E Environmental Overview

INTRODUCTION. Using information documented in Chapter A, Inventory of Existing Conditions, this chapter presents a preliminary environmental screening review of the proposed Master Plan Projects to define and identify environmental issues related to the proposed improvements at King County International Airport/Boeing Field (BFI or Airport). The following narrative summarizes, in a non-quantified fashion, the potential impacts to environmental resources associated with the Proposed Projects and identifies the likely environmental processing necessary for the Airport improvements.

The following discussion assumes that the Proposed Projects would be implemented as presented in **Chapter D, Alternatives Analysis and Development Concepts**. The Proposed Master Plan recommendations comprises 21 airside projects and 17 landside projects. Chapter D also describes the proposed phasing of the projects. Of the 38 projects, 22 include potential new ground disturbances, changes in impervious surface, or vegetation clearing. The following sections provide analyses of potential environmental impacts associated with the proposed projects identified in the Master Plan Update.

Air Quality

Air quality is the measure of the condition of the air expressed in terms of emissions or ambient pollutant concentrations and their temporal and spatial distribution. Air quality regulations are established relative to pollutants for which there is criteria for protecting public health and welfare. These pollutants are commonly referred to as criteria pollutants and include ozone (O_3), carbon monoxide (CO), sulfur oxide (SO), nitrogen dioxide (NO_2), particulate matter (coarse particles PM_{10} and fine particles $PM_{2.5}$), and lead (Pb). Under the National Environmental Policy Act (NEPA) of 1969 a key evaluation is air quality relative to the National Ambient Air Quality Standards (NAAQS), established under the Clean Air Act for the criteria pollutants. According to the U.S. Environmental Protection Agency (USEPA) and Washington State Department of Ecology (WSDOE), King County is designated as an attainment area for all NAAQS. An attainment area is one in which air pollution levels do not exceed the established NAAQS. However, BFI is in an area designated as maintenance by the USEPA for PM_{10}(coarse particles)[1] A maintenance area is one in which an historical exceedance occurred, but pollutant levels were brought into compliance and a plan is in place to maintain the levels below the established NAAQS.

[1] While the USEPA's Greenbook notes that King County is also subject to a maintenance plan, per Section 175A of the Clean Air Act, since two consecutive 10-year maintenance plans have occurred, the maintenance plan's applicability for General Conformity ended after 20 years. In addition, the area was designated as maintenance in 2001. Thus, it is likely that the PM10 requirement for conformity could be removed in 2021 – after 20 years of inclusion in a maintenance plan.

Potential Effects:
Two forms of project-related air emissions can arise from proposed airport improvements: emissions associated with constructing new facilities and changes in emissions associated with ongoing operation of the facilities. A criteria pollutant emissions inventory was prepared for the existing facilities/operation based on 2018, 2023, and 2035 forecast activity levels using the FAA's *Aviation Environmental Design Tool (AEDT)* Version 3b, which has been specifically developed to model aircraft performance for fuel burn, emissions, and noise. **Table E1** presents the results.

Table E1 **AIRCRAFT OPERATING EMISSIONS INVENTORY (EXISTING FACILITIES WITH FORECAST OPERATIONS)**

Year/Aircraft Mode	Statute Tons Per Year					
	CO	VOC	NO_X	SO_X	$PM_{2.5}$	PM_{10}
2018						
Taxi Out	0.6	0.1	0.0	0.0	0.0	0.0
Climb Ground	0.7	0.1	0.1	0.0	0.0	0.0
Climb Below 1000	0.8	0.1	0.2	0.0	0.0	0.0
Climb Below Mixing Height	1.2	0.1	0.3	0.0	0.0	0.0
Descend Below Mixing Height	1.5	0.1	0.1	0.0	0.0	0.0
Descend Below 1000	0.8	0.1	0.0	0.0	0.0	0.0
Descend Ground	0.4	0.1	0.0	0.0	0.0	0.0
Taxi In	0.3	0.1	0.0	0.0	0.0	0.0
2023						
Taxi Out	0.5	0.1	0.0	0.0	0.0	0.0
Climb Ground	0.6	0.1	0.1	0.0	0.0	0.0
Climb Below 1000	0.7	0.1	0.2	0.0	0.0	0.0
Climb Below Mixing Height	1.0	0.1	0.3	0.0	0.0	0.0
Descend Below Mixing Height	1.2	0.1	0.1	0.0	0.0	0.0
Descend Below 1000	0.6	0.1	0.0	0.0	0.0	0.0
Descend Ground	0.3	0.1	0.0	0.0	0.0	0.0
Taxi In	0.3	0.1	0.0	0.0	0.0	0.0
2035						
Taxi Out	0.6	0.1	0.0	0.0	0.0	0.0
Climb Ground	0.7	0.1	0.1	0.0	0.0	0.0
Climb Below 1000	0.8	0.2	0.2	0.0	0.0	0.0
Climb Below Mixing Height	1.0	0.2	0.3	0.0	0.0	0.0
Descend Below Mixing Height	1.2	0.1	0.1	0.0	0.0	0.0
Descend Below 1000	0.6	0.1	0.1	0.0	0.0	0.0
Descend Ground	0.4	0.1	0.0	0.0	0.0	0.0
Taxi In	0.3	0.1	0.0	0.0	0.0	0.0

SOURCE: *BridgeNet International, 2019 & 2020 reflecting the existing and future no action condition using AEDT Version 3b.*
Note: Startup emissions are reported as 0 for all pollutants in all years.

During construction, emissions would be expected from site preparation, building construction, materials delivery, and construction employee commute. These emissions would be temporary and end once construction is completed. Once completed, ongoing operational emissions would be expected from aircraft, ground support equipment, passenger surface traffic vehicles, parking, and stationary equipment. During the

project-related environmental review process, an emissions inventory would be prepared for criteria pollutants for the No Action and the Proposed Projects (i.e. With Project). Note that because USEPA guidance does not call for the modeling of ozone, the precursor pollutants of ozone, volatile organic compounds (VOC) and nitrogen oxides (NOx) are evaluated.

Once operational, the Proposed Projects could change emissions associated with the buildings and aircraft operating on the airfield. With the proposed 300-foot runway shift to the north of Runway 14R, the taxi distance would change slightly. A preliminary estimate of the change in criteria pollutant emissions associated with the 300-foot runway shift found that emissions of individual pollutants would increase by less than 0.2 ton per year by 2035. During project environmental review a more detailed evaluation would be conducted.

Because BFI is in an area designated as maintenance by the USEPA for PM_{10}, before the FAA can approve the recommendations, the Proposed Projects must be first shown to conform to the applicable State Implementation Plan (SIP) for those pollutants. Therefore, today if being approved by the FAA the Proposed Projects would be subject to the General Conformity provisions of the Clean Air Act as defined in 40 CFR Part 93 for this pollutant. However, it is expected that the region will complete 20 years of maintenance designation in 2021, and conformity would no longer apply once that has occurred. USEPA revises the standards and designations based upon actual conditions and thus, this should be reviewed as federal actions are undertaken for the master plan recommendations. Therefore, during the NEPA process, the current status would be considered. A General Conformity Analysis, if required, would require preparation of an emissions inventory to determine if the rule is applicable (i.e., an applicability analysis) based upon whether total direct and indirect emissions are less than the de minimis thresholds. If emissions would be greater than the de minimis threshold, a conformity determination is required. Based upon the preliminary estimate of operational emissions discussed previously, the project-related emissions would be de minimis. However, construction emissions would need to be calculated to ensure that during the construction process the emissions remained de minimis.

Biological Resources (Plants and Animals/Biotic Communities and Endangered Species)

The Endangered Species Act (ESA) requires agencies to examine if actions may have an adverse impact on federally listed endangered or threatened species. Proposed actions must not jeopardize the continued existence of a federally listed species or significantly alter or destroy key habitat for these species. Environmental laws including the ESA, the Marine Mammal Protection Act, Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and the Magnuson-Stevens Fishery Conservation and Management Act serve as guidance for the protection of biological resources.

Potential Effects:
Overall, BFI is a highly developed site consisting mostly of impervious surfaces, with existing vegetation communities limited to mowed areas or landscape vegetation. According to the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS), eight threatened or endangered species known to occur in King County could potentially occur in the vicinity of BFI. There is no ESA-designated critical

habitat on BFI, and potential habitat for ESA-listed aquatic species, the Duwamish River, is not located within approximately 1,200 feet of BFI. No potential habitat for ESA-listed terrestrial species is located within at least 10 miles of BFI, and no endangered plant species are known to grow on Airport property.

Prior to commencing any major construction project at BFI, coordination with the USFWS, NMFS, and Washington Department of Fish and Wildlife (WDFW) may be necessary to determine whether the action would likely jeopardize the continued existence of an ESA-listed species or would result in the destruction or adverse modification of federally designated critical habitat. Construction Best Management Practices (BMPs) should be followed to mitigate temporary construction impacts. BMPs, which are included in the State National Pollutant Discharge Elimination System (NPDES) and local permitting standards, could include straw bales, silt fences, and other sediment controls to prevent runoff and comply with state guidelines to reduce threats to fauna. The proposed fuel storage facility that includes land acquisition and construction near the Lower Duwamish Waterway shoreline could include impacts to ESA-listed aquatic species that occur in the Duwamish River if construction activities include disturbances below the shoreline Mean Higher High Water (MHHW) elevation.

Climate

Increasing concentrations of greenhouse gases in the atmosphere affect global climate. greenhouse gases include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Potential Effects:
For the Master Plan, a CO_2 emissions inventory was prepared for the existing facilities and operation using 2018, 2023, and 2035 activity levels as forecast by the Master Plan. **Table E2** presents the resulting CO_2 emissions as identified by AEDT Version 3b for flight modes up to the mixing height (assumed in AEDT to be about 3,000 feet). **Appendix Six** lists the detailed assumptions used in preparing the air quality, climate, and noise evaluation.

Like air quality (criteria pollutants), two forms of project-related air emissions can arise from proposed airport improvements: emissions associated with constructing new facilities and changes in emissions associated with ongoing operation of the facilities. It is anticipated that overall, greenhouse gas emissions would decrease over time as the county moves to more energy efficient facilities and aircraft energy reduction measures also reduce greenhouse gas emissions. King County's Strategic Climate Action Plan states the County's goal is to reduce county-wide emissions by 50% by 2030. It is anticipated that during the environmental review process that emissions of greenhouse gases would be evaluated.

Like evaluating the potential emissions from the 300-foot runway shift, a preliminary evaluation was conducted of the change in greenhouse gas emissions. That evaluation noted that in the 2035, the shift might increase greenhouse gas emissions by just over one metric ton as presented in **Table E2**. With the runway shift, greenhouse gas emissions could increase from 117 metric tons per year in 2035 to 118.3 metric tons per year (a 1.1 percent increase).

Table E2 **GREENHOUSE GAS EMISSIONS**

Year/Aircraft Operating Mode	CO_2 Metric tons per year
2018	
Taxi Out	24.0
Takeoff Ground Roll	8.7
Climb Below Mixing Height	21.3
Descend Below Mixing Height	23.8
Landing Ground Roll	1.5
Taxi In	11.8
Subtotal	***91.1***
2023	
Taxi Out	25.6
Takeoff Ground Roll	9.7
Climb Below Mixing Height	22.4
Descend Below Mixing Height	24.4
Landing Ground Roll	1.7
Taxi In	12.4
Subtotal	***96.2***
2035	
Taxi Out	31.5[1]/32.8[2]
Takeoff Ground Roll	11.6[1]/11.6[2]
Climb Below Mixing Height	27.1[1]/27.1[2]
Descend Below Mixing Height	29.5[1]/29.5[2]
Landing Ground Roll	2.0[1]/2.0[2]
Taxi In	15.3[1]/15.3[2]
Subtotal	***117.0[1]/118.3[2]***

SOURCE: *BridgeNet International, 2019 and reflect 2018 existing conditions.*
Note: Startup emissions are reported as zero for CO_2 in all years.
[1] AEDT modeled CO_2 emissions data without runway shift.
[2] AEDT modeled CO_2 emissions data with runway shift.

Coastal Resources

Coastal resources include all natural resources occurring within coastal waters and their adjacent shorelines. Federal activities involving or affecting coastal resources are governed by the Coastal Barrier Resources Act, the Coastal Zone Management Act (CZMA), the National Marine Sanctuaries Act, Executive Order 13089, Coral Reef Protection, and Executive Order 13547, Stewardship of the Ocean, Our Coasts, and the Great Lakes.

Potential Effects:
The Duwamish Waterway is the only nearby water body under the jurisdiction of the CZMA and a local Shoreline Master Program. The CZMA does not apply to the Airport as the CZM Program extends from the shoreline seaward. Because the Duwamish River is approximately 1,200 feet west of BFI, none of the Proposed Projects would be expected to impact coastal resources with the exception of the proposed Fuel Facility that includes land acquisition and construction near the Lower Duwamish Waterway shoreline.

Coastal resources could be disturbed if this project includes construction impacts below the Lower Duwamish Waterway shoreline MHHW.

DOT 4(f) Lands and Recreational Uses

The U.S. Department of Transportation (DOT) Act of 1966, specifically Section 4(f), provides for the protection of certain publicly owned resources. DOT Section 4(f) resources include public parks; recreational areas; wildlife and waterfowl refuges of federal, state, or local significance; or any land from an historic site of federal, state, or local significance. The protection includes the constructive use of the Section 4(f) resources based on an FAA determination that the project would substantially impair the resource. Substantial impairment occurs when activities, features, or attributes of the resource that contribute to is significance or enjoyment are substantially diminished. If a project includes the acquisition/displacement of parkland, consideration must also be given to what is known as Section 6(f). Section 6(f) prevents conversion of lands purchased or developed with Land and Water Conservation Fund Act funds (LWCF) to non-recreation uses, unless the Secretary of the Department of Interior, through the National Park Service (NPS), approves the conversion.

Potential Effects:
Near BFI there are 12 public parks and various recreational sites, as listed in **Table A13** and shown in **Figure A18**; historical and cultural resources are described in a subsequent section. Potential impacts to the Georgetown Steam Plant, listed on the National Register of Historic Places (NRHP), include the provision of an access road (potentially a net benefit considered under Section 4(f)) and the 300-foot Runway 14R shift. The runway shift would reposition the RPZ to encompass less of the Steam Plant property than under existing conditions. While this use is industrial in nature, it also serves as a museum and thus may require a DOT 4(f) Evaluation. It is recommended that BFI and King County continue to coordinate with Steam Plant representatives about the compatibility of the Steam Plant within the RPZ and any noise effects of a runway shift. The potential noise impact of the runway shift on the Steam Plant would be expected to occur during the individual project specific environmental review process involving a noise sensitive receptor site analysis, which is detailed in the Noise and Noise Compatible Land Use section.

Farmland

Farmlands, defined as soils best suited for food, feed, forage, fiber, and oilseed crops and, as such, are of major importance in meeting the nation's short- and long-range needs for food and fiber. The Farmland Protection Policy Act (FPPA) regulates federal actions with the potential to convert farmland to non-agricultural uses. The FPPA applies to farmland defined as prime or unique, or to farmland of statewide or local importance as defined by the appropriate state or local agency.

Potential Effects:
BFI is not located on soils identified as farmland; it lies in a fully developed industrial area in Seattle and Tukwila that is not zoned to include farmland. Therefore, none of the Proposed Projects would impact farmland.

Hazardous Materials, Solid Waste, and Pollution Prevention

Hazardous materials, solid waste, and pollution prevention as a resource requiring environmental analysis includes such items as solid waste potentially generated by projects, potential for wastes to impact the environment, potential hazardous materials used during construction and operation of construction projects, the potential to encounter unknown hazardous materials during construction, and the potential to interfere with ongoing remediation of existing contaminated sites. Disrupting sites containing hazardous materials or contaminants may cause significant impacts to soil, surface water, groundwater, air quality, and the organisms using these resources. Federal, state, and local laws regulate hazardous materials use, storage, transport, or disposal.

In accordance with the FAA Modernization and Reform Act of 2012 requirements, this Master Plan Update must include planning for solid waste. The purpose is to evaluate the Airport's existing waste and recycling program and provide recommendations to increase landfill diversion through waste reduction, reuse, and recycling. A copy of the **BFI Recycling, Reuse and Waste Reduction Plan** is included for reference as separate planning document.

Potential Effects:
Solid waste services at BFI include the transfer of mixed loads of non-recyclable construction, demolition, and land clearing (Clearing of Land, or COL) wastes, removal of recyclable materials, and collection and disposal of COL wastes. King County provides technical assistance to minimize solid waste generation, maximize the diversion of solid waste destined for landfills, and increase reuse and recycling efforts. BFI has a hazardous material service under contract that can respond to any spills or contaminated soils encountered during construction. The Airport's Aircraft Rescue and Firefighting (ARFF) personnel respond to fire, spill, and emergency-related incidents. No solid waste impacts associated with the Proposed Projects are anticipated.

Proposed Projects that use, transport, store or dispose of hazardous waste are required to follow strict monitoring procedures set forth by WSDOE to prevent the unregulated release of contaminants. Potential hazardous material generated during demolition and construction such as pavement debris, use of petroleum products, equipment maintenance, and fuel would be stored, used, and disposed of in accordance with federal and state standards. Construction BMPs would be implemented to prevent or minimize the potential for the generation or disposal of hazardous substances during construction and pollution prevention measures will be followed.

Historical, Architectural, Archaeological, and Cultural Resources

Historical, architectural, archaeological, and cultural resources encompass a range of sites, properties, and physical resources associated with human activities, society, and cultural institutions. Resources include past and present expressions of human culture and history in the physical environment, such as prehistoric and historic archaeological sites, structures, objects, and districts which are considered important to a culture or community.

The National Historic Preservation Act (NHPA) of 1966, as amended, the Archaeological and Historic Preservation Act of 1974, and Section 4(f) of the DOT Act of 1966 provide guidelines for evaluating the potential impacts to cultural resources. Section 106 of the NHPA requires federal agencies to consider the effects of their actions on properties included, or eligible for inclusion, in the NRHP. Compliance requires consultation with the Advisory Council on Historic Preservation, the State Historic Preservation Office (SHPO), and the Tribal Historic Preservation Office (THPO).

Historical

Potential Effects:
Several historic and potentially historic structures are located within and near BFI, as presented in **Tables A14**, **A15**, **A16**, and **A17** and shown in **Figure A19**. One NRHP-registered historic site, the Georgetown Steam Plant is potentially impacted by the 300-foot Runway 14R shift, which would reposition the Runway 14R RPZ to encompass less of the Steam Plant property than under existing conditions, but would also require the extension of Taxiway B and potentially increase aircraft noise exposure. It is recommended that BFI and King County continue to coordinate with Steam Plant representatives about the compatibility of the Steam Plant within the RPZ.

The Boeing Field Apartments, a site that has not yet been determined as eligible for listing on the NRHP, is identified for acquisition to provide compatible land use when the Runway 14R RPZ is extended. A determination of eligibility would be required by a qualified historian prior to acquisition. If determined eligible, the property would also be subject to DOT Section 4(f), showing that there is no prudent and feasible alternative and that all steps have been taken to minimize harm.

The Proposed Projects that include the modification or demolition of a structure 50 years old or greater should be reviewed by a qualified historian. The modification or demolition of a building eligible for listing on the Washington Heritage Register or the NRHP could be considered a potential significant impact. Additionally, a review of potential indirect effects would be expected to occur during the individual project-specific environmental review process to determine if the Proposed Project would create significant effects on the historic sites.

Cultural and Archaeological

Potential Effects:
Although there is fill across much of BFI, as deep as 16 feet or more in some areas, there remains the potential for pre-contact and historic archaeological materials under the fill. The Proposed Projects that include ground disturbance should be reviewed by a qualified archaeologist to determine whether there is potential to impact native soils that could contain archaeological material.

Land Use Compatibility

The compatibility of existing and planned land uses near an airport is usually associated with the extent of the noise impact associated with aircraft operations. Local land use plans should be consistent with airport operations, and airport operations should likewise be consistent with local land use plans where possible.

Potential Effects:
The FAA has not established a significance threshold for land use compatibility. The determination of significant impact in this category is normally dependent on the significance of other impacts, principally noise and noise-compatible land use. The Proposed Projects would implement planning and land use activities as defined through the King County Code (King County 2019c), Airport Master Plan Update, and the FAA approved Airport Layout Plan (King County 2012).

Guidance from FAA's Interim Guidance on Land Uses Within a Runway Protection Zone indicates that when an airfield project results in the introduction of new or modified incompatible land uses to an RPZ, then further evaluation is required and possible consultation with FAA's headquarters might be necessary before a compatibility determination can be made. The 300-foot Runway 14R shift project would reposition the Runway 14R RPZ to encompass less of the Georgetown Steam Plant than under existing conditions. Additional consultation and coordination with FAA and Steam Plant representatives would be required about the compatibility of the Steam Plant within the RPZ and the extended runway.

In addition, the City of Seattle has established airport overlay zoning regulations (i.e., see Chapter 23.64 - Airport Height Overlay District) that limit the height of objects near the Airport (includes both Airport property and adjacent property) to promote safe and unobstructed takeoff and landing approach paths. The Airport Height Overlay District is represented by five overlay areas that are related in part on the imaginary surfaces developed by the FAA to establish height limits surrounding airports. These existing overlay zone boundaries, which are presented in the Inventory chapter (see Figure A14), will need to be revised at the north end of the Airport in conjunction with the proposed Runway 14R shift project. No other land use compatibility impacts associated with the Proposed Projects are anticipated.

Natural Resources and Energy Supply

Natural resources and energy supply involve the consumption of natural resources (e.g., water, asphalt, aggregate, and wood) and use of energy supplies (e.g., coal for electricity, natural gas, and fuel used in aircraft and vehicles) that may result from construction, operation, and/or maintenance of proposed projects. The Council of Environmental Quality (CEQ regulations require federal agencies consider energy requirements, natural depletable resource requirements, and the conservation potential of alternatives and mitigation measures in the evaluation of proposed projects. Limited federal guidance exists to guide evaluation of natural resources and energy supply, it does encourage maximizing energy efficiency and minimizing natural resource consumption.

Potential Effects:
The construction, operation, or maintenance of the Proposed Projects would likely involve the consumption of natural resources and the use of energy. Projects might have a significant energy effect if they involved demand for natural resources and energy exceeding supplies that exceeded the available supply. It is not anticipated that the demand for asphalt, concrete, steel, other construction materials, water, electricity, natural gas, fuel, or other utilities by any of the Proposed Projects would exceed supplies. The demand for any public services or utilities would not be expected to increase because of the Proposed Projects.

Noise and Noise Compatible Land Use

Noise is generally defined as unwanted sound that can disturb routine activities and can cause annoyance. As such, the determination of acceptable levels is subjective. The compatibility of existing and planned land uses near airports with proposed aviation actions is usually determined in relation to the level of aircraft noise. Special consideration is needed for the evaluation of noise impacts on sensitive areas within Section 4(f) properties where existing background noise is, generally speaking, very low and a quiet setting is a generally recognized purpose and attribute.

The FAA has adopted guidelines for evaluating the compatibility of various land uses with aircraft generated noise levels provided in 14 CFR Part 150, Land Use Compatibility with Yearly Day-Night Average Sound Levels. The Yearly Day-Night Average Sound Level (DNL) metric is used to evaluate both the existing and future noise levels. DNL is a 24-hour, time-weighted average noise level based on the A-weighted decibel (A-weighted refers to the sound scale pertaining to the human ear). Time-weighted refers to the fact that noise occurring during certain sensitive time periods is penalized for occurring at these times. The nighttime period (10 p.m. to 7 a.m.) is penalized by 10 decibels (dB). This penalty accounts for increased human sensitivity to noise during the quieter period of a day, where sleep is the most common activity.

The main advantage of the DNL metric is that it provides a common measure for a variety of differing noise environments. The same DNL level can describe both an area with very few high-level noise events and an area with many low-level events. DNL is thus constructed because it has been found that the total noise energy in an area predicts community response.

DNL noise levels are depicted as noise contours, which are interpolations of noise levels based on the center of grid cells. Grid cells are squares composed of specific size that are entirely characterized by a noise level. Thus, noise contours connect the points of comparable noise levels, resemble topographical contours, and form concentric “footprints” about a noise source. These footprints drawn around an airport are used to predict community response to the noise from aircraft using an airport.

Table E3 presents the Land Use Compatibility Matrix, adopted from 14 CFR Part 150, indicating those land uses that are considered compatible within certain DNL noise contours. It identifies land uses as being compatible, incompatible, or compatible if sound attenuated. The FAA-developed matrix can act as a guide to King County and surrounding jurisdictions for land use planning and control, and a tool to compare relative land use impacts that would result from various airfield planning alternatives. According to the matrix, DNL 65 dB is the threshold level to determine land use compatibility for noise sensitive land uses (e.g., residences, schools, places of worships). In general, commercial, industrial, and most outdoor recreation land uses are compatible with aircraft noise. The area outside the DNL 65 dB is an area within which most land uses are compatible but is an area where single event noise complaints are often received. The area between the DNL 65 and 70 dB is an area of significant noise exposure where many types of land uses are normally unacceptable and where land use compatibility controls are recommended. Finally, the area inside the DNL 75 dB identifies land uses that are subjected to a significant level of noise and the sensitivity of various uses to noise is increased.

DNL noise contours do not delineate areas that are either free from excessive noise or areas that will subject to excessive noise. In other words, it cannot be expected that a person living on one side of a DNL noise contour will have a markedly different reaction that a person living nearby, but on the other side. What can be expected is that the general aggregate community response to noise within the DNL 65 noise contour, for example, will be less than the response from the DNL 75 noise contour.

For project specific NEPA evaluations, the FAA has defined a significant noise impact results when analysis shows that that the proposed action would cause noise sensitive areas to experience an increase in noise of DNL 1.5 dB or more at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase when compared to not implementing the proposed action for the same timeframe.

Potential Effects

The DNL noise contours at BFI were generated using AEDT version 3b. The program is provided with standard aircraft noise and performance data that can be tailored to the characteristics of individual airports. The AEDT program requires the input of the physical and operational characteristics of each airport analyzed. Physical characteristics include runway end coordinates, airport elevation, and temperature. Operational characteristics include aircraft mix, flight tracks, and approach profiles. Optional data that is contained within the model include departure profiles, approach parameters, and aircraft noise curves. All options were incorporated to model the noise environment at BFI. The overall shape and size of noise contours is a function of the combination of runway use, aircraft types, flight tracks, and time of operations.

Table E3 **LAND USE COMPATIBILITY MATRIX**

Land Use	Yearly Day-Night Noise Level (DNL) in Decibels					
	< 65	65-70	70-75	75-80	80-85	> 85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail-building materials, hardware, and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade-general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	Y(2)	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf course, riding stables and water recreation	Y	Y	25	30	N	N

Numbers in parentheses refer to NOTES.

The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

TABLE KEY

SLUCM	Standard Land Use Coding Manual
Y (Yes)	Land Use and related structures compatible without restrictions
N (No)	Land Use and related structures are not compatible and should be prohibited.
NLR	Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into design and construction of the structure.
25, 30 or 35	Land Use and related structures generally compatible; measures to achieve NLR of 25, 30 or 35 dB must be incorporated into design and construction of structure.

NOTES

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB to 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often states a 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

(2) Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(3) Measure to achieve NLR of 30 dB must be incorporated in the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(4) Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(5) Land use compatible provide that special sound reinforcement systems are installed.

(6) Residential buildings require an NLR of 25.

(7) Residential buildings require an NLR of 30.

(8) Residential building not permitted.

***SOURCE**: Federal Aviation Regulations (FAR) Part 150 Guidelines.*

Table E4 summarizes the aircraft operations used to model the approximate noise impacts. Several assumptions were made to estimate the number of operations, type of aircraft, and BFI's configuration that would be most reasonable to model for the 2018 base year, and the two future planning periods, years 2023 and 2035.

Table E4 **EXISTING AND FUTURE OPERATIONS BY AIRCRAFT TYPE, 2018, 2023, & 2035**

Aircraft Type	2018	2023	2035
Operations			
Commercial Service (Scheduled and Non-Scheduled)	3,718	4,159	5,178
Boeing Company B-737 (Flight Tests & Deliveries)	4,281	5,747	6,819
Air Cargo	13,664	13,296	15,052
General Aviation			
Business Jet & Turboprop	*29,482*	*30,537*	*39,208*
Piston	*108,170*	*75,881*	*68,756*
Air Taxi	22,893	24,918	34,076
Military	1,194	1,701	1,867
Total Operations	**183,402**	**156,239**	**170,955**

***SOURCE**: Mead & Hunt.*

2018 Noise Exposure. Using the existing 2018 aircraft operations and types presented in **Table E4**, noise contours were generated and are presented in **Figure E1**. As can be seen in the illustration, a very small part of the 75 DNL dB noise contour east of the Runway 32L end would extend beyond BFI property into the right-of-way of Airport Way South.

Likewise, the 70 DNL dB noise contour would extend beyond Airport property east of the Runway 32L end into the rights-of-way of Airport Way South, the BNSF/UP railroad, and Interstate 5 (I-5). West of the Runway 32L end, the 70 DNL dB noise contour would extend beyond Airport property into lands used for industrial purposes and encompasses one eligible or potentially eligible historic site. Smaller portions of the 70 DNL dB noise contour would also extend beyond Airport property west of the existing ATCT into the right-of-way of East Marginal Way South, west of the Runway 14R end into Boeing-owned property, and east of the Runway 14R end into rights-of-way for Airport Way South and the BNSF/UP railroad. There are an additional two eligible or potentially eligible historic sites that would be encompassed by the 70 DNL dB noise contour that are on Airport property.

The 65 DNL dB noise contour would extend off Airport property to the north and overlays an area of Georgetown, affecting residential, commercial/office, industrial, and park properties. A church and two additional eligible or potentially eligible historic sites (one, the Georgetown Steam Plant is not located on Airport property) would also be within the 65 DNL dB noise contour to the north. To the east, south, and west of BFI, the 65 DNL noise contour would extend beyond Airport property into primarily industrial lands but does comprise residential properties east of I-5 near the Runway 32L end. An additional seven eligible or potentially eligible historic sites, all on Airport property, and one school, the Raisbeck Aviation High School, would be located within the 65 DNL dB noise contour.

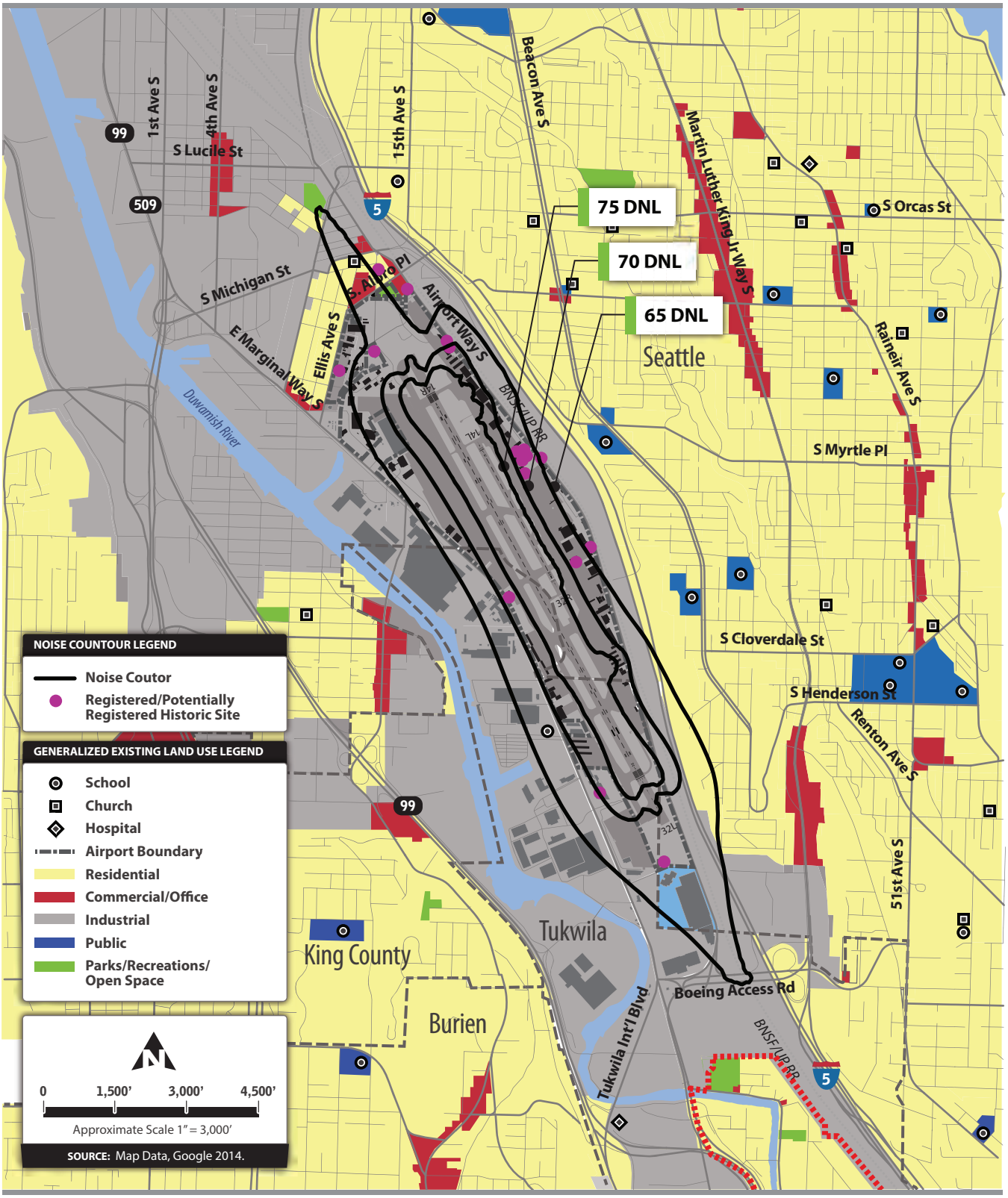


FIGURE E1 **2018 Existing DNL Noise Contours with Generalized Existing Land Use**

Mead & Hunt

King County International Airport/ Boeing Field

Table E5 summarizes the potential noise impacts associated with the various noise contours for the existing 2018 conditions. There were approximately 210 persons located within the DNL 65 dB and higher noise contour, but no persons are in areas with a DNL greater than 70 dB in 2018.

Table E5 **2018 EXISTING NOISE EXPOSURE SUMMARY**

Category	Noise Level Range (DNL)		
	> 65 dB	> 70 dB	> 75 dB
Population Count (persons)	210	0	0
Land Area (acres)	937	409	218
Eligible or Potentially Eligible Historic Sites	12	3	0
Schools	1	0	0
Church	1	0	0

SOURCES: *AEDT version 3b, by BridgeNet International 2020; U.S. Census, 2010. Note = Population rounded to the nearest 10 people.*

Note: Totals and difference calculations subject to rounding of +/- 1 acre or +/- 1 population count.

2023 Noise Exposure. Using the future 2023 aircraft operations and types presented in **Table E4**, noise contours were generated and are presented in **Figure E2**. As can be seen in the illustration, the 2023 noise contours are very similar to the 2018 noise contours, only extending slightly more to the north and south of BFI. **Table E6** summarizes the subtle changes in the potential noise impacts associated with the various noise contours for the future 2023 conditions and the possible changes occurring from the existing 2018 conditions. There would be 230 persons located within the DNL 65 dB and higher noise contour, an increase of less than 20 compared to the existing conditions. No persons are in areas with a DNL greater than 70 dB. The increased size of the noise contours and population occurs despite the overall decrease in total aircraft operations. The operations reduction is due primarily to decreased general aviation training operations. However, there is an increase in all other aircraft operations, especially jet operations (except air cargo) which primarily comprise the noise levels surrounding BFI.

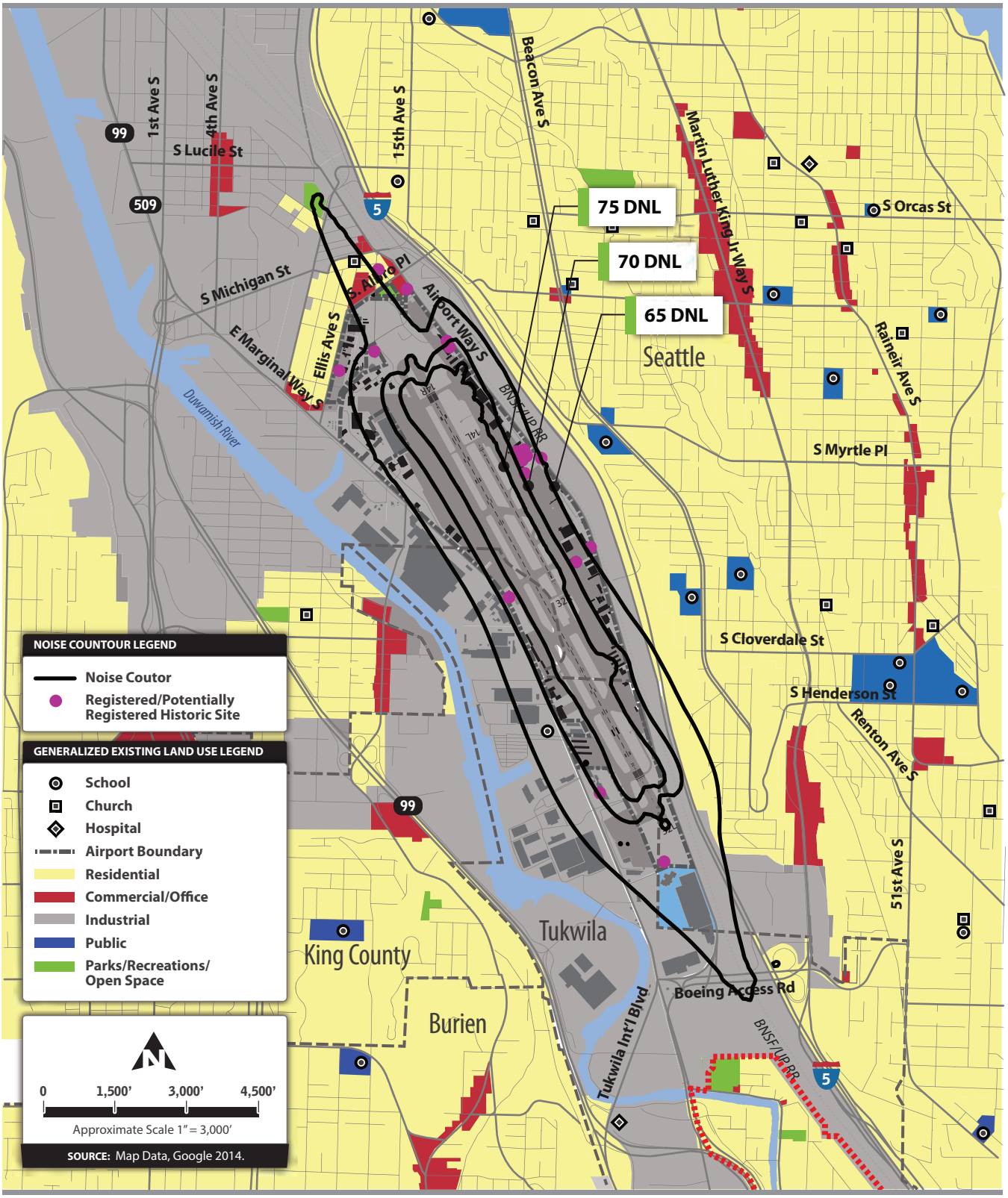


FIGURE E2 **2023 Future DNL Noise Contours with Generalized Existing Land Use**

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Table E6 **2023 FUTURE NOISE EXPOSURE SUMMARY**

Category	Noise Level Range (DNL)		
	> 65 dB	> 70 dB	> 75 dB
Population Count (persons)	230	0	0
Land Area (acres)	959	422	229
Eligible or Potentially Eligible Historic Sites	13	3	0
Schools	1	0	0
Church	1	0	0
Change from Existing 2018			
Population Count (persons)	+13	0	0
Land Area (acres)	+22	+12	+11
Eligible or Potentially Eligible Historic Sites	+1	0	0
Schools	0	0	0
Church	0	0	0

SOURCES: *AEDT version 3b, by BridgeNet International 2020; U.S. Census, 2010. Population rounded to the nearest 10 persons.*
Note: Totals and difference calculations subject to rounding of +/- 1 acre or +/- 1 population count.

2035 Noise Exposure. Using the future 2035 aircraft operations and types presented in **Table E4**, noise contours were generated and are presented in **Figure E3**. As can be seen in the illustration, the 2035 noise contours would also be very similar to the 2018 noise contours but would be longer and wider than the existing conditions. **Table E7** summarizes the potential noise impacts associated with the various noise contours for the future 2035 conditions and the changes occurring from the existing 2018 conditions. There would be 360 persons located within the DNL 65 dB and higher noise contour; an increase of about 150 compared to the existing conditions. No persons would be in the areas with a DNL greater than 70 dB.

As with the 2023 noise exposure analysis, the population increase would occur despite the overall decrease in total aircraft operations. Again, the operations reduction is due primarily to decreased general aviation training operations. The increase in all other aircraft operations, especially jet operations (including air cargo operations in 2035) primarily comprise the noise levels surrounding BFI.

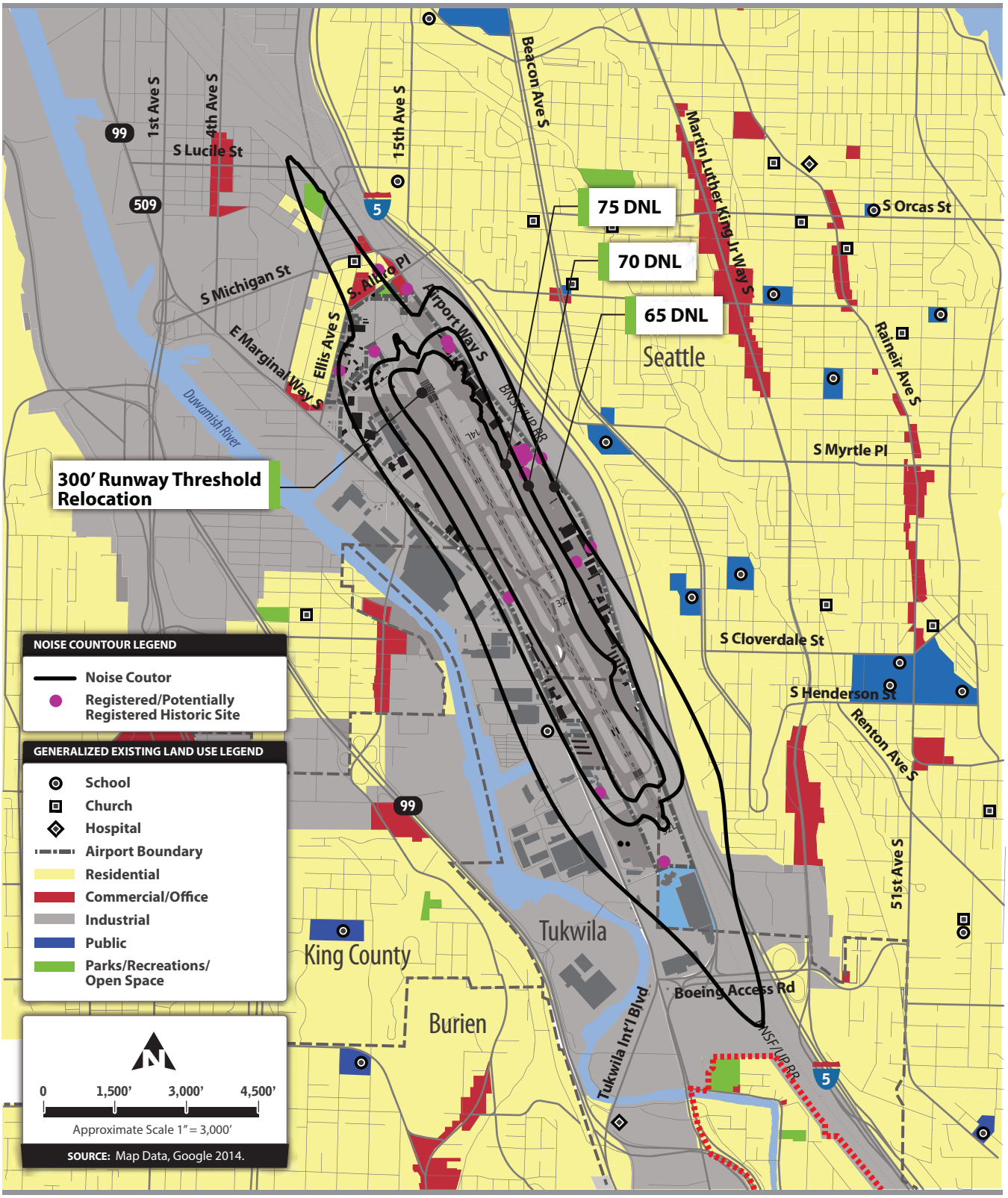


FIGURE E3 **2035 Future DNL Noise Contours with Generalized Existing Land Use**

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King County International Airport/ Boeing Field

Table E7 **2035 FUTURE NOISE EXPOSURE SUMMARY**

Category	Noise Level Range (DNL)		
	> 65 dB	> 70 dB	> 75 dB
Population Count (persons)	360	0	0
Land Area (acres)	1,085	464	249
Eligible or Potentially Eligible Historic Sites	15	4	0
Schools	1	0	0
Church	1	0	0
Change from Existing 2018			
Population Count (persons)	+142	0	0
Land Area (acres)	+148	+55	+31
Eligible or Potentially Eligible Historic Sites	3	1	0
Schools	0	0	0
Church	0	0	0

SOURCES: *AEDT version 3b, by BridgeNet International 2020; U.S. Census, 2010. Population rounded to the nearest 10 persons.*
Note: Totals and difference calculations subject to rounding of +/- 1 acre or +/- 1 population count.

This Master Plan Update did not include a noise sensitive receptor site analysis to determine the threshold level of significance required for project specific NEPA evaluation. Prior to implementing the 300-foot runway shift, additional noise analysis will be required to determine if the project results in a DNL 1.5 dB or more increase at any noise sensitive receptor at or above the DNL 65 dB noise exposure level compared to not implementing the project. Additionally, the analysis will evaluate if any noise sensitive receptor will be exposed at or above the DNL 65 DNL dB level due to a DNL 1.5 dB or greater increase when compared to not implementing the runway shift.

Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks

Socioeconomics

Socioeconomics is a broad term used to describe impacts that are either social or economic in nature. The analysis of significance evaluates how elements of the human environment such as population, employment, housing, and public services might be affected. If federal funding is used to acquire real property or displace persons, then 49 CFR Part 24 Uniform Relocation Assistance and Real Property Acquisition Policies Act (URARPAPA) of 1970 must be met. Otherwise, observing to the fullest extent possible all state, county, and local laws, regulations, and ordinances concerning zoning, transportation, economic development, and housing is required during planning, assessing, or implementing proposed actions.

Potential Effects:
None of the Proposed Projects would be expected to have the potential to induce substantial economic growth, divide established communities, cause extensive relocations of residents or commercial establishments resulting in severe economic hardship, disrupt local traffic patterns or reduce levels of service for roadways, or substantially change the tax base. One Proposed Project would include property acquisition involving residential structures, which is the acquisition of the Boeing Field Apartments for the extended

Runway 14R RPZ. King County would have to follow the guidance contained in URARPAPA when acquiring the properties with federal funds.

Environmental Justice

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income. Fair treatment means that no people group should bear a disproportionate share of negative environmental consequences resulting from industrial, governmental, and commercial operations or policies. Meaningful involvement means that people have an opportunity to participate in decisions about activities that may affect them, and decision makers must seek out and facilitate the involvement of those potentially affected. Several federal laws and policies provide guidance to evaluating environmental justice, but the principal law is Title VI of the Civil Rights Act of 1964, as amended.

Potential Effects:
The FAA has not established a significance threshold for environmental justice but has identified factors to consider when evaluating the context and intensity of potential impacts leading to a disproportionately high and adverse effect on an environmental justice population. These factors include a significant impact in other environmental categories (e.g., noise exposure) or impacts on the physical or natural environment that is unique and significant to the environmental justice population. In consideration of the Proposed Projects identified in the Master Plan Update, the future 300-foot shift to the north of the Runway 14R threshold will have to be evaluated in the NEPA review process to determine if a disproportionately high and adverse impact on the existing minority or low-income populations would result from the project, as compared to other reasonable or feasible alternatives identified in the environmental review, along with the "no-build" or "without project" alternative. For the Runway 14R threshold shift, the repositioning of the DNL 65 dB noise contour, relative to the shift, and its potential impact to the existing environmental justice population would be a key assessment of the analysis. Based upon the preliminary noise contour analysis that was prepared for the Master Plan Update, it is anticipated that the project to shift the Runway 14R threshold would not have a disproportionately high and adverse impact on the minority or low-income populations located north of the Airport, but the final determination will have to be made during the individual project specific NEPA review process. Also as stated in the previous Socioeconomics section, any real property acquired resulting in the relocation of residential structures and residences would conform to the requirements contained in the Uniform Relocation Assistance and Real Property Acquisition Policies Act (URARPAPA).

Children's Environmental Health and Safety Risks

Children are often more vulnerable to pollutants than adults due to differences in behavior and biology, that can lead to greater exposure and/or unique windows of susceptibility during development. Therefore, NEPA requires project sponsors and federal agencies to make it a high priority to identify and assess environmental health and safety risks that might disproportionately affect children. The assessment includes risks attributable to products or substances that children are likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products that they might use or to which they might be exposed. Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks provides guidance for evaluating.

Potential Effects:
The FAA has not established a significance threshold for children's environmental health and safety risks. However, like environmental justice impacts, potential impacts to children's health and safety should be considered in the context and intensity of significant impact in other environmental categories (e.g., noise exposure). As presented in the above Environmental Justice section, the future repositioning of the DNL 65 dB noise contour, relative to the Runway 14R threshold shift project will have to be evaluated during the individual project specific NEPA review process to determine if a disproportionately high and adverse impact on children's health or a significant increase in their safety risks would result from the project. Based upon the preliminary noise contour analysis that was prepared for the Master Plan Update, this potential impact is not anticipated. However, the final determination will have to be made during the individual project specific NEPA review process.

Visual Effects and Light Emissions

Visual effects typically are concerned with the extent to which airport projects would either produce light emissions that create annoyance or interfere with activities or contrast with or detract from the visual resources or visual character of the existing environment. As such, visual effects are difficult to define and assess as subjectivity is involved. There are no federal laws or regulations guiding agencies on assessing impacts to visual resources or controlling light emissions. However, some visual resources are protected under federal, state, or local regulations including, but not limited to scenic roadways/byways, wild and scenic rivers, national scenic areas, scenic easements, trails, biological resources, and coastal areas.

Potential Effects:
Land use near BFI is primarily industrial and commercial, with some residential areas to the north and west. Because of the industrialized nature of the surrounding area, the visual character of the Airport buildings and paved areas fits well within its surroundings. The Airport provides a large area of open space in a relatively densely developed area, which allows for breaks in the views from the water and the land side of BFI. Lighting systems that serve the airfield, terminal buildings, other on-Airport buildings, access roadways, and parking areas produce considerable light emissions. Many of the Proposed Projects would include installing and modifying runway and taxiway lighting. Relocation of the existing Runway 14R Medium Intensity Approach Light System with Sequenced Flashers (MALSF) proposed in conjunction with the 300-foot shift to Runway 14R, would have the slight potential to shine light and affect people in the area. Measures could be taken to prevent this, including adjustment of the beam angle, or shielding of the light fixtures. It is not anticipated that other Proposed Projects would have an adverse light effects or annoyances to surrounding residents.

The Airport has been at its current location for over 90 years and establishes the visual character for much of the area. Two of the Proposed Projects, the acquisition of the Boeing Field Apartments and the Runway 14R departure RPZ land acquisition would convert non-aviation uses to aviation uses. No other Proposed Projects are expected to contrast with or detract from the visual character of the Airport area.

Water Resources

Water resources are defined as surface waters or groundwater considered of vital importance to society. They are important in providing drinking water and in supporting recreation, transportation and commerce, industry, agriculture, and aquatic ecosystems. These resources include wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers. They do not function as separate and isolated ecosystems of the watershed, but rather as a single, integrated natural system.

Wetlands

Wetlands are defined as areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands are protected under the Clean Water Act, Section 404, which requires a project applicant to obtain a permit from the U.S. Army Corp of Engineers (USACE) or authorized state for the discharge of dredge or fill material into waters of the United States. Executive Order 11990 directs federal agencies to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial value of wetlands.

Potential Effects:
USFWS National Wetlands Inventory (NWI) maps identify six potential palustrine emergent wetlands on Airport property within the mowed areas adjacent to the runways (see **Figure A19**). Some of the Proposed Projects that would include potential new ground disturbance are located near these potential wetlands. Prior to completing projects affecting wetlands at the Airport, coordination with the USACE, WSDOE, and King County is recommended to confirm the presence or absence of wetland features and to identify and classify any wetlands that might exist within the project areas. If wetlands were to be disturbed, the County would be required to obtain the requisite permits.

Floodplains

Floodplains are lowland areas adjoining inland and coastal waters which are periodically inundated by floodwaters. They are often discussed in terms of the 100-year flood, which is a flood having a one percent chance of occurring in any given year. Executive Order 11988, Floodplain Management, directs agencies to take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains. DOT Order 5650.2 requires agencies to evaluate the potential effects any actions within a 100-year floodplain. Established DOT policy is to avoid taking any action within a 100-year floodplain where practicable.

Potential Effects:
The Airport is not within the FEMA-mapped 100-year floodplain of the Duwamish Waterway or within the King County-mapped flood hazard areas (King County 2019b). None of the Proposed Projects would be in a 100-year floodplain or flood hazard areas and, therefore, no impacts are anticipated, with one exception. The proposed Fuel Facility includes land acquisition and construction near the Lower Duwamish Waterway shoreline. Floodplain impacts could occur if this project includes construction activities within the floodplain of the Lower Duwamish Waterway.

Surface Water

Surface water components include rivers, streams, ponds, lakes, estuaries, and oceans. Agencies are required to comply with provisions in the Clean Water Act, the Fish and Wildlife Coordination Act, the Rivers and Harbors Act, the Safe Drinking Water Act and any state statutes protecting surface waters. Actions are considered exceeding significance thresholds if established federal, state, local, or tribal water quality standards are surpassed, or if a public water supply is contaminated such that the public health may be adversely affected.

Potential Effects:
The closest surface water to BFI is the Duwamish Waterway, which is approximately 1,200 feet west of the Airport boundary (see **Figure A19**). Proposed Projects that have the potential to impact surface water resources and would likely require NPDES construction permits are all the projects that include new ground disturbance or changes in impervious surface. However, the stormwater infrastructure at BFI has been developed for compliance with Industrial Stormwater General Permit (ISGP), Stormwater Pollution Prevention Plan (SPPP), NDPES, other permit requirements, and local standards such as the King County Code and the King County Surface Water Design Manual. It is not anticipated that any of the Proposed Projects would exceed the FAA's significance thresholds for surface water impacts.

Groundwater

Groundwater is subsurface water that occupies the space between sand, clay, and rock formations. The term aquifer is used to describe the geological layers that store or transmit groundwater. The Safe Drinking Water Act and its implementing regulations (40 CR parts 141-149) prohibit federal agencies from funding actions that would contaminate an EPA-designated sole source aquifer or its recharge area. State and local agencies may also promulgate regulations to protect sole sources aquifers and their recharge areas. As with surface water resources, projects are considered exceeding significance thresholds if federal, state, or local groundwater quality standards are surpassed, or if an aquifer used for public water supply is contaminated such that the public health may be adversely affected.

Potential Effects:
According to King County (King County 2019b), the Airport is not in a critical aquafer recharge area, groundwater management area, wellhead protection area, sole source aquifer, or an area susceptible to groundwater contamination. Any action that increases the extent of impervious surfaces, excavation, or construction of structures have the potential to affect groundwater. Construction activities could impact groundwater through petroleum or chemical spills and through erosion and sedimentation when the ground is bare after earthmoving operations. Although none of the Proposed Projects would be expected to exceed significance thresholds for groundwater impacts, projects with the greatest potential to adversely affect groundwater include those that would cause new ground disturbances or changes in impervious surface. However, the stormwater infrastructure at BFI has been developed for compliance through existing permit requirements.

Wild and Scenic Rivers

Wild and scenic rivers are those rivers having remarkable scenic, recreational, geologic, fish, wildlife, historic, or cultural values. The Wild and Scenic Rivers Act defines the values using a classification system based on the degree of development present along the river, and whether the river is wild, scenic, or recreational.

Potential Effects:
The Duwamish River is the largest surface water body closest to the Airport, which is located approximately 1,200 feet to the west. Since this river is not protected under the Wild and Scenic River Act, no impacts are anticipated from any Proposed Projects.

Environmental Compliance

The Proposed Project improvements are anticipated to receive federal funding and/or require approval of the Airport Layout Plan before they are undertaken. Thus, to obtain the requisite federal approval, compliance with NEPA, including the Washington State Environmental Policy Act (SEPA) would be expected. The following sections briefly describe the issues that these two processes would consider and address.

SEPA Compliance

Enacted by the Washington Legislature in 1971, SEPA was designed to help state and local agencies identify possible environmental impacts that could result from future governmental decisions. SEPA applies to all decisions made by state and local agencies. For example, before a state and local agency authorizes construction or adopts a plan, compliance with SEPA is required.

SEPA also gives local governments the option to allow some minor construction projects to be exempt (called categorical exemptions) from review, depending on their size and scale. For the most part, such small projects are those that would involve an air permit, commercial buildings less than 4,000 square feet and no more than 20 parking spaces, and projects involving small amounts of excavation.

For actions at BFI, the County would be the lead agency under SEPA. In general, the SEPA process involves the following steps:

- Determine if SEPA is required
- Evaluate the proposed action
- Assess the significance of the action and issue a threshold determination

As part of the project evaluation, the project sponsor may consider whether the provisions of a non-project review are applicable or if a project-level evaluation should be done. Non-project actions are governmental actions involving decisions on policies, plans, or programs that contain standards controlling use or modification of the environment, or that will govern a series of connected actions [WAC 197-11-704(2)(b)].

The documentation process under SEPA, if it applies and the project is not exempt, typically involves preparation of an environmental checklist. Based on the results of the checklist, the agency can make a

Determination of Non-Significance (DNS), Mitigated DNS (where the significant impacts are mitigated) or issue a Determination of Significance and then prepare an Environmental Impact Statement (EIS). Per WAC 197-11-610, a NEPA document can be adopted or incorporated by reference by a project sponsor for purposes of meeting SEPA

Many of the Proposed Master Plan Projects may qualify for an exemption under SEPA while other projects may require evaluation.

NEPA Compliance

NEPA requires all federal agencies to consider the effect on the environment before taking a federal action. The FAA has issued two Orders that address the requirements of NEPA:

- FAA Order 1050.1F *Environmental Impacts: Policies and Procedures,* which addresses NEPA compliance for all Divisions of the FAA; and
- FAA Order 5050.4B *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions,* which addresses projects of the Airports Division of the FAA.

Each of the FAA Orders has an accompanying Desk Reference. In August 2020, the Trump Administration enacted revisions to the CEQ regulations that implement NEPA. In the fall of 2021, federal agencies are to be required to issue revised NEPA implementing guidance that aligns with the CEQ revisions. Therefore, it is likely that when King County proceeds to seek federal approval of actions in the Master Plan Update, there will be newer FAA guidance than noted above.

Federal regulations identify three types of NEPA compliance documents:

- **Categorical Exclusion (CatEx)** – applies to a specific list of actions identified by FAA that have been found to produce no extraordinary circumstances (no significant environmental impacts or controversy).
- **Environmental Assessment (EA)** – applies to a small list of actions specifically identified by the FAA or that have been found by experience to have environmental impacts. The purpose of an EA is to determine whether the proposed project would have significant impacts. Upon review of the EA findings, the FAA either issues project approval in the form of a Finding of No Significant Impact (FONSI)[2] or directs the preparation of an Environmental Impact Statement (EIS) to further investigate potential environmental impact.
- **Environmental Impact Statement (EIS)** – applies to a specific list of projects, such as a new runway, and those actions that have been found to have significant environmental impacts.

While King County would be responsible for SEPA compliance, the FAA is the agency ultimately responsible for compliance with NEPA at the Airport. FAA Orders allow the FAA to delegate the preparation of documentation to support a CatEx or an EA to an airport sponsor, such as King County. Historically, only the FAA had responsibility for preparing an EIS, but recent changes might allow the FAA to delegate the responsibility to airport sponsors.

[2] A FONSI can also be a Mitigated FONSI, where the EA has identified mitigation to address all significant impacts.

Many of the Proposed Master Plan improvements are anticipated to fall within the specific categorical exclusions noted in FAA Order 1050.1F paragraph 5-6.4 (Categorical Exclusions for Facility Siting, Construction and Maintenance) if they do not result in extraordinary circumstances. Projects such as acquisition of land greater than three[3] acres and the runway shift [4] could require an EA. At the time of project implementation, the FAA would determine the appropriate approach to NEPA compliance.

A couple of projects will require special attention during the environmental review process: construction of a replacement access to the Georgetown Steam Plant and the 300-foot runway shift. Because the Georgetown Steam Plant is listed on the NHRP, a change in access to the historic site may require consideration relative to DOT Section 4(f). Additionally, prior to implementing the 300-foot runway shift, an updated noise analysis will be required. The focus of the analysis will be to determine if the project results in a DNL 1.5 dB or more increase at the Steam Plant (or any noise sensitive receptor) at or above the DNL 65 dB noise exposure level compared to not implementing the project. This analysis will also include an evaluation of the potential effects on Ruby Chow Park and the Georgetown Apartments (a potential historic structure).

The Proposed Airside Projects, environmental categories, and potential impacts are summarized in **Table E8**, which also presents the environmental processing anticipated for each project. **Figure E4** graphically presents the Proposed Airside Projects in relation to documented environmental sites. The Proposed Landside Projects, environmental categories, and potential impacts are summarized in **Table E9**. **Figure E5** graphically presents the Proposed Landside Projects in relation to documented environmental sites. As outlined in the previous sections, because most of the Proposed Projects occur on land previously disturbed by past Airport development, it does not appear there are significant environmental effects that could not be addressed or mitigated below significant thresholds.

[3] Order 1050.1F section 5-6.4r.

[4] FAA Order 1050.1F Section 5-6.4e for effects what create a significant noise effect.

TABLE E8 **SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS OF PROPOSED MP UPDATE AIRSIDE PROJECTS**

Project Number	Description	Surface Water, Groundwater	Earth, Plants, and Animals/Biotic Communities and Endangered Species	Energy and Natural Resources, Public Services and Utilities, Solid Waste	Land Use Compatibility, Social and Socio-Economic	DOT 4(f) Lands and Recreational Uses	Historical, Architectural, Archaeological, and Cultural, Resources	Wetlands	Floodplains, Coastal Zone, and Wild and Scenic Rivers, Farmland, Aesthetics, Views, Light Emissions	Potential Environmental Processing
Airside Projects with New Ground Disturbance, Change in Impervious Surfaces, and/or Vegetation Removal										
1)	Taxiway A4 and A3 alignment with signage and lighting modifications design and reconstruction	No Impact Anticipated. Construction BMPs. Stormwater infrastructure developed for compliance through existing permit requirements.	No Impact Anticipated. Construction BMPs.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated. Archaeological surveys if native soils excavated.	No Impact Anticipated.	No Impact Anticipated.	SEPA Categorical Exemption Anticipated. Potentially eligible for NEPA Categorical Exclusion unless extraordinary circumstances were identified as defined in FAA Order 1050.1F.
2)	Airport Service Road (ASR) modifications design and reconstruction and relocation of Boeing Pump Station									
5)	Large Aircraft Parking Apron design and construction									
6)	Taxiway A4 and A3 signage and lighting modifications design and removal									
12)	Taxiway B signage and lighting extension and runway guard lights installation design and construction									
13)	Taxiway A signage and lighting modifications design and reconstruction and runway guard lights installation design and construction									
14)	Taxiway A lighting and runway guard lights design and installation									
15)	Taxiway B lighting and runway guard lights design and installation									
18)	Taxiway B pavement maintenance design and reconstruction									
19)	Apron pavement maintenance design and reconstruction									
21)	Runway 32L ALSF-I design and construction and obstruction removal									
8)	Taxiway A5 signage and lighting modifications design and reconstruction and runway guard lights installation design and construction	No Impact Anticipated. Construction BMPs. Stormwater infrastructure developed for compliance through existing permit requirements.	No Impact Anticipated. Construction BMPs.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated. Archaeological surveys if native soils excavated	USFWS NWI mapped wetlands. Coordination with USACE, Ecology, and King County.	No Impact Anticipated.	SEPA Categorical Exemption Anticipated. NEPA documentation would likely be required for the 300-ft runway shift.
11)	Runway 14R/32L pavement and lighting extension design and reconstruction				Noise sensitive receptor site noise analysis required at Steam Plant and residences.	Noise sensitive receptor site noise analysis required at Steam Plant.	Noise sensitive receptor site noise analysis required at Steam Plant.	No Impact Anticipated.		
16)	Runway 14L/32R pavement, lighting, and signage design and reconstruction and modifications				No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated. Archaeological surveys if native soils excavated.			
17)	Taxiway A pavement maintenance design and reconstruction									
Airside Projects with No New Ground Disturbance, Change in Impervious Surfaces, or Vegetation Removal										
3)	ATC Operational Waiver update request submittal	No Impact Anticipated. No Ground Disturbance.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	SEPA Categorical Exemption Anticipated. Acquisition over 3 acres could require preparation of an EA under NEPA.
4)	Multiple Runway 14R/32L modifications of standards request submittals									
9)	Runway 14 RPZ acquisition	No Impact Anticipated. Land acquisition.			RPZ land use compatibility consultation required.		NRHP determination for acquisition of Boeing Field Apartments			
20)	Runway 14R Departure RPZ acquisition									
7)	Taxiway A signage and lighting modifications design and realignment	No Impact Anticipated. Light installations.								

SOURCE: *Anchor QEA and Synergy Consultants, Inc.*
Note: Project number corresponds to numbers shown on Figure E4.

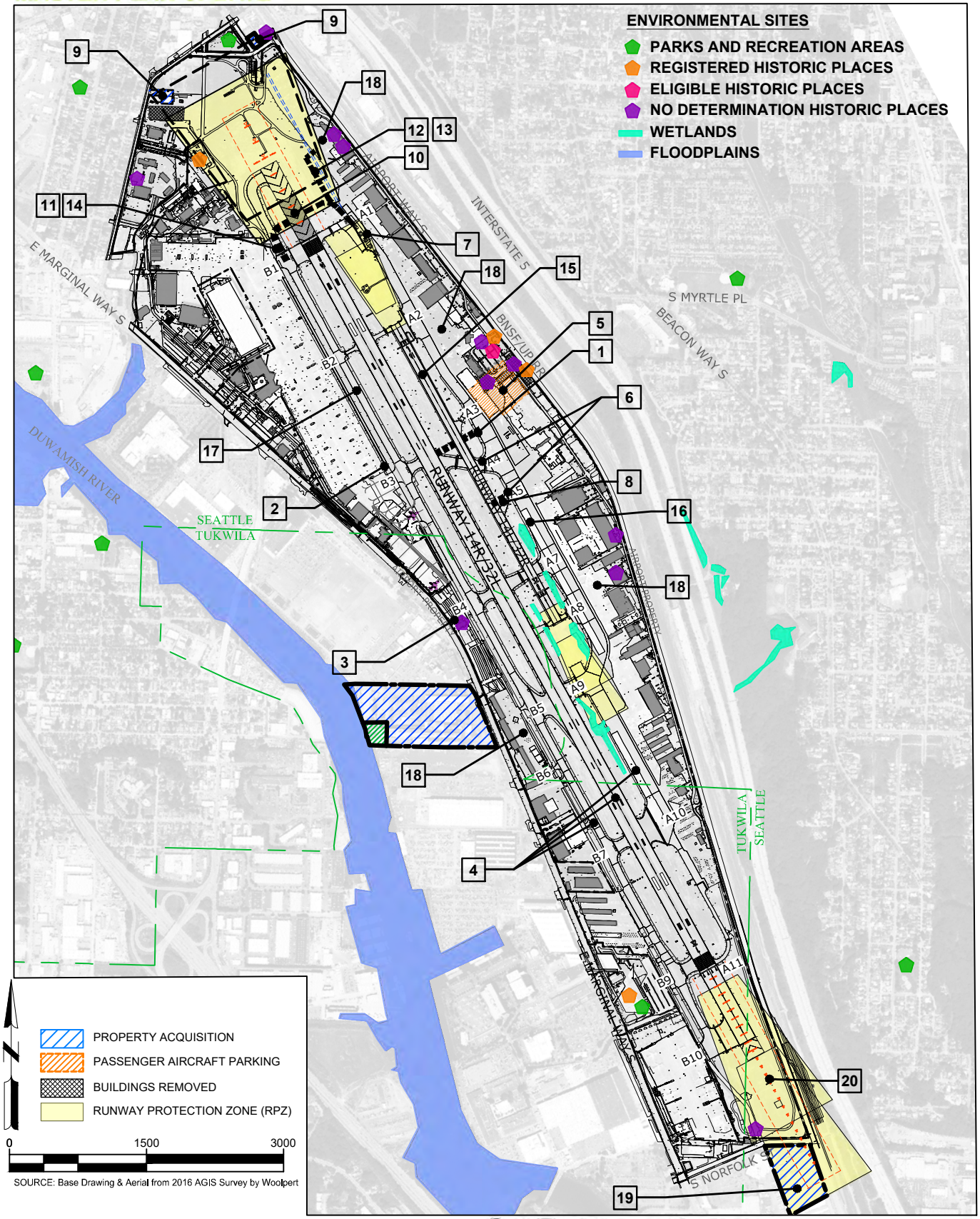


FIGURE E4 **Airside CDP Projects With Existing Environmental Conditions**

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TABLE E9 **SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS OF PROPOSED MP UPDATE LANDSIDE PROJECTS**

Project Number	Description	Surface Water, Groundwater	Earth, Plants, and Animals/Biotic Communities and Endangered Species	Energy and Natural Resources, Public Services and Utilities, Solid Waste	Land Use Compatibility, Social and Socio-Economic	DOT 4(f) Lands and Recreational Uses	Historic, Cultural, and Archaeological Resources	Wetlands	Floodplains, Coastal Zone, and Wild and Scenic Rivers, Farmland, Aesthetics, Views, Light Emissions	Potential Environmental Processing
Landside Projects with New Ground Disturbance, Change in Impervious Surfaces, and/or Vegetation Removal										
1)	Aircraft Parking Apron design and construction and South Arrivals Building removal	No Impact Anticipated. Construction BMPs. Stormwater infrastructure developed for compliance through existing permit requirements.	No Impact Anticipated. Construction BMPs.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated. Archaeological surveys if native soils excavated.	No Impact Anticipated.	No Impact Anticipated.	SEPA Categorical Exemption Anticipated. Projects may be eligible for a NEPA Categorical Exclusion if no extraordinary circumstances would arise
6)	New Fuel Storage Facility design and construction		Potential lower Duwamish Waterway shoreline construction activities. Coordination and permits with USACE, Ecology, and King County.						No Impact Anticipated if no work below Lower Duwamish Waterway MHHW proposed.	SEPA Categorical Exemption Anticipated. Construction below MHHW would initiate Federal, State, and Local permits.
7)	Steam Plant access road design and construction		No Impact Anticipated. Construction BMPs.			Section 4(f) evaluation possibly required			No Impact Anticipated.	SEPA Categorical Exemption Anticipated. Projects may be eligible for a NEPA Categorical Exclusion if no extraordinary circumstances would arise.
10)	Southwest GA Development Area and Woods Meadows buildings demo					No Impact Anticipated.				
11)	Modify existing property for Airport Maintenance Facilities and Airport Administration Offices relocation									
15)	Stormwater system rehabilitation design and construction									
16)	Stormwater system rehabilitation design and construction									
Landside Projects with No New Ground Disturbance, Change in Impervious Surfaces, or Vegetation Removal										
1)	Passenger Terminal Area design and construction modifications	No Impact Anticipated. Construction BMPs. Stormwater infrastructure developed for compliance through existing permit requirements.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	SEPA Categorical Exemption Anticipated. Projects may be eligible for a NEPA Categorical Exclusion if no extraordinary circumstances would arise
2)	Modern Aviation redevelopment improvements design and construction									
3)	Kenmore Aero redevelopment improvements design and construction									
4)	UPS redevelopment improvements design and construction									
8)	Perimeter Intrusion Detection System design and construction									
9)	Snow Removal Equipment building design									
14)	FAA Flight Service building renovation									
17)	ATCT Siting Study preparation	No Impact Anticipated. Land acquisition.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	No Impact Anticipated.	Projects may be eligible for a NEPA Categorical Exclusion if no extraordinary circumstances would arise. Acquisition over 3 acres may require preparation of an EA.
5)	Jorgensen Forge property acquisition									
12)	Property acquisition north of Airport Maintenance Building and vacate roadway									
13)	Woods Meadow property acquisition									

SOURCE: *Anchor QEA and Synergy Consultants, Inc.*
Note: Project number corresponds to numbers shown on Figure E5.

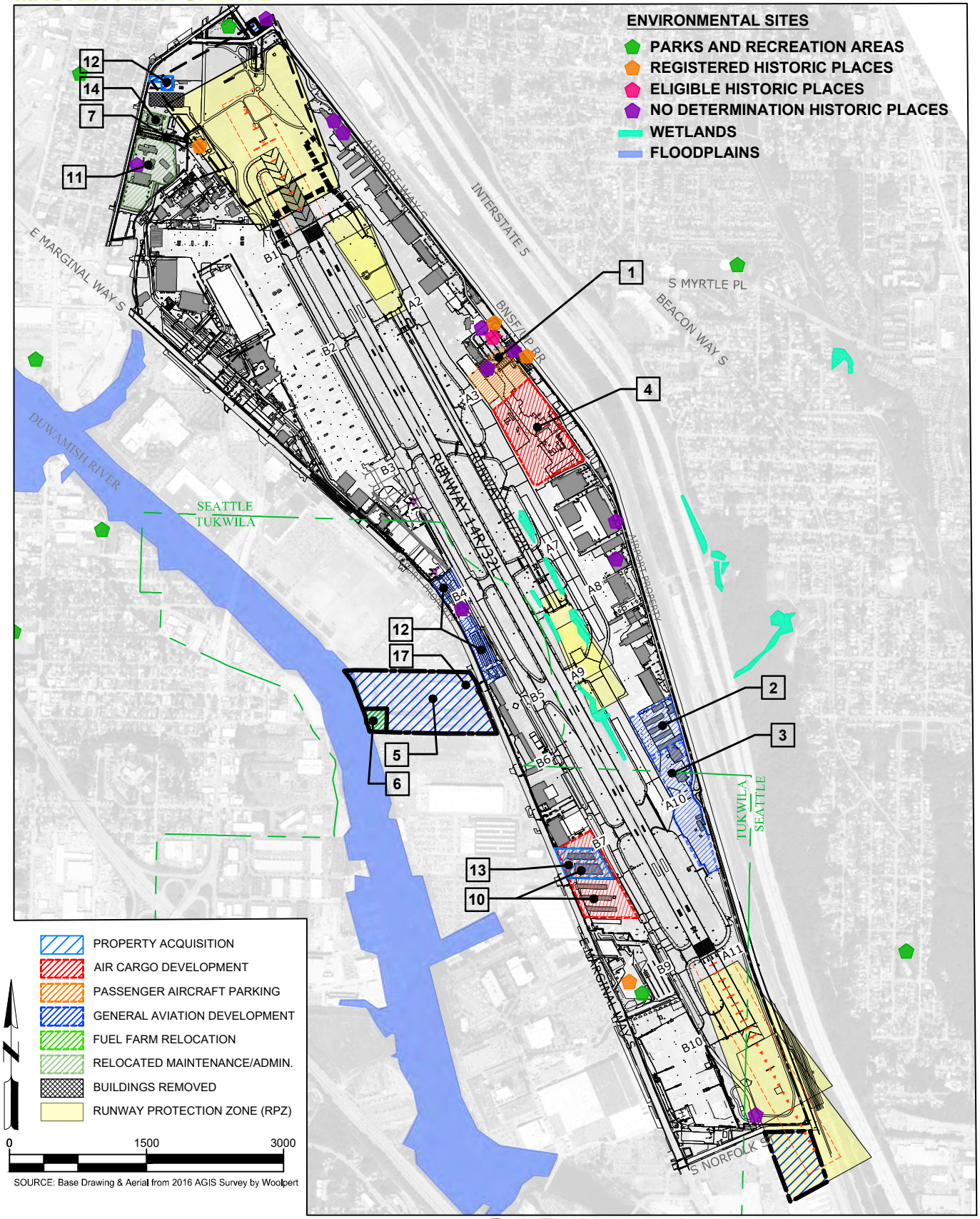


FIGURE E5 **Landside CDP Projects With Existing Environmental Conditions**

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