

## 5 CUMULATIVE IMPACTS

This section describes the potential cumulative long-term effects of the West Seattle Link Extension Project (the 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 Chapter 3, Transportation Environment and Consequences, and Chapter 4, Affected Environment and Environmental Consequences) are discussed in Section 5.5, Potential Mitigation Measures for Cumulative Impacts.

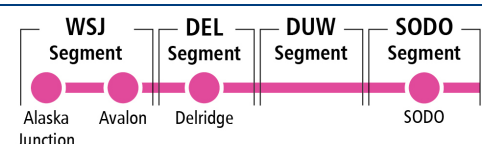
A cumulative impact is defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative 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 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 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 (FTA’s) *Environmental Impact and Related Procedures* (23 Code of Federal Regulations 771)
- *State Environmental Policy Act Handbook* (Washington State Department of Ecology 2018)
- *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)

For this cumulative impacts analysis, Sound Transit reviewed numerous plans, proposals, developments, and State Environmental Policy Act (SEPA) and NEPA documents 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 plans reviewed were used to identify impacts of past and present development actions and reasonably foreseeable future actions that could interact with the 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, Present and Future Development, Transportation, and Public Works Projects in the Study Area) provided information on development trends expected and planned transportation projects. Appendix K was updated between the West Seattle and Ballard Link Extensions (WSBLE) Draft Environmental Impact Statement (EIS) and this West Seattle Link Extension Final EIS to identify new projects in the West Seattle Link Extension study area.
- 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 2022) 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 project scoping, public participation process, and public and agency comments on the WSBLE Draft EIS summarized in Chapter 7, Comment Summary. This information was used to identify past and present growth trends, characterize reasonably foreseeable future actions, and evaluate potential cumulative impacts of the West Seattle Link Extension.

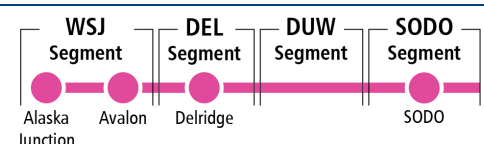
## 5.1 Geographic and Temporal Boundaries of Cumulative Analysis

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 are in a regulatory permitting process; undergoing environmental review under NEPA or SEPA; 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 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 cumulative 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.

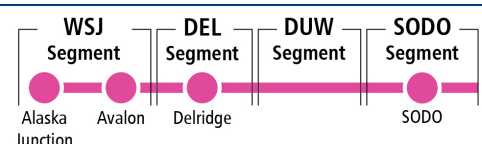
## 5.2 Past and Present Actions

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, then by 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 began to grow and develop complex transportation systems. Neighborhoods along the project corridor have grown tremendously in the last 20 years, which has resulted in increased travel demand and use of the transportation system and a need for additional transportation facilities to accommodate the growth.

### 5.2.1 Past Actions

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 primarily industrial and recent uses include restaurants, wineries, and distilleries.



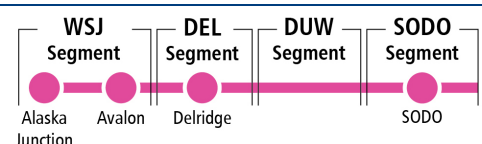
The Seattle Steel Company opened its steel mill on the West Seattle peninsula in 1905 and is currently home to Nucor Steel (Wilma 2001). The mill supported a town that came to be known as Youngstown (in the current Delridge neighborhood), which provided housing, saloons, and other amenities for the workers. 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). Regional transportation facilities serving the study area include the West Seattle Bridge, State Route 99, and Interstates 5 and 90. Major arterials in the study area include Fauntleroy Way Southwest, 35th Avenue Southwest, Delridge Way Southwest, 1st Avenue South, 4th Avenue South, 6th Avenue South, Airport Way South, South Lander Street, South Holgate Street, South Dearborn Street, and South Jackson Street. Transit service is provided by Metro buses and a passenger-only ferry. 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 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. For the purposes of discerning past projects using the database, “past projects” are defined as projects that were constructed at least 10 years ago (before 2013) and from which permanent impacts on the environment have occurred and are occurring. Impacts from past projects that have already been built are considered qualitatively as part of the affected environment and are addressed in Chapter 3 and Chapter 4. Present land use and building permits are shown on Figures K-1 through K-3 in Appendix K.

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 2013. 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 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 project. Transportation and public works projects are shown on Figures K-4 through K-7 in Appendix K.

### 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 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 SEPA; or part of an officially adopted planning document or publicly available development plan.

Reasonably foreseeable future actions relevant to the project were identified by reviewing numerous plans, proposals, developments, and NEPA or SEPA 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, comments received on the WSBLE Draft EIS, and other entities. This information was compiled into tables (see Appendix K) of reasonably foreseeable future actions; these reasonably foreseeable future actions were considered in this cumulative analysis. The projects include privately funded residential, institutional, and commercial developments within the study area as well as transportation and public works projects. Generally, reasonably foreseeable future actions are anticipated to continue the pattern of increasing residential and employment density of the analysis area. These projects are shown on Figures K-1 through K-3 in Appendix K.

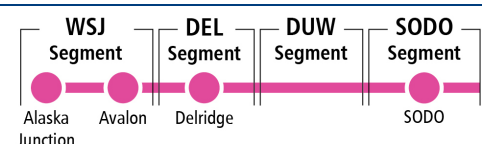
In conjunction with past and present actions, the reasonably foreseeable future actions could add to or interact with environmental impacts from the project alternatives to result in cumulative impacts. Approximate locations of the regional transportation and development actions in the study area that are known at the time of this Final EIS are shown on Figures K-4 through K-7 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 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 project is constructed at the same time as other construction projects whose adverse impacts add to those of the project. During construction, beneficial economic impacts associated with construction-related job creation could also occur.

Sound Transit could build the project in phases. Due to funding or other factors, Sound Transit could construct a smaller portion of the project, deferring completion of the full project to Alaska Junction. Sound Transit has developed a minimum operable segment (M.O.S.) for analysis in the event the full project could not be built at one time. The West Seattle Link Extension M.O.S. consists of the project from just north of the new SODO Station to the Delridge Station. This M.O.S. could be applied to all of the project alternatives.

Because analyses of transportation, air quality, energy, and economic impacts cannot be isolated from influences outside the project (i.e., the effects of past, present, and reasonably foreseeable actions), they inherently include impacts of other projects and processes.





## 5.4.1 Transportation

### 5.4.1.1 Impacts during Operation

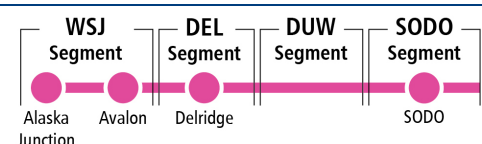
The analysis of future traffic and transit impacts in this technical report is a cumulative analysis based on the results of traffic modeling and ridership modeling that incorporate past, funded, and approved future actions, as well as projected growth that would result from development in the region. 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 numbers of people walking or biking to stations.

As the West Seattle Link Extension 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 A, Future Transportation Project List, of Attachment N.1A, Transportation Technical Analysis Methodology. It would shift trips from personal auto to transit, reducing the number of vehicle miles traveled and vehicle hours of delay along the corridor compared to the No Build Alternative. Fewer vehicle miles and hours could improve general traffic conditions, including freight mobility, within the study area. In the SODO Segment, the South Lander Street overpass that would be constructed as part of the project would eliminate a railroad crossing on South Lander Street between 6th Avenue South and 4th Avenue South, reducing delay.

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 in the immediate vicinity of the stations. 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 encourage parking availability for residents and businesses in the area.

While other transportation projects could also remove street parking to implement their improvements (for example, a City of Seattle project that changes allocation of the right-of-way), 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 potentially reduce the need for parking within the study area. The City of Seattle could adjust curb space use in the project corridor for reasons unrelated to the project, such as policy, adjacent land uses, transportation improvement project needs, transit service availability, and non-motorized network improvements (for example, the Georgetown to Downtown Safety Project).

This Final EIS assumes completion of the Sound Transit 3 program of regional transit improvements by 2042; Sound Transit's Long-Range Vision (Sound Transit 2014) contains additional rail projects beyond the Sound Transit 3 program that may eventually be implemented. Similarly, the Final EIS assumes that a modified version of the King County Metro Connects (Metro 2021) long-range vision is in place by 2042. These improvements are accounted for in the impacts analysis for this project. If regional transit service is expanded beyond these assumptions, it could attract additional ridership to project stations in the project corridor, thereby increasing vehicle and pedestrian activity around stations. Future unfunded projects or local growth could add more pedestrian and bicycle trips to the street network surrounding the light rail stations and improve non-motorized facilities within the study area.



The City of Seattle is in the process of delivering several safety projects as part of Vision Zero, which is Seattle’s plan to eliminate traffic deaths and serious injuries on city streets by 2030, and additional projects may be implemented in the future. These include the Highland Park Way Safety Project and Georgetown to Downtown Safety Project, which will be completed in 2024. In addition, protected bike lanes are planned for several areas near the project corridor. Other development would not likely affect safety in the study area. These projects, together with the West Seattle Link Extension, would lead to an overall improvement in safety.

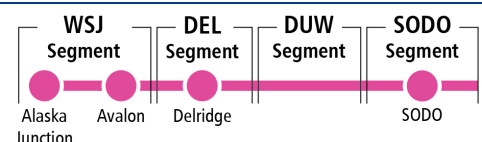
### 5.4.1.2 Impacts during Construction

Other transportation projects in the study area could have construction periods that overlap with civil construction of the project and, if they include road closures, could extend or intensify the disruption to regular travel patterns in the affected areas. Cumulative traffic-related construction impacts could include longer durations of detours for all modes, increased travel delay and congestion, and increased traffic on detour routes.

In bored-tunnel areas, the project would not affect traffic flow outside of station, station shaft, and portal locations. WSDOT, the City of Seattle, Metro, the Port of Seattle, Northwest Seaport Alliance, and Sound Transit have been coordinating and would continue to coordinate on the construction schedules for transportation projects to avoid major construction work on overlapping corridors at the same time. The proposed project, in combination with the proposed Ballard Link Extension, 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 Option SODO-1c, Alternative SODO-1a, and Option SODO-1b would include construction of one roadway overpass at South Lander Street as part of the West Seattle Link Extension. The proposed Ballard Link Extension would include construction of one roadway overpass at South Holgate Street and, depending on the alternative selected for the south end of the Ballard Link Extension, partial or full closures of Major Truck Streets in the area, including 4th Avenue South, Seattle Boulevard South, and 6th Avenue South. Overlapping traffic-related construction impacts in the SODO Segment would be minimized due to the construction schedules of the West Seattle Link Extension and the Ballard Link Extension. However, the construction schedules may be consecutive or separated by a short period of time, resulting in a cumulative impact by extending the duration of construction closures in the area. 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.

Although Alternative SODO-2 would not permanently close the SODO Busway as would occur under the other project alternatives, it would close the SODO Busway for 5 years, followed by a similar closure of 5 years to construct the Ballard Link Extension. This would result in a cumulative 10-year closure of that facility and extending the duration of bus route detours to 4th Avenue South.

The proposed project, in combination with the proposed Ballard Link Extension, could include disruptions to the Link light rail system while the light rail extensions are being integrated into the existing system. The schedules of construction activities that could affect Link light rail service are unknown at this time, but they may occur in similar timeframes, leading to longer periods of service disruptions for light rail riders.



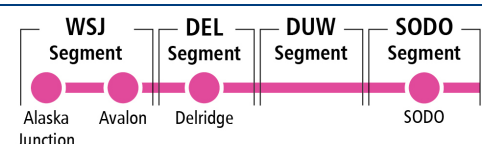
## 5.4.2 Acquisitions, Displacements, and Relocations

Some residents or businesses displaced by the 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 project study area, resulting in a potential later displacement by the 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-7 in Appendix K) 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 Section 4.2, Land Use). Currently available residential units in Seattle exceed the number of units potentially displaced, and there is a sufficient supply of relocation housing similar in size and quality for renters in the study area; however, depending on market conditions and individual circumstances, the replacements property may cost more (see Section 4.1, 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 project and other present and 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). As of June 2023, more than 1,000 new housing units have been permitted or are planned in the study area (see Table K-1 in Appendix K). 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 property no longer needed after construction, thereby increasing the availability of affordable housing.

The project and reasonably foreseeable future actions are anticipated to create more residential and business opportunities than would be lost through displacements and relocations, and an adverse cumulative impact from property acquisition is not expected within the study area.





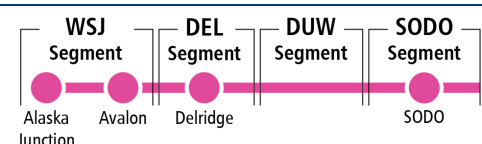
## 5.4.3 Land Use

### 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 West Seattle Link Extension and other foreseeable transit projects would 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 project could indirectly affect land use by acting as a catalyst for others to develop or redevelop land near the project consistent with City of Seattle land use and zoning requirements.

The West Seattle Link Extension, 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, the West Seattle Link Extension and these other 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 West Seattle Link Extension and planned transit projects (Puget Sound Regional Council 2018). However, the West Seattle Link Extension, in combination with planned residential and mixed-use redevelopment, would more directly support planned population and employment growth within the West Seattle Junction hub urban village than would occur without them.

The 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 2022); and Seattle's Comprehensive Plan (City of Seattle 2020), 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 project. The project, along with other development in the West Seattle Junction hub urban village, would also indirectly support the City's Industrial and Maritime Strategy by concentrating residential and commercial development in non-industrial areas. Project alternatives would convert between 2.9 and 4.5 acres in the SODO Segment, between 11.8 and 13.3 acres in the Duwamish Segment, and less than 0.1 to 5.3 acres in the Delridge Segment from industrial land that is in the Duwamish Manufacturing/Industrial Center to transportation uses. This would be less than 0.5 percent of the approximately 5,000 acres of the Duwamish Manufacturing/Industrial Center. Ballard Link Extension Project alternatives, along with other transportation projects, would also result in conversion of industrial lands to transportation use in the Duwamish Manufacturing/Industrial Center as well as the Ballard Interbay Northend Manufacturing/Industrial Center. The Industrial and Maritime Strategy, however, reinforces preservation of this land for industrial uses by making it more difficult for non-industrial land uses to be approved. In addition, this strategy included a new type of zoning for areas around new light rail stations that would encourage higher density employment development in new "Industry and Innovation" zones. This will help to minimize the effect of the



conversion of some land to transportation uses and, while both light rail extensions would convert industrial lands, the cumulative effect of both projects on the industrial land base is expected to be negligible.

The West Seattle Link Extension and other foreseeable transit expansion projects would convert existing land use to public transportation right-of-way, thereby cumulatively decreasing opportunities for other, non-transportation development on acquired land. However, several of the project alternatives, and most of the foreseeable future transit projects, would use existing transportation rights-of-way, thus minimizing the cumulative effect of decreasing non-transportation development opportunities. 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

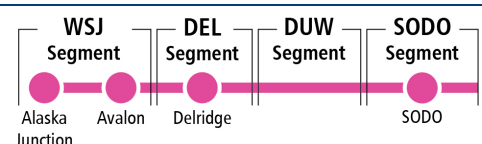
Potential impacts to existing land uses include temporary impacts from construction staging areas; easements; noise, air emissions, and visual changes; and traffic congestion. These impacts would not affect the land use. Indirect impacts on adjacent land use would occur from construction activity, and could contribute to a cumulative impact on land use if there is other construction in the area.

## 5.4.4 Economics

### 5.4.4.1 Impacts during Operation

The project would require business and employee displacements through the acquisition of commercial, industrial and institutional properties (see Section 4.1, 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 mostly occur within existing rights-of-way or on private land. Most of the displaced businesses would be able to relocate within the city, which has an industrial vacancy rate of 7.2 percent, retail vacancy rate of 3.0 percent, and an office vacancy rate of 24.0 percent (see Section 4.1, Acquisitions, Displacements, and Relocations). However, redevelopment has been occurring throughout the study area and would likely continue without the project and as a result of 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 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 project and other foreseeable transit projects, as well as in coordination with private development projects, could ultimately increase property and sales tax revenues. The West Seattle Link Extension and other foreseeable transit projects could also enhance connectivity to tourism and



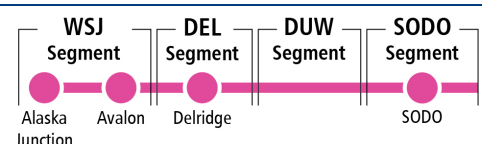
recreation opportunities such as T-Mobile Park, Lumen Field, and Downtown Seattle, thereby potentially increasing sales tax revenue in those areas. As property and sales taxes make up over 40 percent of the revenue for the City of Seattle (see Section 4.3.2.3, Tax Revenue Sources), the project and foreseeable future actions would contribute to a beneficial cumulative impact on the city’s economic health.

The West Seattle Link Extension combined with other foreseeable transit projects would improve access to the Duwamish Manufacturing/Industrial Center. Increased transit connectivity to these areas would increase employment desirability within the area, benefitting existing businesses and attracting future businesses. Increasing transit opportunities to major employment and manufacturing centers would also have a beneficial impact on freight mobility. As noted under Section 5.4.1, Transportation, the reduction in vehicle miles and hours traveled with the project could benefit freight in many locations when 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. The exception could be localized congestion in the immediate vicinity of station locations and along 4th Avenue South, where freight travel times could be affected by mitigation for the closure of the SODO Busway. Some proposed mitigation, such as shared bus and freight lanes, would minimize this impact to freight mobility.

### 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. 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, as well as areas that have experienced construction of numerous infrastructure and private development projects over a longer period of time. Businesses in the Delridge and West Seattle Junction segments were adversely affected by the combined effect of the COVID-19 pandemic and the closure of the West Seattle Bridge from March 2020 to September 2022. These businesses are expected to have recovered by the time construction begins for the West Seattle Link Extension, but if construction of other projects affect access to businesses in these areas before West Seattle Link Extension construction begins, the projects could contribute to a cumulative impact on businesses.

Businesses in the SODO Segment that could be affected by construction activities for both the West Seattle Link Extension and the future 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 Option SODO-1c, 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. The Ballard Link Extension 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.



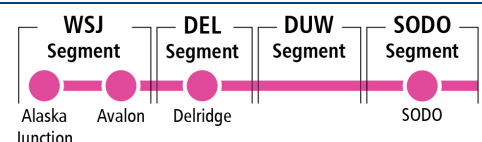
The Seattle area continues to experience growth pressures that are of particular concern to freight customers and carriers facing congestion in the constrained transportation corridors in the Duwamish area. In addition, the Port of Seattle and Northwest Seaport Alliance are facing increased competition from ports outside of the region. While construction activities and temporary road closures near freight facilities 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 federal 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. All Duwamish Segment alternatives would temporarily impact access to and operations of businesses, thereby contributing to cumulative impacts. Preferred Alternative DUW-1a and Option DUW-1b would temporarily affect operations at Harbor Island Marina, while Alternative DUW-2 could temporarily affect access to Terminals 5 and 18. The project could contribute to cumulative adverse economic impacts on ports and port-related activities, depending on alternative selected as the project to build and other projects that may be under construction near Port facilities at the same time. Sound Transit would coordinate with the Port of Seattle and Northwest Seaport Alliance to 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 project.

Light rail generally benefits neighborhoods by increasing transit access and development near stations. The West Seattle Link Extension, 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 West Seattle Link Extension 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 parcels that currently have income-restricted housing under the Multifamily Tax Exemption program or that are managed by Seattle Housing Authority would be affected. 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 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, resulting in an overall beneficial impact.

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 West Seattle Link Extension. 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

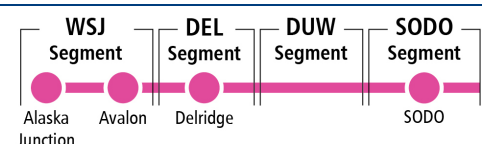
Construction of present and reasonably foreseeable actions, including the West Seattle Link Extension, could temporarily result in adverse cumulative impacts on neighborhoods and social facilities through temporary increases in neighborhood traffic, changes in traffic patterns, and construction noise 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 other reasonably foreseeable actions are constructed at the same time as the West Seattle Link Extension, cumulative impacts to neighborhoods during construction could increase. Sound Transit would work with resource and community providers to minimize impacts from the project and maintain access to resources.

### 5.4.6 Visual and Aesthetic Resources

#### 5.4.6.1 Impacts during Operation

Cumulative change has occurred within the last 15 years in more densely developed urban areas, such as the West Seattle Junction, along Southwest Avalon Way, and North Delridge neighborhood. 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 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 West Seattle Link Extension 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 West Seattle Link Extension would require tree removal from some neighborhoods, especially Pigeon Point in the West Duwamish Greenbelt, which would decrease visual quality. Trees removed would 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 contribute to a cumulative visual impact.

### 5.4.6.2 Impacts during Construction

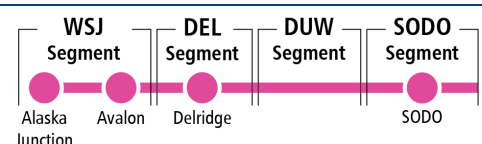
If the West Seattle Link Extension is constructed at the same time as other planned projects, viewers could experience more visual impacts during construction. This would increase overall impacts on the surrounding visual environment.

## 5.4.7 Air Quality

### 5.4.7.1 Impacts during Operation

The analysis in Section 4.6, Air Quality, is an inherently cumulative analysis because the expected impacts for the West Seattle Link Extension are based on Puget Sound regional traffic forecasts, which include reasonably foreseeable transportation projects and projected regional emissions. The analysis projected that the 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).



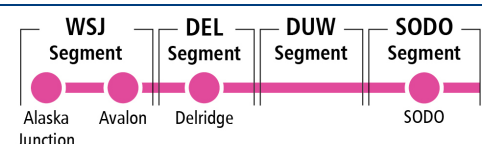
The project is part of Sound Transit's Sound Transit 3 Plan (Sound Transit 2016), which is intended to extend light rail, commuter rail, and bus services and make other transit improvements throughout the central Puget Sound region. As part of the Sound Transit 3 planning process, Sound Transit conducted 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 West Seattle Link Extension, 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 of decreasing vehicle miles traveled and providing a cumulative benefit for air quality. 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 West Seattle Link Extension, combined with 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 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 and contributing to a cumulative benefit for air quality (Morikawa 2011).

Actions taken in response to recent state and local legislation would further contribute to the long-term cumulative reduction in greenhouse gas emissions and improve air quality within the study area. Applicable 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 West Seattle Link Extension and reasonably foreseeable future actions that require construction would temporarily increase air pollutants and greenhouse gas emissions during construction, thereby resulting in cumulative effects on air quality. However, project construction emissions would not exceed the National Ambient Air Quality Standards, and mitigation measures and best practices would minimize air quality impacts, thus minimizing the project's contribution to cumulative adverse effects on air quality.

## 5.4.8 Noise and Vibration

### 5.4.8.1 Impacts during Operation

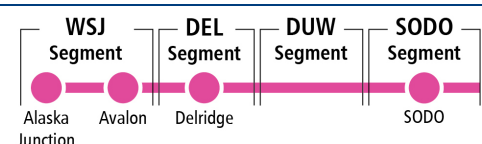
The FTA's methodology for noise and vibration analysis reflects cumulative ambient noise conditions from land uses and activities from past and present activities in combination with project-specific noise and vibration impacts. Sound Transit is committed to minimizing project noise levels at their source for all of its light rail corridors. When noise would exceed FTA impact criteria, Sound Transit would consider noise mitigation measures consistent with its *Design Criteria Manual*, Link Noise and Vibration Policy, and FTA's *Transit Noise and Vibration Impact Assessment Manual* (see Section 4.7.7.1, Light Rail Noise Mitigation). The majority of project operational noise impacts would be mitigated with sound walls along the guideway and with low-impact frogs at special trackwork locations and high-resilience direct-fixation fasteners at other locations.

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 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, thus adding cumulative noise to the surroundings.

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.

### 5.4.8.2 Impacts during Construction

During construction, the West Seattle Link Extension would contribute noise and vibration impacts along with other nearby transportation and private development construction projects, and cumulative impacts could occur. This is particularly true for the Delridge and West Seattle Junctions segments near tunnel portals for alternatives that include tunnels. However, many projects currently planned might be completed before 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 West Seattle Link Extension alignment alternatives, would be built on developed sites or within existing paved rights-of-way, the projects would cumulatively increase 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 West Seattle Link Extension. This would result in a net cumulative 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, and guideway columns for the Duwamish Waterway crossing could be within the 100-year floodplain in the future. The project would potentially include guideway columns in the 100-year floodplain of Longfellow Creek (see Appendix L4.8, Water Resources). Sound Transit would minimize impacts to the floodplain in accordance with Executive Order 11988. No reasonably foreseeable future actions include development in the 100-year floodplain, but climate change would likely result in a higher floodplain elevation in the future. For Preferred Option DEL-6b, Sound Transit has identified the floodplain adjacent to Longfellow Creek in the study area for wetland mitigation, and regrading this area for this mitigation could increase floodplain storage and help accommodate the impacts of climate change on this floodplain.

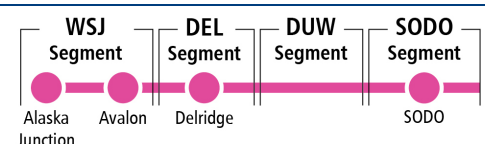
### 5.4.9.2 Impacts during Construction

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, which would minimize cumulative impacts on water resources.

## 5.4.10 Ecosystems

### 5.4.10.1 Impacts during Operation

The project would have ecosystem impacts, including areas where the guideway would be near existing forested habitat. Past and present actions have created the existing urban environment where the West Seattle Link Extension would be located; operation of the project would have a low potential to affect the viability of local wildlife populations. Reasonably foreseeable future actions could remove trees and increase the amount of impervious surface in the area, thus contributing to cumulative ecosystem impacts.



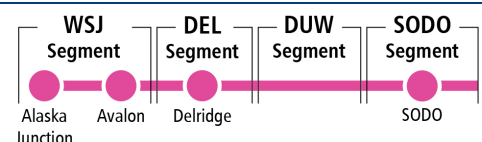
The West Seattle Link Extension would also result in impacts to aquatic habitat, which would contribute to the effects of past, present, and reasonably foreseeable future actions. Cumulative impacts to aquatic habitat may adversely affect Tribal treaty-protected fishing rights of the Muckleshoot Indian Tribe. Cumulative impacts to aquatic habitat could also adversely affect treaty-protected fishing rights of the Suquamish Tribe. Reasonably foreseeable future actions within the study area could incrementally contribute to the continued fragmentation, degradation, and loss of valuable aquatic habitats. Reasonably foreseeable future actions that would 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 are specifically intended to provide beneficial impacts to ecosystems and the environment around the West Seattle Link Extension; for example, the proposed plan to perform remedial cleanup at the East Waterway Operable Unit of the Harbor Island Superfund Site will reduce contaminants in and near the Duwamish Waterway (United States Environmental Protection Agency 2023), thereby diminishing the overall cumulative impact of this project when combined with others.

Other state and local projects may benefit ecosystems. 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 in Executive Order 2023-03. Through the Green Seattle Partnership, there are active restoration programs within the Longfellow Creek watershed to remove invasive plants and restore native species. The City of Seattle has also purchased property to upgrade Duwamish Waterway Park and, through partners, is restoring wetlands in the Delridge neighborhood. The West Seattle Link Extension would support those ecosystem improvement goals by facilitating concentrated development away from more natural 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.

Federal, state, and local regulations require the West Seattle Link Extension and other reasonably foreseeable future actions to mitigate impacts on streams, wetlands, and other high-quality habitats. In addition, Sound Transit’s policy on ecosystem mitigation is to avoid impacts on environmentally sensitive resources as much as practicable and to provide adequate mitigation for unavoidable impacts to ensure no net loss of ecosystem function and acreage as a result of agency projects. Where instituted, these measures would contribute to 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 West Seattle Link Extension, 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 that wildlife would experience much, if any, adverse effects related to project 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 and their contribution to cumulative impacts on ecosystems.





### 5.4.11 Energy Impacts

The energy analysis and scope of travel demand model used for the analyses in Section 4.10, Energy Impacts, considered the entire central Puget Sound region and therefore accounts for the West Seattle Link Extension's contribution to cumulative energy impacts. The construction and operation of the project would consume energy. Energy would be used during operation by light rail vehicles and at stations, as well as for maintenance activities. Energy use by private vehicles or other transit modes is considered as well. Energy would be used during construction by construction equipment at construction sites as well as for transportation of materials to and from construction sites. Operation of the project would be less than 0.5 percent of Seattle City Light's total 2021 power generation, while construction of the project would represent less than 0.1 percent of energy consumed in Washington. The cumulative energy impacts of the 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. The City of Seattle's Green Building Incentives (City of Seattle 2021) would promote more energy-efficient new construction.

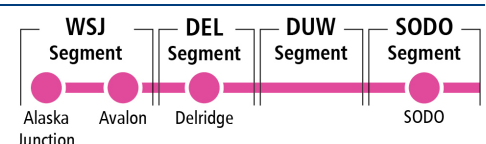
### 5.4.12 Geology and Soils

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 West Seattle Link Extension 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 projects, including the West Seattle Link Extension, are required to be designed and constructed to meet engineering standards for seismic and other geologic hazards, cumulative impacts on geology and soils 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, and are anticipated to continue to result, in the identification and cleanup of past hazardous materials sites and fewer hazardous materials spills and releases. For example, the proposed plan to perform remedial cleanup at the East Waterway Operable Unit of the Harbor Island Superfund Site and sites along the Lower Duwamish Waterway will reduce contaminants in and near the Duwamish Waterway (United States Environmental Protection Agency 2023).



Because encountered hazardous materials must be cleaned up or remediated during project development, future projects, with or without the project, will accelerate the cleanup of existing contaminated sites in the study area. As a result, the West Seattle Link Extension would contribute to a beneficial cumulative impact when added to other projects in the area.

### 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 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 4.12.5, Environmental Impacts of the Build Alternatives during Construction, best management practices would minimize potential hazardous material impacts.

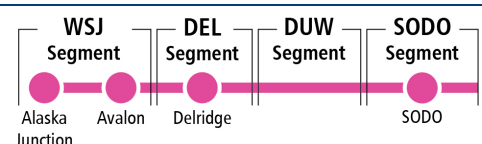
### 5.4.14 Electromagnetic Fields

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 operations of the project would contribute to electromagnetic fields in the study area. However, the project would not result in any electromagnetic interference that would cause potentially sensitive equipment to malfunction (see Section 4.13, 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 used, stray currents could affect metal, water, or buried pipe or cable. Sound Transit would use insulation to limit stray currents from the 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 project 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. Project 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 Section 4.14, 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, Sound Transit's coordination would include consideration of other proposed construction projects within the study area that would occur at the same time as construction of the West Seattle Link Extension.

## 5.4.16 Utilities

### 5.4.16.1 Impacts during Operation

The West Seattle Link Extension, 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 project or any of the reasonably foreseeable actions.

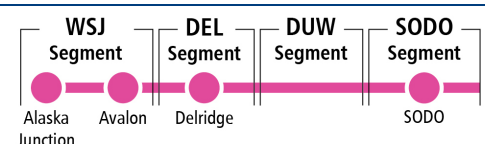
### 5.4.16.2 Impacts during Construction

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 West Seattle Link Extension relocate utilities to areas that create conflicts for the 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

The West Seattle Link Extension has the potential to affect historic and 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 study area may also affect historic or archaeological resources. These past actions and reasonably foreseeable future actions, when combined with the project, would provide new infrastructure and development patterns that would cumulatively change the historic setting of resources as a result of past and ongoing urbanization.



Potential effects of reasonably foreseeable future actions include demolition or substantial alteration of historic properties for redevelopment. Future redevelopment in project station areas would be consistent with adopted zoning and the City of Seattle’s Comprehensive Plan (2022), which currently allows greater density in the station areas than exists today. The City of Seattle’s Landmark ordinance, which would apply to the demolition or substantial alteration of historic structures that meet the City of Seattle’s Landmark criteria, would help reduce loss of historic resources. Furthermore, any changes in zoning by the City of Seattle 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.

### 5.4.17.2 Impacts during Construction

The project would be designed seeking to avoid and minimize construction impacts to historic and archaeological resources; unavoidable adverse impacts would be mitigated in accordance with the requirements of the National Historic Preservation Act (see Section 4.16.6, Mitigation Measures). By avoiding and mitigating impacts to historic and archaeological resources the project would not contribute to a cumulative impact on historic and archaeological resources during construction.

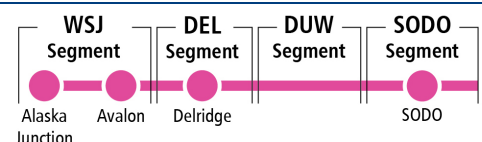
## 5.4.18 Parks and Recreational Resources

### 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. The project would result in long-term permanent changes to parks and recreational resources from project operations, including permanent property acquisition or easements and changes to visual setting, noise levels, amenities, activities, access, or parking that would contribute to other reasonably foreseeable actions effects on parks and recreational resources. However, the project would also create greater connectivity throughout the city, increasing access to Seattle parks and recreational resources. Cumulatively, the project and reasonably foreseeable transportation actions could create a benefit for trail development, park availability, and access to recreational resources.

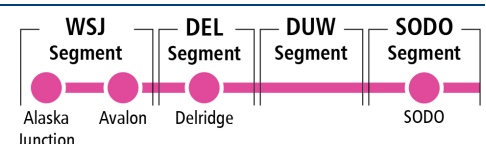
### 5.4.18.2 Impacts during Construction

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 project could also cause cumulative impacts on parklands if the construction period overlaps with that of the other foreseeable actions.



## 5.5 Potential Mitigation Measures for Cumulative Impacts

Adverse operational impacts from the project may contribute to cumulative impacts on transportation, visual and aesthetics, noise, ecosystem, and historical and architectural resources. Avoidance, minimization, and mitigation measures for the 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 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 West Seattle Link Extension 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, school access, solid waste services, and mail delivery routes and temporary park and greenspace impacts.





This page is intentionally left blank.