

4 Affected Environment

4.1 Introduction

This chapter describes existing conditions within the area the Washington Union Station (WUS) Expansion Project (the Project) may affect. The term “existing conditions” refers to the current natural, cultural, and social characteristics of an area that are potentially subject to change, both directly and indirectly, because of a proposed Federal action. Council on Environmental Quality (CEQ) regulations at 40 Code of Federal Regulations (CFR) 1502.15 require that the description of existing conditions be succinct and that data and analyses be commensurate with the importance of the potential impacts. This chapter uses a wide range of data sources to describe existing conditions within the Study Area for each resource. The resources analyzed include:

- Natural Ecological Systems
- Water Resources and Water Quality
- Solid Waste Disposal and Hazardous Materials
- Transportation
- Air Quality
- Greenhouse Gas Emissions and Resilience
- Energy Resources
- Land Use, Land Planning and Property
- Noise and Vibration
- Aesthetics and Visual Quality
- Cultural Resources
- Parks and Recreation Areas
- Social and Economic Conditions
- Public Safety and Security
- Public Health, Elderly and Persons with Disabilities
- Environmental Justice

The information in this chapter is a summary of the more detailed information presented in the *Washington Union Station Expansion Project Affected Environment Technical Report (Appendix C2)*.

Evaluating and documenting existing conditions is a multi-step process that involves regulatory and data review for each of the resources considered. The description of existing conditions focuses on the Project Area and resource-specific Study Areas. Covering approximately 53 acres, the Project Area consists of the direct footprint of the Project (**Figure 1-1**). It includes all areas that construction of the Project would physically disturb. Study Areas are areas that the Project may directly or indirectly affect. The extent of each Study Area varies according to the resource under consideration and the scope of the potential

31 impacts. Depending on the resource and where potential impacts may occur, a Local Study
32 Area and a larger Regional Study Area may be defined. The baseline year used to assess
33 existing conditions is 2017.¹ Therefore, the information presented in this chapter reflects
34 either 2017 conditions or the most recent year for which data are available.

4.2 Natural Ecological Systems

35 Natural ecological systems include vegetation, common and protected wildlife, wetlands, and
36 floodplains. This section provides an inventory of natural ecological systems commensurate
37 to their quality or quantity, the Project's potential to affect them, and the extent to which
38 they are protected by applicable laws and regulations.

4.2.1 Regulatory Context and Guidance

40 Policies, regulations and guidance that pertain to natural ecological systems include:

- 41 ■ Endangered Species Act of 1973 (16 United States Code [USC] 1531) and
42 implementing regulations (50 CFR 402);
- 43 ■ Bald and Golden Eagle Protection Act of 1940 (16 USC 668);
- 44 ■ Migratory Bird Treaty Act of 1918 (16 USC 703-711) and implementing regulations
45 (50 CFR 10);
- 46 ■ Clean Water Act (CWA) of 1972 (22 USC 1251) and implementing regulations (40 CFR
47 110-112);
- 48 ■ CWA Section 404 (33 USC 1344) and implementing regulations (33 CFR 320-330,
49 40 CFR 230);
- 50 ■ Coastal Zone Management Act of 1972 (16 USC 1451-1464);
- 51 ■ Executive Order (EO) 11990, Protection of Wetlands (42 Federal Register [FR] 26961);
- 52 ■ EO 11988, Floodplain Management (42 FR 26951);
- 53 ■ EO 13807, Establishing Discipline and Accountability in the Environmental Review
54 and Permitting Process for Infrastructure; and
- 55 ■ *Guidance for Presidential Memorandum on Environmentally and Economically*
56 *Beneficial Landscape Practices on Federally Landscaped Grounds* (60 FR 40837).

¹ 2017 was chosen because the NEPA process for the Project was initiated in 2015 and the majority of existing conditions data were collected in 2017.

57 **4.2.2 Study Area**

58 The Local Study Area for natural ecological systems includes the Project Area from the
59 historic station building to K Street NE, with a 150-foot buffer (**Figure 4-1**).

The Regional Study Area includes areas of the District surrounding the Local Project Area out to approximately 1,000 feet.

60 **4.2.3 Methodology**

61 The description of existing natural ecological systems is based on information available from
62 the District's Department of Energy and Environment (DOEE), the National Park Service
63 (NPS), and the U.S. Fish and Wildlife Service, complemented by field observations.

64 **4.2.4 Existing Conditions**

65 **4.2.4.1 Wetlands**

66 Wetlands are areas that are inundated or saturated by surface or ground water at a
67 frequency and duration sufficient to support, and that under normal circumstances do
68 support, a prevalence of vegetation typically adapted for life in saturated soil conditions.
69 Wetlands generally include swamps, marshes, bogs, and similar areas.² Wetlands are among
70 the Waters of the United States as defined in 33 CFR 328, along with estuaries, rivers, lakes,
71 and tributary streams.

72 The Local and Regional Study Areas are fully developed. There are no wetlands or other
73 Waters of the United States within either Study Area.

74 **4.2.4.2 Floodplains**

75 A floodplain is any land area susceptible to inundation from any water source (44 CFR 59).
76 Based on Federal Emergency Management Agency flood insurance rate mapping
77 (September 27, 2010) (see **Figure 4-1**), neither the Local Study Area nor the Regional Study
78 Area is in a 100-year floodplain (1 percent chance of flooding every year) or a 500-year
79 floodplain (0.2 percent chance of flooding every year).

² U.S. Environmental Protection Agency. *How Wetlands are Defined and Identified under CWA Section 404*. Accessed from <https://www.epa.gov/cwa-404/section-404-clean-water-act-how-wetlands-are-defined-and-identified>. Accessed on April 3, 2020.

Figure 4-1. Natural Ecological Systems Study Area



81 4.2.4.3 Vegetation, Wildlife, and Protected Species

82 The Local and Regional Study Areas are fully urbanized and lack any natural vegetation or
83 habitat. The only notable vegetation consists of 26 ornamental shade trees (*Zelkova serrata*)
84 on the eastern sidewalk of First Street NE, between G Street and K Street and ten trees of the
85 same species on the western side of 2nd Street NE, between G Street and the H Street
86 Bridge. Common urban-dwelling songbirds such as house sparrows (*Passer domesticus*) or
87 common starlings (*Sturnus vulgaris*) likely use these trees. No Federally listed plant or animal
88 species, or habitat for such species, are within the Local or Regional Study Area. Neither
89 Study Area contains any habitat usable by bald eagles (*Haliaeetus leucocephalus*) for nesting
90 or foraging.

91 4.2.4.4 Coastal Zone Management

92 The District is not part of the Federal Coastal Zone Management Program and does not have
93 a designated coastal zone. Therefore, the Federal consistency requirements of the Coastal
94 Zone Management Act do not apply to the Project.³

4.3 Water Resources and Water Quality

95 There are no natural bodies of surface water in or near the Project Area. Therefore, this
96 section focuses on the following water resources: groundwater; stormwater; drinking water;
97 and wastewater. These resources are regulated under both Federal and District policies for
98 the protection of water quality.

99 4.3.1 Regulatory Context and Guidance

100 Federal policies, regulations, and guidance that may pertain to water resources and are most
101 relevant to the Project include:

- 102 ■ Clean Water Act (CWA), as amended (33 USC 1251-1376) 401 and 402;
- 103 ■ Safe Drinking Water Act of 1974 (42 USC 300f);
- 104 ■ U.S. Environmental Protection Agency (EPA) National Pollutant Discharge Elimination
105 System (NPDES) Construction General Permit;⁴

³ National Oceanic Atmospheric Administration. Coastal Zone Management Programs. Accessed from <https://coast.noaa.gov/czm/mystate/>. Accessed on April 3, 2020.

⁴ U.S. Environmental Protection Agency. 2017. National Pollutant Discharge Elimination System. Accessed from <https://www.epa.gov/npdes/epas-2017-construction-general-permit-cgp-and-related-documents>. Accessed on April 3, 2020.

- 106 ■ Energy Independence and Security Act of 2007 (Public Law 110 – 140); and
- 107 ■ EO 13508, Chesapeake Bay Protection and Restoration;
- 108 District policies, regulations and guidance that may pertain to water resources include:
- 109 ■ DC Water Pollution Control Act of 1984, as amended (DC Law 5-188);⁵
- 110 ■ DC Storm Water Permit Compliance Amendment Act of 2000 (DC Law 13-311);⁶
- 111 ■ DC Municipal Regulations, Title 21 Water and Sanitation;⁷
- 112 ■ DOEE Stormwater Management Guidebook;⁸
- 113 ■ DC Water Green Infrastructure Utility Protection Guidelines;⁹ and
- 114 ■ DC Water *Project Design Manual* Volume 3, Infrastructure Design.¹⁰
- 115 Discharges from DC Water stormwater and combined sewer systems are permitted under
- 116 two NPDES permits:
- 117 ■ Municipal Separate Storm Sewer System (MS4): NPDES Permit Number DC0000221 -
- 118 Authorization to Discharge under the NPDES Municipal Separate Storm Sewer System
- 119 Permit. Effective October 7, 2011.
- 120 ■ Blue Plains Advanced Wastewater Treatment Facility (Blue Plains) and combined
- 121 sewer system: NPDES Permit Number DC0021199. Effective September 30, 2010.

122 4.3.2 Study Area

123 The Local Study Area for water resources extends 500 feet from the Project Area to

124 encompass adjacent connections to the DC Water stormwater, water supply, and wastewater

125 infrastructure (**Figure 4-2**). The Regional Study Area is the Chesapeake Bay Watershed within

126 the District.

⁵ District of Columbia Law 5-188. Water Pollution Control Act of 1984. Accessed from <https://code.dccouncil.us/dc/council/laws/5-188.html>. Accessed on January 22, 2019.

⁶ District of Columbia Law 13-311. Storm Water Permit Compliance Amendment Act of 2000. Accessed from <https://code.dccouncil.us/dc/council/laws/13-311.html>. Accessed on January 22, 2019.

⁷ District of Columbia Municipal Regulations. Title 21, Water and Sanitation. Accessed from <http://dcrules.elaws.us/dcmr/t21>. Accessed on January 22, 2019.

⁸ District Office of Energy and Environment. 2013. *Stormwater Management Guidebook*. Accessed from <https://doee.dc.gov/swguidebook>. Accessed on April 3, 2020.

⁹ DC Water. 2013. *Green Infrastructure Utility Protection Guidelines*. Accessed from <https://www.dewater.com/sites/default/files/Green%20Infrastructure%20Utility%20Protection%20Guidelines.pdf>. Accessed on April 3, 2020.

¹⁰ DC Water and Sewer Authority. 2001. *Project Design Manual Volume 3, Infrastructure Design*. Accessed from <https://www.dewater.com/sites/default/files/Project%20Design%20Manual%20Volume%203%20Infrastructure%20Design.pdf>. Accessed on April 3, 2020.

Figure 4-2. Water Resources and Water Quality Study Area



127 **4.3.3 Methodology**

128 The information in this section was compiled from available sources, including NPDES
129 permits; water quality reports; Geographic Information System (GIS) mapping; geotechnical
130 investigations; District stormwater, wastewater, and water plans; and WUS user information
131 (for estimating wastewater generation).

132 **4.3.4 Existing Conditions**

133 **4.3.4.1 Groundwater**

134 The Local Study Area lies within the Northern Atlantic Coastal Plain Aquifer System, which
135 underlies a population of 21 million people in six states (New York, New Jersey, Pennsylvania,
136 Maryland, Virginia, North Carolina) and the District. This aquifer system is the seventh largest
137 source of groundwater for public supply in the United States.¹¹

138 Locally, groundwater occurs in two aquifers in the sediments underlying the Project Area.
139 Shallow alluvial sediments form an unconfined aquifer covering much of the southern
140 portion of the District, including the Project Area. Deeper silty sands form a second,
141 productive confined aquifer. The two aquifers may be hydraulically connected in the Project
142 Area. Given the densely urbanized character of the Local Study Area, recharge potential is
143 limited.

144 There are no public groundwater supplies or wellhead protection areas in the Local Study
145 Area. Based on a review of past and ongoing data, groundwater surface in the Project Area
146 south of the H Street Bridge lies at approximately 15 feet above sea level (asl). North of the
147 H Street Bridge, groundwater level raises from approximately 15 feet asl to approximately
148 25 feet asl at the northern end of the Project Area. Local groundwater levels may be
149 influenced by past or ongoing dewatering for construction activities and underground
150 infrastructure.¹²

151 A 2017 geotechnical investigation found that groundwater samples taken from the shallow
152 alluvial aquifer contained no total petroleum hydrocarbons, diesel range organics (TPH-DRO),
153 polychlorinated biphenyls (PCBs), or poly-aromatic hydrocarbons (PAHs). Various
154 concentrations of arsenic, cadmium, chromium and lead were detected at levels that exceed
155 the DOEE Groundwater Quality Standards or EPA Groundwater Maximum Contaminant

¹¹ United States Geological Survey. 2017. *Groundwater Quality in the Northern Atlantic Coastal Plain Aquifer System*. Accessed from <https://www.usgs.gov/news/groundwater-quality-northern-atlantic-coastal-plain-aquifer-system>. Accessed on April 2, 2020.

¹² Wood Environment and Infrastructure Solutions. 2019. *Preliminary Report of Aquifer Pump Test and Seepage Analysis, Union Station, Washington, D.C.*

156 Levels. However, no metal concentrations in groundwater exceeded DC Water’s sewer
157 discharge limits.¹³

158 4.3.4.2 Stormwater

159 Hydrologic Characteristics

160 Land cover in the Local Study Area consists of 28 acres of impervious surface and 25 acres of
161 ballasted track, which is assumed to sit atop an impervious subbase. Existing soils are
162 categorized as “urban land” or unknown. Geotechnical investigations at WUS in 2013 and
163 2016 found fill extending down to 13 to 44 feet below ground surface.^{14, 15}

164 The Local Study Area is relatively flat, sloping slightly from north to south at a 2-percent
165 average slope. The highest elevation is 104 feet at the northeast end and the lowest
166 elevation is 28 feet, on First Street in the southwest section of the Local Study Area.

167 Catchment Areas

168 The Local Study Area is located within the Tidal River subwatershed of the Anacostia River
169 watershed. The Anacostia River is an 8.7-mile tidal river formed by the convergence of the
170 Northwest Branch and the Northeast Branch in Prince George’s County, MD. The Anacostia
171 river flows into the Potomac River, which in turn is a tributary of the Chesapeake Bay.

172 Stormwater runoff from the Local Study Area drains to combined sewer infrastructure
173 through the combined sewer system (CSS) or through the MS4. The CSS collect rainwater
174 runoff, domestic sewage, and industrial water in the same stream. During large storm events,
175 the combined flow discharges directly to surface waters via Combined Sewer Overflow (CSO)
176 outfalls.

177 Stormwater flows from the Project Area are not currently routed through any structural Best
178 Management Practices (BMPs) such as retention ponds or erosion and sediment control
179 systems. Combined flows from the southwest portion of the Project Area are conveyed in the
180 Tiber Creek trunk sewer to either Blue Plains or, during large storm events, to CSO No.12 in
181 the Anacostia River. Combined flows from the railroad corridor to the northeast are
182 conveyed by the Northeast Boundary trunk sewer to either Blue Plains or CSO No.19 in the
183 Anacostia River. Approximately 7,000 square feet of the Project Area flow to the MS4 in the
184 Hickey Run watershed, which is a tributary of the Anacostia River approximately 1 mile
185 downstream of the District-Maryland line (see **Figure 4-2**).

¹³ Amec Foster Wheeler. 2018. *Interim Environmental Sampling Report, Aquifer Pump Test and Seepage Analysis Project, Washington Union Station.*

¹⁴ Langan Engineering and Environmental Services, Inc. 2013. *Geotechnical Engineering Report, Washington Union Station Platform 27/28 Elevator Project.*

¹⁵ Amec Foster Wheeler. 2015. *Washington Union Station Preliminary Report of Geotechnical Study.*

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Stormwater Retention Volume

The District’s regulated Stormwater Retention Volume (SWRv) is the runoff resulting from 1.2 inches of rainfall on surfaces within a project limit of disturbance (LOD).¹⁶ **Table 4-1** shows the existing SWRv for the Project Area, calculated in accordance with DOEE guidelines.

Table 4-1. Stormwater Retention Volume for the Project Area

Drainage Area	Paved Area ¹ (acres)	Compacted Area (acres)	Natural Area (acres)	Total Area (acres)	SWRv
Tiber Creek (CSO 12)	26.9	16.6	0	43.4	129,243
Northeast Boundary (CSO 19)	1.1	8.7	0	9.8	13,906
Hickey Run (MS4)	0	0.2	0	0.2	178
TOTAL	28.0	25.5	0	53.4	143,327

1. LOD defined as the Project Area boundary

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4.3.4.3 Wastewater

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DC Water owns and operates the wastewater collection system in the District, including approximately 1,800 miles of sanitary and combined sewers conveying flows to Blue Plains. Blue Plains treats an average of 300 million gallons per day (MGD) of raw sewage and discharges treated wastewater to the Potomac River. During large rain events, DC Water combined sewer flows are released to 53 CSO outfalls, as permitted under DC Water’s NPDES Permit No. DC0021199.

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Combined stormwater and wastewater flow from the southwest portion of WUS drain to the Tiber Creek trunk sewer, which services the center of the District and discharges to either Blue Plains or, during large storms, to CSO outfall #12 in the Anacostia River. Combined flows from the railroad corridor to the northeast are conveyed by the Northeast Boundary trunk sewer to either Blue Plains or, during large storms, to CSO outfall #19 in the Anacostia River.

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DC Water is implementing the Clean Rivers Project to reduce CSOs into the Anacostia River. In March 2018, DC Water completed the Anacostia River Tunnel, one of four components of the project. When complete, the Clean Rivers Project will reduce CSOs to the Anacostia River by 98 percent. DC Water is currently constructing the Northeast Boundary Tunnel (NEBT), which is the final segment of the project. The NEBT is expected to reduce the chance of flooding in its service area from a 50 percent to a 7 percent chance.

¹⁶ District Department of Energy and Environment. 2020. *Stormwater Management Guidebook*. Accessed from <https://doee.dc.gov/swguidebook>. Accessed on April 3, 2020. The District’s SWRv of 1.2 inches represents the 90th percentile rainfall event. This is a lower threshold that required by the Energy Independence and Security Act (EISA), under which Federal development or redevelopment projects must incorporate to the *maximum extent technically feasible* stormwater management measures that maintain or restore the pre-development hydrology of the site. Performance or design goals based on the pre-development hydrology can be established based on retention of the 95th percentile rainfall event (EPA. December 2009. *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*. Accessed from: <https://www.epa.gov/sites/production/files/2015-09/documents/eisa-438.pdf>. Accessed on March 3, 2020).

208 **4.3.4.4 Water Supply**

209 The Washington Aqueduct, a Federally owned and operated water supply agency, withdraws
210 water from the Potomac River at Great Falls and Little Falls and treats it at two drinking
211 water treatment plants in the District (Dalecarlia and McMillan). DC Water purchases treated
212 drinking water from the Washington Aqueduct and distributes it to its customers. DC Water
213 maintains a network of more than 1,300 miles of pipes serving homes and buildings across
214 the District.¹⁷ WUS receives domestic and fire water supply from two DC Water water mains
215 below K Street and 2nd Street.

216 **4.3.4.5 Wastewater and Water Demand**

217 Drinking water usage at WUS in 2017 averaged 91,800 gallons per day, based on water bills,
218 or approximately 1.9 gallon per day per passenger.¹⁸ Water demand can be assumed to equal
219 wastewater demand plus 10 percent to account for consumption, system losses, and other
220 uses. Based on average daily water demand in 2017, estimated wastewater demand for WUS
221 can be estimated at approximately 83,500 gallons per day, or 1.7 gallons per day per
222 passenger.

4.4 Solid Waste Disposal and Hazardous Materials

223 This section describes existing conditions pertaining to solid waste disposal, including
224 hazardous materials.

225 **Hazardous materials** are hazardous substances as defined by the Comprehensive
226 Environmental Response, Compensation, and Liability Act (CERCLA)¹⁹; hazardous wastes as
227 defined by the Resource Conservation and Recovery Act (RCRA)²⁰; asbestos; and petroleum
228 products. The Occupational Safety and Health Administration (OSHA) also defines hazardous
229 materials as any substance or chemical that is a health hazard or a physical hazard.²¹

¹⁷ DC Water. *DC Water website*. Accessed from <https://www.dewater.com/drinking-water>. Accessed on April 3, 2020.

¹⁸ Water bills for WUS provided by Union Station Redevelopment Corporation. Unit flow rates for water and wastewater calculated as total demand divided by the number of passengers. Estimated 2017 wastewater flow calculated as 2017 water demand divided by 1.1. Rail terminal usage includes Amtrak, Maryland Area Regional Commuter (MARC), and Virginia Railway Express (VRE) ridership, for a total of 48,300 passengers.

¹⁹ 42 USC 9061 *et seq.* (1980). Accessed from <https://www.govinfo.gov/content/pkg/USCODE-2011-title42/html/USCODE-2011-title42-chap103.htm>. Accessed on March 25, 2019.

²⁰ 40 CFR 261. *Resource Conservation and Recovery Act (RCRA)*. Accessed from <https://www.gpo.gov/fdsys/pkg/CFR-2012-title40-vol27/xml/CFR-2012-title40-vol27-part261.xml>. Accessed on April 3, 2020.

²¹ 29 CFR 1910.1200. *Occupational Safety and Health, Hazard Communication*. Accessed from <https://www.gpo.gov/fdsys/granule/CFR-1999-title29-vol6/CFR-1999-title29-vol6-sec1910-1200>. Accessed on April 3, 2020.

230 **Solid waste** is any “garbage or refuse, sludge from a wastewater treatment plant, water
231 supply treatment plant, or air pollution control facility, and other discarded material resulting
232 from industrial, commercial, mining, and agricultural operations, and from community
233 activities.”²² Solid waste includes construction debris and excavated soils, and encompasses
234 hazardous waste regulated by RCRA.

235 **RCRA Hazardous waste** pertains to solid waste that is either a RCRA-listed hazardous waste
236 or meets the RCRA-defined characteristics of hazardous waste, which are ignitability,
237 corrosivity, and reactivity. Non-hazardous waste is solid waste not defined as a hazardous
238 waste by RCRA.

239 More detailed information on solid waste disposal and hazardous materials in the Study Area
240 and sources of information are available in the July 2018, *Washington Union Station*
241 *Expansion Project Affected Environment Technical Report* in **Appendix C2**.

242 **4.4.1 Regulatory Context and Guidance**

243 Federal policies, regulations, and guidance that pertain to solid waste and hazardous
244 materials and are most relevant to the Project include:

- 245 ■ RCRA Solid Waste Regulations (40 CFR 239 through 282);
- 246 ■ EPA National Emission Standards for Hazardous Air Pollutants (NESHAP) Regulations
247 (40 CFR 61);
- 248 ■ Toxic Substances Control Act (TSCA) PCB regulations (40 CFR 761);
- 249 ■ TSCA, 15 USC 2601-2692 including the Asbestos Hazard Emergency Response Action;
- 250 ■ OSHA Lead in Construction Standard (29 CFR 1926.62);
- 251 ■ OSHA Standards for Hazardous Materials (29 CFR 1910 and 1926);
- 252 ■ CERCLA as amended (42 USC 9601 et seq.);
- 253 ■ RCRA and Superfund Amendments and Reauthorization Action (42 USC 6901 et seq);
- 254 ■ Emergency Planning and Community Right-to-Know Act of 1986 (42 USC 116);
- 255 ■ Oil Pollution Act of 1990 (33 USC 2701 et seq); and
- 256 ■ U.S. Department of Transportation (DOT) Hazardous Materials Transportation act of
257 1975 as amended (49 USC 5101-5127).

²² U.S. Environmental Protection Agency. *Criteria for the Definition of Solid Waste and Solid and Hazardous Waste Exclusions*. Accessed from <https://www.epa.gov/hw/criteria-definition-solid-waste-and-solid-and-hazardous-waste-exclusions>. Accessed on April 3, 2020.

- 258 District policies, regulations, and guidance that pertain to solid waste and hazardous
259 materials include:
- 260 ■ DOEE, Control of Asbestos, Title 20 District of Columbia Municipal Regulations
261 (DCMR) 800;
 - 262 ■ Asbestos Notification Form, DOEE, Air Quality Division;
 - 263 ■ District of Columbia Hazardous Waste Regulations, 20 DCMR Chapters 40 through 54;
 - 264 ■ Green Construction Code, Sections 406 and 503 of Title 12K of the District of
265 Columbia Municipal Regulations (12K DCMR 406, 503);
 - 266 ■ DOEE Control of Asbestos, Title 20 DCMR 800; and
 - District of Columbia Illegal Dumping Enforcement Amendment Act of 1994, DC Law
10-117, DC Official Code 8-901 et seq.

267 **4.4.2 Study Area**

268 The Local Study Area for solid waste and hazardous materials consists of the Project Area
269 (**Figure 1-1**) where Project-related solid waste would be generated or handled. It is unlikely
270 that solid waste and hazardous materials present at a regional level would require handling
271 or storage within the Project Area. Therefore, a Regional Study Area was not considered.

272 **4.4.3 Methodology**

273 A profile of current solid waste disposal practices and a baseline for existing solid waste and
274 hazardous materials generation and disposal was developed for the Local Study Area based
275 on available data and environmental database queries.

276 **4.4.4 Existing Conditions**

277 **4.4.4.1 Solid Waste and Hazardous Materials**

278 Based on information provided by the National Railroad Passenger Corporation (Amtrak), in
279 2016 WUS generated 800 tons of municipal solid waste (trash or garbage comprised of
280 everyday items discarded by the public) and 7.2 tons of recyclables. A total of approximately
281 86.6 tons of non-industrial recycled materials (such as consumer glass, metal, and plastics)
282 was recorded for the Local Study Area in 2016. Other recycled wastes included, but were not
283 limited to, lead-acid batteries, crushed fluorescent lamps, oily solids/debris, paint (latex and
284 oil-based), and non-hazardous solid waste.

285 A recycling/waste report completed by Sustainable Solutions Group for WUS provided
286 additional solid waste disposal quantities. According to this report, approximately 1,145 tons

287 of solid waste and 415 tons of recycled waste were removed from WUS between January and
288 August 2017. Approximately 27 percent of solid waste was recycled.

289 Some hazardous materials used for operation and maintenance are stored at WUS. The Tier II
290 Emergency and Hazardous Chemical Inventory for January to December 2015 identified the
291 following hazardous materials:

- 292 ■ 211.2 gallons of diesel fuel in two aboveground storage tanks (ASTs);
- 293 ■ 3,990 gallons of ethyl alcohol in one AST;
- 294 ■ 801.6 gallons of gasoline in one AST;
- 295 ■ 1,000 pounds of halite in bags;
- 296 ■ 6,200 pounds of lead-acid batteries;
- 297 ■ 22.6 gallons of transformer oil in one AST; and
- 298 ■ AST of unknown capacity presumed to contain fuel oil.

299 Also, Amtrak periodically sprays the area near the tracks to control pests and vegetation. An
300 April 2017 spray log showed 900 gallons of herbicides being applied to approximately 18
301 acres of the Project Area. Applied products included Opensight®, Esplanade 200sc, Oust
302 Extra, and other herbicides.

303 Amtrak has a Spills Prevention, Control, and Countermeasures (SPCC) Plan (2015) outlining
304 spill response actions and preventable measures. SPCC Plan checklists for January 2016
305 through July 2017 indicated no evidence of releases from petroleum storage tanks.

306 Historically, asbestos cement was used for conduit pipes along the tracks at WUS. A May
307 2005 Asbestos Abatement Plan documented the removal of 3,200 linear feet of asbestos-
308 cement conduit. A 2008 survey at two sub-platform areas at WUS where several hundred
309 linear feet of piping were located found no asbestos-containing materials (ACM).

310 **4.4.4.2 Hazardous Materials Releases and Hazardous Waste Generation**

311 On September 9, 2015, WUS was assigned EPA identification number DCD 938970716 for the
312 property's listing as an RCRA Conditionally Exempt Small Quantity Generator (CESQG) (more
313 recently known as a Very Small Quantity Generator [VSQG]) and the associated generation of
314 ignitable waste, corrosive waste, and lead.

315 A review of state and Federal databases recording oil or hazardous material releases and the
316 generation of hazardous waste found records for five sites wholly or partially within the
317 Project Area:

- 318 ■ Washington Union Station, 50 Massachusetts Avenue NE;
- 319 ■ Amtrak Parking, 900 2nd Street NE;
- 320 ■ Station Place, 100 F Street NE;

- 321 ■ Station Place, 600 2nd Street NE; and
322 ■ Florida Avenue Dump, 300 New York Avenue NE.

323 Detailed information from this review for each location is available in **Section 4.5.1.1,**
324 *Database Report*, of the July 2018, *Washington Union Station Expansion Project Affected*
325 *Environment Technical Report (Appendix C2)*. Based on the findings of the database search,
326 environmental concerns in or next to the Project Area can be classified by potential level of
327 risk to the environment (high, moderate, or low), as follows.

328 **High Risk: Former Underground Storage Tanks (USTs) and Spills, and Hazardous**
329 **Materials Generated and Stored Identified Within the Project Area**

330 The listings below are considered to present a high risk to environmental conditions within
331 the Project Area based on the high number of listings, types of hazardous material released,
332 and types of hazardous materials generated and stored.

- 333 ■ USTs: Four USTs formerly located at WUS and ranging from 1,000 to 5,000 gallons in
334 capacity were once used for petroleum products. In addition, 13 USTs were formerly
335 located at 100 F Street NE, ranging from 500 to 15,000 gallons in capacity and used
336 for storage of petroleum products. All these USTs are closed but no closure reports
337 are available.
- 338 ■ Spills: Two Leaking UST (LUST) reported in 2002 were listed as closed for 100 F Street
339 NE and 600 2nd Street NE. In addition, multiple Emergency Response Notification
340 System listings were identified at WUS and 900 2nd Street NE related to hazardous
341 materials spills of diesel, fuel oil, unknown chemicals, vehicular fluids, and
342 transformer fluids.
- 343 ■ Hazardous Materials Generated and Stored: Amtrak and Walgreens are listed as
344 CESQGs (VSQGs) due to on-site storage and generation of hazardous pharmaceutical
345 materials. The former Florida Avenue Dump at 300 New York Avenue NE is listed in
346 the Comprehensive Emergency Response, Compensation, and Liability Information
347 System database.

348 **Moderate Risk: Active Railroad Right-of-Way Within the Project Area**

349 The presence of the railroad right-of-way and lack of sampling data to confirm potential
350 impacts from releases of hazardous materials into soil or groundwater is considered a
351 concern and a moderate risk to environmental conditions.

352 Railroad tracks have been present within the Project Area since at least 1907. Railroad rights-
353 of-way are often impacted with residual oil and hazardous materials (OHM), including metals,
354 pesticides, and petroleum constituents such as PAHs. Sources of OHM may include creosote-
355 or arsenic-laced railroad ties, herbicides, lubricating oils, diesel fuel, and diesel exhaust. Fill of
356 unknown origin may contain debris, coal, coal ash, coal slag, or other potential contaminants.
357 Fill in the Project Area consists of a mixture of clays, silts, and gravels along with minor
358 amounts of construction debris such as brick and concrete fragments.

359 **Low Risk: Hazardous Building Materials**

360 Building materials do not typically present a concern when intact under normal use
361 conditions. Therefore, this concern is considered a low risk to environmental conditions
362 within the Project Area. Based on the age of the structures located in the Project Area (pre-
363 1980), ACM as well as lead-based paint, mercury switches, PCB-containing light ballasts, and
364 other hazardous building materials may be present. These materials would require special
365 handling if the pre-1980 structures in the Project Area are demolished or renovated.

366 **4.4.4.3 Adjoining Property Listings**

367 Environmental concerns identified on 14 adjoining properties, which have the potential to
368 impact the Project Area, were classified as moderate risk. Twelve LUST sites are located next
369 to the Project Area, three of which have not achieved regulatory closure. Their current
370 condition is unknown. Although the remaining LUST sites have achieved regulatory closure,
371 no closure reports or confirmatory analytical results were available. Additional listings
372 identified near the Project Area include CESQG (VSQG), Facility Index System, Voluntary
373 Cleanup Program, and Brownfield properties. Although the databases yielded limited
374 information, the generation or storage of hazardous materials and documented
375 contamination at adjoining properties must be noted.

4.5 Transportation

376 The Federal Railroad Administration's (FRA) *Procedures for Considering Environmental*
377 *Impacts*²³ states that an Environmental Impact Statement (EIS) should consider impacts on
378 both passenger and freight transportation by all modes, with local, regional and national
379 perspectives. Consistent with this requirement, this section describes existing conditions for
380 a variety of transportation modes at WUS to provide a baseline against which the potential
381 impacts of the Project alternatives as they relate to transportation can be assessed. Existing
382 conditions pertaining to railroad (including Amtrak, Virginia Railway Express [VRE], and
383 Maryland Area Regional Commuter [MARC] Train); bus (intercity, charter, tour, and
384 sightseeing); transit (Metrorail, Streetcar, and Metrobus); bicycle; pedestrian; ride-for-hire;
385 and private vehicle modes are assessed. Additional details on existing transportation
386 conditions are provided in the July 2018, *Washington Union Station Expansion Project,*
387 *Affected Environment Technical Report (Appendix C2).*

²³ U.S. Department of Transportation. Federal Railroad Administration. 1999. *Procedures for Considering Environmental Impacts* (64 FR 28545). Accessed from <https://www.fra.dot.gov/eLib/Details/L02710>. Accessed on April 3, 2020.

388 **4.5.1 Regulatory Context and Guidance**

389 Federal policies, regulations, and guidance that pertain to transportation include:

- 390 ■ *The Comprehensive Plan for the National Capital: Federal Elements, Transportation,*
391 *adopted in 2016, prepared by the National Capital Planning Commission (NCPC).²⁴*

392 District Policies, regulations, and guidance that pertain to transportation include:

- 393 ■ *The Comprehensive Plan for the National Capital: District Elements, Transportation,*
394 *adopted in 2006 and amended in 2011, prepared by the District of Columbia Office of*
395 *Planning;²⁵*
- 396 ■ *District Department of Transportation (DDOT) Design and Engineering Manual;²⁶*
- 397 ■ *DDOT Pedestrian Safety and Work Zone Standards – Covered and Open Walkways;²⁷*
- 398 ■ *DDOT Public Realm Manual;²⁸*
- 399 ■ *DDOT DC Temporary Traffic Control Manual;²⁹*
- 400 ■ *DDOT Guidelines for Comprehensive Transportation Review;³⁰ and*
- 401 ■ *DDOT Environmental Policy and Process Manual, 2nd Edition.³¹*

402 Regional Policies, regulations, and guidance that pertain to transportation include:

²⁴ National Capital Planning Commission. 2016. *The Comprehensive Plan for the National Capital: Federal Elements*. Accessed from <https://www.ncpc.gov/plans/compplan/>. Accessed on March 3, 2020.

²⁵ DC Office of Planning. 2006. *The Comprehensive Plan for the National Capital: District Elements*. Accessed from <https://planning.dc.gov/page/comprehensive-plan>. Accessed on March 3, 2020.

²⁶ District Department of Transportation. 2019. *Design and Engineering Manual*. Accessed from <https://ddot.dc.gov/page/design-and-engineering-manual>. Accessed on February 28, 2020.

²⁷ District Department of Transportation. 2007. *Pedestrian Safety and Work Zone Standards – Covered and Open Walkways*. Accessed from https://dc.gov/sites/default/files/dc/sites/ddot/publication/attachments/pedestrian_safety_and_work_zone_standards_covered_and_open_walkways_july_2010.pdf. Accessed on April 3, 2020.

²⁸ District Department of Transportation. 2011. *Public Realm Manual*. Accessed from https://ddot.dc.gov/sites/default/files/dc/sites/ddot/publication/attachments/ddot_public_realm_design_manual_2011.pdf. Accessed on April 3, 2020.

²⁹ District Department of Transportation. 2006. *D.C. Temporary Traffic Control Manual – Guidelines and Standards*. Accessed from <https://comp.ddot.dc.gov/Documents/Temporary%20Traffic%20Control%20Manual.pdf>. Accessed on April 3, 2020.

³⁰ District Department of Transportation. 2019. *DDOT Guidelines for Comprehensive Transportation Review (CTR) Requirements*. Accessed from <https://ddot.dc.gov/publication/ddot-guidelines-comprehensive-transportation-review-ctr-requirements>. Accessed on February 28, 2020.

³¹ District Department of Transportation. 2012. *DDOT Environmental Policy and Process Manual*. Accessed from <https://ddot.dc.gov/page/ddot-environmentalpolicy-and-process-manual-0>. Accessed on April 3, 2020.

- 403 ■ Transportation Planning Board’s (TPB) *2014 Constrained Long-Range Transportation*
404 *Plan (CLRP)*.³²

405 4.5.2 Study Area

406 The Local Study Area for transportation, depicted in **Figure 4-3**, includes the Project Area and
407 the immediately adjacent roadway network, along with 34 study intersections near WUS.
408 **Table 4-2** lists the study Intersections. Traffic conditions and coordination with DDOT were
409 the basis for the identification of these intersections. The Regional Study Area is the
410 Metropolitan Washington Council of Governments (MWCOG) area of jurisdiction. MWCOG
411 includes local Metropolitan Planning Organizations (MPO) in Maryland, the District, and
412 Virginia.

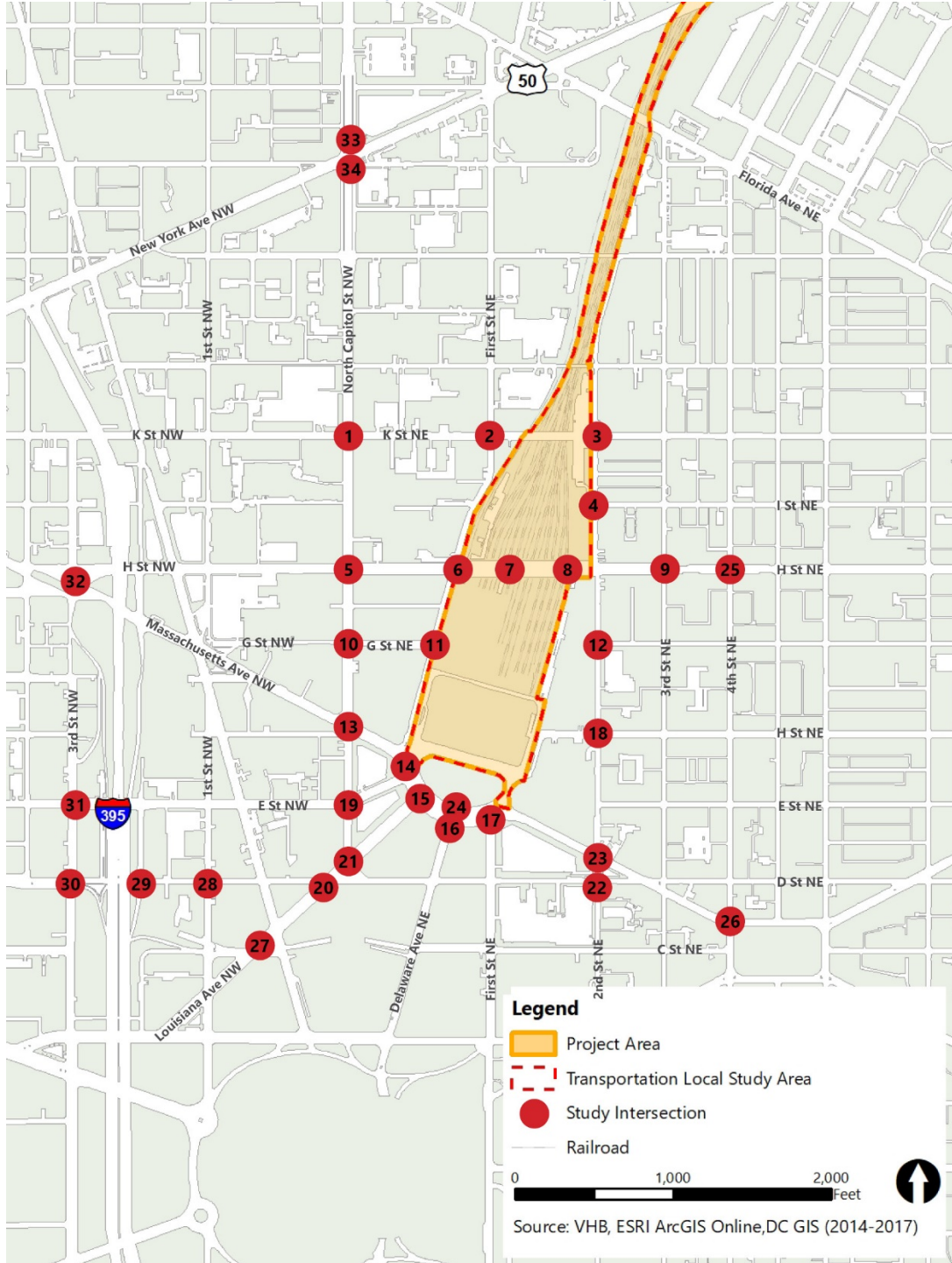
413 4.5.3 Methodology

414 The existing conditions analysis is based on a review of current transportation modes and
415 conditions; the most recent data available for each data source at the time of analysis (2018);
416 traffic counts taken to characterize existing levels of service (LOS) at the study intersections;
417 and field observations. The base year for the existing conditions analysis is 2017. The analysis
418 made use of the most recent data then available for each data source projected forward to
419 2017 if necessary, except where past data are consistent with expected 2017 levels.³³ The
420 analysis focuses on activity during the morning (AM) and evening (PM) peak hours.

³² Metropolitan Washington Council of Governments (MWCOG). *TPB Constrained Long-Range Transportation Plan. 2014 CLRP and FY 2015-2020 TIP*. Accessed from http://www1.mwcog.org/clrp/resources/KeyDocs_2014.asp. Accessed on April 3, 2020.

³³ Traffic counts that predated 2017 were grown to 2017 levels using a 0.5 percent annual growth factor, consistent with the growth factor used to project forward to 2040 in the 2040 transportation impact analysis.

Figure 4-3. Transportation Local Study Area



Note: Key Intersection numbers refer to **Table 4-2**.

Table 4-2. Study Intersections

#	Intersection	#	Intersection
1	North Capitol Street & K Street	18	2nd Street & F Street NE
2	First Street & K Street NE	19	North Capitol Street & E Street
3	2nd Street & K Street NE	20	Louisiana Avenue & D Street NW
4	2nd Street & Driveway/I Street NE	21	Louisiana Avenue & North Capitol Street
5	North Capitol Street & H Street	22	2nd Street & D Street NE
6	WUS Garage & H Street NE	23	2nd Street & Massachusetts Avenue NE
7	WUS Bus Exit & H Street NE	24	Massachusetts Avenue westbound at Delaware Ave NE
8	Kaiser Permanente Entrance & H Street NE	25	4th Street & H Street NE
9	3rd Street and H Street NE	26	Massachusetts Avenue/C Street & 4th Street NE
10	North Capitol Street and G Street	27	Louisiana Ave & C Street NW
11	First Street and G Street NE	28	First Street & D Street NW
12	2nd Street and G Street NE	29	Tunnel Ramp/2nd Street & D Street NW
13	North Capitol Street & Massachusetts Avenue & F Street	30	3rd Street & I-395 On-Ramp/Indiana Avenue/D Street NW
14	E Street & Massachusetts Avenue & First Street NE	31	3rd Street & E Street NW
15	Louisiana Avenue & Massachusetts Avenue NE	32	3rd Street & Massachusetts Avenue & H Street NW
16	Delaware Avenue & Massachusetts Avenue NE	33	North Capitol Street (Southbound Ramp) & New York Avenue
17	First Street & Massachusetts Avenue NE	34	North Capitol Street (Northbound Ramp) & New York Avenue

422 These were identified based on total activity for all transportation modes. The station-wide
423 AM peak hour is 8:00 AM to 9:00 AM and the station-wide PM peak hour is 4:30 PM to 5:30
424 PM. In certain instances, the analysis further identifies mode-specific peak hours or periods.

425 The existing conditions analysis drew from a variety of data sources:

- 426 ■ **Trains and Platforms:** Ridership data, schedules, and platform occupancy data;
- 427 ■ **Bus facility:** Bus counts, reservation, passenger counts, fleet, ridership, bus
428 movements, passenger behavior, and schedules;
- 429 ■ **Parking:** Parking counts and Amtrak ridership garage usage;
- 430 ■ **Transit:** Transit ridership and schedule for Washington Metropolitan Area Transit
431 Authority (WMATA) Metrobus and Metrorail, and for DC Circulator;
- 432 ■ **Bicycle:** Bicycle counts, plans, bikeshare counts and usage;
- 433 ■ **Pedestrian:** Pedestrian volumes in and near WUS;
- 434 ■ **Traffic:** Traffic counts at study intersections, roadway conditions, signal timing,
435 Amtrak ridership surveys, Metropolitan Police Department (MPD) and DDOT crash
436 data, DC Vision Zero traffic safety plan; and
- 437 ■ **For-Hire Vehicles:** Usage and dwell time for taxis and transportation networking
438 companies (TNCs; TNC are companies such as Uber or Lyft).

439 **4.5.4 Existing Conditions**

440 **4.5.4.1 Commuter and Intercity Railroads**

441 With 37 million annual riders, WUS is busier than any of the region’s three commercial
442 airports. Three passenger railroads serve WUS: Amtrak, MARC, and VRE. Because WUS is the
443 southernmost electrified station on the East Coast, all trains heading southward of it operate
444 using diesel engines. Trains from the north and continuing south make use of the “run-
445 through” tracks and switch from electric to diesel engines at the station.

446 **Amtrak**

447 Amtrak provides intercity railroad service to and from WUS. Eighty-five percent of Amtrak’s
448 ridership originating or terminating at WUS travels on either the Acela Express or the
449 Northeast Regional trains. The remaining 15 percent use long-distance services.

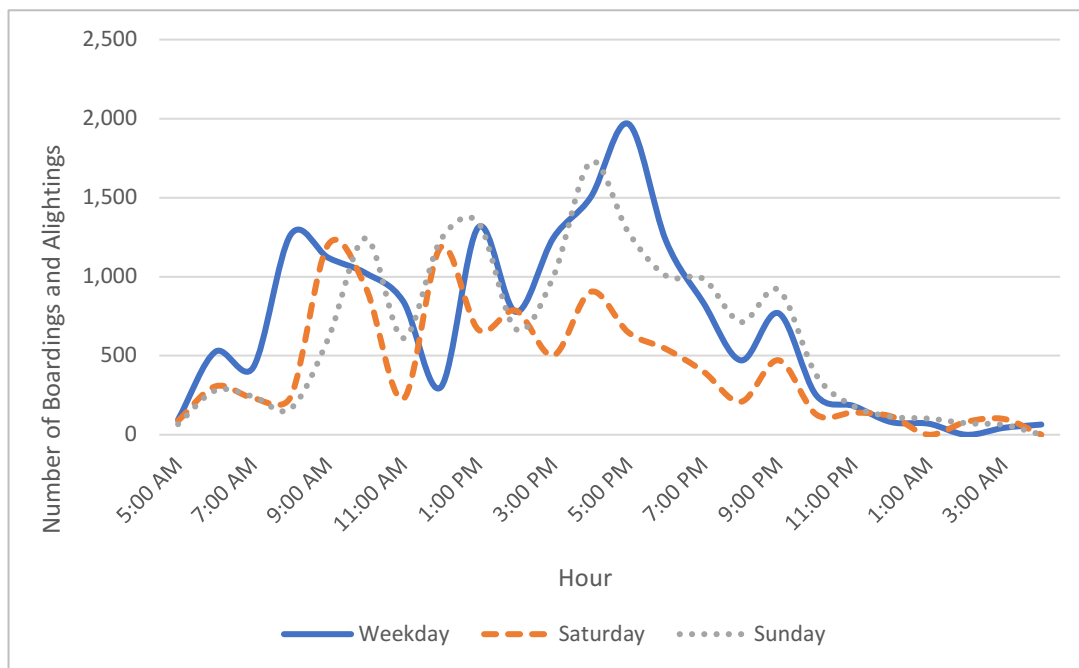
450 Acela provides high-speed, business-class service between the District and Boston,
451 Massachusetts. Northeast Regional trains provide frequent-stop service between the District
452 and Boston with extensions southward to Lynchburg, Norfolk, and Newport News, Virginia.
453 Several long-distance trains serve or originate from WUS. The Capitol Limited to Chicago via
454 Pittsburgh and Cleveland; and the Vermonter to St. Albans, Vermont originate at WUS. The
455 Cardinal to Chicago, via Cincinnati and Indianapolis; Silver Service to Florida; the Palmetto to

456 Savannah; the Crescent to New Orleans; and the Carolinian to Charlotte all originate in New
 457 York City and stop at WUS.

458 In 2015, annual Amtrak ridership at WUS was 5.08 million. Projected 2017 ridership was
 459 5.14 million. Weekdays on average see higher ridership (16,394) than Saturdays and Sundays
 460 (10,105 and 14,998 respectively).³⁴ On average, Amtrak operates 93 daily weekday trips at
 461 WUS. Amtrak trains operate throughout the day, with peak period trips accounting for
 462 approximately 41 percent of all trips and midday trips accounting for approximately 32
 463 percent. Most of the scheduled trips serving WUS originate and terminate at WUS.

464 The overall peak hour of weekday Amtrak ridership is between 5:00 PM and 6:00 PM, with
 465 nearly 2,000 boardings and alightings.³⁵ On Saturdays, the overall peak hour is between 9:00
 466 AM and 10:00 AM (1,200 boardings and alightings). On Sundays, the overall peak hour is
 467 between 4:00 PM and 5:00 PM (1,700 boardings and alightings). Weekdays typically have
 468 three distinct periods with relatively high levels of ridership activity: 8:00 AM to 11:00 AM;
 469 1:00 PM to 2:00 PM; and 3:00 PM to 7:00 PM. **Figure 4-4** illustrates average daily boardings
 470 and alightings by hour and service day. Amtrak’s highest ridership trips are all on the
 471 Northeast Regional Line.

Figure 4-4. Fiscal Year 2015 Amtrak Average Daily Ridership at WUS by Hour and Service Day



Source: Amtrak, 2015. Amtrak Union Station Ridership by Train Time.

³⁴ Amtrak. 2015. *Amtrak Union Station Ridership by Train Time*.

³⁵ A boarding refers to a passenger getting onto a transit vehicle, in this case a train. An alighting refers to a passenger disembarking from a transit vehicle.

472

MARC

473

MARC provides commuter rail service between the District, Maryland, and West Virginia.

474

Three MARC lines serve WUS: the Brunswick Line (diesel), Camden Line (diesel), and the Penn

475

Line (electric). The Brunswick Line runs from WUS to Martinsburg, West Virginia, with a spur

476

to Frederick, Maryland. The Camden Line connects WUS and the Baltimore-Camden Station.

477

The Penn Line operates between WUS and Perryville, Maryland via Baltimore-Penn Station.

478

MARC service currently uses WUS’s western stub-end tracks.

479

Across the three MARC lines, daily WUS ridership over twelve months in 2014-2015 was

480

16,020 passengers (**Table 4-3**), for an annual total of 3.97 million riders. Based on ridership

481

trends, 2017 numbers are not expected to have changed substantially. Data are currently

482

unavailable from MARC regarding overcrowding of trains. However, in the *MARC Growth and*

483

Investment Plan Update 2013 to 2050, crowded rush hour trains are cited as a challenge.

484

Table 4-4 shows MARC train operations, points of service, and trips during peak service.

Table 4-3. MARC Commuter Rail Average Daily Ridership at WUS by Route and Service Day

	Average WUS Weekday Ridership	Average WUS Saturday Ridership	Average WUS Sunday Ridership
MARC Penn Line	10,795	1,143	741
MARC Camden Line	2,067	-	-
MARC Brunswick Line	3,158	-	-
MARC Total	16,020	1,143	741

Source: MARC Ridership Data by Line. 2015. Accessed from <https://data.maryland.gov/Transportation/MTA-Average-Weekday-Ridership-by-Month/ub96-xxqw>. Accessed on October 20, 2015.

Table 4-4. MARC Train Operations, Points of Service, and Trips

MARC Train	Operations at WUS	Points of Service	Number of Trips Served Weekday Peak: AM	Number of Trips Served Weekday Peak: PM
Penn Line	Weekday Peak, Midday, Evening, Weekend	Perryville Baltimore, MD BWI	8 Southbound to WUS	11 Northbound to points of service
Camden Line	Weekday Peak	Baltimore	5 Westbound to WUS	6 Eastbound to points of service
Brunswick Line	Weekday Peak, One Evening Trip	Martinsburg, WV	8 Eastbound to WUS	8 Westbound to points of service

Source: MARC Schedules (Brunswick, Camden, and Penn Lines). Accessed from <https://mta.maryland.gov/marc-train>. Accessed on October 20, 2015.

485

VRE

486

VRE operates two lines on weekdays only that both terminate at WUS: the Fredericksburg

487

Line and the Manassas Line. VRE uses diesel locomotives and operates on the run-through

488

tracks on the east end of the rail terminal. In Fiscal Year 2015 (FY2015), VRE had a total of

489

18,589 riders across all lines and stations. Estimated 2017 WUS ridership was 4,352 riders

490

daily and 1.09 million rider annually.

491 The Fredericksburg Line provides weekday peak service from Spotsylvania County, Virginia. In
 492 the northbound direction (Spotsylvania to DC), six trips serve WUS in weekday AM peak
 493 periods (6:30 AM to 9:00 AM). In the southbound direction (DC to Spotsylvania), seven trips
 494 serve WUS in weekday PM peak periods (3:00 PM to 7:00 PM).

495 The Manassas Line provides peak weekday service from Broad Run in Prince William County,
 496 Virginia. In the northbound direction (Manassas, Virginia to DC), five trips serve WUS in
 497 weekday AM peak periods (6:24 AM to 8:39 AM). In the southbound direction (DC to
 498 Manassas), six trips serve WUS in weekday PM peak periods (3:45 PM to 6:50 PM).

499 In the middle of the day, VRE stores its trains in the Ivy City yards, owned by Amtrak. As a
 500 result, VRE trains cross multiple tracks in the morning and afternoon to stage trains, affecting
 501 the operations of the WUS rail terminal.

502 Based on 2014 data, on weekdays, approximately 4,333 persons rode VRE trains at WUS,
 503 with slightly more passengers riding in the outbound direction than in the inbound direction.
 504 The Manassas Line had higher ridership than the Fredericksburg Line. **Table 4-5** shows
 505 average weekday VRE ridership at WUS by route and direction.

Table 4-5. VRE Commuter Rail Average Weekday Ridership at WUS by Route and Direction

	Inbound	Outbound
VRE Fredericksburg	879	1,124
VRE Manassas	1,128	1,202
Total	2,007	2,326

Source: VRE, 2014.³⁶

506 Based on 2015 data, two trips on the Manassas Line and three trips on the Fredericksburg
 507 Line experienced overcrowding during the mid-week peak.³⁷ One additional trip on the
 508 Manassas Line was nearing capacity. The five overcrowded trips were during the PM peak
 509 period in the outbound direction. The most severely overcrowded trip was the 3:10 PM
 510 Fredericksburg Line trip, which experienced passenger loads at 123 percent of seated
 511 capacity.

512 **4.5.4.2 WMATA Metrorail**

513 WUS is served by the WMATA Union Station Metrorail station (WUS Metrorail station),
 514 located on the Red Line and directly west of the WUS. Entrances to WUS from the Metrorail
 515 station are in the western colonnade, Claytor Concourse, and the food court. The WUS
 516 Metrorail station is the busiest station in the system, with 28,762 entries and 29,251 exits for
 517 the month of October 2015. On Saturdays, entries total 9,577 and exits total 8,744. On

³⁶ Virginia Railway Express. 2014. *FY14 VRE Ridership by Station*.

³⁷ Virginia Railway Express. 2015. *VRE Performance Measures Report*.

518 Sundays, entries average 8,211 and exits average 6,876.³⁸ Based on WMATA’s ridership
 519 trends, it can be estimated that ridership has remained at similar levels.

520 The WUS Metrorail station has north and south mezzanine entrances leading to the WMATA
 521 platforms. The south mezzanine experiences the highest passenger traffic on weekdays, with
 522 14,962 entries against 13,800 for the north mezzanine.³⁹ In 2009, the most recent year for
 523 which data are available, WMATA indicated that it could take passengers up to 5 minutes and
 524 35 seconds to travel from the WMATA platform level to the train platform level because of
 525 queuing at escalators.⁴⁰

526 **Table 4-6** shows 2015 peak-hour ridership data for the Red Line Metrorail segments centered
 527 on WUS. In the AM peak period (8:00 AM to 9:00 AM), ridership was higher in the westbound
 528 direction (toward Glenmont). In the PM peak period (5:00 PM to 6:00 PM), the ridership was
 529 higher in the eastbound direction (toward Shady Grove), with a notable drop-off east of
 530 WUS.

Table 4-6. WUS Peak Hour Ridership by Red Line Segment

Segment	Eastbound (To Glenmont)		Segment	Westbound (To Shady Grove)	
	AM Peak (8 AM – 9 AM)	PM Peak (5 PM – 6 PM)		AM Peak (8 AM – 9 AM)	PM Peak (5 PM – 6 PM)
Judiciary Square to Union Station	5,071	9,948	NoMA-Gallaudet to Union Station	8,499	2,592
Union Station to NoMA-Gallaudet	1,955	7,776	Union Station to Judiciary Square	10,378	5,275

Source: WMATA, 2015.⁴¹

531 **4.5.4.3 DC Streetcar**

532 The DC Streetcar (Streetcar) is operated by DDOT on a 2.4-mile track that connects WUS to H
 533 Street NE and Benning Road up to the Kingman and Heritage Islands Park. The closest stop to
 534 WUS is located on H Street NE, behind the station. It is accessible from the bus facility. To
 535 reach the platform, pedestrians must cross to the center median (signalized crossing) and

³⁸ Washington Metropolitan Area Transit Authority. 2015. *October 2015 Metrorail Faregate Data*.

³⁹ Washington Metropolitan Area Transit Authority. 2011. *Union Station Access and Capacity Study*. Accessed from <https://www.wmata.com/initiatives/plans/upload/Final-Union-Station-Project-Report-Feb182011.pdf>. Accessed on April 3, 2020.

⁴⁰ Washington Metropolitan Area Transit Authority. 2011. *Union Station Access and Capacity Improvement Study*. Accessed from <https://www.wmata.com/initiatives/plans/upload/Final-Union-Station-Project-Report-Feb182011.pdf>. Accessed on April 3, 2020.

⁴¹ Washington Metropolitan Area Transit Authority. 2015. *May 2015 Passenger Load Data*.

536 walk approximately 200 feet. The Streetcar operates seven days a week. As of July 2017,
537 weekday ridership on the entire Streetcar line was 3,805 and weekend ridership was 2,875.

538 **4.5.4.4 Intercity, Tour/Charter, Transit, and Commuter Buses**

539 WUS's existing bus facility features 61 slips (short-term parking spots). It is the largest bus
540 facility in the Washington, DC region. Vehicular access to the WUS bus facility is via H Street
541 NE. The facility presently offers long-term storage of buses and large vehicles such as box
542 trucks, mobile communications trucks (TV trucks), and recreational vehicles (RVs). Shuttle
543 buses serving the United States Citizenship and Immigration Service and Gallaudet University
544 also use the WUS bus facility.

545 Intercity carriers that serve WUS include Greyhound, Bolt Bus, Megabus, Washington Deluxe,
546 and Best Bus. The WUS bus facility served between 130,000 and 284,000 monthly riders from
547 August 2013 to December 2015.⁴² Megabus consistently had the highest ridership, followed
548 by Greyhound, Bolt Bus, Washington Deluxe, and Best Bus. Greyhound served 754,632
549 passengers in calendar year 2014. Bolt served 392,994 passengers while Megabus reported
550 1.478 million riders for that same period. Overall ridership decreased in 2015, which may be
551 partially attributable to falling gas prices.

552 Tour and charter buses use the WUS bus facility to drop off and pick up visitors at the station.
553 Rental data from the month of May in three successive years (2013, 2014, and 2015) indicate
554 that between 2,100 and 2,381 buses rented a spot that month. Daily bus counts taken by
555 Union Station Parking Garage (USPG) between May 26 and June 17, 2016 found that, on
556 weekdays, the initial peak takes place in the 11:00 AM hour and averages 11 buses per hour.
557 The evening peak occurs at 5:00 PM, with 12 buses per hour on average. On weekends, the
558 midday peak period occurs in the 12:00 PM hour, with nine buses per hour and the PM peak
559 period occurs in the 5:00 PM hour, with nine buses per hour. In any one hour, the number of
560 reservations peaked at 27. Facility use is very low in the overnight hours.

561 Daily sightseeing coach buses provide scheduled service from WUS to popular tourist
562 attractions such as Gettysburg, Mount Vernon, and the monuments on the National Mall at
563 night. These bus services occupy two slips in the bus facility. Hop-on/hop-off sightseeing
564 buses use the middle lanes of Union Station Drive NE in the front of WUS, with some layovers
565 at the Columbus Circle Bus Lane and the WUS bus facility. These bus companies include Duck
566 Tours, Old Town Trolley, Big Bus, and City Sights DC, which all pick up and drop off
567 passengers in Columbus Circle. The sightseeing bus companies have kiosks and ticket
568 counters at WUS. Big Bus has a small kiosk adjacent to WUS's front entrance, at the end of
569 the taxi lane, for ticket sales. City Sights DC and Old Town Trolley/Duck Tours have ticket
570 counters in WUS's main lobby.

⁴² August 2013 to December 2015 data provided by Union Station Redevelopment Corporation (USRC).

571 Transit and commuter bus service is provided at and near WUS in the Local Study Area by
572 WMATA, the Maryland Transit Administration (MTA), DC Circulator, OmniRide (Prince
573 William County), and Loudoun County Transit (LCT). Thirteen Metrobus routes and three DC
574 Circulator routes operate in the Local Study Area. All routes provide local service except
575 Metrobus Route X9. The local bus routes in the Local Study Area serve WUS from either
576 Massachusetts Avenue NE near Columbus Circle or North Capitol Street. Metrobus Route X2,
577 which has the highest ridership in the entire Metrobus system, is the only route in the Local
578 Study Area that is overcrowded. The buses that stop and lay over in Columbus Circle
579 contribute to congestion in the circle during peak periods. **Table 4-7** shows detailed
580 information on Metrobus and DC Circulator ridership.

581 Weekday peak periods for Metrobus and DC Circulator are 6:00 AM to 9:00 AM and 3:00 PM
582 to 7:00 PM. Most routes operate seven days a week. Several Metrobus routes only operate
583 during weekday peak periods, including Routes 97, D3, X1, and X9. Metrobus Route 13Y only
584 operates during early AM weekend hours to serve passengers traveling to and from Reagan
585 National Airport and Crystal City/Pentagon City in Arlington County, Virginia before the
586 Metrorail system opens.

587 The Georgetown to WUS (GT-US) Circulator, the National Mall (NM) Circulator, and the
588 Congress Heights to WUS (CH-US) Circulator operate seven days a week. The DC Circulator
589 uses the WUS bus facility for its GT-US route. This route regularly uses three to four bus slips.
590 As of December 2016, approximately 120,000 riders used the GT-US route monthly. Monthly,
591 approximately 65,000 riders used the CH-US Circulator service that serves WUS from
592 Massachusetts Avenue NE while 17,000 riders used the NM Circulator service that serves
593 WUS from E Street NE.

594 **4.5.4.5 Vehicular Parking**

595 **Current Parking Garage Usage and Occupant Behavior**

596 WUS has a parking garage for private vehicles, including monthly parking and rental cars.
597 USPG operates the bus facility and parking garage on behalf of Union Station Redevelopment
598 Corporation (USRC). There are approximately 2,200 marked parking spaces on four levels in
599 the garage. Rental car companies also use large, unmarked areas (see **Section 4.5.4.6** below).
600 Altogether, total garage capacity is approximately 2,450 vehicles. Review of USPG data
601 indicates that the garage operates above or near 90 percent occupancy on most weekdays
602 throughout the year.⁴³

⁴³ **Appendix A6, Parking Program Technical Memorandum.**

Table 4-7. Metrobus and DC Circulator Average Ridership by Route and Service Day

Route	Weekday	Saturday	Sunday
X2	16,583	11,570	8,532
80	8,550	3,232	2,438
GT-US	7,281	-	-
96	5,629	4,037	3,035
D8	5,498	3,028	1,937
P6	5,425	2,644	1,994
D6	5,263	2,372	1,654
X9	2,358	-	-
97	1,949	-	-
NM	1,882	-	-
CH-US	2,501	1,229 ¹	
D4	1,608	967	844
X8	1,539	649	489
X1	889	-	-
D3	582	-	-
13Y	-	89	69

1. Daily average for the weekend.
 Source: WMATA, 2015⁴⁴; DDOT, 2016 and 2019.⁴⁵

603 **Retail/Tourism/Short-term Visitor Parking**

604 USRC’s lease agreement with Union Station Investco, LLC (USI), which manages WUS retail,
 605 stipulates the provision of 600 parking spaces in the garage. Per USPG parking data, an
 606 average of around 860 parkers keep their vehicles in the facility between 1 and 5 hours.

607 **4.5.4.6 Rental Cars**

608 The WUS parking garage supports 51,800 square feet of rental car facilities used by
 609 Enterprise Car Rental and Carshare; Avis/Budget Car Rental; and Hertz Car Rental. Zipcar and
 610 Maven operate out of regular parking spaces. The garage features approximately 85 marked
 611 parking spaces for rental cars and three large areas used for cleaning rental vehicles and
 612 providing simple maintenance. Information from USPG provided in April 2017 indicate that
 613 the average occupancy of the rental car facility is around 275, up from 260 in 2016.⁴⁶ Rental
 614 car operators indicated that current conditions are cramped and lead to vehicle accidents.⁴⁷
 615 Field observations confirmed that when the facility is near capacity, vehicles are “stacked,”

⁴⁴ Washington Metropolitan Area Transit Authority. 2015. Metrobus Ridership by Route and Trip Data. DDOT provided additional data for the CH-US Circulator in 2019.

⁴⁵ District Department of Transportation. 2016. DC Circulator Dashboard (2018).

⁴⁶ Union Station Parking Garage email correspondence to VHB, April 12, 2017. Once rental cars are factored in, the total capacity of the existing parking garage is approximately 2,450 cars.

⁴⁷ Union Station Parking Garage email correspondence to VHB, April 11, 2016.

616 meaning that multiple vehicles are parked in a single parking space to maximize parking per
617 square foot, with very limited room left for vehicles to maneuver.

618 **4.5.4.7 For-Hire Vehicles**

619 For-hire vehicles at WUS include traditional taxis, limousines, and TNCs like Uber and Lyft,
620 which conduct pick-ups and drop-offs along Union Station Drive in front of WUS. Pick-ups and
621 drop-offs also occur on First, 2nd, and H Streets NE.

622 There are designated taxi lanes for passenger pick-up in Columbus Circle in front of WUS,
623 which taxis enter via H Street NE. USPG manages day-to-day taxi operations, with taxi
624 dispatchers at the WUS front entrance to manage the flow. Taxi lane operations vary. When
625 there is no passenger queue, taxis line up single file. When there is a passenger queue, taxis
626 queue in both lanes.

627 On average, taxis pick up 1.2 passengers per vehicle in the AM peak hour (8:00 AM to 9:00
628 AM) and 1.3 passengers in the PM peak hour (4:30 PM to 5:30 PM). The average queue
629 length is 51 vehicles, approximately 1,270 feet, in the AM peak hour. In the PM peak hour, it
630 is 103 vehicles, approximately 2,579 feet. The District discourages taxi queueing on H Street
631 and enforcement is conducted regularly. Passenger queueing is longest directly after Amtrak
632 trains arrive at WUS. The maximum observed passenger queue was approximately 70
633 persons in the AM peak hour and approximately 80 persons in PM peak hour.⁴⁸

634 Detailed information on the operation of TNCs is not available because these companies
635 provide only limited public operational data. Based on DDOT data, approximately 4,100 TNC
636 pick-ups and 5,300 drop-offs occur daily at WUS.

637 **4.5.4.8 Private Pick-up and Drop-off**

638 Private passenger vehicles routinely pick up and drop off passengers in Union Station Drive
639 NE. The two outermost lanes are reserved for vehicles picking up and dropping off
640 passengers. In the PM peak period, USPG Traffic Control personnel direct traffic and ensure
641 cars are not idling in this lane.

642 The maximum total number of vehicles entering the pick-up/drop-off area from 3:30 PM to
643 4:30 PM was 385. Private automobiles had the highest average dwell time, as it took
644 passengers an average of 62.3 seconds to enter or exit a vehicle. The longest queue for the
645 pick-up/drop-off area was in the PM peak period, with approximately 1,755 feet or 70
646 vehicles.

⁴⁸ Taxi pick-up may shift to different locations when construction or rehabilitation activities are occurring at WUS. Observations were conducted when “normal” operations were in place, with taxi pick-up happening in front of the main entrance of WUS and taxis queueing along the east ramp.

647 **4.5.4.9 Loading**

648 WUS receives daily deliveries of goods at two separate loading dock facilities, one on First
649 Street NE between Massachusetts Avenue NE and G Street NE; and the other on H Street NE
650 to the east of the railroad tracks. The second loading facility is shared with the adjacent
651 Station Place private development. Based on counts from April 2017, an average of 48
652 vehicles use the H Street NE loading dock daily and an average of 43 vehicles use the First
653 Street NE loading dock daily. A mix of vehicles use the loading docks. The First Street loading
654 dock provides access for Amtrak vehicles, including Red Cap service, Package Express, and
655 Food Court suppliers. The H Street NE loading dock primarily serves WUS retail. The hour
656 with the peak average loading for both docks is 10:00 AM to 11:00 AM, with an average of 12
657 vehicles. The 8:00 AM to 9:00 AM and 9:00 AM to 10:00 AM hours average 8 and 9 vehicles,
658 respectively.

659 **4.5.4.10 Pedestrians**

660 Since WUS is in the center of the District, it experiences high volumes of pedestrian activity.
661 Pedestrian counts taken on April 6, 2016 found the following:

- 662 ■ AM pedestrian activity inside WUS follows train arrival patterns. The peak 5-minute
663 period was 8:40 AM to 8:45 AM. External pedestrian activity gradually rose until
664 approximately 8:40 AM, which matches commuter flows.
- 665 ■ Midday pedestrian activity generally increased between 11:30 AM and 12:30 PM,
666 then declined after 1:15 PM, corresponding with lunch time at WUS' restaurants. The
667 peak 5-minute period inside WUS was 12:40 PM to 12:45 PM, with some spikes due
668 to train arrivals. External pedestrian activity was stable throughout the midday
669 period.
- 670 ■ PM pedestrian activity peaked at approximately 5:15 PM then decreased afterward.
671 The peak 5-minute period inside WUS was 5:10 PM to 5:15 PM. Smaller peaks also
672 occurred, likely associated with arrival and departure of trains. The external
673 pedestrian activity remained relatively stable throughout the PM.

674 The greatest concentration of pedestrians in the peak 5-minute periods were in the
675 northwestern quadrant of WUS, where passengers can connect from trains serving WUS to
676 Metrorail. Some additional peaks were noted on the escalator connecting the WUS
677 concourse to the bus garage level, primarily associated with charter and intercity bus
678 passengers entering and exiting WUS.

679 Outside of WUS, a substantial number of pedestrians use the crosswalks on First Street on
680 the west side of WUS near Columbus Circle, particularly in the AM and PM peak periods.
681 Pedestrian counts found 434 people crossing this area during the AM peak of 8:40 AM to
682 8:45 AM; 314 during the midday peak of 12:15 PM to 12:20 PM; and 487 during the PM peak
683 of 5:10 PM to 5:15 PM. Many pedestrians do not use the crosswalks to cross the street.

684 **4.5.4.11 Bicycles**

685 Bicycle circulation is accommodated through on-road facilities and off-road shared-use paths.
 686 The Metropolitan Branch Trail (MBT), which carries high volumes of commuter and
 687 recreational bicycle traffic, runs along the west side of 2nd Street NE between L Street NE
 688 and F Street NE and on an elevated structure parallel to the Metrorail tracks north of L Street
 689 NE. The MBT connects the regional bicycle network in the northeast and northwest parts of
 690 the District with that in Maryland.

691 A cycle track on First Street NE between M Street and Massachusetts Avenue connects to the
 692 NoMA neighborhood and to the MBT. On-street bike lanes connect WUS, NoMA, Capitol Hill,
 693 and points east via G Street NE, I Street NE, and M Street NE. Bike lanes also connect WUS
 694 and downtown via E Street NW. On-street bike lanes on 4th Street NE and 6th Street NE
 695 provide north-south connections in the NoMA and Capitol Hill neighborhoods east of WUS.
 696 There is also a westbound bike lane on Columbus Circle.

697 Counts taken in July and August 2015 determined the AM peak hour for bicycle activity to be
 698 8:15 AM to 9:15 AM for both roadway segments considered. In the PM, the peak hour was
 699 5:00 PM to 6:00 PM for First Street NE and 5:15 PM to 6:15 PM for Massachusetts Avenue
 700 NE. Massachusetts Avenue had a higher number of riders during the AM and PM peak hours.
 701 There were more southbound riders during the AM peak hour and more northbound riders
 702 during the PM peak hour (**Table 4-8**). Peak hour levels were estimated to be 10 percent
 703 higher in 2017 than in 2015, reflecting growing bicycle activity in the District.

Table 4-8. AM and Peak Hour Bicycle Activity, 2015 Counts and 2017 Estimates

On Street	Between	Peak Hour	North-Bound	South-Bound	AM Peak Hour Total (2015)	2017 Total Estimate
First Street NE	G Place NE / Massachusetts Ave NE	8:15 AM-9:15 AM	32	95	127	140
Massachusetts Avenue NE	Louisiana Ave NE/ E Street NE	8:15 AM-9:15 AM	82	99	181	199
First Street NE	G Place NE / Massachusetts Ave NE	5:00 PM-6:00 PM	64	51	115	127
Massachusetts Avenue NE	Louisiana Ave NE/ E Street NE	5:15 PM-6:15 PM	143	74	217	239

Source: DDOT, 2015. Counts conducted on July 28, 2015 and August 8, 2015.

704 Bicycle parking at WUS includes bicycle racks and covered, secure storage at Bikestation
 705 Washington DC, which is located west of historic station building on First Street NE.
 706 Bikestation provides full-time access for members and is staffed 66 hours a week. The facility
 707 provides space for more than 100 bicycles; private changing rooms and day-use lockers for
 708 rent; and bicycle rentals, repairs, and retail sales.

709 Bike rentals are available through Capital Bikeshare and several other companies. The Capital
710 Bikeshare station at WUS, located on F Street NE in front of WUS, has 54 bicycle docks,
711 making it one of the largest docking stations in the regional system. Additional Capital
712 Bikeshare stations in the Local Study Area are located at North Capitol Street and F Street
713 NW (21 docks), 2nd Street and G Street NE (19 docks), and North Capitol Street and G Place
714 NE (17 docks). Bike and Roll provides bike rentals and bike tours from the Bikestation. Tours,
715 including evening tours, are offered on a seasonal basis. Bike rentals are available year-
716 round, weather permitting.

717 DDOT allows private dockless bikeshare providers to operate in the District. These services
718 allow users to rent and park bicycles in a location of their choice. Representative usage data
719 for these services are currently not available. Site visits confirmed that dockless bikes are
720 available near WUS.

721 **4.5.4.12 Vehicular Traffic**

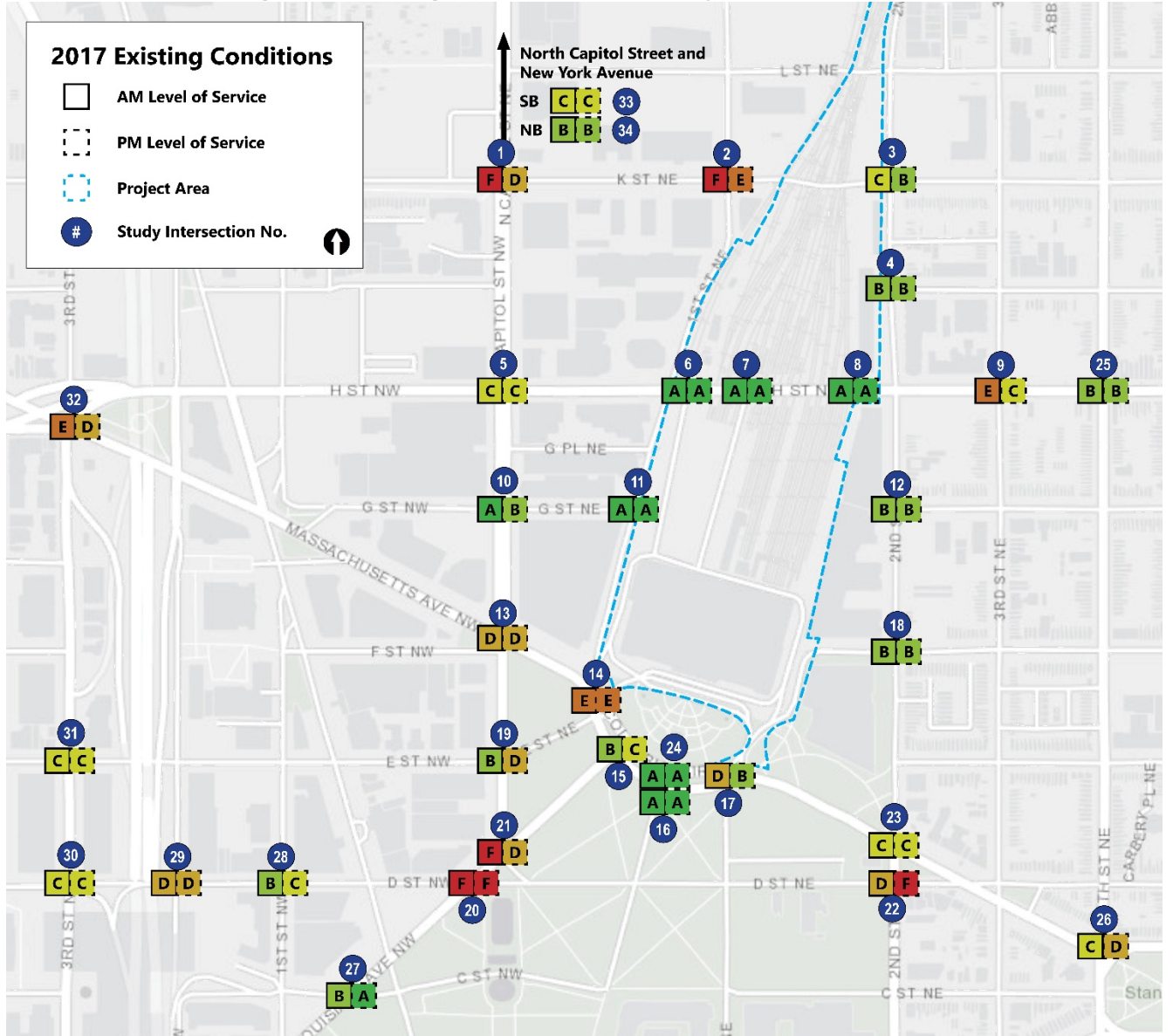
722 The road network around WUS consists of principal and minor arterials, collectors, and local
723 streets. H Street, North Capitol Street, and Massachusetts Avenue (west of North Capitol
724 Street) are principal arterials. E Street, K Street, and Massachusetts Avenue (east of North
725 Capitol Street) are minor arterials. D Street, F Street, First Street, 2nd Street, and Delaware
726 Avenue are collectors. The remaining streets within the Local Study Area are local streets.

727 The capacity analysis results for the 34 study intersections (see **Figure 4-5**) found that most
728 of these intersections operate at an acceptable LOS except for the following ones, which
729 operate at LOS F:

- 730 ■ North Capitol Street and K Street in the AM peak hour, due to heavy westbound and
731 southbound traffic volumes.
- 732 ■ First Street and K Street NE in the AM peak hours, also because of high westbound
733 and southbound traffic volumes.⁴⁹
- 734 ■ Louisiana Avenue and D Street NW in both peak hours because of heavy westbound
735 and eastbound traffic volumes.
- 736 ■ Louisiana Avenue and North Capitol Street during the AM peak hour, due to the high
737 volume of southbound vehicles attempting to turn right onto Louisiana Avenue from
738 North Capitol Street.
- 739 ■ Second Street and D Street NE in the PM peak hour, because of heavy northbound
740 and southbound traffic volumes.

⁴⁹ Since 2017, DDOT has completed a “road diet” on K Street NE east of 2nd Street NE. This may have lowered LOS performance further.

Figure 4-5. Existing Levels of Service at Study Intersections



741 LOS range from “A” being the best to “F” being the worst based on the average delay vehicles
742 experience to clear the intersection. For signalized intersection, LOS F corresponds to an
743 average delay greater than 80 seconds. For stop-controlled intersection, it corresponds to an
744 average delay greater than 50 seconds. LOS E (average delay between 56 and 80 seconds for
745 signalized intersections and between 36 and 50 seconds for stop-controlled ones) is typically
746 consider the acceptable LOS threshold in the District.

747 LOS for the 34 study intersections are presented in **Section 5.5.13, Vehicular Traffic**, of the
748 July 2018, *Washington Union Station Expansion Project, Affected Environment Technical*
749 *Report (Appendix C2)*.

750 **4.5.4.13 Transportation Outside the Local Study Area**

751 This section provides a broad overview of the existing transportation infrastructure in the
752 Regional Study Area.

753 **Regional Passenger Railroad Infrastructure**

754 WUS sits in the middle of the region’s intercity and commuter passenger railroad
755 infrastructure. In the Regional Study Area, there are Amtrak stations at Rockville and New
756 Carrollton in Maryland, and at Alexandria, Manassas, and Quantico in Virginia. Amtrak
757 Northeast Regional service (with the exclusion of Rockville) and various Amtrak long-distance
758 trains serve these stations. Multiple stations for the MARC and VRE commuter services are
759 located within the Regional Study Area. A VRE railyard is in Prince William County, Virginia.

760 **Regional Transit Network**

761 The region has a robust transit network. The WMATA Metrorail system consists of six lines
762 and 91 stations, all within the Regional Study Area. As of 2016, annual ridership was
763 748,000.⁵⁰ WMATA’s Metrobus system serves most of the region. Local jurisdictions provide
764 additional transit bus service. These local services include: DC Circulator (District of
765 Columbia); Ride On (Montgomery County, Maryland); The Bus (Prince George’s County,
766 Maryland); ART (Arlington County, Virginia); DASH (Alexandria, Virginia); Fairfax Connector
767 (Fairfax County, Virginia); The Q (Fairfax City, Virginia); OmniLink (Prince William County,
768 Virginia); and LCT (Loudoun County, Virginia).

769 **Regional Road Network**

770 The regional road network is notable for high levels of traffic congestion. Major roadways
771 within the Regional Study Area include various parkways and highways. Notable parkways,
772 most under the control of NPS, include the George Washington Memorial Parkway; the Clara
773 Barton Parkway; the Rock Creek and Potomac Parkway; the Baltimore-Washington Parkway;

⁵⁰ Washington Metropolitan Area Transit Authority. 2016. *Metrorail Average Weekday Passenger Boardings*. Accessed from https://www.wmata.com/initiatives/plans/upload/2016_historical_rail_ridership.pdf. Accessed on April 3, 2020.

774 and Suitland Parkway. Major interstates and limited access highways include I-495 (the
775 Capital Beltway), I-95, I-66, I-270, MD 200 (the Intercounty Connector), and U.S. 50.

776 **Regional Bicycle Infrastructure Network**

777 The region has a bicycle infrastructure network running throughout various jurisdictions. As
778 of 2015, the District had 60 miles of bicycle lanes; Arlington County had 24 miles; and
779 Montgomery County had 17 miles.⁵¹ The MBT, which is a partially completed hiker-biker trail,
780 extends from First and L Streets NE in the District to Silver Spring, Maryland.

781 **4.5.4.14 Transportation Safety**

782 Pedestrians and bicyclists face safety problems as they cross six lanes of traffic in front of
783 WUS. There are also high pedestrian volumes at an un-signalized crosswalk in the southwest
784 section of Union Station Drive, near the intersection with Massachusetts Avenue NE. The
785 front of WUS and H Street are a challenge for bicyclists because of garage traffic and, for H
786 Street, the grades, traffic volumes, and lack of accommodations. Union Station Drive does
787 not have bicycle lanes and bicyclists must use the middle bus lane.

788 Seventy-two crashes occurred across all modes from 2012 to 2016 in front of WUS.⁵²
789 Approximately 5,465 reported vehicular crashes occurred in the Local Study Area, of which
790 10 percent resulted in injury and 3 percent were serious but not fatal. The intersections with
791 the highest crash incidence were on roadways with high traffic volumes: North Capitol
792 Street/H Street, North Capitol Street/New York Avenue, New York Avenue/First Street NE,
793 and New York Avenue/Florida Avenue NE. Each had more than 100 crashes between 2012
794 and 2016. These locations, as well as several intersections on K Street NE east of the rail
795 terminal overpass, had the highest incidence of crashes resulting in major injury.

796 Approximately 3 percent of all crashes in the Local Study Area involved a bicyclist or
797 pedestrian being struck by a vehicle. The North Capitol Street corridor between H Street and
798 New York Avenue had the highest incidence of pedestrian/bicycle crashes, with the
799 intersection of North Capitol Street and New York Avenue having the most pedestrian/bicycle
800 crashes of any single intersection in the Local Study Area. Other locations with relatively high
801 numbers of cross-modal conflicts include First Street NE, which runs along the west side of
802 the Project Area and features a cycletrack; and First Street NW between D Street NW and
803 New York Avenue.

⁵¹ National Capital Region Transportation Planning Board. 2015. *Bicycle and Pedestrian Plan for the National Capital Region*. Accessed from <https://www.mwcog.org/documents/bicycle-and-pedestrian-plan/>. Accessed on April 3, 2020.

⁵² Metropolitan Police Department of the District of Columbia, Crash Data Management System – COBALT. Accessed from <http://opendata.dc.gov/>. Accessed on July 17, 2018.

4.6 Air Quality

804 This section describes existing conditions as they pertain to air quality as defined by the EPA
805 under the Clean Air Act (CAA) of 1970 (42 USC 7401 *et seq.*) and its amendments. Air quality
806 refers to the condition of the ambient air and is determined through the measurement of air
807 pollution. Ambient air is generally defined as the portion of the atmosphere (outside of
808 buildings) to which the public has access. Air pollution is a general term that refers to
809 substances that degrade the quality of the atmosphere. Air pollution is of concern because of
810 its demonstrated effects on human health. Urban air pollution is typically caused by mobile
811 sources or stationary sources. Mobile sources include cars, trains, or trucks. Stationary
812 sources include boilers or generators.

813 Under the CAA, EPA has established National Ambient Air Quality Standards (NAAQS) for
814 criteria pollutants to protect public health and welfare. There are six criteria air pollutants of
815 nationwide concern because of their potential effect on public health and the environment:
816 Carbon monoxide (CO); sulfur dioxide (SO₂); nitrogen dioxide (NO₂); ozone (O₃); particulate
817 matter sized 10 micrometers or less (PM₁₀) and sized 2.5 micrometers or less (PM_{2.5}); and
818 lead (Pb).

819 EPA designates areas where measured concentrations of a given criteria pollutant are below
820 the NAAQS as being in Attainment for that pollutant. Areas where concentrations of a criteria
821 pollutant are above the NAAQS are Nonattainment Areas. Areas recently moved from
822 Nonattainment to Attainment status are Maintenance Areas. Additional details are available
823 in the July 2018, *Washington Union Station Expansion Project Affected Environment Technical*
824 *Report (Appendix C2)*.

825 4.6.1 Regulatory Context and Guidance

826 Federal policies, regulations, and guidance pertaining to air quality and relevant to the
827 Project and the analysis in this Section include:

- 828 ■ CAA of 1970 (42 USC 7401);
- 829 ■ Conformity Rule (40 CFR 51 and 93);
- 830 ■ NAAQS (40 CFR 50);
- 831 ■ FRA *Procedures for Considering Environmental Impacts* (64 Federal Register [FR]
832 28545);
- 833 ■ Control of Hazardous Air Pollutants from Mobile Sources 2007 (72 FR 8427);⁵³

⁵³ U.S. Environmental Protection Agency. 2007. *Final Rule for Control of Hazardous Air Pollutants from Mobile Sources*. Accessed from <https://www.epa.gov/mobile-source-pollution/final-rule-control-hazardous-air-pollutants-mobile-sources>. Accessed on April 3, 2020.

- 834 ■ Federal Highway Administration (FHWA) *Updated Interim Guidance on Mobile Source*
835 *Air Toxic Analysis in National Environmental Policy Act (NEPA) Documents*;⁵⁴
- 836 ■ FHWA Technical Advisory T6640.8A;⁵⁵
- 837 ■ EPA *Guideline for Modeling Carbon Monoxide from Roadway Intersections*;⁵⁶
- 838 ■ EPA’s *Using Motor Vehicle Emission Simulator (MOVES) 2014 in Project-Level Carbon*
839 *Monoxide Analyses*; and⁵⁷
- 840 ■ EPA’s *Emission Factors for Locomotives* guidance (EPA-420-F-09-025).⁵⁸
- 841 District of Columbia (District) policies, regulations, and guidance pertaining to air quality and
842 relevant to the Project include:
- 843 ■ 20 DCMR 20-1 through 20-15, Air Quality;⁵⁹
- 844 ■ 20 DCMR 605, Control of Fugitive Dust;⁶⁰

⁵⁴ U.S. Department of Transportation, Federal Highway Administration. 2016. *Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents*. Memorandum. Accessed from https://www.fhwa.dot.gov/environMent/air_quality/air_toxics/policy_and_guidance/msat/. Accessed on April 3, 2020.

⁵⁵ U.S. Department of Transportation, Federal Highway Administration. 2018. Accessed from https://www.environment.fhwa.dot.gov/legislation/nepa/guidance_preparing_env_documents.aspx. FHWA Technical Advisory T6640.8A. Accessed on April 3, 2020.

⁵⁶ U.S. Environmental Protection Agency. 1992. *Guideline for Modeling Carbon Monoxide from Roadway Intersections*. Accessed from <https://nepis.epa.gov/Exe/ZyNET.exe/2000F7L2.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1991+Thru+1994&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C91thru94%5CTxt%5C0000014%5C2000F7L2.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL>. Accessed on April 3, 2020.

⁵⁷ U.S. Environmental Protection Agency. 2015. *Using MOVES2014 in Project-Level Carbon Monoxide Analyses*. Accessed from <https://nepis.epa.gov/Exe/ZyPdf.cgi?Dockey=P100M2FB.pdf>. Accessed on April 3, 2020.

⁵⁸ U.S. Environmental Protection Agency. 1997. *Emission Factors for Locomotives*. Accessed from <https://nepis.epa.gov/Exe/ZyNET.exe/P1001Z8C.TXT?ZyActionD=ZyDocument&Client=EPA&Index=1995+Thru+1999&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&IntQFieldOp=0&ExtQFieldOp=0&XmlQuery=&File=D%3A%5Czyfiles%5CIndex%20Data%5C95thru99%5CTxt%5C0000022%5CP1001Z8C.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActionS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1&SeekPage=x&ZyPURL>. Accessed on April 3, 2020.

⁵⁹ 20 District of Columbia Municipal Regulations Chapters 20-1 through 20-15, Air Quality. Accessed from <http://dcrules.elaws.us/dcmr/t20>. Accessed on April 3, 2020.

⁶⁰ 20 District of Columbia Municipal Regulations Chapter 6, Control of Fugitive Dust. Accessed from https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/aqd.revch6_.pdf. Accessed on April 3, 2020.

- 845 ■ 20 DCMR 900, Engine Idling;⁶¹
846 ■ 20 DCMR 1501, General Conformity; and⁶²
847 ■ 20 DCMR 7, Volatile Organic Compounds and Hazardous Air Pollutants.⁶³

848 4.6.2 Study Area

849 The Local Study Area for air quality includes portions of the District near the air emission
850 sources associated with the Project where the public has access to ambient air. It coincides
851 with the Local Study Area for transportation (**Figure 4-3**) to capture emissions from both
852 stationary sources in the Project Area and mobile source emissions from roadway traffic
853 associated with the Project.

854 The Regional Study Area (**Figure 4-6**) encompasses the jurisdictions that are members of
855 MWCOG. This is the area within which MWCOG conducts regional air quality modeling.⁶⁴

856 4.6.3 Methodology

857 Regional climate and meteorological conditions in the Regional Study Area were determined
858 based on publicly available data from the National Oceanic and Atmospheric Administration
859 and the National Weather Service. This information includes data on historical temperatures,
860 precipitation, wind speeds, and distributions.

861 Existing ambient air quality conditions are described based on DOEE and EPA air quality
862 monitoring data from sources such as the Ambient Air Monitoring Network Plans and the
863 EPA AirData Database.

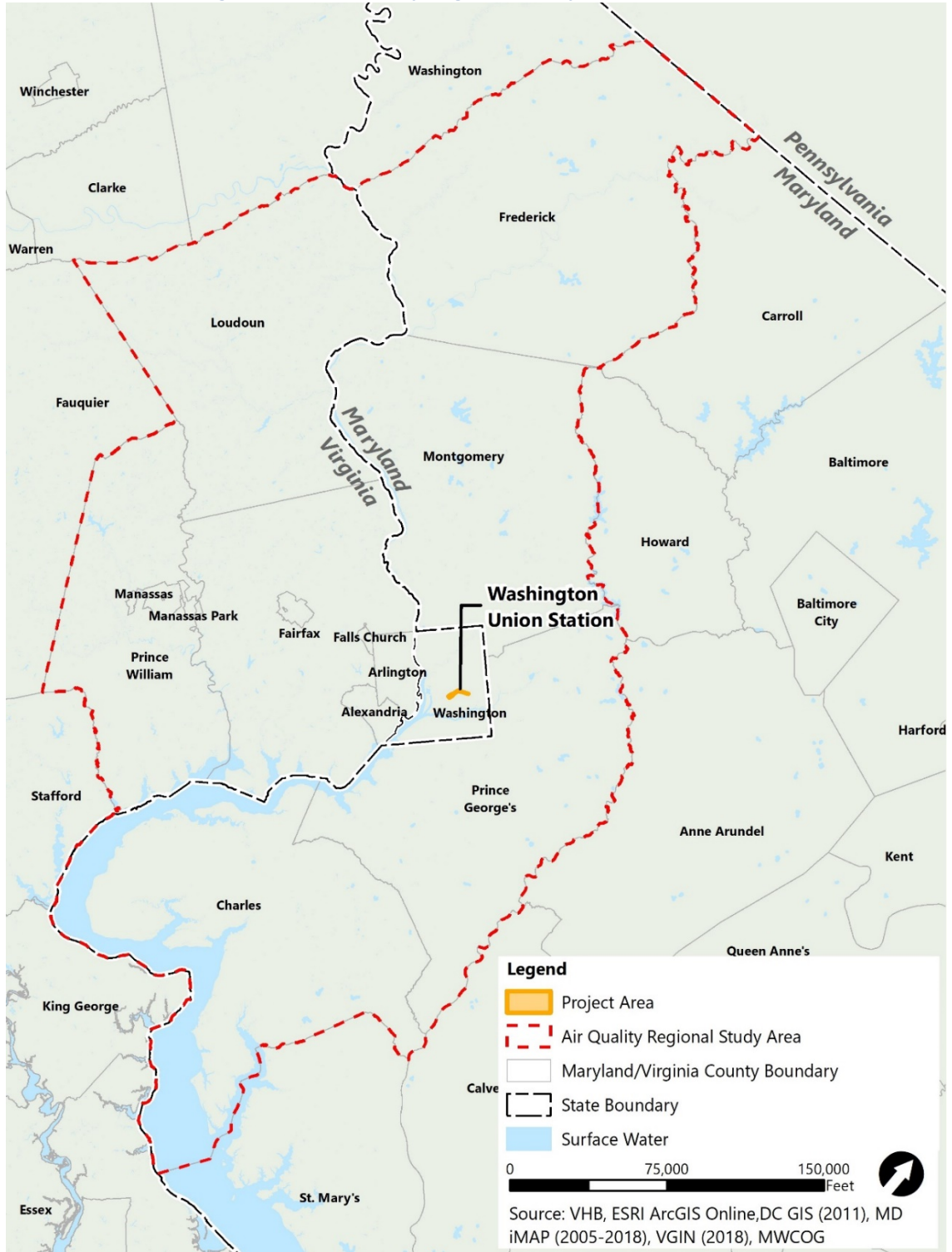
⁶¹ 20 District of Columbia Municipal Regulations Chapter 9, *Engine Idling*. Accessed from <https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/chapter9revised.pdf>. Accessed on April 3, 2020.

⁶² 20 District of Columbia Municipal Regulations Chapter 15, *General Conformity*. Accessed from <http://dcrules.elaws.us/dcmr/20-1501>. Accessed on April 3, 2020.

⁶³ 20 District of Columbia Municipal Regulations Chapter 7, *Volatile Organic Compounds and Hazardous Air Pollutants*. Accessed from <https://dcregs.dc.gov/Common/DCMR/RuleList.aspx?ChapterNum=20-7&ChapterId=467>. Accessed on April 3, 2020.

⁶⁴ Metropolitan Washington Council of Governments. FY 2017-2022 *Transportation Improvement Program - Amendment to Constrained Long-Range Transportation Plan (CLRP)*. November 2016. Accessed from http://www1.mwco.org/clrp/resources/KeyDocs_2016.asp. Accessed on April 3, 2020.

Figure 4-6. Air Quality Regional Study Area



864 **4.6.4 Existing Conditions**

865 **4.6.4.1 Regional Climate Setting**

866 Regional climate and meteorological conditions can substantially affect air quality. Emission,
 867 transport, and dispersion of pollutants are highly dependent on wind speed, wind direction,
 868 air temperature, precipitation, humidity, and other meteorological factors. The District has a
 869 humid subtropical climate with hot and humid summers, cold winters, light snowfall, and
 870 annual precipitation occurring throughout the year.⁶⁵ Between 1980 and 2010, average
 871 monthly temperatures ranged from a low of 36 degrees Fahrenheit (°F) in January to a high
 872 of 79.8 °F in July.⁶⁶ Predominant wind direction is from the west-northwest.

873 **4.6.4.2 Ambient Air Quality**

874 EPA has designated the District as a Marginal Nonattainment Area for the 8-hour O₃ standard
 875 in an O₃ Transport Region; and a Moderate Maintenance Area for CO and PM_{2.5}.⁶⁷ **Table 4-9**
 876 presents 2015 background concentrations of criteria pollutants in the ambient air measured
 877 at the monitoring location closest to the Project Area (McMillan Reservoir, 2500 First Street
 878 NW) as well as the corresponding NAAQS. Concentrations of all criteria pollutants were
 879 below the NAAQS. Concentrations of O₃ and PM_{2.5} approached the NAAQS. Additional details
 880 on existing air quality conditions are available in the July 2018, *Washington Union Station*
 881 *Expansion Project Affected Environment Technical Report (Appendix C2)*.

Table 4-9. 2015 Background Air Quality Concentrations (McMillan Reservoir Monitoring Location)

Pollutant	Averaging Period	Concentration	NAAQS
CO (parts per million [ppm])	8-hour	1.5	9
	1-hour	1.7	35
NO ₂ (parts per billion [ppb])	1-hour	49	100
	Annual	13	53
O ₃ (ppm)	8-hour	0.068	0.070
PM _{2.5} (micrograms per cubic meter [µg/m ³])	Annual	9.2	12.0
	24-hour	22	35
PM ₁₀ (µg/m ³)	24-hour	-	150
SO ₂ (ppb)	1-hour	12	75
Lead (µg/m ³)	3-month	0.0046	0.15

Source: EPA. Air Quality Design Values. Accessed from <https://www.epa.gov/air-trends/air-quality-design-values>. Accessed on June 29, 2017.

⁶⁵ Vetmed Uni Vienna. 2017. *Koppen Classification: Cfa*. Accessed from <http://koeppen-geiger.vu-wien.ac.at/usa.htm>. Accessed on April 20, 2020.

⁶⁶ National Weather Service. 2016. *DCA Normals, Means, and Extremes*. Accessed from <http://www.weather.gov/lwx/dcanme>. Accessed on April 3, 2020.

⁶⁷ U.S. Environmental Protection Agency. *Nonattainment Areas for Criteria Pollutants (Green Book)*. Accessed from <https://www.epa.gov/green-book>. Accessed on April 3, 2020.

4.7 Greenhouse Gas Emissions and Resilience

882 This section reviews existing conditions pertaining to greenhouse gas (GHG) emissions,
883 changing climate conditions, and resilience to changing precipitation patterns, sea level rise,
884 and the frequency and intensity of extreme weather events.

885 GHGs are gases that trap heat in the atmosphere. Gases that are considered GHGs affect air
886 quality and climate change. Some major GHGs include carbon dioxide (CO₂), methane (CH₄),
887 nitrous oxide (N₂O), and fluorinated gases (hydrofluorocarbons, perfluorocarbons, etc.). The
888 precise sources of these pollutants, their effects on human health and general welfare, as
889 well as their final disposition in the atmosphere vary considerably. Because CO₂ is the most
890 common GHG, emissions are often measured in CO₂ equivalent (CO₂e). For a given GHG, the
891 CO₂e is the amount of CO₂ that would have the same warming effect. Additional details on
892 GHG emissions and resilience are available in the July 2018, *Washington Union Station*
893 *Expansion Project Affected Environment Technical Report (Appendix C2)*.

4.7.1 Regulatory Context and Guidance

895 Federal policies, regulations, and guidance that pertain to GHG and resilience that are
896 relevant to the Project include:

- 897 ■ EO 13783, Promoting Energy Independence and Economic Growth;
- 898 ■ EO 13677, Climate Resilient International Development;
- 899 ■ EO 13834, Efficient Federal Operations;
- 900 ■ Environmental Protection Agency (EPA) *Greenhouse Gas Endangerment Finding*;⁶⁸
901 and
- 902 ■ EPA and U.S. Department of Transportation (USDOT) *Greenhouse Gas Emissions and*
903 *Corporate Average Fuel Economy Standards (2011)*.^{69,70}

904 District policies, regulations and guidance that pertain to GHG and resilience include:

⁶⁸ U.S. Environmental Protection Agency. December 15, 2009. *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act (74 F.R. 66495)*. Accessed from https://www.epa.gov/sites/production/files/2016-08/documents/federal_register-epa-hq-oar-2009-0171-dec.15-09.pdf. Accessed on April 3, 2020.

⁶⁹ U.S. Environmental Protection Agency, U.S Department of Transportation. May 7, 2010. *Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards (75 F.R. 25324)*. Accessed from <https://www.gpo.gov/fdsys/pkg/FR-2010-05-07/pdf/2010-8159.pdf>. Accessed on April 3, 2020.

⁷⁰ U.S. Environmental Protection Agency, U.S Department of Transportation. October 15, 2012. *2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards (77 F.R. 62624)*. Accessed from <https://www.gpo.gov/fdsys/pkg/FR-2012-10-15/pdf/2012-21972.pdf>. Accessed on April 3, 2020.

- 905 ■ *Sustainable DC Plan*;⁷¹ and
906 ■ *Climate Ready DC*.⁷²

907 **4.7.2 Study Area**

908 The state of scientific knowledge of the dispersion and health effects of GHG emissions has
909 not sufficiently advanced to accurately consider them as microscale levels; therefore, a Local
910 Study Area was not defined for GHG. The GHG Regional Study Area is the same as the Air
911 Quality Study Area and is the defined jurisdictions of MWCOG (**Figure 4-6**). For climate
912 change impacts and resiliency, the Local Study Area includes the Project Area and
913 surrounding areas within one-half mile (**Figure 4-7**). The Regional Study Area for resiliency is
914 the same as for GHG.

915 **4.7.3 Methodology**

916 Global, national, and regional trends in GHG emissions and climatic changes were reviewed
917 to characterize the existing conditions. Existing local and regional GHG emissions, including
918 the operations and maintenance of WUS and climate change issues, were considered.

919 **4.7.4 Existing Conditions**

920 **4.7.4.1 Greenhouse Gas Emissions and Climate Trends**

921 Climate and meteorological conditions can substantially affect air quality and GHG emissions
922 across the region. These regional conditions and resulting potential impacts to the natural
923 and built environment are summarized in the Intergovernmental Panel on Climate Change’s
924 latest synthesis report,⁷³ the *U.S. Third National Climate Assessment*, and *Climate Ready*
925 *DC*.⁷⁴

⁷¹ Department of Energy and Environment, District Office of Planning, and Office of the Mayor. 2016. *The Sustainable DC Plan*. Accessed from http://www.sustainabledc.org/wp-content/uploads/2017/03/SDC_Plan_2016_compressed2.pdf. Accessed on April 3, 2020.

⁷² D.C. Department of Energy and Environment. November 2016. *Climate Ready DC Plan*. Accessed from https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/CRDC-Report-FINAL-Web.pdf. Accessed on April 3, 2020.

⁷³ Intergovernmental Panel on Climate Change. 2014. *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Accessed from <http://ar5-syr.ipcc.ch/>. Accessed on April 3, 2020.

⁷⁴ District of Columbia Department of Energy and Environment. 2013. *Climate Ready DC: The District of Columbia’s Plan to Adapt to a Changing Climate, Department of Energy and Environment*. Accessed from https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/CRDC-Report-FINAL-Web.pdf. Accessed on April 3, 2020.

Figure 4-7. Resilience Local Study Area



927 DOEE’s 2013 GHG emissions inventory found 7.75 million metric tons of CO₂e in the District,
928 a reduction of 2.35 million metric tons compared to 2006.⁷⁵ Passenger vehicles produced the
929 majority of transportation-related CO₂e emissions. Electricity used in transit accounted for 6
930 percent. The District has set a GHG emission reduction target for 2032 of 50 percent of the
931 2006 emissions. This would amount to approximately 5.05 million metric tons of CO₂e.

932 **4.7.4.2 Regional and District Climate Trends**

933 The Northeast region has recorded an increase in average annual temperature of almost 2°F
934 between 1895 and 2011. The majority of the southern portion of the Northeast region is
935 projected to experience more days per year above 90°F by mid-century.⁷⁶ The Northeast has
936 also experienced a 70 percent increase in precipitation volume during extreme storm events

937 The frequency and intensity of heavy downpours will likely continue through the end of the
938 century. Sea level in the Northeast region has risen approximately 1 foot since 1990,
939 exceeding the global average of 8 inches, resulting in increased regional coastal flooding. Sea
940 level rise will likely continue accelerate due to local land subsidence, which will pose a major
941 coastal flooding threat.⁷⁷

942 Consistent with regional trends, the District’s average annual temperature has increased by
943 more than 2°F in the last 50 years. The District experiences an average of 30 dangerously hot
944 days per year (highs greater than 95°F). As average temperature is projected to continue
945 rising, the District is expected to experience hot days and heatwaves more frequently.
946 District annual precipitation volumes have not changed but more precipitation has been
947 occurring in the fall and winter, and less in the summer.⁷⁸

948 The Potomac River and Anacostia River water levels have risen 11 inches in the past 90 years,
949 resulting in a 300 percent increase of flooding along riverfronts.⁷⁹ As the land along the
950 shores of the Potomac and Anacostia Rivers sinks, sea level is rising, allowing extreme high
951 tides to reach farther inland. At the official tide gauge along the District’s Southwest
952 Waterfront, sea level has risen six or seven inches during the last 50 years. If current trends

⁷⁵ District of Columbia Department of Energy and Environment. 2018. *District of Columbia Greenhouse Gas Inventory Update 2012-2013*. Accessed from <https://doee.dc.gov/service/greenhouse-gas-inventories>. Accessed on April 3, 2020.

⁷⁶ U.S. Global Research Program. 2014. *National Climate Assessment*. Accessed from <https://nca2014.globalchange.gov/report>. Accessed on April 3, 2020.

⁷⁷ Horton, et al. 2014: Ch. 16: *Northeast*. *Climate Change Impacts in the United States: The Third National Climate Assessment*. Accessed from http://s3.amazonaws.com/nca2014/low/NCA3_Full_Report_16_Northeast_LowRes.pdf?download=1. Accessed on April 3, 2020.

⁷⁸ District of Columbia Department of Energy and Environment. 2014. *Climate Ready DC: The District of Columbia’s Plan to Adapt to a Changing Climate*. Accessed from <https://doee.dc.gov/climate-ready>. Accessed on April 3, 2020.

⁷⁹ District of Columbia Department of Energy & Environment, *Climate Ready DC: The District of Columbia’s Plan to Adapt to a Changing Climate*. Accessed from <https://doee.dc.gov/climate-ready>. Accessed on April 3, 2020.

953 continue, sea level in the District is likely to rise 16 inches to 4 feet in the next century.⁸⁰ The
954 District will likely become more vulnerable to storm surge flooding from coastal storms and
955 hurricanes.

4.8 Energy Resources

956 This section describes the existing conditions pertaining to energy use at WUS. The discussion
957 focused on operation-related energy use. This includes energy used at WUS (including the
958 parking garage) for lighting, plug loads, operations-related equipment, heating, and cooling.
959 The energy used at WUS is predominantly generated using fossil fuels, which emit GHGs and
960 air pollutants. Additional details on energy resources are available in the July 2018,
961 *Washington Union Station Expansion Project Affected Environment Technical Report*
962 **(Appendix C2)**.

4.8.1 Regulatory Context and Guidance

964 Federal policies, regulations, and guidance that pertain to energy resources include:

- 965 ■ Sections of 42 USC (energy conservation, decreased dependence on foreign oil, use
966 of alternative fuels, and increased efficiency in energy use);⁸¹
- 967 ■ EO 13834 Efficient Federal Operations;⁸²
- 968 ■ Energy Independence and Security Act of 2007;⁸³

969 District policies, regulations, and guidance that may pertain to energy resources include:

- 970 ■ The DC Energy Conservation Code (ECC);⁸⁴
- 971 ■ The Green Building Act of 2006;⁸⁵

⁸⁰ U.S Environmental Protection Agency. November 2016. *Climate Change Indicators in the United States: What Climate Change Means for the District of Columbia*. Accessed from <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100Q5CG.PDF?Dockey=P100Q5CG.PDF>. Accessed on April 3, 2020.

⁸¹ 42 USC *The Public Health and Welfare*. Accessed from <http://uscode.house.gov/browse/prelim@title42&edition=prelim>. Accessed on April 3, 2020.

⁸² EO 13834 Regarding Efficient Federal Operations. Accessed from <https://www.epa.gov/fgc/executive-order-13834-regarding-efficient-federal-operations>. Accessed on April 3, 2020.

⁸³ *Summary of the Energy Independence and Security Act*. Accessed from <https://www.epa.gov/laws-regulations/summary-energy-independence-and-security-act>. Accessed on April 3, 2020.

⁸⁴ District of Columbia Department of Consumer and Regulatory Affairs. *2013 District of Columbia Green Construction Code*. Accessed from <https://codes.iccsafe.org/content/document/920>. Accessed on April 3, 2020.

⁸⁵ *Green Building Act of 2006*. Accessed from https://doe.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/Green_Building_Act_of_2006_B16-515.pdf. Accessed on April 3, 2020.

- 972 ■ The Clean and Affordable Energy Act of 2008;⁸⁶

973 **4.8.2 Study Area**

974 The Local Study Area for energy resources is the portion of the Project Area extending from
975 the front of WUS up to K Street (**Figure 4-8**) to account for operation-related energy use
976 within the Project Area. The Regional Study Area includes the District.

977 **4.8.3 Methodology**

978 The data sources used to describe energy use at WUS include utility bills from the local
979 electric utility, Pepco, and bills from the Capitol Power Plant.

980 **4.8.4 Existing Conditions**

981 **4.8.4.1 Electricity**

982 WUS uses locally supplied electricity from Pepco at an average of 1,260,000 kilowatt hours
983 (kWh) of electricity per billing period (nine billing periods per year). In 2015, WUS (including
984 the parking garage) used approximately 11,400,000 kWh. The electricity used at WUS is
985 primarily generated from fossil fuels.

986 **4.8.4.2 Heating**

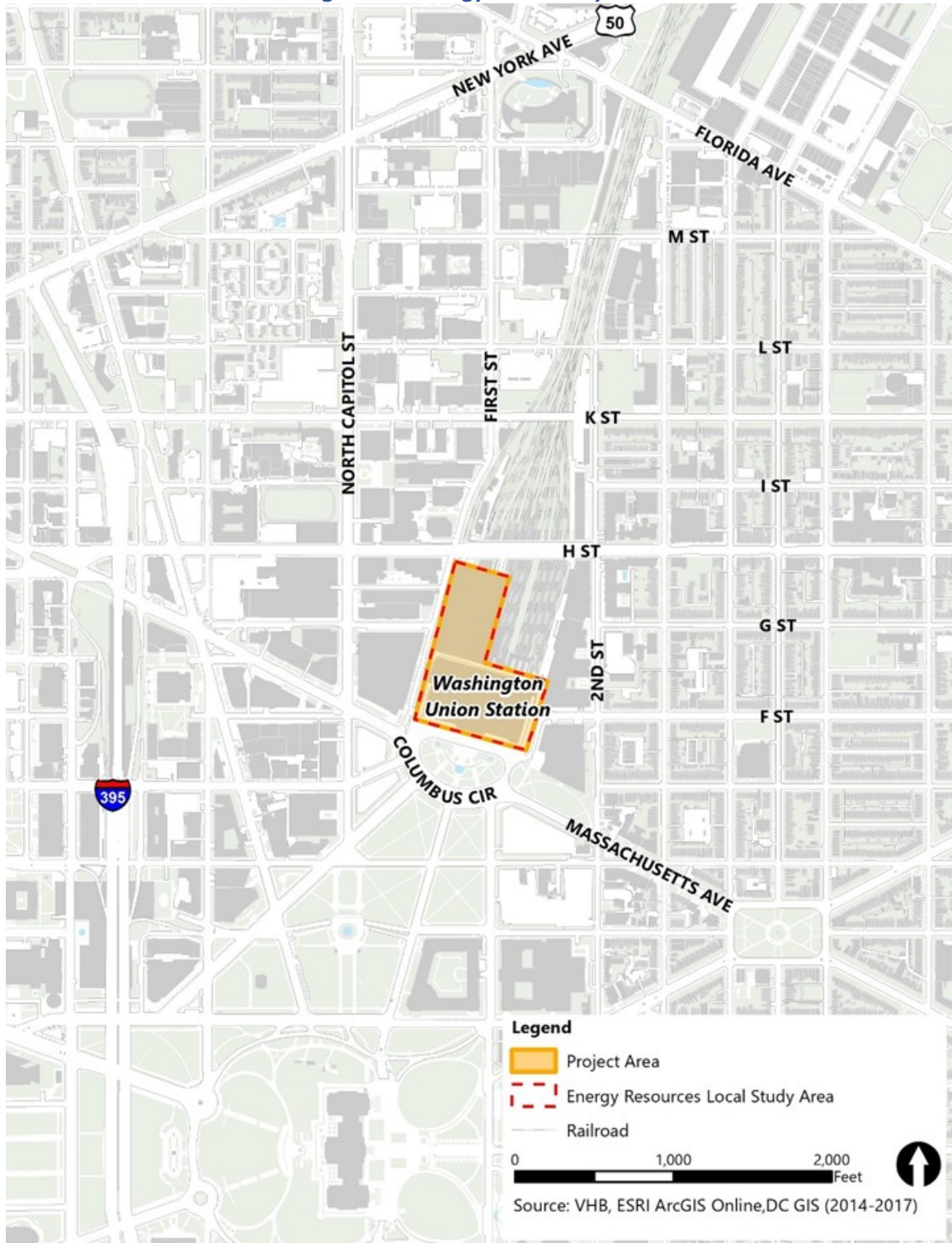
987 The Architect of the Capitol's (AOC) Capitol Power Plant provides steam used to heat WUS.
988 The plant uses natural gas to generate its steam. In 2014, heating WUS consumed
989 approximately 15,900 thousand pounds of Capitol Power Plant steam. The highest steam
990 consumption occurred from January through March, which generally are the coldest months
991 of the year. Approximately 19 billion British Thermal Units (BTUs) of natural gas were used to
992 produce the 15,900 thousand pounds of steam that heated the facility in 2014.

993 **4.8.4.3 Cooling**

994 WUS is cooled using chilled water from the Capitol Power Plant. The plant chillers run on
995 electricity. In 2014, WUS consumed 30,999,659,000 BTUs of chilled water for cooling. The
996 highest level of consumption took place in July 2014 (4,922,527,000 BTUs) and the lowest
997 one in February 2014 (1,019,348,000 BTUs).

⁸⁶ *Clean and Affordable Energy Act of 2008*. Accessed from
<http://dcclims1.dccouncil.us/images/00001/20080819161530.pdf>. Accessed on April 3, 2020.

Figure 4-8. Energy Local Study Area



4.9 Land Use, Land Planning and Property

999 This section describes existing conditions pertaining to land use, land planning, and property.
1000 It identifies existing land uses, property ownership, local zoning, development, and master
1001 plans pertinent to the Project.

1002 4.9.1 Regulatory Context and Guidance

1003 Policies, regulations, and guidance that pertain to land use, land planning, and property
1004 include:

- 1005 ■ *NCPC, Comprehensive Plan for the National Capital – Federal Elements*;⁸⁷
- 1006 ■ *Council of the District of Columbia (DC Council) Comprehensive Plan for the National*
1007 *Capital – District Elements*;⁸⁸
- 1008 ■ *District of Columbia Zoning Regulations 2016*;⁸⁹
- 1009 ■ *Mount Vernon Triangle Action Agenda*;⁹⁰
- 1010 ■ *NoMa Vision Plan and Development Strategy*;⁹¹
- 1011 ■ *Northwest One Redevelopment Plan*;⁹² and
- 1012 ■ *H Street Corridor Strategic Development Plan*.⁹³

⁸⁷ National Capital Planning Commission. 2016. *Comprehensive Plan for the National Capitol: Federal Elements*. Accessed from <https://www.ncpc.gov/compplan/>. Accessed on April 3, 2020.

⁸⁸ District of Columbia Office of Planning. 2016. *Comprehensive Plan for the National Capitol: District Elements*. Accessed from <https://www.ncpc.gov/compplan/>. Accessed on April 3, 2020.

⁸⁹ District of Columbia. 2016. *DC Municipal Regulations, Title 11 – Zoning Regulations of 2016*. Accessed from <http://www.dcregs.dc.gov/Search/DCMRSearchByTitle.aspx>. Accessed on April 3, 2020.

⁹⁰ District of Columbia Office of Planning. 2003. *Mount Vernon Triangle Action Agenda*. Accessed from <https://planning.dc.gov/sites/default/files/dc/sites/op/publication/attachments/Mount%20Vernon%20Triangle%20Action%20Agenda.pdf>. Accessed on April 3, 2020.

⁹¹ District of Columbia Office of Planning. 2006. *NoMA Vision Plan and Development Strategy*. Accessed from <https://planning.dc.gov/sites/default/files/dc/sites/op/publication/attachments/Section%25201-%2520Introduction.pdf>. Accessed on April 3, 2020.

⁹² District of Columbia Office of Planning. 2006. *Northwest One Redevelopment Plan*. Accessed from <https://planning.dc.gov/sites/default/files/dc/sites/op/publication/attachments/NorthwestOneFinal.pdf>. Accessed on April 3, 2020.

⁹³ District of Columbia Office of Planning. 2004. *H Street NE Strategic Development Plan*. Accessed from <https://planning.dc.gov/publication/h-street-corridor-revitalization-main-page>. Accessed on April 3, 2020.

1013 **4.9.2 Study Area**

1014 The Local Study Area for land use, land planning, and property is the Project Area and, south
1015 of K Street, the zoning districts within one-half mile of the Project Area. North of K Street,
1016 where the Project Area consists solely of railroad tracks, the Local Study Area includes zoning
1017 districts within only one-quarter mile of the Project Area (**Figure 4-9**).

1018 The Regional Study Area includes the neighborhoods adjacent to the Project Area. Its outer
1019 limits are the limits of the Atlas District/H Street Corridor, Capitol Hill, the Monumental Core,
1020 NoMA, and the Mount Vernon Triangle neighborhoods (**Figure 4-9**).

1021 **4.9.3 Methodology**

1022 Existing land use conditions and local zoning and master plans in the area were identified
1023 using data from the DC Office of Planning (DCOP). Master plan information from NCPC was
1024 also consulted. Property ownership was determined using data from the District Office of
1025 Zoning (DCOZ) and the Office of Tax and Revenue. Information on zoning districts was based
1026 on the DCOZ and the District’s Municipal Regulations.

1027 Near-term development projects in the Study Area were identified using information from
1028 DCOP, District Department of Consumer and Regulatory Affairs, DCOZ, the District Zoning
1029 Commission, the District Board of Zoning Adjustment, the District Office of the Deputy Mayor
1030 for Planning and Economic Development, the Mount Vernon Triangle Business Improvement
1031 District (BID), the NoMA BID, the Capitol Hill BID, and Advisory Neighborhood Commissions.

1032 **4.9.4 Existing Conditions**

1033 **4.9.4.1 Land Use, Zoning, and Local and Regional Planning**

1034 WUS is an active transportation hub, intercity and regional rail hub, shopping destination,
1035 and office space. The parking garage and bus facility serve intercity, tour, and charter buses,
1036 as well as private vehicles. WUS has approximately 108,000 square feet of retail uses. WUS
1037 and the WUS parking garage are both owned by USDOT and leased to USRC. As Federal
1038 property, they are not subject to local zoning. However, they have been zoned under the
1039 Production, Distribution, Repair (PDR)-3 zone, which permits high-density commercial and
1040 PDR activities employing a large workforce.

1041 **Figure 4-10** shows the diversity of land uses in the Local Study Area around WUS. To the
1042 south is the Monumental Core of Washington. This area includes Columbus Plaza, a park
1043 managed by NPS immediately adjacent to WUS. Further south from Columbus Plaza are
1044 surface parking lots and parks, congressional office buildings, and the U.S. Capitol Building, all
1045 managed by the AOC. To the west of WUS is the NoMA neighborhood. NoMA will be the
1046 densest mixed-use neighborhood in the District at full build out. To the east are the busy
1047 residential neighborhoods of Capitol Hill and the H Street corridor.

Figure 4-9. Land Use, Planning, and Property Local and Regional Study Areas



Figure 4-10. Local Study Area Land Uses



1048 Land use in the Local Study Area is marked by intense development activity. As of December
1049 2017, there were 65 developments planned or under construction, comprising approximately
1050 28,460,000 total square feet. Among those is the development planned for the privately
1051 owned air rights above the WUS rail terminal, which are presently undeveloped. This area
1052 has a special zoning designation of Union Station North (USN), which permits maximum
1053 heights from 90 to 130 feet above the crest of the H Street Bridge sidewalk, with 20 feet of
1054 inhabitable penthouse potential. The zoning designation supports mixed uses for residential,
1055 retail, hotel, and office. Altogether, development activity in the Local Study Area is expected
1056 to deliver approximately 18,000 residential units, 1,200,000 square feet of retail, 7,300,000
1057 square feet of office space, 1,233 hotel rooms, and 3,214,000 square feet of mixed-use
1058 space.

1059 The Local and Regional Study Areas overlap with several neighborhoods, as shown in
1060 **Figure 4-9** above. These neighborhoods consist of varying land uses and property types. The
1061 following paragraphs briefly characterize the neighborhoods. Because both the Local and the
1062 Regional Study Areas include parts of each neighborhoods, these brief descriptions address
1063 both study areas, as specified.

1064 ■ **Capitol Hill:** This historic neighborhood extends to the southeast of WUS between F
1065 Street NE to the north; 11th and 14th Streets NE to the east; the Southeast Freeway
1066 (I-695) to the south; and the U.S. Capitol Complex to the west. Within the Local Study
1067 Area, it includes rowhouses along residential streets as well as denser residential and
1068 commercial uses. Adjacent to WUS are the Thurgood Marshall Federal Building and
1069 the Securities and Exchange Commission Building. Within the Regional Study Area,
1070 the neighborhood is predominantly residential, characterized by rowhouses along
1071 with commercial (largely along 8th Street SE and Pennsylvania Avenue) and
1072 educational uses. It is largely zoned RF-1, a zoning that promotes rowhouses.

1073 ■ **Atlas District/H Street Corridor:** The corridor is bounded by 2nd Street NE to the
1074 west, Florida Avenue NE to the north, 15th Street NE to the east, and F Street NE to
1075 the south. The H Street Corridor within both the Local and the Regional Study Areas
1076 has mixed commercial and residential uses and is an active street with many
1077 restaurants and bars. Off H Street, the neighborhood is largely comprised of
1078 rowhouses with some local education uses. While much of the neighborhood is
1079 zoned RF-1, H Street, the main entertainment district, is within the H Street Mixed
1080 Use zone, with different sub-districts that promote either housing, neighborhood
1081 retail, or entertainment uses. The corridor also has several Planned Urban
1082 Developments where specific land use proposals can be accommodated.⁹⁴

1083 ■ **NoMA:** This neighborhood is bounded by New York Avenue, Florida Avenue, the
1084 WUS tracks, Massachusetts Avenue, and New Jersey Avenue. Most of it is within the
1085 Local Study Area. Near WUS, NoMA is largely commercial and residential, with
1086 institutional uses more distant. The Postal Square Building, owned by the United

⁹⁴ Planned Urban Developments can be implemented throughout the District.

1087 States Postal Service (USPS), the U.S. Government Publishing Office (GPO)
1088 Warehouse #4, and the District’s Housing Authority headquarters are in this area.
1089 The areas near WUS are zoned D-5, a downtown zone that promotes high-density
1090 commercial and mixed uses. Within the Regional Study Area, NoMA is notable for a
1091 mix of office and residential mixed-use development, with some Federal uses, and
1092 parking lots that are awaiting redevelopment.

1093 ■ **Mount Vernon Triangle:** Mount Vernon Triangle is the area bounded by New York
1094 Avenue NW, New Jersey Avenue NW, Massachusetts Avenue NW, and 7th Street
1095 NW. The neighborhood has a Community Improvement District (CID) with the same
1096 footprint. The area is fast-changing and is characterized by a mixture of residential
1097 and office buildings with ground-floor retail and some remaining surface parking lots
1098 slated for redevelopment. The neighborhood is largely zoned D-4-R, which promotes
1099 high-density residential and mixed-use development and requires ground floor
1100 windows and entrances.

1101 ■ **Monumental Core:** The Monumental Core includes the U.S. Capitol Complex, the
1102 National Mall and the Smithsonian museums. Some private office uses are present, in
1103 addition to Federal office buildings and headquarters. Much of the land is Federally
1104 owned and is not subject to zoning. Other areas have D zoning that promotes a
1105 dense downtown development with a mix of uses and a strong concentration of
1106 Federal uses.⁹⁵

1107 ■ **Areas Adjacent to the Tracks:** The tracks north of K Street, which are within the
1108 Project Area, are owned by Amtrak via its subsidiary, the Washington Terminal
1109 Company. The part between K Street and Florida Avenue NE is zoned MU-9,
1110 permitting high-density mixed-use activities.⁹⁶ Between Florida Avenue NE and the
1111 end of the tracks within the Project Area, the tracks are zoned PDR-3.

1112 Between K Street and Florida Avenue, adjacent uses on the east are mostly industrial
1113 with rowhouses beyond. The east is zoned PDR-1, a commercial and industrial zone,
1114 immediately adjacent to the tracks while the residential areas are zoned RF-1. On the
1115 west, uses are a mix of surface parking lots and mixed-use developments zoned D-5.

1116 Between Florida Avenue and the northern limit of the Project Area, adjacent land
1117 uses are largely industrial, including Union Market, the WMATA Brentwood facility,
1118 Amtrak Wedge Yard, Ivy City Yard, and the Brentwood light industrial area. These
1119 areas are zoned PDR-4 and are owned by transportation agencies including WMATA
1120 and Amtrak; private entities; and USPS. Other nearby uses on the east side include
1121 Gallaudet University and commercial and residential uses in the Ivy City
1122 neighborhood. The areas on the east side of the tracks are zoned PDR, or RF-1,

⁹⁵ District of Columbia Office of Planning. “Downtown (D) Zones – D-4.” Accessed from <http://handbook.dcoz.dc.gov/zones/downtown/d-4/>. Accessed on April 3, 2020.

⁹⁶ District of Columbia Office of Planning. “Mixed-Use (MU) Zones – MU-9.” Accessed from <https://handbook.dcoz.dc.gov/zones/mixed-use/mu-9/>. Accessed on April 3, 2020.

1123 allowing for rowhouse uses. Properties are largely privately owned, but the Federal
1124 government owns parcels along New York Avenue that are used for NPS
1125 maintenance activities or leased to other entities.

4.10 Noise and Vibration

1126 This section describes existing noise and vibration levels near WUS.

4.10.1 Regulatory Context and Guidance

1128 Federal policies, regulations, and guidance that pertain to noise and vibration that are
1129 relevant to the Project include:

- 1130 ■ FRA High-Speed Ground Transportation Noise and Vibration Impact Assessment;⁹⁷
- 1131 ■ Federal Transit Administration (FTA) Transit Noise and Vibration Impact
1132 Assessment;⁹⁸ and
- 1133 ■ FHWA, Procedures for Abatement of Highway Traffic Noise and Construction Noise
1134 (23 CFR 772).⁹⁹

1135 District of Columbia (District) policies, regulations, and guidance include:

- 1136 ■ DDOT Noise Policy¹⁰⁰ (January 2011); and
- 1137 ■ District Noise Ordinance (DCMR Chapter 20-27).

4.10.2 Study Area

4.10.2.1 Study Area for Operational Noise and Vibration

1140 The operational noise and vibration Local Study Area includes the physical limits of the
1141 Project Area and noise- and vibration-sensitive locations within 600 feet from the Project
1142 Area (**Figure 4-11**).

⁹⁷ Federal Railroad Administration. October 2012. *High-Speed Ground Transportation Noise and Vibration Impact Assessment*. Report DOT/FRA/ORD-12/15. Accessed from <https://www.fra.dot.gov/eLib/Details/L04090>. Accessed on April 3, 2020.

⁹⁸ Federal Transit Administration. May 2006. *Transit Noise and Vibration Impact Assessment*. Report FTA-VA-90-1003-06. Accessed from https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Noise_and_Vibration_Manual.pdf. Accessed on April 3, 2020.

⁹⁹ 23 CFR 772 Procedures for Abatement of Highway Traffic Noise and Construction Noise. Accessed from <https://www.fhwa.dot.gov/legsregs/directives/fapg/cfr0772.htm>. Accessed on April 3, 2020.

¹⁰⁰ District Department of Transportation. January 10, 2011. *District Department of Transportation Noise Policy*. Accessed from <https://comp.ddot.dc.gov/Documents/Highway%20Noise%20Policy.pdf>. Accessed on April 3, 2020.

Figure 4-11. Operational Noise and Vibration Study Area

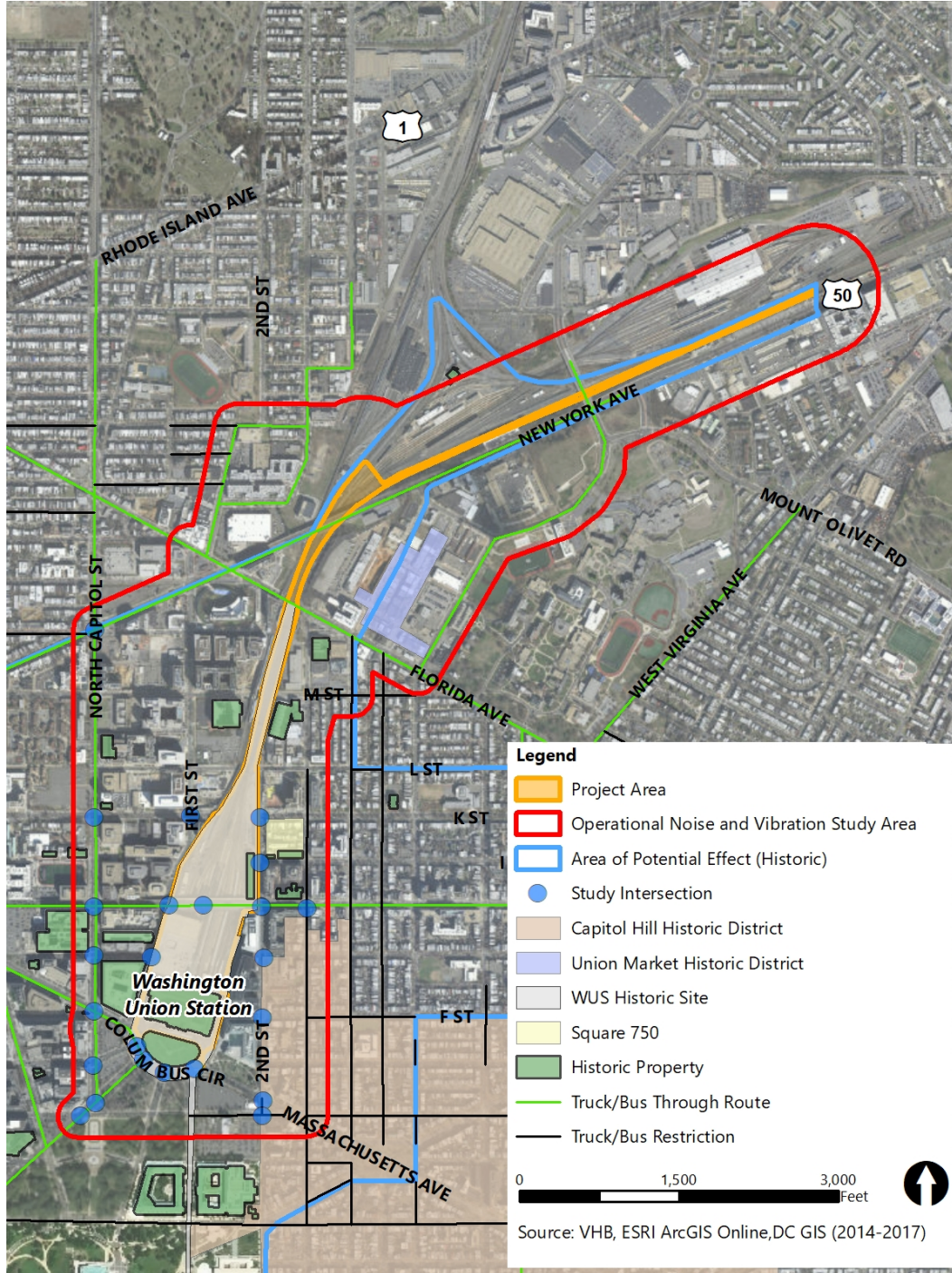
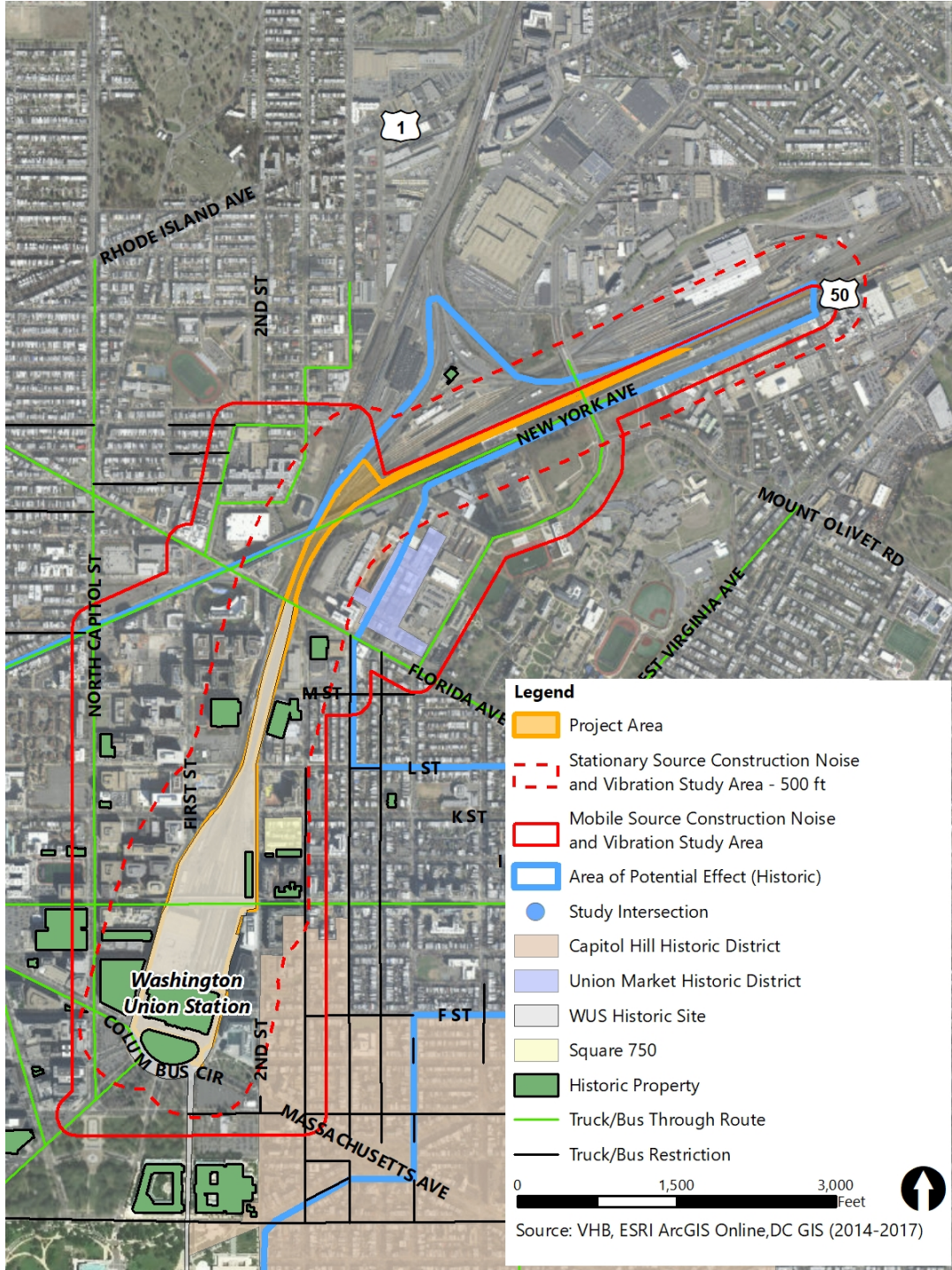


Figure 4-12. Construction Noise and Vibration Study Areas



1143 The boundaries of the Local Study Area are: D Street (to the south); 3rd Street (to the east,
1144 south of M Street); 6th Street (to the east, north of M Street); Brentwood Parkway and New
1145 York Avenue (to the northeast); R Street, Harry Thomas Way NE, and Eckington Place NE (to
1146 the northwest); and North Capitol Avenue (to the west).

1147 **4.10.2.2 Study Area for Construction Noise and Vibration**

1148 The Study Areas for construction noise and vibration, shown in **Figure 4-12**, extend from the
1149 Project Area to locations where noticeable noise and vibration effects may occur. The
1150 stationary source construction noise Study Area encompasses land within 500 feet from the
1151 edge of the Project Area. It is based on the most stringent applicable stationary noise limit
1152 (65 dBA L_{max}); the maximum sound emissions from construction equipment excluding pile
1153 driving (90 dBA at 50 feet); and sound propagation conditions (which include intervening
1154 buildings).

1155 The stationary source vibration Study Area extends 200 feet from the edge of construction. It
1156 is based on the most stringent limits for potential human annoyance (65 vibration decibels
1157 [VdB]) and the maximum vibration emissions from construction equipment (typical pile
1158 driving, 104 VdB at 25 feet).

1159 The mobile source construction noise Study Area was defined based on the transportation
1160 Local Study Area (see **Figure 4-3**) and the location of established truck routes in the District.
1161 The Study Area includes receptors 200 feet from the roads anticipated to be used by
1162 construction trucks. It is approximately bounded by D Street (to the south); 3rd Street (to the
1163 east south of M Street); 6th Street (to the east north of M Street); Brentwood Parkway and
1164 New York Avenue (to the northeast); R Street, Harry Thomas Way NE, and Eckington Place NE
1165 (to the northwest); and North Capitol Street (to the west).

1166 The mobile source vibration Study Area was defined similarly to the mobile source noise
1167 Study Area, except that it includes receptors within 50 feet of the roadways where there is
1168 potential for perceptible vibration and human annoyance from heavy trucks.

1169 **4.10.3 Methodology**

1170 Because people can hear certain frequencies or pitches of sound better than others, sound
1171 levels are typically measured and reported using a descriptor called the A-weighted decibel
1172 (dBA). The dBA descriptor weights different frequencies of sound to correspond to human
1173 hearing. Sound is also dynamic and fluctuates over time. Depending on the source and type
1174 of sound, different metrics (ways of measuring) are used to characterized sound levels:

- 1175 ■ **Maximum A-weighted Level (L_{max})** represents the highest sound level generated by
1176 a source. For mobile sources, the maximum level typically occurs when the source is
1177 closest to the measurement location.

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- **Energy-average Level (Leq)** is the level of continuous sound over a given time period that would deliver the same amount of energy as the actual, varying sound exposure. The Leq metric accounts for how loud the noise event is during the period, how long it lasts, and how many times it occurs.
 - **Day-night Average Level (Ldn)** is a single value that represents the sound energy over a 24-hour period with a 10-decibel (dB) penalty applied to sound that occurs between 10:00 PM and 7:00 AM when people are more sensitive to noise. Ldn accounts for how loud events are, how long they last, how many times they occur, and whether they occur at night.
 - **Sound Exposure Level (SEL)** describes the cumulative noise exposure from a single noise event over its entire duration. In calculating SEL, the noise exposure is normalized to a time duration of one second so events with different durations can be compared in terms of their sound energy.

1191 For context, **Figure 4-13** shows typical Lmax noise levels from various transit and non-transit
1192 sources.

1193 Some activities, including train operations and the operation of construction equipment, also
1194 generate ground-borne vibration (defined as the oscillatory motion of the ground). Vibration
1195 may be perceptible and disturb people or sensitive activities in nearby buildings. Humans
1196 generally respond to vibration in a low frequency range between approximately 4 and 80
1197 hertz (Hz). Vibration levels are expressed in decibel notation as “VdB” to differentiate them
1198 from sound decibels. **Figure 4-14** shows typical ground-borne vibration velocity levels from
1199 transportation and construction sources and the typical human and structural response.

1200 Additional details on noise and vibration are available in the *Washington Union Station*
1201 *Expansion Project Affected Environment Technical Report (Appendix C2)*.

Figure 4-13. Typical Lmax for Transit Sources and Non-Transit Sources

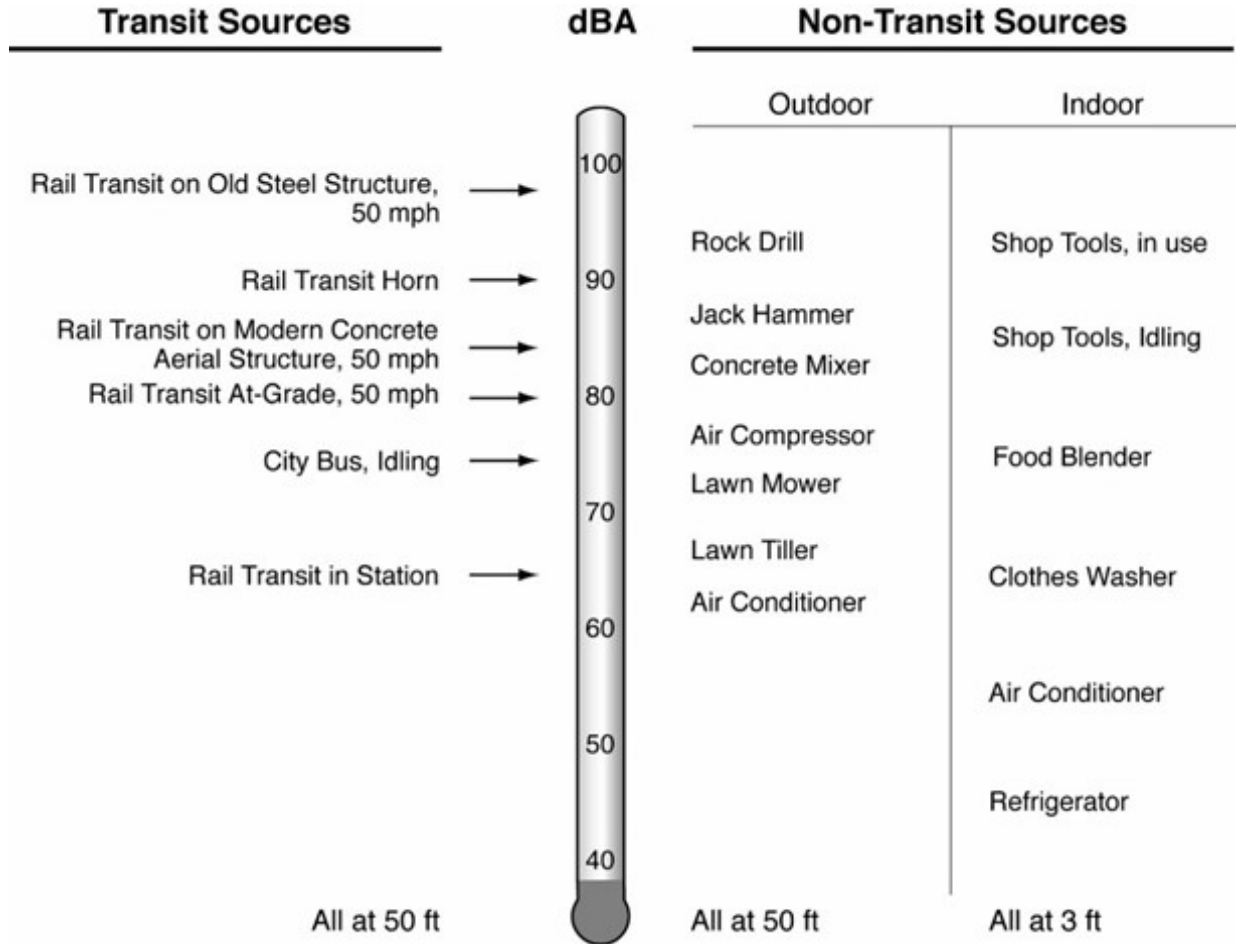
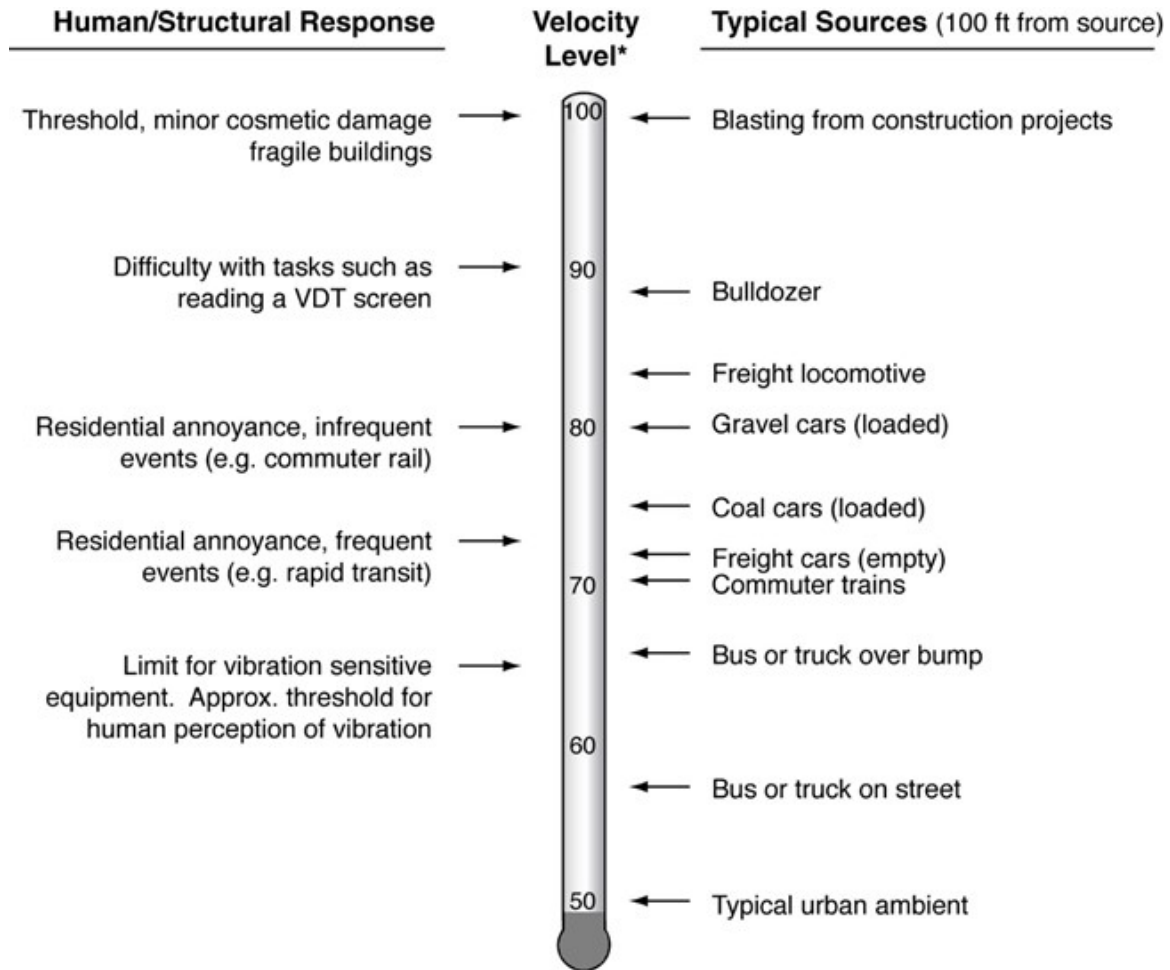


Figure 4-14. Typical Ground-Borne Vibration Levels



* RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second

1202 The process to evaluate existing conditions for noise and vibration included: identifying noise
 1203 and vibration-sensitive uses; understanding the predominant existing sources of noise and
 1204 vibration; and characterizing the resulting noise and vibration conditions through
 1205 measurements and modeling.

1206 Noise and vibration receptors are categorized based on their use as defined by FTA (see
 1207 **Table 4-10**). Vibration-sensitive land uses are like noise-sensitive land uses except that only
 1208 interior locations are considered. Historic properties are categorized based on their use.

Table 4-10. FTA Land Use Categories and Noise Metrics for Impact Assessment

FTA Land-Use Category	Noise Metric (dBA)	Description of Land-Use Category
1	Outdoor Leq ¹	Tracts of land where quiet is essential. Includes lands set aside for serenity and quiet (such as outdoor amphitheaters, concert pavilions, national historic landmarks with significant outdoor use, recording studios and concert halls).
2	Outdoor Ldn	Residences and buildings where people normally sleep (such as homes, hospitals, and hotels where a nighttime sensitivity to noise is important).
3	Outdoor Leq ¹	Institutional land uses with primarily daytime and evening use (such as schools, libraries, theaters, and churches, cemeteries, monuments, museums, where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material, certain historical sites, parks, campgrounds, and recreational facilities are also included).

1. Leq for the noisiest hour of related activity during hours of noise sensitivity.

1209 **4.10.3.1 Measurement**

1210 Measurements were taken at locations representative of a cluster of sensitive uses
 1211 (**Figure 4-15**). Existing noise conditions were then predicted at all receptor locations based on
 1212 the measurements, FTA modeling procedures, and the FHWA Traffic Noise Model (TNM). All
 1213 noise measurements were conducted with equipment that meets American National
 1214 Standards Institute Type I accuracy.

1215 Noise measurements were conducted at 19 locations. They included 17 short-term
 1216 measurement taken over 1-hour periods, with simultaneous observations and counts of train
 1217 activity, transit operations, and traffic conditions (volumes and speeds). Long-term (24-hour)
 1218 noise measurements were taken at two locations to determine the relationship of short-term
 1219 (1-hour Leq) and long-term (24-hour Ldn) noise levels.

1220 At measurement sites representative of FTA Noise Category 3 land uses (such as museums,
 1221 parks and libraries), the 1-hour noise measurement took place during a peak period between
 1222 6:00 AM to 9:00 AM or 3:00 PM to 7:00 PM. Category 3 receptors were assessed based on
 1223 the peak transit hourly Leq noise level.

Figure 4-15. Noise and Vibration Measurement Locations



1224 At measurement sites representative of FTA Noise Category 2 land uses (such as residences
1225 and hotels), three 1-hour measurements were taken during the morning peak (6:00 AM to
1226 9:00 AM), midday (10:00 AM to 4:00 PM), and nighttime (10:00 PM to 7:00 AM) periods. The
1227 measurements were used to estimate the Ldn according to the methods outlined in
1228 Appendix D of *FTA's Noise Guidance Manual*.

1229 For measurement locations representative of Category 3 institutional receptors,
1230 measurements were conducted for 1 hour during a peak transit period (morning or
1231 afternoon) to determine the peak-transit Leq. For measurement locations representative of
1232 Category 3 residential receptors, measurements were conducted for three 1-hour periods,
1233 including a late night/early morning, peak, and mid-day period to determine the peak-transit
1234 Leq and estimate the Ldn.

1235 Short-term measurements included observations of train operations, traffic counts by vehicle
1236 classification, and vehicle travel speeds. The contribution from different sources was
1237 determined through monitoring.

1238 Vibration measurements were conducted at five exterior ground-level locations to determine
1239 the maximum vibration levels from train pass-bys. Measurements were conducted for 1 hour
1240 at each site and recorded train type, speed, track, and consist.

1241 **4.10.3.2 Modeling**

1242 Existing operational noise conditions throughout the Study Area were modeled using the
1243 Cadna-A sound prediction software based on measurements results, train and streetcar
1244 operations, and the most recent traffic data available.

1245 **4.10.3.3 Existing Sources of Noise and Vibration**

1246 Existing noise and vibration sources were identified through a review of VRE, MARC, Amtrak,
1247 and Metrorail's current train schedules and the number of operations throughout a 24-hour
1248 period.

1249 **4.10.4 Existing Conditions**

1250 **4.10.4.1 Noise and Vibration Sensitive Land Uses**

1251 Noise and vibration sensitive receptors in the Study Areas include multi-family
1252 condominiums, townhouses, apartments, hotels, museums, medical facilities, schools, TV
1253 studios, and parks. Existing properties as well as those under construction or planned for
1254 construction were considered, as shown in **Table 4-11**.

Table 4-11. Existing, Under Construction, and Planned Residential Properties Near WUS (2017)

Location	Status
West of WUS	<p>Existing</p> <ul style="list-style-type: none"> ■ Avalon First + M Apartments, First Street NE and M Street NE ■ Constitution Square Flats 130 Apartments, First Street NE and M Street NE ■ Hilton Garden Inn on First Street NE, between M Street NE and N Street NE ■ Courtyard Marriott, 2nd Street NE ■ The Gale Apartments, 100, 151 and 200 Q Street NE <p>Under Construction</p> <ul style="list-style-type: none"> ■ Storey Park Apartments, between K Street NE and L Street NE <p>Planned</p> <ul style="list-style-type: none"> ■ 100 K Street NE Apartments ■ NoMA Station Phases II-IV, between L Street NE and M Street NE ■ Washington Gateway Elevation apartments Phases II and III, Florida Ave NE ■ Eckington Yards Apartments, R Street NE
Union Market and New York Avenue Area	<p>Existing</p> <ul style="list-style-type: none"> ■ Homewood Suites Hotel and Hampton Inn Hotel, 501 New York Ave NE ■ Motel 6, 1345 4th Street NE ■ The Edison at Union Market, 340 Florida Avenue NE <p>Under Construction</p> <ul style="list-style-type: none"> ■ Mixed-use residential development, 301/331 N Street NE ■ Mixed-use residential development, 301 Florida Avenue NE ■ The Shapiro Residences, 1270 4th Street NE ■ The Highline, 320 Florida Avenue NE <p>Planned</p> <ul style="list-style-type: none"> ■ The Morse (Kettler) Property, 300 Morse Street, Square 3587 (Lots 805, 814 and 817)
East of WUS	<p>Existing</p> <ul style="list-style-type: none"> ■ Townhouses, 3rd Street NE and Abbey Place NE between M Street and L Street ■ Loree Grand Apartments, 3rd Street NE between L Street and K Street ■ Historic residential rowhouses, between K Street NE, I Street NE, 2nd Street NE, and 3rd Street NE ■ Senate Square Apartments, on 2nd Street NE between H Street and I Street ■ Landmark Lofts, H Street NE between 2nd Street and 3rd Street ■ Kaiser Permanente Medical Facility, 2nd Street NE and H Street NE ■ Station House Apartments, 2nd Street NE between H Street and G Street ■ Residential townhouses, 2nd Street NE between F Street and E Street <p>Under Construction (2017)</p> <ul style="list-style-type: none"> ■ Toll Brothers City Living Apartments, 2nd Street NE between L Street and K Street ■ Planned

Location	Status
	<ul style="list-style-type: none"> ■ Central Armature Works (residential development and hotel), 1200 3rd Street NE ■ Press House at Union District Hotel and Apartments ■ Residential development, 300 M Street NE

1256 **4.10.4.2 Existing Noise and Vibration Sources**

1257 The predominant sources of noise and vibration in the Study Areas observed during
 1258 measurement activities included railroad operations at WUS and traffic on the adjacent
 1259 roadways. The following paragraphs describe these sources and their noise and vibration
 1260 characteristics.

1261 **Railroad Operations**

1262 Rail operations are the predominant source of noise and vibration at receptors near the rail
 1263 terminal and tracks. Sources of noise and vibration associated with railroad operations
 1264 included train movements, diesel-electric locomotives idling, and auxiliary equipment, such
 1265 as radiator cooling fans and on-board Heating, Ventilation and Air-Conditioning equipment
 1266 operating on passenger coaches and locomotives. Occasional car coupling activities
 1267 generated short noise events. Other noise sources included general maintenance activities
 1268 such as the cleaning and servicing of trains. Some trains sounded their bells when
 1269 approaching or departing WUS. Commuter trains do not typically sound their horn but they
 1270 may do so under emergency conditions. The DC Streetcar generally sounded its bell during
 1271 departure.

1272 Trains operate at relatively low speeds (approximately 10 miles per hour) in and out of WUS
 1273 and generally below 20 miles per hour throughout the Study Areas. The tracks include both
 1274 continuously-welded-rail and jointed rail segments, with many track turnouts. Jointed rail
 1275 and track turnouts introduce gaps in the rail running surface that increase noise and
 1276 vibration. The rail corridor is elevated on retained fill between the northern end of the rail
 1277 terminal and Florida Avenue, after which it transitions to grade north of New York Avenue.
 1278 For receptors at ground-level near the rail corridor, the retained fill structure typically shields
 1279 line of sight to the trains, which reduces noise levels.

1280 **Traffic**

1281 Past approximately 100 feet of the tracks, road traffic was the predominant source of noise.
 1282 Traffic noise varies with volumes, speeds, and the proportion of trucks or buses. The speed
 1283 limit in most of the Study Areas is 25 miles per hour (mph), unless otherwise marked (New
 1284 York Avenue is 35 mph). Peak AM and PM vehicle volumes were approximately 1,500 to
 1285 2,000 vehicles per hour along most principal and minor arterial roads. Traffic noise from
 1286 principal arterial roads typically ranged from 60 to 70 dBA (Leq).

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Noise Measurements

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Table 4-12 shows ambient noise measurements and predominant noise sources at each measurement location. At the 1-hour locations, noise levels ranged from approximately 51 dBA to approximately 79 dBA.

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Figure 4-16 and **Figure 4-17** present the hourly sound level measurements taken over 24 hours at Locations N11 and N19, respectively. These figures show the hourly Leq as well as the sound levels that were exceeded 10, 50, or 90 percent of the time during the hour. L90 sound levels are generally representative of the quieter ambient background noise conditions and L10 sound levels representative of the louder ambient noise conditions (for instance when trains or loud vehicles pass by the microphone). At N11, near the tracks, ambient noise levels ranged between 60 and 70 dBA Leq throughout the entire 24-hour period. Noise did not substantially decrease during the late-night and early-morning hours because of train and roadway traffic in the area during that time. At N19, adjacent to New York Avenue, ambient noise levels ranged from 63 to 80 dBA Leq throughout the entire 24-hour period. Noise levels were relatively constant but louder during the morning peak period due to rush-hour traffic.

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Vibration Measurements

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The maximum measured exterior vibration levels at the closest receptor locations with vibration-sensitive use such as 840 First Street NE (Site V2), Courtyard Marriott (Site V4), and historic residences (Site V5), ranged from 61 to 65 VdB. Such levels are generally below the thresholds of human perception. At historic buildings such as the Railway Express Agency (REA) building (V1) and Uline Ice Company Plant and Arena (V3), vibration levels ranged from 66 to 85 VdB, below the thresholds for increased risk of structural damage.

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Table 4-12. Existing Ambient Noise Measurement Results

Site Number	Distance to Tracks (Feet)	Location	Duration	Period	Leq (dBA)	Ldn (dBA)	Predominant Noise Source
N1	650	Columbus Circle Park	1 hour	Afternoon Peak	61.5	59.5 ¹	Traffic on Columbus Circle NE Train operations are not audible at this location
N2	625	Postal Museum	1 hour	Afternoon Peak	65.0	63.0 ¹	Traffic on First St NE
N3	25	WUS Taxi Loop	1 hour	Night	66.3	71.3 ²	Train operations including locomotives idling and traffic on the taxi loop
			1 hour	Morning Peak	72.1		
			1 hour	Midday	67.9		
N4	525	Residences (Capitol Hill Historic District)	1 hour	Night	59.7	65.0 ²	Traffic on 2nd St NE Train operations are not audible at this location
			1 hour	Morning Peak	63.3		
			1 hour	Midday	64.1		
N5	50	Kaiser Permanente Medical Facility	1 hour	Night	71.1	76.1 ²	Railroad operations
			1 hour	Morning Peak	71.3		
			1 hour	Midday	74.9		
N5a	Overhead	H Street NE	30 mins	Peak	76.3	74.3 ²	Railroad operations Traffic noise on H St NE
N6	625	CNN Television Studio	1 hour	Peak	71.6	69.6 ²	Traffic on H Street NE Noise from Metro trains are occasionally audible, but do not contribute substantially to the overall noise environment
N7	450	Historic residences	1 hour	Night	51.1	56.2 ²	Trains at WUS Traffic on 2nd Street and 3rd Street NE
			1 hour	Morning Peak	53.1		
			1 hour	Midday	54.9		
N8	250	Storey Park Apartments	1 hour	Peak	65.8	63.8 ¹	Traffic on L Street NE and train operations
N9	200	Historic residences	1 hour	Night	58.2	63.3 ²	Trains at WUS and traffic on 2nd St NE
			1 hour	Morning Peak	61.4		
			1 hour	Midday	61.8		
N10	15	Metropolitan Branch Trail	1 hour	Night	72.9	77.8 ²	Metro trains operating within approximately 15 feet of the microphone location
			1 hour	Morning Peak	74.9		
			1 hour	Midday	75.6		

Site Number	Distance to Tracks (Feet)	Location	Duration	Period	Leq (dBA)	Ldn (dBA)	Predominant Noise Source
N11	15	Central Armature Works	24 hours	24 hours	See Figure 4-16	71.5	Railroad operations
N12	15	Metropolitan Branch Trail	1 hour	Peak	67.8	65.8 ¹	Metro railroad operations
N13	350	Residences (Union Market Historic District)	1 hour	Night	65.7	70.9 ²	Train operations Traffic on Florida Ave NE
			1 hour	Morning Peak	67.3		
			1 hour	Midday	69.6		
N14	375	Residences (Union Market Historic District)	1 hour	Peak	66.2	64.2 ¹	Traffic from nearby roads such as 4th St NE
N15	325	Gale Apartments	1 hour	Night	56.8	62.7 ²	Trains operations Traffic on Harry Thomas Way NE
			1 hour	Morning Peak	61.6		
			1 hour	Midday	62.8		
N16	400	Motel 6	1 hour	Night	69.1	73.5 ²	Traffic on local streets and New York Ave
			1 hour	Morning Peak	68.2		
			1 hour	Midday	68.8		
N17	1000	Lower Senate Park	1 hour	Peak	58.6	56.6 ¹	Traffic from surrounding roadways Columbus Circle NE
N18 (V2)	50	REA Building	1.5 hours	Peak	70.3	68.3 ¹	Train operations This building is not a noise-sensitive receptor since it is currently used for office space
N19	200	NPS Maintenance Facility	24 hours	24 hours	See Figure 4-17	78.9	Traffic on New York Ave NE

1. Ldn estimated according to FTA guidance for measurements conducted between 7:00 AM and 7:00 PM.

2. Ldn estimated using the three 1-hour measurements taken in night, morning peak, and midday periods.

Figure 4-16. Long-Term Noise Measurements, Site N11

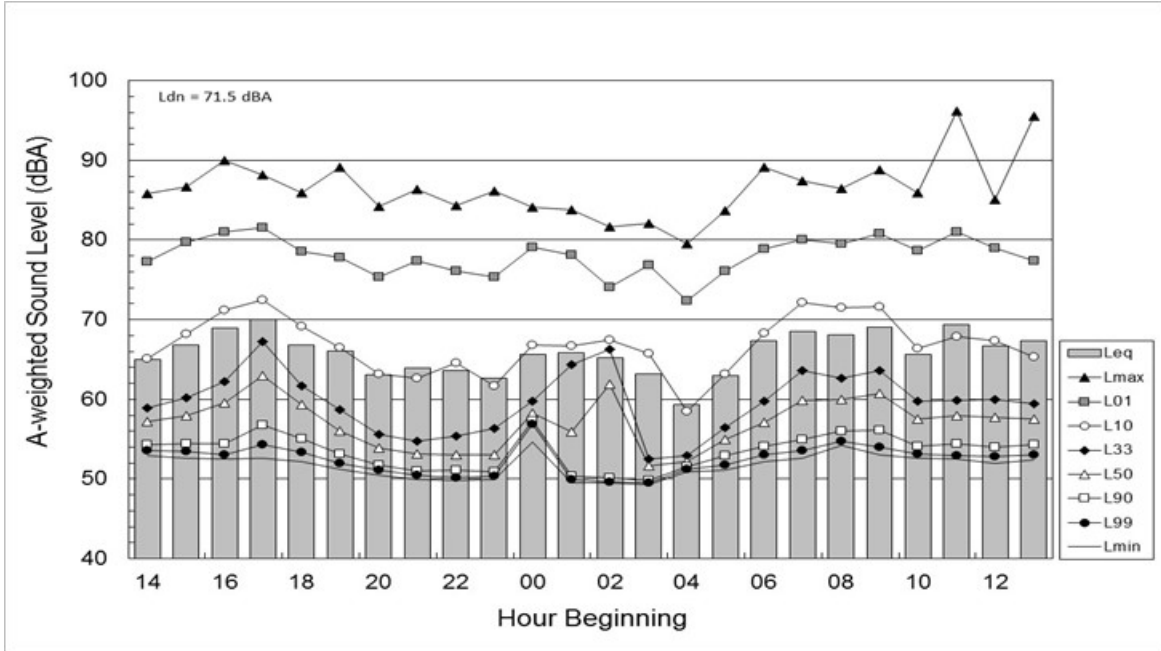
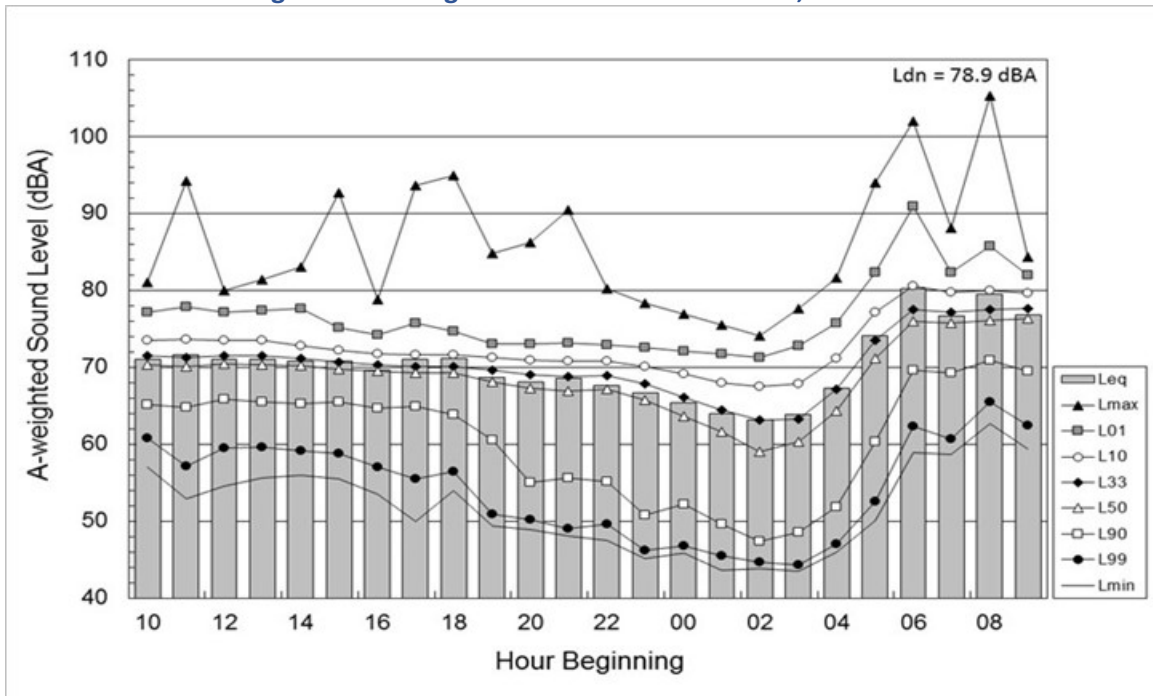


Figure 4-17. Long-Term Noise Measurements, Site N19



4.11 Aesthetics and Visual Quality

1312 This section describes existing conditions pertaining to aesthetics and visual quality. The
1313 urban and cultural environment, including streetscapes, buildings, parks, and monuments,
1314 contribute to the visual character of the area around WUS. WUS itself, in the heart of the
1315 nation’s capital, and its monumental historic headhouse are a major contributor to the visual
1316 character of the area. Additional details on aesthetics and visual quality are available in the
1317 July 2018, *Washington Union Station Expansion Project Affected Environment Technical*
1318 *Report (Appendix C2)*.

4.11.1 Regulatory Context and Guidance

1320 Federal policies, regulations, and guidance that pertain to aesthetics and visual quality and
1321 are relevant to the Project include:

- 1322 ■ NCPCC, *The Comprehensive Plan for the National Capital: Federal Elements, Urban*
1323 *Design Element*,¹⁰¹
- 1324 ■ EO 1259, *Commission of Fine Arts (CFA) Review of Public Buildings in the District of*
1325 *Columbia Proposed by the Federal or DC governments*;¹⁰²
- 1326 ■ Shipstead-Luce Act of 1930 (Public Law [PL] 71-231, PL 76-248),¹⁰³
- 1327 ■ EO 1862, *CFA Review of New Structures and Matters of Art Proposed by the Federal*
1328 *Government in DC*;¹⁰⁴
- 1329 ■ EO 11593, *Protection and Enhancement of the Cultural Environment*,¹⁰⁵ and
- 1330 ■ The Height of Buildings Act of 1910.

1331 District policies, regulations, and guidance that may pertain to aesthetics and visual quality
1332 include:

- 1333 ■ The Historic Landmark and Historic District Protection Act of 1978 (DC Law 2-144, as
1334 amended through October 1, 2016); and

¹⁰¹ National Capital Planning Commission. 2016. *The Comprehensive Plan for the National Capital: Federal Elements*. Accessed from <https://www.ncpc.gov/plans/compplan/>. Accessed on April 3, 2020.

¹⁰² EO 1259. Accessed from <https://www.cfa.gov/about-cfa/legislative-history/executive-order-1259-october-25-1910>. Accessed on April 11, 2019.

¹⁰³ Shipstead-Luce Act. 40 USC 121. Accessed from <https://www.cfa.gov/about-cfa/legislative-history/shipstead-luce-act-public-law-231-71>. Accessed on April 11, 2019.

¹⁰⁴ EO 1862. Accessed from <https://www.cfa.gov/about-cfa/legislative-history/executive-order-1862>. Accessed on April 11, 2019.

¹⁰⁵ EO 11593. Accessed from <https://www.archives.gov/federal-register/codification/executive-order/11593.html>. Accessed on April 11, 2019.

- 1335 ■ District of Columbia Municipal Regulations (DCMR), *Zoning Regulations Special*
1336 *Purpose Zones* (DCMR 11K 305.)¹⁰⁶

1337 **4.11.2 Study Area**

1338 Because of the close connection between potential aesthetics and visual quality impacts and
1339 impacts on cultural resources, the aesthetics and visual quality Study Area (**Figure 4-18**)
1340 coincides with the Area of Potential Effects (APE) defined in **Section 4.12, Cultural Resources**.
1341 In addition to individual cultural resources, the APE also includes culturally significant
1342 viewsheds from Arlington National Cemetery, the Old Post Office Building, the Washington
1343 Monument, the U.S. Capitol, the Washington National Cathedral, and St. Elizabeths West
1344 Campus. There is no Regional Study Area for this resource because there is no potential for visual
1345 impacts outside the Local Study Area.

1346 **4.11.3 Methodology**

1347 Existing conditions and views of WUS were characterized from key viewpoints that are
1348 character-defining and may impact the integrity of WUS as a cultural resource.
1349 Characterization of views included assessment of views and vistas, urban design context, and
1350 population of viewers in the Study Area.

1351 **4.11.4 Existing Conditions**

1352 **4.11.4.1 Existing Land Use and Population**

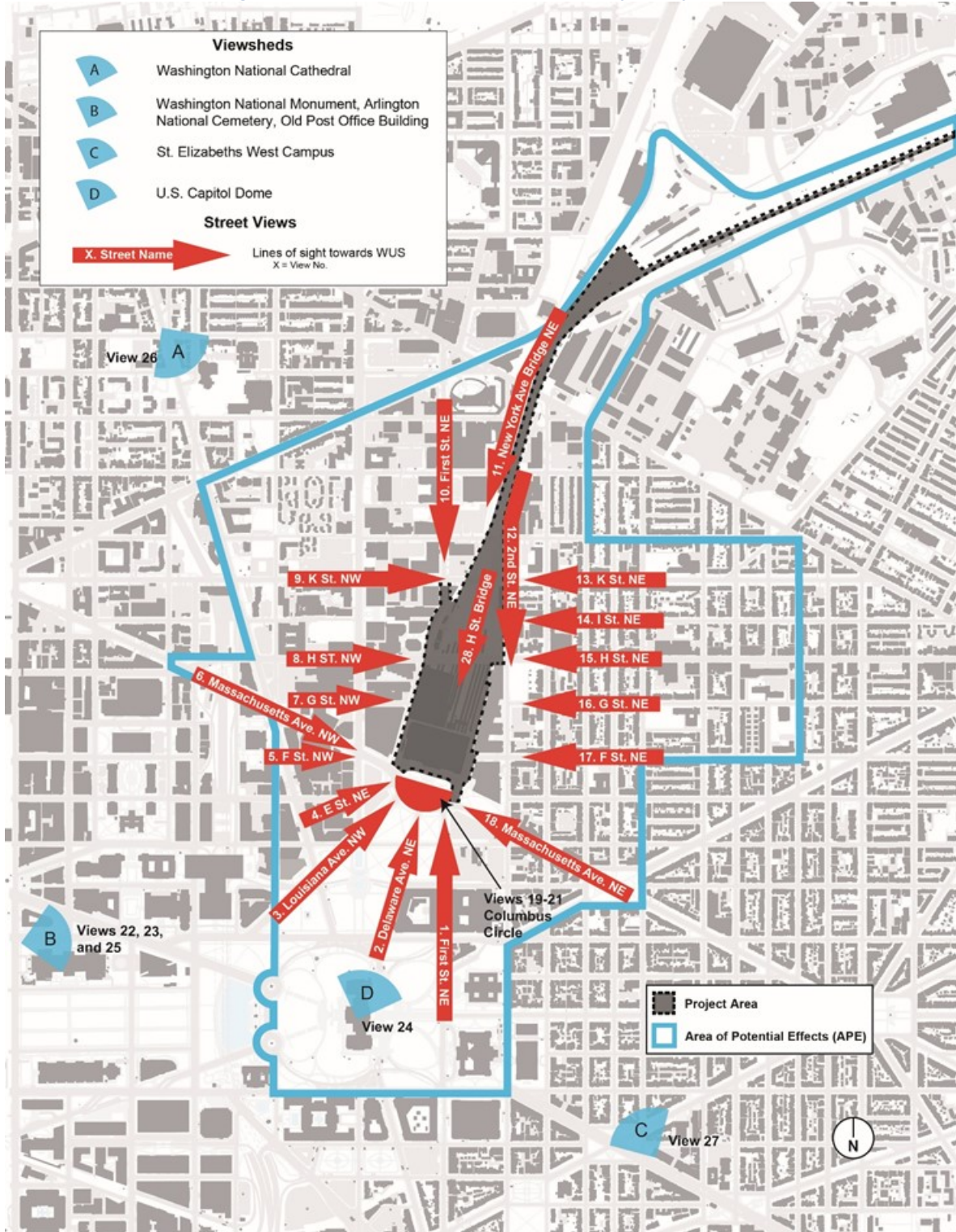
1353 Visual quality is largely determined by the existing environment, land use, and population.
1354 WUS is surrounded by a variety of land uses (see **Section 4.9, Land Use, Land Planning and**
1355 **Property**) that bring a wide range of people to the area. Numerous travelers, visitors,
1356 commuters, and residents pass through the Study Area daily and experience its visual
1357 character. Based on existing land uses, residents and commuters predominate to the east
1358 and west of WUS, while mostly commuters (including many government workers), visitors,
1359 and tourists are found to the south of WUS.

1360 **4.11.4.2 Existing Visual Quality**

1361 The visual quality of the environment surrounding WUS is influenced by topography, open
1362 space, vegetation, and the scale, form, location, and materials of the built environment. The
1363 topography of the Study Area slopes slightly upward between the U.S. Capitol and WUS.

¹⁰⁶ District of Columbia Municipal Regulations (DCMR) 11-K305, Special Purpose Zones. Accessed from <https://dcregs.dc.gov/Common/DCMR/SectionList.aspx?SectionNumber=11-K305>. Accessed on January 24, 2019.

Figure 4-18. Aesthetics and Visual Quality Study Area



1364 The Project Area itself is mostly level. The significant difference in elevation between the rail
1365 terminal and the surrounding streets is a defining characteristic of the Study Area.

1366 To the south of WUS, parks and large public buildings dominate the visual environment. The
1367 Senate Park and the Capitol Grounds feature open grassy areas, trees, tree-lined pathways
1368 and streets, and other plantings. These elements obscure views of WUS, especially during
1369 spring to late fall when trees are in leaf (**Figure 4-19** and **Figure 4-20**). Public buildings in that
1370 area primarily consist of AOC assets including the U.S. Capitol, U.S. Supreme Court, the
1371 Thurgood Marshall Federal Judiciary Building, the Russell, Dirksen, and Hart Senate Office
1372 Buildings, the Library of Congress, and the Cannon House Office Building. All these buildings
1373 are defined by their monumental massing and stone masonry facades. Immediately to the
1374 south of WUS, Columbus Plaza, dominated by a large fountain, was designed as a grand
1375 entrance forecourt to WUS.

1376 The area to the east of WUS consists mostly of residential neighborhoods featuring tree-lined
1377 streets and mostly low-scale residences. From spring through fall, vegetation obstructs views
1378 towards the Project Area (**Figure 4-21**). Typical buildings in this area include two-story single-
1379 family rowhouses constructed of brick, stone masonry, and wood. Larger commercial and
1380 residential buildings are concentrated along 2nd Street NE (**Figure 4-22**). Between 2nd Street
1381 NE and WUS, a large building houses the U.S. Securities and Exchange Commission. Sidewalks
1382 in that area are typically brick with granite curbing.

1383 The area to the west of WUS is largely commercial and public, with numerous businesses,
1384 institutions, and government offices. The National Postal Museum and U.S. Government
1385 Publishing Office are located in that area. Streets feature fewer trees and buildings are
1386 generally taller and more massive than in the residential neighborhoods to the east (**Figure 4-
1387 23**). Commercial and institutional building construction varies. Many are multi-story
1388 structures with glass curtain walls. Others are glass and masonry clad (**Figure 4-24**).

1389 The ongoing construction of new commercial and high-density residential buildings to the
1390 west, north, and east of WUS is progressively changing the visual environment in the vicinity
1391 of the station (**Figures 4-25**).

1392 **4.11.4.3 Existing Street Views and Significant Viewsheds**

1393 The general urban design of much of the area surrounding WUS, especially to the west,
1394 south, and east, reflects the 18th-century L'Enfant Plan. The McMillan Plan of 1901 re-
1395 established the L'Enfant Plan and was instrumental in determining the location of WUS. The
1396 L'Enfant and McMillan Plans, which are listed in the National Register of Historic Places
1397 (NRHP), established significant visual corridors directed towards WUS (see **Figure 4-18**). Key
1398 existing views are briefly characterized in **Table 4-13**.

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Figure 4-20. Northeast View, towards WUS from the Capitol Grounds, across Constitution Avenue NW and Louisiana Avenue



Figure 4-19. Northeast View towards WUS from Senate Park along Louisiana Avenue Between D Street NE and Columbus Circle NE



Figure 4-22. View Looking West towards the Project Area and the REA Building from I Street NE and 6th Street NE



Figure 4-21. View Looking West towards the Project Area and WUS from F Street NE and 3rd Street NE



Figure 4-24. View Looking West of the WUS Rail Terminal



Figure 4-23. View Looking Northeast from I Street NE and 2nd Street NE



Figure 4-25. View Looking East along H Street NE from 7th Street NE



Table 4-13. Street View Descriptions

Street View ¹	Existing Visual Description
1. First Street NE, view looking north	In the distance, especially from Independence Avenue and East Capitol Street, only the WUS headhouse roof is visible. Approaching Columbus Plaza, the entire south elevation can be seen. WUS and Columbus Plaza are listed in the NRHP and both contribute to the NRHP-eligible WUS Historic Site. The street is characterized by institutional buildings of Capitol Hill, open space for parking, and the park-like space of Lower Senate Park.
2. Delaware Avenue NE, view looking northeast	From Constitution Avenue NE, C Street NE, and D Street NE only the center three bays of the WUS headhouse are visible. Approaching Columbus Plaza, the entire south elevation can be seen. The street is characterized by the Russell Senate Office Building and the open park like setting of Upper and Lower Senate Parks.
3. Louisiana Avenue NW, view looking northeast	Along Louisiana Avenue NE, only the center pavilion of the WUS headhouse is visible. Approaching Columbus Plaza, the entire south elevation of the headhouse and the far western portion of the WUS parking garage can be seen. The street is characterized by a variety of uses including areas for parking, the Upper Senate Park, the Japanese American Memorial, and institutional and commercial buildings.
4. E Street NE, view looking northeast	From E Street NE and North Capitol Street NW, portions of the south and west elevations of the WUS headhouse are visible. Approaching Columbus Plaza, the entire south elevation of the headhouse and the far western portion of the WUS parking garage can be seen. The street is characterized by open parking lots.
5. F Street NW, view looking east	Only the front portion of the WUS headhouse and Columbus Plaza are visible. The street is characterized by multi-story commercial and institutional buildings of various styles and ages.
6. Massachusetts Avenue NW, view looking southeast	Only Columbus Plaza is visible until one passes through the plaza or drives through Columbus Circle NE. The street is characterized by multi-story commercial and institutional buildings of various styles and ages.
7. G Street NW, view looking east	The WUS parking garage is visible along G Street NW. The street is characterized by institutional and commercial buildings, especially the GPO Building and the former Gales School on the corner of Massachusetts Avenue and G Street NW.
8. H Street NW, view looking east	The H Street Bridge is visible looking east towards the Project Area. From the H Street Bridge (looking south), only the WUS parking garage is visible. The WUS headhouse and rail terminal are not visible to pedestrians. The street is characterized by multi-story commercial and institutional buildings, especially the GPO Building.
9. K Street NW, view looking east	The K Tower and other elements of the rail terminal, including the K Street underpass and sections of the Burnham Walls, are visible looking east towards the Project Area. The rail terminal (and its contributing features, including underpasses, the Burnham Walls, historic catenaries, signal bridges, K Tower, the REA Building, and Substation 25A) is part of the NRHP-eligible WUS Historic Site. K Street at this location is characterized by varied building types, which include commercial buildings, a former church, a school, and multi-family residential buildings.
10. First Street NE, view looking south	The WUS parking garage and Burnham Walls are visible looking south towards the Project Area. The street is characterized by the Metropolitan Branch Trail that runs beside it as well as many multi-story commercial and multi-family residential buildings.
11. New York Avenue Bridge NE, view looking south	From the New York Avenue NE Bridge, the WUS rail terminal, headhouse, and parking garage are visible. The U.S. Capitol is also visible beyond. New York Avenue is a busy thoroughfare and a main access route into the District. It is surrounded by industrial, commercial, and residential buildings.

Street View	Existing Visual Description
12. 2nd Street NE, view looking south	Moving south along 2nd Street NE, the view of the Project Area changes. From M Street and L Street, elements of the rail terminal are visible, including the Burnham Walls, street underpasses, catenaries, and signal bridges within the terminal. At K Street, Substation 25A is also visible. At I Street, the REA Building comes into view. 2nd Street NE is bordered by the rail terminal to the west and mostly by single-family rowhouses and multi-family apartment buildings of various styles and ages to the east.
13. K Street NE, view looking west	Looking west along K Street NE, the K street underpass and Burnham Walls of the rail terminal are visible. At this location, K Street is characterized by two-story traditional rowhouses as well as new multi-story residential and mixed-use buildings of various styles and ages.
14. I Street NE, view looking west	The REA Building is visible looking west along I Street NE. The street is characterized by a mixture of multi-story, multi-family apartment buildings and two-story, single-family rowhouses of varying styles and ages.
15. H Street NE, view looking west	Looking west along the H Street NE commercial corridor, the H Street Bridge and WUS parking garage are visible. From the H Street Bridge, portions of the rail terminal are visible, including the REA Building and K Tower. The roof of the WUS headhouse is also visible. H Street is a busy commercial corridor featuring two- and multi-story commercial buildings, residences, and mixed-use buildings of various styles and ages.
16. G Street NE, view looking west	There is no direct view to the Project Area from G Street NE due to the height of the existing office buildings along 2nd Street NE. East of 2nd Street NE, the street is characterized by the single-family rowhouses that are prevalent in the Capitol Hill neighborhood.
17. F Street NE, view looking west	Looking west, the WUS headhouse and a section of the Retail and Ticketing Concourse are visible. Multi-story office buildings line the west side of 2nd Street; the rest of F Street is mostly characterized by two-story residences and several small businesses.
18. Massachusetts Avenue NE, view looking northwest	Columbus Plaza and the Columbus Fountain are visible along Massachusetts Avenue. As one approaches Columbus Circle NE, the South elevation of the WUS headhouse becomes visible. From west of 4th Street, Massachusetts Avenue is characterized by two- and multi-story institutional, commercial, and residential buildings of various styles and ages. The buildings are set back from the street, providing a wide viewshed towards Columbus Plaza and WUS.
28. H Street Bridge looking south	Looking south from the north sidewalk at the center of the bridge, the view is characterized by the strong presence of the existing WUS parking garage on the west and the open space above the rail terminal on the east, bordered by multi-story commercial buildings along second street. The foreground of the view is dominated by the street, road traffic, streetcar infrastructure, and the south barrier wall. Portions of the historic passenger concourse roof and barrel vault of the WUS headhouse are visible.

1. Numbers are those shown in **Figure 4-18**.

4.12 Cultural Resources

1400 This section describes existing cultural resources at and near WUS. For the purposes of this
1401 section, cultural resources include districts, buildings, sites, structures, and objects included
1402 in or eligible for inclusion in the NRHP (also defined as historic properties) and the DC
1403 Inventory of Historic Sites; properties that fall within AOC's purview and are listed as AOC
1404 Heritage Assets; and properties that are under the jurisdiction of NPS's National Mall and
1405 Memorial Parks (NAMA).

1406 Additional details on historic and cultural resources are available in the July 2018,
1407 *Washington Union Station Expansion Project Affected Environment Technical Report*
1408 **(Appendix C2)** and the *Washington Union Station Expansion Project Draft Section 106*
1409 *Assessment of Effects to Historic Properties (Appendix D1)*.

4.12.1 Regulatory Context and Guidance

1410 Federal policies, regulations, and guidance that are relevant to this section include:

- 1411 ■ Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended
1412 (16 USC 470);
- 1413 ■ *Protection of Historic Properties* (36 CFR 800);
- 1414 ■ The Secretary of the Interior's *Standards for the Treatment of Historic Properties* (36
1415 CFR 68);
- 1416 ■ *Assumption of Responsibility for Preservation of Historic Property*, (54 USC 306101);
- 1417 ■ National Register of Historic Places (36 CFR 60); and
- 1418 ■ AOC Heritage Assets.¹⁰⁷

1419 District policies, regulations, and guidance relevant to this section include:

- 1420 ■ The Historic Landmark and Historic District Protection Act of 1978 (DC Law 2-144, as
1421 amended);
- 1422 ■ DCMR, *Preservation Regulations*, Title 10-C; and
- 1423 ■ DC Inventory of Historic Sites.¹⁰⁸

4.12.2 Section 106 Consultation

1424 Section 106 of the NHPA requires Federal agencies to consider the effects of their
1425 undertakings on historic properties listed or eligible for listing in the NHRP. Federal agencies

¹⁰⁷ AOC, Order 37-1, *Preservation Policy and Standards*, February 6, 2012.

¹⁰⁸ DC Inventory of Historic Sites. Accessed from <https://planning.dc.gov/node/924472>. Accessed on April 3, 2020.

1428 must consult with the State Historic Preservation Officer (SHPO) or, if applicable, Tribal
 1429 Historic Preservation Officer, having jurisdictions on the historic properties that may be
 1430 affected by the undertaking. Agencies must also afford the Advisory Council on Historic
 1431 Preservation (ACHP) a reasonable opportunity to comment the undertaking. Other
 1432 participants in the Section 106 consultation process include consulting parties, which are
 1433 individuals and organizations with a demonstrated interest in the undertaking due to the
 1434 nature of their legal or economic relation to the undertaking or affected properties, or their
 1435 concern with the undertaking's effects on historic properties.

1436 FRA is the Federal agency responsible for compliance with Section 106 for the Project. FRA
 1437 initiated consultation with the District SHPO on the Project on November 23, 2015. Following
 1438 initiation of the process and in consultation with the SHPO, FRA identified potential
 1439 consulting parties and invited them to participate in the process. The invited parties are
 1440 identified in **Section 8.4, National Historic Preservation Act Section 106 Consultation**. The
 1441 parties that accepted in the invitation are shown in **Table 4-14**.

Table 4-14. Agencies and Organizations Participating in the Section 106 Consultation Process

Section 106 Consulting Parties		
ACHP	DC Preservation League	Megabus
Akridge	DDOT	MWCOG
Amtrak	Federal Highway Administration	NPS
Advisory Neighborhood Commission (ANC) 6C	FTA	NCPC
AOC	General Services Administration	National Railway Historical Society, DC Chapter
Capitol Hill Restoration Society	GPO	National Trust for Historic Preservation
CFA	Greyhound	USRC
Committee of 100 on the Federal City	MARC	VRE
DC SHPO	MTA	WMATA

1442 With input from the DC SHPO and consulting parties, FRA:

- 1443 ■ Defined the APE for the Project;
- 1444 ■ Identified the historic properties in the APE; and
- 1445 ■ Assessed the Project’s potential effects on those historic properties.

1446 The key steps of the consultation process to date are described in more detail in **Section 8.4,**
 1447 *National Historic Preservation Act Section 106 Consultation*. Seven meeting have been held
 1448 with consulting parties. Additionally, the public was afforded opportunities to comment on

1449 the Project and historic preservation issues at the EIS scoping meeting (December 7, 2015)
1450 and at four public meetings held between March 2016 and March 2018 (See **Section 8.3.1,**
1451 *Public Meetings*).

1452 **4.12.3 Study Area**

1453 The Local Study Area consists of the APE defined as part of the Section 106 process for the
1454 Project. **Figure 4-26** shows the Local Study Area and the location of the cultural resources
1455 within its boundaries. The Local Study Area contains 49 cultural resources and six culturally
1456 significant viewsheds (Washington National Cathedral, Washington National Monument, Old
1457 Post Office Building, Arlington National Cemetery, U.S. Capitol Dome, and St. Elizabeths West
1458 Campus). There is no Regional Study Area because neither the No-Action Alternative nor the
1459 Action Alternatives have the potential to affect cultural resources beyond the Local Study
1460 Area

1461 **4.12.4 Methodology**

1462 FRA determined the APE based on a visual survey of streets and viewsheds towards the
1463 Project Area. The visual survey also identified areas of high traffic volume and confirmed
1464 routes typically used by trucks and buses. The APE was refined through consultation with the
1465 DC SHPO and Section 106 consulting parties. The APE was presented to the consulting parties
1466 on September 7, 2017. The SHPO concurred with the APE in a letter dated
1467 September 29, 2017.

1468 Cultural resources in the APE were identified by analyzing the various data sources available (such
1469 as the NRHP,¹⁰⁹ *DC Inventory of Historic Sites*,¹¹⁰ *AOC's List of Heritage Assets*,¹¹¹ and the list
1470 of memorials and monuments within NPS's NAMA¹¹²). Additional potentially eligible historic
1471 properties were identified through consultation with Consulting Parties and the SHPO.
1472 Because WUS is located in an area that has been thoroughly studied by many public and private
1473 entities for purposes of historic preservation, no new cultural resources were identified.
1474 Therefore, no further research or studies were required or conducted except for a Determination
1475 of Eligibility (DOE) for the WUS Historic Site, which expands the historic designation of WUS to
1476 include historically significant features of the rail terminal.¹¹³

¹⁰⁹ The National Register of Historic Places is the official list of the Nation's historic places worthy of preservation; authorized by the National Historic Preservation Act of 1966 (see <https://www.nps.gov/subjects/nationalregister/index.htm>).

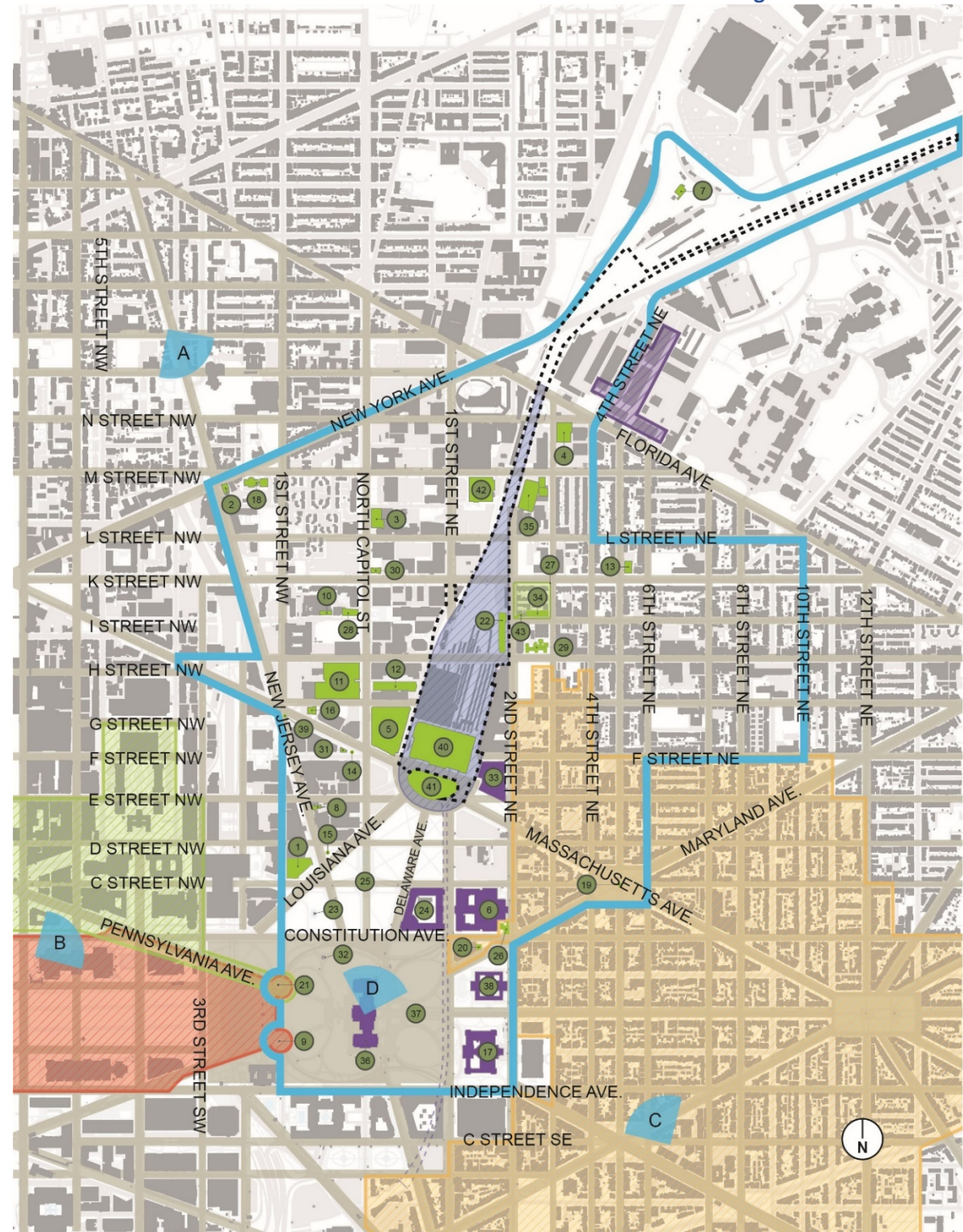
¹¹⁰ The DC Inventory of Historic Sites is the list of historic landmarks and historic districts in the District of Columbia. Properties listed in the Inventory are protected by the District's historic preservation law, which promotes compatible alterations and adaptation for current use (see <https://planning.dc.gov/page/dc-inventory-historic-sites>).

¹¹¹ The List of Heritage Assets is an internal Architect of the Capitol document.

¹¹² Historic properties recognized as part of a National Park are automatically listed on the NRHP (see <https://www.nps.gov/nama/index.htm>).

¹¹³ The SHPO concurred with the DOE for the WUS Historic Site on April 29, 2019.

Figure 4-26. Cultural Resources within the APE



Project Area

Area of Potential Effects (APE)

Historic Districts and Sites

Capitol Hill Historic District

NR, DC

National Mall Historic District

NR, DC

L'Enfant - McMillan Plan

NR, DC

Pennsylvania Avenue National Historic Site

NR, DC

Union Market Historic District

NR, DC

WUS (Proposed Designation Expansion)

[NR and DC Eligible]

First Street Tunnel (Below-grade)

Historic Properties

Architect of the Capitol Heritage Assets

AOC	Architect of the Capitol	NPS	National Park Service
NHL	National Historic Landmark	DC	District of Columbia Inventory of Historic Sites
NR	National Register of Historic Places		

1	Acacia Building	[Potentially NR and DC Eligible]	24	Russell Senate Office Building	AOC
2	Augusta Apartment Building (and Louisa Addition)	NR, DC	25	Senate Parks, Underground Parking and Fountain	AOC
3	C&P Telephone Company Warehouse	NR, DC	26	Belmont-Paul Women's Equality National Monument	NHL, NR, DC
4	Capital Press Building (Former)	[Potentially NR and DC Eligible]	27	Square 750 Rowhouse Development	[Potentially NR and DC Eligible]
5	City Post Office (Postal Museum)	DC	28	St. Aloysius Catholic Church	NR, DC
6	Dirksen and Hart Senate Office Buildings	AOC	29	St. Joseph's Home (Former)	[Potentially NR and DC Eligible]
7	Eckington Power Plant; Coach Yard Power Plant	[DC Eligible]	30	St. Philip's Baptist Church	DC
8	Engine Company No. 3	DC	31	SunTrust Bank (Former Childs Restaurant)	[Potentially NR and DC Eligible]
9	Garfield Memorial	AOC	32	The Summerhouse	AOC
10	Gonzaga College High School	[Potentially NR and DC Eligible]	33	Thurgood Marshall Federal Judiciary Building	AOC
11	Government Printing Office	DC	34	Topham's Luggage Factory (Former)	[Potentially NR and DC Eligible]
12	Government Printing Office Warehouse No. 4	[Potentially NR and DC Eligible]	35	Uline Ice Company Plant and Arena Complex	NR, DC
13	Hayes School	DC	36	United States Capitol	AOC
14	Holodomor Ukrainian Holocaust Memorial	NPS	37	United States Capitol Square	AOC
15	Japanese American Memorial to Patriotism During WWII	NPS	38	United States Supreme Court	AOC
16	Joseph Gales School	DC	39	Victims of Communism Memorial	NPS
17	Library of Congress, Thomas Jefferson Building	AOC	40	Washington Union Station (WUS)	NR, DC
18	M Street High School (Perry School)	NR, DC	41	WUS Plaza (Columbus Plaza) and Columbus Fountain	NR, DC
19	Major General Nathaneal Greene Statue	NR, DC	42	Woodward and Lothrop Service Warehouse	NR, DC
20	Mountjoy Bayly House	NHL, NR	43	901 Second Street NE	[Potentially NR and DC Eligible]
21	Peace Monument	AOC			
22	Railway Express Agency Building	[DC Eligible]			
23	Robert A. Taft Memorial	AOC			

Viewsheds

- A Washington National Cathedral
- B Washington Monument, Arlington National Cemetery, Old Post Office Building
- C St. Elizabeths West Campus
- D U.S. Capitol Dome

1476 Additional information on the process of determining the APE and identification of historic
 1477 properties is available in the *Washington Union Station Expansion Project Draft Section 106*
 1478 *Assessment of Effects to Historic Properties* (**Appendix D1** and **Appendix D1a**).

1479 **4.12.5 Existing Conditions**

1480 **4.12.5.1 Architectural Historic Properties**

1481 The APE contains 49 cultural resources ranging from residential, commercial, industrial, and
 1482 institutional buildings to monuments of national significance and city plans. These resources
 1483 are listed in **Table 4-15** along with their historic designation and date of construction.

Table 4-15. Cultural Resources within the Area of Potential Effect

Name	Historic Designation	Date of Construction/Period of Significance
Properties listed in the National Register of Historic Places or the DC Inventory of Historic Sites		
Augusta Apartment Building (and Louisa Addition)	National Register and DC Inventory	Constructed in 1900-1901
Capitol Hill Historic District	National Register and DC Inventory	Period of Significance spans 1790-1945.
C&P Telephone Company Warehouse	National Register and DC Inventory	Constructed in 1927
City Post Office (Postal Museum)	DC Inventory Listed	Constructed in 1914.
Engine Company No. 3	DC Inventory	Constructed in 1916
Government Printing Office	DC Inventory	Constructed in 1904
Hayes School	DC Inventory	Constructed in 1897
Holodomor Ukrainian Holocaust Memorial	NPS memorial	Constructed in 2015
Japanese American Memorial to Patriotism During WWII	NPS memorial	Constructed in 2001
Joseph Gales School	DC Inventory	Constructed in 1881
L’Enfant – McMillan Plan	National Register and DC Inventory	Period of Significance spans 1790-1942
M Street High School (Perry School)	National Register and DC Inventory	Constructed in 1890-1891
Major General Nathanael Greene Statue	National Register and DC Inventory	Constructed in 1877
Mountjoy Bayly House	National Register Listed; National Historic Landmark	Construction unknown; predates War of 1812
National Mall Historic District	National Register and DC Inventory	Period of Significance: 1791-present and 1791-1965
Pennsylvania Avenue National Historic Site	DC Inventory (National Register Eligible)	Period of Significance: 1891-1938

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Name	Historic Designation	Date of Construction/Period of Significance
Sewall-Belmont House	National Historic Landmark; National Register and DC Inventory	Constructed in 1800
St. Aloysius Catholic Church	National Register and DC Inventory	Constructed in 1857-1859
St. Philip's Baptist Church	DC Inventory	Constructed in 1892
Uline Ice Company Plant and Arena Complex	National Register and DC Inventory	Constructed in 1931
Union Market Historic District	National Register and DC Inventory	Period of Significance 1929-1939
Victims of Communism Memorial	NPS memorial	Constructed in 2007
Washington Union Station	National Register and DC Inventory	Constructed in 1908
Washington Union Station Plaza and Columbus Fountain	National Register and DC Inventory, managed by the National Park Service	Constructed in 1912
Woodward and Lothrop Service Warehouse	National Register and DC Inventory	Constructed in 1937-1939
Properties Potentially Eligible or Eligible for Listing in the National Register of Historic Places and/or DC Inventory of Historic Sites		
Acacia Building	Potentially National Register and DC Inventory Eligible	Constructed in 1936
Capital Press Building (Former)	Potentially National Register and DC Inventory Eligible	Constructed in 1931
Eckington Power Plant	DC Inventory Eligible	Constructed in 1907
Gonzaga College High School	Potentially National Register and DC Inventory Eligible	Constructed in 1859
Government Printing Office Warehouse No. 4	Potentially National Register and DC Inventory Eligible	Constructed in 1937
Railway Express Agency (REA) Building	DC Inventory Eligible	Constructed in 1908.
Square 750 Rowhouse Development	Potentially National Register and DC Inventory Eligible	Constructed ca 1882
St Joseph's Home (Former)	Potentially National Register and DC Inventory Eligible	Constructed in 1872-1874
Sun Trust Bank (Former Childs Restaurant)	Potentially National Register and DC Inventory Eligible	Constructed in 1926
Tophams Luggage Factory (Former)	Potentially National Register and DC Inventory Eligible	Constructed in 1928
WUS Historic Site	National Register and DC Inventory Eligible	Period of Significance: 1903-1935
901 Second Street NE	National Register and DC Inventory Eligible	Constructed in 1907
AOC Heritage Asset		
Dirksen and Hart Senate Office Buildings	AOC Heritage Asset	Constructed in 1958 and 1982, respectively

Name	Historic Designation	Date of Construction/Period of Significance
Garfield Monument	AOC Heritage Asset	Constructed in 1958 and 1982, respectively
Library of Congress, Thomas Jefferson Building	AOC Heritage Asset	Constructed in 1897
Peace Monument	AOC Heritage Asset	Constructed in 1878
Robert A. Taft Memorial	AOC Heritage Asset	Constructed in 1959
Russell Senate Office Building	AOC Heritage Asset	Constructed in 1909
Senate, Underground Parking and Fountain	AOC Heritage Asset	Constructed in 1932
The Summerhouse	AOC Heritage Asset	Constructed in 1880-1881
Thurgood Marshall Federal Judiciary Building	AOC Heritage Asset	Constructed in 1992
United States Capitol	AOC Heritage Asset	Construction dating to 1798
United States Capitol Grounds	AOC Heritage Asset	Design dating from 1874-1892.
United States Supreme Court	AOC Heritage Asset	Constructed in 1935

1484 The resources in **Table 4-15** illustrate the history of the development of Washington DC and
 1485 of the neighborhoods surrounding WUS. While they range in dates from the late 18th century
 1486 to the present, the majority of the 49 resources were constructed in the 19th and early
 1487 20th centuries.

1488 The oldest cultural resources within the APE date to the late 18th century and include the U.S.
 1489 Capitol, the L’Enfant-McMillan Plan, and the National Mall and Capitol Hill Historic Districts.
 1490 These resources illustrate the early planning and development of the city around the U.S.
 1491 Capitol.

1492 Other resources pre-dating WUS are predominately associated with the Swampoodle
 1493 neighborhood. Swampoodle was a residential and commercial area, mainly occupied by Irish
 1494 and Italian immigrants and by African Americans, that developed in the mid-to-late 19th
 1495 century. These 19th-century resources include several schools, churches, apartment buildings,
 1496 and rowhouses that largely reflect popular revival styles of the era. The Joseph Gales School
 1497 (1881) and M Street School (1890) were built in the Romanesque Revival style; Hayes School
 1498 and many of the rowhouses in Square 750 and the Capitol Hill Historic District reflect the
 1499 Italianate style; the Government Printing Office (1904) and St. Aloysius Catholic Church
 1500 (1857) are built in the Renaissance Revival style; the Augusta Apartment Building (1900)
 1501 reflects the less common Jacobean Revival style.

1502 The construction of WUS from 1903 to 1908 consolidated the operations of the Baltimore &
 1503 Ohio and Pennsylvania Railroads. It also served as a catalyst for the 20th-century urban design

1504 and development of the District of Columbia. Several cultural resources are directly linked to
1505 the construction of the station and rail terminal, including WUS (1908), Columbus Plaza
1506 (1912), the REA Building (1908), and Eckington Power Plant (1907). These properties vary in
1507 function and architectural style. WUS and Columbus Plaza, designed by the renowned
1508 architecture firm D.H. Burnham & Company, are recognized as outstanding examples of the
1509 early-20th-century Beaux Arts style. The REA Building, also designed by Burnham & Co.,
1510 reflects a Stripped Classical style, consistent with its industrial function. The Eckington Power
1511 Plant bears little ornamentation and is an example of industrial architecture from the early
1512 20th century.

1513 The WUS Historic Site encompasses several resources associated with WUS, including the
1514 WUS headhouse and the rail terminal. Character-defining objects and structures within the
1515 Historic Site include the REA Building, K Tower, umbrella sheds and track platforms, retaining
1516 walls (known as the Burnham Walls), bridge underpasses (allowing H Street NE, K Street NE, L
1517 Street NE, M Street NE, and Florida Avenue NE to pass below the tracks), three remaining
1518 signal bridges, single catenaries, a catenary with cross beam, an ownership marker,
1519 pneumatic switch valves, and electric substation 25A. The period of significance for the WUS
1520 Historic Site is 1903 to 1935.

1521 Several cultural resources within the APE post-date WUS and were constructed close to the
1522 station and rail terminal between 1914 and 1937. These resources include commercial and
1523 industrial buildings and warehouses ranging in style from Beaux Arts to Art Deco, Stripped
1524 Classical, and Streamline Modern: City Post Office (1914); SunTrust Bank/Former Childs
1525 Restaurant (1926); C&P Telephone Company Warehouse (1927); Topham's Luggage Factory
1526 (1928); Capitol Press Building (1931); Uline Ice Company Plant and Arena (1931); Woodward
1527 and Lothrop Service Warehouse (1937); and GPO Warehouse No. 4 (1937).

1528 Finally, a number of resources were constructed in the last decades of the 20th and early 21st
1529 centuries. Many are buildings and monuments or memorials included in AOC's *List of*
1530 *Heritage Assets* and NPS NAMA. They include the Thurgood Marshall Federal Judiciary
1531 Building (1992), the Japanese American Memorial to Patriotism During WWII (2001), the
1532 Victims of Communism Memorial (2007), and the Holodomor Ukrainian Holocaust Memorial
1533 (2015).

1534 4.12.5.2 Archaeological Resources

1535 The WUS Historic Preservation Plan includes an archaeological assessment that found that
1536 the Project Area may contain a range of prehistoric and historic archaeological materials,
1537 from isolated artifacts to significant cultural features.¹¹⁴ The rail terminal has low-to-
1538 moderate potential for prehistoric material and moderate-to-high potential for historic

¹¹⁴ Washington Union Station Historic Preservation Plan Partners. June 2015. *Washington Union Station Historic Preservation Plan* (3 volumes). Accessed from <https://www.usrcdc.com/projects/historic-preservation-plan/>. Accessed on May 15, 2019.

1539 material (mostly dating from the nineteenth and early twentieth centuries) to be present.
1540 **Figure 4-27** shows areas with archaeological potential.

4.13 Parks and Recreation Areas

1541 This section identifies existing parks and recreation areas near WUS that have the potential
1542 to be affected by the Project. For the purposes of the analysis, parks and recreation areas
1543 include public parks, private parks open to the public, off-street bicycle trails, walking paths,
1544 and areas used for general recreation. On-street bicycle and pedestrian routes are discussed
1545 in **Section 4.5, Transportation**.

1546 Additional details on parks and recreation areas are available in the July 2018, *Washington*
1547 *Union Station Expansion Project Affected Environment Technical Report (Appendix C2)*.

4.13.1 Regulatory Context and Guidance

1548 Relevant Federal and District policies, regulations, and guidance include:

- 1550 ■ NPS Organic Act of 1916 (16 USC Sections 1-4);
- 1551 ■ NPS Director's Order 12;¹¹⁵
- 1552 ■ NPS NEPA Handbook;¹¹⁶
- 1553 ■ NCPC and District of Columbia Parks and Recreation (DCPR), *Comprehensive Plan for*
1554 *the National Capital* (2011);¹¹⁷

4.13.2 Study Area

1556 The Study Area for parks and recreation areas includes the Project Area and the part of the
1557 District within up to two city blocks of the Project Area (**Figure 4-28**). Impacts on a regional
1558 scale are not anticipated; therefore, there is no Regional Study Area.

¹¹⁵ United States Department of the Interior, National Park Service. October 5, 2011. *Director's Order #12: Conservation Planning, Environmental Impact Analysis, and Decision-Making*. Accessed from https://www.nps.gov/policy/dorders/do_12.pdf. Accessed on April 3, 2020.

¹¹⁶ United States Department of the Interior, National Park Service. 2015. *NEPA Handbook*. Accessed from https://www.nps.gov/subjects/nepa/upload/NPS_NEPAHandbook_Final_508.pdf. Accessed on April 3, 2020.

¹¹⁷ Title 10, Part A8, published pursuant to Section 9a of the District of Columbia Comprehensive Plan Act of 1994, effective April 10, 1984 (D.C. Law 5-76; D.C. Official Code Section 1-301.66).

Figure 4-27. Potential for Archaeological Resources within the Project Area

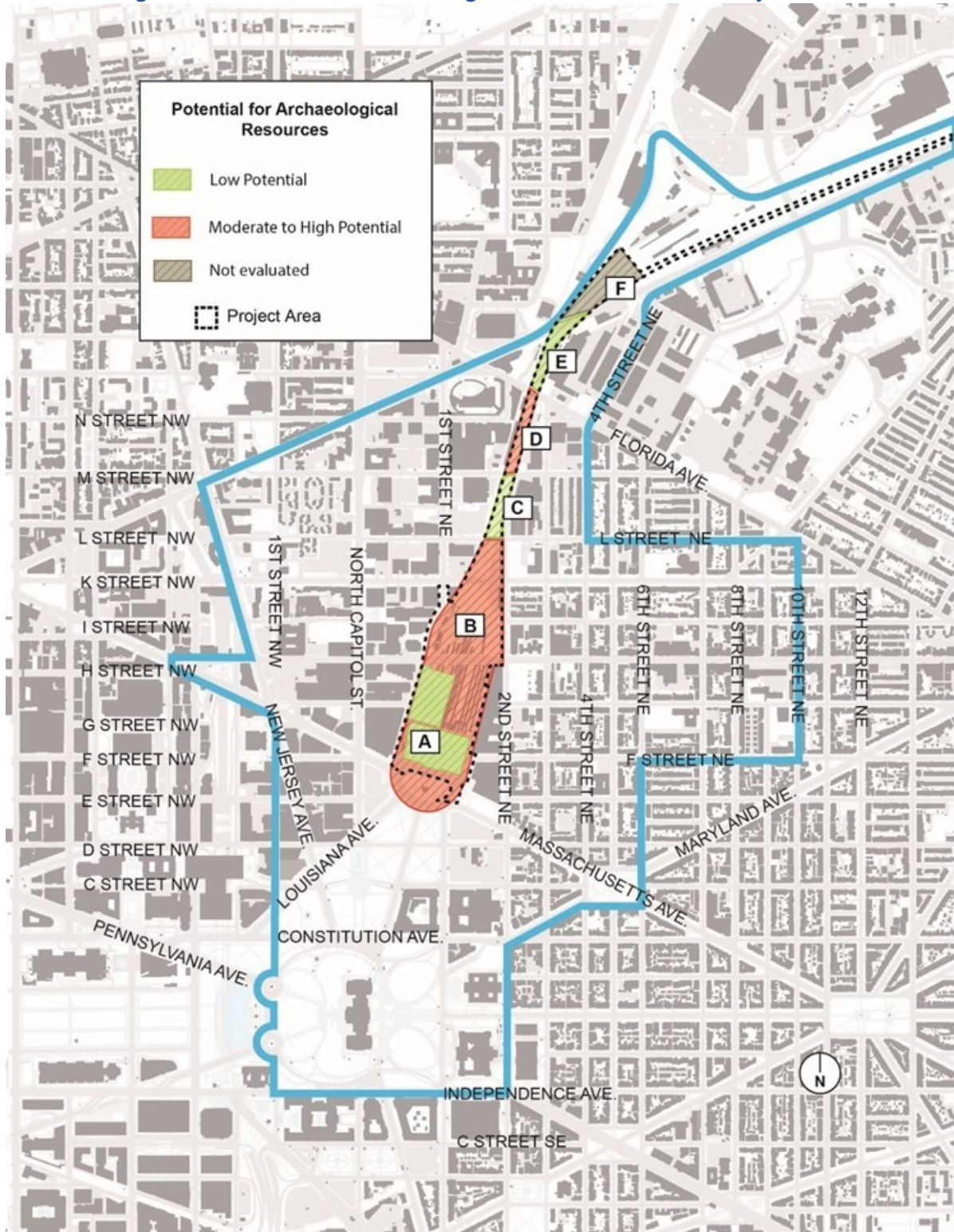


Figure 4-28. Parks and Recreation Areas, Study Area



1560 **4.13.3 Methodology**

Parks and recreation areas in the Study Area were identified by coordinating with relevant local, national, and regional recreation area authorities and through review of GIS-based resources and aerial photography.

1561 **4.13.4 Existing Conditions**

Table 4-16 identifies and briefly describes the existing parks and recreation areas within the Study Area, the agency with jurisdiction over the property, the estimated property size, and the approximate distance from the Project Area. There are eight existing or planned parks and recreation areas within the Study Area, including neighborhood and community parks, school recreational facilities, memorials, plazas, and other open areas. All parks and recreation areas are easily accessible by pedestrians and visitors in vehicles. They mostly attract users from the surrounding area.

Table 4-16. Parks and Recreation Areas within the Study Area

Resource Name	Resource Description	Jurisdiction	Est. Size (square feet)	Approx. Distance (feet)
Columbus Circle	Plaza and landscaped area immediately across from the primary entrance to WUS; serves as the gateway to Union Station and link to the U.S. Capitol Complex.	NPS	1,400	25
Metropolitan Branch Trail	Off-street multi-use trail.	DDOT, DC Department of General Services	Linear	25
“NoMA Green” (planned)	Planned public park with plaza and landscaped areas, walking paths, a dog park, a playground, and seating areas.	Private	1,800	80
Playground at Capitol Hill Montessori (Elementary School)	Children’s playground associated with the Capitol Hill Montessori Elementary School.	DC Public Schools	300	600
Plaza at 750 First Street NE	Pedestrian plaza open to public use in a commercial/office setting.	Private	750	120
Plaza at 899 North Capitol Street NE	Pedestrian plaza open to public use in a commercial/office setting.	Private	250	500
Plaza at Storey Park Development	Planned plaza and open/seating space open to public use and associated with a planned commercial, residential, and retail development.	Private	400	800
Upper and Lower Senate Parks	Part of the U.S. Capitol Complex, within the National Mall; lawns, plazas, and landscaped areas on the north side of the U.S. Capitol Complex (known as the senate side); fountains and small memorials present throughout.	Federal Land; AOC	5,700	420

4.14 Social and Economic Conditions

1562 This section describes existing conditions pertaining to demographics, jobs, economic
1563 conditions, tax revenue, and commercial activity at WUS. Additional details on social and
1564 economic conditions are available in the July 2018, *Washington Union Station Expansion*
1565 *Project Affected Environment Technical Report*, in **Appendix C2**.

4.14.1 Regulatory Context and Guidance

1567 The following are District regulations and guidance pertaining to social and economic
1568 conditions that are most relevant to the Project.

- 1569 ■ DC Code 8-109.01 – 8.109.12, Subchapter V: *Environmental Impact Statements*;
- 1570 ■ DC Workforce Investment Council, Workforce Innovation and Opportunity Act
1571 2016-2020 Unified State Plan;¹¹⁸ and
- 1572 ■ DC Office of the Deputy Mayor for Planning and Economic Development, *DC’s*
1573 *Economic Strategy: Strategy Report*.¹¹⁹

4.14.2 Study Area

1574 The Local Study Area (**Figure 4-29**) includes the Project Area up to K Street NE and the 21
1575 2010 U.S. Census block groups within one half-mile of the Project Area. The Regional Study
1576 Area is comprised of the District.
1577

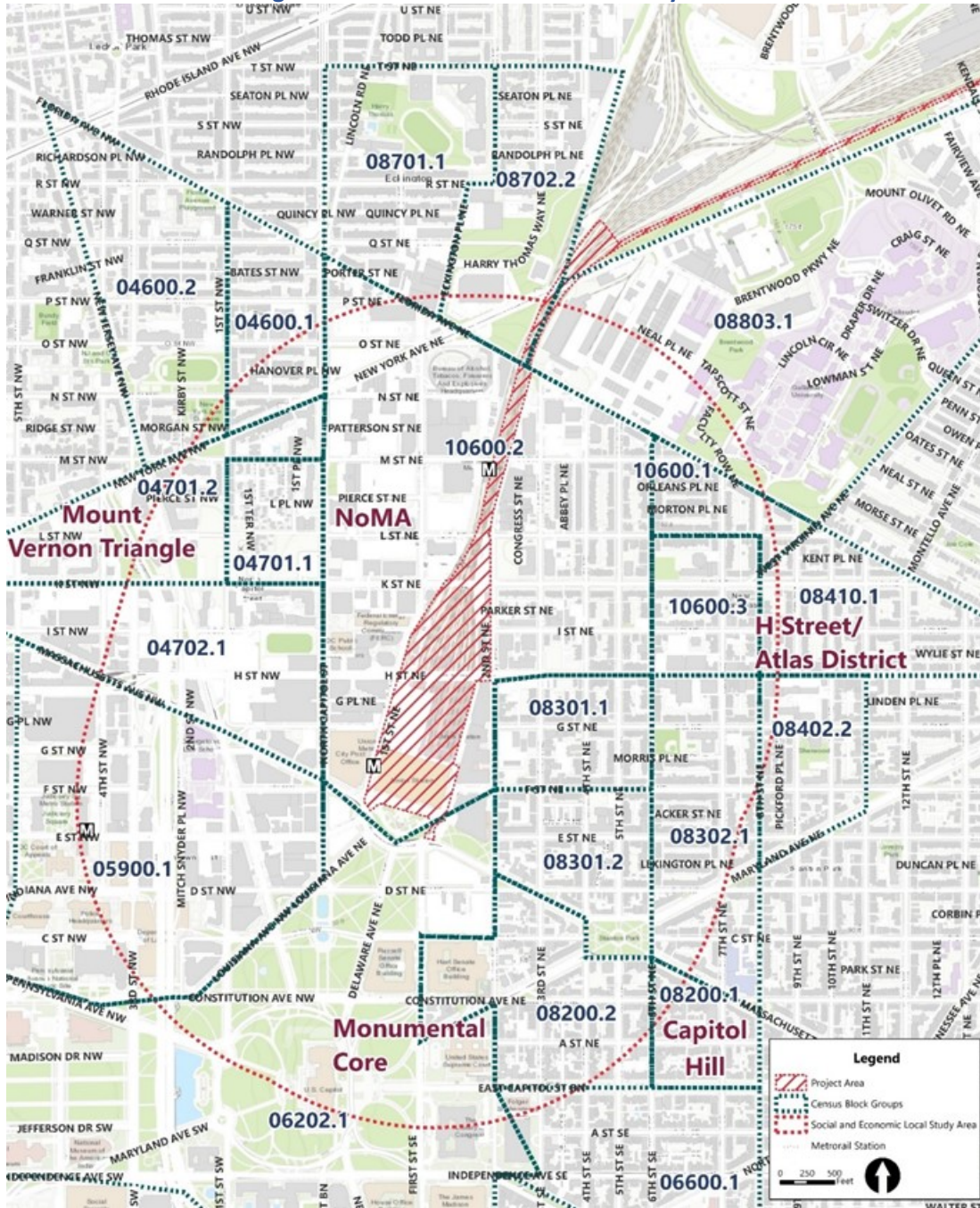
4.14.3 Methodology

1579 A socioeconomic profile of the Study Area was established using the following indicators:
1580 demographics, jobs, tax and other public revenues, current economic conditions of the
1581 neighborhood(s), commercial activity, and local government services. The social,
1582 demographic, economic, and commuting data used are from the 2010 Census, the 2012 to
1583 2016 American Community Survey (ACS) 5-year Estimates, and the DC Office of Tax and
1584 Revenue. Bureau of Labor Statistics data were also used.

¹¹⁸ D.C. Workforce Investment Council. 2016. *Workforce Innovation & Opportunity Act 2016-2020 Unified State Plan*.
https://dcworks.dc.gov/sites/default/files/dc/sites/dcworks/publication/attachments/WIOA_DC_Unified_State_Plan_Final.pdf. Accessed on April 3, 2020.

¹¹⁹ D.C. Office of the Deputy Mayor for Planning & Economic Development. 2017. *DC’s Economic Strategy, Strategy Report*.
http://dceconomicstrategy.com/wp-content/uploads/2017/03/Econ-Strategy_Full-Report-for-Distribution_03.07.17-1-1.pdf. Accessed on April 3, 2020.

Figure 4-29. Socioeconomic Local Study Area



1585 **4.14.4 Existing Conditions**

1586 **4.14.4.1 Demographics**

1587 **Total Population**

1588 The population of the Local Study Area in 2015 was 34,895, which is approximately
 1589 5.4 percent of the total population of the District in 2015. The population of the District
 1590 increased between 2010 and 2015 by 7.6 percent (from 601,723 to 647,484). In the Local
 1591 Study Area, the increase over the same period was 10.1 percent.

1592 **Age**

1593 **Table 4-17** shows the age distribution of the population in the Local Study Area and the
 1594 District in 2015. Persons between the ages of 25 and 35 formed the largest age group in both
 1595 the Local Study Area (34.5 percent) and the District (22.5 percent). In general, in 2015, the
 1596 population of the Local Study Area was slightly younger than that of the District as a whole.
 1597 Persons under 44 years of age represented 72 percent of the former and 66 percent of the
 1598 latter.

Table 4-17. Local Study Area and District Population by Age (2015)

Age Group	Local Study Area		District	
	Population	Percent of total	Population	Percent of Total
Under 5 Years	1,826	5.23	40,433	6.24
5-14 Years	1,906	5.46	55,231	8.53
15-19 Years	1,145	3.28	38,439	5.94
20-24 Years	3,607	10.34	59,429	9.18
25-34 Years	12,020	34.45	145,477	22.47
35-44 Years	4,614	13.22	89,941	13.89
45-54 Years	3,284	9.41	76,763	11.86
55-64 Years	3,529	10.11	68,472	10.58
65-74 Years	1,832	5.25	41,097	6.35
75-84 Years	804	2.30	21,690	3.35
85 and Older	328	0.94	10,512	1.62
Total	34,895	100	647,484	100

Source: 2011-2015 ACS five-year estimates¹²⁰

1599 **Gender**

1600 Gender distribution in the Local Study Area’s population remained constant between 2010
 1601 and 2015 at approximately 49 percent male and 51 percent female. By comparison, the
 1602 District had a slightly lower male population (approximately 47 percent) and higher female
 1603 population (approximately 53 percent).

¹²⁰ United States Census. 2010. *American Community Survey 5-Year Estimates*. Accessed from <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>. Accessed on July 6, 2017 and April 17, 2018.

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Race

Table 4-18 shows the racial and ethnic breakdown of the Local Study Area’s population in 2015, along with the District’s. The Local Study Area, with 50.29 percent of white residents, was home to proportionately fewer minorities than the District as a whole.

Table 4-18. Local Study Area and District Population by Race (2015)

Race or Ethnicity	Local Study Area		District	
	Population	Percent of total	Population	Percent of Total
White	17,548	50.29	230,489	35.60
Black or African American	12,144	34.80	310,678	47.98
Asian	1,785	5.12	23,494	3.63
Native American and Alaskan Native	191	0.55	1,265	0.20
Native Hawaiian/Other Pacific Islander	17	0.05	218	0.03
Other race	58	0.17	1,790	0.28
Two or more races	796	2.28	13,747	2.12
Hispanic or Latino	2,356	6.75	65,803	10.16
Total	34,895	100	647,484	100

Source: 2011-2015 ACS five-year estimates¹²¹

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Median Household Income

The weighted average median household incomes for the 21 block groups within the Local Study Area was \$88,798 in 2015, up from \$65,915 in 2010.¹²² This is \$17,950 higher than the 2015 median household income for the District overall (\$70,848).

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4.14.4.2 Economic Conditions

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The Federal government comprises a large share of the District’s economy (approximately 30 percent of District’s Gross Domestic Product [GDP]) and is the largest employer in the District. Other significant industries include tourism, education, and professional services. The District has experienced substantial economic growth in 2012-2017, with an increase in GDP, jobs, tax revenue, and population, and a decrease in unemployment.¹²³ Between 2012 and 2017, the real GDP increased by 11.6 percent and the median household income of \$75,628 was the second-highest among states. The District’s unemployment stood at 6.1 percent, down from 8.7 percent in 2012. Tourism topped at 21.3 million visitors in 2015,

¹²¹ United States Census. 2010. *American Community Survey 5-Year Estimates*. Accessed from <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>. Accessed on July 6, 2017 and April 17, 2018.

¹²² United States Census. *2011-2015 American Community Survey, 5-Year Estimates and 2006-2010 American Community Survey, 5-Year Estimates*. Accessed from <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>. Accessed on April 17, 2018.

¹²³ Government of the District of Columbia. 2017. *DC’s Economic Strategy Report 2017*. Accessed from http://dceconomicstrategy.com/wp-content/uploads/2017/03/Econ-Strategy_Full-Report-for-Distribution_03.07.17-1-1.pdf. Accessed on April 3, 2020.

1621 which included more than 2 million overseas visitors. Visitor spending in 2015 totaled \$7.1
1622 billion.¹²⁴ In addition, the District operate as a center for meetings, conventions, and
1623 exhibitions.

1624 4.14.4.3 Employment

1625 There were an estimated 783,200 jobs in the District as of October 2016. Within the Local
1626 Study Area, there were a total of 120,032 jobs in 2015, up approximately 4.0 percent since
1627 2010.¹²⁵ The leading industries in the Local Study Area included public administration
1628 (51.1 percent); educational services (8.8 percent); and professional, scientific, and technical
1629 services (6.7 percent).

1630 4.14.4.4 Economic Planning Policy

1631 Economic planning policy in the District is guided by *DC's Economic Strategy* report
1632 developed in March 2017 and *The Comprehensive Plan for the National Capital*, which was
1633 adopted in 2006 and amended in 2011. The *DC's Economic Strategy* report provides two
1634 specific goals: raise the private sector GDP by 20 percent and reduce unemployment rates
1635 below 10 percent by the end of 2021. The report provides an action framework to meet
1636 these goals. *The Comprehensive Plan* is a framework guiding the future growth and
1637 development of the District as an inclusive city with equitable places to live and work with
1638 equitable opportunities.^{126, 127, 128}

¹²⁴ Government of the District of Columbia. 2017. *DC's Economic Strategy Report 2017*. Accessed from http://dceconomicstrategy.com/wp-content/uploads/2017/03/Econ-Strategy_Full-Report-for-Distribution_03.07.17-1-1.pdf. Accessed on April 3, 2020.

¹²⁵ United States Census Bureau. OnTheMap Application and LEHD Origin-Destination Employment Statistics (Beginning of Quarter Employment, 2nd Quarter of 2002-2015). Accessed from <https://onthemap.ces.census.gov/>. Accessed on April 19, 2018.

¹²⁶ National Capital Planning Commission. 2010. *The Comprehensive Plan for the National Capital: District Elements, Capitol Hill*. Accessed from https://planning.dc.gov/sites/default/files/dc/sites/op/publication/attachments/District%20Elements_Volume%20II_Chapter%2015_April%208%202011.pdf. Accessed on April 3, 2020.

¹²⁷ National Capital Planning Commission. 2010. *The Comprehensive Plan for the National Capital: District Elements, Near Northwest*. Accessed from https://planning.dc.gov/sites/default/files/dc/sites/op/publication/attachments/District%20Elements_Volume%20II_Chapter%2021_April%208%202011.pdf. Accessed on April 3, 2020.

¹²⁸ National Capital Planning Commission. 2010. *The Comprehensive Plan for the National Capital: District Elements, Upper Northeast*. Accessed from https://planning.dc.gov/sites/default/files/dc/sites/op/publication/attachments/District%20Elements_Volume%20II_Chapter%2024_April%208%202011.pdf. Accessed on April 3, 2020.

1639 **4.14.4.5 Taxes, Public Revenue, and Local Government Services**

1640 The District's largest revenue sources are real property taxes, individual income taxes, and
1641 sales taxes. In 2016, the District collected approximately \$7.9 billion from taxes, fees, and
1642 other sources. Real property tax rates vary according to property type. The 2016 retail sales
1643 tax rate was 5.75 percent. Some goods and services are taxed at a higher rate, including
1644 restaurant meals, hotel rooms, and parking in commercial lots. Individual income tax rates
1645 are progressive and vary according to income levels.¹²⁹

1646 Most revenue is allocated to the District's general fund. Tax revenue funds police, fire,
1647 emergency medical services; public education; human services; child and family services;
1648 parks and recreation; environmental protection; public health services; sanitation services;
1649 employment services; economic development; housing and community development; public
1650 works; and emergency planning.¹³⁰

1651 **4.14.4.6 Commercial Activity at WUS**

1652 The WUS parking garage and retail uses within WUS are USRC's primary sources of revenue.
1653 USRC uses this revenue to manage WUS and sustain ongoing operations. Existing retail space
1654 at the WUS is under a long-term (99-year) lease between USRC and USI, a private entity
1655 controlled by Ashkenazy Acquisition Corporation. USPG, LLC operates the WUS parking
1656 garage for USRC under another lease agreement. In Fiscal Year 2016, garage revenue
1657 (\$8,532,403) represented approximately 59 percent of WUS's total revenue. Revenue from
1658 the USI lease (\$3,200,505) represented approximately 22 percent of the total.¹³¹

1659 There are approximately 206,000 square feet of retail space in WUS. WUS is one of the
1660 District's largest retail shopping centers and serves a variety of clientele and needs. As of
1661 2015, 36 percent of the retail space at WUS were food and beverage stores, 27 percent were
1662 clothing and accessories stores, and 10 percent were health and personal care stores.¹³² The
1663 primary consumer groups for WUS retail and services are local residents, local workers,
1664 commuters, and tourists.

¹²⁹ Government of the District of Columbia. 2016. *DC Tax Facts 2016*. Accessed from <https://cfo.dc.gov/sites/default/files/dc/sites/ocfo/publication/attachments/2016%20Revised%20Tax%20Facts.pdf>. Accessed on April 3, 2020.

¹³⁰ Government of the District of Columbia. 2016. *Fiscal Year 2016 Approved Budget by Agency and Fund*. Accessed from <https://cfo.dc.gov/sites/default/files/dc/sites/ocfo/publication/attachments/Gross%20Funds%20FY%202016%20Approved%20Budget.pdf>. Accessed on April 3, 2020.

¹³¹ *USRC Annual Report 2016*. Accessed from https://www.usrcdc.com/wp-content/uploads/2017/02/usrc_annual_report_2016_final_spreads.pdf. Accessed on April 3, 2020.

¹³² Beyer Blinder Belle and Grimshaw. 2015. *Washington Union Station Master Development Plan*.

4.15 Public Safety and Security

1665 This section characterizes existing conditions pertaining to public safety and security at WUS.
1666 Additional details on existing conditions for public safety and security are available in the
1667 July 2018, *Washington Union Station Expansion Project Affected Environment Technical*
1668 *Report (Appendix C2)*.

4.15.1 Regulatory Context and Guidance

1670 Federal policies, regulations, and guidance:

- 1671 ■ FRA Safety Standards (49 CFR 200 – 299);
- 1672 ■ FRA High-Speed Passenger Rail Safety Strategy;¹³³
- 1673 ■ Rail Safety Improvement Act of 2008 (Public Law 110-432);
- 1674 ■ U.S. Code on Railroad Safety (49 USC 20101 et seq);
- 1675 ■ Department of Homeland Security/Transportation Security Administration
- 1676 Regulations concerning Rail Transportation Security (49 CFR 1580); and
- 1677 ■ Transportation Security Administration— Security Directive RAILPAX-04-01 and
- 1678 RAILPAX-04-02.¹³⁴

1679 Other relevant guidance includes:

- 1680 ■ Amtrak safety and security procedures;¹³⁵
- 1681 ■ District of Columbia Fire Code;¹³⁶
- 1682 ■ District of Columbia Construction Codes Supplement;¹³⁷ and
- 1683 ■ DCMR Title 24, Public Space and Safety.

¹³³ U.S. Department of Transportation, Federal Railroad Administration. 2009. *High-Speed Passenger Rail Safety Strategy*. Accessed from <https://www.fra.dot.gov/eLib/Details/L03624>. Accessed on April 3, 2020.

¹³⁴ Department of Homeland Security, Office of the Inspector General. 2010. *TSA's Preparedness for Mass Transit and Passenger Rail Emergencies*. Accessed from https://www.oig.dhs.gov/assets/Mgmt/OIG_10-68_Mar10.pdf. Accessed on April 3, 2020.

¹³⁵ Amtrak is responsible for assessing and implementing safety and security measures for the NEC and its trains in the Study Area and commuter services, in collaboration with Amtrak, are responsible for assessing and implementing safety and security measures for their trains in the Study Area.

¹³⁶ Department of Consumer and Regulatory Affairs. District of Columbia Construction Codes. Accessed from <https://dcra.dc.gov/page/dc-construction-codes>. Accessed on April 3, 2020.

¹³⁷ Department of Consumer and Regulatory Affairs. District of Columbia Construction Codes. Accessed from <https://dcra.dc.gov/page/dc-construction-codes>. Accessed on April 3, 2020.

1684 **4.15.2 Study Area**

1685 The Local Study Area includes the Project Area and a half-mile buffer (**Figure 4-30**). The
1686 Regional Study Area includes service boundaries for fire, law enforcement, and emergency
1687 services in the District (**Figure 4-31**). These service boundaries include those specific to WUS
1688 and the District, including Amtrak Police, Metro Transit Police, U.S. Park Police, and U.S.
1689 Capitol Police.

1690 **4.15.3 Methodology**

1691 The assessment is based on a review of publicly available information on law enforcement
1692 services, emergency response services, crime data, and transportation security measures.

1693 **4.15.4 Existing Conditions**

1694 **4.15.4.1 Safety**

1695 Railroad safety in the Project Area is overseen by FRA and relevant Amtrak departments.
1696 Based on FRA safety data, between 2012 and 2017, there were 29 train crashes within the
1697 District on Amtrak tracks. Of these, 23 were derailments, with three injuries and \$1.18 million
1698 in reported damages.

1699 **4.15.4.2 Fire and Medical Emergency Response**

1700 WUS and the Local Study Area are served by Fire Battalions 1 and 2. The closest fire station to
1701 WUS is Engine 3 Station at 439 New Jersey Avenue NW. Other stations close to WUS are
1702 Engines 2, 6, 10, 12, 13, and 18 (**Figure 4-32**). Exact protocols for fire response vary by
1703 incident type and size. District fire services also coordinate with other local municipalities.

1704 Eight hospitals in the District provide emergency care, none of which fall within the Local
1705 Study Area. Five hospitals are located within 3 miles of WUS: Howard University Hospital, a
1706 Level 1 Trauma Center;¹³⁸ Bridgepoint Hospital, Capitol Hill Campus;¹³⁹ and Children's
1707 National Medical Center.¹⁴⁰ Emergency response services in the Regional Study Area are
1708 provided by MPD and the District of Columbia Fire Department.

¹³⁸ Howard University Hospital. *Emergency Medicine*. Accessed from <http://huhealthcare.com/healthcare/hospital/departments/emergency-medicine>. Accessed on April 3, 2020.

¹³⁹ Bridgepoint Health Care. 2018. *Bridgepoint Hospital Capitol Hill, Overview*. Accessed from <http://www.bridgepointhealthcare.com/overview-bridgepoint-hospital-capitol-hill/>. Accessed on April 3, 2020.

¹⁴⁰ Children's National Health System. 2018. *Children's National Medical Center, About Us*. Accessed from <https://childrensnational.org/about-us>. Accessed on April 3, 2020.

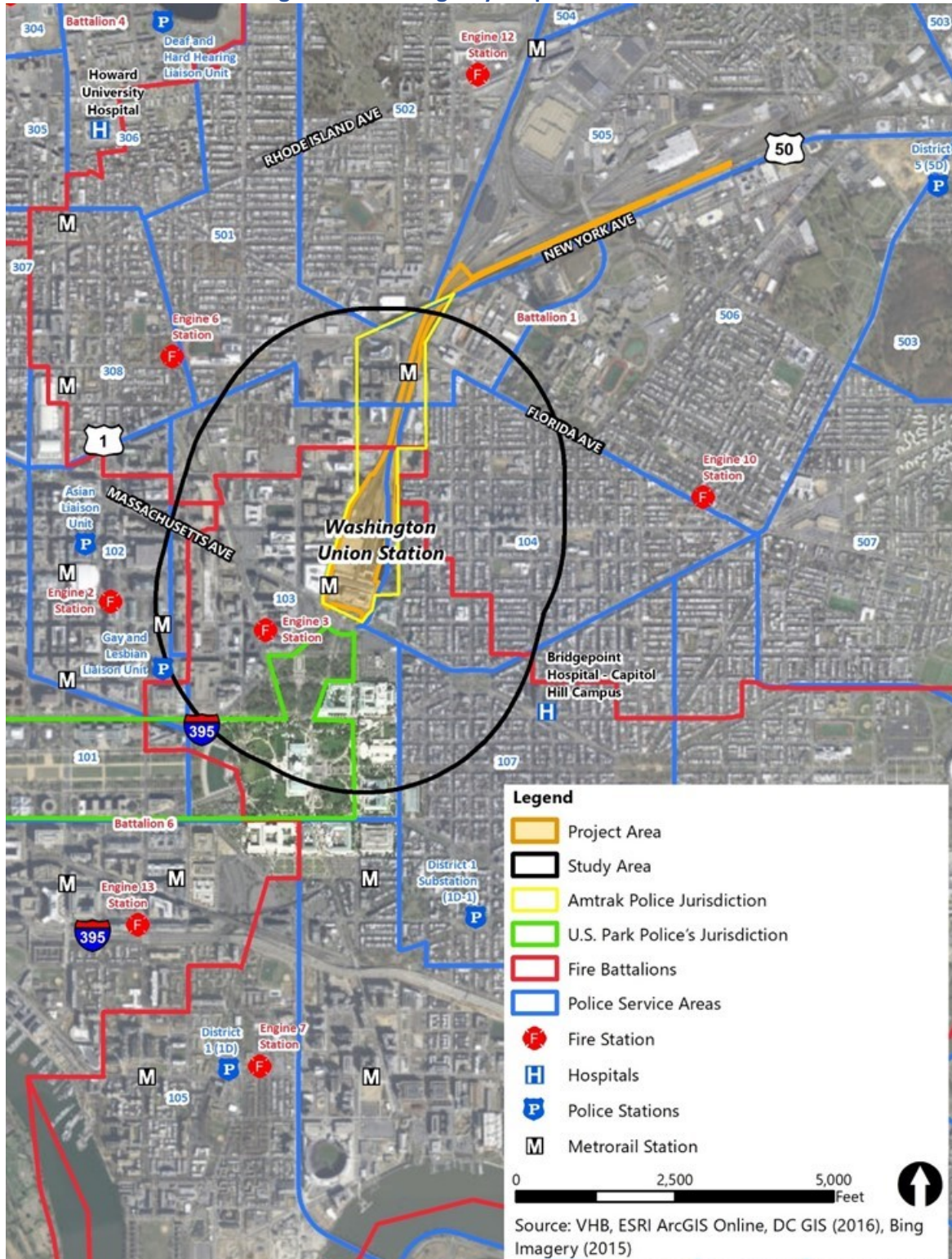
Figure 4-30. Public Safety and Security Local Study Area



Figure 4-31. Public Safety and Security Regional Study Area



Figure 4-32. Emergency Response Resources



1714 **4.15.4.3 Police**

1715 Multiple overlapping police and security forces operate in the Local Study Area. The largest
1716 force is MPD. MPD is divided into seven districts, themselves divided into Police Service Areas
1717 (PSA). WUS is within the First District, PSA 102. Other PSAs overlapping with the Local Project
1718 Area include PSAs 104, 501, 502, and 505. The nearest substation is First District Substation
1719 on 500 E Street SE.

1720 Amtrak Police have jurisdiction and authority over WUS. Amtrak Police regularly patrol WUS,
1721 have an office and information desk in the Claytor Concourse, and are headquartered in the
1722 rail terminal area. Amtrak Police uses contracted security forces (Allied Universal Security
1723 Services) to maintain order in the terminals and perform screening of freight deliveries at the
1724 east and west loading docks. Metro Transit Police are responsible for the Metrorail platform
1725 and concourse, as well as for the West Porch.

1726 Columbus Plaza and the area near Columbus Circle to the south of WUS (in the Lower Senate
1727 Areas) are under the jurisdiction of the U.S. Park Police. GPO Police are responsible for the
1728 H Street and K Street bridges that connect into WUS over First Street NE. Federal Protective
1729 Service (FPS) is responsible for securing the Securities and Exchange Commission and Postal
1730 Square Buildings. U.S. Capitol Police are responsible for the Thurgood Marshall Federal
1731 Building and associated parking lots and park land controlled by the AOC.

1732 The Police Coordination Amendment Act of 2001 governs how Federal law enforcement
1733 agencies interact with MPD in the District, including the Local Study Area.¹⁴¹

1734 **4.15.4.4 Crime**

1735 The Local Study Area saw a 24 percent increase in reported crimes in 2016 compared to
1736 2015.¹⁴² This included a 43 percent increase in violent crime and a 21 percent increase in
1737 property crime. MPD's First District had the highest numbers of total reported crimes in
1738 2016.¹⁴³ The highest incidences of violent crime in the Local Study Area in 2016 occurred in
1739 the unit blocks of Massachusetts Avenue NE and Massachusetts Avenue NW; and near the
1740 intersection of First Street NE and L Street NE. The highest incidences of property crime
1741 occurred at these same locations as well as near the intersection of New Jersey Avenue NW
1742 and F Street NW, and the intersection of 3rd Street NE and G Street NE.¹⁴⁴

¹⁴¹ Government of the District of Columbia. 2018. *Covered Federal Law Enforcement Agencies*. Accessed from <https://mpdc.dc.gov/page/covered-federal-law-enforcement-agencies>. Accessed on April 3, 2020.

¹⁴² District of Columbia Metropolitan Police Department. 2018. Crimemap Application. Accessed from <http://crimemap.dc.gov/>. Accessed on March 22, 2018.

¹⁴³ District of Columbia Metropolitan Police Department. 2018. Crimemap Application. Accessed from <http://crimemap.dc.gov/>. Accessed on March 22, 2018.

¹⁴⁴ District of Columbia Metropolitan Police Department. 2018. Crimemap Application. Accessed from <http://crimemap.dc.gov/>. Accessed on March 15, 2018.

1743 In the Local Study Area from January 1, 2016 to February 28, 2018, a total of 3,553 criminal
1744 incidents were reported.¹⁴⁵ Theft from automobiles or other locations represented the
1745 majority of these incidents (2,871). Assaults with dangerous weapons, sexual assaults, and
1746 homicides accounted for 169 of the reported crimes.

1747 MPD crime reduction initiatives include a full-scale body-worn camera program, a citywide
1748 closed-circuit television system, and increased officers on the street during the summer. Six
1749 locations in the Local Study Area have MPD closed-circuit television cameras installed. MPD
1750 places an emphasis on community policing and beat patrols.

1751 **4.15.5 Security**

1752 WUS's concourses are publicly accessible and there are no security measures to restrict
1753 entry. Platform access is restricted to ticketed passengers and railroad personnel. Major
1754 entrances to the tracks at 3rd Street NE and from the Ivy City Yard are controlled by
1755 electronic system or guards. The H Street Bridge and New York Avenue Bridge are fenced but
1756 may provide an opportunity for intrusion of people or materials from above onto the tracks.
1757 In both cases, however, fencing and walls limit such intrusion.

1758 Loading facilities are located on First Street NE and in a loading dock on H Street shared with
1759 the adjacent Station Place development. There are no screening facilities at the loading
1760 docks, though security personnel patrol the area.

1761 The Transportation Security Administration (TSA) conducts periodic bag and passenger
1762 screenings with uniformed and canine divisions inside WUS. The parking and bus garage do
1763 not screen vehicles, passengers, or luggage.

1764 DDOT has designated 19 corridors radiating from the District as emergency event/evacuation
1765 routes extending into Maryland and Virginia and connecting to the Capital Beltway (I-495).
1766 Within the Local Study Area, New York Avenue, H Street NE, and I-395 are designated
1767 evacuation routes. The District's Homeland Security and Emergency Management Agency
1768 (HSEMA) coordinates preparedness and response in the event of an emergency. The District
1769 and the Federal governments have developed multiple contingency plans for securing critical
1770 infrastructure and ensuring the safety of citizens in an emergency. The District Response
1771 Plan, developed by HSEMA to facilitate coordinated planning and unified response in times of
1772 crisis, identifies Amtrak, MTA, and VRE as stakeholder organizations and agencies tasked with
1773 support roles during an emergency by providing emergency transit support and coordination

¹⁴⁵ Government of the District of Columbia. 2011. *Criminal Incidents*. Accessed from <http://opendata.dc.gov/datasets?q=crime>. Accessed on March 15, 2018.

1774 during an emergency.¹⁴⁶ In case of railroad failure during an emergency event, WUS would
1775 serve as a primary hub of multimodal activity.

1776 4.15.6 Traffic Restrictions

1777 Traffic restrictions have been put in place along several routes around WUS to improve traffic
1778 safety and limit the potential for explosive attacks using large vehicles.¹⁴⁷ The District has
1779 defined Primary Routes with no heavy vehicle restrictions, Bus Restricted Routes, Truck
1780 Restricted Routes, Bus and Truck Restricted Routes, and Directional Restricted Routes. New
1781 York Avenue, Florida Avenue, New Jersey Avenue, Massachusetts Avenue NW, N Capitol
1782 Street, and H Street are all Primary Routes in the Local Study Area. There are Bus and Truck
1783 Restricted Routes in the Local Study Area along D Street NE, Constitution Avenue, F Street
1784 NE, and sections of 3rd, 4th, and 5th Streets NE. Buses and trucks are restricted along
1785 3rd Street and 5th Street NE between H Street and D Street, and on F Street NE between
1786 4th Street and 6th Street.

4.16 Public Health, Elderly, and Persons with Disabilities

1787 This section characterizes existing conditions pertaining to public health, the elderly, and
1788 persons with disabilities. FRA's *Procedures for Considering Environmental Impacts*¹⁴⁸ specify
1789 that the "EIS shall assess impacts of the alternatives on the transportation and general
1790 mobility of the elderly and handicapped." Additional details on public health, elderly and
1791 persons with disabilities are available in the July 2018, *Washington Union Station Expansion
1792 Project Affected Environment Technical Report* (Appendix C2).

1793 4.16.1 Regulatory Context and Guidance

1794 Federal policies, regulations, and guidance that pertain to public health, the elderly, and
1795 persons with disabilities that are relevant to the Project include:

- 1796 ■ NAAQS (40 CFR 50);
- 1797 ■ OSHA Safety and Health Regulations for Construction (29 CFR 1926);
- 1798 ■ NESHAP Regulations (40 CFR 61);

¹⁴⁶ DC Homeland Security and Emergency Management Agency, *District Response Plan*, September 2014. Accessed from <https://hsema.dc.gov/page/document-library>. Accessed on April 3, 2020.

¹⁴⁷ Truck and Bus Routes. Accessed from <http://opendata.dc.gov/datasets/truck-and-bus-through-route>. Accessed on March 10, 2018.

¹⁴⁸ U.S. Department of Transportation. Federal Railroad Administration. 1999. *Procedures for Considering Environmental Impacts*. Accessed from <https://www.fra.dot.gov/eLib/Details/L02710>. Accessed on April 3, 2020.

- 1799 ■ Standards and Practices for All Appropriate Inquiries (40 CFR 312) under CERCLA
1800 (42 USC 9601);
- 1801 ■ ADA (42 USC 1210);
- 1802 ■ Transportation Services for Individuals with Disabilities (49 CFR 37);
- 1803 ■ FTA Americans with Disabilities Act Guidance (FTA Circular 4710.1);¹⁴⁹ and
- 1804 ■ EPA Memorandum, *Promoting the Use of Health Impact Assessment to Address*
1805 *Human Health in Reviews Conducted Pursuant to the National Environmental Policy*
1806 *Act and Section 309 of the Clean Air Act*;¹⁵⁰
- 1807 District policies, regulations, and guidance that pertain to public health, elderly, and persons
1808 with disabilities include:
- 1809 ■ DCMR, Title 22-B, Public Health and Medicine;¹⁵¹
- 1810 ■ The District of Columbia Building Code,¹⁵² Chapter 11, *Accessibility*; and
- 1811 ■ The District of Columbia Green Construction Code,¹⁵³ Chapter 8, *Indoor*
1812 *Environmental Quality and Comfort*.

1813 4.16.2 Study Area

1814 The Local Study Area (**Figure 4-33**) for public health, elderly, and persons with disabilities is
1815 the Project Area with a half-mile buffer. Regional impacts were not considered since all
1816 potential impacts are expected to be local.

¹⁴⁹ Federal Transit Administration. 2015. FTA Circular 4710.1 *Americans with Disabilities Act: Guidance*. Accessed from https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/Final_FTA_ADA_Circular_C_4710.1.pdf. Accessed on January 21, 2019.

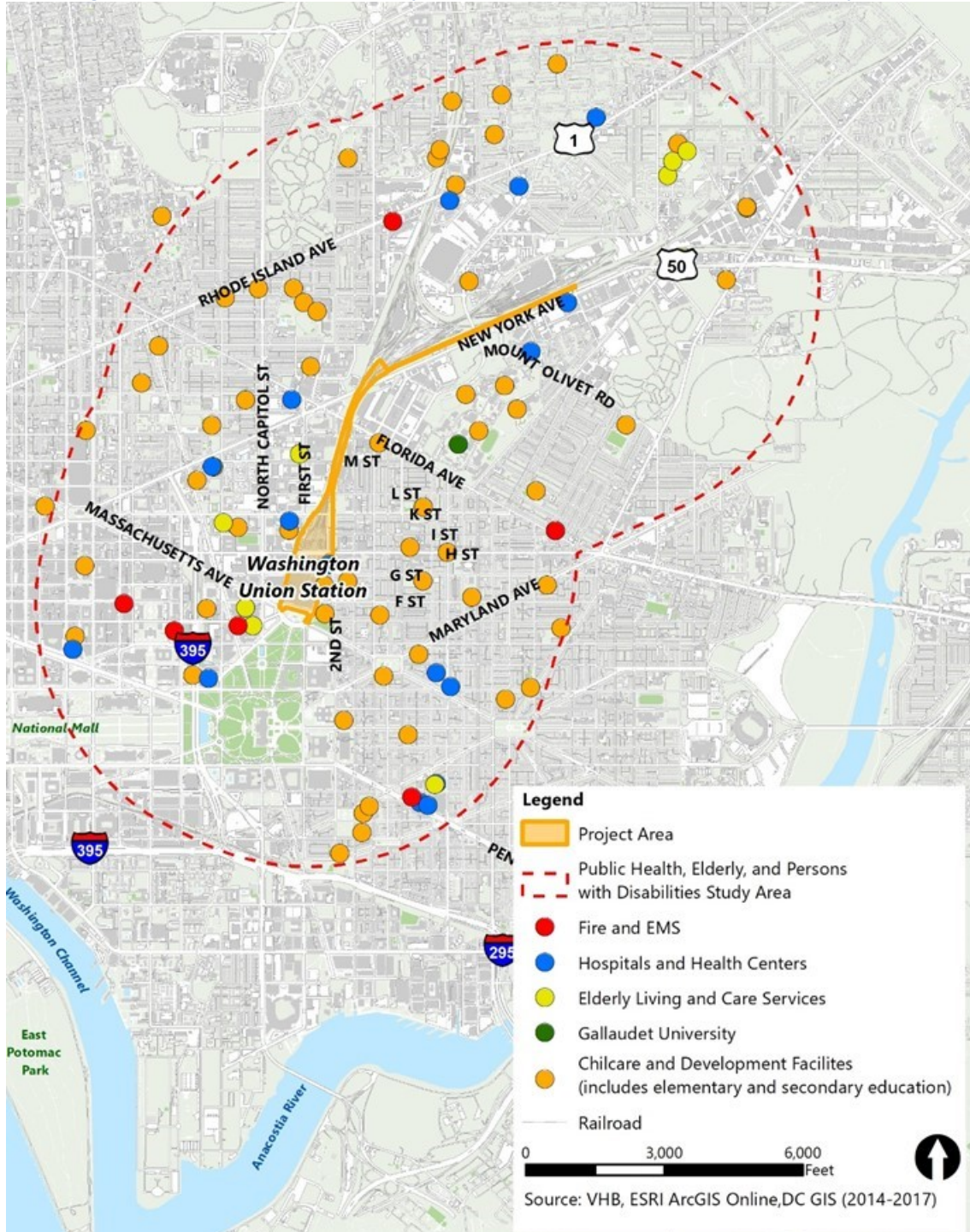
¹⁵⁰ U.S. Environmental Protection Agency. 2015. *Promoting the Use of Health Impact Assessment to Address Human Health in Reviews Conducted Pursuant to the National Environmental Policy Act and Section 309 of the Clean Air Act*. Accessed from https://www.epa.gov/sites/production/files/2016-03/documents/hia_memo_from_bromm.pdf. Accessed on April 3, 2020.

¹⁵¹ District of Columbia Municipal Regulations. 2018. Title 22-B *Public Health and Medicine*. Accessed from <https://dcregs.dc.gov/Common/DCMR/ChapterList.aspx?subtitleNum=22-B>. Accessed on April 3, 2020.

¹⁵² International Code Council and District of Columbia. 2014. *District of Columbia Building Code – Chapter 11, Accessibility*. Accessed from <https://codes.iccsafe.org/public/chapter/content/9182/>. Accessed on April 3, 2020.

¹⁵³ District of Columbia. 2013. *District of Columbia Green Construction Code, Chapter 8, Indoor Environmental Quality and Comfort*. Accessed from <https://codes.iccsafe.org/public/document/details/toc/920>. Accessed on April 3, 2020.

Figure 4-33. Public Health, Elderly, and Persons with Disabilities Local Study Area



1818 **4.16.3 Methodology**

1819 The assessment considered entrances, transit connections, retail and food areas, concourses,
 1820 platforms, support facilities, existing populations of users, elderly, and persons with
 1821 disabilities within the Project Area and the Local Study Area. Public health data were
 1822 acquired from the EPA Human Health Risk Assessment tools, databases, and guidelines;
 1823 Emergency Planning and Community Right-to-Know Act existing Tier I and Tier II reports; U.S.
 1824 Department of Health and Human Service (HHS) health data; and DC Health. Data sources for
 1825 the elderly and disabled included Census data. Existing accessibility and ADA compliance
 1826 features and known station and track issues were also considered.

1827 **4.16.4 Existing Conditions**

1828 **4.16.4.1 Public Health**

1829 The Project Area is located in the heart of Washington, D.C. and visitors, residents, and
 1830 workers to the Local Study Area may be exposed to a range of urban environmental stressors
 1831 related to air quality, solid waste and hazardous materials, noise and vibration, and water
 1832 resources. Existing conditions pertaining to these aspects of the environment are
 1833 characterized in **Section 4.3, Water Resources and Water Quality, Section 4.4, Solid Waste**
 1834 **Disposal and Hazardous Materials, and Section 4.10, Noise and Vibration.**

1835 Air quality is the main potential stressor in the Local Study Area. Diesel locomotives at WUS
 1836 have the potential to affect public health due to emission of fine particulates. The diesel
 1837 locomotives are currently naturally ventilated. Prolonged direct exposure to diesel emissions
 1838 is limited by WUS practices related to boarding and by maintaining safe distances from
 1839 locomotives when locomotives are being switched.

1840 Children and the elderly are most susceptible to environmental stressors. There are several
 1841 facilities in the Local Study Area that cater to these sensitive populations (**Table 4-19**).

Table 4-19. Concentrations of Sensitive Populations in the Local Study Area

Name	Address
Children	
FERC Child Development Center	888 First Street NE
Harbor at Station Place	10 F Street NE
Thurgood Marshall Child Development Center	1 Columbus Circle NE
Bright Beginnings	128 M Street NW
Kiddie University	806 H Street NE
Kiddie University	728 F Street NE
Bre Bre’s Child Development Home	639 Maryland Avenue NE
Elonda’s Day Care	816 6th Street NE
Seniors and Elderly	
Hayes Senior Wellness Center	500 K Street NE
DC Office of Aging	500 K Street NE/441 4th Street NW

Name	Address
Sibley Plaza	1140 N. Capitol Street
Unique Residential Care Center	901 First Street NW

1842 **4.16.4.2 Transportation and Mobility of the Elderly and Persons with Disabilities**

1843 WUS received its last major renovation in the 1980s and some of its elements do not meet
 1844 current accessibility standards. Such limitations impair mobility for the elderly and persons
 1845 with disabilities with respect to accessibility to WUS, transit services, and facilities. Ramps
 1846 that allow passengers access from WUS to the train level are difficult to navigate for
 1847 wheelchair users and those with limited mobility. Amtrak Red Cap service is available to help
 1848 users with reduced mobility reach their trains. However, existing platforms do not meet ADA
 1849 requirements for warning strips, safety zones, vertical circulation, or pedestrian circulation.
 1850 Existing platforms lack level boarding and have an excessive gap between the platform and
 1851 train. Congestion within corridors and platforms; the narrow width of platforms; and single
 1852 points of access and egress are a hazard to those with impaired mobility due to increased
 1853 chances of trip and fall accidents.

1854 According to ACS data for 2015, there were an estimated 1,350 individuals older than 65
 1855 within the Local Study Area in that year, or approximately 6.9 percent of the total population
 1856 in the area. Elderly populations are higher in residential neighborhoods northwest of WUS
 1857 and west of North Capitol Street and east of WUS and east of 6th Street NE. Sensitive
 1858 receptors related to elderly persons within the Local Study Area are listed in **Table 4-19**
 1859 above. The Local Study Area partially overlaps with the campus of Gallaudet University, an
 1860 educational institution for the deaf and hard-of-hearing. Gallaudet University runs a shuttle
 1861 bus service between WUS and the campus out of the WUS bus facility.

1862 The Local Study Area features a comprehensive sidewalk network that is in relatively good
 1863 condition. Most intersections have high visibility crosswalks across major approaches, with
 1864 wheelchair ramps and detectable warning surfaces to aid visually impaired individuals. The
 1865 majority of intersections in the Local Study Area have accessible pedestrian signal
 1866 equipment. Those that do not are expected to be rebuilt or retrofitted in the next few years.

1867 **4.17 Environmental Justice**

1868 As outlined in FTA Circular 4703.1, *Environmental Justice Policy Guidance for Federal Transit*
 1869 *Administration Recipients*, the USDOT is required to make environmental justice (EJ) part of
 1870 its mission by identifying and addressing, as appropriate, disproportionately high and adverse
 1871 human health or environmental effects of programs, policies, and activities on minority
 1872 populations or low-income populations. This section describes existing demographic
 1873 conditions in the Local Study Area to identify whether minority or low-income populations
 are present that could be disproportionately adversely affected by the Project.

1874 Additional details existing conditions pertaining to environmental justice are available in the
1875 July 2018, *Washington Union Station Expansion Project Affected Environment Technical*
1876 *Report (Appendix C2)*.

1877 **4.17.1 Regulatory Context and Guidance**

1878 Federal policies, regulations, and guidance that pertain to EJ include:

- 1879 ■ EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations*
1880 *and Low-income Populations*;
- 1881 ■ U.S. Civil Rights Act Title VI (42 USC 2000d);
- 1882 ■ *Memorandum of Understanding on Environmental Justice and EO 12898* (August 4,
1883 2011);¹⁵⁴
- 1884 ■ Council on Environmental Quality (CEQ), *Environmental Justice: Guidance Under the*
1885 *National Environmental Policy Act (NEPA)*;¹⁵⁵
- 1886 ■ USDOT Order 5610.2(a), *Actions to Address Environmental Justice in Minority*
1887 *Populations and Low-Income Populations*;¹⁵⁶
- 1888 ■ USDOT, *Environmental Justice Strategy*;¹⁵⁷
- 1889 ■ *Promising Practices for EJ Methodologies in NEPA Reviews: Report of the Federal*
1890 *Interagency Working Group on Environmental Justice and NEPA Committee*;¹⁵⁸
- 1891 ■ FTA Transit Laws, 49 USC 53; and
- 1892 ■ FTA Circulars:

¹⁵⁴ Memorandum of Understanding on Environmental Justice and Executive Order 12898. Accessed from <https://www.epa.gov/sites/production/files/2015-02/documents/ej-mou-2011-08.pdf>. Accessed on April 3, 2020.

¹⁵⁵ Council on Environmental Quality. 1997. *Environmental Justice: Guidance Under the National Environmental Policy Act*. Accessed from https://www.epa.gov/sites/production/files/2015-02/documents/ej_guidance_nepa_ceq1297.pdf. Accessed on April 3, 2020.

¹⁵⁶ U.S. Department of Transportation. Final DOT Environmental Justice Order 5610.2(a). Accessed from https://www.fhwa.dot.gov/environment/environmental_justice/ej_at_dot/orders/order_56102a/. Accessed on April 3, 2020.

¹⁵⁷ U.S. Department of Transportation. November 15, 2016. *Environmental Justice Strategy*. Accessed from <https://www.transportation.gov/policy/transportation-policy/environmental-justice-strategy>. Accessed on April 3, 2020.

¹⁵⁸ Federal Interagency Working Group on Environmental Justice & NEPA Committee. 2016. *Promising Practices for EJ Methodologies in NEPA Reviews: Report of the Federal Interagency Working Group on Environmental Justice & NEPA Committee*. Accessed from https://www.epa.gov/sites/production/files/2016-08/documents/nepa_promising_practices_document_2016.pdf. Accessed on April 3, 2020.

- 1893
- 1894
- 1895
- 1896
- 4702.1B *Title VI Requirements and Guidelines for Federal Transit Administration Recipients*;¹⁵⁹ and
 - 4703.1 *Environmental Justice Policy Guidance for Federal Transit Administration Recipients*.¹⁶⁰

1897 **4.17.2 Study Area**

1898 EJ communities exist at the local level and are generally identified at the Census block group,
1899 not the regional, level. Therefore, only a Local Study Area was defined for EJ (**Figure 4-34**).
1900 The Local Study Area includes Census block groups that are wholly or partially within one
1901 half-mile of the Project Area.

1902 **4.17.3 Methodology**

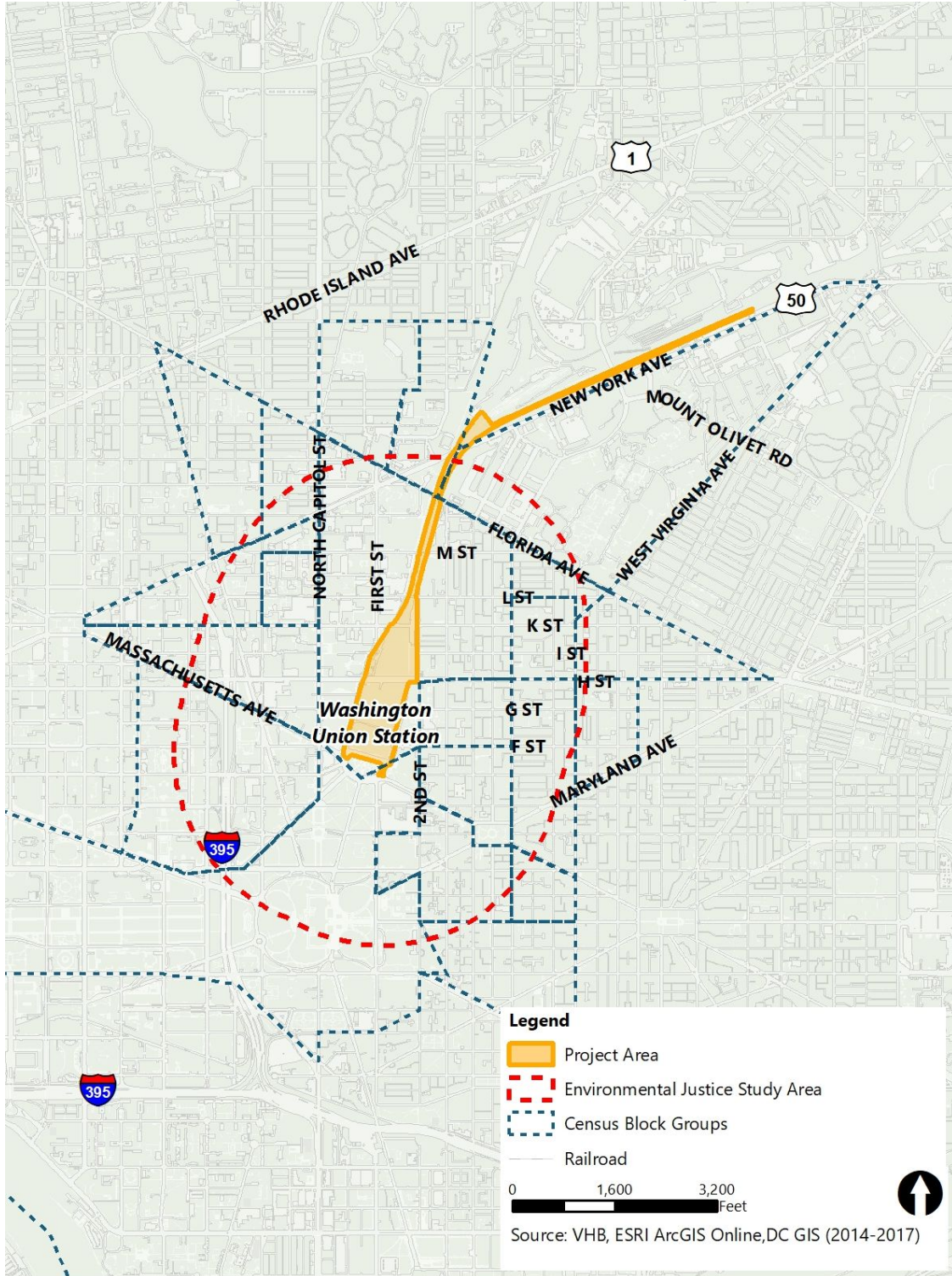
1903 The data source used to identify minority populations was the 2010 Census. Minority
1904 populations were considered at the block level. The CEQ guidance threshold of 50 percent
1905 was used as an indicator of minority population requiring consideration. The data source for
1906 identifying low-income populations was the ACS five-year average data for 2011 to 2015 and
1907 HHS poverty guidelines. Due to high median income in the District, households below
1908 150 percent of the HHS poverty guidelines were considered low-income. Low-income
1909 populations were considered at the block group level. A threshold of 27 percent was used to
1910 identify concentrations of low-income residents requiring environmental justice
1911 consideration.

1912 Due to the rapid demographic change at WUS since 2010, additional data sources were used
1913 to confirm the location of minority and low-income populations. For Census blocks where the
1914 minority population was below the threshold, the presence of places of worship with
1915 predominantly minority congregations was used to determine whether distinct
1916 environmental justice populations may exist. Distinct low-income populations were
1917 confirmed through mapping the locations of low-income housing units. Populations in Census
1918 blocks without housing units were considered homeless if confirmed through newspaper
1919 articles or field observations.

¹⁵⁹ U.S. Department of Transportation. Title VI Requirements and Guidelines for Federal Transit Administration Recipients. Accessed from https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/FTA_Title_VI_FINAL.pdf. Accessed on April 3, 2020.

¹⁶⁰ U.S. Department of Transportation. 2012. Environmental Justice Policy Guidance for Federal Transit Administration Recipients. Accessed from <https://www.transit.dot.gov/regulations-and-guidance/fta-circulars/environmental-justice-policy-guidance-federal-transit>. Accessed on April 3, 2020.

Figure 4-34. Environmental Justice Local Study Area



1920 **4.17.4 Existing Conditions**

1921 **4.17.4.1 Minority Populations**

1922 Based on the 2010 Census, minorities represented approximately 64 percent of the District's
1923 population and approximately 50 percent of the Local Study Areas. African Americans made
1924 up the largest minority group in the Local Study Area, at approximately 39 percent. The
1925 lowest concentrations of minority populations occurred in the southeastern portion of the
1926 Local Study Area, while the highest concentrations occurred to the north and west. Sixty-six
1927 of the 130 Census blocks in the Local Study Area had minority populations over 50 percent.
1928 These Census blocks comprise portions of the Mount Vernon Square, North Capitol Street,
1929 NoMA, Truxton Circle, Eckington, and Near Northeast neighborhoods (**Figure 4-35**). Five
1930 places of worship with predominantly African American congregations were in Census blocks
1931 with less than 50 percent minority population (**Figure 4-35**).

1932 Three blocks adjacent to the Project Area had a minority population over 50 percent. Of
1933 these blocks, one (0062021008) is a parking lot and one (0106002034) includes WUS as well
1934 as office buildings. It is likely that the reported populations were transient and homeless and
1935 that these blocks do not currently have a minority population present.

1936 **4.17.4.2 Low-Income Populations**

1937 Based on ACS data for 2011-2015, low-income residents made up approximately 22 percent
1938 of the population in the Local Study Area and 27 percent of the District's. Seven of the 21
1939 block groups in the Local Study Area had more than 27 percent low-income residents (**Table**
1940 **4-20** and **Figure 4-36**).

1941 Low-income housing consists of communities managed by the District Housing Authority
1942 (identified as public housing) as well as of reserved low-income units in private
1943 developments. Some developments are exclusively low-income while others are mixed-
1944 income, with units reserved for residents meeting certain income limits. Many mixed-income
1945 developments are in the Near Northeast neighborhood along H Street NE, within block
1946 groups that have a low-income population below the threshold.

1947 There is a substantial homeless population near WUS. News reports and field visits have
1948 reported the presence of encampments on First Street NE and under the K Street NE
1949 underpass. There are also homeless encampments in the L Street NE underpass.¹⁶¹ Several
1950 organizations in the Local Study Area provide social services for the homeless.

¹⁶¹ In January 2020, the District enacted and implemented a policy to permanently remove all homeless encampments from the K Street NE underpass. The removal policy did not apply to L Street encampments. Heim, Joe and Moyer, Justin Wm., "No Room on the Street: D.C. Orders Homeless out of Underpass in Fast-Developing Neighborhood," *Washington Post*, January 10, 2020. Accessed from https://www.washingtonpost.com/local/no-room-on-the-street-dc-orders-homeless-out-of-underpass-in-fast-developing-neighborhood/2020/01/10/1704d604-319c-11ea-9313-6c8a89b1b9fb_story.html. Accessed on April 24, 2020.

Figure 4-35. Minority populations in the Local Study Area

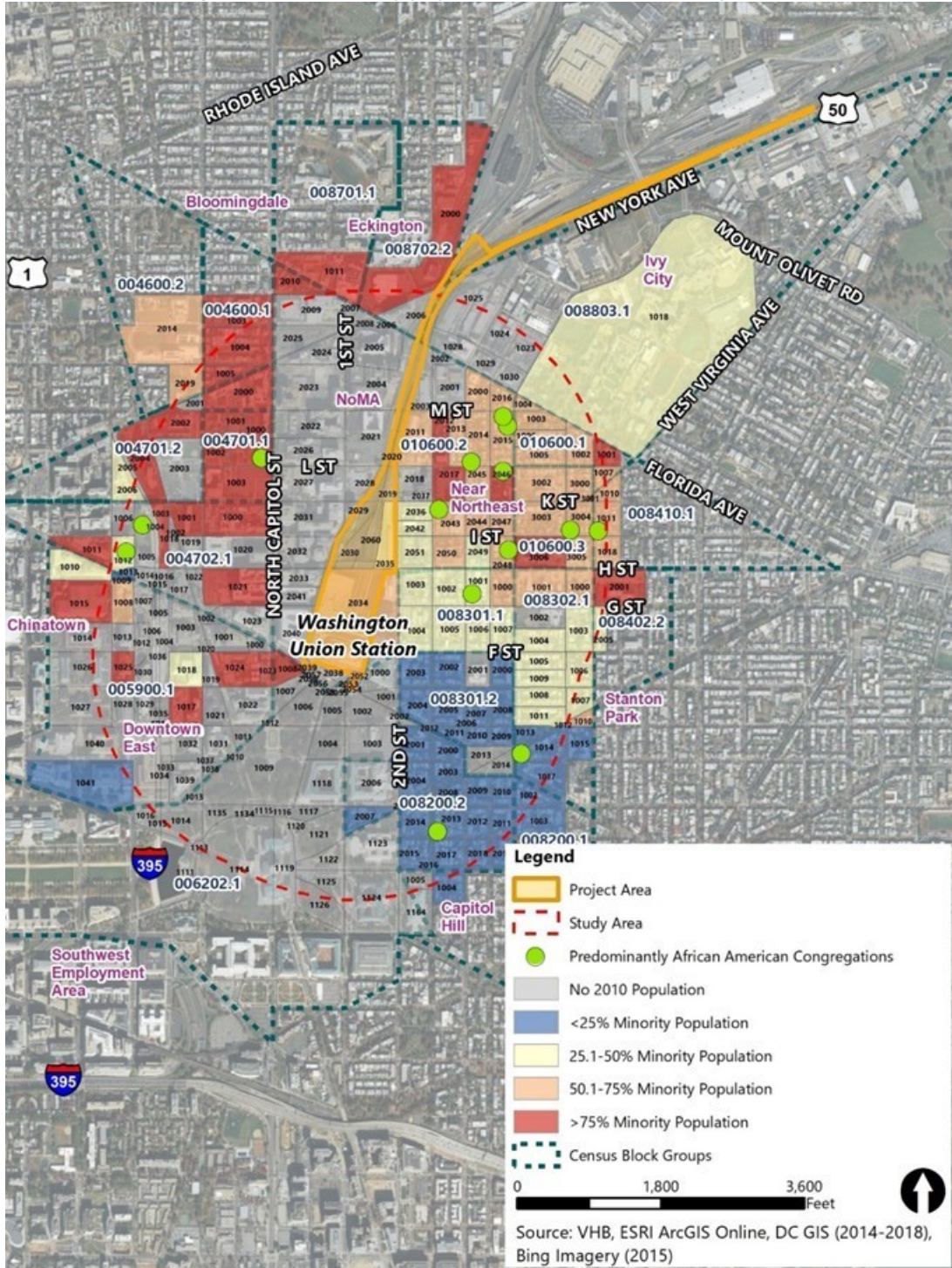


Table 4-20. Low Income Population in the Local Study Area

Block Group	Below Poverty Line	Below 150% of Poverty Line
004600.1	26.6%	31.0%
004600.2	6.9%	10.3%
004701.1	7.0%	52.7%
004701.2	32.4%	47.8%
004702.1	15.1%	23.7%
005900.1	13.9%	16.7%
006202.1	0.0%	0.0%
006600.1	2.6%	4.7%
008200.1	0.0%	2.5%
008200.2	10.3%	12.7%
008301.1	1.6%	1.6%
008301.2	5.9%	6.4%
008302.1	6.5%	11.8%
008402.2	20.5%	29.6%
008410.1	8.5%	10.6%
008701.1	7.7%	15.2%
008702.2	24.0%	26.3%
008803.1	51.8%	67.4%
010600.1	27.5%	37.9%
010600.2	11.4%	13.5%
010600.3	20.5%	27.1%

Figure 4-36. Low Income Population and Social Services in the Local Study Area

