

## 5 CUMULATIVE IMPACTS

This section describes the potential cumulative long-term effects of the West Seattle and Ballard Link Extensions (WSBLE) Project in conjunction with past, present, and reasonably foreseeable future 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.

Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” (40 Code of Federal Regulations 1508.7). 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.

Analysis of cumulative impacts has influenced all parts of the WSBLE Project, including scoping, alternative development, describing the affected environment, and evaluation of direct and indirect environmental impacts and potential mitigation measures.

The cumulative impacts analysis follows the National Environmental Policy Act (NEPA) (40 Code of Federal Regulations 1500-1508) and the following guidance documents:

- *Consideration of Cumulative Impacts in EPA Review of NEPA Documents* (United States Environmental Protection Agency 1999).
- Federal Transit Administration’s Environmental Impact and Related Procedures (23 Code of Federal Regulations 771).
- *State Environmental Policy Act Handbook* (Washington State Department of Ecology 2003).
- *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis* (Council on Environmental Quality 2005).
- *Executive Order 13274 Indirect and Cumulative Impacts Work Group Baseline Draft Report* (ICF Consulting 2005).
- *Indirect and Cumulative Impact Analysis* (National Cooperative Highway Research Program 2006).

As part of the cumulative impacts analysis, Sound Transit reviewed numerous plans, proposals, developments, and NEPA documentation from the City of Seattle, Port of Seattle, Seattle Department of Transportation, Washington State Department of Transportation (WSDOT), Puget Sound Regional Council, Sound Transit, private developers, and other entities. Actions identified in these plans were used to identify impacts of past and present development actions and reasonably foreseeable future actions that could interact with the WSBLE Project alternatives. Examples of the information used include:

- City of Seattle Comprehensive Plan (City of Seattle 2018b), neighborhood plans (City of Seattle 2016a), transportation plans (City of Seattle 2015b), and bicycle and pedestrian plans (City of Seattle 2017a, 2019a), and lists of reasonably foreseeable future development projects (Appendix K, Reasonably Foreseeable Future Actions in Study Area) provided information on development trends expected and planned transportation projects.

- King County Metro (Metro) (2017) and Sound Transit transportation plans (Sound Transit 2014, 2018a) provided information on planned transit projects.
- Puget Sound Regional Council regional transportation plans (Puget Sound Regional Council 2018) provided population and growth projections, overall transportation goals for the Puget Sound region, and land use forecasts.

Other organizations and the public provided information on planned private projects as part of the WSBLE Project scoping and public participation process (Sound Transit 2019a). The above information was used to identify past and present growth trends, characterize reasonably foreseeable future actions, and evaluate cumulative impacts of the WSBLE Project.

### 5.1 Geographic and Temporal Boundaries of Cumulative Analysis

Past, present, and reasonably foreseeable future development actions were considered in accordance with cumulative impact analysis regulatory guidance. Development actions were placed into three categories:

- **Past actions** include nonnative settlements dating back to the 1800s and continuing trends in development patterns up to the present.
- **Present actions** are those projects by private developers or local, state, or federal agencies just completed or under construction.
- **Reasonably foreseeable future actions** are those that are reasonably likely to occur by virtue of being funded, approved, or under consideration for regulatory permitting; undergoing environmental review under NEPA or the State Environmental Policy Act; or part of an officially adopted planning document or publicly available development and thus could be under construction at any time from the present through 2042 (the WSBLE Project's design year).

The study area for cumulative analysis combines the study areas in Chapter 3 for transportation facilities and in Chapter 4 for most of the other environmental resources. This study area is generally 0.5 mile or less around project alternatives. Exceptions include:

- Ecosystems impacts are studied at a broader level to capture how reasonably foreseeable future actions would affect the function of ecosystems at a system-wide level.
  - Habitats, migratory animals, animals with large foraging areas, and avian species are analyzed at the wildlife corridor level.
  - Fish species are analyzed at the watershed level to capture impacts on stream quality.
- The Puget Sound region study area applies to transportation, air quality, energy, and, to some degree, economics.
- Greenhouse gases are considered at a regional level, even though they have global impacts.
- Socioeconomic resources that may experience a range of cumulative impacts from new infrastructure and development projects, such as land use, economics, neighborhoods and community facilities, public services, visual resources, and parks, are analyzed within 0.5 to 1 mile from the aggregate footprint of all project alternatives, as the project could have impacts on a broader area.

## 5.2 Past and Present Actions

Like the rest of the Puget Sound region, Seattle has been home to Indigenous Tribes since time immemorial. When the first Euroamericans landed on Alki Point in what is now West Seattle in 1851, there were at least 17 documented village sites in the vicinity of modern day Seattle. Starting in the mid-1800s, Seattle experienced growth driven by industry, first by timber harvesting, shipbuilding, shipping, railroads, and commercial fishing. Industry growth was followed by aircraft manufacturing and, more recently, by technology. Expansion of state and federal highway systems in the 1950s and 1960s led to rapid population growth throughout the region. With development came a transformation from tidelands and forests to an urban environment. As Seattle became denser, neighborhoods such as West Seattle and Ballard also began to grow. Neighborhoods along the project corridor have grown tremendously in the last 20 years, which has resulted in a need for additional transportation facilities to accommodate the growth.

### 5.2.1 West Seattle Link Extension

Tribes historically had several winter villages and seasonal camps lining the Duwamish Waterway (also known as the Duwamish River). The waterway and nearby uplands provided fishing, hunting, and gathering resources for Indigenous Tribes. When Euroamerican settlers arrived in the early 1850s, the Duwamish were camped at the mouth of the river. After the Treaty of Point Elliott was signed in 1855, the Duwamish People were forced to leave their ancestral villages around Seattle and move to designated reservations to preserve their heritage and culture. Two reservations were established specifically for the Duwamish. The United States established both the Muckleshoot and Port Madison reservations as homelands for Duwamish People. Following the reservation's establishment in 1857, the Tribe and its members came to be known as Muckleshoot, rather than by the historic Tribal names of their Duwamish and Upper Puyallup ancestors. Today, the vast majority of Duwamish descendants are members of the Muckleshoot, Puyallup, Tulalip, Suquamish, and Lummi Tribes.

Before it was filled in through multiple regrade projects in the early 1900s, the area now known as SODO (south of Downtown) consisted of tideflats up to what is now Interstate 5. Beginning in 1895, dirt and fill was taken from the Denny, Jackson, and Beacon Hill regrades to fill SODO's tideflats. The United States Army Corps of Engineers began dredging and filling the Duwamish River estuary and tide flats in 1895 to create Harbor Island and the East and West Duwamish waterways. The Port of Seattle, which was established in 1911, fostered the development of numerous industries in the SODO and Duwamish areas that continue today. This area is industrial and recent uses include restaurants, wineries, and distilleries.

The Seattle Steel Company opened its steel mill on the West Seattle peninsula in 1905 and is currently home to Nucor Steel (Wilma 2001). The mill supported a town that came to be known as Youngstown (in the current Delridge neighborhood), which provided housing, saloons, and other amenities for the workers. The business and commercial center shifted to the town of West Seattle in today's Admiral District. The current community of Delridge includes areas that were previously native Duwamish village sites and the older neighborhoods of Youngstown and Pigeon Point.

Of all Seattle's neighborhoods, West Seattle has historically been the most isolated and independent. Located on a large peninsula west of Seattle's downtown, it was an autonomous city before annexation into Seattle in 1907. Development patterns have largely been defined by transportation and connectivity to the mainland, first by ferry, then by streetcar, and most

recently by bridges and roadways (Sheridan 2002). The taller West Seattle Bridge that now spans the Duwamish Waterway opened in 1984 and remains the main transportation link between West Seattle and Seattle (Tate 2001). In the last 10 years, rapid change has occurred between California Avenue Southwest and Fauntleroy Way Southwest in the West Seattle Junction area as smaller single-story buildings have been replaced by multi-story, mixed-use buildings that are primarily residential. In the Delridge area, redevelopment has also increased in the last decade, with single-family homes being replaced with multi-family buildings or townhouse-style development that increases density on properties. General development has reduced the availability of industrial areas within the city, particularly along the waterways.

### 5.2.2 Ballard Link Extension

The area of the Ballard Link Extension was also historically home to Tribal villages and hunting, fishing, and gathering areas. As Euroamericans came to the region, the area around Downtown Seattle developed along a relatively steep hillside along the eastern shores of Elliott Bay, where the protected deep-water harbor served as a port. Incorporated as a town in 1869, Seattle first concentrated industrial, commercial, social, and residential activities near Front and Commercial streets (now First Avenue and First Avenue South) and Yesler Way, now considered the heart of the Pioneer Square District. Maritime trade in lumber and salmon sustained early Seattle through the 1860s and 1870s (Crowley and McRoberts 1999). Seattle's population increased twelvefold to more than 40,000 with the arrival of railroads in the 1880s.

After the Great Seattle Fire of 1889, city leaders developed new building code provisions that mandated safer and more fire-resistant building construction, streets were regraded, and modern water and sewer utilities were installed. Tidelands along Elliott Bay and Salmon Bay were developed with piers and later filled for development. Construction and development of the Downtown commercial core grew in the first few decades of the twentieth century. By the late 1950s, Boeing's success helped to lift Seattle's economy, and Seattle's Downtown saw a number of construction projects in the 1950s and 1960s. In 1953, the Alaskan Way Viaduct effectively separated Downtown from its waterfront, and the new Interstate 5 freeway, constructed in 1963, severed Downtown from the Capitol Hill and First Hill neighborhoods. The threat of "urban renewal" led residents to champion historic preservation and to save landmarks such as Pioneer Square and the Pike Place Market from redevelopment in the early 1970s (City of Seattle no date).

The current location of Seattle's Chinatown-International District is its third location in Seattle; this district developed in its current location in the early 1900s after moving from earlier locations farther west. The current neighborhood began with a series of buildings on the south side of King Street from 8th Avenue South to Maynard Avenue South. The proximity of King Street Station, built in 1910, and Union Station, built in 1911, combined with demand from seasonal laborers, led to construction of several hotels and single-room-occupancy hotels, which catered to laborers in the area. Between 1910 and 1912, the three largest merchant shops in Seattle moved to hotel buildings in the new Chinatown location, and soon many other commercial enterprises followed. Construction of Interstate 5 also divided this neighborhood, and construction of other projects in more recent years, including sports stadiums and the First Hill Streetcar, have disrupted this neighborhood.

Magnolia and Queen Anne Hill developed as the city expanded from Downtown; these neighborhoods were originally connected by horse and wagon trolley services and later streetcars. As the city grew, the Port of Seattle was established, and the port recognized a need for port facilities and additional moorage space for boats in the Interbay area between the north end of Elliott Bay (Smith Cove) and Salmon Bay. The Great Northern Railway (now BNSF

Railway) was built through Interbay to connect Downtown Seattle to areas north in 1892, and a large railyard was developed in the flat area between the bays. Terminals 90 and 91 were built by the United States Navy during World War II at Smith's Cove (now Smith Cove) and later surplused to the Port of Seattle (HistoryLink.org 2020). Eventually all the tidelands in Interbay were filled in for the mostly light industrial development that exists today.

The south side of Salmon Bay, then a saltwater inlet of Puget Sound lying between Ballard on the north and Magnolia, Interbay, and Queen Anne on the south, was identified for a cargo-handling pier in the early 1900s. Moorage space for boats was becoming increasingly scarce in Seattle's Downtown port, and fishing vessels did not have their own dedicated home port. Fishermen's Terminal was part of Seattle's larger maritime development plans that included the concurrent construction of the Lake Washington Ship Canal and the Hiram Chittenden Locks, which were both completed in 1917. After approval by Seattle voters in 1912, the Port of Seattle began construction on the 45-acre Fishermen's Terminal property in February 1913, and it was dedicated in 1914. A bulkhead wall was constructed along the southern end of the site that raised the terminal land above the level to which Salmon Bay would rise when the Hiram Chittenden Locks were finished in 1916. This facility and the locks ultimately led to Salmon Bay becoming the home to the North Pacific fishing fleet and have supported development of maritime-related industries nearby for many years. In 2019, the shoreline of Fishermen's Terminal was designated part of the Washington State Maritime Heritage Area.

With Salmon Bay to the south and Puget Sound to the west and north, the proximity to water encouraged growth in both the fishing and lumber industries in Ballard in the late 1800s. The lumber mills and fishing industry attracted thousands of Scandinavian immigrants that gave Ballard a unique Nordic feel. Ballard grew as its own city from the 1850s to the early 1900s and was annexed into Seattle in 1907. It continued to grow through the twentieth century as a residential neighborhood as well as a center for fishing and services to support the fishing industry. Ballard has undergone a number of changes throughout the twentieth century; residential density in particular has increased, while industrial land use decreased, notably in the last 20 years. Although Ballard has changed rapidly over the last several decades, it still retains its sense of identity with a strong Scandinavian influence (Ernst 2014).

### 5.2.3 Present Development

As described in Chapter 1, Purpose and Need, city and regional planning efforts support development patterns that focus growth within already urbanized areas to create walkable, compact, and transit-oriented communities that maintain unique local character. Various sources were used to identify recent past and present actions included in this cumulative impact analysis. The Seattle Department of Construction & Inspections maintains a land use and building permit database that was the primary source of information about past and present projects that are currently undergoing permitting processes. Past projects are defined as projects that were constructed before 2010. Impacts from past projects that have already been built are considered qualitatively as part of the affected environment and are addressed in Chapter 3, Transportation Environment and Consequences, and Chapter 4, Affected Environment and Environmental Consequences.

For the purposes of this analysis, present projects are defined as larger development projects that have begun or completed the permit process or construction since 2010. Larger development projects are defined as those over \$5 million in construction and/or that include 10 or more residential units. Larger projects were included because they might have direct or indirect environmental impacts that could contribute to the WSBLE Project's cumulative impacts. Additional sources of information for past and present projects included the City of Seattle, Port

of Seattle, Washington Maritime Federation, WSDOT, Puget Sound Regional Council, and comments received during early project scoping and scoping. Environmental documentation of large infrastructure projects (such as the Alaskan Way Viaduct Replacement Project) was also reviewed to evaluate potential impacts that could also impact the same areas as the WSBLE Project. Present land use and building projects are shown on Figures K-1 through K-7 in Appendix K, Present and Future Development, Transportation, and Public Works Projects in the Study Area.

### **5.3 Reasonably Foreseeable Future Actions**

Reasonably foreseeable future actions are future projects that could produce environmental impacts that could add or interact with the WSBLE Project. Reasonably foreseeable future actions are not speculative and are included regardless of the agency, organization, or person serving as their proponent (Council on Environmental Quality 1997). They must be reasonably likely to occur based on being funded, approved, or under consideration for regulatory permitting; undergoing environmental review under NEPA or the State Environmental Policy Act; or part of an officially adopted planning document or publicly available development plan.

Reasonably foreseeable future actions relevant to the WSBLE Project were identified by reviewing numerous plans, proposals, developments, and NEPA documentation from the City of Seattle, Port of Seattle, Seattle Department of Transportation, WSDOT, Puget Sound Regional Council, Sound Transit, private developers, actions identified in the Sound Transit WSBLE Project Scoping Information Report, and other entities. This information was compiled into a table (see Appendix K) of reasonably foreseeable future actions along with the associated impacts stated in each project's environmental review process documentation; these reasonably foreseeable future actions were considered in this cumulative analysis.

In conjunction with past and present actions, the reasonably foreseeable future actions could add to or interact with environmental impacts from the WSBLE Project alternatives to result in cumulative impacts. Approximate locations of the regional transportation and development actions in the study area that are known at the time of this Draft Environmental Impact Statement are shown on Figures K-8 through K-15 in Appendix K.

### **5.4 Cumulative Impact Analysis**

Both adverse and beneficial cumulative impacts could occur over the long term during project operation, when impacts of the WSBLE Project would interact with long-term impacts of other past, present, and reasonably foreseeable future actions. Construction impacts could contribute to short-term adverse cumulative impacts if the WSBLE Project is constructed at the same time as other construction projects whose adverse impacts add to those of the WSBLE Project. During construction, beneficial economic impacts associated with construction-related job creation could also occur.

The following sections address potential cumulative impacts of both project construction and operation. See Chapters 3 and 4 for a discussion of direct and indirect impacts of the project alternatives that could result in future cumulative impacts.

There are two potential minimum operable segments (M.O.S.): a West Seattle and Ballard Link Extensions M.O.S. (SODO Station to Delridge Station and SODO Station to Smith Cove Station), and a Ballard Link Extension-only M.O.S. (SODO Station to Smith Cove Station). The end-of-line station for an M.O.S is also considered an interim terminus because it is assumed that the project would be fully built out at a later date. The M.O.S.'s include an interim terminus station in SODO, potentially in Delridge, and in Smith Cove. Project construction impacts could

occur twice in these areas, once when the interim terminus station is constructed and again when the full build WSBLE is constructed.

Because analyses of transportation, air quality, energy, and economic impacts cannot be isolated from influences outside the WSBLE Project, they inherently include impacts of other projects and processes.

### 5.4.1 Transportation

#### 5.4.1.1 Impacts during Operation

The analysis of future traffic and transit impacts in Chapter 3, Transportation Environment and Consequences, is a cumulative analysis based on the results of traffic modeling and ridership modeling that incorporate past, funded, and approved future actions, as well as projected growth that would result from development in the region. Other reasonably foreseeable transit and development projects could affect transit ridership and travel patterns within the study area, including traffic operations near new stations. This could include possible transit-oriented development in station areas, which would likely increase the number of people walking or biking to stations.

As the WSBLE Project becomes operational, its contribution to cumulative impacts on transportation would be beneficial in several ways. The project would contribute travel efficiencies in addition to those provided by the other reasonably foreseeable future transportation improvement projects listed in Appendix K. It would increase the number of people traveling in the project corridor with more people riding transit while reducing the number of vehicle miles traveled and vehicle hours of delay compared to the No Build Alternative. Fewer vehicle miles and hours traveled within the corridor could improve general traffic conditions, including freight mobility within the study area.

The project, in combination with other reasonably foreseeable future transit projects, is not expected to have a cumulative impact on parking throughout the study area. The project would either remove or convert some street parking to bus (or other transit) loading zones; however, the project would also be removing some of the residential or commercial land uses that created demand for parking in these areas. Sound Transit would work with the Seattle Department of Transportation to consider appropriate on-street parking measures within a 0.25-mile radius of each station to discourage hide-and-ride activity and to make sure parking is available for residents and businesses in the area. While other transportation projects could also remove street parking to implement their improvements, these changes would be consistent with City goals and policies related to curb space management. With the project creating a more connected and accessible regional transit system, especially in the commercial and residential areas along the project corridor, transit ridership would increase and reduce the need for parking within the study area.

#### 5.4.1.2 Impacts during Construction

During the 5- to 10-year period of civil construction, the WSBLE Project may add to and interact with construction impacts from other transportation and development projects being built at the same time. Construction in or near roadways typically requires temporary lane closures, detours, and traffic delays. Interactions among two or more concurrent construction projects can intensify these impacts. However, most reasonably foreseeable future actions that can be

reliably identified at present would be completed or near completion before the WSBLE Project construction would begin.

Other transportation projects in the study area could have construction periods that would overlap with the WSBLE Project, and if they include road closures, they could contribute to cumulative traffic impacts on travel throughout Downtown and adjacent neighborhoods. In bored-tunnel areas, the WSBLE Project would not affect traffic flow outside of station, station shaft, and portal locations. WSDOT, the City of Seattle, Metro, and Sound Transit have been coordinating and would continue to coordinate on the construction schedules for transit projects to avoid major construction work on overlapping corridors at the same time.

The proposed project could include building roadway overpasses at South Lander Street and South Holgate Street, two of the few major east-west streets in SODO that cross the light rail and BNSF Railway tracks. Preferred Alternative SODO-1a and Option SODO-1b would include construction of two roadway overpasses: one at South Lander Street as part of the West Seattle Link Extension and one at South Holgate Street as part of the Ballard Link Extension. Cumulative traffic-related construction impacts in the SODO Segment would be minimized using a phased approach between the West Seattle Link Extension and the Ballard Link Extension. Access for all types of vehicles and non-motorized access would be maintained on one roadway while the other is under construction. South Lander Street and South Holgate Street would not be closed for construction at the same time. With Alternative SODO-2, a section of the SODO Busway would be closed for the duration of construction. For both the West Seattle and Ballard Link extensions, construction of Alternative SODO-2 would result in the SODO Busway being closed for 10 years. Metro buses during the peak hour would be relocated onto 4th Avenue South and/or 6th Avenue South; this would not substantially affect the general traffic conditions on these roadways.

### 5.4.2 Acquisitions, Displacements, and Relocations

Some residents or businesses displaced by the WSBLE Project could have been previously displaced by other projects under construction or recently completed projects, such as the Alaskan Way Viaduct Replacement. Not all of the identified foreseeable future actions have finalized environmental documents, including displacement data, and all projects are subject to change from a variety of factors, such as funding and design modifications. Other projects could result in the relocation of businesses or residences into the WSBLE Project study area, resulting in a potential later displacement by the WSBLE Project. Where possible, Sound Transit would provide early coordination with other projects to minimize displacement of individual businesses and residences multiple times.

The majority of present and reasonably foreseeable future actions (see Figures K-1 through K-15 in Appendix K, Present and Future Development, Transportation, and Public Works Projects in the Study Area) would not require land acquisitions or cause displacements because they are either within an existing transportation right-of-way or are related to private redevelopment projects, which involve willing buyers and sellers. However, Seattle's recent history of large-scale redevelopment has caused involuntary displacement of individuals through the sale of rental properties to private developers. These properties are often affordable housing or business locations. New developments would be required to comply with the City's affordable housing and business mandate (City of Seattle 2018a), thereby increasing availability within the project vicinity and minimizing cumulative impacts to affordable housing.

The City of Seattle is planning for growth and redevelopment in urban areas to support higher population densities, increase housing availability, and provide greater employment



opportunities, consistent with local zoning (see Sections 4.2.2 and 4.3.2, Land Use). Sound Transit's study of available and vacant properties within the WSBLE study area indicates that most, if not all, displaced entities could be relocated within the city, although not necessarily within the same neighborhood (see Sections 4.2.1 and 4.3.2, Acquisitions, Displacements, and Relocations). As redevelopment occurs within the study area, property values and rents could increase, causing residents and business to leave the area or making it less affordable for displaced individuals or businesses to relocate within the same area. However, mixed-use, high-density redevelopment that could indirectly result from the WSBLE Project and other foreseeable future actions would increase housing availability within the same areas and neighborhoods from which individuals are being displaced, and the City's Mandatory Housing Affordability policy requires developers to provide affordable housing or pay into a fund that supports affordable housing (City of Seattle 2019b). In addition, following Sound Transit's Real Property Excess, Surplus, and Disposition Policy (Sound Transit 2013) and Equitable Transit Oriented Development program (Revised Code of Washington 81.112.350; Sound Transit 2018b), affordable housing developers would be given priority for redevelopment of Sound Transit surplus property after construction, thereby increasing the availability of affordable housing.

An adverse cumulative impact from property acquisition is not expected because more residential and employment opportunities would likely be created than lost within the study area.

### 5.4.3 Land Use

#### 5.4.3.1 Impacts during Operation

Establishing light rail and other high-capacity transit systems, in conjunction with other land use actions by local governments, often creates changes in land use, especially around station areas. Direct impacts associated with the WSBLE Project and other foreseeable transit projects could occur where the transit alternatives would require private or public property acquisitions for new project facilities (e.g., stations) or where proximity impacts (e.g., visual, noise, and traffic impacts) cause changes in adjacent land uses. The WSBLE Project could indirectly affect land use by providing new or improved access that could encourage private development by making properties more attractive to developers.

The WSBLE Project, as well as other planned transportation projects, would be consistent with all applicable City of Seattle, King County, and regional land use plans and policies (see Appendix L4.2, Land Use). Cumulatively, these projects would increase mobility options throughout the city and increase population densities where land use plans allow. Increasing land use densities in these areas would reduce the potential for land development in areas where increased development would not be consistent with local plans and policies. Based on population growth trends in the Seattle metropolitan area, density would likely increase in the city without the WSBLE Project and planned transit projects (Puget Sound Regional Council 2018). However, the WSBLE Project, in combination with planned transportation projects such as the RapidRide Corridor and Westlake Multimodal Transit Hub improvements, would more directly support planned population and employment growth within the Downtown urban core than would occur without them.

The WSBLE Project would support the goals of several regional and local plans, such as Puget Sound Regional Council's VISION 2050 (Puget Sound Regional Council 2020); King County's *Comprehensive Plan* (King County 2018); and Seattle's *Comprehensive Plan* (City of Seattle 2018b), *Urban Village Strategy* (City of Seattle 2015a), and *Transit Master Plan* (City of Seattle

2016b), by encouraging mixed-use transit-oriented development and affordable housing through Sound Transit's Equitable Transit Oriented Development program in areas planned for high-density development. This development would occur predominantly in areas surrounding transit stations and would improve neighborhoods' appeal by improving transit, recreational, employment, and retail opportunities and accessibility. Foreseeable future transit projects would also be required to comply with land use plans and likely increase the land use benefits associated with the WSBLE Project.

The WSBLE Project and other foreseeable transit expansion projects would convert existing land use to public transportation right-of-way, thereby cumulatively decreasing opportunities for development on acquired land. However, several of the WSBLE Project alternatives, and most of the foreseeable future transit projects, would use existing transportation rights-of-way. The WSBLE Project would also operate underground through the most densely populated areas of the city. Therefore, the WSBLE Project and foreseeable transit projects would only require a small portion of the total available land for development and redevelopment within the study area. In addition, where land is acquired, transit projects would support high-density, mixed-use redevelopment in surrounding areas.

### 5.4.3.2 Impacts during Construction

No direct impacts on land use would occur during construction. Indirect impacts on adjacent land use could occur from construction activity, and could contribute to a cumulative impact if there is other construction in the area.

## 5.4.4 Economics

### 5.4.4.1 Impacts during Operation

All WSBLE Project alternatives would require business and employee displacements through the acquisition of commercial, industrial and institutional properties (see Sections 4.2.2 and 4.3.2, Acquisitions, Displacements, and Relocations, and Section 5.4.2, Acquisitions, Displacements, and Relocations). In addition, of the non-industrial areas that would be most impacted by displacements, many are priority areas for redevelopment and increased density established by the City of Seattle. Other reasonably foreseeable actions would not individually require large-scale displacements, as they occur within existing rights-of-way or on private land. Most of the displaced businesses would be able to relocate within the project vicinity, which has an industrial vacancy rate of 4.3 percent, retail vacancy rate of 1.8 percent, and an office vacancy rate of 6.3 percent (see Sections 4.2.1 and 4.3.1, Acquisitions, Displacements, and Relocations). However, redevelopment has been occurring throughout the study area and would likely continue without the WSBLE Project and in relation to other foreseeable future actions. Planned private development projects would also increase the availability of residential, retail, industrial, and office space, as well as employment opportunities, within the project vicinity. As redevelopment occurs, it is also possible that it may become more expensive for business owners to operate within the study area, and it is possible that the WSBLE Project could contribute to a cumulative impact on businesses in the study area. Pressure on industrial lands, including those along waterways, has been of increasing concern to this business community as property values rise and interest in redeveloping these properties for non-industrial uses increases due to the relatively affordability of the property within the city. The extent of redevelopment is limited, however, based on zoning, and changes in zoning require approval by the City and a public process.

While business displacements could temporarily affect tax revenue, the dense mixed-use development that would likely occur consistent with zoning around station areas for the WSBLE Project and other foreseeable transit projects, as well as in coordination with private development projects, could ultimately increase property and sales tax revenues. The WSBLE Project and other foreseeable transit projects could also enhance connectivity to major tourism and recreation opportunities, such as T-Mobile Park, Lumen Field, and Downtown, thereby potentially increasing sales tax revenue in those areas. As property and sales taxes make up over 40 percent of the revenue for the City of Seattle, the WSBLE Project and foreseeable future actions would contribute to a beneficial cumulative impact on the city's economic health.

The WSBLE Project and other foreseeable transit projects would improve access to two major industrial centers within the study area: the Duwamish Manufacturing/Industrial Center and Ballard Interbay Northend Manufacturing/Industrial Center. Increased transit connectivity to these areas would increase employment desirability within the area, as well as increasing existing business and attracting future businesses. Increasing transit opportunities to major employment and manufacturing centers would also have a beneficial impact on freight mobility. All project alternatives would be expected to either improve or maintain travel times throughout the city and major freight corridors compared to the No Build Alternative, thereby improving local, regional, and international freight mobility to and from Downtown Seattle, the Port of Seattle, and other commercial hubs.

### 5.4.4.2 Impacts during Construction

Construction of any project could create temporary adverse impacts to neighboring businesses by increasing noise, dust, traffic congestion, visual impacts, and difficulty accessing commercial properties. These impacts could influence the decision to patronize a specific business, resulting in a temporary adverse impact. Cumulative adverse construction-related impacts would be the most noticeable if construction occurs simultaneously for projects within the same area. For example, access restrictions to businesses within the Interbay and Magnolia neighborhoods could be expected in the South Interbay Segment if the Pier 91 upland development occurs at the same time as WSBLE Project construction. The Downtown Segment would have the greatest potential for these cumulative impacts, as it has the highest density of reasonably foreseeable future actions. However, any adverse impacts would be temporary and construction is typically an indicator of economic growth, as it brings temporary and permanent jobs and revenue to local economies. Sound Transit would work closely with affected businesses during construction to maintain necessary access and ensure business activities could continue throughout construction as much as possible. Businesses throughout the corridor could experience fatigue from multiple construction projects over many years in the same area. These cumulative impacts would be most likely to occur in neighborhoods that have seen large-scale development in recent decades, including West Seattle Junction, Downtown, and Ballard, as well as areas that have experienced construction of numerous infrastructure and private development projects over a longer period of time. The Chinatown-International District Segment, which has experienced construction of Interstate 5, the Downtown Seattle Transit Tunnel, the First Hill Streetcar, and nearby stadiums, would experience cumulative impacts with the construction of WSBLE in addition to reasonably foreseeable future projects that could have overlapping construction periods and potentially create multiple interruptions for businesses. Some neighborhoods, particularly the Chinatown-International District, Downtown, and Uptown, as well as many performance and event venues, may still be recovering from the economic effects of the COVID-19 pandemic when construction of the project begins.

Businesses in the SODO Segment that could be affected by construction activities for both the West Seattle Link Extension and the Ballard Link Extension could experience an extended

construction period. Recent construction of a roadway overpass on South Lander Street over rail lines closed South Lander Street between 1st Avenue South and 3rd Avenue South for 2 years and affected access to nearby businesses. Preferred Alternative SODO-1a and Option SODO-1b would include a new South Lander Street Overpass and construction period closures, which would further impact these businesses. All SODO alternatives would include a South Holgate Street roadway overpass, which would further impact businesses in SODO. As described in Section 5.4.1.2, Impacts during Construction, all traffic including freight could be affected by road closures in this segment. Construction would be phased so that South Holgate Street and South Lander Street are not closed at the same time, to minimize impacts on freight movement, local circulation, and business access.

The Seattle area continues to experience growth pressures that are of particular concern to freight customers and carriers facing congestion in the constrained transportation corridors in the SODO and Duwamish areas. In addition, the Port of Seattle and Northwest Seaport Alliance are facing increased competition from ports. As described in Section 3.11.3.7, while temporary road closures near Terminals 5 and 18 and construction activities at Terminal 18 are not anticipated to substantially affect traffic and freight, customers and carriers may still have concerns about congestion around Harbor Island freight terminals. Short-term and intermittent closures on the United States Army Corps of Engineers-maintained navigation channel in the Duwamish Waterway during construction could add to these concerns. This perception of potential transportation delays may lead customers and carriers to consider other options for business locations and port facilities. Sound Transit would coordinate with the Port of Seattle and Northwest Seaport Alliance with construction phasing and the timing of road closures in the SODO and Duwamish segments that minimize impacts to property access and freight movement.

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

#### 5.4.5.1 Impacts during Operation

Seattle's recent population boom has dramatically changed the appearance, character, and cohesion of residential neighborhoods, as formerly modest lower-density neighborhoods with potentially more affordable housing are redeveloped with mixed-use multi-family buildings with retail and commercial space. Rents in newer construction buildings tend to be higher than in older buildings. While redevelopment can improve the vitality of urban areas, it also can increase property values and rents to levels that become unaffordable to the original residents. When prices are too high, residents are forced to move out of the neighborhood. This phenomenon is often exacerbated for lower-income populations. However, as neighborhoods revitalize, amenities and community resources also often improve, which can increase the quality of life for both new and remaining members of the community. As population growth is anticipated to continue at a steady rate (Puget Sound Regional Council 2020), this trend would be expected to continue with or without the addition of the WSBLE Project. The WSBLE Project would, however, support more concentrated development and redevelopment in station areas and areas where zoning allows for it, thereby reducing the potential for neighborhood change in other areas.

Light rail generally benefits neighborhoods by increasing transit access and development near stations. The WSBLE Project, other foreseeable future transit projects, and foreseeable transit-oriented development projects, would cumulatively benefit neighborhood vitality through

improved access, residential infill, growth in employment base, and greater patronage of local businesses. All residential neighborhoods and urban villages served by the WSBLE Project and other foreseeable transit projects would also experience greater connectivity throughout Seattle, to the Downtown urban core and other employment centers as well as other regional destinations as light rail expansions currently under construction begin operations. In addition, these projects would collectively enhance access options and connectivity to other modes of transit (e.g., bicycling, bus, and walking), as well as reduce travel time for regional destinations.

Some Seattle Housing Authority low-income housing units and some transitional housing facilities could be displaced by the project, which could cumulatively impact the supply of low-income and affordable housing. As previously described, however, Sound Transit's Equitable Transit Oriented Development program could help increase the number of low-income and affordable housing units in the project vicinity. In addition, some social services could be temporarily or permanently relocated by the project, which could be a cumulative impact if similar services have already been displaced, either directly or indirectly, by redevelopment. Sound Transit would coordinate with all displaced resource providers to find adequate replacement facilities within the area and aid in the transition process consistent with Sound Transit's *Real Property Acquisition and Relocation Policy, Procedures, and Guidelines* (Sound Transit 2017). The WSBLE Project (in conjunction with other reasonably foreseeable future transit projects) would provide increased accessibility to an efficient regional transit system to those who work at and/or use social resources and community facilities in the study area.

Past development and policies have adversely affected communities of color in the Chinatown-International District. Development of the neighborhood occurred initially because residents were not allowed to live or own property in other areas of the city. During World War II, thousands of Japanese residents from the Japantown area of the neighborhood were relocated to internment camps. Many lost their homes and businesses, and the generational wealth associated with owning property and businesses. While some returned to the area following the war, many did not. Additional displacement occurred in the 1960s for construction of Interstate 5. In the following decades, additional public and private development around this community increased traffic in and around the neighborhood and added to economic pressure related to rising property values. Some infrastructure improvements, such as the Downtown Seattle Transit Tunnel and the First Hill Streetcar, have provided increased mobility within the city and region.

As discussed in Section 4.3.4, Social Resources, Community Facilities, and Neighborhoods, for the Ballard Link Extension, the Chinatown-International District was identified by the City as having a high displacement risk to residents and businesses. Increased property values and redevelopment encouraged by the addition of transit service could result in changes to neighborhood composition and character. These changes are already occurring to some extent with recent growth trends. Sound Transit is partnering with the community and other agencies on a community-based planning effort for the area to evaluate strategies to maintain and enhance community cohesion as well as strengthen connections between the Chinatown-International District, Pioneer Square, and the transit hub. These efforts are in early phases and will continue during the Final Environmental Impact Statement and final design phases, guided by the community and informed by the actions of the Sound Transit Board to identify the light rail project to be built.

Light rail and other transit projects often influence increased mixed-use development near transit stations, and there can be potential for displacement inequity. However, Sound Transit's adopted Equitable Transit Oriented Development program, in combination with the City of Seattle's Mandatory Housing Affordability requirements (see Appendix L4.2, Land Use), would encourage and prioritize affordable housing development opportunities and could create a

greater availability of affordable housing opportunities than would exist without the WSBLE Project. Equitable transit-oriented development can also include cooperative or affordable commercial space and uses, childcare and human development, and community-based management or stewardship of property.

### 5.4.5.2 Impacts during Construction

Construction of all foreseeable actions, including the WSBLE Project, could temporarily result in adverse cumulative impacts on neighborhoods and social facilities through temporary increases in neighborhood traffic, changes in traffic patterns, and construction noise and dust. All construction projects can affect access and egress from neighborhoods due to increased congestion, detours, lane or road closures, and bus line reroutes. If several foreseeable actions, such as the RapidRide D Line Improvements, Third Avenue Transit Spine, and Westlake Multimodal Transportation Hub, are constructed at the same time as the WSBLE Project, cumulative impacts to neighborhoods could increase. The Downtown area has the highest concentration of reasonably foreseeable actions and it therefore has the most potential for these cumulative construction impacts; however, the WSBLE Project in this segment would be primarily in a bored tunnel, and construction area impacts would be focused near station areas. Social and community resources within the Chinatown-International District Segment have historically faced multiple construction-related interruptions, delays, and accessibility issues associated with recent redevelopment and infrastructure projects, such as the First Hill Streetcar. Sound Transit would work with resource and community providers in the Downtown and the Chinatown-International District segments to minimize impacts from the WSBLE Project and maintain access to resources.

## 5.4.6 Visual and Aesthetics

### 5.4.6.1 Impacts during Operation

Cumulative change has occurred within the last 10 years in more densely developed urban areas, such as the West Seattle Junction, along Avalon Way Southwest in West Seattle, and in Ballard. In general, the visual setting in these areas is constantly changing due to redevelopment and would likely continue to change in the study area with or without the WSBLE Project (see Appendix N.2, Visual and Aesthetics Technical Report).

Where zoning allows, the visual change resulting from past actions and reasonably foreseeable future actions, together with the WSBLE Project stations, would likely include changes in development density and the visual environment. The elevated Delridge Station alternatives could change the visual character due to the station's height, whereas other stations could be more visually compatible with the existing light industrial, commercial, multi-family, and mixed-use areas.

With a few exceptions, the project's elevated guideway would add another transportation element to views but would be visually compatible with the large arterials that it would be above or parallel. Further modifications to some of these roadways are included in reasonably foreseeable future projects as dedicated bus lanes and improved traffic systems are constructed. Although several reasonably foreseeable future transit projects would include visual enhancements, they would incrementally increase the area of transportation-dedicated land, especially when positioned adjacent to one another, which could result in a cumulative visual impact. This cumulative impact could decrease the visual quality along these transportation corridors. The WSBLE Project would require tree removal from some

neighborhoods, especially Pigeon Point in West Seattle (at the West Duwamish Greenbelt) and the Southwest Queen Anne Greenbelt, which would decrease visual quality. Trees removed would need to be replaced, but may not be replaced in the same area for safety reasons and impacts in some locations may not be able to be fully mitigated. In combination with past projects that have removed vegetation in these areas, this could be a cumulative visual impact.

### 5.4.6.2 Impacts during Construction

If the WSBLE Project is constructed at the same time as other planned projects, viewers could experience more visual impacts during construction. This would increase overall impacts on the surrounding visual environment.

## 5.4.7 Air Quality

### 5.4.7.1 Impacts during Operation

The analysis in Sections 4.2.6 and 4.3.6, Air Quality, is an inherently cumulative analysis because the expected impacts for the WSBLE Project are based on Puget Sound regional traffic forecasts, which include reasonably foreseeable transportation projects and projected regional emissions. The analysis projected that the WSBLE Project would reduce regional vehicle miles traveled and associated car exhaust emissions compared to the No Build Alternative. A reduction in emissions would provide a beneficial cumulative impact to local and regional air quality.

In the last few decades, climate change, or the change in global or regional climate patterns attributed to increasing levels of atmospheric greenhouse gases, has become an issue of international concern. Climate change can lead to more severe weather conditions, such as increased frequency of droughts, intensity of hurricanes, and sea level rise. Humans are already experiencing the effects of climate change as increasing smog conditions affect respiratory health and changing weather patterns diminish agricultural yields (Mickley 2007, Mall et al. 2017). Engines that burn fossil (petroleum-based) fuels release carbon dioxide into the air and are one of the largest contributors to greenhouse gases across the world. In the United States, energy production and transportation are the largest contributors to greenhouse gases, followed by industries, residences, and offices (United States Environmental Protection Agency 2017). The Intergovernmental Panel on Climate Change advocates reducing the burning of fossil fuels, improving fuel efficiency, conserving energy, and using cleaner energy sources to reduce greenhouse gas emissions and slow climate change (Intergovernmental Panel on Climate Change 2014).

The WSBLE Project is part of Sound Transit's Sound Transit 3 Plan (Sound Transit 2016), which extends light rail, commuter rail, and bus services as well as makes other transit improvements throughout the central Puget Sound region. As part of the Sound Transit 3 planning process, Sound Transit conducted an analysis that found the Sound Transit 3 system would reduce greenhouse gas emissions by more than 130,000 metric tons annually, or the equivalent of 14.6 million gallons of gasoline burned. Once completed, the entire Sound Transit system would save the region an estimated 793,000 metric tons of greenhouse gases per year, or the equivalent of 89 million gallons of gasoline burned per year (Sound Transit 2016). The WSBLE Project in combination with reasonably foreseeable transit projects would reduce automotive vehicle miles traveled within Seattle and the central Puget Sound region, thereby reducing petroleum consumption and greenhouse gas emissions in the area.

Implementing improved transit in combination with high-density redevelopment often has a cumulative effect on decreasing vehicle miles traveled. Research has shown that individuals who live closer to high-density developments with effective transit options have lower vehicle miles traveled than those who live in more typical suburban developments (Stiffler 2011). This trend is even stronger in low-income communities. These findings are substantiated by other studies, which have shown that as density increases and distance to urban centers decreases, vehicle miles traveled decline and transit or non-motorized trips increase (Transit Cooperative Research Program 2008; Fang and Volker 2017). The WSBLE Project, other foreseeable transit projects, and foreseeable private development projects may influence development of high-density, mixed-use redevelopment around stations and in other planned areas, thereby also decreasing vehicle miles traveled and greenhouse gas emissions to provide a cumulative benefit for air quality.

Long-term operations of the WSBLE Project and many of the other foreseeable future actions would concentrate density in planned growth areas, rather than in low-density growth patterns, thereby using less land area, supporting fewer vehicle miles traveled, and resulting in less overall energy consumption (Morikawa 2011).

Recent state and local legislation would further contribute to the cumulative reduction in greenhouse gas emissions and improve air quality within the study area. Notable recent legislation is as follows:

- In May 2019, Washington Governor Jay Inslee signed into law the Clean Energy Transformation Act, which requires all electric utility providers in Washington to transition to carbon-neutral electricity by 2030 and to 100 percent carbon-free electricity by 2045.
- In August 2019, the City of Seattle passed Resolution 31895, or Seattle's Green New Deal, which affirms Seattle's commitment to transition away from its dependency on fossil fuels and build climate resiliency through actions such as making Seattle climate pollution-free by 2030 and establishing dedicated revenue sources for achieving city-wide sustainability.
- In January 2020, Washington Governor Jay Inslee issued Executive Order 20-01, which requires all state agencies to prioritize battery-electric and low-emission vehicles when replacing or enhancing existing fleets; zero-energy or zero-energy-capable facilities during new construction; energy efficiency in owned and leased facilities; and transitioning the Washington State Ferry system to a zero-carbon-emission fleet.

### 5.4.7.2 Impacts during Construction

The WSBLE and reasonably foreseeable future actions would temporarily increase air pollutants and greenhouse gas emissions during construction. 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

### 5.4.8.1 Impacts during Operation

The Federal Transit Administration's methodology for noise and vibration analysis reflects cumulative ambient noise conditions from land uses and activities from past and present activities in combination with project-specific noise and vibration impacts. Sound Transit is committed to minimizing project noise levels at their source for all of its light rail corridors. When



noise would exceed FTA impact criteria, Sound Transit would provide noise mitigation measures. All WSBLE Project noise and most vibration impacts could be mitigated depending on the alternatives chosen. However, there could be residual vibration impacts in some segments.

The light rail vibration might occur concurrently with vibration from heavy trucks on rough roads and local construction activities for other projects. Cumulative vibration levels in most areas are not expected to differ from existing vibration levels. Exceptions to this would include areas that have extremely rough roadways with potholes or cracks, which would increase vibration levels from passing trucks and other heavy vehicles, and areas near active construction sites where equipment could cause short-term increases in vibration levels.

No other reasonably foreseeable future actions are expected to cause notable vibration impacts during project operation, so cumulative vibration impacts are not expected. 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. In addition, the indirect impact of the WSBLE Project, combined with local land use policies, would attract more development around rail stations, which might result in more intense urban activities in some station areas, adding cumulative noise to the surroundings.

### 5.4.8.2 Impacts during Construction

During construction, the WSBLE Project would contribute noise and vibration impacts along with other nearby transportation and private development construction projects, and cumulative impacts would be anticipated. This is particularly true for the tunnel alternatives in the Downtown Segment, where construction of high-rise buildings is proposed near WSBLE Project alternatives. However, many projects currently planned might be completed before WSBLE Project construction. Any construction activities would have to comply with the City of Seattle's noise regulations or require a noise variance from the City. Where necessary, Sound Transit would monitor noise and vibration during construction to minimize related disturbances on residential and other sensitive areas and work with other adjacent projects to limit nighttime noise and vibration impacts.

## 5.4.9 Water Resources

### 5.4.9.1 Impacts during Operation

Although many of the reasonably foreseeable actions, as well as some WSBLE Project alignment alternatives, would be built on developed sites or within existing paved rights-of-way, the projects would create a cumulative increase in the amount of impervious surfaces and stormwater runoff within the study area. However, new development and redevelopment are expected to bring existing pollution-generating surfaces up to current standards for runoff control and stormwater quality treatment as well as adhere to updated stormwater quantity control requirements. Through the replacement of these surfaces, improvements in stormwater runoff control and water quality would likely occur over time, with or without the WSBLE Project. This would result in a net benefit for the hydrology and water quality within the study area. While no impacts to the regulated floodplain of the Duwamish Waterway are expected from the project, climate change projections suggest that sea level rise is likely to affect the water level of the Duwamish Waterway. Under a high emissions scenario (Representative Concentration Pathway 8.5), there is a 17 percent probability that sea level rise will exceed 3 feet and a 1 percent probability that it will exceed 5 feet by the year 2100 (Miller et al. 2018). This increase

would likely result in a change in the floodplain in the project corridor. No cumulative adverse impact on water resources would be expected from the WSBLE Project.

### 5.4.9.2 Impacts during Construction

Erosion and sedimentation from cleared areas and earth-moving activities, as well as guideway column construction, could temporarily affect water quality in streams and waterbodies. These impacts would increase if projects in the same area are constructed at the same time. However, all projects would be required to comply with federal, state, and local permit conditions as well as all erosion, sedimentation, stormwater pollution, and water quality plans/protections during construction.

### 5.4.10 Ecosystems

#### 5.4.10.1 Impacts during Operation

Past projects have contributed to massive changes to the Duwamish River, including channelization for the Duwamish Waterway and development of Harbor Island and industrial properties on both sides of the waterway. Loss of estuarine habitat has occurred as tidelands were dredged and filled for industrial development, and also from construction of existing transportation structures, such as the Spokane Street Bridge and the West Seattle Bridge. Contamination of the waterway from adjacent industrial uses has also adversely affected habitat. Loss of aquatic habitat in Longfellow Creek has occurred from channelization, placement of the creek in culverts under roads and private properties, and encroachment of the stream buffer by development. Natural segments in the study area remain in very few places, such as the protected Longfellow Creek Natural Area. Upland forested habitat throughout the area has been highly fragmented through historical development, and large areas of continuous habitat have been maintained only in protected parks and greenbelts, such as the West Duwamish Greenbelt and the Southwest Queen Anne Greenbelt.

The Salmon Bay area has also been altered substantially by previous projects, including the Hiram M. Chittenden Locks, which raised the water level, and the Lake Washington Ship Canal, which connected Salmon Bay to Lake Union. To accommodate the maritime industry, shoreline habitats have been filled and modified in order to build piers, marinas and other maritime facilities. The Ballard Bridge also modified habitat in this area. Natural shoreline exists only in small pockets, such as the constructed cove and restoration area near Seattle Central College's Seattle Maritime Academy.

The WSBLE alternatives would generally have a low potential to adversely affect the viability of local wildlife populations because of the highly urbanized environment of the study area (see Sections 4.2.9 and 4.3.9, Ecosystems). There are a few higher-value habitats that support native fish and wildlife species in the study area, including the Duwamish Waterway, West Duwamish Greenbelt, Longfellow Creek and its associated natural area, Kinnear Park, Southwest Queen Anne Greenbelt, and Salmon Bay. Two golf courses and some small residential parks also provide lower-quality habitat. Loss of higher-value upland habitat from some of the WSBLE Project alternatives would have a cumulative impact on overall loss of forested habitat in the city of Seattle, and would reduce the habitat available for some species, such as the great blue herons in the West Duwamish Greenbelt. These habitats also support several federally and state-listed endangered and threatened species and federal and state species of concern. Some reasonably foreseeable future actions could also contribute to cumulative impacts on terrestrial habitat by removing large trees and increasing the amount of

impervious surface in the area. As urban development continues within the study area, changes to the landscape have the potential to further degrade or reduce the few remaining high-quality breeding/nesting and foraging habitats for resident and migratory species.

Some WSBLE alternatives would also result in impacts to aquatic habitat. Preferred Alternative DUW-1a and Alternative DUW-2 could be constructed with bridge types that would avoid in-water impacts to aquatic habitat in the Duwamish Waterway. Option DUW-1b could not be built in a way that would avoid in-water impacts and therefore could have a greater contribution to cumulative impacts to aquatic habitat than the other Duwamish Segment alternatives. All of the bridge alternatives in the Interbay/Ballard Segment would impact aquatic habitat in Salmon Bay. Impacts from these WSBLE alternatives could contribute to cumulative impacts on the Duwamish Waterway and Salmon Bay when considered with past alterations and ongoing development in shoreline areas. The Muckleshoot Indian Tribe is signatory to both the Treaty of Point Elliott and the Treaty of Medicine Creek; the Muckleshoot Indian Tribe has treaty-protected fishing rights and Usual and Accustomed Areas in the Puget Sound region, which includes the Duwamish Waterway and Salmon Bay. The Suquamish Tribe of the Port Madison Reservation (the Suquamish Tribe) is signatory to the Treaty of Point Elliott and has treaty-protected fishing rights and Usual and Accustomed Areas in the Puget Sound region, which includes the Duwamish Waterway and access to Usual and Accustomed Areas through Salmon Bay. Cumulative impacts to aquatic habitat could adversely affect Tribal treaty-protected fishing activity of the Muckleshoot Indian Tribe. Cumulative impacts to aquatic habitat could also adversely affect treaty-protected fishing activity of the Suquamish Tribe. Reasonably foreseeable future actions within the study area could incrementally contribute to the fragmentation, degradation, and/or loss of valuable aquatic habitats and adversely affect wildlife, including fish. Foreseeable future actions that will remove riparian habitat, disturb stream channels, or fill or alter wetland habitat could further impact these habitats. Federal, state, and local permitting requirements would require mitigation for these impacts, which would reduce the potential for cumulative impacts. Some future actions, such as the Waterfront Seattle and Pier 62/63 reconstruction, include components that will positively impact habitats through the creation of new greenspace or restoration of existing habitat in the study area.

Other state and local projects would also benefit terrestrial and aquatic habitat in the study area. Recently, the City of Seattle committed to increasing the city-wide tree canopy cover to 30 percent by 2037 and restoring 2,500 acres of forested parkland by 2025. Through the Green Seattle Partnership, there are active restoration programs within the Longfellow Creek watershed, which remove invasive plants and restore native species. The City has also purchased property to upgrade Duwamish Waterway Park and, through partners, is restoring wetlands in the Delridge neighborhood. These efforts actively work to preserve and enhance existing habitats within the study area, and the WSBLE Project would support those goals by encouraging concentrated development away from these areas and within designated urban centers, thereby reducing the effects of development on existing habitats and resulting in a beneficial cumulative impact for species within the study area. Overall, the potential for cumulative impacts on ecosystems from the project is expected to be minor after mitigation.

Federal, state, and local regulations require the WSBLE Project and other reasonably foreseeable future actions to mitigate any permanent impacts on streams, wetlands, and other high-value habitats. The Washington State Department of Fish and Wildlife and the Washington Hydraulic Code require mitigation for and minimization of any impacts on fish and/or their habitats. In concurrence with the Washington Hydraulic Code, any new or replaced culverts must also be designed so as to not impede fish passage. The project would provide water quality treatment for pollution-generating impervious surfaces that are rebuilt as part of the project. Some of these surfaces do not currently receive any treatment; therefore, the project

would benefit the water quality of water bodies in the area and the aquatic habitat in those water bodies. In addition, Sound Transit's policy on ecosystem mitigation is to avoid impacts on environmentally sensitive resources as much as possible, and to provide adequate mitigation for unavoidable impacts to ensure no net loss of ecosystem function and acreage as a result of agency projects. Potential mitigation measures include restoration or enhancement of degraded streams, wetlands, and wetland buffers; removal of fish passage barriers; and planting disturbed areas with native vegetation. Where instituted, these measures would provide cumulative benefits to fish, wildlife, and their habitats.

### 5.4.10.2 Impacts during Construction

Construction associated with all reasonably foreseeable future actions, including the WSBLE Project, would contribute to temporary habitat loss resulting from vegetation removal for construction staging areas and access. Although erosion and sedimentation could temporarily affect water quality in waterbodies, all projects would be required to comply with permit conditions as well as erosion, sedimentation, stormwater pollution, and water quality plans/protections during construction, which would prevent those impacts. Wildlife within the study area is regularly exposed to the noise associated with a highly urbanized environment, and it is unlikely wildlife would experience much, if any, adverse effects related to construction noise. Following construction, cleared areas would be revegetated and all areas would be restored to pre-construction conditions, where possible, thereby reducing any long-term cumulative construction effects. In-water construction activities could contribute to a cumulative impact on aquatic species related to ongoing disruption if other in-water projects are under construction nearby at the same time, or if they are constructed consecutively. Sound Transit would coordinate with the appropriate regulatory agencies during the permitting process to minimize these potential impacts during construction.

### 5.4.11 Energy Impacts

The energy analysis and scope of travel demand model used for the analyses in Sections 4.2.10 and 4.3.10, Energy Impacts, considered the entire central Puget Sound region and therefore accounts for cumulative impacts of the WSBLE Project. The cumulative energy impacts of the WSBLE Project and other reasonably foreseeable future actions would be negligible. The Sound Transit Sustainability Plan (Sound Transit 2019b) requires future stations to be as energy-efficient as possible and meet green building standards.

### 5.4.12 Geology and Soils

Past and ongoing urban development within Seattle has substantially altered geologic surface conditions throughout the study area. Development associated with the reasonably foreseeable future actions and the WSBLE Project would increase the amount of infrastructure placed in geologically sensitive areas, including steep slopes and landslide-prone areas, liquefaction-prone areas, seismic and volcanic hazard areas, and peat settlement-prone areas. Because the project will be designed and constructed to meet engineering standards for seismic and other geologic hazards, cumulative impacts due to operation or construction of the reasonably foreseeable actions would not be expected.

## 5.4.13 Hazardous Materials

### 5.4.13.1 Impacts during Operation

Operational impacts could occur if Sound Transit acquires properties that are a source of contamination, possibly requiring ongoing cleanup responsibility. Long-term monitoring or other protective measures or restrictions could be required. For project elements within the Harbor Island Superfund Site or the Lower Duwamish Waterway Superfund Site, Sound Transit would coordinate with the United States Environmental Protection Agency and the Washington State Department of Ecology on any potential protective measures or restrictions that might be required for the project. Federal environmental regulations have resulted in the identification and cleanup of past hazardous materials sites and fewer hazardous materials spills and releases. Because encountered hazardous materials must be cleaned up or remediated during project development, future projects, with or without the WSBLE Project, will accelerate the cleanup of existing contaminated sites in the study area. As a result, the WSBLE Project would have a potential beneficial cumulative impact when compared with the No Build Alternative.

### 5.4.13.2 Impacts during Construction

Construction of the project may involve disturbance of contaminated sites. When encountered, Sound Transit would adhere to local, state, and federal regulations and implement applicable best management practices, which include construction stormwater pollution prevention plans, spill control and prevention plans, contaminated media management plans, and health and safety plans. Construction of the WSBLE Project could result in hazardous material spills or encounters with existing hazardous materials in the study area, which could result in a cumulative impact if multiple construction projects are occurring in the same area and there are releases of contaminants. However, as discussed in Sections 4.2.12.4.1 and 4.3.12.4.1, best management practices would minimize potential hazardous material impacts.

## 5.4.14 Electromagnetic Fields

Electromagnetic fields are produced anywhere that electricity is used and they currently occur in the environment. This includes moving vehicles, radio emitters, electrical transmission lines, and use of electrical equipment. The light rail would contribute to electromagnetic fields. However, the WSBLE Project would not result in any electromagnetic interference that would cause potentially sensitive equipment to malfunction (see Sections 4.2.13 and 4.3.13, Electromagnetic Fields). Sound Transit did not identify any areas where electromagnetic interference would combine with past, present, or future actions to pose any cumulative impacts of risk to human health. Any time electrical currents are utilized, stray currents could affect metal, water, or buried pipe or cable. Sound Transit would use insulation to limit stray currents from the WSBLE Project and potential impacts on nearby utilities.

## 5.4.15 Public Services, Safety, and Security

### 5.4.15.1 Impacts during Operation

Substantial regional population growth has resulted in an increased demand for public services, which is expected to increase as the region continues to grow. The WSBLE 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 which 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.

### 5.4.15.2 Impacts during Construction

As discussed in Sections 4.2.14 and 4.3.14, Public Services, Safety, and Security, Sound Transit would coordinate with public service providers and agencies throughout the design and construction of the project. To minimize cumulative construction-related impacts on emergency response services, school traffic, solid waste services, and mail delivery routes, coordination would include consideration of other proposed construction projects within the study area that would occur at the same time as construction for both extensions. Construction of the South Lander Street and South Holgate Street overpasses in the SODO Segment would be phased between construction of the West Seattle Link Extension and the Ballard Link Extension to keep one roadway open at all times and minimize impacts on emergency response times in this area.

## 5.4.16 Utilities

### 5.4.16.1 Impacts during Operation

The WSBLE Project, in combination with other reasonably foreseeable future actions, would increase the demand for electrical power within the study area. In combination with other reasonably foreseeable transit and residential actions, light rail service could encourage development of property in and around the project corridor and, therefore, utility demand near new stations. However, the City of Seattle and local utility providers have accounted for this planned growth in adopted local land use plans and planned system upgrades. Development within the study area would be consistent with what is allowed in the adopted land use plans and development regulations. Therefore, utility services beyond those already planned for would not be needed to accommodate the WSBLE Project or any of the reasonably foreseeable actions.

### 5.4.16.2 Impacts during Construction

Utility lines within the study area that conflict with the project would be relocated prior to or during construction. Other foreseeable future actions would perform similar relocations where necessary. During construction, cumulative utility impacts could occur if reasonably foreseeable actions that are constructed before the WSBLE Project, such as the City Center Gateway ITS, relocate utilities to areas that create conflicts for the WSBLE Project. Advance construction coordination between utility providers, Sound Transit, and construction projects would minimize the likelihood of these occurrences. Where utility relocations are necessary, utility providers would have an opportunity to upgrade infrastructure, potentially resulting in beneficial cumulative impacts.

## 5.4.17 Historic and Archaeological Resources

### 5.4.17.1 Impacts during Operation

All project 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 older development, recent redevelopment, and general changes in uses surrounding them. The reasonably foreseeable future actions in the project vicinity may also have direct impacts on historic or archaeological resources in the WSBLE study area. 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. Furthermore, changes in zoning by the City could result in redevelopment of historic properties and long-term alteration to the scale and character of neighborhoods, which could have indirect impacts on historic properties. Redevelopment also has the potential to disturb archaeological resources. Incrementally, the WSBLE could contribute to a cumulative impact on historic and archaeological resources.

### 5.4.17.2 Impacts during Construction

Construction-related impacts to historic resources can be caused by several factors, including but not limited to restricted access, increased truck traffic along haul routes, glare, noise, vibration, and temporary changes to setting. Together, these factors can lead to reduced commercial activity and reduced investment in historic resources, especially when construction timelines and areas overlap for multiple reasonably foreseeable future projects.

Any construction project has the potential to impact previously unidentified archaeological resources. However, Sound Transit would work to identify potential archaeological resources prior to construction consistent with the archaeological resources survey plan reviewed by the Washington State Historic Preservation Officer. In addition, the project will have an Inadvertent Discovery Plan to address the potential discovery of archaeological resources during construction.

## 5.4.18 Parks and Recreational Resources

### 5.4.18.1 Impacts during Operation

Sound Transit would restore disturbed parks and recreational resources to pre-construction conditions and provide replacement parkland for any permanent impacts, resulting in zero net loss of parkland and recreational resources. At least two reasonably foreseeable actions would impact parks within the Ballard Link Extension study area: the Waterfront Seattle Project and the Ballard Multimodal Corridor. The Waterfront Seattle Project would create a new, elevated pedestrian crossing, which includes greenspace, over Alaskan Way in Downtown Seattle. The Ballard Multimodal Corridor, or Burke-Gilman “Missing Link,” Project would complete a 1.4-mile segment of the Burke-Gilman Trail through the Ballard neighborhood. The finished 20-mile Burke-Gilman Trail would create a safe, direct, and defined multi-use trail for people of all abilities to connect with several greenspaces and recreational resources. The WSBLE Project would create greater connectivity throughout the city, increasing access to Seattle parks and recreational resources. Cumulatively, the WSBLE Project and the foreseeable projects could create a benefit for trail development, park availability, and access to recreational resources.

### 5.4.18.2 Impacts during Construction

Construction projects in the vicinity of parks and recreational resources could cause temporary impacts to those resources, such as increased noise and dust, and temporarily decreased access. Traffic congestion surrounding park areas could also increase as a result of detours, closures, and new traffic patterns. The WSBLE Project could also cause cumulative impacts on parklands if the construction period overlaps with that of the other foreseeable actions. The Waterfront Seattle and Ballard Multimodal Corridor projects are expected to be completed in 2023 and 2021, respectively, so overlap is not expected. The Burke-Gilman Trail currently ends before reaching the study area; therefore, if it is completed in time, a portion of the trail may have to be closed or relocated during construction (see Section 3.19.6.4, Non-motorized Facilities, and Section 3.19.6.5, Safety).

## 5.5 Potential Mitigation Measures for Cumulative Impacts

Operational cumulative impacts on transportation, visual and aesthetics, noise, ecosystem, and historical and architectural resources could occur. Avoidance, minimization, and mitigation measures for the WSBLE Project operation impacts on these and all resources are discussed in Chapters 3 and 4. However, most cumulative impacts would occur during project construction, rather than project operation, if the construction of other foreseeable actions overlaps with that of the WSBLE Project. In most cases, mitigation would remain the responsibility of each project proponent to meet 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 the WSBLE Project to minimize the potential cumulative effects of overlapping construction periods within the same area. Such coordination would reduce cumulative construction impacts related to detours, temporary bus and trail reroutes, reduced access, increased dust and noise, vibration, hazardous materials, proximity impacts on visual resources, reduced emergency service response times, and temporary park and greenspace impacts.