

4 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter discusses the affected environment and environmental consequences of the West Seattle Link Extension and the Ballard Link Extension (WSBLE). Section 4.1, Introduction to Resources and Regulatory Requirements, describes the resources evaluated and applicable laws and regulations. Section 4.2, West Seattle Link Extension, discusses the West Seattle Link Extension and Section 4.3, Ballard Link Extension, discusses the Ballard Link Extension. The following resources are discussed for both extensions:

- Acquisitions, Displacements, and Relocations
- Land Use
- Economics
- Social Resources, Community Facilities, and Neighborhoods
- Visual and Aesthetic Resources
- Air Quality
- Noise and Vibration
- Water Resources
- Ecosystems
- Energy Impacts
- Geology and Soils
- Hazardous Materials
- Electromagnetic Fields
- Public Services, Safety, and Security
- Utilities
- Historic and Archaeological Resources
- Parks and Recreational Resources
- Section 4(f) Resources

Each resource section for the West Seattle Link Extension and the Ballard Link Extension describes the following:

- The affected environment, including the study area for the resource.
- The operational, construction, and indirect impacts of each alternative considered in this Draft Environmental Impact Statement.
- Potential mitigation measures for unavoidable impacts.

National Environmental Policy Act and State Environmental Policy Act regulations require that an environmental impact statement disclose direct and indirect impacts (i.e., effects) of a proposed action on the environment. Direct impacts are caused by the action and occur at the same time and place. Indirect impacts (sometimes called “secondary impacts”) are caused by the action but are later in time or farther removed in distance. Examples include changes in land use patterns and related effects on air quality. Impacts can be either temporary (short-term), such as construction impacts, or operational (long-term), such as property displacements or impacts due to light rail operations. Cumulative impacts, which could result from the project’s incremental impact when added to those of other past, present, and reasonably foreseeable future actions, are discussed in Chapter 5, Cumulative Impacts.

The Sound Transit Board of Directors' (Board) May 2019 Board Action identified which alternatives were preferred. A preferred alternative is not a decision on the project to build. It is a statement of preference for alternatives at the time of the Board Action based on currently available information from the Alternatives Development process. After completion of the Draft Environmental Impact Statement and public comment, the Board will confirm or modify the preferred alternative. Some segments contain more than one preferred alternative, and a preferred alternative was not identified for the Chinatown-International District Segment. For Alaska Junction Segment and the Interbay/Ballard Segment, the Board identified preferred alternatives as well as preferred alternatives with third-party funding. Some other alternatives evaluated in this Draft Environmental Impact Statement could also require third-party funding. Alternatives that could require third-party funding incorporate enhancements to the scope of the Sound Transit 3 Representative Project (such as tunnels and alternatives that require replacement of the 4th Avenue South Viaduct) identified in the Sound Transit 3 Plan (Sound Transit 2016). See Chapter 2, Alternatives Considered, for a description of all preferred alternatives and identification of which alternatives could require third-party funding.

Alternatives or Options that Could Require Third-Party Funding

As described in the introduction to Chapter 2, Alternatives Considered, at the time the Sound Transit Board identified alternatives for study in the Draft Environmental Impact Statement some alternatives were anticipated to require third-party funding based on early cost estimates. The asterisk (*) identifies these alternatives and the alternatives that would only connect to these alternatives in adjacent segments. Example: the Preferred Dakota Street Station Lower Height Alternative* (Preferred Alternative DEL-2a*).

Both the West Seattle Link Extension and the Ballard Link Extension include improvements in SODO. The SODO alternatives for the Ballard Link Extension are continuations of the SODO alignments in the West Seattle Link Extension and would connect to the SODO alignments in West Seattle Link Extension with the same alternative name. The West Seattle Link Extension improvements would be operational in 2032, before the Ballard Link Extension, which would be operational in 2037. Therefore, the Ballard Link Extension assumes the West Seattle Link Extension improvements are in place. A description of the improvements for each of the extensions is provided in Chapter 2.

The operational impact analysis considers the fully built West Seattle Link Extension and Ballard Link Extension as well as shorter, minimum operable segments as defined in Section 2.4.2, Minimum Operable Segments for WSBLE, where the impacts would be different than the fully built alternatives. Impacts from the minimum operable segments would have additional potential impacts when compared with the fully built alternatives for the following resources:

- Acquisitions, Displacements, and Relocations
- Land Use
- Economics
- Social Resources, Community Facilities, and Neighborhoods
- Air Quality
- Noise and Vibration
- Energy Impacts
- Public Services, Safety, and Security
- Utilities
- Historic and Archaeological Resources

There are two alternatives with different station configurations. Those station configurations, for Preferred Alternative SODO-1a in the West Seattle Link Extension and Alternative CID-2a in the Ballard Link Extension, are described in Chapter 2, Alternatives Considered, and are discussed in the resource sections where potential impacts would be different than for the main alternative.

4.1 Introduction to Resource and Regulatory Requirements

This section describes the resources evaluated and the applicable federal, state, and local laws and regulations. Sound Transit's Environmental Policy states that the agency will satisfy all applicable laws and regulations and mitigate environmental impacts consistent with Sound Transit's policies. The West Seattle and Ballard Link Extensions Project, as a regional transit authority facility, is an essential public facility as defined by Revised Code of Washington 36.70A.200. That means that once Sound Transit's routing decisions have been finalized, local jurisdictions have a duty to accommodate the proposed project in their land use plans and development regulations. Sound Transit and the City of Seattle have worked closely during the environmental process to consider City code requirements and their application to the project. This work will continue through final design as more project detail is developed. Sound Transit and the City of Seattle have identified code requirements where further coordination is needed. For example, some elements of the City code do not specifically address light rail, including Seattle Municipal Code (SMC) land use code chapters 23.45, 23.47A, 23.48, 23.49, and 23.50, and Chapter 25.11, Tree Protection. The City and Sound Transit are developing a permitting plan, which includes potential code amendments to accommodate light rail to reduce permitting timelines while fulfilling the City's responsibility to review and approve projects.

4.1.1 Acquisitions, Displacements, and Relocations

Sections 4.2.1 and 4.3.1, Acquisitions, Displacements, and Relocations, summarize expected property acquisitions based on current conceptual designs and describe major differences between alternatives. Building and operating the WSBLE Project requires acquiring public and private property for right-of-way and other facilities, and displacing and relocating some residential, commercial, and public uses. Sound Transit overlaid the proposed footprint for all the light rail alternatives over the parcel data from King County and conducted field surveys to identify which parcels would be affected, and to estimate the potential acquisitions and displacements for each alternative. The number of parcels affected, which includes both full and partial acquisitions, is presented for each alternative.

The summary of parcels affected is an estimate based on conceptual design to provide for comparison of alternatives and will be updated as the project design is refined. In addition, properties that are currently vacant or underdeveloped may be developed during completion of this Draft Environmental Impact Statement and the Final Environmental Impact Statement, or later before project construction begins. Therefore, the number and type of displacements may vary between what is included in the Environmental Impact Statement and what is ultimately required. Final determinations of the property needs for the project, including acquisitions and displacements, will be based on the project's final design after Sound Transit completes the Environmental Impact Statement process, selects the alternative to be built, and develops final engineering and design plans.

In addition to the potential property acquisitions described in Sections 4.2.1 and 4.3.1, the project would require easements, such as subsurface easements, aerial easements, and temporary construction easements. Land or public rights-of-way owned by Washington State Department of Transportation, City of Seattle, King County, and/or Port of Seattle and state-owned aquatic lands managed by Washington State Department of Natural Resources through

the Aquatic Resources Program may also be needed. The area of these easements is not included in the data presented in this section.

Other impacts associated with acquisitions and displacements are discussed in Sections 4.2.2 and 4.3.2, Land Use; Sections 4.2.3 and 4.3.3, Economics; Sections 4.2.4 and 4.3.4, Social Resources, Community Facilities, and Neighborhoods; Sections 4.2.14 and 4.3.14, Public Services, Safety, and Security; Sections 4.2.16 and 4.3.16, Historic and Archaeological Resources; Sections 4.2.17 and 4.3.17, Parks and Recreational Resources; and Sections 4.2.18 and 4.3.18, Draft Section 4(f) Evaluation Summary.

The WSBLE Project would comply with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Code of Federal Regulations Title 49, Part 24), as amended. The Act is a federal requirement that established minimum requirements and provides guidance on how federal agencies, or agencies receiving federal financial assistance for a project, will compensate property owners or tenants who need to relocate if they are displaced by a project. Sound Transit has also adopted the *Real Property Acquisition and Relocation Policy, Procedures, and Guidelines* (Sound Transit 2017) to guide its compliance with Revised Code of Washington Chapter 8.26 and Washington Administrative Code Chapter 468-100. Property acquisition will meet these laws and policies so that property owners are treated uniformly and equitably.

4.1.2 Land Use

Sections 4.2.2 and 4.3.2, Land Use, describe existing and potential future land uses and summarizes overarching land use policies as they relate to the WSBLE Project. Appendix L4.2, Land Use, provides a detailed analysis of the consistency of the WSBLE Project with applicable adopted plans. Sound Transit reviewed applicable regulations, Sound Transit policies, adopted plans, and planning studies related to land use. High-capacity transit such as light rail is addressed in local comprehensive plans and other planning documents. Planning studies were reviewed, but a consistency analysis was not conducted of these studies because they have not been adopted by the corresponding jurisdiction. However, their findings have been incorporated into adopted plans. The City of Seattle planning studies reviewed were the *Ballard Final Urban Design and Transportation Framework Report* (2016a), *North Delridge Action Plan* (2018), *West Seattle Triangle Urban Design Framework* (2011), *Uptown Urban Design Framework* (2016b), and *South Lake Union Urban Design Framework* (2010).

Some proposed stations exceed current height limits defined in SMC 23.80, Essential Public Facilities, for the underlying zoning as described in Sections 4.2.2 and 4.3.2. The code includes provisions for a variance from the height limits, and Sound Transit and the City are continuing to evaluate design review for light rail facilities.

Local and regional plans identify the need to connect urban centers with high-capacity transit to allow for more efficient use of land as an alternative to increasing traffic congestion. In addition to summarizing the plan and policy consistency analysis, Appendix L4.2 also describes transit-oriented development potential.

4.1.3 Economics

Sections 4.2.3 and 4.3.3, Economics, identify potential adverse and beneficial effects on local and regional economies associated with the WSBLE Project alternatives. Large transit projects that acquire private property or require conversions in land use to a transportation use along the

new transit corridor might be disruptive to businesses and communities but might also present new opportunities for economic activity. The economic analysis addresses the ways in which land acquisition, construction, and operations of light rail facilities would impact local economic conditions along the project corridor and in the broader economic area. Federal and state regulations, policies, and related resources that guide a major transit project Environmental Impact Statement were used to conduct this assessment and are summarized in Appendix L4.3, Economics.

4.1.4 Social Resources, Community Facilities, and Neighborhoods

Sections 4.2.4 and 4.3.4, Social Resources, Community Facilities, and Neighborhoods, describe the existing social resources, community facilities, and neighborhoods that could be affected by the WSBLE project alternatives and identify potential impacts on them. The National Environmental Policy Act and State Environmental Policy Act require evaluation of potential impacts to the human environment, which includes how a project may alter, for better or worse, access to social resources and community facilities or how the project may impact neighborhoods. Social resources include social service providers, emergency housing (shelters), and food banks. Community facilities include social service providers; grocery stores; park and recreation facilities; community, youth and senior centers; sports venues; cultural institutions such as libraries, museums, and theaters; religious institutions; cemeteries; daycare facilities; and government offices.

Consistent with published guidance from the Federal Transit Administration (FTA), four key neighborhood and community issues are considered when addressing the affected environment and potential impacts of a transportation project: changes in quality of life, barriers to social interaction, impacts on community resources, and effects on safety and security. The analysis in Sections 4.2.4 and 4.3.4 also considers the demographics of potentially affected areas, the potential social effects of economic changes, and the potential for displacement of cultural institutions as result of the project. Public services, including fire and emergency services, police, government offices and facilities, schools, solid waste and recycling, post offices, and libraries are shown and discussed in Sections 4.2.14 and 4.3.14, Public Services, Safety, and Security. Sections 4.2.17 and 4.3.17, Parks and Recreational Resources, provide additional information about the parks and recreational facilities within the study area.

4.1.5 Visual and Aesthetic Resources

Sections 4.2.5 and 4.3.5, Visual and Aesthetic Resources, summarize the visual and aesthetic resources around the WSBLE alternatives and potential impacts on sensitive viewers in these areas. Appendix N.2, Visual and Aesthetic Resources Technical Report, provides additional detail on this analysis. Visual and aesthetic resources are the landscape's natural and cultural features that can be seen and that contribute to the public's appreciation and enjoyment of their surroundings. These resources include elements from both the built and natural environments. They can include solitary built and natural landmarks (such as buildings, trees, and bodies of water) or entire landscapes.

Sound Transit conducted a visual analysis for the WSBLE Project using a modified version of the Federal Highway Administration methodology (1988) for assessing impacts related to transportation projects (see Appendix N.2, Visual and Aesthetics Technical Report, Section 2.2,

Methodology). Local planning documents, ordinances, and codes were used to identify protected view corridors and viewpoints.

The methodology assesses impacts in terms of the extent to which the project's presence would change the visual quality of a view that would be seen by concentrations of sensitive viewers, especially highly sensitive viewers.

High Viewer Sensitivity

People with high viewer sensitivity are very aware of the existing viewed landscape and are concerned about changes to it. These viewers typically include residents, recreationists, or others for whom the viewed landscape is important.

Visual character is a non-evaluative description of a viewed landscape such as suburban residential, industrial, shoreline, and high school campus. Conflicts in visual settings can occur when an object of one visual character type (like a factory with an industrial character) is placed in or next to another visual character type (like a high school campus) and visual incompatibility results.

Visual quality assigns “value” or “degree of attractiveness” to a viewed landscape in order to determine changes from a proposed project. Visual quality is evaluated in terms of three components: vividness (distinctiveness, memorability, and drama), intactness (the elements in the views “fit” with their natural and human-built surroundings), and unity (compositional harmony). For this section, the seven visual quality categories used in the Federal Highway Administration methodology have been simplified to the categories described below:

- Low visual quality – areas with low visual quality have some combination of features that seem visually out of place, lack visual coherence, do not have compositional harmony, and/or might contain unsightly elements.
- Average visual quality – areas with average visual quality are average-appearing or commonly occurring landscapes that have a generally pleasant appearance but might lack enough vividness, intactness, and unity to place them in the high visual quality category. Because most of the visual quality of the study area is average, Sound Transit further refined the average category to high average, average, and low average to better describe the influence of a Build Alternative on visual quality. In this analysis, a view with high average visual quality would have vividness, intactness, and unity characteristics that would be slightly higher than average, but not high enough to qualify as high. Likewise, a view with low average visual quality would have slightly lower than average vividness, intactness, and unity characteristics, but not enough to be considered to have low visual quality.
- High visual quality – areas with high visual quality must be outstanding in terms of being very memorable, distinctive, unique (in a positive way), and/or intact. These areas can be natural, park-like, or urban, with urban areas displaying strong and consistent architectural and urban design features.

The following factors were used to assess how the alternatives would affect visual and aesthetic resources:

- Changes to visual character near areas with concentrations of sensitive viewers (this is a qualitative description).
- Changes to the visual quality of views toward the alternative near areas with concentrations of sensitive viewers. If the visual quality category would be lowered one category or more (high to average or average to low) the change was considered an impact.
- Potential blockage of or intrusion on existing views from City of Seattle scenic routes and public places (see below in this section).

Of the factors identified above, the primary factor used to assess potential impacts from the alternatives was change to the visual quality of views toward the Build Alternatives that would be seen from areas with concentrations of sensitive viewers.

SMC 25.05, Environmental Procedures, contains several policies and regulations of relevance to visual and aesthetic resources. These policies are listed in Appendix N.2 and address light and glare; shadows on open space; height, bulk, and scale; and public view protection of “significant natural and human-made features” that can be seen from specific public places such as viewpoints, parks, scenic routes, and view corridors. Protected features include Mount Rainier, the Olympic and Cascade mountains, the downtown Seattle skyline, and major bodies of water (including Puget Sound, Lake Washington, Lake Union, and the Lake Washington Ship Canal).

4.1.6 Air Quality

Sections 4.2.6 and 4.3.6, Air Quality, discuss the potential long-term as well as short-term air quality impacts of the WSBLE Project. The analysis evaluates impacts of criteria pollutants, mobile source air toxics, and greenhouse gases during project construction and operation. This analysis evaluates the final operational condition for both extensions together due to the regional nature of air quality.

The Puget Sound Clean Air Agency, United States Environmental Protection Agency, and Washington State Department of Ecology work together in regulating air quality in the WSBLE corridor. Appendix L4.6A, Applicable Laws, Regulations, Guidance, and Policies, presents a list of federal, state, and local laws, regulations, guidance, and policies applicable to the air quality analysis for the WSBLE Project.

4.1.7 Noise and Vibration

Sections 4.2.7 and 4.3.7, Noise and Vibration, discuss the potential long-term and short-term noise and vibration impacts of the WSBLE Project. The FTA criteria found in the *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018) are the primary noise and vibration criteria by which transit-related impacts are identified. The following materials are also considered:

- Code of Federal Regulations Title 23 Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise
- Washington State Department of Transportation *Traffic Noise Analysis and Abatement Policy and Procedures* (2020)
- Sound Transit Light Rail Noise Mitigation Policy (Board Motion No. M2004-08, 2004).
- Seattle noise control code, SMC 25.08

Criteria Pollutants

Six criteria air pollutants have been recognized by the United States Environmental Protection Agency as potentially harmful, and emission standards have been set to protect the public health and welfare. These pollutants are particulate matter, sulfur dioxide, nitrogen dioxide, ozone, carbon monoxide, and lead.

Mobile Source Air Toxics

Mobile source air toxics are hazardous air pollutants emitted from on-road and non-road vehicles, and can cause cancer and noncancer health risks. These include acetaldehyde, acrolein, benzene, 1,3-butadiene, diesel particulate matter, and formaldehyde.

Greenhouse Gases

Greenhouse gases accumulate in the atmosphere and influence long-term average atmospheric temperatures. Greenhouse gases include, but are not limited to, carbon dioxide, methane, nitrous oxide, hydrochlorofluorocarbons, perfluorocarbons, and sulfur hexafluoride.

Appendix N.3, Noise and Vibration Technical Report, provides more detailed information on the noise and vibration impacts of the WSBLE Project.

4.1.8 Water Resources

Sections 4.2.8 and 4.3.8, Water Resources, discuss how the WSBLE Project would affect surface water, including streams, rivers and bays, shorelines, floodplains and floodways, and groundwater (including critical aquifer recharge areas, sole-source aquifers, and wellhead protection areas that may be present). They also describe the affected water resources, the potential for flooding, and potential water quality impacts associated with the project.

Appendix L4.8, Water Resources, contains the following supporting information:

- A list of relevant laws, ordinances, manuals, and guidelines
- A table of designated water uses for the waterbodies in the study area
- Discussion of calculation of changes in impervious surfaces
- Maps of drainage and combined sewer overflow basins in the study area
- Maps and explanation of hydrologic soil groups in the study area
- Best management practices for stormwater impacts

Sections 4.2.9 and 4.3.9, Ecosystems, include discussions of wetlands, stream habitat, and stream and wetland buffers.

4.1.9 Ecosystems

Sections 4.2.9 and 4.3.9, Ecosystems, address the ecosystems (aquatic and terrestrial) present in the vicinity of the WSBLE Project, including streams and aquatic habitat, vegetation, terrestrial wildlife and wildlife habitat, wetlands, and threatened and endangered species.

An ecosystem is defined by the interaction between plants, animals, microorganisms, and the physical environment in which they live.

City code requirements regarding tree preservation outside of environmental critical areas address residential and commercial properties and do not address light rail. As discussed in Section 4.1, Introduction to Resource and Regulatory Requirements, Sound Transit and the City will continue to coordinate through the permit planning process.

Appendix N.4, Ecosystem Resources Technical Report, contains additional details on the relevant federal, state, and City of Seattle laws and guidelines that pertain to aquatic and upland ecosystems in Seattle. Additional information on water quality and hydrology is provided in Sections 4.2.8 and 4.3.8, Water Resources.

4.1.10 Energy Impacts

Sections 4.2.10 and 4.3.10, Energy Impacts, present the energy estimates for the WSBLE Project operation and construction activities, including:

- Vehicles operating within the study area, including project light rail, automobile, and other transit use
- Construction of the project

There are no federal, state, or local laws that specifically and quantitatively regulate energy consumption in the transportation sector. Many state, local, and regional transportation plans and policies identify goals for the efficient use of energy, and energy conservation and use reduction goals occur at all levels of government. Sound Transit has a Sustainability Plan and Program that is described in further detail in Section 2.7, Environmental Practices and Commitments, in Chapter 2, Alternatives Considered. Sound Transit monitors its environmental impacts with an internationally certified (ISO 140001) Environmental and Sustainability Management System. In addition, City of Seattle Resolution 31447, which adopted the 2013 Seattle Climate Action Plan, calls for carbon neutrality and equity in environmental programs (City of Seattle 2013).

4.1.11 Geology and Soils

Sections 4.2.11 and 4.3.11, Geology and Soils, discuss the potential long-term as well as short-term geology and soils impacts of the proposed WSBLE Project. The analysis includes consideration of topography, geology, soil characteristics, groundwater conditions, and geologic hazards. Additional information, including figures, is provided in Appendix L4.11, Geology and Soils.

Washington state's Growth Management Act (Chapter 36.70A Revised Code of Washington) requires all cities and counties to identify critical areas within their jurisdiction and develop regulations to protect such areas. Among the critical areas designated by the Growth Management Act are geologically hazardous areas, which are defined as areas that, because of their susceptibility to erosion, sliding, earthquake-induced damage, or other geologic events, are not readily suited for development consistent with public health and safety concerns without suitable design measures. The Build Alternatives will pass through Seattle, where the City includes geologic hazard areas in its Environmentally Critical Areas ordinance (SMC 25.09). Geologic hazards affect project design and the type of construction methods used for the project and, if not adequately considered during project design, could affect the long-term operations and safety of the light rail system.

Geology and soil considerations are closely related to groundwater conditions. While Sections 4.2.11 and 4.3.11 include general information on groundwater within the project segments, more detailed information about groundwater along the alternative routes is discussed in Sections 4.2.8 and 4.3.8, Water Resources. Locations of possible contaminated soils and contaminated groundwater are discussed in Sections 4.2.12 and 4.3.12, Hazardous Materials.

4.1.12 Hazardous Materials

Sections 4.2.12 and 4.3.12, Hazardous Materials, discuss the WSBLE Project alternatives' potential to encounter hazardous materials or to introduce new sources of hazardous materials contamination that could pose risks to human health and the environment along with potential mitigation measures. Applicable laws and regulations related to hazardous materials are listed in Appendix L4.12, Hazardous Materials.

4.1.13 Electromagnetic Fields

Sections 4.2.13 and 4.3.13, Electromagnetic Fields, discuss the potential for electromagnetic fields from light rail trains and facilities might interfere with the operation and function of sensitive equipment. Electromagnetic fields are created by the generation, transmission, distribution, and use of electricity.

Electromagnetic fields surround all electrical equipment, appliances, and facilities, including light rail trains. Additionally, metal objects, such as trucks and buses, move through the earth's static magnetic field creating electromagnetic fields. Electromagnetic fields can result in electromagnetic interference, which can cause disruption and possibly malfunction in sensitive equipment such as magnetic resonance imaging equipment, electron microscopes, mass spectrometers, and magnetic devices, such as heart pacemakers. There are no regulatory requirements or exposures limits for electromagnetic field exposures. However, several organizations, such as the Institute of Electrical and Electronics Engineers, have developed guidelines for electromagnetic field exposure. Standard practices for protecting sensitive equipment from electromagnetic fields, such as shielding, have also been developed.

In certain situations, with sufficiently high exposure, electromagnetic fields can affect human health. The World Health Organization, however, has concluded that "current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields" (World Health Organization 2019). The impact discussion in Sections 4.2.13 and 4.3.13, therefore, focuses on potential for interference with sensitive equipment as well as the potential impact of stray currents. Appendix L4.13A, Electromagnetic Field Potentially Sensitive Equipment, lists potentially sensitive equipment in the project corridor as well as the permissible static magnetic field fluctuations by instrument type. Appendix L4.13B, Electromagnetic Field Graphs, provides figures that summarize the dissipation of the static magnetic field disruption caused by light rail trains.

Examples of Electromagnetic Field Sources

Electromagnetic field sources include the earth's static magnetic field (about 0.53 gauss in Seattle); 60-hertz electric power distribution and use; heavy steel-laden flatbed truck (0.18 gauss at approximately 16 feet); and radio emitters such as broadcast antennas, wireless internet routers, cellular phones, and many others.

4.1.14 Public Services, Safety, and Security

Sections 4.2.14 and 4.3.14, Public Services, Safety, and Security, discuss potential impacts from the WSBLE Project on the following types of public services within the study area or with service areas within the study area:

- Fire and emergency medical services (including hospitals)
- Police
- Schools (public and private)
- Solid waste and recycling collection
- United States Postal Service
- Other government facilities

4.1.15 Utilities

Sections 4.2.15 and 4.3.15, Utilities, discuss potential impacts to utilities from the WSBLE Project. Existing utilities in the study area include electricity, water, steam, wastewater

management, stormwater management, natural gas, fuel oil, and telecommunications. Utilities within the project corridor are regulated by policies and procedures for Seattle Public Utilities, Seattle City Light, and King County, as well as Washington Administrative Code Section 468-34 and Washington State Department of Transportation policies within the department's right-of-way.

4.1.16 Historic and Archaeological Resources

Sections 4.2.16 and 4.3.16, Historic and Archaeological Resources, identify and describe the WSBLE Project's potential impacts to historic and archaeological resources. The Historic and Archaeological Resources Technical Report (Appendix N.5) provides a detailed methodology for this project, and more information about federal, state, and local regulations regarding historic properties. The two main federal laws pertaining to historic and archaeological resources are the National Historic Preservation Act and the National Environmental Policy Act (NEPA). The National Historic Preservation Act requires that federal agencies, in this case the FTA, identify and assess the effects of federally assisted undertakings on historic properties (any prehistoric or historic district, site, building, structure, or object) and consult with other regulatory agencies, Native American Tribes, and interested parties to find acceptable ways to avoid, minimize, or mitigate adverse effects. Historic and archaeological resources must also be given consideration under NEPA. In addition, for United States Department of Transportation projects, Section 4(f) of the United States Department of Transportation Act includes protections for National Register of Historic Places (National Register)-eligible properties.

Historic properties are identified and evaluated by the lead federal agency in consultation with the State Historic Preservation Officer at the Washington State Department of Archaeology and Historic Preservation, interested and affected Native American Tribes, local jurisdictions, and other consulting parties, as appropriate.

Applicable state laws and authorities include the Washington State Environmental Policy Act and laws and regulations relating to cultural and archaeological resources such as the Washington Heritage Register program. The Washington Heritage Register program is administered by the Washington State Department of Archaeology and Historic Preservation. Under state law, Revised Code of Washington 27.53, Archaeological Sites and Resources, any alteration to an archaeological site requires a permit from the Washington State Department of Archaeology and Historic Preservation. State law, Revised Code of Washington 27.44, Indian Graves and Records, also protects Native American burial sites. Revised Code of Washington 76.09 (Confidentiality of Information) provides for the confidentiality of information on archaeological sites.

National Register Eligibility

To be eligible for listing in the National Register, a historic property must retain integrity and at least one of the following criteria (36 Code of Federal Regulations, part 60.4):

- a) Is associated with an important event or series of events that have made a significant contribution to the broad patterns of American history.
- b) Is associated with an important individual who was significant in our past.
- c) Embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master or possesses high artistic values; or represents a significant and distinguishable entity whose components lack individual distinction.
- d) Has yielded, or may be likely to yield, information important in history or prehistory.

The analysis presented in Sections 4.2.16 and 4.3.16 follows guidance provided by the Department of Archaeology and Historic Preservation's Washington State Standards for Cultural Resources Reporting.

The City of Seattle's Landmarks Preservation Ordinance (SMC 25.12) states that, in order to be eligible for landmark designation, a property must be at least 25 years old, possess integrity or the ability to convey its significance, and meet at least one of six criteria. Only the Seattle Landmarks Preservation Board can determine whether a property meets the criteria. A Certificate of Approval from the Board is required to alter or demolish a landmark.

4.1.17 Parks and Recreational Resources

Sections 4.2.17 and 4.3.17, Parks and Recreational Resources, discuss park and recreation resources along the WSBLE alternatives and potential impacts to them from the WSBLE Project. The WSBLE Project is near many parks and recreational resources in several neighborhoods in Seattle.

Section 4(f) of the United States Department of Transportation Act of 1966 and Section 6(f) of the Land and Water Conservation Act (Code of Federal Regulations Title 59) are federal regulations protecting a subset of these resources. Section 4(f) resources and potential impacts to them are discussed in Sections 4.2.18 and 4.3.18, Draft Section 4(f) Evaluation Summary. There are no Section 6(f) resources impacted by the project; however, there are parks and recreational resources that have received Washington State Recreation and Conservation Office funding. Such resources have similar conversion and replacement requirements as Section 6(f).

Seattle Ordinance 118477, enacted in February 1997, requires that City of Seattle land or facilities used for park and recreation purposes "shall be preserved for such use; and no such land or facility shall be sold, transferred, or changed from park use to another usage, unless the City...receives in exchange land or a facility of equivalent or better size, value, location and usefulness in the vicinity, serving the same community and the same park purposes."

4.1.18 Section 4(f) Resources

Sections 4.2.18 and 4.3.18, Draft Section 4(f) Evaluation Summary, summarize potential project effects on Section 4(f) resources in West Seattle and Ballard, respectively. Section 4(f) of the United States Department of Transportation Act of 1966 (United States Code Title 49 Section 303[c]) protects publicly owned parks, recreation areas, and wildlife and waterfowl refuges, as well as historic sites. Section 4(f) requires consideration of the following:

- Parks and recreational areas of national, state, or local significance that are both publicly owned and open to the public.
- Wildlife and waterfowl refuges of national, state, or local significance that are publicly owned and open to the public to the extent that public access does not interfere with the primary purpose of the refuge.
- Historic sites of national, state, or local significance in public or private ownership, regardless of whether they are open to the public, that are listed in, or eligible for, the National Register as identified according to Section 106 of the National Historic Preservation Act. Within a National Register-listed or eligible historic district, Section 4(f) applies to those

4.1 Introduction to Resource and Regulatory Requirements

properties that are considered contributing to the eligibility of the historic district, as well as any individually eligible property within the district.

- In addition, Section 4(f) applies to all archaeological sites in or eligible for inclusion in the National Register, including those discovered during construction, except when the FTA concludes that the archaeological resource is important chiefly because of what can be learned by data recovery and has minimal value for preservation in place, and the official(s) with jurisdiction over the Section 4(f) resource have been consulted and have not objected (Section 774.13(b)).

Under Section 4(f), the FTA cannot approve the “use” of a Section 4(f) resource unless it determines that:

- There is no feasible and prudent avoidance alternative to the use of land from the property; and the action includes all possible planning to minimize harm to the property resulting from such use; or
- The use of the property, including any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) committed to by the applicant, will have a *de minimis* impact on the property.

The potential Section 4(f) resources in the study area were identified first. They are described in detail in Sections 3.1 and 4.1, Section 4(f) Resources in the Study Area, of Appendix H, Draft Section 4(f) Evaluation, and summarized in Sections 4.2.18.1 and 4.3.18.1, Affected Environment, of this chapter. FTA and Sound Transit then proposed determinations that some park and recreational resources are not significant and, therefore, are not Section 4(f) resources. FTA and Sound Transit have requested concurrence on the significance of resources from the officials with jurisdiction. For the remaining significant resources, FTA and Sound Transit proposed determinations about the extent to which the project would use each property. Attachment H.1, Section 4(f) Status of Parks and Recreational Resources in the Study Area, to Appendix H lists the parks and recreational resources in the study area and identifies which are Section 4(f) resources. All the historic resources in the study area that are included in or eligible for inclusion in the National Register are Section 4(f) resources. There are no known archaeological sites affected by the project, but sites discovered during construction and determined eligible for the National Register will be evaluated pursuant to Sections 774.9(e) and 774.11(f). The Section 106 findings in the project Section 4(f) evaluation are described in Appendix N.5, Historic and Archaeological Resources Technical Report. The proposed type of Section 4(f) use was determined for each resource as one of the following Section 4(f) use types, pending concurrence with the officials with jurisdiction, where required:

- **Permanent Use.** A permanent use occurs when land from a Section 4(f) property is permanently incorporated by a transportation project.
- **Temporary Occupancy.** A temporary occupancy occurs when the project temporarily uses Section 4(f) property during construction. Temporary occupancy is not a Section 4(f) use, known as a temporary use exception, if the following criteria, as outlined in Code of Federal Regulations Title 23 Section 774.13(d), are met:
 - “Duration must be temporary, i.e., less than the time needed for construction of the project, and there should be no change in ownership of the land;
 - Scope of the work must be minor, i.e., both the nature and the magnitude of the changes to the Section 4(f) property are minimal;

4.1 Introduction to Resource and Regulatory Requirements

- There are no anticipated permanent adverse physical impacts, nor will there be interference with the protected activities, features, or attributes of the property, on either a temporary or permanent basis;
 - The land being used must be fully restored, i.e., the property must be returned to a condition which is at least as good as that which existed prior to the project; and
 - There must be documented agreement of the official(s) with jurisdiction over the Section 4(f) resource regarding the above conditions.”
- **Constructive Use.** A constructive use occurs when a transportation project does not incorporate a Section 4(f) property, but the project’s proximity impacts are so severe that the protected activities, features, or attributes that qualify a property for protection under Section 4(f) are substantially impaired (Code of Federal Regulations Title 23 Section 774.15(a)).
 - **De minimis Use.** A determination of *de minimis* use can be made if the project would not adversely affect the features, attributes or activities that make the Section 4(f) property significant based on a consideration of impacts and mitigation measures. A *de minimis* determination for a park, recreation area, wildlife, or waterfowl refuge can only be made after receipt and consideration of public comment, and after FTA receives written concurrence from the official(s) with jurisdiction. A *de minimis* determination for a historic resource necessitates prior written concurrence from the applicable State Historic Preservation Officer (or Tribal Historic Preservation Officer) of “no adverse effect” or “no historic properties affected” under Section 106.

A permanent use where impacts would be greater than *de minimis*, temporary occupancy that does not qualify as a temporary use exception, and constructive use are considered individual uses and require an evaluation of whether there would be a feasible and prudent avoidance alternative.