

## 5 CUMULATIVE IMPACTS

This chapter considers the potential cumulative long-term impacts of TDLE in conjunction with past, present, and reasonably foreseeable actions. Cumulative short-term construction impacts are also analyzed. Potential mitigation measures for cumulative impacts (in addition to the mitigation described in Chapters 3 and 4) are discussed in Section 5.5, Potential Mitigation Measures for Cumulative Impacts.

Code of Federal Regulations Title 40, Section 1508.1(g)(3) defines cumulative effects or impacts as the “effects on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from actions with individually minor but collectively significant effects taking place over a period of time.” Public agencies must analyze cumulative impacts to fully understand how a proposed action and its alternatives interact with past actions, present-day activities, and actions that are planned and reasonably certain to occur in the future. Studying the proposed project in conjunction with other actions can reveal unintended impacts that may not be clear when the proposed project is analyzed by itself.

During the scoping process and Draft EIS preparation, Sound Transit gathered information from agencies and the public to identify impacts of past and present developments and reasonably foreseeable actions that could interact with the impacts of TDLE alternatives, including:

- Adopted transportation plans, land use plans, and neighborhood plans from King County, Pierce County, and the cities of Federal Way, Milton, Fife, and Tacoma.
- Lists of known major public and private land use proposals in King County, Pierce County, and the cities of Federal Way, Milton, Fife, and Tacoma.
- Information provided by WSDOT, King County Metro Transit, Pierce Transit, and Intercity Transit on planned transportation projects and developments.
- PSRC regional transportation plan (PSRC 2018) and Vision 2050 (PSRC 2020), which provided population and growth projections, overall transportation goals for the Puget Sound region, and land use forecasts.
- Information provided by other organizations and the public on planned private projects, community values, and concerns.

This information was used to identify past and ongoing development trends, prepare growth projections, characterize reasonably foreseeable actions, and identify and evaluate expected cumulative impacts to which TDLE could contribute. Appendix G, Present and Reasonably Foreseeable Actions, provides additional details on the actions considered in this analysis. Information on actions gathered during Draft EIS preparation was updated through January 2024. These actions include larger public projects, which often have development documentation available, and private projects, where development information may be limited or not publicly available. Chapter 3, Transportation Environment and Consequences, provides information on travel forecasts and Section 4.3, Economics, provides information on demographic and economic trends.

## 5.1 Geographic and Temporal Boundaries of Cumulative Impact Analysis

Consistent with regulatory guidance for cumulative impact analysis, the development actions that were considered included those that are past, present, and reasonably foreseeable.

- Past actions include non-native settlements dating back to the 1800s through developments up to the present.
- Present actions are those projects just completed or under construction by local, state, or federal agencies.
- Reasonably foreseeable actions are those that have obtained some local, state, or federal government funding, approval, or are under environmental review, and thus could be under construction at any time from the present through 2042 (TDLE's design year and the targeted year for operation of planned projects identified in the Sound Transit 3 Plan).

The study area for cumulative impact analysis is generally a combination of the study areas defined in Chapter 3 for transportation facilities and Chapter 4 for the various environmental resources and construction impacts. However, a broader area for certain elements of the environment is included in the cumulative impacts analysis for the following elements:

- Ecosystem-related resources, where broader study areas are necessary to capture how the effects from reasonably foreseeable projects may interact to affect the function of larger ecosystem networks.
  - Wildlife corridors are considered for avian species and other migratory animals or animals with large foraging areas.
  - Streams are considered at the watershed level for impacts to fish habitat and water quality.
  - Wetlands are considered at the watershed level for impacts to aquatic species and water quality.
- The Puget Sound Region (Pierce, King, Snohomish, and Kitsap counties) applies to resources such as transportation, air quality (and greenhouse gases), energy, and, to some degree, the economics analysis.
- Greenhouse gases are studied at the regional level, while it is acknowledged that the effects are felt on a global level.
- Socioeconomic resources that may experience a range of cumulative impacts from new infrastructure and development projects, such as land use, economics, neighborhoods, public services, visual resources, and parks.

## 5.2 Past and Present Actions

The Puget Sound area has been occupied by humans for more than 10,000 years. Coast Salish peoples who call the region home now belong to numerous Tribes. The area covered by the TDLE project primarily lies on the Puyallup Tribe of Indians Reservation, but portions of the project may also be viewed as traditional territories of other Tribes including the Muckleshoot Indian Tribe. The Yakama Nation and the Nisqually Indian Tribe have interest in the TDLE project as well, primarily in relation to cultural resources.

Since the mid-19th century, ongoing impacts from past actions have shaped the project vicinity. Seattle and Tacoma have become increasingly urban, with suburban population growth spreading to surrounding areas, including the cities in the TDLE study area. Development that has occurred adjacent to both I-5 and SR 99 in the northern portion of the TDLE study area has been predominantly commercial and residential, with some industrial, office, mixed use, and agricultural uses as well. Development in Fife and Tacoma has a much longer history, dating back to the 1800s and the development of Tacoma and its port as a center for railroads, shipping, industry, and manufacturing. The Port of Tacoma actively operates along the waterfront of Commencement Bay, including the Blair and Hylebos Waterways.

Past and present regional and local planning efforts have emphasized an integrated, long-range growth-management, economic, and transportation strategy based on a vision of high-density, urbanized centers linked by a high-quality, multimodal transportation system that includes light rail. The environmental effects of past and ongoing actions are considered in relation to the natural and built environments.

### 5.2.1 Natural Environment

Much of the TDLE study area is becoming urbanized but was originally forestlands, wetlands, and estuarine environments. The topography in many sections of the project corridor was substantially modified through urban development as well as through the construction of I-5 and SR 99, where hills were cut or regraded and valleys and lowlands filled to create the existing highways.

Fife and portions of Tacoma near the Puyallup River and Commencement Bay occupy areas that were once mostly tidelands and lower river valley, featuring a meandering Puyallup River with extensive floodplains, estuarine wetlands, and multiple creeks. The surface waters and shorelines in the study area have been historically altered by channelization, dikes, levees, and fill. Many of the streams have reaches that have been either channelized or piped. The industrial and urban development in the study area has imparted a legacy of contamination dating back over a century. The resulting environmental degradation has prompted restoration efforts to protect water quality and wildlife habitat, including Superfund sites to restore the Hylebos Creek and Commencement Bay waterways in Fife and Tacoma, respectively. Urbanization has resulted in hydrologic changes, such as decreased base flow and aquifer recharge during summer months and increased seasonal flow fluctuations and flooding during periods of heavy rain as compared with predevelopment conditions. The development has also impacted water quality by introducing runoff contamination from pollution-generating surfaces as well as increasing water temperatures resulting from the removal of vegetation that previously provided shade along stream banks.

Past actions affecting the natural environment were highly varied, including timber harvesting, natural resource extraction, lumber and paper mills, smelters, farming and ranching, railroads, the port, and shipping. The wetlands now present in the TDLE study area represent fragments of larger historical wetland systems, and some are more recently formed wetlands that have developed as a result of changes in transportation, land use, and surface water drainage patterns. The Hylebos Creek basin has the largest forested wetland in the TDLE corridor, covering areas from South Federal Way to Fife. In Fife, fragmented portions of wetland are present throughout the project area. Several streams have floodplains extending well beyond their banks and designated federal floodplains and county and city flood hazard areas exist, particularly within the study area in Fife.

Due to the developed nature of the TDLE study area, most of the vegetation present reflects landscaping practices for urban and suburban areas, with remnant tree canopy retained for shade or aesthetics. The largest remaining native forest in the study area is located in the Hylebos Creek riparian corridor to the west of I-5 in Federal Way and Milton.

### 5.2.2 Built Environment

In the five decades since the completion of I-5 in Washington, industrial and commercial development in western Washington has grown steadily along much of this corridor. Employment in the vicinity of the study area from Federal Way to Fife, which includes a section of Milton and unincorporated Pierce County, encompasses a variety of industries and business sectors, including retail, food service, and light industrial. The land uses adjacent to the SR 99 and I-5 corridors in Federal Way and Milton are primarily commercial and open space, with some residential development. In Fife, the study area includes industrial land uses that have historically been connected to port activities, commercial, and some mixed-use development. In Tacoma, development in the study area has been heavily influenced by the railroads and related industries, and by manufacturing, warehousing, and shipping.

### 5.3 Reasonably Foreseeable Actions

Reasonably foreseeable actions are future projects that would produce environmental impacts that could add to or interact with the impacts associated with TDLE alternatives and other past and present actions. Reasonably foreseeable actions are not speculative and are considered regardless of the agency, organization, or person serving as their proponent (CEQ 1997). They must be likely to occur in the reasonably foreseeable future by virtue of being funded, approved, or under consideration for regulatory permitting; undergoing environmental review process under the National Environmental Policy Act or the State Environmental Policy Act; or part of an officially adopted planning document or publicly available development plan.

Changes to transportation infrastructure are one of the biggest influences on transportation conditions and other environmental topics, such as noise and air quality. Present and reasonably foreseeable actions are shown in Figures G-1 through G-4 and listed in Table G-1 of Appendix G, Present and Reasonably Foreseeable Actions.

### 5.4 Cumulative Impacts Analysis

Adverse and beneficial cumulative impacts could occur over the long-term during project operation, when impacts of TDLE would add to or interact with long-term impacts of other past, present, and reasonably foreseeable actions. Adverse cumulative impacts could occur over the short-term during construction when activities necessary to build TDLE would accumulate with impacts from other projects under construction at the same time. The following sections discuss expected cumulative impacts of project construction and operations on elements of the environment.

The direct and indirect long-term and construction impacts of the project that could contribute to future cumulative impacts are discussed in Chapters 3 and 4. Operational cumulative impacts on transportation, visual and aesthetics, noise, ecosystem, and historic resources could occur. Avoidance, minimization, and mitigation measures for operation impacts are also discussed in Chapters 3 and 4.

Operation of TDLE would shift some vehicle trips to light rail transit, thereby reducing demand on traffic and bus transit movement, improving air quality, water quality, and energy consumption compared with future conditions projected under the No-Build Alternative. Therefore, a key contribution of TDLE, once in operation, would be to reduce the adverse cumulative impacts on these resources to levels below what they would be without the project.

Most cumulative impacts would occur during project construction if the construction of other foreseeable actions overlaps with the TDLE project. Individual projects would be responsible for mitigation and meeting regulatory requirements for direct construction impacts on resources such as ecosystems, water resources, hazardous materials, and historic and archaeological resources. Sound Transit would coordinate as necessary with projects that would be under construction at the same time as TDLE to minimize the potential cumulative effects of overlapping construction periods within the same area. Such coordination would reduce cumulative construction impacts related to detours, reduced access, increased dust and noise, and reduced emergency service response times.

### 5.4.1 Transportation

The analysis of the No-Build Alternative and the TDLE alternatives for transportation impacts is inherently cumulative because it is based on regional forecasts that assume future funded projects and future growth in population and employment located in designated growth centers and consistent with adopted land use plans. However, there could be differences in impacts based on the details of other individual transportation or development projects and the actual rate and timing of population or employment growth in a given community.

During the period of construction, TDLE may add to and interact with construction impacts from other transportation and development projects being built at the same time, including the Operations and Maintenance Facility South (OMF South). Construction in or near roadways typically requires temporary lane closures, parking restrictions, detours, and traffic delays. Interactions among two or more concurrent construction projects can intensify these impacts.

#### 5.4.1.1 Regional Transportation

Based on the latest state, regional, and surrounding local agencies' transportation plans, several transportation projects are assumed to be constructed by 2042 and therefore are included in the No-Build and build alternatives analysis. The No-Build Alternative includes the following major improvements: the WSDOT Puget Sound Gateway Program, which includes the SR 167 Completion Project; the I-5 SR 161/SR 18 Federal Way Triangle Phase 2 improvements; the Port of Tacoma Road Interchange improvements; the 54th Avenue Interchange improvements; and other projects listed in Section 2.2, No-Build Alternative. These projects are also listed in Appendix G, Present and Reasonably Foreseeable Actions.

WSDOT could continue to implement lane management strategies, such as express tolled lanes or HOV designations along the highway system. Depending on how lane management strategies were administered, managed lanes could improve travel conditions on the highway system for some travel modes. WSDOT has no specific plans to implement lane management strategies on I-5 adjacent to the TDLE corridor beyond the current 2+ HOV lane designation on the inside travel lanes in both directions.

The I-5 SR 161/SR 18 Federal Way Triangle Project Phase 2 improvements portion of the WSDOT Puget Sound Gateway Program was suspended in 2023, with no scheduled resumption date. The construction timeline for these improvements could potentially overlap

with construction of the TDLE alignment in the South Federal Way Segment. Improvements to I-5 access ramps on S 348th Street would be adjacent to the construction of all alignment alternatives at the northern end of the South Federal Way Segment. Construction of the roundabout at the intersection of Enchanted Parkway S, S 356th Street, and 16th Avenue S would be in close proximity to the station location for the South Federal Way alternatives and would affect portions of the construction zone for the SF Enchanted Parkway Alternative. If TDLE project construction and construction of these improvements occurred simultaneously, there would be additional impacts to traffic accessing I-5 from S 348th Street or along Enchanted Parkway and SR 18 during construction.

Stages 2a and 2b of the SR 167 Completion Project may overlap with TDLE construction in the Fife Segment and could affect traffic operations along SR 99 between the Fife and South Federal segments. Construction of the 54th Avenue Interchange and Port of Tacoma Road Interchange improvements could potentially coincide with TDLE construction in the Fife Segment and may affect traffic accessing I-5 at two access points: SR 509 at Port of Tacoma Road and SR 99 at 54th Avenue E.

Together with TDLE, these reasonably foreseeable projects would result in cumulative benefit to regional transportation in the TDLE study area by shifting some vehicle trips to light rail transit and improving travel conditions through the access improvements and managed lanes. In Chapter 3, Transportation Environment and Consequences, Table 3-7 shows the projected 2042 daily transit ridership for the No-Build and build alternatives in the TDLE corridor as well as the expected daily ridership and change in the number of new transit riders with the build alternatives.

### 5.4.1.2 Transit Operations

Future extensions of the regional mass transit network are depicted in Sound Transit's Regional Transit Long-Range Plan and include an extension south to the Tacoma Mall area (Sound Transit 2014). Sound Transit 3 included funding for the extension of Tacoma Link beyond the planned Hilltop Tacoma Link Extension, to Tacoma Community College. If voters approve funding for construction of additional transit extensions, transit accessibility for the communities in the TDLE corridor would be increased through connections to additional regional destinations. Metro and Pierce Transit have adopted long-range plans that propose changes to bus service in their respective service networks. If fully implemented, they would include expansions to communities in the TDLE corridor and could increase overall light rail ridership.

### 5.4.1.3 Arterial and Local Streets

The analysis of future transportation impacts in Chapter 3, Transportation Environment and Consequences, is a cumulative analysis based on the results of traffic and ridership modeling that incorporates funded and approved actions as well as projected growth that would include development in the region. Other planned, but not funded, regional and local transportation and development projects could have some impacts on transit ridership and travel patterns within the study area, including traffic operations near the TDLE stations. This includes potential transit-oriented development in station areas, which would likely increase the number of people walking or biking to stations. Future transit and roadway capacity projects could also improve person throughput, traffic flow, and circulation on local streets along the corridor and reduce the impacts of proposed light rail stations on local traffic operations. Stages 2a and 2b of the SR 167 Completion Project may overlap with TDLE construction in the Fife Segment and could create additional impacts to traffic accessing the Wapato Way E crossing of I-5. If construction in the Fife Segment and construction of the 54th Avenue and Port of Tacoma Road interchange

improvements were to occur simultaneously, there would be potential for additional impacts to traffic operations on local and arterial streets, including Pacific Highway E, Port of Tacoma Road, and 54th Avenue E in Fife.

Planned Puyallup Avenue Corridor improvements in the City of Tacoma are currently partially funded, with construction anticipated between 2027 and 2031. Reconstruction of the roadway to implement bicycle, pedestrian, and streetscape improvements have the potential to overlap with TDLE construction activities in the Tacoma Segment. If construction activities in the Tacoma Segment and on Puyallup Avenue were to occur simultaneously, there would potentially be additional impacts to east-west traffic traveling along Puyallup Avenue, E 25th Street, and E 26th Street. Traffic crossing I-5 to access the Tacoma Dome and Portland Avenue station areas or SR 509 on E McKinley Way, East D Street, East L Street, and Portland Avenue E would also potentially be impacted.

### 5.4.1.4 Freight Mobility and Access

As described in Chapter 3, long-term travel impacts on freight mobility and access within the study area would be mitigated with the measures identified for Arterials and Local Streets in Section 5.4.1.3. None of the build alternatives would have additional long-term impacts because the light rail guideway would operate in its own right-of-way, and other traffic impacts related to bus or vehicular trips to stations already include the effects of continued urban growth and development. It is anticipated that there would be limited potential additional cumulative transportation impacts on freight mobility and access with the build alternatives.

### 5.4.1.5 Nonmotorized

Future nonmotorized projects, including the spuyaləpabš Trail (formerly the Tacoma to Puyallup Regional Trail), could add more pedestrian and bicycle trips to the street network surrounding the TDLE light rail stations. These future projects could also improve sidewalks, trails, and other nonmotorized facilities within the TDLE study area, either as other properties are developed and redeveloped or as the result of future projects by the local jurisdictions.

Sound Transit has initiated work with local jurisdictions to identify a preliminary list of pedestrian and bicycle improvements to support station access as part of the System Access Program. This preliminary list of nonmotorized improvements would be refined in the future, incorporating comments from the Tribes, agencies, and public. Some of the nonmotorized improvements may be implemented by others such as the Puyallup Tribe of Indians, cities, or others as lead agencies and require multi-agency funding partnerships to implement. Some, but not all, of the system access improvement projects are expected to receive funding.

As part of future system access improvements, the Fife Multiuse Path could be provided beneath the TDLE guideway between 54th Avenue E and the SR 167 Completion Project, where it would connect to the planned spuyaləpabš Trail. This would provide a direct connection to a regional shared-use path system, with connections to the Interurban Trail to the south in addition to the shared-use path provided as part of the SR 167 Completion Project. There is currently no funding commitment by any party, including Sound Transit, to build the Fife Multiuse Path. System access projects that are implemented would provide a cumulative benefit to safely accommodate pedestrian and bicycle travel in the TDLE corridor.

### 5.4.1.6 Safety

The future safety impacts under the No-Build and build alternatives includes reasonably foreseeable transportation projects. Other development would not likely affect safety in the TDLE study area.

### 5.4.1.7 Parking

Parking within the TDLE corridor could be affected by other land use and transportation facility changes. In particular, transportation projects that increase roadway capacity or multimodal options, as well as increased residential and commercial development activities near station areas, could increase parking demand within the TDLE corridor, or they could reduce on- and off-street supply. Plans for local development near TDLE station areas, including the Federal Way South Station Subarea and Fife City Center Plan, would encourage transit oriented development (TOD) around future stations. Parking demand generated by new development in TDLE station areas would be accommodated by developers and based on jurisdictional parking requirements in local development regulations.

FWLE is constructing additional parking at the Federal Way Downtown Station. Some parking spaces at the S 320th Park & Ride in the Federal Way Segment would be temporarily impacted by TDLE construction, and a few parking spaces would be permanently removed due to column placement. The Federal Way's City Center Access Project is under development and may also permanently impact some parking spaces at this location. The park-and-ride is underutilized and removing a limited number of parking spaces would not be anticipated to have an adverse cumulative effect.

### 5.4.1.8 Navigation

There are no known reasonably foreseeable projects that would result in cumulative impacts on navigation in the TDLE study area.

## 5.4.2 Acquisitions, Displacements, and Relocations

Several other public projects planned in the vicinity of TDLE could result in additional property acquisition. Most notably, Sound Transit is planning for the OMF South project, which includes new connecting track, access roads, and the OMF facility site itself. Two of the three alternatives being considered for OMF South are located in Federal Way, adjacent to TDLE, with connecting track overlapping TDLE in the Federal Way Segment. The two OMF South alternatives in Federal Way would have displacements similar to TDLE along the 1.4 to 1.6 miles of mainline guideway, as well as additional displacement of businesses and residences for the OMF site itself.

The Federal Way City Center Access Project may impact homes in Belmor that are adjacent to S 324th Street, which could cause a slight increase in the cumulative number of residences impacted by the projects. The WSDOT I-5 SR 161/SR 18 Federal Way Triangle Improvements would have property impacts associated with a new ramp and roundabout in the vicinity of S 356th Street, Enchanted Parkway, and I-5 which could increase the cumulative property impacts in this location; however, in 2023 the project was suspended and the timeline for when it may resume is unknown. The SR 167 Completion Project is being constructed within the project vicinity in Fife and could displace some of the same properties as any of the build alternatives. There could also be other smaller public or private projects in the project vicinity that would acquire new properties and displace existing uses.

An adverse cumulative impact from property acquisition is not expected because Sound Transit would compensate affected property owners in accordance with Sound Transit's Real Estate Property Acquisition and Relocation Policy, Procedures, and Guidelines (Sound Transit 2017). Benefits would depend on the level of impact, available relocation options, and other factors. In addition, Sound Transit supports potential TOD, which increases residential and commercial densities surrounding stations and is anticipated to provide more residential and employment opportunities than lost within the study area. However, these housing and economic opportunities generally occur after project construction so would likely not be immediately accessible to those displaced. Where appropriate, Sound Transit would facilitate TOD with local jurisdictions and potential development partners in accordance with Sound Transit's Equitable Transit Oriented Development Policy (Sound Transit 2018). Additional discussion about TOD is included in Sections 4.2.3.4 and 4.3.3.4.

### 5.4.3 Land Use

TDLE, in conjunction with other land use actions by local governments and other property owners, could result in cumulative impacts on land use conditions. However, the land use analysis in Chapter 4 includes a review of future changes due to local and regional plans to accommodate future population and employment changes and is already inherently cumulative.

Although there are reasonably foreseeable land developments in the study area that would increase density without light rail, light rail would support more dense urban areas (consistent with local development regulations), particularly near planned light rail stations, than would likely occur without light rail. TDLE, along with actions taken by jurisdictions, could cumulatively help achieve local and regional planning goals that encourage high-density, mixed-use, TOD in a timelier manner. Land use changes are expected to be greatest near stations due to increased transit accessibility and pedestrian activity, which are generally attractive to businesses and residents. Such changes would depend on existing or amended land use regulations, including zoning designations, adopted by local governments and on the decisions of property owners about whether to develop or redevelop their property. No adverse cumulative impacts to land use are anticipated as TDLE is consistent with local and regional transportation and comprehensive plans, which account for development.

### 5.4.4 Economics

The economic analysis of cumulative impacts used Puget Sound Regional Council data to reflect future regional and local activity, accounting for future changes in regional population, employment, and housing. Pierce County and King County Department of Assessment's data and subarea plans were used to examine existing and future land use in the local area. Additionally, other known transportation projects were included in this analysis. Impacts from the broader TDLE project are evaluated in the cumulative impact analysis along with the potential impacts from FWLE, OMF South, the Federal Way City Center project, and other local transportation projects.

Investments in public transportation systems can benefit regional economies by helping offset increases in congestion and improving connections between businesses and the regional labor force. Many of the benefits associated with the project are embedded in the broader set of Sound Transit projects that would connect TDLE to the dense business corridors in the Seattle metropolitan area. The proposed build alternatives associated with TDLE would support economic activity in the affected area.

Construction of WSDOT's SR 509 and SR 167 Completion projects are currently anticipated to be completed around the time TDLE construction is beginning but may overlap. If these projects overlap, they would contribute to increasing the number of construction-related jobs available. Construction of the planned OMF South would start prior to TDLE construction, and these projects may overlap. The combined impacts related to job creation for construction-related work would be positive.

Additionally, effects to local businesses should be examined within the context of other foreseeable projects to ensure that the alternatives do not exacerbate business disruption or displacement. On its own, the TDLE project is not anticipated to disrupt major employment centers. Much of the potential disruption during construction is anticipated to occur on parcels that will overlap or are adjacent to the transit corridor. Most of the impacted businesses are anticipated to be retailers, warehousing, or local service providers. In aggregate, some of the potential cumulative effects from multiple projects may be offset by applying the same impact minimization measures and best management practices identified in Chapter 4, such as coordination with businesses and districts during construction, marketing assistance, businesses advisory services, and signage to help patrons find businesses.

### 5.4.5 Social Resources, Community Facilities, and Neighborhoods

Actions that occurred in the past, such as the development of the roadway and transit network within the study area, as well as implementation of prior land use plans, have resulted in the development patterns that shape the neighborhoods present in the study area. As a result of TDLE and other reasonably foreseeable transportation projects, commercial and residential development projects, and land use changes, these neighborhoods could experience benefits. These benefits could include improved access to a regional high-capacity transit network, reduced travel time, residential infill, growth in employment base, and increased patronage of local businesses, especially in proximity to station areas.

Future private development, particularly around station areas, could increase property values and taxes and may affect the availability of affordable housing opportunities or affordable properties for small businesses. Affordable housing goals and policies adopted by the cities of Federal Way, Fife, Milton, and Tacoma, as well as those adopted by Sound Transit, all encourage more housing options, including affordable housing, particularly near high-capacity transit. For example, Tacoma's Comprehensive Plan (One Tacoma) includes the policy to "Facilitate the expansion of a variety of types and sizes of affordable housing units, and do so in locations that provide low-income households with greater access to convenient transit and transportation, education and training opportunities, Downtown Tacoma, manufacturing/industrial centers, and other employment areas." See Appendix H2 Land Use.

If TDLE were constructed at similar times as other large infrastructure projects, such as OMF South, residents and businesses could experience increased short-term construction impacts due to cumulative increases in congestion, noise, access limitations, and construction durations. Impact minimization measures, best management practices, and mitigation measures identified in Chapter 4 would be implemented to reduce cumulative construction impacts on neighborhoods or community facilities.

### 5.4.6 Visual and Aesthetic Resources

Construction of I-5 in the 1960s was a major change to the visual environment in the project corridor. The freeway and corresponding development along SR 99 in recent decades also changed other more natural or rural landscapes. The addition of light rail to the project corridor

would have a cumulative impact, increasing the visual prominence of these existing linear transportation corridors. Those impacts could include the following:

- Change to the visual quality of the TDLE corridors near areas with concentrations of sensitive viewers (mostly residents).
- Potential blockage of or intrusion on scenic views.
- Impacts from light, glare, and shade related to guideways, stations, parking areas, and trains.

Other projects, such as the FWLE Extension project, which is just north of TDLE, and the planned OMF South, which could also be located near TDLE, could have cumulative impacts based on additional elevated guideway, large structures, noise walls, and the relocation of high voltage transmission lines. In Tacoma, the Hilltop Tacoma Link Extension Project could expand the Sound Transit Operations and Maintenance Facility on E 25th Street, which could contribute to impacts with the potential Tacoma 25th Street-West and Tacoma 25th Street-East alternatives. Although most cumulative impacts would occur in previously developed areas or adjacent to other existing large infrastructure, making the cumulative nature of these impacts minimal, TDLE and other reasonably foreseeable projects could increase the overall impacts on the surrounding visual environment.

If TDLE is constructed at the same time as other reasonably foreseeable actions, viewers could experience more visual change during construction. Cumulative visual impacts could also occur with increased private development near station areas.

### 5.4.7 Air Quality and Greenhouse Gas Emissions

The operational air emissions from the build alternatives are inherently cumulative. Chapter 4.6 finds the build alternatives would not result in an exceedance of the National Ambient Air Quality Standards or the Washington Ambient Air Quality Standards. All the build alternatives would result in a net decrease in criteria pollutant and greenhouse gas (GHG) emissions within the project area. Other reasonably foreseeable light rail projects, such as FWLE and the Hilltop Tacoma Link Extension, would have similar impacts to air quality and greenhouse gas emissions as TDLE, although at different scales. Therefore, the proposed project, combined with past, present, and reasonably foreseeable actions, would not contribute to adverse long-term cumulative impacts on air quality or GHG emissions. Temporary impacts to air quality and GHG emissions from construction of TDLE could contribute to an increase in cumulative construction impacts from other reasonably foreseeable projects. However, construction emissions would not exceed the National Ambient Air Quality Standards, and mitigation measures and best practices would minimize air quality impacts.

### 5.4.8 Noise and Vibration

The FTA-accepted methodology for noise and vibration analysis for both ambient noise conditions and vibration analysis reflects both cumulative ambient noise conditions and project-specific noise and vibration impacts. FTA methods identify noise impacts and mitigation in the context of the cumulative noise exposure that receivers would experience, based on existing noise levels in combination with new noise generated by the project. Sound Transit policy is to mitigate all noise and vibration impacts associated with the project. All noise impacts could be mitigated through a combination of noise barriers, changes to special trackwork, and residential sound insulation. For vibration, impacts in the South Federal Way Segment could be mitigated with standard mitigation measures. In the Fife Segment, one or two vibration impacts

(depending on the alternative) would require additional testing inside affected structures to determine the response of the foundations and potential site-specific mitigation measures. No vibration impacts are anticipated in the Tacoma Segment.

For both the SR 99 and I-5 corridors, vehicles are the dominant noise source. The OMF South project is not anticipated to have transit noise or vibration impacts from the maintenance facility site or the mainline tracks with the 40-mph curve. TDLE operations would increase train frequency on the mainline tracks in the Federal Way Segment, which would cause transit noise impacts and would be mitigated by noise barriers. Modification of the existing berm and I-5 noise walls by the OMF South project may result in traffic noise impacts for about one to three residences (Sound Transit 2023). Sound Transit plans to conduct additional noise analysis in coordination with Federal Way and WSDOT during final design of OMF South. The City Center Access Project and associated improvements on I-5 may also contribute to additional future traffic noise and vibration in the project area.

The overall day-night average sound level along the TDLE corridor, when TDLE is combined with other foreseeable projects, is not predicted to vary more than 2 to 3 decibels from the noise levels reported in Section 4.7. Three decibels is the minimum noise change that is discernible to the average person.

During construction, TDLE would contribute noise and vibration impacts along with other nearby transportation and private development construction projects, and cumulative impacts could occur. Although Sound Transit is committed to mitigating project noise impacts, light rail would still create a new noise source and therefore would contribute to cumulative noise in the project corridor.

Maximum vibration levels at any site are the result of heavy trucks on rough roads, light rail pass-by (where applicable), and local construction activities. Cumulative vibration levels in most areas would be the same as the existing vibration levels in most cases. Exceptions to this would include areas with extremely rough roadways with potholes and other discontinuities that result in increased vibration levels from passing trucks and other heavy vehicles as well as areas near active construction sites, where short-term increases in vibration level would result from active construction equipment. No other reasonably foreseeable actions are expected to cause notable vibration impacts during project operation, so cumulative vibration impacts are not expected.

### 5.4.9 Ecosystem Resources

Past actions have greatly changed the ecological landscape in the study area and vicinity, and ongoing and reasonably foreseeable actions could contribute to additional cumulative impacts. To address the effects of past development, restoration programs and projects (e.g., aquatic and terrestrial habitat improvement projects, culvert replacement projects to eliminate fish passage barriers) are being planned and implemented throughout the region. The potential for the build alternatives to result in adverse cumulative impacts would be related to the direct impacts of that alternative. In other words, a project alternative with a greater extent and/or intensity of adverse impacts on ecosystem resources would have a greater potential for adverse cumulative impacts.

There are some reasonably foreseeable actions that have the potential to result in benefits rather than adverse effects on the environment. For example, WSDOT and WDFW are working cooperatively to inventory and assess fish passage barriers on WSDOT facilities statewide. This inventory is part of a court-mandated comprehensive state program to address culverts blocking fish passage. Culvert replacement and retrofitting projects through that program may improve

fish access to streams over time within the study area. Sound Transit is coordinating its light rail facility design with WSDOT to avoid conflicts with future culvert replacement projects.

Construction of FWLE impacted wetlands, wetland buffers, riparian forest buffer, and forested habitat (Sound Transit 2016) and required the relocation of a portion of a stream channel (Bingaman Creek). FWLE lies almost entirely in WRIA 9 (Duwamish-Green), a different watershed from the proposed TDLE project, and impacts will be mitigated, thereby reducing the potential for cumulative impacts. Habitat loss and fragmentation could contribute to cumulative impacts on wildlife in nearby watersheds, including those that contain the TDLE study area. However, by complying with WSDOT's and local jurisdictions' rules concerning tree replacement and the maintenance of visual quality, FWLE is expected to increase the amount of vegetated area over the long term.

Other reasonably foreseeable future projects that could adversely affect ecosystem resources in the study area include Sound Transit's OMF South, the City of Federal Way's City Center Access project, and the SR 167 Completion Project. All these projects would be constructed and operated largely on developed or partially developed parcels. Nevertheless, possible short-term and long-term impacts of these projects include loss or degradation of vegetation, wildlife habitat, streams, wetlands, and associated buffer areas. Under all three of these projects, unavoidable impacts to ecosystem resources would be mitigated as required by federal, state, local, and Tribal agencies with regulatory authority. The Federal Way City Center Access project also includes the correction of four barriers to fish migration in headwater reaches of East Fork Hylebos Creek Tributary 0016A, along with the daylighting of approximately 1,000 linear feet of stream channel. The impacts (both adverse and beneficial) of OMF South and the Federal Way City Center Access project would contribute to those of the alternatives in the Federal Way and South Federal Way segments since they occur within the upper watershed of Hylebos Creek, impacting East Fork Hylebos Creek Tributary 0016A and its riparian buffer.

The SR 167 Completion Project includes the creation and/or restoration of approximately 2.6 miles of stream habitat and 110 acres of riparian buffer associated with Hylebos Creek, Surprise Lake Creek, and Wapato Creek. Based on a review of maps in the environmental reevaluation document for that project, some of the stream relocation sites and riparian habitat restoration areas along the mainstem of Hylebos Creek would be affected by TDLE. The restored areas along Hylebos Creek will be returned to the Puyallup Tribe of Indians when WSDOT completes construction. Careful coordination between Sound Transit, WSDOT and the Puyallup Tribe would be essential in these areas to avoid or minimize effects on restored areas.

The SR 167 Completion Project would also enlarge or replace several existing stream-crossing structures in the urban stream basins of Hylebos Creek and Wapato Creek, which cross the TDLE study area, and would maintain or improve fish passage, as well as provide additional movement opportunities for terrestrial wildlife, including under I-5 (FHWA and WSDOT 2018).

Several of the wetlands affected by the SR 167 Completion Project fall within the TDLE study area (FHWA and WSDOT 2018). If these wetlands are diminished or eliminated before TDLE construction begins, TDLE-related wetland impacts would decrease. Even if this is the case, the impacts of the TDLE Fife Segment build alternatives on wetlands in the Hylebos Creek and Wapato Creek watersheds would contribute cumulatively to those of the SR 167 Completion Project. Another consideration is mitigation for wetland impacts of both the SR 167 Completion Project and TDLE. The TDLE study area includes some sites that are currently under construction for habitat restoration to mitigate for wetland impacts from the SR 167 Completion Project (FHWA and WSDOT 2018). If TDLE affects a wetland mitigation site for the SR 167 Completion Project, additional mitigation requirements may be triggered.

Coupled with the impacts of the past, present, and future projects described above, the impacts of the build alternatives could contribute cumulatively to reductions in the area and function of ecosystem resources in the study area. This could affect stream water quality, wetland function, wildlife habitat availability and connectivity, and fish habitat. The potential for future projects to adversely affect ecosystem resources in the study area would be limited through compliance with regulatory requirements and development of compensatory mitigation during the permitting processes with federal, state, local, and Tribal resource agencies. Sound Transit will adhere to mitigation sequencing requirements during project design to ensure that project impacts are avoided and/or minimized to the degree feasible. These reviews and permitting processes would trigger the development and implementation of compensatory mitigation for unavoidable impacts on wetlands, streams, and their buffers.

### 5.4.10 Water Resources

Over time, new development and redevelopment are expected to bring many existing pollution-generating surfaces up to current standards of flow control and water quality treatment for stormwater runoff. Improvements in stormwater runoff control and water quality would occur over time with or without TDLE. This would result in a net benefit for the hydrology and water quality within the study area.

The SR 167 Completion Project anticipates having impacts to several water resources in the TDLE study area, including Hylebos Creek (which includes the Surprise Lake Tributary), Wapato Creek, and the Puyallup River. Impacts were generally estimated for land use, hydrology, flooding, water quality, and the proposed Riparian Restoration Program (FHWA and WSDOT 2018). The Riparian Restoration Program is a watershed strategy for stormwater management that will use an innovative approach to conventional flow control facilities to reduce flood levels, improve degraded stream and riparian corridor habitat, and provide benefits to fish and wildlife. The increase to impervious surfaces in areas being converted to roadway would be designed using current standards and could be expected to result in improvements in the hydrology and water quality of the streams within the overlap of the project corridors. The project design includes mitigation strategies to offset impacts to floodplains and other water resources and, as a result, would not be expected to have cumulative adverse impacts on water resources within the TDLE study area.

The TDLE project design has taken factors related to climate change and their potential impacts to water resources under consideration for all alternatives. These considerations include structure sizing at roadway crossings, as well as channel modification designs for those crossings subject to sea-level rise impacts, increased erosion, or sedimentation. Hydrologic changes would be incorporated as a part of updated hydraulic modeling performed as the design progresses. As a result, these design inclusions would benefit the hydrologic systems of the stream basins within the study area by providing a buffer against related climate uncertainty and the associated impacts.

### 5.4.11 Energy

TDLE is not anticipated to contribute to a cumulative adverse impact with respect to energy. Given the regional scale of the energy analysis and the scope of the travel demand model used for the analysis, the long-term cumulative impacts of the proposed project are accounted for in the analysis described in Section 4.10. The cumulative energy impacts of reasonably foreseeable actions noted in this chapter would be negligible on the local and regional scale.

#### 5.4.12 Geology and Soils

TDLE would be entirely within a highly urbanized area. In general, surface geology and soils conditions have already been substantially altered. The relatively small changes, including the reworking of soil, minor earthworks and grade changes, and minor changes to slope stability, would have little or no meaningful impact to existing, long-term geologic, hydrogeologic, or soils conditions and are not expected to result in adverse cumulative impacts when added to potential impacts for other reasonably foreseeable actions expected within the study area.

#### 5.4.13 Hazardous Materials

Environmental regulations at both a state and a federal level generally require the identification and cleanup/removal of historical hazardous materials sites and remediation of hazardous materials. Any hazardous materials identified during evaluation of acquisitions or encountered during construction of all reasonably foreseeable projects would be cleaned up or remediated during project development or during future development projects. Thus, the cleanup of existing contaminated sites in the study area would be accelerated with the TDLE project and other projects would result in a beneficial cumulative impact.

#### 5.4.14 Electromagnetic Fields

As described in Section 4.13, TDLE would not result in electromagnetic interference that causes sensitive electronic equipment to malfunction. There is no known sensitive equipment in the study area, and the use of electromagnetic interference to operate light rail is unlikely to generate health impacts for riders or people along the tracks. Although an increase in employment and population along the project corridor could increase the demand for electrical power and could increase the number of sources and cumulative intensity of EMFs, no areas were identified where electromagnetic interference would combine with past, present, or reasonably foreseeable actions to result in human health effects or disturbance to sensitive equipment.

#### 5.4.15 Public Services, Safety, and Security

Regional population growth has resulted in an increased demand for public services, which is expected to increase as the region continues to grow. TDLE would not add any unplanned growth in the area, but would support planned growth. Existing services, such as police and emergency service providers, would continue to be available in the areas they currently serve, as well as any expanded services that may be added to accommodate planned growth within the area. Station design and security services along the light rail system would minimize crime incidents and would not contribute to a cumulative impact.

#### 5.4.16 Utilities

Light rail service could encourage development of property in and around the project area, which could increase demand for utility services. However, local governments and public utilities have already accounted for this planned growth in adopted local land use plans and policies. Development near the project would be consistent with what is allowed in the adopted land use plans and current local development regulations. Therefore, the cumulative impacts on utilities would be negligible and in accordance with planned growth. Any increased need for utilities, such as electricity, would be mitigated by Sound Transit by working directly with public utility providers.

#### 5.4.17 Historic and Archaeological Resources

All build alternatives would have the potential to affect historic or archaeological resources within the study area. The settings surrounding these resources have been altered by past and present redevelopment and general changes in uses surrounding them. The reasonably foreseeable actions in the project vicinity may have direct impacts on historic or archaeological resources in the study area in addition to the TDLE impacts, as identified in Section 4.16.

Incrementally, new infrastructure and development patterns have changed, and will continue to change, the historic setting of resources as a result of past and ongoing urbanization. Changes in zoning by the local jurisdictions could result in redevelopment altering the character of neighborhoods, which could impact historic properties. Because at least one historic resource will be adversely affected by all of the alternatives, TDLE would contribute to cumulative impacts to historic resources.

Redevelopment also has the potential to disturb archaeological resources. Incrementally, TDLE could contribute to a cumulative impact on archaeological resources. However, Sound Transit would work to identify potential archaeological resources in the TDLE study area to inform final design prior to construction. In addition, the project would have an Inadvertent Discovery Plan to address the potential discovery of archaeological resources during construction.

FTA, in consultation with Washington SHPO, the affected Tribes, and other consulting parties, will execute a Section 106 Programmatic Agreement to resolve adverse effects (see draft Programmatic Agreement, Appendix J5). The agreement will identify parties responsible for complying with elements of the agreement and will outline mitigation measures for impacts to historic and archaeological resources. When combined with past, present, and foreseeable actions, and taking into account mitigation, the project would make a minor contribution to cumulative effects on historic and archaeological resources.

#### 5.4.18 Park and Recreational Resources

One new park (Cappa Park) is planned to be developed in the Fife Segment and is partially within the footprint of all of the alternatives in Fife. The timing of Cappa Park's development is unknown and could potentially overlap with TDLE construction. With any of the alternatives in the Fife Segment, columns and elevated guideway would be located within the planned Cappa Park. Depending on the alternative, columns and elevated guideways would be located along the north or south boundary of the site. Temporary construction impacts, such as impacts to access or some dust or noise, could occur. Sound Transit will continue to coordinate with the City of Fife as planning for the new park and TDLE continue. No major additional changes to parks or recreational resources, including Section 6(f) and RCO properties, by TDLE or other reasonably foreseeable future projects or actions are anticipated. Population and employment growth are expected to occur under both the No-Build and the project alternatives and would likely increase the use of parks and recreational facilities throughout the project area.