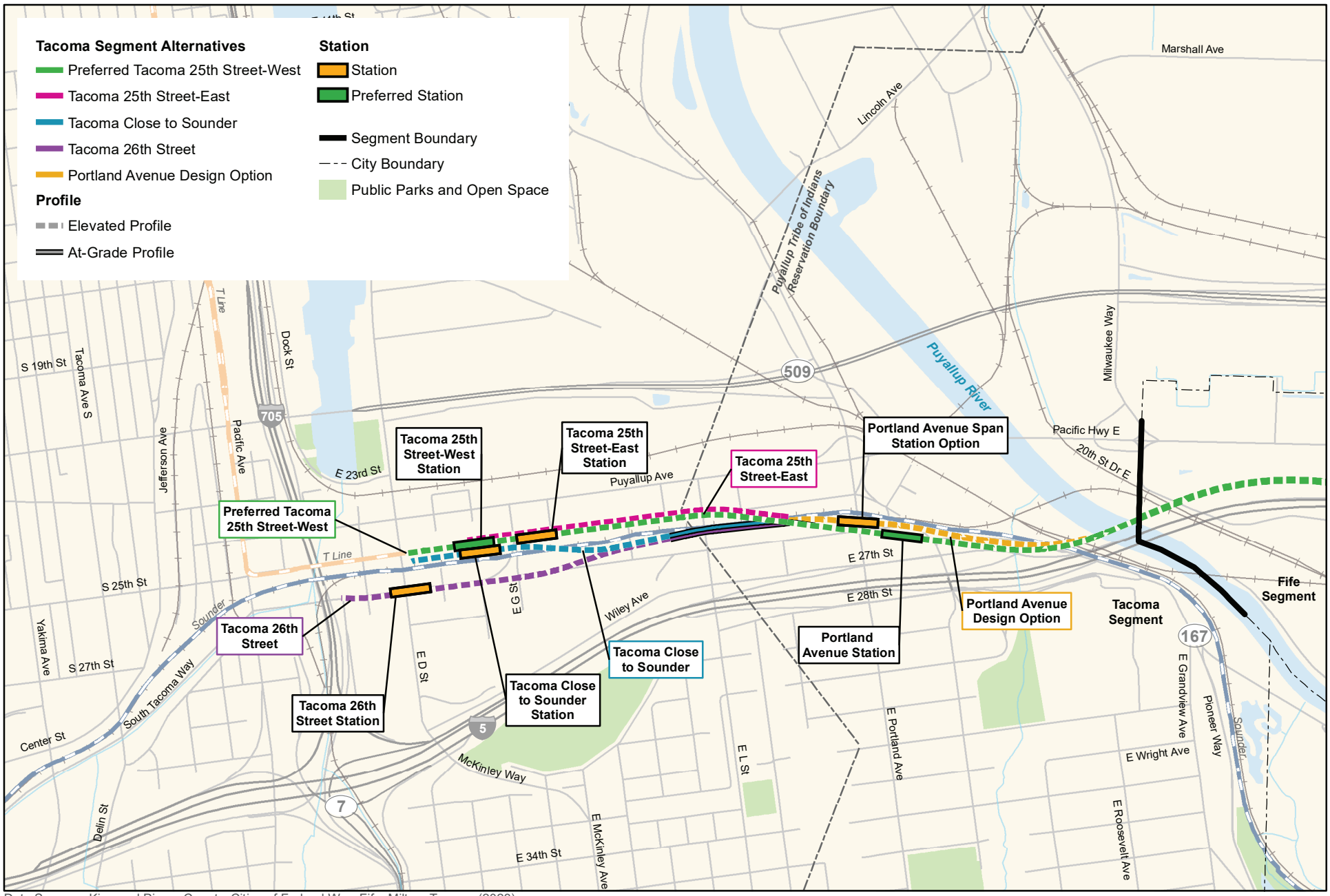


Figure 2-28 Fife 54th Span Station Option with Surface Parking

2.1.2.4 Tacoma Segment

There are four build alternatives in the Tacoma Segment (Figure 2-29). These alternatives would each have the same alignment and design options between the Fife/Tacoma city limit to the Portland Avenue Station. From the Fife/Tacoma city limit, all Tacoma Segment alternatives would cross the Puyallup River north of the new I-5 bridge that was completed in 2022. Two bridge types are being studied for the crossing: a long-span bridge that would completely span the river and a pier-supported bridge that would have a pier or piers in the river. The long-span structure type in the conceptual design (Appendix F, Conceptual Design Drawings) is a segmental box girder, which would be approximately 60 feet higher than the nearby I-5 bridge deck. The pier-supported bridge would be about 10 feet higher than the nearby I-5 bridge deck. Other structure types for a long-span bridge could include a cable-stayed, extradosed, truss, or arch. Bridge type would be determined during final design based on various factors, including engineering feasibility and constraints, environmental effects, cost, and coordination with Tribes and other agencies on permitting requirements.

After crossing the Puyallup River, all alternative alignments travel northwest to serve the Portland Avenue Station, which includes a design and station option. West of the Portland Avenue Station, the alternatives would follow different alignments as described below. All of the stations near the Tacoma Dome include active bus zones and layover space; these bus transit options are discussed in Table 5-7 in Appendix J1, Transportation Technical Report.



Data Sources: King and Pierce County, Cities of Federal Way, Fife, Milton, Tacoma (2023).

N

0 0.5 1 Mile

FIGURE 2-29
Tacoma Segment Alternatives

Tacoma Dome Link Extension

Portland Avenue Station (common to all Tacoma alternatives)

The Portland Avenue Station would be an elevated station between E Portland Avenue and E Bay Street along the south side of E 26th Street (Figure 2-30). A siding track, which is a short section of track that allows trains to pass, would be provided to the west of the Portland Avenue Station.

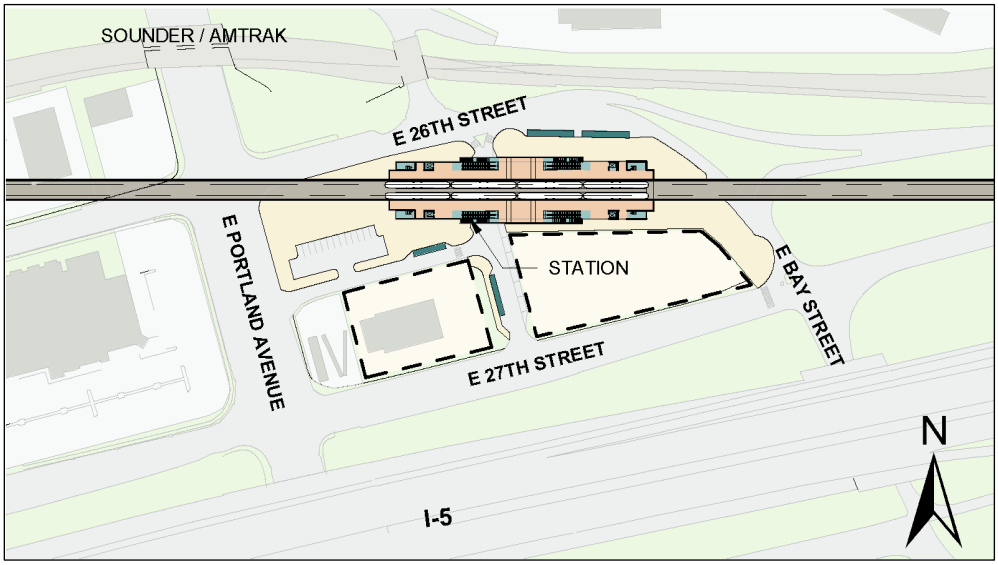


Figure 2-30 Portland Avenue Station

Portland Avenue Design Option and Portland Avenue Span Station Option (common to all Tacoma alternatives)

All Tacoma Segment alternatives could include the Portland Avenue Design Option and Portland Avenue Span Station Option (Figure 2-31). The design option would shift the guideway just north of the E 26th Street and E Portland Avenue intersection. This would allow for the station option to span E Portland Avenue. The elevated station would be between E 26th Street and E 25th Street.

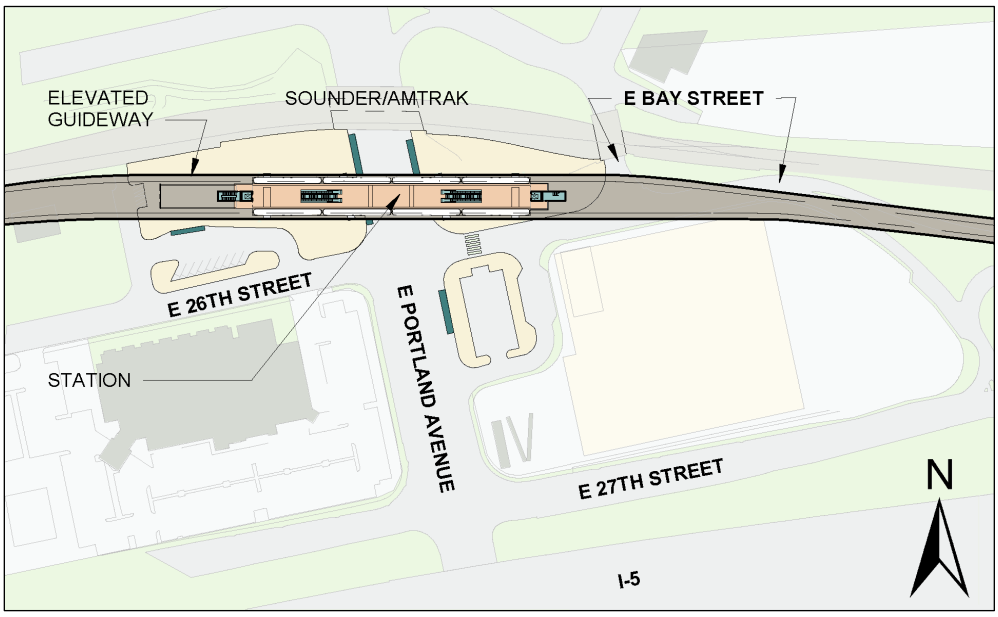


Figure 2-31 Portland Avenue Span Station Option

Potential Nonmotorized Access

For all alternatives, other parties could provide an optional Portland Avenue bike and pedestrian bridge near the Portland Avenue Station or the Portland Avenue Span Station to improve nonmotorized access between the station north of I-5 and the neighborhoods to the south of I-5. While the bridge is not currently a part of the funded project, it is an option analyzed in this Draft EIS. There are two options for the bike and pedestrian bridge; the west option could be located along E Portland Avenue, and the east option could be located to the west of E Bay Street/East R Street. On the south side of I-5, access to the pedestrian overpass could be provided near E 29th Street. On the north side of I-5, the overpass could either tie directly into the station or provide access next to the station.

Figure 2-32 Straddle Bent

Preferred Tacoma 25th Street-West Alternative

From the Portland Avenue Station, the Preferred Tacoma 25th Street-West Alternative would continue northwest to E 25th Street and then travel above E 25th Street on straddle bents (Figure 2-32) until just east of East D Street. The Tacoma 25th Street-West Station would be along E 25th Street between East G Street and East D Street.

The Tacoma 25th Street-West Station would be an elevated station located over E 25th Street, between the Tacoma Dome Station Parking Garage and Freighthouse Square (Figure 2-33).

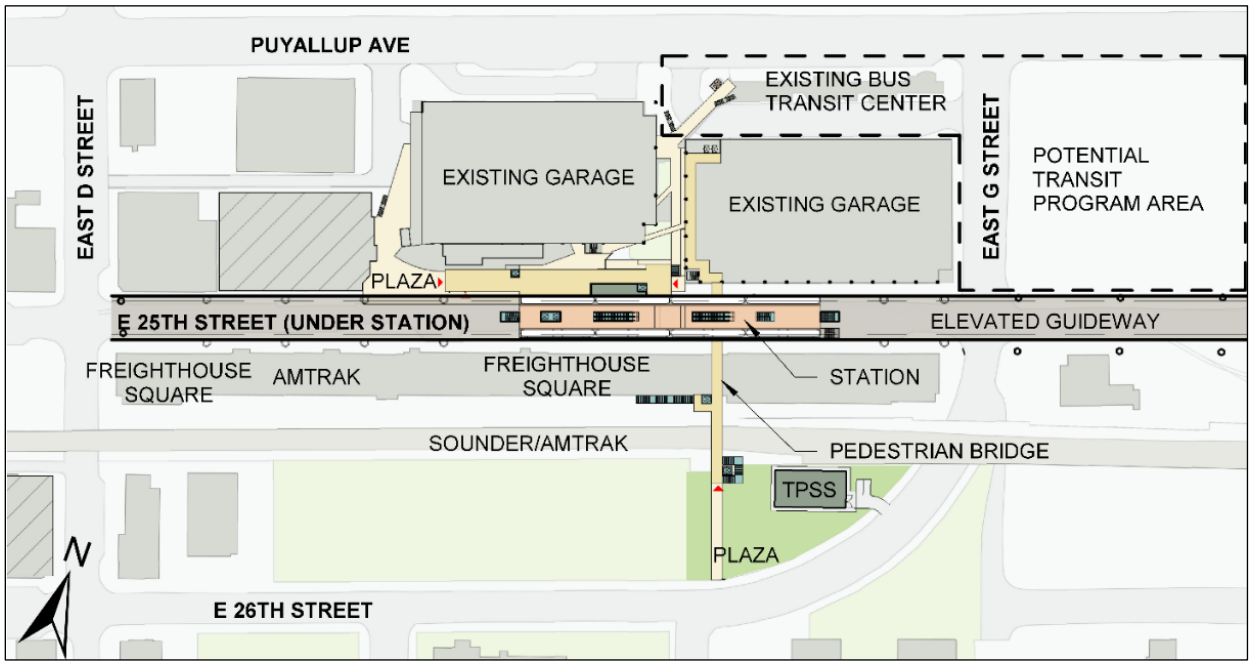


Figure 2-33 Tacoma 25th Street-West Station

Station entrances would be provided on the north side of E 25th Street at each end of the station. A grade-separated pedestrian bridge over the Sounder/Amtrak tracks would be provided to minimize the number of pedestrians and bicyclists crossing those tracks at-grade. A second grade-separated pedestrian connection from the station to the existing parking garage is not part of the project but could potentially be funded through the TDLE nonmotorized access fund. Transit facilities for both active bus bays and bus layover would be provided at the station, with different configurations possible. The area where transit facilities would be located is called the Potential Transit Program Area. This station would be the terminus for TDLE and would include tail tracks.

Tacoma 25th Street-East Alternative

The Tacoma 25th Street-East Alternative would have the same alignment as the Tacoma 25th Street-West Alternative, except that it would connect to the Tacoma 25th Street-East Station located over E 25th Street just east of East G Street.

The Tacoma 25th Street-East Station would be over E 25th Street to the southeast of the Tacoma Dome Station Parking Garage (Figure 2-34). Station entrances would be at the west end of the station at the corner of East G Street and E 25th Street. A grade-separated pedestrian connection between the station, the existing parking garage, and the plaza area to the west along the north side of E 25th Street is not part of the project but could potentially be funded through the TDLE nonmotorized access fund. This would facilitate access to Tacoma Link as well as the parking garage. Transit facilities for both active bus bays and bus layover would be provided at the station, with different configurations possible within the Potential Transit Program Area. This station would be the terminus for TDLE and would include tail tracks.

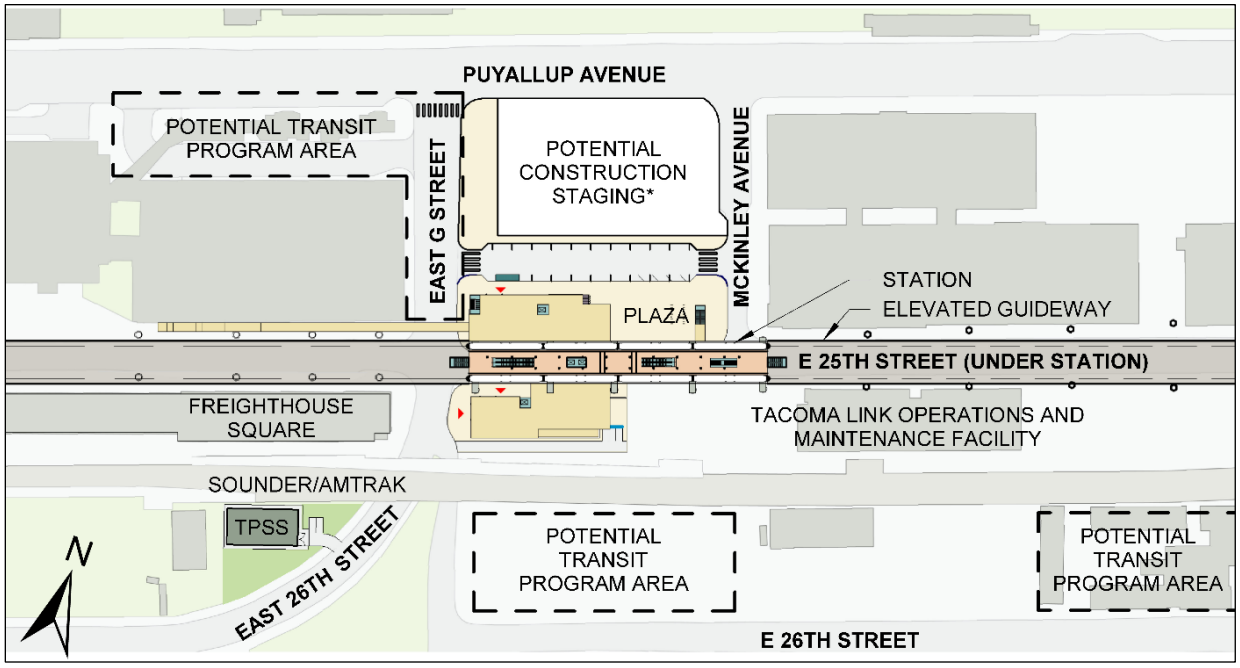


Figure 2-34 Tacoma 25th Street-East Station

Tacoma Close to Sounder Alternative

The Tacoma Close to Sounder Alternative would continue northwest from the Portland Avenue Station or Portland Avenue Span Station and run parallel along the south side of the Sounder tracks until McKinley Avenue, where it would cross over to the north side of the Sounder tracks to a station between East G Street and East E Street. There would be a short section where the guideway would be at-grade in exclusive right-of-way along the Sounder tracks between approximately East N and East L Streets.

The Tacoma Close to Sounder Station would be on E 25th Street and East G Street, on the site of the existing Freighthouse Square building (Figure 2-35). The portions of Freighthouse Square east and west of the Amtrak station would be demolished. The Sounder concourse and Amtrak station are undergoing further evaluation to determine if they can be retrofitted to meet fire and life safety requirements, or if they would be rebuilt to meet the required codes. In addition to standard station uses, the design concept for the station would include space under the platform and guideway that could potentially be used for other non-transit uses. Any such uses would be in compliance with applicable requirements established by local jurisdictions, state, and federal agencies in addition to Sound Transit's policies and guidelines. Station entrances would be at both the west and east ends of the station. A grade-separated pedestrian bridge over the Sounder/Amtrak tracks to E 26th Street would be provided to minimize pedestrians and bicyclists crossing those tracks at-grade. A pedestrian bridge connection between the station and the existing garage is not part of the project but could potentially be funded through the TDLE nonmotorized access fund. Transit facilities for both active bus bays and bus layover would be provided at the station, with different configurations possible within the Potential Transit Program Area. The Tacoma Close to Sounder Station would be the terminus and would include tail tracks.

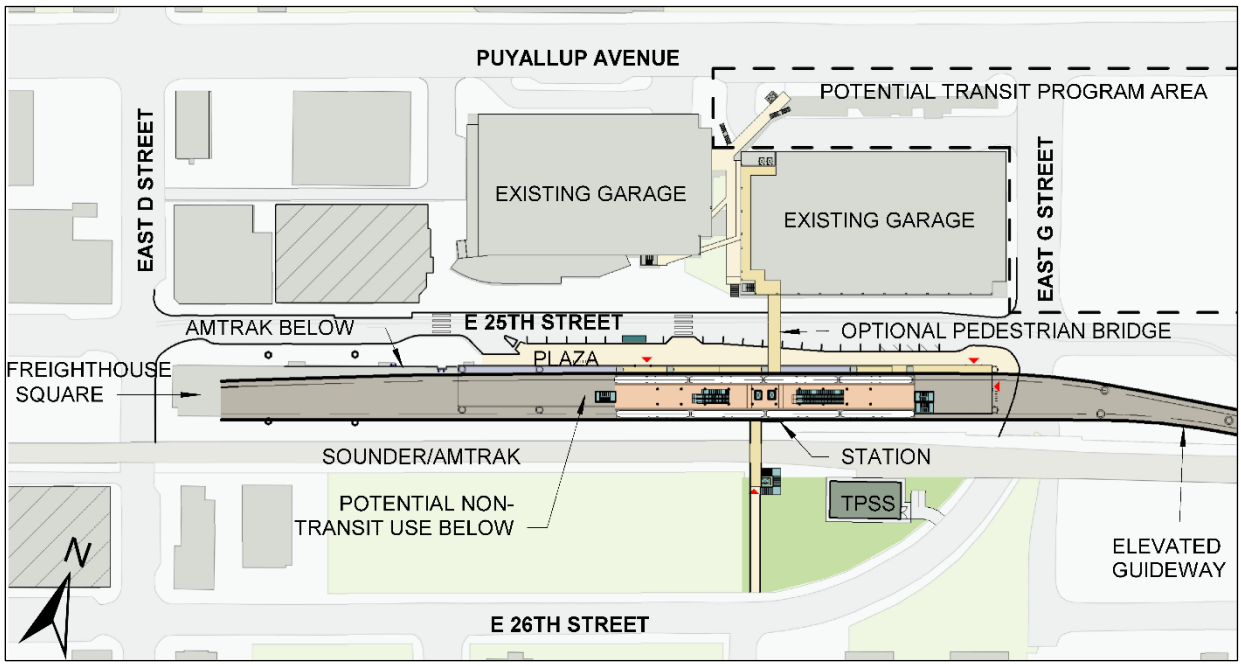


Figure 2-35 Tacoma Close to Sounder Station

Tacoma 26th Street Alternative

The Tacoma 26th Street Alternative would continue northwest from the Portland Avenue Station or Portland Avenue Span Station and run parallel along the south side of the Sounder tracks until just west of I-705. There would be a short section where the guideway would be at-grade or a retained-cut under East L Street. The alignment would continue southwest to be elevated over E 26th Street and then continue west over E 26th Street on straddle bents and end just east of East C Street.

The Tacoma 26th Street Station would be over the intersection of East D Street and E 26th Street, and station plazas would be on the northeast and southeast corners (Figure 2-36). Station entrances would be on both the north and south sides of E 26th Street to the east of East D Street, as well as one entrance west of East D Street on the south side of E 26th Street. A grade-separated pedestrian bridge over the Sounder/Amtrak tracks would be provided to minimize pedestrians and bicyclists crossing those tracks at-grade. Transit facilities for both active bus bays and bus layover would be provided at the station, with different configurations possible within the Potential Transit Program Area. This station would be the terminus and would include tail tracks.

The Tacoma Close to Sounder and Tacoma 26th Street alternatives would run parallel to active Sounder commuter rail tracks that are also used by Amtrak. The TDLE current design anticipates sufficient separation from track centers such that no crash wall would be required to be installed between the freight rail and light rail corridor. As design progresses, Sound Transit will continue to evaluate whether a crash wall would be required in accordance with BNSF and American Railway Engineering and Maintenance of Way Association track standards.

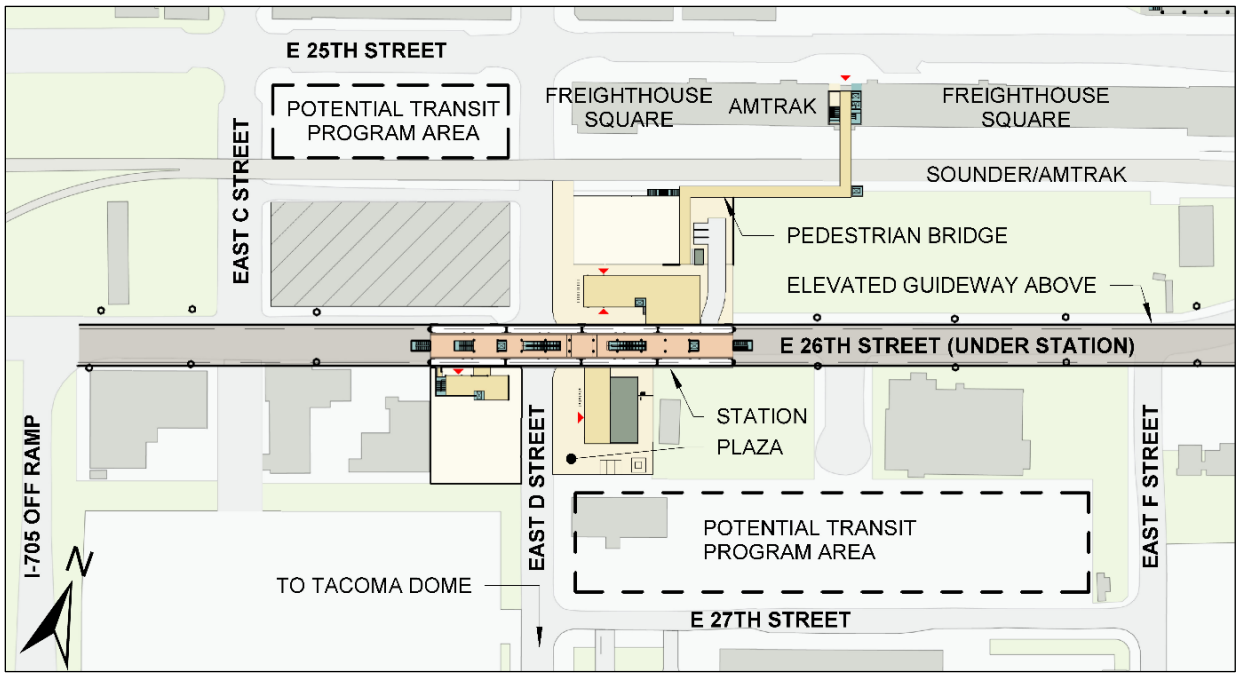


Figure 2-36 Tacoma 26th Street Station

2.2 No-Build Alternative

The No-Build Alternative includes the transportation system and environment as they would exist in 2042 without the proposed project, and it provides a baseline condition for comparing impacts of the build alternatives. The year 2042 is used as the analysis year because it is consistent with full buildout of the light rail capital projects included in the Sound Transit 3 Plan. The No-Build Alternative includes projects, funding packages, and proposals in the central Puget Sound region that are planned to occur with or without TDLE. No-Build improvements include roadway and transit actions by state, regional, and local agencies that are currently funded or committed and those that are likely to be implemented based on approved and committed funding.

The No-Build Alternative includes the following link light rail improvements by Sound Transit:

- Extension north to Everett, including stations.
- Extension south to Federal Way, including stations.
- Extension of East Link to downtown Redmond, including stations.
- Extension to West Seattle, including stations.
- Extension to Ballard with new downtown Seattle tunnel, including stations.
- New Link light rail line from south Kirkland to Issaquah, including stations.
- Infill Link stations at NE 130th Street, S Graham Street, and S Boeing Access Road in Seattle.
- Sounder commuter rail South line capacity enhancements and extension to Tillicum and DuPont.
- An OMF in the north service district.
- An OMF in the south service district.
- Extension of T Line to Tacoma Community College, including stations.

The No-Build Alternative also includes the following major regional transportation projects listed in the State Transportation Improvement Plan and PSRC Regional Capacity Projects List:

- I-5 SR 161/SR 18 Triangle Project – Phase 2 (project was proposed at the time the No-Build analysis was conducted but has since been suspended).
- SR 167 Completion Project from SR 161 to SR 509.
- I-5/Port of Tacoma Road Interchange.
- I-5/54th Avenue Interchange.
- I-5 High Occupancy Vehicle Projects near Fife/Tacoma.

Future bus rapid transit service provided by Pierce Transit (STREAM) and King County Metro that connects to the TDLE corridor is also included in the No-Build Alternative. The bus service network used in the Draft EIS analysis is consistent with future service plans developed by King County Metro, Pierce Transit, and Sound Transit. These plans are subject to change by the transit agencies depending on funding availability and other factors. The Transportation Technical Report (Appendix J1 of this Draft EIS) describes the major projects as well as local agency projects assumed in the No-Build Alternative.

2.3 Minimum Operable Segments and Interim Termini

There are two minimum operable segments (M.O.S.s) for TDLE: one to the station in South Federal Way and one to the station in Fife. While these would serve as end-of-line stations for an M.O.S., they could also serve as interim termini if the project is phased.

Minimum Operable Segment

An M.O.S. is defined by the FTA as "a segment of the Locally Preferred Alternative that provides the most cost-effective solution with the greatest benefits for the project. The M.O.S. must be able to function as a stand-alone project and not be dependent on any future segments being constructed" (FTA 2008).

Interim Terminus

An interim terminus is a station that temporarily serves as the end of the line when a project is constructed in phases. An interim terminus can also be successfully operated on a long-term basis, if necessary, until the entire project is built.

These stations were determined to be reasonable M.O.S.s or interim terminuses because they each include transit integration opportunities and a 500-stall parking facility and they are close to regional highways for access, including I-5, SR 18, and SR 167. Transit integration opportunities at stations would be coordinated with the transit agencies and local jurisdictions. Neither M.O.S. would change the planned number of stalls in the parking facility. Potential parking control mitigation measures for an M.O.S. scenario would be the same as for the full build alternatives described in Section 3.8, Parking.

In an M.O.S. or interim terminus scenario, crossovers and tail tracks (approximately 500 feet long) would be provided. Additional operator facilities, such as staff restrooms, storage rooms, supervisor office, security office, crew rooms, staff parking, would also be provided at the station. These would be consistent with the project requirements of the Sound Transit Requirements Manual (Sound Transit 2024).

The Portland Avenue Station was not identified as a reasonable interim terminus station and M.O.S. because of its proximity (less than 1 mile) to the TDLE terminus and lack of customer parking.

2.4 Alternatives Development and Scoping

As described in Chapter 1, Purpose and Need for TDLE, the project is the result of a lengthy planning process. After voter approval for funding the Sound Transit 3 Plan, which included the TDLE Project, Sound Transit continued to build on past planning with the alternatives development process described below. FTA will incorporate or use, as appropriate, planning products or the results from transportation planning studies, including the purpose and need for the action, the range of reasonable alternatives, environmental analyses, and proposed mitigation actions resulting from metropolitan or statewide transportation planning. This is consistent with provisions in 49 USC 5303 and 5304, 23 USC 139(f), and 23 CFR 450.318.

To identify alternatives to study in the EIS, Sound Transit completed an alternatives development process that included a three-level screening process: prescreening, Level 1, and Level 2 alternatives evaluation. The alternatives development process began with early scoping under SEPA in April 2018. Sound Transit published an early scoping notice in the SEPA register on March 28, 2018, initiating early scoping, and started the 30-day comment period. The early scoping process is discussed below. Detailed information on the development of the alternatives is included in Appendix I, Alternatives Development Supporting Documents.

2.4.1 Early Scoping

Early scoping for TDLE began in spring 2018. Sound Transit asked for comments from the Tribes, public, and agencies, on:

- The route (alignment), stations, potential alternatives, benefits, and impacts for TDLE.
- The Purpose and Need Statement.

The representative project is the project that was presented to the public as part of Sound Transit 3. The project included an extension of light rail from the FWLE terminus to the Tacoma Dome area, with stations in South Federal Way, Fife, and East Tacoma, as well as at the Tacoma Dome. The representative project alignment was primarily located adjacent to I-5. The representative project from Sound Transit 3 was used as a starting point for comments on potential station and alignment alternatives.

Early scoping comments from the Puyallup Tribe of Indians and agencies helped guide the location of stations and the alignment in the early phases of alternatives analysis. In general, early scoping comments indicated a preference for station locations farther from I-5 and in areas that could support transit integration, multimodal access, and TOD. Comments also indicated the importance of minimizing environmental impacts from the stations and alignment.

Public comment addressed alignments, station locations, and other community considerations for TDLE and are summarized in Appendix I, Alternatives Development Supporting Materials.

The early scoping comments were used to inform the set of station and alignment alternatives that were evaluated in the alternatives development phase. Detailed information on early scoping is provided in the Tacoma Dome Link Extension Early Scoping Summary Report (Sound Transit 2018b).

2.4.2 Initial Development of Draft EIS Alternatives

Station and alignment concepts developed from a previous study of the corridor, as well as early scoping comments, were evaluated using an alternatives evaluation process. Over 50 alternatives and options were evaluated. Most of the alternatives were variations on alignments that followed either I-5, SR 99, or other local streets parallel to I-5, and they included options on both sides of I-5 or in the median, with a variety of station siting options in the South Federal Way, Fife, East Tacoma, and Tacoma Dome areas.

Concepts were not evaluated beyond this prescreening phase where they were inconsistent with the project purpose and need or the Sound Transit 3 Plan, included circuitous routing that would add travel time to the high-capacity transit service, or were determined to be infeasible based on environmental constraints. Alternatives were then evaluated in the increasingly detailed Level 1 and Level 2 alternatives evaluation phases, using criteria based on the project purpose and need. Those alternatives that were the most promising have been carried through and included in this Draft EIS. Detailed information on the alternatives evaluation criteria and process is included in the Pre-Screening, Level 1, and Level 2 Alternatives Evaluation Reports in Appendix I, Alternatives Development Supporting Documents.

2.4.3 NEPA and SEPA EIS Scoping Process

The NEPA and SEPA EIS scoping process was conducted between April 1 and May 1, 2019. The scoping process allowed Tribes, agencies, and the public to comment on the project's Purpose and Need Statement, topics to study in the Draft EIS, and the proposed route and station alternatives to be evaluated.

Scoping comments received from the Puyallup Tribe of Indians, agencies, and the public provided guidance on alignment and station preferences as well as modifications of alternatives to be studied in the Draft EIS. These comments are summarized in the Tacoma Dome Link Extension Scoping Summary Report (Sound Transit 2019a), which is included in Appendix I, Alternatives Development Supporting Documents. Additional information about outreach and engagement throughout the environmental review process is included in Appendix B, Public Involvement and Tribal and Agency Coordination.

2.4.4 Alternatives Carried Forward

Following the alternatives development process and public scoping period, the Sound Transit Board of Directors reviewed the comments received and the technical results of the alternatives evaluation. The Board approved Motion M2019-75 (South Federal Way, Fife, and East Tacoma) and M2019-77 (Tacoma Dome) on July 25, 2019, which identified preferred alternatives, other alternatives, and design options to study in the Draft EIS (Sound Transit 2019b and 2019c).

Table 2-3 summarizes the alternatives identified in the Sound Transit Board Motions M2019-75 and M2019-77 for study in the Draft EIS.

Table 2-3 TDLE Alternatives Carried Forward

Alternative Name in Sound Transit Board Motion	Draft EIS Alternative
South Federal Way Segment	
SF2 West	SF Enchanted Parkway Alternative
SF 8/9	SF I-5 Alternative
Fife Segment	
Fife 3	Fife Station, part of the Preferred Alternative
Fife A (I-5 Alignment)	Fife I-5 Alternative
Fife B (SR 99 Alignment)	Fife Pacific Highway Alternative
Tacoma Segment	
ET 3A/TD 2	Preferred Tacoma 25th Street-West Alternative
ET 3A/TD 3	Tacoma 25th Street-East Alternative
ET 3A/TD 2 Option for alignment and station close to Sounder corridor	Tacoma Close to Sounder
ET 3B/TD 4 East In-Street	Tacoma 26th Street Alternative

Source: Sound Transit Board Motion M2019-75 and M2019-77.
SF = South Federal Way.
ET = East Tacoma.
TD = Tacoma Dome.

Following the identification of the Draft EIS alternatives in July 2019, additional alternatives and design and station options were added based on comments received from local agencies as well as additional refinement of the alternatives by Sound Transit. These included the following:

- South Federal Way SF 352nd Span Station Option: Added to address the Board's direction to evaluate opportunities to establish appropriate nonmotorized access to the station.
- Fife Median Alternative: Added to address local agency comments.
- Portland Avenue Design Option, including Portland Avenue Span Station Option: Added to address refinement to the alignment and direction from the Board to study a station spanning Portland Avenue (M2019-75) in the Tacoma Segment.

2.4.5 Alternatives Not Carried Forward

The scoping process generated alternative suggestions that were considered but not identified for study in the Draft EIS for the reasons shown in Table 2-4. Additional information on alternatives not carried forward is included in Appendix I, Alternatives Development Supporting Documents.

Table 2-4 TDLE Alternatives Suggested During Scoping and Not Carried Forward

Alternative Suggested	Reason Not Evaluated in Draft EIS
Cut-and-cover tunnel station in Tacoma Dome Area	A cut-and-cover tunnel alternative was determined to have substantial cost and engineering complications as well as environmental impact challenges (including potential cultural resources impacts) that would create constructability challenges. The cut-and-cover option would also have resulted in additional property impacts as well as a longer construction schedule.
Over Sounder Station in Tacoma Dome Area	An alignment over the existing Sounder tracks created several constructability, operational, and maintenance concerns, as well as effects on the built environment. This option would likely have required extended service disruptions to both Sounder and Amtrak service.

2.4.6 Additional Alternatives Development and Engagement

As the analysis of alternatives was being developed, coordination with regional Tribal partners identified known cultural resources adjacent to I-5 in the South Federal Way Segment. As a result, the need for additional alignments was identified, and the SF 99-West and SF 99-East alternatives were developed. In Fife, climate change and floodplain concerns were identified and resulted in two design options being developed, the 54th Avenue Design Option and 54th Span Design Option. A public engagement period was held from February 27 to March 14, 2023, to share information about the potential additional alignment and station locations being considered based on the new cultural resources and floodplain information. In March 2023, the Sound Transit Board identified additional alternatives along the SR 99 (Pacific Highway) corridor as well as additional station options in Fife to study in the Draft EIS (Motion M2023-19). The additional alternatives in the South Federal Way Segment and design options in Fife are included in this Draft EIS.

2.5 Construction Approach

This section provides an overview of potential construction activities and timing. Construction and testing of TDLE is anticipated to take approximately 5 years to complete. Major activities would include:

- Civil construction: This includes utility relocation, foundation and column placement, guideway construction, and track work, followed by construction of other facilities, such as stations, park-and-ride lots and structures, and ancillary facilities.

- Systems installation: This includes the installation of the electrical system that would power the trains.
- Testing and startup activities: Before beginning revenue operations, Sound Transit would complete a safety certification process by testing communications, safety, and emergency systems.

The major construction activities that could cause environmental impacts and community disruption include but are not limited to:

- Demolition (buildings, pavement).
- Clearing and vegetation removal.
- Construction of elevated structures and bridges.
- Pile driving or auguring piles.
- Temporary, partial, or total road or lane closures and detour routes.

The potential construction activities and impacts described in this section are discussed qualitatively because it is not known exactly how the project would be constructed at this stage of development.

2.5.1 Construction Sequence, Activities, and Durations

Construction of linear projects is typically divided into segments. The extent of these segments is generally based on the nature of the construction activity, such as foundations, column placement, at-grade guideway construction, elevated guideway construction, retained cut and fill sections, station platforms, and park-and-ride facilities. To reduce the overall project construction period, the contractor may use multiple work crews/work zones along the corridor at any given time.

A work-specific construction plan would be developed during final design to establish the various construction phases and construction contracts, their estimated schedules and durations, and appropriate sequencing. Where possible, construction activities would be coordinated with other capital improvement projects being carried out by or permitted by the local jurisdictions to help minimize construction impacts.

Typical construction would occur on a 5- to 6-day workweek schedule and would occur primarily between the hours of 7 a.m. and 10 p.m. In some locations (such as when street or freeway detours are involved and/or daytime construction periods need to be abbreviated to reduce impacts), additional shifts, all-week, nighttime, or 24-hour construction activities could be necessary.

The construction of the elevated guideway shafts, columns, and pier caps (the guideway substructure) would require temporary roadway realignment or detours when located within the roadway. Construction of the guideway girders, decks, and rail systems (the guideway superstructure) could begin as soon as several substructure columns or bents are completed and would require temporary traffic controls, lane closures, or detours. There could be extended lane closures where guideway construction runs parallel or within the median of a roadway.

The duration of construction would range from approximately 1 to 4 years in any given portion of the corridor. The typical durations for major construction activities are shown in Table 2-5. Activities would be most intense in the initial part of construction, with later periods involving station finishing, systems installation, and testing.

Table 2-5 Major Construction Activities and Durations

Construction Activity	Estimated Duration
Demolition of structures, clearing and vegetation removal, utility relocations	2 to 12 months depending on the activity. Demolition of existing structures and relocation of utilities would be the most time-intensive activities.
Guideway construction	1 to 2.5 years in a given area
Bridge construction at Puyallup River crossing	3 years
Station construction	2 to 3 years

Truck hauling would require loading areas, staging space for trucks awaiting loading, and provisions to prevent tracking soil on public streets. Truck haul routes would require approval by local jurisdictions. Truck hauling activities may be required to occur in off-peak periods or during daytime periods to avoid peak traffic periods or to minimize potential impacts from noise on sensitive receptors, such as residences.

2.5.2 Typical Construction Activities

Typical construction activities necessary prior to construction, regardless of the track alignment or profiles, would involve partial and full demolition of existing structures; vegetation clearing and soil fill, excavation, and grading; relocating utilities and drainage systems; remediation of contaminated sites; preparing construction access; temporarily restricting some roads or traffic lanes; and detouring traffic. Underground utility work may require temporary steels plates in the roadway and temporary lane closures. When work occurs in roadways, reconstruction of streets, sidewalks (ADA-compliant), and other existing facilities may occur. Overhead utility relocation work may consist of temporary lane closures, site access, vegetation removal, and demolition of existing structures. Work could include construction of new utility pole foundations and installation of poles, anchors, vaults, conduit, and cables, followed by removal of existing overhead utilities. Outside of road right-of-way, restoration of work areas could be necessary.

When work would be adjacent to or over a roadway, closure of lanes or the full roadway may be needed. Where construction would partially or fully close streets, through traffic would be rerouted on detours while maintaining access to existing businesses and residences. Road closures and detours would require approval by the agency with jurisdiction, such as the local city and WSDOT.

Ground improvements, or mechanical methods to address weak soils to enable building on them, would likely be needed to support the construction of either a long-span or pier-supported bridge across the Puyallup River and potentially in other locations along the TDLE corridor. Ground improvement methods may include jet grouting, ground freezing, rock displacement, or a combination of these methods.

Sound Transit has identified some areas of the project where dewatering (the removal of water from soil) could be needed. Various areas of the project would be constructed at-grade or elevated above the water table, which may reduce the need for dewatering. The exception would occur in wetland areas, floodplain areas near Fife and Tacoma, and near the Puyallup River, where soft material below the water table needs to be removed to create a stable base for the track or transit facility. Deep foundations are the primary project element that would extend below the groundwater table; however, this foundation support method can be completed without the need for dewatering.

2.5.2.1 Elevated Light Rail Construction

Construction of an elevated guideway (Figure 2-37) would involve demolition of structures, clearing, grading, relocating utilities, preparing necessary construction access, and constructing the guideway structure. A temporary construction road would typically be built for constructing an elevated guideway in undeveloped areas or where access is not available from existing roads. Constructing an elevated guideway within existing street right-of-way may require temporary closure of some traffic lanes/sidewalks and detours. Elevated guideways and stations for light rail, similar to structures such as highway bridges, are generally reinforced concrete, steel, or combinations of both.

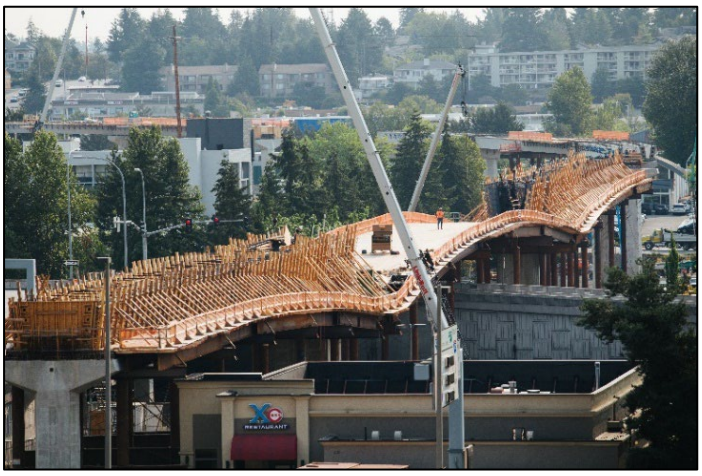


Figure 2-37 Construction of an Elevated Guideway

Construction would begin with preparation work to build foundations that may consist of shallow spread footings, deep-driven or augured piles, or drilled shafts. Once foundations are in place, concrete columns would be constructed. The elevated superstructure could be steel, cast-in-place concrete, precast concrete, or segmental concrete. If steel and/or cast-in-place concrete is used, temporary support structures referred to as false-work could be required. False-work would support elements of the superstructure while concrete is poured and the concrete gains enough strength to support itself, or while the steel beams are joined through welding or bolting (Figure 2-38). If the elevated guideway is close to or within the roadway, the false-work would require temporary lane/sidewalk closures and traffic detours until a sufficient portion of the elevated structure is complete. Precast girder construction is expected to be the primary method of construction for the elevated guideway and can typically be built without false-work between the columns. Construction equipment requires a 40- by 60-foot-wide staging area, with the new column at the center of the 40-foot dimension (Figure 2-39). Within existing roadways, temporary barriers and lane closures would be required to manage the

Figure 2-38 Construction of Elevated Guideway Showing False-Work

Figure 2-39 Construction of Guideway Columns

traffic volumes. The column and pier cap would be constructed inside the same 40-foot-wide staging area. The precast girders over the existing roadway are typically erected at night or on weekends when the traffic volume is lower.

Some short-term partial or full street closures may be required to accommodate placing girders and other construction activities. After construction, an elevated guideway can have low-growing native vegetation under and around it, although there would be a 15-foot-wide zone from the edge of the guideway that would remain clear of trees.

2.5.2.2 At-Grade Light Rail Construction

Construction methods and impacts for at-grade guideways would be similar to typical road construction. Existing structures in the project footprint would be demolished, and conflicting utilities would be relocated first. Shallow, near-surface excavations would be required to construct the subgrade, track, and station platform slabs for at-grade segments. In areas where access is not available from existing roads, a temporary construction road would be built. During the grading phase, the contractors would install culverts or other permanent drainage structures and below-grade light rail infrastructure.

2.5.2.3 Retained Cut and Fill Light Rail Construction

Construction of retained cut and fill guideway sections would be similar to construction of at-grade guideway but may be more intensive and of longer duration due to the need to construct retaining walls. Retained cut or fill sections are needed in areas where it is necessary to create a level surface for the track ballast and could include retaining walls where necessary. Construction of cuts and fills may include demolition of existing structures, clearing and grading, excavation, utility relocation, construction of temporary access roads between 15 and 30 feet wide, and temporary traffic detours and lane closures. Depending on the depth of the cut and groundwater conditions, dewatering may be necessary during construction.

Fill material for retained fill construction would be delivered to the site by truck. Retained fill structures may require ground improvement, depending on the ability of existing soils to support the increased loads. Reconstruction of streets, sidewalks, and other existing facilities may also be necessary, depending on the final alignment and profile of the retained fill.

2.5.2.4 Bridge Light Rail Construction Over Water

All TDLE alternatives would include the construction of a bridge over the Puyallup River. If bridge foundations are in the water, they would be constructed inside sheet-pile cofferdams (temporary enclosures providing a dry working area in the water) where needed. Cofferdams would be driven or vibrated into place. Bridge foundations would include drilled shafts and cast-in-place concrete pile caps. In other areas, foundation excavations would be supported by a temporary shoring system, such as soldier pile shoring.

Temporary work trestles could be installed in the Puyallup River to support material delivery and operation of heavy equipment. Temporary work trestles would be constructed with driven or vibrated steel-pipe pile bents, framing, and decking, and would be removed when the work is complete. Barges for material supply and supporting cranes would also be required for construction of foundations in water and would be moored outside of the navigation channels.

2.5.3 Staging Areas and Construction Easements

Figure 2-40 Staging Area Adjacent to Guideway Construction

Construction staging areas would be needed before, during, and for a short time after construction work occurs. Staging areas would be used for construction, equipment storage, construction materials delivery and storage, concrete batch plants or concrete pumping, demolition or spoils handling (in accordance with applicable regulations), contractor trailers, access roads, and construction crew parking (Figure 2-40). Construction staging areas would be located within the project's construction limits shown in Appendix F, Conceptual Design Drawings. At-grade, elevated, retained cut and fill sections would have construction staging areas along the alignments. Contractors generally use the property on which the facility is being constructed and property that has been acquired for right-of-way by Sound Transit or other properties as negotiated by the contractor. Additional property may be required for activities such as contractor employee parking. Also, construction may require using one lane or all lanes (temporary closure) of a road.

Following construction, staging sites may be used for project-related purposes or might be redeveloped consistent with local zoning codes. Construction easements are for temporary use of property during construction and would be required in numerous locations along the alignment. In undeveloped areas, 50- to 100-foot-wide construction areas could be necessary to maneuver equipment and materials along the corridor during construction. These would include areas acquired for project right-of-way as well as temporary construction easements. Where the project would have limited property acquisitions on either side, construction activities may require narrow temporary easements from adjacent properties. Following construction, these easement areas would be restored to preconstruction conditions.

Where the project would temporarily partially or fully close streets, traffic would need to be rerouted via detours so that construction could proceed in an efficient and timely manner while still maintaining access to existing businesses and residences. Traffic closures or detours would require approval by local jurisdictions and/or WSDOT.

2.5.4 Overview of Construction Approach for TDLE Alternatives

An example of construction steps for TDLE is provided below. Durations provided assume 0.5-mile segments of guideway construction. An overview of station construction is described in Section 2.5.5. Actual construction steps and durations may vary and will be determined during final design.

The TDLE guideway would be primarily elevated with some sections of at-grade and retained cut and fill profiles located along some areas of the WSDOT right-of-way. Work would begin with site preparation, including clearing of vegetation and construction of access points and roadways, followed by construction of foundations, columns, and elevated structures. In areas

with at-grade and retained cut or fill profiles, grading would occur as necessary to create a level surface for the track ballast, and retaining walls would be constructed where necessary for retained sections.

Elevated structures would be constructed along southbound I-5 and some local roadways (Figures 2-41 and 2-42). Where the light rail would go along or over existing roadways, elevated structure construction would be used to allow for construction of the guideway while maintaining some surface traffic. The roadway would remain intact if no roadway modifications are specified.

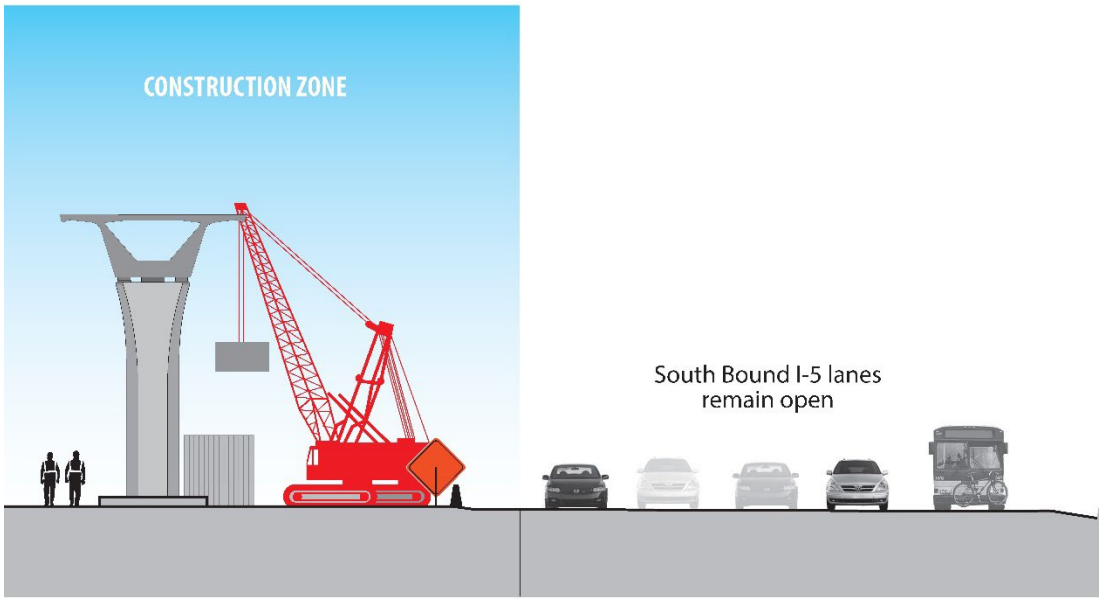


Figure 2-41 Construction along I-5 (Typical Cross-Section)

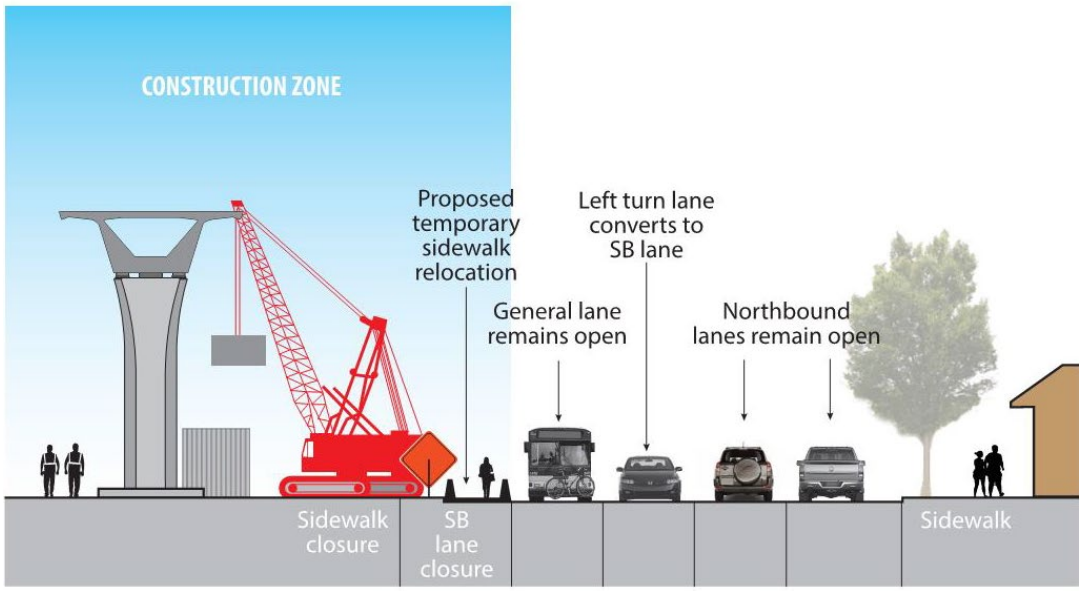


Figure 2-42 Construction of Elevated Guideway on Side of Roadway (Typical Cross Section)

The primary civil construction activities for guideway construction would occur during five phases:

1) Utility relocation: Utility relocations would be required where the guideway would conflict with aboveground or belowground utilities, including electric, sewer, water, gas, and communications. This phase would last approximately 6 months for all relocations in a 0.5-mile section. This phase could overlap with street reconstruction in some areas.
2) Street reconstruction: This phase would involve widening the existing roadway on one or both sides to allow adequate space in the median for column construction. The area needed for road widening would be cleared and prepared for work crews, and the existing street infrastructure (sidewalks, curbs, gutters, and pavement) would be removed and rebuilt. Once paving is completed, all lanes would be restriped in their new configuration and the widened median area would be prepared for light rail construction. This phase would last approximately 6 months for a 0.5-mile distance. This work could overlap with utility relocations in some areas.
3) Foundation and column construction: This phase would involve drilling shafts for the columns, pouring the footings for the columns, and then installing the columns. For most of the guideway, this phase would last 6 to 8 months for a 0.5-mile distance.
4) Guideway placement: It is expected that the elevated guideway structure would be constructed using concrete segmental box girders, which are typically poured off site and trucked to the project location to be placed by crane. This phase would last about 6 months for a 0.5-mile distance.
5) Track and systems installation: This phase would involve placement of track on the guideway and installation of electrical, communication, and signaling systems, much of which would be completed by equipment operating from the side of the guideway and/or workers on the guideway.

Where guideway construction runs parallel or within the median of Pacific Highway in south Federal Way, Milton, and Fife, there could be extended lane closures that could be in place for approximately 1 to 2.5 years. Construction areas may only have one lane in each direction open on Pacific Highway. Some full closures at night or on weekends would be needed for construction activities over the roadway, such as installing girders. The contractor will determine construction closures when the final design is developed. Figure 2-43 shows a typical cross section of column construction in the median; Figure 2-44 provides a plan view of typical construction in the median. Longer spans would take up to a year and a half to complete. Business access points would be reconstructed where necessary, and alternate access may be needed.

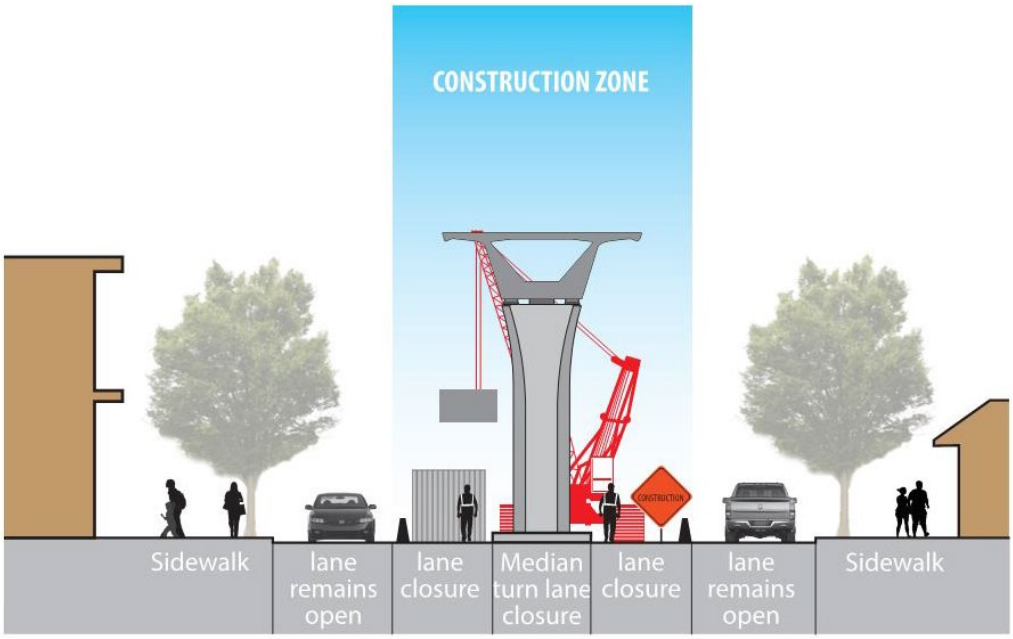


Figure 2-43 Construction of Elevated Guideway in Median (Typical Cross Section)

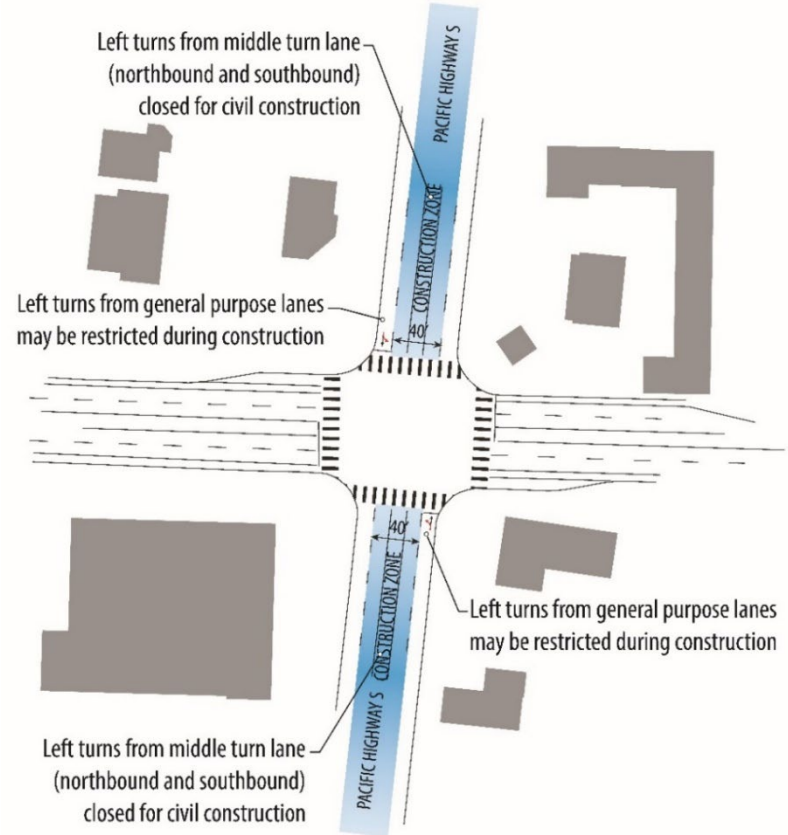


Figure 2-44 Construction of Elevated Guideway in Median (Typical Plan View)

Construction of the elevated guideway over wetlands and creeks may require temporary trestles, which are temporary steel and timber bridges supported on steel pipe pile bents. The temporary trestle would allow the heavy equipment and the crew to access the elevated guideway construction. As soon as the elevated guideway structure is complete, the temporary trestle would be removed. Installation and removal of the temporary trestle in wetland and stream areas would require environmental permits.

Where the light rail would go over or near Sounder/Amtrak tracks, construction methods to allow the project to be built while maintaining rail operations would be used to minimize disruptions to those tracks.

Bridge Construction over the Puyallup River

Two bridge options are being considered for all the alternatives in the Tacoma Segment. See Section 3.10, Navigation, for the discussion of potential construction impacts and mitigation measures.

Long-Span Bridge

Light rail guideway construction for a segmental box girder structure spanning the Puyallup River may be able to be accomplished without the need to place permanent or temporary structures or equipment within the river. If other long-span structure types are selected as the bridge type, barges or temporary in-water equipment may be needed to support construction.

Foundations for these alternatives would include work within the levee prism on each side of the river. Due to the proximity to the river and to freight rail tracks, this work would begin with construction of excavation shoring systems and then excavation. Drilled shafts would then be constructed within the excavation, starting with steel casings installed via vibratory methods, followed by construction of the shafts within the casings. A cast-in-place concrete cap would be built on top of the shafts; then the columns and guideway would be constructed similar to other elevated guideway in the project, depending on the bridge type used.

Pier-Supported Bridge

Light rail guideway construction for alternatives that include piers in the Puyallup River would generally look like the typical elevated light rail construction described above, with some key differences. In order to position equipment and materials needed to construct the guideway, temporary over-water access would be constructed. One typical type of access would be in the form of a steel pile-supported work trestle with a timber deck. For this type, steel piles are driven first, then a steel beam and girder superstructure is erected, and then a decking made of heavy timbers is placed on top. Another possible type of access would be the assembly of one or more modular steel floating barge systems anchored to the shore and riverbed. Over-water access would be the first step in any in-river construction.

Foundation construction in the river would require construction of cofferdams, typically constructed of either steel sheet piling or steel pipe piling that is driven into place using impact or vibratory means. The water within the cofferdams is pumped out, allowing for construction to proceed in dry conditions. The cofferdams also serve to isolate the foundation construction from the rest of the river, and they would be removed after foundation and concrete column construction is complete. Foundation construction would be deep-driven or augured piles, or drilled shafts, likely multiple piles or shafts connected by a cast-in-place concrete cap. Columns and guideway would be constructed similar to other elevated guideway in the project.

With alternatives that include piers in the river, additional work in the river to mitigate against scour of the riverbed or levees on each side of the river may also be needed. This could consist of the addition of riprap and other rock to the riverbed. Scour mitigation work may require additional cofferdams in the river, depending on the nature of the migration work.

In-Water Work Restrictions

Any in-water work in the Puyallup River would be subject to work-window restrictions to protect Endangered Species Act (ESA)-listed fish as well as timing restrictions for Tribal fishing and ceremonial activities. The exact windows and associated activity restrictions would be determined during the permitting process with the Puyallup Tribe of Indians, United States Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and United States Army Corps of Engineers (USACE).

Guideway construction adjacent to and above BNSF freight rail right-of-way on each side of the river would likely be temporarily paused from October through December, as historically the freight railroads do not allow construction during this window, which typically sees the highest rail traffic volume.

2.5.5 Stations

In the South Federal Way and Fife segments, the construction footprint for each station area would be approximately 8 to 10 acres and would accommodate construction of the station, parking (either surface or garage), and staging areas. All Portland Avenue and Tacoma Dome Station options would have smaller construction footprints of approximately 5 to 8 acres because they do not have parking. Construction of the stations themselves would be similar to construction of the guideway in terms of sequencing (e.g., utility relocations, site preparation, and column construction for elevated stations). The extent of demolition and utility relocations would be greater than for the guideway, due to the size of the sites. Once the station structure itself is complete, other components of station construction would include surface parking lots and/or garage structures, bus circulation areas, internal circulation facilities (stairways, escalators, and elevators), and other ancillary facilities, such as traction power substations, storage buildings, and payment kiosks.

The SF Enchanted Parkway, SF I-5, SF 99-Enchanted, SF 99-352nd, Portland Avenue, and Tacoma Close to Sounder stations would not be located in roadways and would not require roadway reconstruction, although they may include new access roads on what is currently private property. The SF 352nd Span, Fife 54th Span, Portland Avenue Span, Tacoma 25th Street-West, Tacoma 25th Street-East, and Tacoma 26th Street stations would span or be located within the roadway, would be constructed in multiple phases, and would require additional night and weekend closures and traffic detours to allow for construction.

Station construction would generally last 2 to 3 years at each station area.

2.6 Environmental Practices and Commitments

Sound Transit views environmental stewardship as a responsibility of all employees, contractors, and consultants. To that end, the agency integrates environmental ethics and sustainable business practices into all planning, design, construction, and operations.

Sound Transit goes beyond regulatory requirements in its commitment to environmental stewardship and sustainability. The 2004 Environmental Policy states that the agency will satisfy

all applicable laws and regulations and mitigate environmental impacts consistent with Sound Transit's policies, as well as strive to exceed compliance, restore the environment, avoid environmental degradation, and prevent pollution and conserve resources (Sound Transit 2004). The 2007 Sustainability Initiative builds on this and identifies the agency's sustainability objectives as also addressing social and economic development issues (Sound Transit 2007).

Sound Transit's internationally certified (ISO 14001) Environmental and Sustainability Management System implements the agency's Sustainability Plan. Sound Transit maintains the Environmental and Sustainability Management System to be accountable for controlling environmental impacts, maintaining environmental compliance, and demonstrating performance improvement. The Board-approved long- and short-term goals for the management system's environmental and sustainability objectives are found in Sound Transit's 2015 and 2019 Sustainability Plan update documents (Sound Transit 2019d). Examples of environmental or best management practices that are integrated into the project design and implementation include measures to minimize project impacts, such as stormwater control, appropriate compensation for affected properties, due diligence work to address hazardous materials, and construction plans that keep the community informed.

Sound Transit uses the ENVISION rating system to evaluate the sustainability of its infrastructure projects and verify the project is providing sustainable transportation options, meaningful engagement with communities, using renewable energy, improving quality and reliability, and taking steps to protect the environment (ISI 2023). In addition to meeting environmental commitments, Sound Transit would avoid and minimize impacts where possible. Where adverse impacts cannot be avoided, potential measures to mitigate the adverse impacts of TDLE would be identified. When a project alternative is selected to be built, mitigation commitments would be documented in the NEPA ROD. If needed, mitigation measures may be refined through final design and permitting, which would require consultation with FTA.

2.7 Project Funding and Opinion of Probable Cost

As a result of reduced revenue resulting from the COVID-19 pandemic and higher real estate and construction costs, Sound Transit will not be able to deliver many expansion projects on their original timelines. In August 2021, the Sound Transit Board adopted Resolution R2021-05, referred to as the system expansion realignment plan. The plan serves as a framework for delivering projects efficiently and on schedule while addressing the affordability gap. The resolution establishes a target for beginning TDLE operations in 2032; however, due to the additional alternatives analysis identified in Motion M2023-19, the beginning of operations is now projected to be later, in 2035. The resolution also establishes affordable completion dates for parking facilities at both Fife and Federal Way stations in 2038, approximately 3 years after their forecasted start of service.

2.7.1 Project Funding

Sound Transit's regional transit programs and projects are typically funded through a combination of voter-approved taxes collected in a three-county district, FTA and other grants, bonds, and fare box revenue. In 2016, voters approved funding for Sound Transit 3, which included funding to construct TDLE. Additional funding sources to complete the project could include FTA grants, additional voter-approved tax revenue or other sources.

After the Sound Transit Board selects the alternative to be built, Sound Transit will coordinate with FTA to identify if there are any impacts to other previous FTA-funded projects and any financial steps that need to be taken to cover those impacts.

2.7.2 Cost Comparison

This section provides preliminary opinions of probable cost for each design alternative. These opinions of probable cost are intended to serve as a basis for comparing various design alternatives and options; they are not intended to serve as a method for establishing the project budget. These opinions of cost are based on early design and will continue to be refined during future stages of final design. The opinion of probable cost consists of many components and include one-time capital costs and construction costs (including parking), anticipated/estimated mitigation, right-of-way/property acquisition costs, engineering costs, equipment costs, and contingency. However, it does not include the cost of additional light rail vehicles needed to operate the project or variable market factors.

The opinion of probable cost for each design alternative shown in Table 2-6 is based on the current level of design (approximately 10 percent design). At this early phase of project development, the opinion of probable costs is for comparative purposes only (Sound Transit 2016). It does not represent the project budget. Sound Transit has developed the high-level conceptual opinion of probable cost for all alternatives under evaluation in the Draft EIS. A project baseline budget is typically established at approximately 60 percent design (depending on the delivery method) prior to the start of construction.

Given the current early level of project design, there remain uncertainties regarding the project scope, engineering data, mitigation requirements, schedule, and project delivery methods. Therefore, these conceptual estimates focus on the project elements that are defined consistently across alternatives, that capture the essential physical features of alternatives, and that help distinguish alternatives from one another.

A more detailed estimate, applying a “bottoms up” cost methodology will be developed in the future. Early preliminary information from this methodology for other projects indicates cost growth attributable to the change in estimating methodology, market conditions, design development, and scoping changes. Capital projects across the Puget Sound region are experiencing the effects of market factors including increases in the cost of materials, equipment, and labor. Sound Transit anticipates that construction costs will continue to escalate over the course of project development and final design. Each project estimate throughout the various design phases will therefore need to be evaluated and adjusted specifically considering current market conditions. This market conditions adjustment is independent of escalation and will fluctuate with economics and the value of any given project considered by the marketplace.

Table 2-6 Opinion of Probable Cost for TDLE in 2024 Dollars

Alternative	Opinion of Probable Cost[1]
Federal Way Segment[2]	
FW Enchanted Parkway (with and without the FW Design Option)	$390 million - $398 million
South Federal Way Segment[3]	
SF Enchanted Parkway	$1.66 billion - $1.71 billion
SF Enchanted Parkway with SF 352nd Span Station Option	$1.67 billion - $1.72 billion
SF I-5	$1.57 billion - $1.60 billion
SF 99-West Alternative	$1.56 billion - $1.62 billion
SF 99-West Alternative with Porter Way Design Option	$1.57 billion - $1.63 billion
SF 99-East Alternative	$1.71 billion - $1.75 billion
SF 99-East Alternative with Porter Way Design Option	$1.70 billion - $1.74 billion
Fife Segment[3]	
Fife Pacific Highway	$0.99 billion - $1.04 billion
Fife Pacific Highway - 54th Avenue Design Option	$0.97 billion - $1.03 billion
Fife Pacific Highway - 54th Span Design Option	$0.99 billion - $1.05 billion
Fife Median	$1.09 billion - $1.15 billion
Fife Median Highway - 54th Avenue Design Option	$1.07 billion - $1.13 billion
Fife Median Highway - 54th Span Design Option	$1.09 billion - $1.15 billion
Fife I-5	$0.99 billion - $1.05 billion
Fife I-5 - 54th Avenue Design Option	$0.97 billion - $1.03 billion
Fife I-5 - 54th Span Design Option	$0.99 billion - $1.05 billion
Tacoma Segment[4]	
Preferred Tacoma 25th Street-West (Portland Avenue Station)	$1.27 billion - $1.51 billion
Tacoma 25th Street-West (Portland Avenue Span Station Option)	$1.25 billion - $1.49 billion
Tacoma 25th Street-East (Portland Avenue Station)	$1.18 billion - $1.42 billion
Tacoma 25th Street-East (Portland Avenue Span Station Option)	$1.20 billion - $1.44 billion
Tacoma Close to Sounder (Portland Avenue Station)	$1.12 billion - $1.36 billion
Tacoma Close to Sounder (Portland Avenue Span Station Option)	$1.11 billion - $1.35 billion
Tacoma 26th Street (Portland Avenue Station)	$1.23 billion - $1.47 billion
Tacoma 26th Street (Portland Avenue Span Station Option)	$1.21 billion - $1.45 billion

Notes:
(1) A more detailed estimate, applying a “bottoms up” cost methodology will be developed in the future. Opinions of probable cost are for comparative purposes only and do not represent the project budget.
(2) The FW Design Option would cost approximately $10 million dollars more.
(3) In the South Federal Way Segment and the Fife Segment, provision of a new parking garage at each station represents the higher end of the cost range whereas provision of new surface parking at each station represents the lower end of the range.
(4) In the Tacoma Segment, the higher end of the cost range reflects the costs for the alternative with a long-span bridge at the Puyallup River crossing whereas the lower end of the range reflects the costs for the pier-supported bridge.

Each alternative developed for system planning had conceptual alignment drawings, potential station locations, and/or written descriptions prepared that provided needed definition for each of the major cost components. These documents formed the basis for the identification of various composite cost elements that were used to prepare the capital cost estimates.

2.7.3 Operation and Maintenance Costs

This section provides estimated operation and maintenance costs for TDLE. The major determinants of maintenance and operating costs are service levels, running time, and trackway profile. TDLE would have estimated annual operation and maintenance costs of approximately $54 million. If the project were constructed in phases, the M.O.S to the station in South Federal Way and the M.O.S to the station in Fife would have annual operation and maintenance costs of approximately $21 million and $41 million, respectively. These estimates will be refined during final design.

Each alternative developed for system planning had conceptual alignment drawings, potential station locations, and/or written descriptions prepared that provided needed definition for each of the major cost components. These documents formed the basis for the identification of various composite cost elements that were used to prepare the capital cost estimates.