3.0 AFFECTED ENVIRONMENT

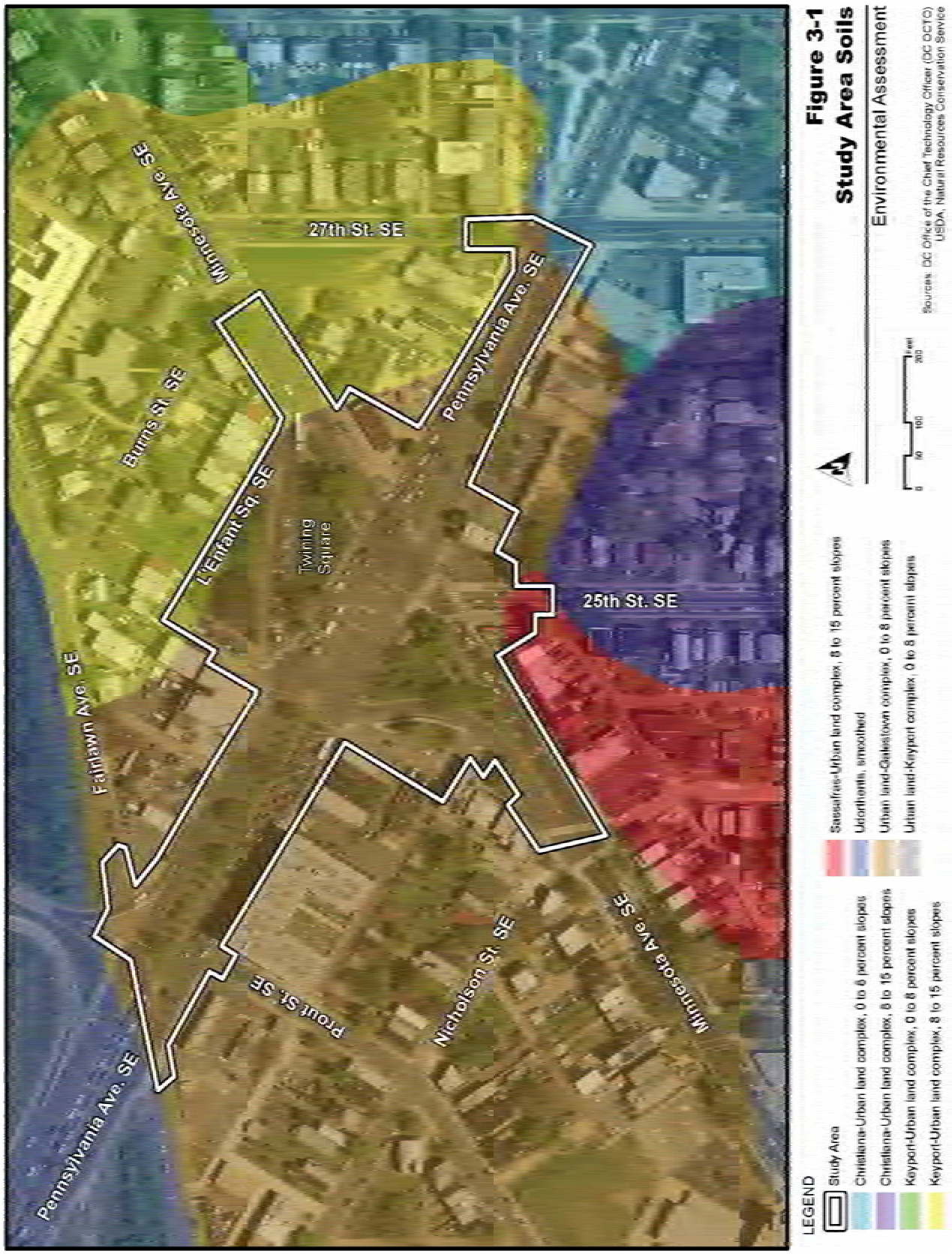
3.1 Natural Resources

3.1.1 Soils

Given the development history of the Study Area, most of the Study Area is expected to represent completely or partially disturbed soil sequences. The current use of land is roadway, sidewalk, and dry, grassed open space. The soil types in this area have only fair potential for landscaping because of droughtiness. Soils occurring in the Study Area include Urban land-Galestown complex, Keyport-Urban land complex, Sassafras-Urban land complex and Christiana-Urban land complex. The Urban land-Galestown complex is the most common soil, which is found in the western, central, and part of the northern sections of the Study Area.[33] The northern and eastern edges of the Study Area are reported as Keyport-Urban land complex. Small segments of Sassafras-Urban land complex and Christiana-Urban land complex are found along the southern edge of the Study Area. See **Figure 3-1** for an overview of the Study Area soils.

- **Urban land- Galestown complex (UmB).** Urban land- Galestown complex represents areas where roughly 70 percent of the soil surface is covered with impervious surfaces, with smaller areas of graded and reworked Galestown series soils exposed. The 1976 District soil survey notes that roughly 5 percent of Urban land-Galestown mapping units are relatively undisturbed Galestown soils. Galestown soils developed out of old marine deposits of sand and found on uplands and terraces along the Coastal Plain. They are generally deep and somewhat excessively drained. The typical profile includes a thick two-layer A Horizon of loamy sand over a very thick, coarse loamy sand B Horizon. The substratum is generally more than three feet below the surface.

- **Christiana-Urban land complex (CfC).** Christiana series soils are deep, well drained soils formed in silty material deposited over older clay deposits.[34] They are generally found on well-dissected uplands, and within the Study Area are reported as part of the Christiana-Urban land complex, where roughly 40 percent of the area is covered with impervious surfaces, 20 percent consists of reworked or graded Christiana series soils, and 20 percent consists of relatively undisturbed Christiana series soils. The remaining 20 percent includes a mixture of associated soil series and areas of eroded Christian series soils where the clayey subsoil is exposed. The typical profile for Christiana series soils includes a thin silt loam A Horizon over a two-layer subsoil. In its upper layer, the subsoil is a heavy yellowish brown silt loam, but changes to a red silty clay within a foot of the surface.


Minnesota Ave. SE
27th St. SE
Pennsylvania Ave. SE
Burns St. SE
L'Enfant Sq. SE
Fairlawn Ave. SE
Twining Square
25th St. SE
Pennsylvania Ave. SE
Minnesota Ave. SE
Nicholson St. SE
Prout St. SE
LEGEND
Study Area
Christiana-Urban land complex, 0 to 6 percent slopes
Christiana-Urban land complex, 8 to 15 percent slopes
Keyport-Urban land complex, 0 to 8 percent slopes
Keyport-Urban land complex, 8 to 15 percent slopes
Sassafras-Urban land complex, 8 to 15 percent slopes
Udorthents, smoothed
Urban land-Galestown complex, 0 to 8 percent slopes
Urban land-Keyport complex, 0 to 8 percent slopes
Figure 3-1
Study Area Soils
Environmental Assessment
Sources: DC Office of the Chief Technology Officer (DC OCTO)
USDA, Natural Resources Conservation Service

- **Keyport-Urban land complex (KmC).** Keyport soils are generally deep, moderately well drained soil developed in silty material over older clay deposits. They are typical found in lower settings in the Coastal Uplands. Areas in the Study Area which are reported as Keyport- Urban land complex consists of strongly slopes areas where roughly 40 percent of the area is covered with impervious surfaces, 20 percent consists of reworked or graded Keyport series soils, and 20 percent consists of relatively undisturbed Keyport series soils. The remaining 20 percent includes a mixture of associated soil series and areas of severely eroded Keyport series soils where the grey clayey subsoil is exposed. The typical soil profile for Keyport series soils includes a thin silt loam A Horizon, and a thick, multi-layered subsoil which is dominated by clay within a foot of the surface due to erosion deflation.

- **Sassafras-Urban land complex (SgC).** Sassafras series soils are deep, well drained soils formed in marine sediments, and found on side slopes and ridges tops in upland settings.[35] Sassafras series soils reported within the Study Area are included in Sassafras- Urban land complex mapping units where roughly 40 percent of the mapping unit is impervious surfaces, 20 percent is disturbed Sassafras series soils, 20 percent is undisturbed Sassafras series soils, and 20 percent consists of associated soils types. Typical soil profiles in strongly sloped areas of Sassafras soils consists of a sandy loam A Horizon less than a foot thick, over a multi-layer subsoil which approached two feet in thickness. Subsoil grades from sandy loam to sandy clay loam and back.

3.1.2 Water Resources

Groundwater

Groundwater in the vicinity of Pennsylvania and Minnesota Avenues, SE occurs within poorly consolidated sand and gravel aquifers of the Coastal Plan Physiographic Province. The Coastal Plain is characterized by unconsolidated interleaved deposits of gravel, sand, silt, and clay, with the surface soils in the vicinity of the Study Area formed in reworked river terrace deposits from the Pliocene and Pleistocene, as well as Potomac Group soils from the Cretaceous.[36] The Potomac Group is the oldest layer of the Coastal Plain deposits and consists of mostly silty clays with interbedded sand and gravel.[37] The Coastal Plain can be divided into six regional aquifers which are separated by four regional confining units that slow the vertical flow of groundwater. Groundwater in the District is not used as a potable water source.

Water Quality

While there are no surface waters within the Study Area, stormwater runoff from the Study Area ultimately enters tributaries which flow into the nearby Anacostia River. Due to its urbanized character, the Anacostia River has become highly degraded and thus the focus of restoration efforts by the District.

The 1972 Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, is a national policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters; enhance the quality of water resources; and to prevent, control, and abate water pollution. Based on review of 2010 EPA water quality assessments, the Anacostia River is impaired for Protection of Human Health related to Consumption of Fish and Shellfish and for Secondary Contact Recreation and Aesthetic Enjoyment, both upstream and downstream of the project Study Area. These impairments are likely

caused by oxygen depletion in the water, as well as the presence of trash and other debris. A probable source contributing to impairment is urban-related stormwater runoff which brings oil and grease into the Anacostia River.

3.1.3 Wildlife

The Endangered Species Act of 1973 (ESA) provides for the conservation of species which are listed as endangered or threatened. The ESA is implemented by the U.S. Fish and Wildlife Service (FWS), who manages land and freshwater species, and by the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS), who manages marine species.

Terrestrial Organisms

The District provides habitat to a variety of wildlife species which are accustomed to urban conditions and frequent human disturbances. Common wildlife in the District include deer, raccoons, squirrels, chipmunks, frogs, salamanders, turtles, snakes, bats, ducks and a range of bird species.

Migratory Birds

The Study Area is located within the Atlantic Flyway, an important pathway for migratory birds traveling along the Atlantic coast and through parts of the Washington, D.C. area. Migratory bird species are known to utilize the Chesapeake Bay during their migration to feed, rest, winter and breed during the spring. Ospreys are a common migratory bird found in the Anacostia River watershed. They are known to nest high on trees or on lower platforms, such as the concrete pilings beneath the South Capitol Street Bridge.[38] In 2011, ospreys caused a stop-work order, as the birds had built a nest atop a construction crane being used on the Anacostia Riverwalk Trail.[39] The Study Area is within the Anacostia River watershed. However, it does provide any habitat for migratory birds, such as mature forests, wetlands or immediate proximity to the river corridor. The Study Area likely supports a limited population of birds, small mammals, reptiles and amphibians. Wildlife found in the Study Area are those that are able to adapt to the urban landscape.

3.1.4 Vegetation

The Study Area includes the 25th Street, SE intersection with Minnesota Avenue, the green space area designated as Twining Square, and two small cut-through/side streets designated as L'Enfant Square, SE. The primary vegetative areas within the Study Area are roadside and urban lawn, with low growing plants and trees. The NPS park land at the intersection, U.S. Reservation 487, is divided into four reservations totaling approximately 1.2 acres of grassed park property with interspersed trees throughout. The NPS medians in the Study Area are also grassed with interspersed street trees (approximately 0.24 acres). Based on an engineering survey of Pennsylvania Avenue, SE, there are approximately 15 trees in the northern reservation (north of Pennsylvania Avenue) and approximately 18 trees in the southern reservation (south of Pennsylvania Avenue). According to the D.C. Street Trees Map by Casey Trees®, Willow oak trees and Thornless honeylocust trees are both found in the vicinity of the Pennsylvania and Minnesota Avenues, SE intersection.[40]

Twining Square does not function as green space or as a visitor destination; the intersection is urban in nature, and is primarily used by commuters and residents as a through-way, rather than as a destination.

3.2 Cultural Resources

3.2.1 Historical Context

The following present a narrative of the development history of the Study Area, based on historic maps that were available for review. See ***Appendix E, Section 106 Consultation and Cultural Resources Information (Cultural Resources)*** for additional information, details and historic maps.

Based on a reconstruction of early land grants prepared as part of an archival study prepared for adjacent Anacostia Park, the present Study Area appears to have been primarily within "Green's Purchase," acquired by Luke Green in 1668.[41] Green's Purchase was likely subdivided into smaller tenancies and periodically transferred, and subsequently sold off as smaller parcels in the late eighteenth and early nineteenth centuries.

The first available cartographic source which depicted detail on the south side of the Anacostia River is Boschke's 1861 topographic map of Washington, DC. Based on the features indicated on this map, the Study Area was largely surrounded by undeveloped or rural land at that time. Although, there is what appears to be a small structure and orchard present in the southern section of the Study Area, while a second structure was present outside the northwest Study Area extension.

Anacostia Road, a precursor to present day Minnesota Avenue, was clearly well established by 1861. The less detailed picture provided by the 1879 Hopkins *Atlas of 15 Miles Around Washington* suggests that the orchard property belonged to Elizabeth Howard, while the structure off the northwestern Study Area extension belonged to Henry Naylor, one of eight structures that he is depicted as owning in the Study Area vicinity. One of those eight is the additional structure, built along the Anacostia-Bladensburg Road between 1861 and 1879, now visible within the southern portion of the Study Area. Another important development in the vicinity of the Study Area was the establishment of the Alexandria Branch of the B&O Railroad alignment passing to the west of the Study Area.

Additional detailed information available on the 1888 USCGS topographic sheets for the District indicates that both mid-nineteenth century structures within the Study Area, and the Howard orchard, survived into the last part of the nineteenth century. This highly detailed and accurate map also indicates that the present Study Area included a deeply incised stream valley filled with marsh, and bordered by a sand dune or possibly elevated fill along the subsequent alignment of the Pennsylvania Avenue extension. During this period a new Pennsylvania Avenue bridge was under construction, and plans were underway to develop the area south of the proposed Pennsylvania Avenue extension as Twining City. Overall, the topographic sheets indicated that the immediate Study Area vicinity remained rural, with large segments of woodland to the east.

Many of the avenues and streets east of the Anacostia River, including Pennsylvania Avenue did not exist as of 1901 but were proposed. By 1903 the Study Area vicinity was actively being developed as a suburb of the District, fully subdivided but only partially developed. The 1903 Baist *Real Estate Atlas of Surveys of Washington* indicated that neither of the mid-nineteenth century structures survived the extension of Pennsylvania Avenue and the development of the Twining City subdevelopment. Several modern elements within the Study Area are present on this source. The most significant is the depiction of L'Enfant Circle, although it is indicated as a perfect square reservation with a circular road exchange

within it, a configuration which is not supported by any other cartographic source reviewed during this historical context research. Most of the present lot configuration is also present on this source. However, very few structures had been constructed prior to 1903, and the handful of primarily wooden structures was restricted to the area south and west of the Study Area. Only one structure, in Lot 1 of Square 5560, appears to fall within the Study Area, and that may be an artifact of the georeferencing distortion.

Based on the sequence of Baist Real Estate Atlases, subsequent development of the Study Area vicinity was relatively slow but consistent. Prior to 1913, development was only present south of Pennsylvania Avenue. In 1913, a single structure was present along the north of Pennsylvania Avenue, and a small handful of frame structures had been completed along the south side of Burns Street on lots backing onto the square. See *Appendix E, Cultural Resources* to view the complete Historic Context Report with historic maps.

Review of the Baist series indicated that the park land reservation was established early in the twentieth century as an irregular rectangle which remained stable into the 1940s.

In the 1920s and early 1930s, Twining Square was known as L'Enfant Square. In 1929, the Office of Public Buildings and Public Parks of the National Capital assumed jurisdiction over Reservations 487 A, B, C and D (Twining Square and the adjacent medians) at the intersection of Pennsylvania and Minnesota Avenues, SE via the March 29, 1929 request of the Commissioners of the District. In 1933, in accordance with the recommendation of the National Capital Park and Planning Commissions, U.S. Reservation 487 officially became "Twining Square" instead of "L'Enfant Square." The name Twining Square was selected to honor the first military member of the District Commissioners, Major William Johnson Twining who served from 1878-1882.

Fewer mid-twentieth century cartographic resources were identified during the archival research. Aerial photographs from 1949, 1951, 1957, and 1963 were examined but provided little useful information about the interior of the Study Area beyond documenting the construction of access lanes within the reservation. Land transfer to and from the DC Commissioners modified the reservation space in 1938 (along the outer edges, Land Order 487), and again prior to 1949 to construct the internal access lanes (recorded in 1951, Land Order 463). A 1954 Baist map suggests that redevelopment was underway in the Study Area vicinity at that time, as the three early twentieth century frame structures on the south side of Burns Street had been removed to make room for a row of brick rowhouses. The structures previously present on either side of Pennsylvania Avenue east of Minnesota Avenue were also demolished in the mid-twentieth century, and service stations were constructed in their place.

Subsequent disturbance from the 1970s to present is more difficult to track, as few archival sources were readily available for review and most late twentieth century maps do not identify specific building footprints. Aerial photographs suggest redevelopment of the northeastern corner of Fairlawn and Pennsylvania Avenue between 1957 and 1963, the northeast corner of the Pennsylvania Avenue and Minnesota Avenue sometime between 1963 and 1980, and the northeastern corner of Fairlawn and Pennsylvania Avenue was again redeveloped between 1963 and 1980. The northeastern corner of Fairlawn and Pennsylvania Avenue is outside but adjacent to the Study Area, but the redeveloped lot on the northeastern corner of Pennsylvania and Minnesota extends into the Study Area.

**It is important to note that Build Alternative 1 – Revised Square Alternative is often referred to as the "Modified Square Alternative" in the cultural resources reports and correspondence.*

Area of Potential Effects (APE)

Direct and an Indirect Areas of Potential Effect (APE) were developed using a composite of the Build Alternatives considered for this project. Both the alternatives carried forward and the alternatives dismissed from further consideration were included in the development of the APE. **Figure 3-2** delineates the APE-Direct, which is equivalent to the Study Area. The APE-Direct was approved by the DC State Historic Preservation Office (SHPO) in April of 2011. The archaeological APE is restricted to the APE-Direct due to proposed ground disturbing activities.

The APE-Direct presently consists of a sloped streetscape, with the northern and southern extensions up Minnesota Avenue, SE and the eastern extension up Pennsylvania Avenue, SE rising in elevation, while the western extension has a very gentle slope down. Development is primarily commercial along Pennsylvania Avenue and the southern portion of Minnesota Avenue, while the northern extension of Minnesota Avenue and the other cross streets consist of residential development.

The historic architectural and history APE, also known as the APE-Indirect is based upon a site visit and line-of-sight survey. The Architectural APE-Indirect, illustrated in **Figure 3-3**, was delineated to include the full parcel of all structures adjacent to the APE-Direct, and includes one building beyond the APE-Direct (Pennsylvania Avenue, Minnesota Avenue, and 25th Street, and Pennsylvania Avenue and Fairlawn Avenue). A detailed description and photographs of the current visual conditions within the APE-Indirect are provided in *Appendix E.* The APE-Indirect was approved by the DC SHPO in April of 2011.

3.2.2 Historic Structures

Through research and coordination with the DC SHPO, it was determined that three buildings are eligible for the National Register of Historic Places (NRHP) for purposes of compliance with Section 106 of the National Historic Preservation Act (NHPA) for this project. These properties include the Morton's Department Store Building at 2324 Pennsylvania Avenue, SE; the Highland Theater Building at 2523 Pennsylvania Avenue, SE; and the Little Tavern Building at 2537 Pennsylvania Avenue, SE. The Little Tavern Building was demolished in 2012 and there are currently no buildings or structures that occupy the lot. **Figure 3-4** provides the locations of these structures within the APE-Indirect. See *Appendix E* for a description and photographs of the historic structures.

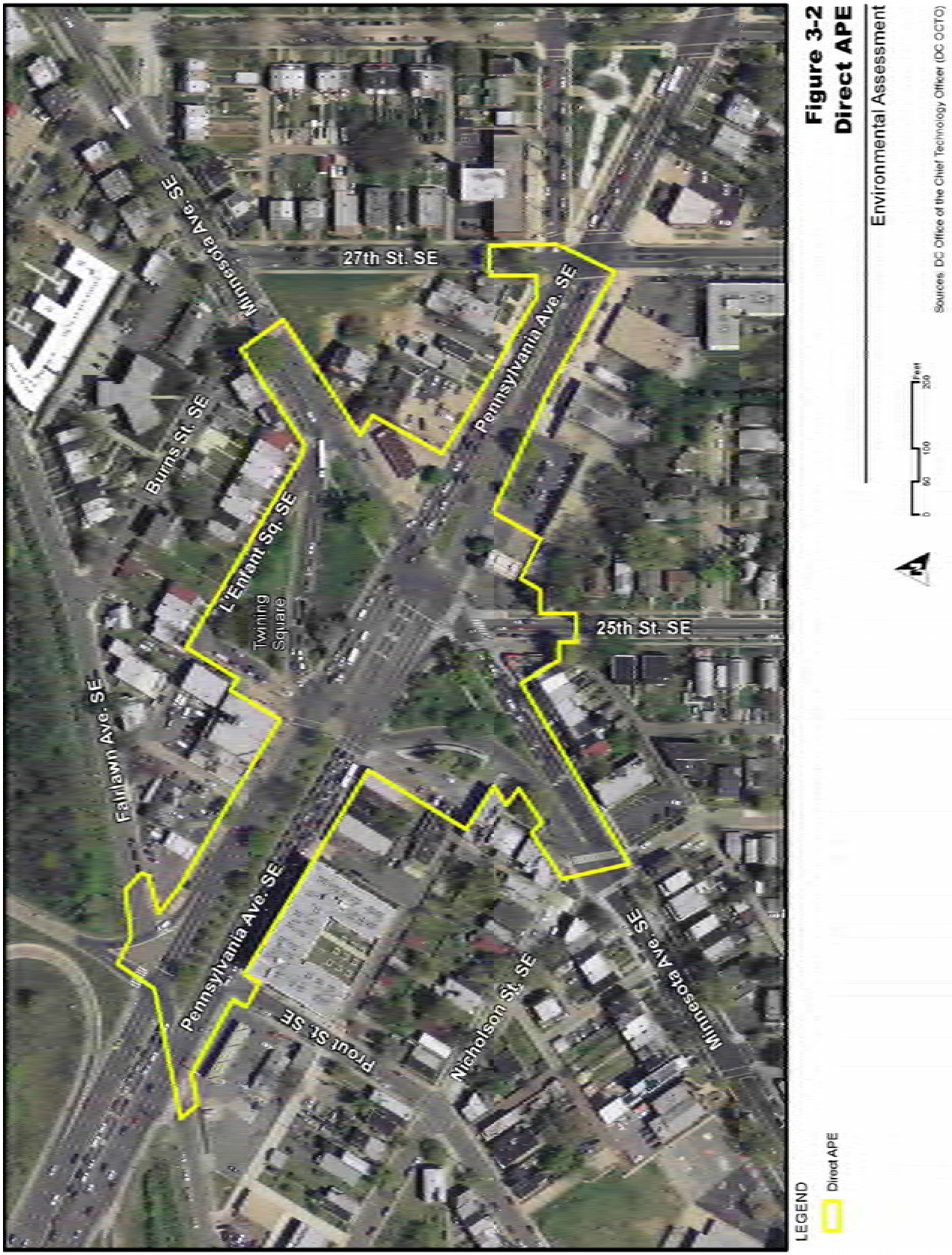


Figure 3-2
Direct APE
Environmental Assessment

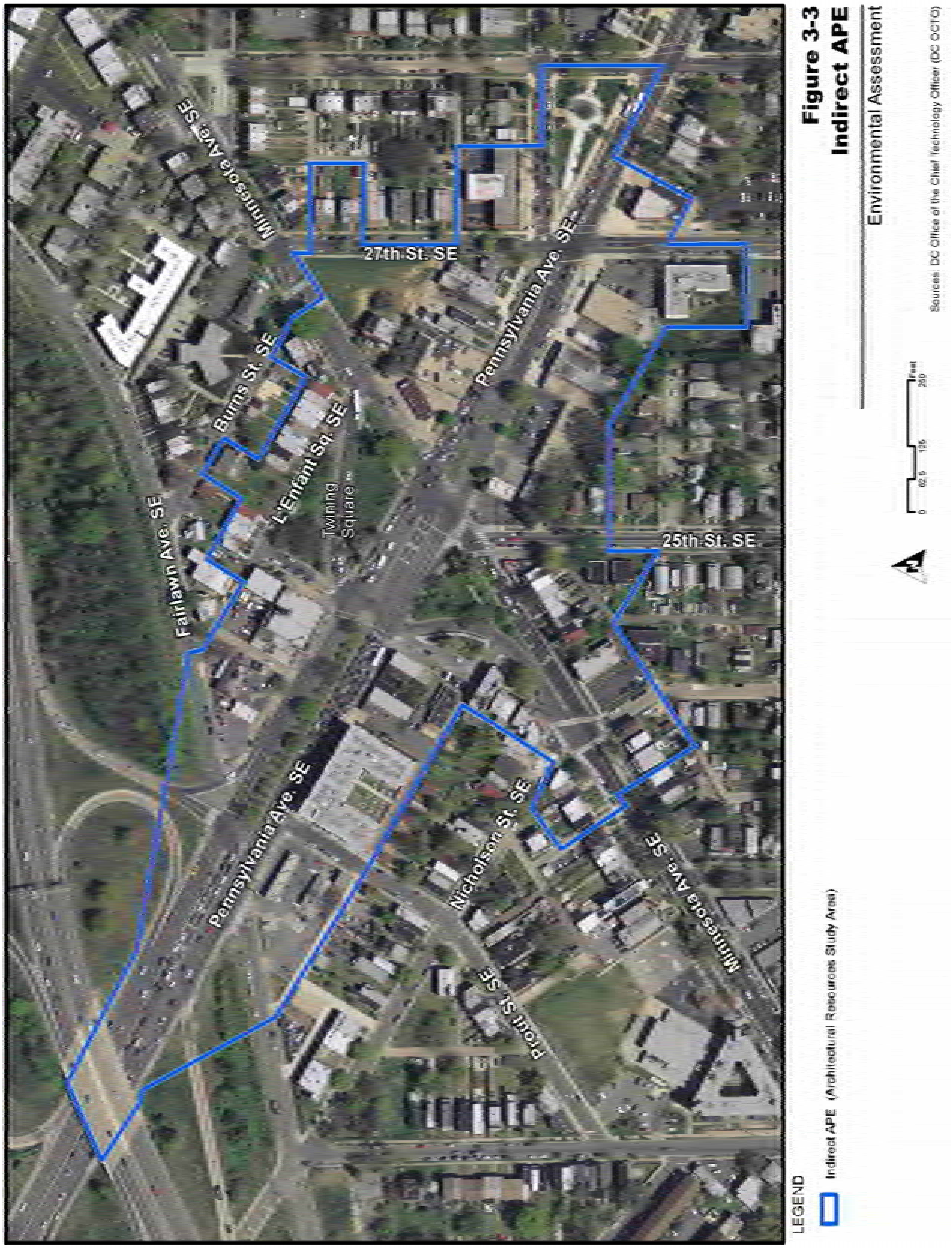


Figure 3-3
Indirect APE
Environmental Assessment

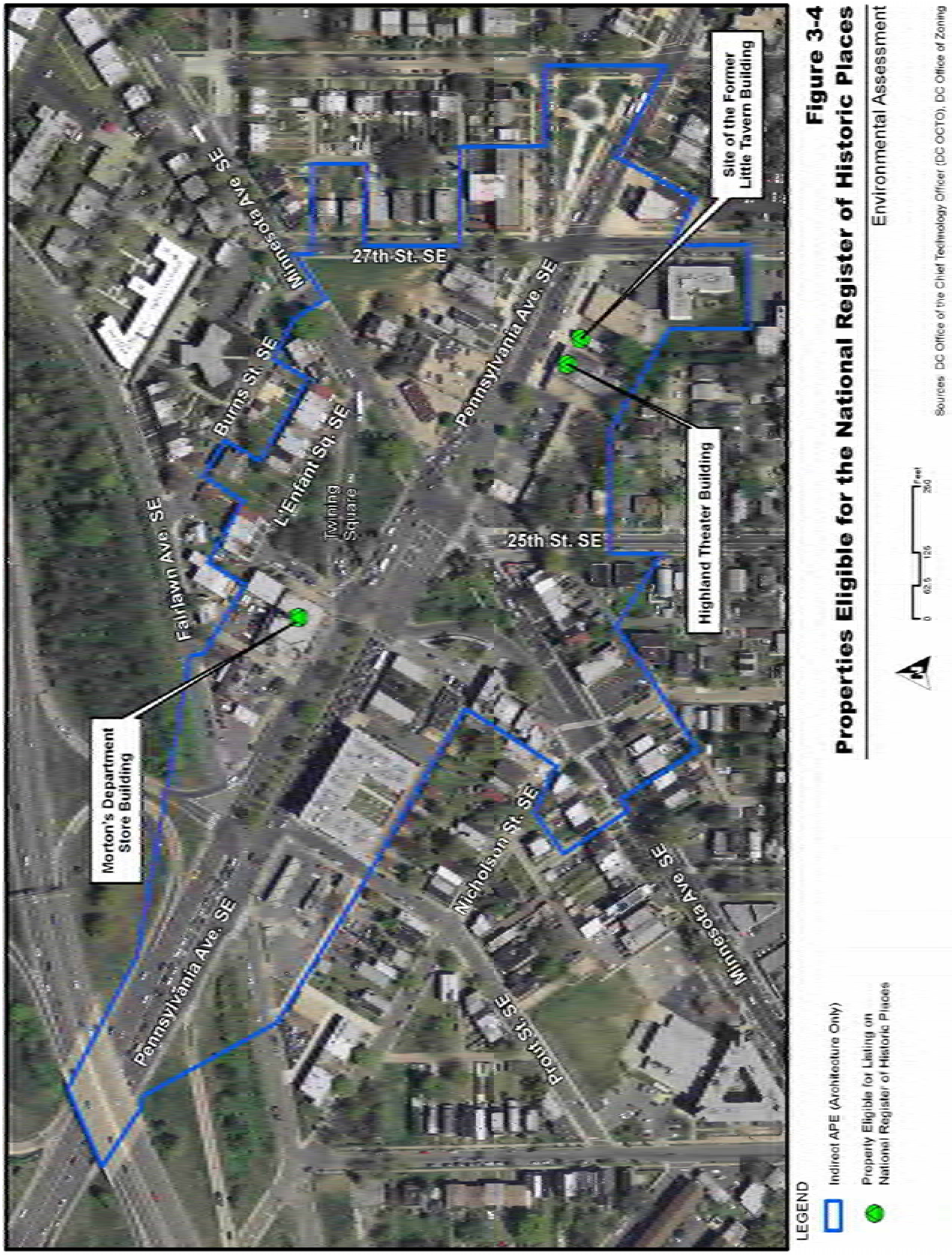


Figure 3-4
Properties Eligible for the National Register of Historic Places
Environmental Assessment