DRAFT—Cultural Resources Assessment for Burlington Northern Santa Fe (BNSF) Intermodal Facility Access, City of Tukwila, King County, Washington

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This report was prepared by HRA archaeologists Alexander E. Stevenson, Michele Punke, and Jordan Pickrell, and by HRA architectural historian Carl Williams, all of whom meet the Secretary of the Interior's professional qualifications standards for their respective professions. This report is intended for the exclusive use of the Client and its representatives. It contains professional conclusions and recommendations concerning the potential for project-related impacts to archaeological resources based on the results of HRA's investigation. It should not be considered to constitute project clearance with regard to the treatment of cultural resources or permission to proceed with the project described in lieu of review by the appropriate reviewing or permitting agency. This report should be submitted to the appropriate state and local review agencies for their comments prior to the commencement of the project.

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1. Introduction and Project Description

The project area is located in the incorporated community of Allentown, within the City of Tukwila. For several years, the City has worked with Allentown residents on issues related to community impacts resulting from the BNSF South Seattle Intermodal Facility, and on identifying alternatives for a rerouted truck access—one with fewer adverse impacts on the neighborhood. Trucks currently use 42nd Avenue S and S 124th Street to access the rail facility. Over 20 different alternatives for truck access to the rail facility have been studied since 1998.

Truck traffic has increased along the existing truck route over the last several years, due to increased rail activity. The approximately 50 homes along S 124th Street experience 24-hour per day truck traffic, adding to the other existing airport, highway, and train noise levels in the neighborhood. Truck traffic also creates safety issues for residents. To the extent that truck traffic backs up at the checkpoint station at the east end of S 124th Street, trucks line up, idling on S 124th Street, waiting to check into the rail facility, creating access difficulties, vehicle exhaust, noise, and safety issues for residents.

This report presents the results of cultural resource analysis for five alternatives for the City of Tukwila's (City) Burlington Northern Santa Fe (BNSF) Intermodal Facility Access project (the project). Historical Research Associates, Inc. (HRA), staff reviewed multiple datasets, including the Department of Archaeology and Historic Preservation's (DAHP) on-line database, as well as King County tax assessor records, geologic data, and historic maps. The results of this analysis are presented in Sections 2, 3, and 4. General recommendations regarding additional activities are included in Section 5.

1.1 Regulatory Context and the Area of Potential Effects

There is currently no specific regulatory context for the project. However, it is anticipated that federal funds or permitting or both will be necessary when an alternative access route is selected for development, and that the project will be classified as a federal undertaking. As such, HRA's analysis establishes an appropriate context for eventual compliance under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, as well as with requirements of the National Environmental Policy Act (NEPA).

1.1.1 Access Alternatives

Five Access Alternatives were selected by the City for examination and analysis (Figure 1-1).

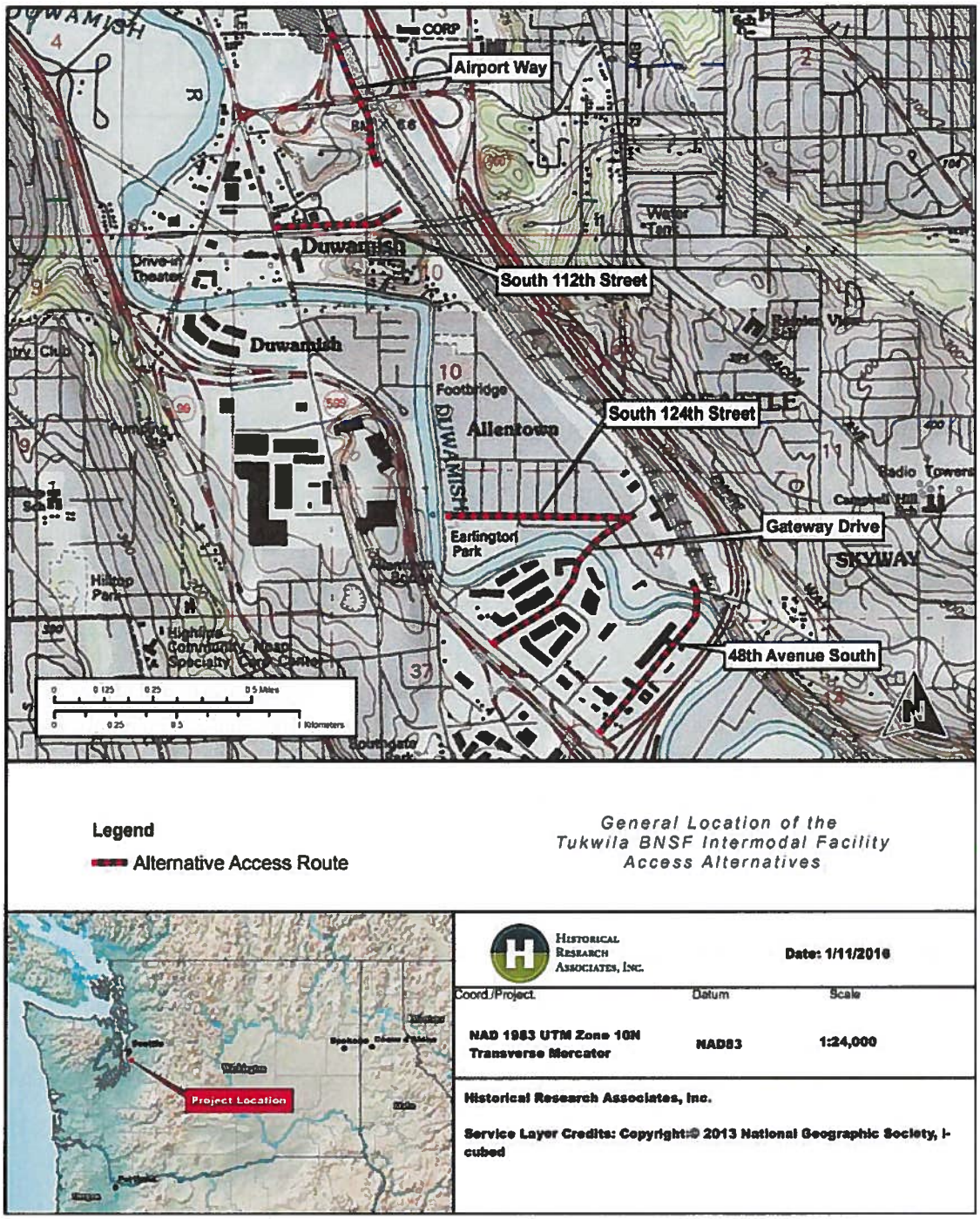

Figure 1-1. Locations of the Access Alternatives.

2. Known Archaeological Sites, Ethnographically Important Places, and Traditional Cultural Properties

This chapter provides a review of archival data, including previous cultural resources surveys—documented archaeological sites; historic-period buildings, structures, and objects (BSOs); and historic maps. Understanding the parameters of previous cultural resource surveys and the location and characteristics of known cultural resources in the vicinity of a project is important for understanding how intensively work has been conducted in the area and the potential for additional cultural materials in the project area.

2.1 Methods

HRA archaeologist Alexander Stevenson, MS, conducted an archival record search for records pertaining to locations within a 0.25-mile search radius of the each alternative access route. Mr. Stevenson searched the DAHP's online database, the Washington Information System for Architectural and Archaeological Records Data (WISAARD), for cultural resource survey reports, archaeological site records, historic property inventory (HPI) forms, historic register information, and cemetery records. He also reviewed a statewide archeological predictive model on DAHP's WISAARD for probability estimates for archaeological resources.

2.2 Archival Research Results

2.2.1 Previous Cultural Resources Studies

Twenty cultural resource studies have been conducted within the 0.25-mile search radius of the Access Alternatives since 1995 (Table 2-1). These studies have included both surface and subsurface survey. Many of these studies have focused on work in the vicinity of recorded archaeological sites and known traditional cultural properties (TCPs) along the Duwamish River (see Sections 2.2.2 and 2.2.5 below). These studies have not included large enough sections of the Access Alternatives that they would suffice to support a detailed interpretation of the presence or absence of archaeological deposits.

Table 2-1. Previous Cultural Resource Studies Conducted within the 0.25 mile Search Radius of the Access Alternatives.

Access Alternatives	NADB	Title	Citation
Airport Way; South 112th Street; Gateway Drive; 48th Avenue South	1339816	*Central Link Light Rail Transit Project, Final Environmental Impact Statement, Technical Report, Historic and Prehistoric Archaeological Sites, Historic Resources, Native American Traditional Cultural Properties, Paleontological Sites*	Courtois et al. 1999
Airport Way; South 112th Street; Gateway Drive; 48th Avenue South	1339836	*Central Link Light Rail Transit Project, Final Environmental Impact Statement, Technical Report, Historic and Prehistoric Archaeological Sites, Historic Resources, Native American Traditional Cultural Properties, Paleontological Sites*	Courtois et al. 1999
South 124th Street	1339746	*Results of Exploratory Backhoe Trenching for the City of Tukwila Community Recreation Center Project*	King 1995
South 124th Street	1334688	*King County Department of Natural Resources Water Pollution Control Division, Alki Transfer/ CSO Facilities Project, Allentown Site (45KI431) and White Lake Site (45KI438 and 45KI438A) Data Recovery*	Lewarch et al. 1996
South 124th Street	1339760	*Cultural Resource Monitoring Alki Transfer/ CSO Facilities Project, Southern Transfer/ Interurban Project*	Robbins et al. 1996
Airport Way; South 112th Street; South 124th Street	1339749	*Cultural Resource Monitoring Alki Transfer/ CSO Project, Allentown Trunk*	Robbins et al. 1995
South 124th Street; Gateway Drive	1340097	Memo RE: *Cultural Resources Reconnaissance Survey and Monitoring of Geotechnical Test Trenches at Codiga Farms Backwater Channel Site, Tukwila, Washington*	Grant 2001
South 124th Street; Gateway Drive; 48th Avenue South	1340277	*Archaeological Monitoring at Three Locations for the Level 3 Construction Project from the Lewis River to Seattle*	Ellis and Erickson 2000
Airport Way	1686481	*Cultural Resources Assessment for the Boeing Access Road Rehabilitation Project, Tukwila, King County, Washington*	Baldwin et al. 2015
Airport Way	1353028	*Cultural Resources Reconnaissance for Norfolk Water Quality Treatment Site and Puget Creek Natural Area, City of Seattle, King County, Washington*	Silverman et al. 2009
Airport Way	1682084	*Results of Archaeological Monitoring for the Norfolk MLK Water Quality Treatment Site Project, Seattle, Washington*	Earley 2012
South 112th Street	1686392	*Duwamish Hill Preserve Phase II Project, Tukwila, King County, Washington*	Hoyt et al. 2015

Table 2-1. Previous Cultural Resource Studies Conducted within the 0.25 mile Search Radius of the Access Alternatives.

Access Alternatives	NADB	Title	Citation
South 112th Street	1681545	*Letter to Dennis Clark RE: Subsurface Investigation of the Proposed Duwamish Gardens*	Johnson and Hoyt 2008
South 112th Street	1683387	*Duwamish Gardens Project, City of Tukwila, King County, Washington, Archaeological Delineation at 45-KI-703*	Lockwood et al. 2013
South 112th Street	1684792	*Eligibility Recommendation for the Historic Component of Archaeological Site 45-KI-703*	Allen and Johnson 2014
South 112th Street	1354290	*The Duwamish River Bend Site Data Recovery at 45KI703*	Blukis Onat et al. 2010
South 112th Street	1351592	*Cultural Resources Investigations for the River Bend Hill Trail Redevelopment, King County, Washington*	Cowan 2007
South 112th Street	1351593	*Cultural Resources Shovel Probe Subsurface Investigation for the River Bend Hill Trail Redevelopment, King County, Washington*	Cowan and Blukis Onat 2008
South 112th Street	1683238	*Cultural Resources Assessment for the Creston Duwamish Transmission Poles Replacement Project, King County, WA*	Shantry 2011

2.2.2 Previously Recorded Archaeological Sites

The Duwamish River valley in the general vicinity of the Access Alternatives includes several precontact archaeological sites that have been determined eligible for or are listed in the National Register of Historic Places (NRHP). Although many of these sites have been recorded outside of the search radius, their presence speaks to the heightened archaeological potential of this general area.

A total of four previously recorded archaeological sites are located within 0.25 miles of at least one alternative access route (Table 2-2). Two of these sites, 45KI431 and 45KI703, have been determined eligible for listing in the NRHP. Site 45KI431, a Native American village, is located within the South 124th Street alternative access route. Sites 45KI703 and 45KI516—representing occupation or camp sites from the precontact through historic eras—are not located immediately adjacent to any of the Access Alternatives but represent site-types that may be found near or within any of the Access Alternatives.

Table 2-2. Previously Recorded Archaeological Sites within the 0.25 mile Search Radius of the Access Alternatives.

Alternative Access Route	Site No. (citation)	Citation	Site Type/Description	NRHP/WHR status	Distance from Alternative access route (direction)

Table 2-2. Previously Recorded Archaeological Sites within the 0.25 mile Search Radius of the Access Alternatives.

Alternative Access Route	Site No. (citation)	Citation	Site Type/Description	NRHP/WHR status	Distance from Alternative access route (direction)
All	45KI538*	Hudson 1996	Railroad/ Columbia and Puget Sound Railroad – Current BNSF Railroad	Unevaluated	Adjacent to or within all Access Alternatives
South 112th Street	45KI703	LeTourneau 2004	Precontact camp/ Large precontact camp	NRHP eligible	0.15 miles south
Gateway Drive; South 124th Street	45KI431*	Lewarch 1992	Precontact shell midden/village	NRHP eligible	Within South 124th Street Alternative; 0.25 miles northeast of Gateway Drive Alternative
48th Avenue South	45KI516	Roedel 2002	Multicomponent site (Ethnographic/ Historic-era)/ Occupation site	Unevaluated	0.23 miles south

*likely to be directly affected/impacted by development

Site 45KI538, remnants of the Columbia and Puget Sound Railroad, which is the current BNSF alignment, is adjacent to or included in all Access Alternatives. This site has not been evaluated for NRHP eligibility.

2.2.3 Cemeteries

No cemeteries or isolated human remains are recorded in WISAARD within the 0.25-mile search radius of any of the Access Alternatives.

2.2.4 Ethnogeography

Thomas Talbot Waterman recorded important Native American place names in the Puget Sound region in the early 1900s (Waterman 1922). The names of places attest to the importance of the landscape for Native Americans in the area. Often these place names convey information about resources that may be collected in an area, but they may also describe unique features on the land or villages in the area. There are many important ethnographic places in the vicinity of the Access Alternatives.

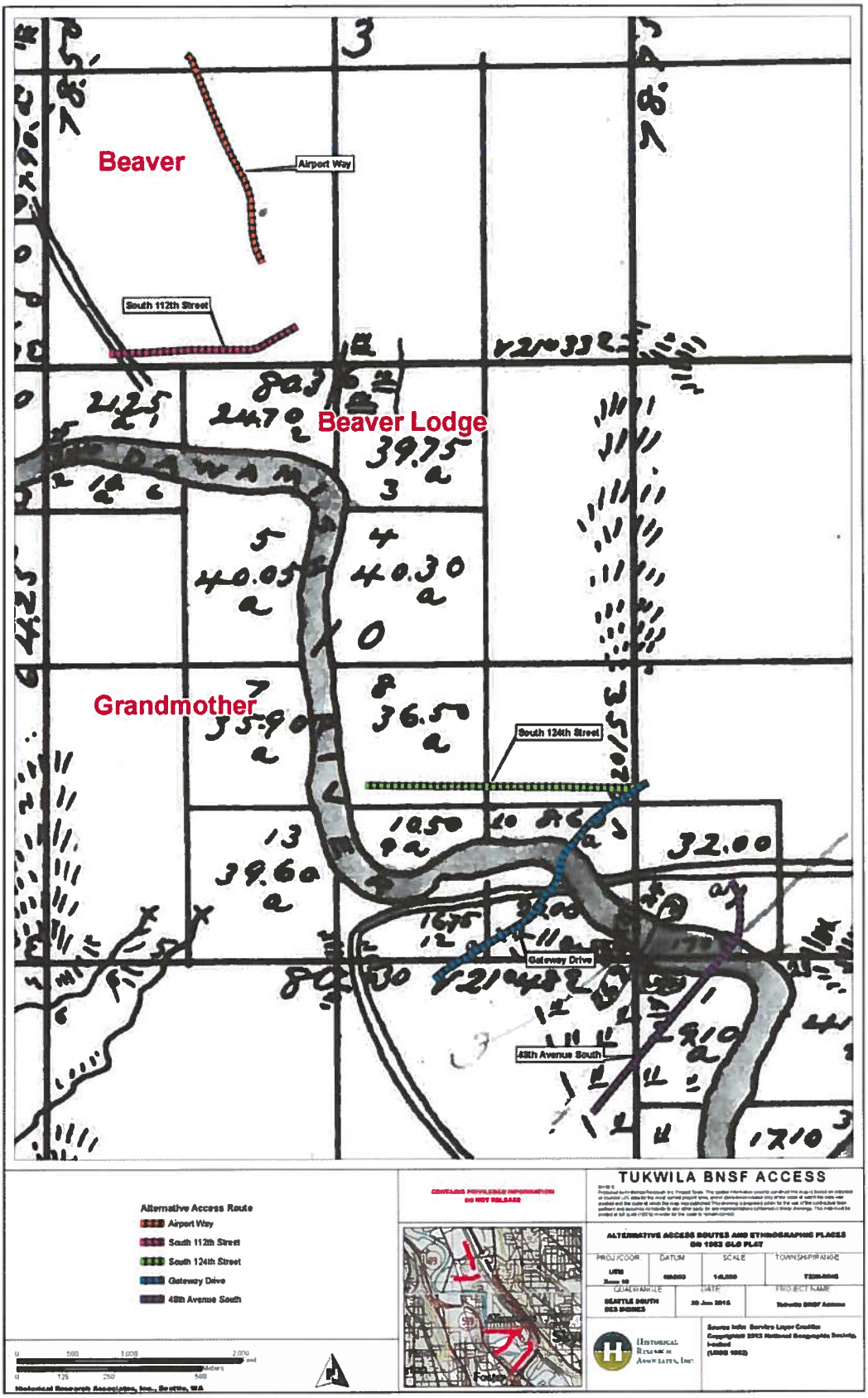

Figure 2-1. Approximate locations of ethnographically important places in the vicinity of the Access Alternatives.

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The locations known as "Beaver" and "Beaver Lodge" (Hilbert et al. 2001:119–127, location 191) are located near the Airport Way and South 112th Street Alternative routes. This area also figures prominently in the well-known North-wind and South-wind story (Miller and Blukis Onat 2004). The location known as "Grandmother" is noted in the vicinity of the southern Access Alternatives (Hilbert et al. 2001; Miller and Blukis Onat 2004).

2.2.5 *Traditional Cultural Properties*

The Duwamish River holds particular importance for Puget Sound Native American groups (Ballard 1929; Haeberlin and Gunther 1930; Hilbert et al. 2001). Although anthropogenic forces have changed the river dramatically over the last 200 years, the river retains this importance (Miller and Blukis Onat 2004). Importance of the river is primarily derived from its use as a fishing location and its place in the cosmology of local Native American groups.

Larson (1996) and others (i.e., Miller and Blukis Onat 2004) have documented the traditional cultural importance of a number of specific locations along the Duwamish River in the vicinity of the Access Alternatives. At least five individual locations that may be considered TCPs were identified through interviews conducted by Larson in 1994 (Larson 1996). Because TCPs are highly sensitive cultural locations, their exact locations are not included here. There is at least one TCP (recorded by Larson 1996) within 0.25 miles of each alternative access route.

2.3 Historic Map Review

2.3.1 *Airport Way*

The Airport Way alternative access route is located in the southwestern quarter of Section 3, Township 23 North, Range 4 East, Willamette Meridian. No land ownership or cultural features are indicated along this alternative access route in the 1862 and 1863 General Land Office (GLO) plats (USSG 1862, 1863). By 1895, the Columbia & Puget Sound Rail Road track was located along the Airport Way alignment (USGS 1895). In 1907, the Northern Pacific Railway owned the track. It is currently owned by BNSF. The access route falls within the railroad right of way, which is recorded on maps through 1936 (Kroll 1912, 1926; Metsker 1936). It also appears on aerial photographs between 1936 and 2013. Parcels in the immediate vicinity of the Airport Way access route were generally agricultural or forested through the mid-1960s. In 1968 and 1969, the rail yard was constructed at the south end of the access route. The South Boeing Access Road and the overpass spanning the Airport Way access route were constructed between 1964 and 1968. Industrial development in the general area occurred during the latter part of the twentieth century. The parcels immediately adjacent to the access route were landscaped. No buildings are evident on aerial photographs of those parcels between 1940 and 2013 (NETR 1940, 1964, 1968, 1969, 1980, 1990, 2013).

2.3.2 South 112th Street

The South 112th Street alternative access route is located near the south edge of the southwestern quarter of Section 3, Township 23 North, Range 4 East, Willamette Meridian. A section of road appears to cross the western end of the access route on the 1862 GLO plat (USSG 1862). By 1895, the unnamed road was further developed, running along the eastern bank of the Duwamish River to the north and south of the South 112th Street alternative access route. A few houses were located along the road in the 1890s. By this date, the Columbia & Puget Sound Rail Road track was located to the east of the South 112th Street alternative access route (USGS 1895). The Northern Pacific Railway owned and operated the track in the early twentieth century. BNSF owns the track at present. The Seattle Tacoma Electric Rail Road crossed the western end of the alignment by 1907. The Kroll Map Company's 1912 King County Atlas maps the Seattle Tacoma Interurban Railway across the alignment, approximately 360 feet from the western end of the South 112th Street alternative access route. This location is further documented by later twentieth-century atlases, and the line was abandoned by 1936 (Kroll 1912; Kroll 1926; Metsker 1936). Aerial photographs of the area between 1936 and 2013 indicate that the parcels remained agricultural or forested through 1940. A few commercial/industrial buildings were constructed northwest of the South 112th Street alternative access route by 1964. Further development occurred through the second half of the twentieth century (NETR 1964, 1968, 1969, 1980, 1990, 2013).

2.3.3 South 124th Street

The South 124th Street alternative access route is located in the southeastern quarter of Section 10, Township 23 North, Range 4 East, Willamette Meridian. No land ownership or cultural features are documented in the vicinity of the South 124th Street alternative access route on the 1862 GLO (USSG 1862). By 1895, the Columbia & Puget Sound Rail Road/Northern Pacific Rail Road track was in place at the east end of the South 124th Street alternative access route (USGS 1895), and the track alignment has remained in that location through the present (Anderson 1907; Kroll 1912; Kroll 1926; Metsker 1936). It is currently owned by BNSF. By 1895, an unnamed road running along the east bank of the Duwamish River crossed the western end of the South 124th Street alternative access route. The alternative access route follows the alignment of that road from the draw bridge spanning the river through the length of the route, which is within the Allentown Acres Addition, as mapped by Anderson (1907). Between 1907 and 1926, the alignments of unnamed roads within the Allentown Acres Addition shifted in relation to the South 124th Street alternative access route. The current east–west alignment was labeled as South 124th Street by 1936 (Kroll 1912, 1926; Metsker 1936). A few structures are present, mostly on parcels south of the alternative access route, in the 1930s and 1940s. The majority of commercial/industrial development in the vicinity began in the 1950s, continuing into the 1960s (NETR 1936, 1940, 1956, 1964, 1968, 1969, 1980).

2.3.4 Gateway Drive

The Gateway Drive alternative access route is located in the southeastern quarter of Section 10, Township 23 North, Range 4 East, Willamette Meridian. It crosses the Duwamish River in a northeast to southwest alignment. Near the west bank of the Duwamish River, the Gateway Drive alternative access route crosses an unnamed road depicted on the 1862 GLO Plat (USSG 1862). In 1863, the land on the west bank of the river was owned by C. C. Lewises. The Gateway Drive alternative access route is located within Bennett L. Johns' claim on the east bank of the Duwamish (USSG 1863). By 1907, Jos. Foster owned the property on the west bank of the Duwamish. The Seattle Tacoma Electric Rail Road was mapped adjacent to the western end of the Gateway Drive alternative access route by 1907 and is recorded as the Seattle Tacoma Interurban Railway on maps from 1912 and 1926. The line was abandoned by 1936. East of the river, the Gateway Drive alternative access route is within the Allentown Acres Addition (Anderson 1907; Kroll 1912, 1926; Metsker 1936). The area of the Gateway Drive alternative access route west of the Duwamish River remained agricultural or undeveloped through the 1960s. In the 1970s, a large commercial/industrial structure was built northwest of the Gateway Drive alternative access route. By 1990, the contemporary structures appear in aerial photographs of the area. On the east bank of the Duwamish River, initial construction within the Allentown Acres Addition began as early as the 1930s, with the majority of the development occurring in the mid-twentieth century (NETR 1936, 1940, 1956, 1964, 1968, 1969, 1980).

2.3.5 48th Avenue South

The 48th Avenue South alternative access route runs from the northeastern quarter of Section 15, across the northwestern corner of Section 14, crosses the Duwamish River at a southwest to northeast alignment, and turns north in the southwestern quarter of Section 11, Township 23 North, Range 4 East, Willamette Meridian. An unnamed road depicted on the 1862 GLO plat intersects the northern end of the 48th Avenue South alternative access route (USSG 1862). On the 1863 GLO plat, the alternative access route crosses land claimed by C. C. Lewises and Stephen Foster west of the Duwamish River and Bennett L. Johns' claim on the east bank of the river (USSG 1863). The Seattle Tacoma Electric Rail Road ran perpendicular to the western end of the 48th Avenue South alternative access route by 1907. It is mapped as the Seattle Tacoma Interurban Railway between 1912 and 1936. By 1936, the track had been abandoned (Kroll 1912, 1926; Metsker 1936). Interstate 5 was constructed south of the 48th Avenue South alternative access route in the 1960s. The large building adjacent to the north of the alternative access route, west of the Duwamish River, was constructed between 1968 and 1969. Additional commercial/industrial buildings appear north of the 48th Avenue South alternative access route by 1980 (NETR 1964, 1968, 1969, 1980).

3. Archaeological Potential

This chapter provides a review of geologic data derived from a number of sources and is a geoarchaeological analysis of sediments observed in previous studies, which are used to assess archaeological potential of the five proposed alternative routes. DAHP's predictive model is also referenced to address the routes' archaeological potential.

3.1 Methods

HRA reviewed geotechnical manuscripts, online geological resources, historical maps, and LIDAR topographic data in order to reconstruct the geological setting and the geomorphic history of the Duwamish River Valley near the Access Alternatives. Access Alternatives were plotted on available surficial geology maps using ESRI ArcGIS geographic information systems (GIS) software.

3.2 General Geology

The Access Alternatives are located near the eastern margin of Puget Sound within the Puget Lowland. The Quaternary history of landform genesis within the Puget Lowland is complex and has involved a variety of glacial and interglacial depositional and erosional forces. Additional modifiers of the landscape include, but are not limited to, tectonic deformation; relative sea level rise and fall driven by climate change and isostatic adjustments; alluvial deposition; and extensive modification by humans. The following discussion will present the current geologic setting of the alternatives analysis area by examining the physiographic setting and geomorphic history of the region.

3.3 Access Alternatives

The eastern portions of the South 124th Street, Gateway Drive, and 48th Avenue South Access Alternatives are situated along the upland margins of the Duwamish River valley, positioned on Eocene-aged marine sandstone and volcaniclastic rock (Harris 1998; Nesbitt 1998; Troost and Booth 2008). Since the end of the last glacial period, the uplands within the project area have remained relatively unmodified by natural erosional or depositional forces. Landscape stability in the uplands has allowed soils to form, but most of this land has been disturbed by modern human development of the area and has a lower potential for containing archaeological resources.

The majority of all five of the Access Alternatives are positioned on alluvial sediments in the Duwamish River valley. As with other river basins in the Puget Sound area, the Duwamish River valley was carved by subglacial fluvial action (Booth and Hallet 1993; Collins and Montgomery 2011; Dragovich et al. 1994). Prior to engineering modifications, the Duwamish River was a natural

distributary of the Cedar and Green Rivers, as well as the White River at certain times. At the end of the last glacial period, coincident isostatic rebound and global eustatic sea level rise resulted in near-constant sea level relative to landscape features near the latitude of the Access Alternatives. While most of the isostatic rebound occurred during the first one thousand years after glaciation, sea level rise continued until around 6,000 years ago when it reached near its present level (Clague et al. 1982; Mosher and Hewitt 2004).

As a result of this early- to mid-Holocene sea level rise, base levels within Puget Lowland rivers rose as well, infilling glacially-formed river valleys with alluvium. The depth of the alluvium within the Duwamish River valley is as much as 250 feet in some areas (Troost and Booth 2008). Near the project vicinity, over 150 feet of alluvium overlies bedrock (Troost and Booth 2008:Plate 2L). Included in this alluvial material are at least three lahar deposits originating from Mount Rainier between approximately 5,700 and 1,000 calibrated years before present (cal yr B.P.) (Dragovich et al. 1994; Zehfuss 2005), the largest of which was the 5700 cal yr B.P. Oceola Mudflow (Crandell 1971; Vallance and Scott 1997). Using rates of infilling from the nearby Puyallup River basin estimated by Dragovich et al. (1994), Lewarch et al. (1996:2–4) suggest that the river mouth and delta front would have reached the project vicinity around 1600 cal yr B.P. Prior to that time, the setting would have been dominantly marine and estuarine.

Human impacts to most of the river systems in the Puget Sound area have been extensive, with massive fill deposits overlying alluvial and estuary sediments at the majority of the river deltas in the area, including at the mouth of the Duwamish (Troost et al. 2005). Upriver from the mouth, the natural course of the Duwamish prior to human modification was meandering, with common nearby sloughs, oxbow lakes, and tributary channels that would have been important resource locations for local inhabitants. Although some of the lower elevation floodplain features have been infilled (Troost and Booth 2008), there remains the potential for buried archaeological deposits to be present. Deposition from overbank flooding along the mainstem of the channel and along the margins of now abandoned meanders may have buried evidence of human occupation of the area. These areas along the margins of the Duwamish River, especially those locations where disturbance has been limited to surface or near-surface sediments, have the greatest potential for containing intact archaeological deposits.

3.3.1 Airport Way

The Airport Way alternative encompasses portions of two Eocene-age bedrock knolls that likely represented islands in the drowned Duwamish valley during late glacial sea level rise (Lewarch et al. 1996:2–2). These knolls are thought to represent important locations described in local Native American legends of the North and South Winds (Waterman 1922). Since the last glacial period, these two bedrock knolls have remained relatively stable, with little gain or loss of surficial sediment due to natural processes. Boreholes excavated into the knoll on the western side of the alternative encountered clayey sediment in the upper 5 feet (likely residuum) and decomposing bedrock below

that depth (Seattle Engineering Department 1974). The potential for near-surface archaeological materials is moderate on the knolls, although this potential is largely dependent upon the history of development and disturbance of a particular location. There is very little potential for subsurface archaeological materials to be associated with the knoll landforms. Subsurface archaeological investigations of the knolls have revealed loamy sediments shallowly overlying bedrock on the knolls (Cowan and Blukis Onat 2008) and no evidence of archaeological deposits.

Boreholes drilled along the alignment of the Airport Way alternative revealed apparently intact organic-rich silts, sands, and clays below variable amounts of modern fill (AMEC 2003; Converse Consultants NW 1993a; Robinson and Ward 2002; Seattle Public Utilities 1951, 1952). Fill layers were generally thick in the immediate areas of transportation alignments, but much thinner elsewhere. Many of the boreholes extracted near to the knoll formations encountered sandstone bedrock deposits within the upper 5 to 10 feet (AMEC 2003; Converse Consultants NW 1993a). Areas between the knolls in the Airport Way alternative are composed of alluvium that has been modified by development, although the potential for intact near-surface or buried archaeological deposits is still relatively high.

3.3.2 South 112th Street

The South 112th Street alternative overlaps with and is directly south of the Airport Way alternative. The Duwamish River, adjacent to the alternative to the south, appears to occupy a route similar to its mid-1800s channel alignment (Figure 3-1). As with the Airport Way alternative, the depositional setting of the South 112th Street alternative is primarily alluvial, with the two bedrock knolls found at the northern and southern ends of the alternative. Archaeological potential for intact deposits on the knolls is moderate, although if present would likely be found near the surface.

Alluvial sediment sampled in the western portion of the South 112th Street alternative included a shallow layer of fill (a few feet in depth) overlying over 200 feet of clayey, silty, sandy, and gravelly alluvium with variable amounts of organics and shell (AMEC 2003). This deep alluvial record contains sediments consistent with the marine/estuarine/deltaic/alluvial evolutionary history of the Duwamish River valley that began at the end of the last glacial period (Dragovich et al. 1994). Archaeological shovel probing in the northern portion of the South 112th Street alternative by Shantry (2011) revealed floodplain alluvium, including beds of sand and silt, many with organic constituents, to a depth of at least 8.5 feet.

Figure 3-1. Historic and modern alignment of Duwamish River in the vicinity of Access Alternatives.

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Archaeological site 45KI703 is located adjacent to the South 112th Street alternative along the north bank of the Duwamish River. A thick, intact precontact archaeological deposit was found at this site buried below approximately 3 feet of alluvium and fill (Blukis Onat et al. 2010). Nearby shovel probing revealed modern materials and historic-era artifacts to a depth of approximately 3 feet below the surface, while precontact artifacts likely associated with 45KI703 were found at depths of between approximately 6 feet below the surface (Johnson and Hoyt 2003). Given this alternative's environmental and cultural setting, there is a high potential for near-surface and more deeply buried archaeological deposits to be present in the alluvial floodplain portions of this alternative.

3.3.3 South 124th Street

The South 124th Street alternative is positioned along the north bank of the Duwamish River within floodplain sediments. The southwestern portion of the alternative is positioned on a point bar formation that has been intensively studied as part of archaeological data excavations and studies at the Allentown Site (45KI431) (Lewarch et al. 1996). Archaeological deposits were discovered at the surface and found to extend over 6 feet in depth at the site. It is likely that deposits related to the site are still present in the area, although trench excavations on the shoreline of the Duwamish River in the southwestern portion of the alternative did not contain significant archaeological materials (King 1995). Nearby borehole data (Converse Consultants NW 1993a) suggest that intact floodplain and point bar deposits are present outside of the recorded archaeological site, and these deposits have the potential for containing archaeological material. There is high potential for encountering near surface or more deeply buried archaeological deposits along this alternative.

3.3.4 Gateway Drive

The Gateway Drive alternative is positioned along both banks of the Duwamish River within its alluvial floodplain. The alternative is located adjacent to the Allentown Site (45KI431) and a similar point bar landform forms the southwestern portion of the alternative. The Duwamish River has migrated slightly to the northeast since the mid-1800s (Figure 3-1), suggesting that sediments on the southwestern bank of the river at this location are likely capped by relatively recent alluvium or fill material. Portions of the alternative southwest of the former channel, however, are relatively intact (Converse Consultants NW 1993b) and have a high potential for containing archaeological materials. Archaeological investigations of backhoe trenches excavated on the northeast side of the river between the Gateway Drive and 48th Avenue South Access Alternatives encountered intact alluvial deposits to depths of 15 feet , although no archaeological materials were encountered (Grant 2001). There is high potential for encountering near-surface or more deeply buried archaeological deposits along this alternative.

3.3.5 48th Avenue South

The 48th Avenue South alternative is in a similar setting to the Gateway Drive alternative. The alternative is positioned on a point bar that has grown to the northeast as the river meandered in that direction (Figure 3-1). Sediments in the far southwestern portion of the alternative are covered in a thin layer (2 to 5 feet) of fill that overlies alluvium. As with the Gateway Drive alternative, the 48th Avenue South alternative has a high potential to contain near-surface or more deeply buried archaeological deposits on both sides of the river.

3.4 DAHP Predictive Model

DAHP created a predictive model for the State of Washington to assess the potential of areas across the state to contain archaeological resources. DAHP's model addresses prehistoric archaeological sites rather than historic-period sites, although the model also uses information from GLO mapped features associated with Native American occupation. Quite often, the size of the area to be modeled dictates the methods and variables used. DAHP's predictive model was geared toward a regional or statewide scale.

DAHP's predictive model was constructed using similar types of data on a large scale. Researchers used standardized and repeatable statistical methods (Bayesian and kriging) with regional environmental and cultural resources data. They correlated data on geology, soils, landforms, and from GLO plats with locations of known prehistoric archaeological sites to "determine the probability that, under a particular set of environmental conditions, another location would be expected to contain an archaeological site" (GeoEngineers 2009:3). The model also incorporates spatial proximity to archaeological resources and then adjusts the environmental prediction accordingly at a particular location.

By using these methods, DAHP's predictive model combined local information from field surveys to identify locations with five resulting predictions for encountering archaeological sites: Very High (5), High (4), Moderate (3), Low (2), and Very Low (1). The majority of the area where the Access Alternatives are proposed is considered High to Very High risk for containing archaeological resources.

4. Buildings, Structures, and Objects

This chapter provides a review of Buildings, Structures, and Objects (BSOs) at least 35 years of age or older that are in the study area of each alternative access route. BSOs of this age may be eligible for listing on local, state, or national historic registers, as such it is integral to know how many BSOs may be effected/impacted along each alternative access route.

4.1 Methods

The King County Assessor's website and WISAARD were both reviewed to assess the age and NRHP status of buildings structures and objects (BSOs) within or immediately adjacent to each of the Access Alternatives. BSOs that were at least 35 years old were specifically targeted for identification because they meet minimum age criteria, minus five years, for listing on the King County Landmarks Register (the City of Tukwila has an interlocal agreement for historic preservation with King County) and may meet the age criteria for listing on the NRHP and/or Washington Heritage Register (WHR). This 35 year minimum age threshold was used because it is anticipated that this project will require up five years of planning and permitting prior to construction.

Study areas, including Access Alternatives and adjacent tax parcels, were identified for BSO review (Figure 4-1). It is anticipated that development of any alternative access route would likely affect or impact these parcels. The effects/impacts of the development would likely not stretch beyond tax parcels that are immediately adjacent to the identified Access Alternatives.

4.2 Access Alternatives

A total of 48 BSOs older than 35 years old and adjacent to each of the Access Alternatives are discussed below and are highlighted in Figure 4-1 and figures in Appendix A. A total of eight BSOs have been evaluated for NRHP eligibility and determined not eligible. None of the BSOs within the study areas have previously been determined eligible for or listed in local, state, or national historical registers.

4.2.1 Airport Way

The Airport Way alternative study area includes 11 parcels, of which one parcel contains a BSO over 35 years of age—a governmental service building built in 1948 (Table 4-1; see Figure 4-1; Appendix A). None of the BSOs in this alternative study area have been evaluated for NRHP eligibility.

Table 4-1. Airport Way BSOs.

Parcel	Address	Year Built (1980+)	Landmark Status
032304-9099	10640 East Marginal Way S 98168	1948	Undetermined

4.2.2 South 112th Street

The South 112th Street alternative study includes 23 parcels, of which six parcels have BSOs over 35 years of age (Table 4-2; see Figure 4-1; Appendix A). They range in age from 1943 to 1975, and include a variety of uses from a multi-family duplex, to government and private service structures, as well as light industrial and transportation warehouses (King County 2015). None of the BSOs in this alternative study area have been evaluated for NRHP eligibility.

Table 4-2. South 112th Street BSOs.

Parcel	Address	Year Built (1980+)	Landmark Status
102304-9001	11222 East Marginal Way S 98168	1975	Undetermined
102304-9059	11231 East Marginal Way S 98168	1975	Undetermined
032304-9057	10868 East Marginal Way S 98168	1960	Undetermined
032304-9129	11180 East Marginal Way S 98168	1957	Undetermined
032304-9099	10640 East Marginal Way S 98168	1948	Undetermined
335140-0245	3928 S 113th St 98168	1943	Undetermined

4.2.3 South 124th Street

The South 124th Street alternative study area includes 52 parcels, of which 34 parcels include BSOs over 35 years of age (Table 4-3; see Figure 4-1; Appendix A). The 34 parcels include 30 residential buildings (27 single-family residences, three mobile homes, and one duplex); one warehouse; one convenience store; and one BNSF-owned railroad terminal. Six BSOs in this alternative study area were evaluated for NRHP eligibility and determined not eligible for listing in the NRHP (Appendix A) (DAHP 2015a, 2015b, 2015c, 2015d, 2015e, 2015f).

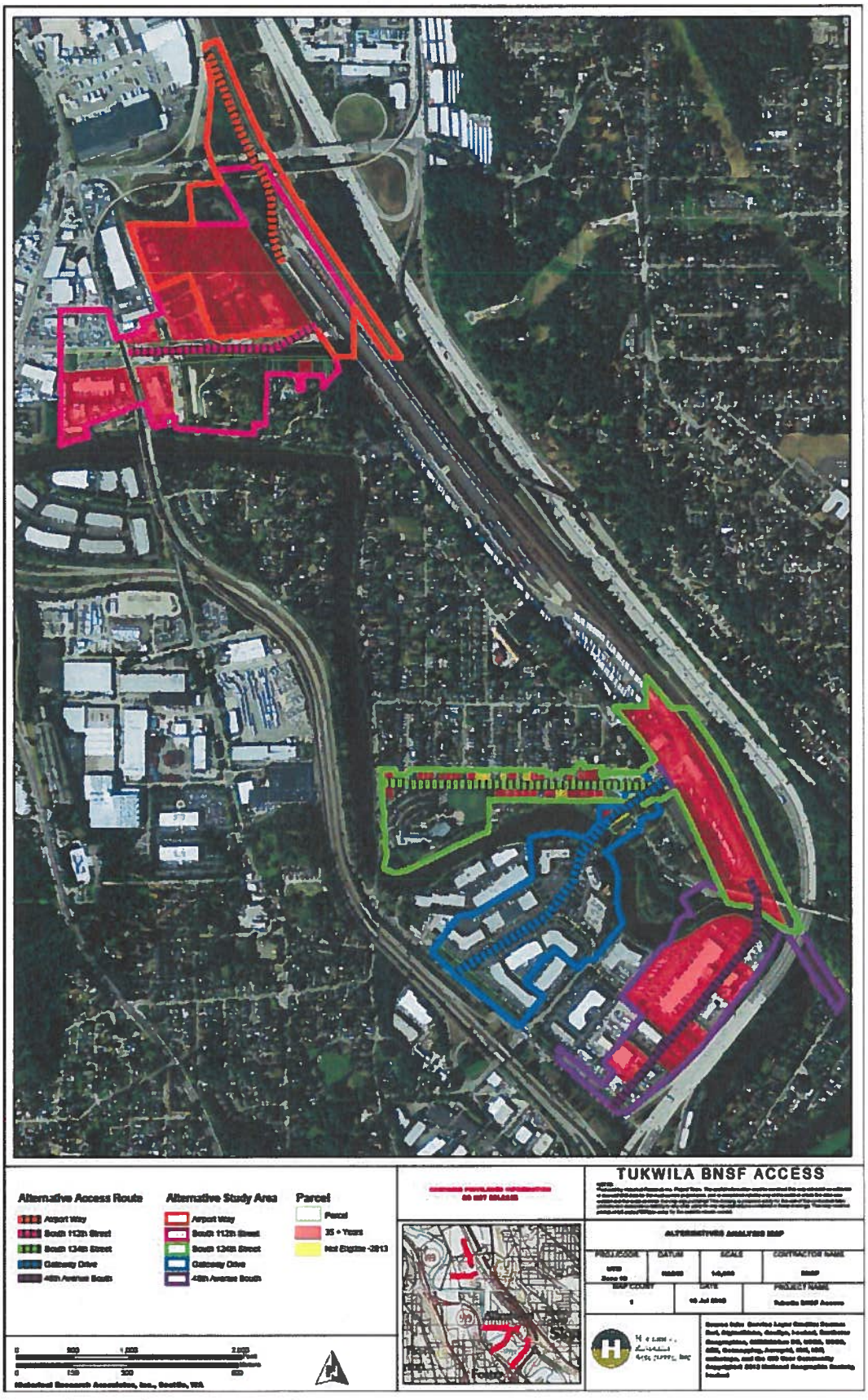

Figure 4-1. Study areas, BSOs over 35 years old, and NRHP status of BSOs over 35 years old.

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Table 4-3. South 124th Street BSOs.

Parcel	Address	Year Built (1980+)	Landmark Status
017900-0995	4610 S 124th St 98178	1943	Not eligible—2013
017900-1210	4702 S 124th St 98178	1943	Not eligible—2013
017900-2285	5023 S 124th St 98178	1943	Not eligible—2013
017900-2265	12404 50th Pl S 98178	1942	Not eligible—2013
017900-0785	4518 S 124th St 98178	1936	Not eligible—2013
017900-3115	4811 S 124th St 98178	1925	Not eligible—2013
017900-1660	12256 49th Ave S 98178	1979	Undetermined
017900-3135	4815 S 124th St 98178	1977	Undetermined
000380-0003	12200 51st Pl S 98178	1970	Undetermined
017900-3200	4919 S 124th St 98178	1967	Undetermined
017900-0782	4504 S 124th St 98178	1965	Undetermined
017900-3070	4715 S 124th St 98178	1962	Undetermined
017900-1225	4710 S 124th St 98178	1960	Undetermined
017900-3025	4615 S 124th St 98178	1958	Undetermined
017900-3170	4915 S 124th St 98178	1958	Undetermined
017900-1010	5616 S 124th St 98178	1954	Undetermined
017900-1465	4816 S 124th St 98178	1952	Undetermined
017900-0550	4402 S 124th St 98178	1951	Undetermined
017900-1240	4718 S 124th St 98178	1949	Undetermined
017900-3238	12404 42nd Ave S 98178	1947	Undetermined
017900-1230	4714 S 124th St 98178	1946	Undetermined

Table 4-3. South 124th Street BSOs.

Parcel	Address	Year Built (1980+)	Landmark Status
017900-0330	4306 S 124th St 98178	1943	Undetermined
017900-0340	4316 S 124th St 98178	1943	Undetermined
017900-0350	4318 S 124th St 98178	1943	Undetermined
017900-0565	4412 S 124th St 98178	1942	Undetermined
017900-0105	4208 S 124th St 98168	1928	Undetermined
017900-3030	4623 S 124th St 98178	1924	Undetermined
017900-3005	4603 S 124th St 98178	1924	Undetermined
017900-0575	4426 S 124th St 98178	1923	Undetermined
017900-0100	12258 42nd Ave S 98168	1922	Undetermined
017900-1665	4916 S 124th St S 9178	1922	Undetermined
017900-0555	4408 S 124th St 98178	1921	Undetermined
017900-3095	4801 S 124th St 98178	1906	Undetermined
017900-3055	4705 S 124th St 98178	1905	Undetermined

4.2.4 *Gateway Drive*

The Gateway Drive alternative study area includes 22 parcels, of which seven parcels include BSOs over 35 years of age (Table 4-4; see Figure 4-1; Appendix A). Of those parcels, six are single-family residences while the remaining parcel has a structure owned by BNSF. The single-family residences range in age from 1940 to 1957 (King County 2015). Four BSOs in this alternative study area were evaluated for NRHP eligibility and determined not eligible for listing in the NRHP (Figure 4-1; Appendix A) (DAHP 2015g, 2015h).

Table 4-4. Gateway Drive BSOs.

Parcel	Address	Year Built (1980+).	Landmark Status
017900-2845	12507 50th Pl S 98178	1957	Not eligible—2013
017900-2685	12410 50th Pl S 98178	1943	Not eligible—2013
017900-2285	5023 S 124th St 98178	1943	Not eligible—2013
017900-2265	12404 50th Pl S 98178	1942	Not eligible—2013
000380-0003	12200 51st Pl S 98178	1970	Undetermined
017900-2835	12501 50th Pl S 98178	1940	Undetermined
017900-2840	4925 S 125th St 98178	1920	Undetermined

4.2.5 48th Avenue South

The 48th Avenue South alternative study area includes 13 parcels, of which five parcels have BSOs over 35 years of age (Table 4-5; see Figure 4-1; Appendix A). The BSOs range in build date, from the oldest in 1969 to the youngest in 1980 (King County 2015). None of the BSOs in this alternative study area have been evaluated for NRHP eligibility.

Table 4-5. 48th Avenue South BSOs

Parcel	Address	Year Built (1980+)	Landmark Status
000300-0030	13050 48th Ave S 98168	1980	Undetermined
000480-0018	12840 48th Ave S 98168	1976	Undetermined
000300-0109	13123 Interurban Ave S 98168	1975	Undetermined
000380-0003	12200 51st Pl S 98178	1970	Undetermined
000480-0013	12855 48th Ave S 98168	1969	Undetermined

4.2.6 Additional Considerations

In addition to the BSOs within the study area, it should be noted that King County's 42nd Avenue South Bridge, or Allentown Bridge, built in 1949, is over the 35 year old threshold (King County 2015). It may require evaluation for historic register eligibility if there are any potential alterations to it.

5. Summary and Recommendations

The sections below summarize information developed in the previous sections and include recommendations regarding additional actions which may be needed if a particular alternative access route is selected for development. Summaries and recommendations are presented below that correspond to the materials discussed in the sections above.

5.1 Known Archaeological Sites, Ethnographically Important Places, and Traditional Cultural Properties

All of the Access Alternatives are within an area identified by local Native American groups as a traditionally important landscape. TCPs are known in the vicinity of each of the Access Alternatives. HRA recommends that:

- Consultation take place with local Native American groups and DAHP regarding the project's possible effects/impacts on ethnographically important places and TCPs.

Archaeological site 45KI538 is adjacent to or within each of the Access Alternatives. HRA recommends:

- Evaluation of 45KI538 for NHRP, WHR, and King County Landmark List Eligibility; if this site is eligible for a local, state, or national register, then additional cultural resources procedures (i.e., mitigation) may be required.

Archaeological site 45KI431 is immediately adjacent to or within the South 124th Street alternative access route. This site is eligible for the NRHP. HRA understands that development of this alternative access route would affect/impact this archaeological site. HRA recommends:

- Additional study of possible effects/impacts of project development on Site 45KI431;
- Additional study should include consultation with Native American groups, DAHP, and other interested agencies;
    - Based on HRA's understanding of project development use, selection of this alternative access route would likely require data recovery and/or other NRHP mitigation, as agreed upon by consulting parties.

Remnants of the Seattle Tacoma Electric Rail Road may be located on the western ends of the all the Access Alternatives with the exception of Airport Way. This resource would be of archaeological importance if encountered during project development.

5.2 Archaeological Potential

The Duwamish River valley in the vicinity of the Access Alternatives contains numerous archaeological sites. All of the Access Alternatives include areas of high potential for containing archaeological deposits. The access routes are currently developed and include paving and utilities. Because of these physical limitations, HRA recommends the following if any of the Access Alternatives are selected for development:

- An experienced archaeologist and geoarchaeologist should be included in geotechnical investigations to assess the potential of specific portions of the selected alternative access route to contain archaeological deposits;
- Archaeological monitoring of ground disturbing geotechnical investigation and, eventually, certain construction activities will likely be needed; and
- An Inadvertent Discovery Plan (IDP) that will be followed if or when an archaeologist is not present during construction should be prepared.

5.3 Buildings, Structures, and Objects

Since each alternative access route includes BSOs that are 35 years or older, HRA recommends:

- Reconnaissance-level survey and inventory of each study area be conducted. This survey and inventory may be divided into two thresholds:
    - a 35 year old minimum age (pre-1980) may be applied to evaluate eligibility of BSOs for listing in the King County Landmark List (Table 5-1); and
    - a 50 year old minimum age (pre-1965) may be applied to identify BSOs that may be eligible for listing in the NRHP and WHR (Table 5-1).
- BSOs already determined not eligible for the NRHP do not need to be resurveyed or inventoried.

Table 5-1. BSOs Survey & Inventory Table.

Study Area	Parcel	Address	Year Built
Meet minimum age for King County Landmark List (10 BSOs)			
S 112th Street	102304-9001	11222 East Marginal Way S 98168	1975
S 112th Street	102304-9059	11231 East Marginal Way S 98168	1975
S 124th Street	017900-3200	4919 S 124th St 98178	1967
S 124th Street	017900-1660	12256 49th Ave S 98178	1979
S 124th Street	017900-3135	4815 S 124th St 98178	1977
48th Avenue/Gateway Drive/S 124th Street	000380-0003	12200 51st Pl S 98178	1970
48th Avenue	000300-0030	13050 48th Ave S 98168	1980
48th Avenue	000480-0018	12840 48th Ave S 98168	1976
48th Avenue	000300-0109	13123 Interurban Ave S 98168	1975
48th Avenue	000480-0013	12855 48th Ave S 98168	1969
Meet minimum age for NRHP & WHR (40 BSOs)			
Airport Way/S 112th Street	032304-9099	10640 East Marginal Way S 98168	1948
S 112th Street	032304-9129	11180 East Marginal Way S 98168	1957
S 112th Street	032304-9057	10868 East Marginal Way S 98168	1960
S 112th Street	335140-0245	3928 S 113th St 98168	1943
S 124th Street	017900-0782	4504 S 124th St 98178	1965
S 124th Street	017900-3070	4715 S 124th St 98178	1962
S 124th Street	017900-1225	4710 S 124th St 98178	1960
S 124th Street	017900-3025	4615 S 124th St 98178	1958
S 124th Street	017900-3170	4915 S 124th St 98178	1958

Table 5-1. BSOs Survey & Inventory Table.

Study Area	Parcel	Address	Year Built
S 124th Street	017900-1010	5616 S 124th St 98178	1954
S 124th Street	017900-1465	4816 S 124th St 98178	1952
S 124th Street	017900-0550	4402 S 124th St 98178	1951
S 124th Street	017900-1240	4718 S 124th St 98178	1949
S 124th Street	017900-1230	4714 S 124th St 98178	1946
S 124th Street	017900-0330	4306 S 124th St 98178	1943
S 124th Street	017900-0340	4316 S 124th St 98178	1943
S 124th Street	017900-0350	4318 S 124th St 98178	1943
S 124th Street	017900-0565	4412 S 124th St 98178	1942
S 124th Street	017900-0105	4208 S 124th St 98168	1928
S 124th Street	017900-3005	4603 S 124th St 98178	1924
S 124th Street	017900-3030	4623 S 124th St 98178	1924
S 124th Street	017900-0575	4426 S 124th St 98178	1923
S 124th Street	017900-0100	12258 42nd Ave S 98168	1922
S 124th Street	017900-1665	4916 S 124th St S 9178	1922
S 124th Street	017900-0555	4408 S 124th St 98178	1921
S 124th Street	017900-3095	4801 S 124th St 98178	1906
S 124th Street	017900-3055	4705 S 124th St 98178	1905
Gateway Drive	017900-2840	4925 S 125th St 98178	1920
Gateway Drive	017900-2265	12404 50th Pl S 98178	1942
Gateway Drive	017900-2835	12501 50th Pl S 98178	1940

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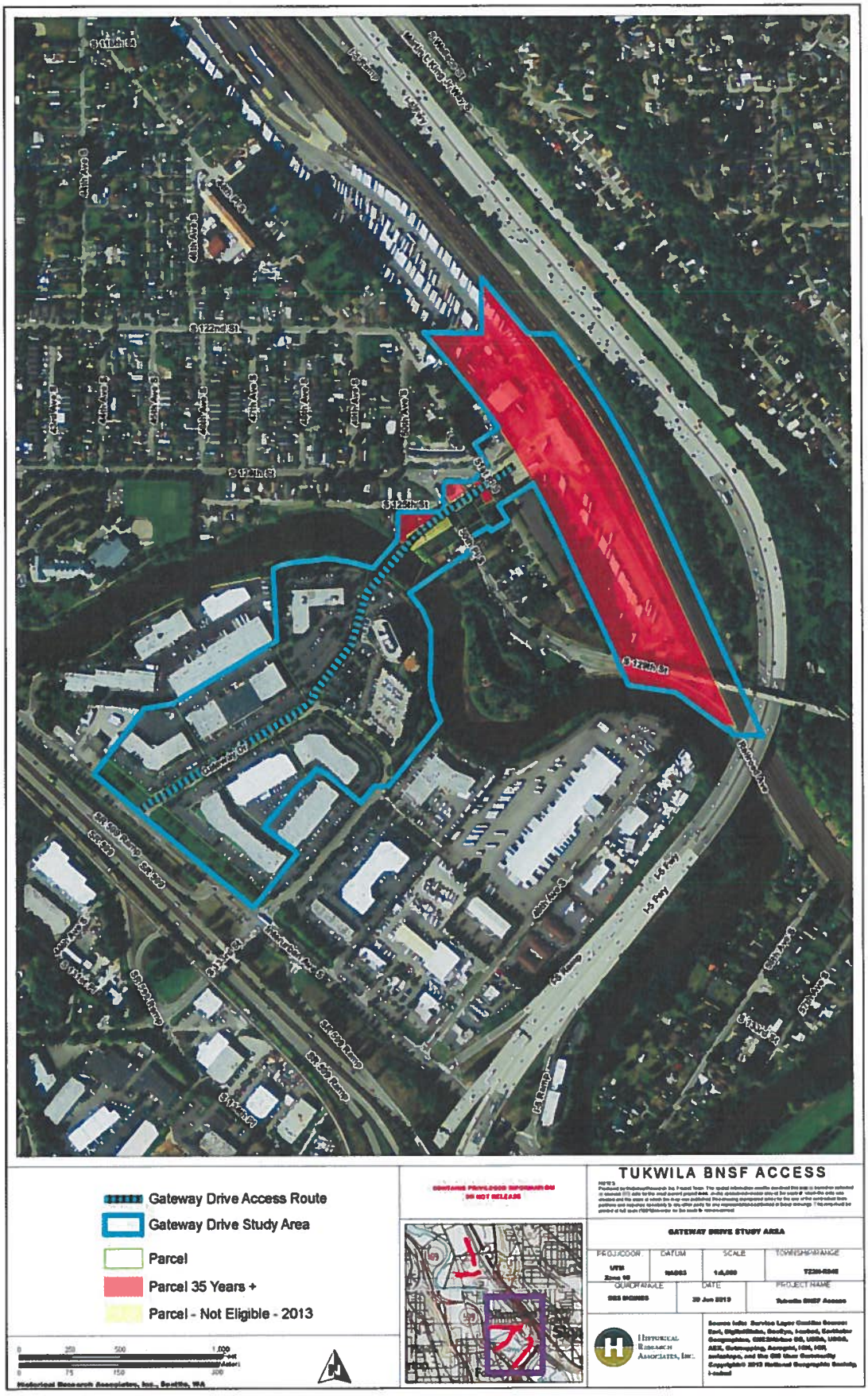
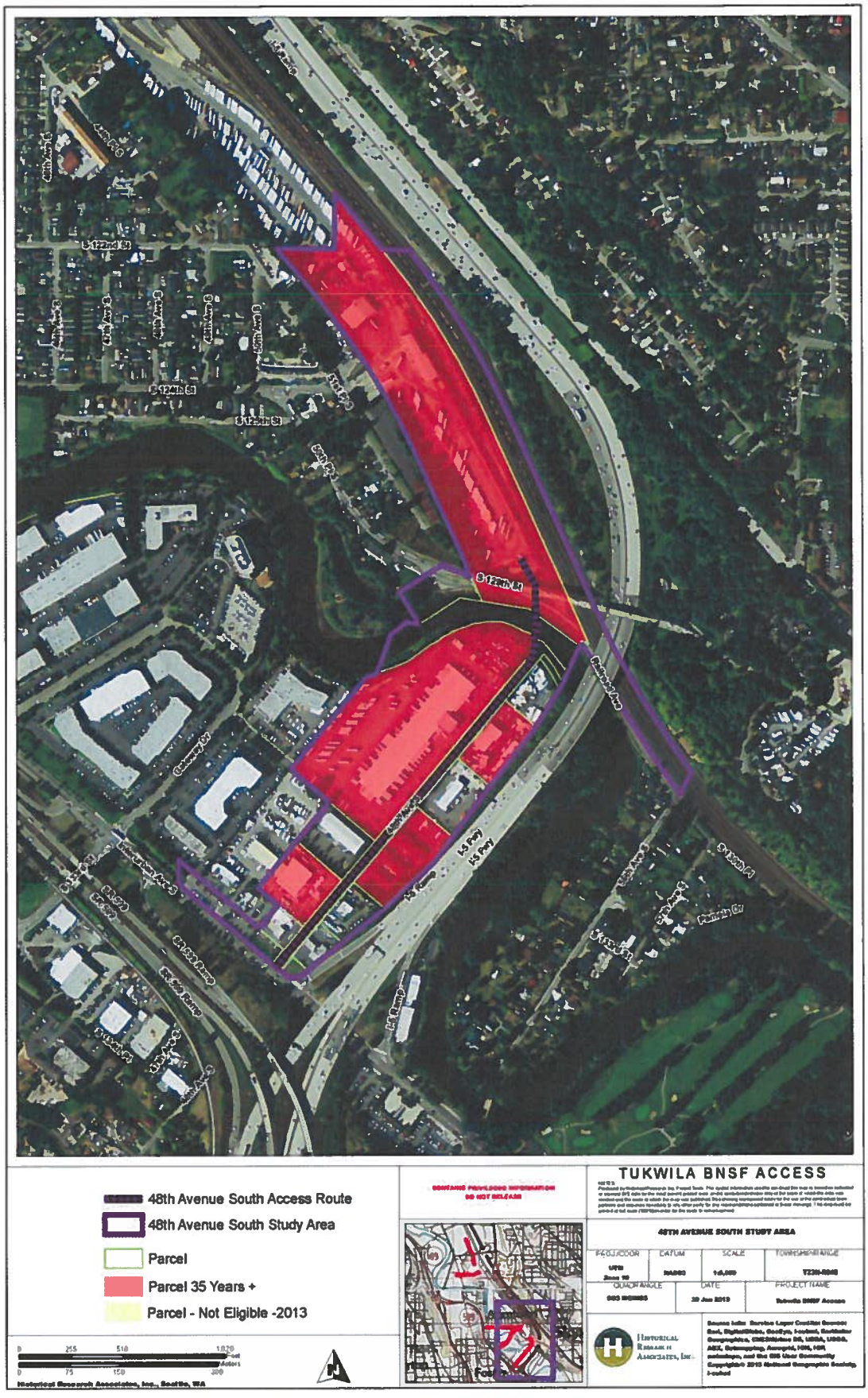
Appendix A. BSO Study Area Maps


Airport Way Access Route
Airport Way
Parcel
Parcel 35 Years +
TUKWILA BNSF ACCESS
AIRPORT WAY STUDY AREA
Historical Research Associates, Inc.


South 112th Street Access Route
South 112th Street Study Area
Parcel
Parcel 35 Years +
TUKWILA BNSF ACCESS
SOUTH 112TH STREET STUDY AREA
Historical Research Associates, Inc.


South 124th Street Access Route
South 124th Street Study Area
Parcel
Parcel 35 Years +
Parcel - Not Eligible -2013
TUKWILA BNSF ACCESS
SOUTH 124TH STREET STUDY AREA
Historical Research Associates, Inc.


Gateway Drive Access Route
Gateway Drive Study Area
Parcel
Parcel 35 Years +
Parcel - Not Eligible - 2013
TUKWILA BNSF ACCESS
GATEWAY DRIVE STUDY AREA
PROJECTION
DATUM
SCALE
TOWNSHIP/RANGE
QUADRANGLE
DATE
PROJECT NAME
Historical Research Associates, Inc.


48th Avenue South Access Route
48th Avenue South Study Area
Parcel
Parcel 35 Years +
Parcel - Not Eligible -2013
TUKWILA BNSF ACCESS
48TH AVENUE SOUTH STUDY AREA
Historical Research Associates, Inc.

Attachment C

Summary of Impact Table