

# Draft Section 4(f) Evaluation



---

# VIRGINIA AVENUE TUNNEL RECONSTRUCTION PROJECT

*Draft Section 4(f) Evaluation*

*July 2013*

---



## Table of Contents

1	Project Description.....	1
2	Purpose and Need.....	1
2.1	Structural and Operational Deficiencies of Virginia Avenue Tunnel.....	1
2.2	Freight Transportation Demand.....	1
2.3	Commerce Demands.....	1
3	Proposed Action.....	1
4	Regulatory Requirements.....	2
4.1	Key Considerations in Section 4(f).....	2
4.2	Assessing “Use” of Section 4(f) Properties.....	2
5	Section 4(f) Properties.....	5
5.1	Virginia Avenue Tunnel.....	5
5.2	L’Enfant Plan of Washington, DC.....	6
5.3	Capitol Hill Historic District.....	6
5.4	Virginia Avenue Park.....	6
6	Other Section 4(f) Properties.....	6
6.1	Garfield Park.....	7
6.2	Marine Corps Turf Field.....	7
6.3	St. Paul AUMP Church.....	7
7	Alternatives Considered.....	7
7.1	Alternative 2, Rebuilt Tunnel / Temporary Runaround Track.....	8
7.2	Alternative 3, Two New Tunnels.....	9
7.3	Alternative 4, New Partitioned Tunnel / Online Rebuild.....	10
8	Impacts on Section 4(f) Properties.....	11
8.1	Virginia Avenue Tunnel.....	11
8.2	L’Enfant Plan of Washington, DC.....	12
8.3	Capitol Hill Historic District.....	12
8.4	Virginia Avenue Park.....	13
9	Evaluation of Section 4(f) Properties.....	13
9.1	Virginia Avenue Tunnel.....	14
9.1.1	Avoidance Alternatives.....	14
9.1.1.1	Avoidance Alternatives Considered.....	14
9.1.1.2	Feasibility and Prudence Test.....	15
9.1.1.3	Remaining Build Alternatives.....	16
9.1.2	Least Harm.....	17
9.1.3	Planning and Measures to Minimize Harm.....	19
9.2	L’Enfant Plan of Washington, DC.....	20
9.2.1	Avoidance Alternatives.....	20
9.2.1.1	Avoidance Alternatives Considered.....	20
9.2.1.2	Feasibility and Prudence Test.....	21
9.2.1.3	Remaining Build Alternatives.....	22
9.2.2	Least Harm.....	22
9.2.3	Planning and Measures to Minimize Harm.....	25
9.3	Capitol Hill Historic District.....	26
9.3.1	Avoidance Alternatives.....	26
9.3.1.1	Avoidance Alternatives Considered.....	26

---

9.3.1.2 Feasibility and Prudence Test .....	27
9.3.1.3 Remaining Build Alternatives .....	28
9.3.2 Least Harm .....	28
9.3.3 Planning and Measures to Minimize Harm .....	31
9.4 Virginia Avenue Park .....	32
9.4.1 Avoidance Alternatives .....	32
9.4.1.1 Potential Avoidance Alternatives .....	32
9.4.1.2 Feasibility and Prudence Test .....	33
9.4.1.3 Remaining Build Alternatives .....	34
9.4.2 Least Harm .....	34
9.4.3 Planning and Measures to Minimize Harm .....	37
10 Least Overall Harm to Section 4(f) Properties .....	37
10.1 Analysis .....	38
10.2 Preliminary Conclusion .....	42
11 Overall Planning and Measures to Minimize Harm .....	43
12 Agency Coordination .....	45
13 Section 4(f) Conclusion .....	45

## List of Figures and Tables

Figure 1: Project Location .....	1
Figure 2: Cross Section View of Post-Construction Alternative 2 between 3rd and 9th Streets SE .....	9
Figure 3: Cross Section View of Post-Construction Alternative 3 between 3rd and 9th Streets SE .....	10
Figure 4: Cross Section View of Post-Construction Alternative 4 between 3rd and 9th Streets SE .....	11
Table 1: Summary of Agency Coordination Activities .....	46

This Section 4(f) Evaluation has been prepared in compliance with Section 4(f) of the U.S. Department of Transportation Act of 1966, which is codified at 49 U.S.C. § 303 and 23 U.S.C. § 138, implementing regulations at 23 C.F.R. § 774.

Section 4(f) permits the use of land from a publicly-owned public park, recreation area, wildlife or waterfowl refuge, or land of a historic site of national state or local significance only if there is no feasible and prudent avoidance alternative, to the use of land from the property; and the action includes all possible planning to minimize harm to the property resulting from such use.

The authority to administer Section 4(f) and make Section 4(f) approvals resides with the Secretary of the U.S. Department of Transportation (USDOT). The Secretary of Transportation has delegated the authority for administering Section 4(f) to the Federal Highway Administration (FHWA) Administrator in 49 C.F.R. § 1.48.

The proposed reconstruction of Virginia Avenue Tunnel (the Project) requires FHWA approval because this Project would temporarily affect ramps of Interstate 695 (I-695) located at 6<sup>th</sup> and 8<sup>th</sup> Streets SE during construction. In addition, the Project requires use of land from properties protected by Section 4(f), and therefore FHWA approval is also required in order for this Section 4(f) use to proceed.

## 1 Project Description

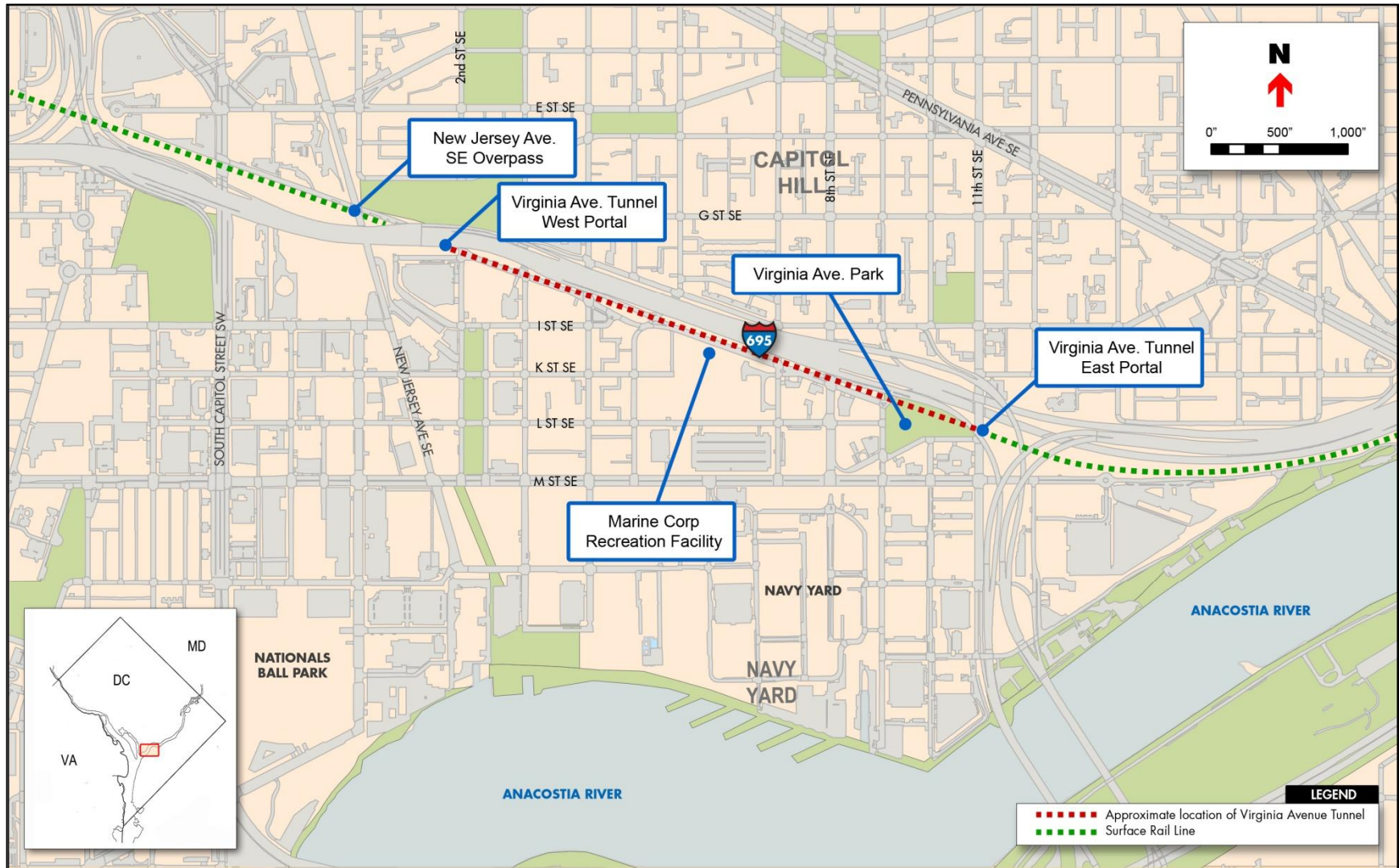
CSX Transportation, Inc. (CSX) is seeking permits and approvals from FHWA and the District Department of Transportation (DDOT) for the reconstruction of the Virginia Avenue Tunnel, a 3,800-foot long freight rail tunnel located in the Capitol Hill neighborhood of the District of Columbia. Owned by CSX, the tunnel is located beneath eastbound Virginia Avenue SE from 2nd Street SE to 9th Street SE; Virginia Avenue Park between 9th and 11th Streets; and the 11th Street Bridge right-of-way. The tunnel is also aligned on the south side of I-695 (see Figure 1). The tunnel portals are located a short distance west of 2nd Street SE and a short distance east of 11th Street SE. The tunnel connects with other CSX-owned rail lines running through the District, which are part of CSX's eastern seaboard freight rail corridor.

## 2 Purpose and Need

The purpose of the proposed action is to preserve, over the long-term, the continued ability to provide efficient freight transportation services in the District of Columbia, the Washington Metropolitan Area and the eastern seaboard. These services would continue if the following needs are met:

1. Address the structural and operational deficiencies of the century-old Virginia Avenue Tunnel;
2. Accommodate expected increases in freight transportation that, in part, would stem from the Panama Canal expansion scheduled for 2015; and

Figure 1  
Project Location





3. Ensure that during construction freight transportation services remain uninterrupted while the functions of the tunnel are being replaced with a new facility.

## 2.1 Structural and Operational Deficiencies of Virginia Avenue Tunnel

Virginia Avenue Tunnel's horizontal clearance only allows a single railroad track, which causes a bottleneck in the rail network due to the existence of two railroad tracks on both sides of the tunnel. In addition, the tunnel's vertical clearance does not allow the operation of double-stack intermodal container freight trains, a type of operation that CSX and other major railroad companies have adopted as the norm in the freight rail transportation industry where the rail network allows it. Finally, as an aging piece of infrastructure nearing the end of its useful life, the tunnel is increasingly subject to inspection and preventative maintenance for safe rail operations. These frequent inspections and preventive maintenance activities are difficult to conduct without compromising normal rail operations.

## 2.2 Freight Transportation Demand

Virginia Avenue Tunnel and the eastern seaboard freight rail corridor need to accommodate expected increases in freight transportation demand over the next few years, in part due to the Panama Canal expansion scheduled to occur in 2015. The projected increased demand for freight transportation requires taking steps now to modernize the freight rail network, including replacing the tunnel with a more modern facility. By accommodating double-stacked intermodal containers, CSX would be able to transport the expected increase in freight in fewer trains than would otherwise be possible.

## 2.3 Commerce Demands

Reconstructing an existing and vital piece of transportation infrastructure presents challenges in terms of how to maintain freight operations during the construction of the replacement tunnel. The ability to quickly and efficiently move goods to markets throughout the country is vital to the U.S. economy. As one of the nation's major freight railroad companies, CSX provides a valuable service by facilitating the shipment of goods and services to the general public.

## 3 Proposed Action

The proposed action is to rebuild the existing Virginia Avenue Tunnel and its single railroad track configuration with a new two-track tunnel with the necessary vertical clearance (minimum 21 feet) to allow double-stack intermodal train operations. Two-track means that there would be two separate railroad tracks in the tunnel. Double-stack means that intermodal container trains operating within the tunnel would be able to transport rail cars carrying two vertically stacked intermodal freight containers. These types of containers are among other types of freight rail traffic that use the tunnel, such as coal and other merchandise. The new tunnel would allow freight trains, including those with double-stack intermodal containers, to move in both directions, simultaneously, if necessary, and enabling more efficient freight

movement. This would allow more efficient freight movement, especially in light of expected increases in freight traffic. Reconstructing the tunnel to allow double-stack intermodal container freight trains would require lowering the grade below the rail line's New Jersey Avenue SE Overpass.

## 4 Regulatory Requirements

### 4.1 Key Considerations in Section 4(f)

A Section 4(f) property is any publicly owned land of a public park, recreational area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance.

As noted in 23 C.F.R. § 774.3, Section 4(f) Approvals, a transportation project approved by a U.S. Department of Transportation (U.S. DOT) modal agency (for this Project, FHWA) may not use a Section 4(f) property unless it is determined that:

1. There is no feasible and prudent avoidance alternative, as defined in § 774.17, to the use of land from the property; and
2. The action includes all possible planning, as defined in § 774.17, to minimize harm to the property resulting from such use.

As defined in 23 C.F.R. § 774.17, the use of a protected Section 4(f) property occurs when any of the conditions below are met:

3. When land [of the Section 4(f) property] is permanently incorporated into a transportation facility;
4. When there is a temporary occupancy of land [of the Section 4(f) property] that is adverse in terms of the [Section 4(f)] statute's preservation purpose as determined by the criteria in § 774.13(d); or
5. When there is constructive use of a Section 4(f) property as determined by the criteria in § 774.15.

The FHWA may determine that the use of Section 4(f) property, including any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) committed to by the applicant, will have a de minimis impact, as defined in 23 C.F.R. § 774.17, on the property. The de minimis impact criteria and associated determination requirements vary by type of Section 4(f) property involved. For example, the use of a historic site may be de minimis if the Administration renders a "no adverse effect" in accordance with Section 106 of the National Historic Preservation Act (NHPA).

A feasible and prudent avoidance alternative avoids using Section 4(f) property and does not cause other severe problems of a magnitude that substantially outweighs the importance of protecting the Section 4(f) property. The feasible and prudent standard applies only to an alternative that fully avoids any use of a Section 4(f) property. It would not apply when choosing among alternatives that require the use of at least one Section 4(f) property. In

assessing the importance of protecting the Section 4(f) property, it is appropriate to consider the relative value of the resource to the preservation purpose of the statute.

An alternative is not feasible if it cannot be built as a matter of sound engineering judgment.

An alternative is not prudent if:

- It compromises the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need;
- It results in unacceptable safety or operational problems;
- After reasonable mitigation, it still causes:
  - Severe social, economic, or environmental impacts;
  - Severe disruption to established communities;
  - Severe disproportionate impacts to minority or low income populations; or
  - Severe impacts to environmental resources protected under other Federal statutes;
- It results in additional construction, maintenance, or operational costs of an extraordinary magnitude;
- It causes other unique problems or unusual factors; or
- It involves multiple factors in paragraphs (3)(i) through (3)(v) of this definition, that while individually minor, cumulatively.

All possible planning to minimize harm means that all reasonable measures identified in the Section 4(f) evaluation to minimize harm or mitigate for adverse impacts and effects must be included in the project. With regard to historic sites, reasonable measures normally serve to preserve the historic activities, features, or attributes of the site as agreed by the Administration and the official(s) with jurisdiction over the Section 4(f) resource in accordance with the Section 106 consultation process outlined 36 C.F.R. § 800, Protection of Historic Properties.

If there is no feasible and prudent avoidance alternative and the use is not de minimis, then the FHWA may approve only the alternative that causes the least overall harm in light of the statute's preservation purpose. The least overall harm is determined by balancing the following factors, which are identified in 23 C.F.R. § 774.3(c)(1):

- The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);
- The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;
- The relative significance of each Section 4(f) property;
- The views of the official(s) with jurisdiction over each Section 4(f) property;
- The degree to which each alternative meets the purpose and need for the project;
- After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and
- Substantial differences in costs among the alternatives.

If two or more alternatives are "substantially equal" in terms of harm to the 4(f) property, then FHWA may select any one of the alternatives being considered. Regardless, the alternative selected must include all possible planning to minimize harm to Section 4(f) property, such as compliance with Section 106, as applicable.

An "individual Section 4(f) evaluation must be completed when approving a project that requires the use of Section 4(f) property if the use . . . results in a greater than de minimis impact and a programmatic Section 4(f) evaluation cannot be applied to the situation." (Section 4(f) Policy Paper, July 20, 2012)

## 4.2 Assessing "Use" of Section 4(f) Properties

Section 4.1 briefly described the term "use" in Section 4(f).

The most common form of use is when land is permanently incorporated into a transportation facility. This can occur when land from a Section 4(f) property is either purchased outright as transportation right-of-way or when the applicant for Federal-aid funds has acquired a property interest that allows permanent access onto the property such as a permanent easement for maintenance or other transportation-related purpose.

The second form of use is commonly referred to as temporary occupancy and results when Section 4(f) property, in whole or in part, is required for project construction-related activities. The property is not permanently incorporated into a transportation facility but the activity is considered to be adverse in terms of the preservation purpose of Section 4(f). Section 23 CFR 774.13(d) provides the conditions under which "temporary occupancies of land..are so minimal as to not constitute a use within the meaning of Section 4(f)." If all of the conditions in this section are met, the temporary occupancy does not constitute a use. If one or more of the conditions for the exception cannot be met, then the Section 4(f) property is considered used by the project even though the duration of onsite activities is temporary. Written agreement by the official(s) with jurisdiction over the property with respect to all the conditions is necessary and should be retained in the project file. Assurances that documentation will eventually be obtained via subsequent negotiations are not acceptable. Also, it is typical that the activity in question will be detailed in project plans as an integral and necessary feature of the project.

The third and final type of use is called constructive use. A constructive use involves no actual physical use of the Section 4(f) property via permanent incorporation of land or a temporary occupancy of land into a transportation facility. A constructive use occurs when the proximity impacts of a proposed project adjacent to, or nearby, a Section 4(f) property result in substantial impairment to the property's activities, features, or attributes that qualify the property for protection under Section 4(f). As a general matter this means that the value of the resource, in terms of its Section 4(f) purpose and significance, will be meaningfully reduced or lost. The types of impacts that may qualify as constructive use, such as increased noise levels that would substantially interfere with the use of a noise sensitive feature such as a campground or outdoor amphitheater, are addressed in 23 CFR 774.15. A project's proximity

to a Section 4(f) property is not in itself an impact that results in constructive use. Also, the assessment for constructive use should be based upon the impact that is directly attributable to the project under review, not the overall combined impacts to a Section 4(f) property from multiple sources over time.

It should be noted that none of the identified Section 4(f) properties affected by or adjacent to the Project's limit of disturbance (see Sections 5 and 6) meet the criteria for a constructive use.

## 5 Section 4(f) Properties

Section 4(f) and the implementing regulations in 23 C.F.R. § 774 define a Section 4(f) property as publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance. A historic site includes any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register.

There are several protected Section 4(f) resources or properties within the limits of disturbance (LOD) of the Project, which are listed below:

- Virginia Avenue Tunnel
- The L'Enfant Plan of Washington DC;
- Capitol Hill Historic District; and
- Virginia Avenue Park.

The LOD refers to all areas where construction would take place, including areas needed for staging, materials stockpiling, utility relocations, and temporary freight train operations. The LOD would be restricted from the general public, except Virginia Avenue's cross streets, which would remain open for public passage throughout construction by means of temporary bridges.

### 5.1 Virginia Avenue Tunnel

Virginia Avenue Tunnel, which is owned by CSX, is eligible for the National Register of Historic Places (National Register), and is therefore, considered a Section 4(f) resource. It was originally constructed by the Baltimore & Potomac Railroad in two phases between 1872 and 1904, using a cut-and-cover construction method. The first phase consisted of the portion of the tunnel from 11th Street SE to a location between 7th and 8th Streets SE. The second phase of construction extended the location of the tunnel's west portal by an additional half-mile to 2nd Street SE. Most of the tunnel is an elliptical brick arch with 28 feet clear span (distance inside the tunnel wall to wall). A structural failure occurred in 1985, and 300 feet of tunnel was replaced. The walls are of cut stone masonry ten feet high and eight-and-a-half feet thick. The ceiling is also of brick masonry, with maximum vertical clearance of approximately 18 feet. As noted in Section 6.2, the tunnel structure is approaching the end of reliable service.

## 5.2 L'Enfant Plan of Washington, DC

The L'Enfant Plan of Washington, DC (L'Enfant Plan), which is listed on the National Register, is a Baroque city plan with Beaux Arts modifications designed by Pierre L'Enfant (1792). Roughly bounded by Florida Avenue from Rock Creek NW to 15 Street NE, south to C Street, and east to the Anacostia River, the plan consists of regular orthogonal street grids with numerically and alphabetically designated streets, intersected by diagonal avenues. It also consists of historic and contemporary system of parks and medians. The 1901-02 McMillan Commission recommendations resulted in physical changes to the L'Enfant Plan necessary for urban development. Virginia Avenue SE was identified as part of the L'Enfant Plan.

## 5.3 Capitol Hill Historic District

The Project Area is located within in a small portion in the southeast area of the Capitol Hill Historic District (CHHD) on the south side of I-695. Most of this historic district is located north of I-695. CHHD, which is listed on the National Register, is primarily a residential area with two- to four-story row houses and small frame houses in a variety of architectural styles including Federal, Italianate, Greek revival, Queen Anne, Romanesque revival, and vernacular interpretations. It also includes religious, commercial, institutional and military buildings, as well as parks. The neighborhood began as a boarding house community for members of Congress, and is one of the District's oldest and largest residential communities. CHHD is roughly bounded by the U.S. Capitol; F Street NE and Constitutional Avenue to the north; 14TH, 13th, and 11th streets SE to the east, and including some areas south of I-695 extending to the Washington Navy Yard. CHHD also contains contributing resources, including Virginia Avenue Park, which is described below.

## 5.4 Virginia Avenue Park

Virginia Avenue Park is owned by the National Park Service (NPS) but maintained and operated by the DC Department of Parks and Recreation (DPR). Not only is Virginia Avenue Park a publicly-owned, public recreational resource, it is also a contributing resource to the CHHD. In 1966, jurisdiction of the park was transferred to the District of Columbia, but the NPS still retains fee title. The 2.63-acre park is located between 9th Street SE and near 11th Street SE and between I-695 and Potomac Avenue SE / L Street SE. It contains the Virginia Avenue Community Garden, a fenced dog area, and passive recreational amenities that include grassy fields, park benches and picnic tables. The community garden offers residents opportunities to grow herbs, vegetables and fruits. Each participating household is limited to two plots.

## 6 Other Section 4(f) Properties

Other Section 4(f) properties adjacent to the Project's LOD include two recreational resources (Garfield Park and, the Marine Corps turf field) and one historic property (St. Paul AUMP Church). As noted in Section 4.2, the Project would not require the constructive use of these properties. The reasons for this assessment are provided below.

### 6.1 Garfield Park

Garfield Park is located between New Jersey Avenue and 3rd Street SE immediately north of I-695, and is under the jurisdiction of DPR. Regardless of the Build Alternative, pedestrian access to Garfield Park from 2nd Street SE on the south side of I-695 would not be available during construction because of the need to relocate the Tiber Creek Intercepting Sewer. This work would be conducted under I-695 in the vicinity of 2nd Street SE. Garfield Park is accessible from several other locations and none of these would be affected by the Project. From the south side of I-695, the park is accessible from New Jersey Avenue SE and 3rd Street SE. Fencing would be installed between the construction area under I-695 and Garfield Park to ensure that park users are not exposed to construction activities. The park is used for passive recreation, tennis and volleyball. These activities would be unaffected by construction activities underneath I-695.

### 6.2 Marine Corps Turf Field

The Marine Corps turf field is a soccer field located within the Marine Recreation Facility. The field is primarily used by marines for physical fitness and the Marine Band for practice sessions. However, the Marine Corps allow the field to be available to Sports on the Hill, a volunteer youth sports organization, and other visiting recreational teams and spectators with prior approval by the facility. This level of public access may qualify the turf field as a Section 4(f) resource. Regardless of the Build Alternative, access to and activities associated with the turf field would not be affected. Access is through L Street SE, not Virginia Avenue SE, and fencing between the construction area and the turf field would be installed to ensure that Marines and visitors are not exposed to construction activities.

### 6.3 St. Paul AUMP Church

St. Paul AUMP Church is an historic property listed on the National Register. The church is of a Gothic Revival style with gabled asphalt roof, arched windows, crenellated battlements, and a tower. Washington's second licensed African-American architect, R.C. Archer Jr., designed the church. It is the only church in the District that evolved from the oldest incorporated, independent African denomination in the United States. Although the church appears to be structurally sound, it has evidence of damage from water leakage. The LOD under each of the three Build Alternatives would be in the vicinity the church, but the existing tunnel is located over 100 feet away. The vibration effects of demolishing the existing tunnel and reconstructing the new tunnel would not be expected to migrate to the church site. The construction activities causing the highest level of vibration that could cause building damage are predicted to migrate a little over 30 feet. Nevertheless, the church would be inspected prior to the start of construction and monitored during construction.

## 7 Alternatives Considered

Three Build Alternatives are under consideration. They were selected for detailed study in the National Environmental Policy Act (NEPA) process from among 12 concepts that were

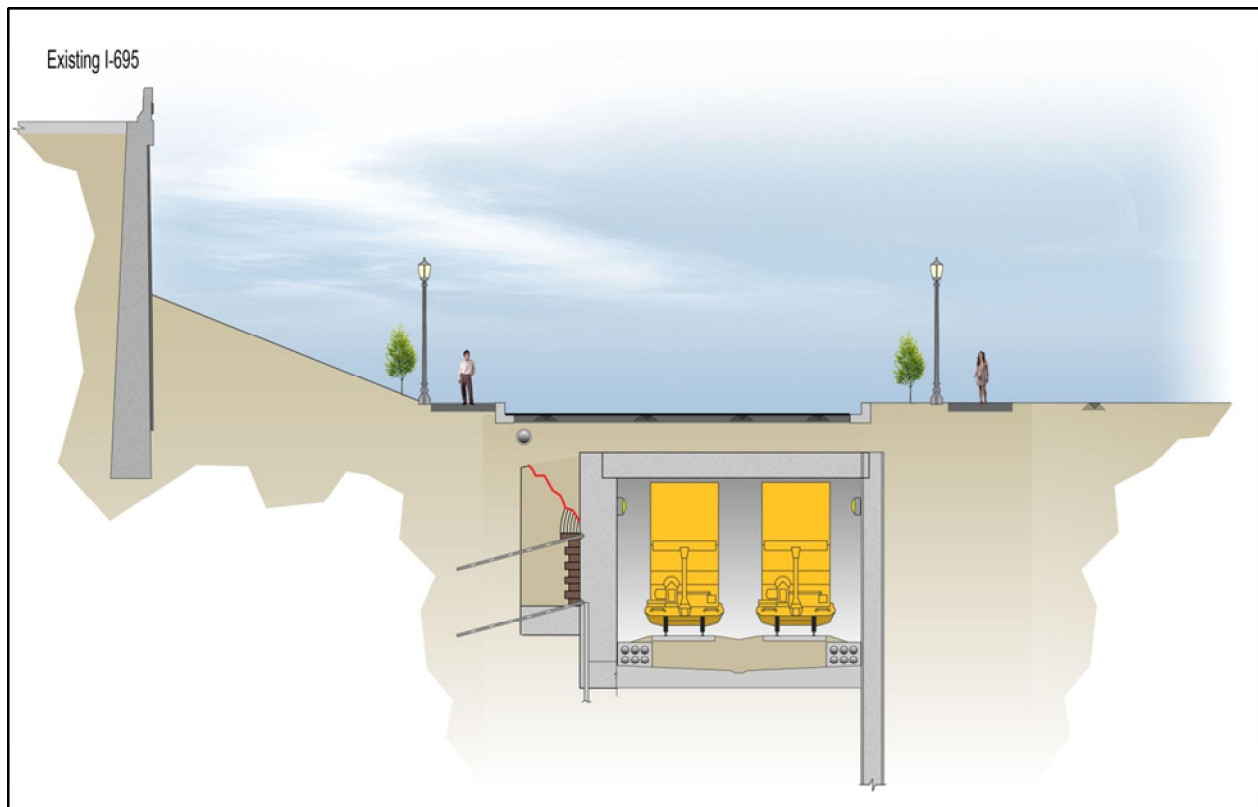
considered as part of the scoping process. Seven of these concepts involved the rebuilding of the existing Virginia Avenue Tunnel generally along its current alignment but with two railroad tracks and sufficient vertical clearance to allow for double-stacking of intermodal containers (rebuild concepts). Four other concepts would have involved rerouting mainline freight rail traffic out of the Virginia Avenue Tunnel at its present depth and location in lieu of near-term reconstruction of the tunnel (reroute concepts). All four reroute concepts and four of the seven rebuild concepts were eliminated from consideration. However, they were considered as possible alternatives that may avoid the Section 4(f) resources identified in Section 6.5. Concept 1, which was later renamed Alternative 1, is the “no build”, which is automatically considered in the Draft Environmental Impact Statement (EIS) as a viable option, and is also used as a point of comparison to evaluate the potential impacts of the Build Alternatives.

### 7.1 Alternative 2, Rebuilt Tunnel / Temporary Runaround Track

Originally Concept 2, Alternative 2 involves rebuilding the existing Virginia Avenue Tunnel. It would be rebuilt with two railroad tracks and enough vertical clearance to accommodate double-stack intermodal container freight trains. It would be rebuilt in generally the same location, except aligned approximately seven feet to the south of the existing tunnel center line. It would be rebuilt using protected open trench construction methods. During construction, freight trains would be temporarily routed through a protected open trench outside the existing tunnel (runaround track). The runaround track would be aligned to the south and generally parallel to the existing tunnel, and would be located below street level. Due to new columns associated with the rebuilt 11th Street Bridges, the runaround track would slightly separate from the tunnel alignment on the east end starting just west of Virginia Avenue Park. Safety measures such as securing fencing would be used to prevent pedestrians and bikers from accessing the runaround track. A typical cross section of post-construction Virginia Avenue Tunnel under Alternative 2 between 3rd Street and 9th Street SE is shown on Figure 2.



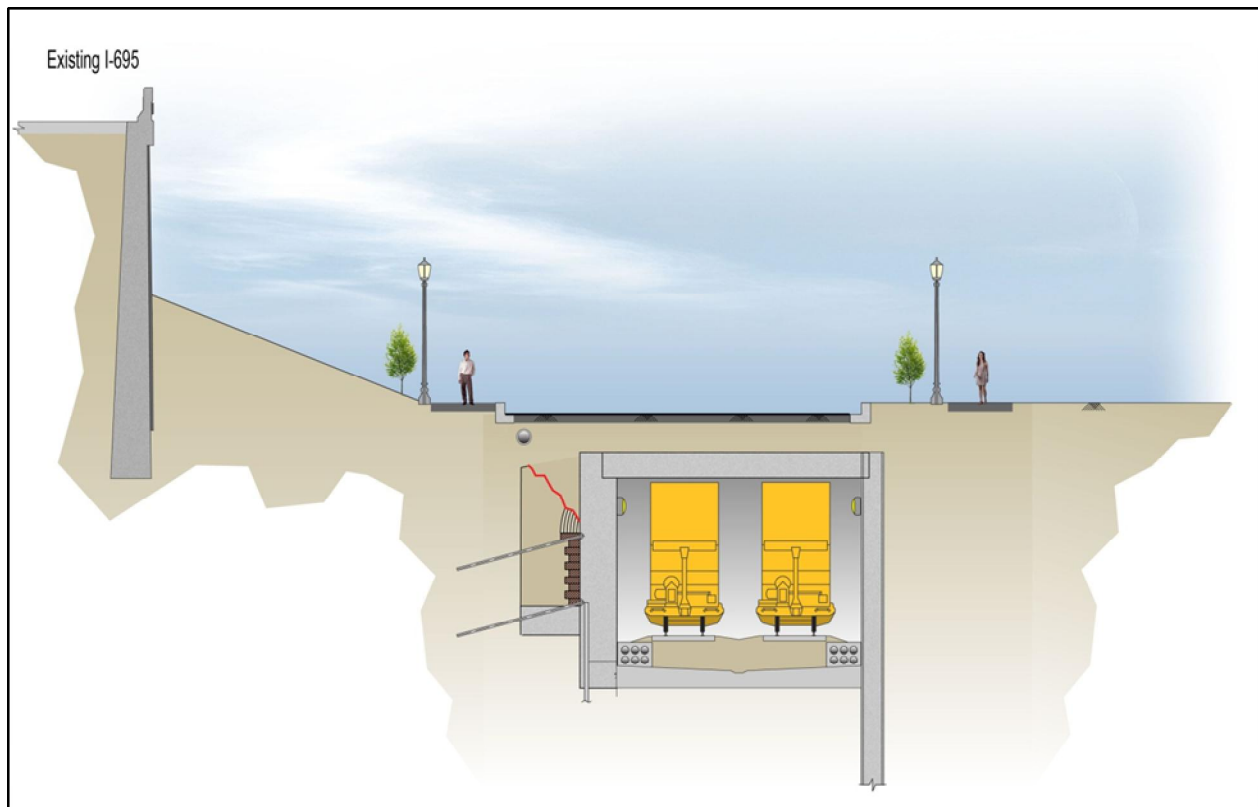
Figure 2  
Cross Section View of Post-Construction Alternative 2  
between 3rd and 9th Streets SE



## 7.2 Alternative 3, Two New Tunnels

Originally Concept 5, Alternative 3 involves replacing the existing Virginia Avenue Tunnel with two new permanent tunnels. Each tunnel would have a single railroad track with enough vertical clearance to allow double-stack intermodal container freight trains. A new parallel south side tunnel would be built first as trains continue operating in the existing Virginia Avenue Tunnel. After the south side tunnel is completed, train operations would switch over to the new tunnel and the existing Virginia Avenue Tunnel would be demolished and rebuilt. With the exception of operating in a protected open trench for approximately 230 feet immediately east of the 2nd Street portal (within the Virginia Avenue SE segment between 2nd and 3rd Streets SE), trains would operate in enclosed tunnels throughout construction under Alternative 3. Throughout most of the length of the entire rebuilt tunnel, the two tunnels would be separated by a center wall. This center wall would be the new centerline of the two tunnels, and it would be aligned approximately 25 feet south of the existing tunnel centerline, between 2nd and 9th Streets SE. Due to new columns associated with the rebuilt 11th Street Bridge, the tunnels would be separated on the east end starting just west of Virginia Avenue Park, resulting

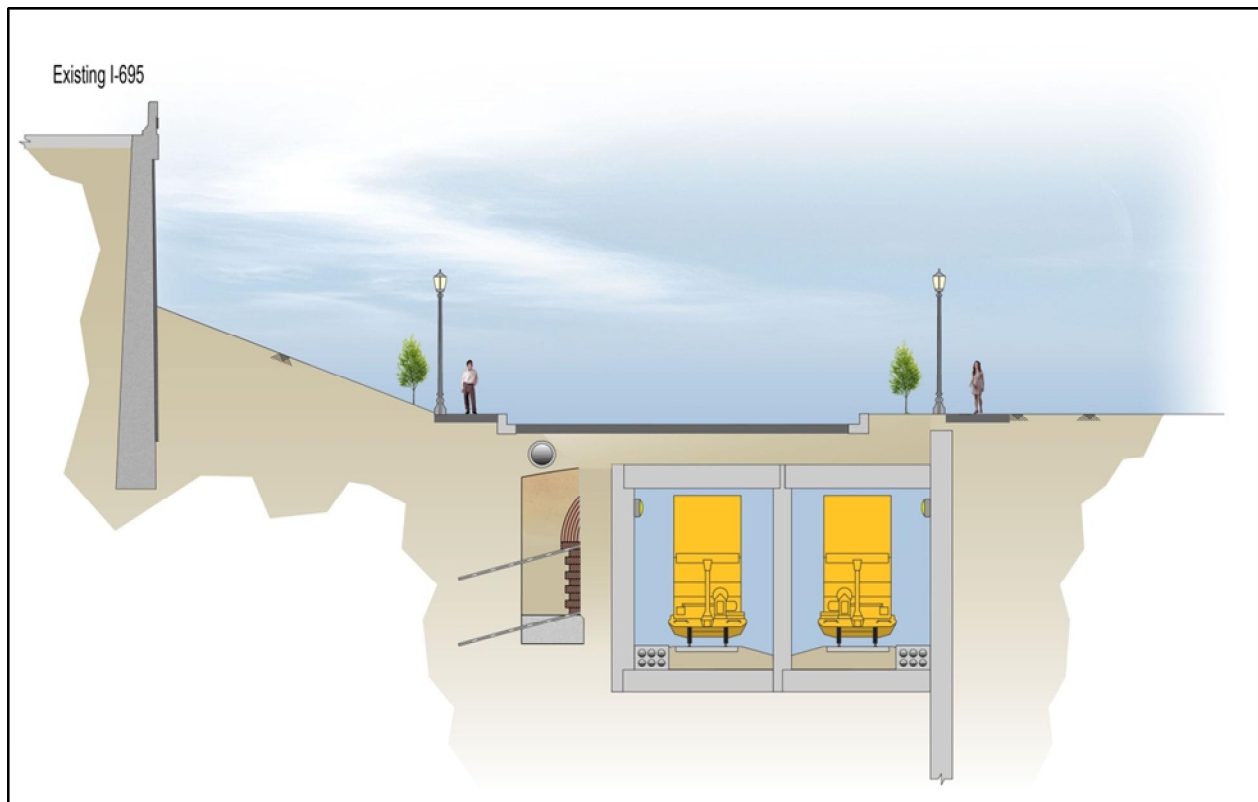
Figure 2  
Cross Section View of Post-Construction Alternative 2  
between 3rd and 9th Streets SE



## 7.2 Alternative 3, Two New Tunnels

Originally Concept 5, Alternative 3 involves replacing the existing Virginia Avenue Tunnel with two new permanent tunnels. Each tunnel would have a single railroad track with enough vertical clearance to allow double-stack intermodal container freight trains. A new parallel south side tunnel would be built first as trains continue operating in the existing Virginia Avenue Tunnel. After the south side tunnel is completed, train operations would switch over to the new tunnel and the existing Virginia Avenue Tunnel would be demolished and rebuilt. With the exception of operating in a protected open trench for approximately 230 feet immediately east of the 2nd Street portal (within the Virginia Avenue SE segment between 2nd and 3rd Streets SE), trains would operate in enclosed tunnels throughout construction under Alternative 3. Throughout most of the length of the entire rebuilt tunnel, the two tunnels would be separated by a center wall. This center wall would be the new centerline of the two tunnels, and it would be aligned approximately 25 feet south of the existing tunnel centerline, between 2nd and 9th Streets SE. Due to new columns associated with the rebuilt 11th Street Bridge, the tunnels would be separated on the east end starting just west of Virginia Avenue Park, resulting

Figure 4  
Cross Section View of Post-Construction Alternative 4  
between 3rd and 9th Streets SE



## 8 Impacts on Section 4(f) Properties

This section describes the Project's potential impacts to the four Section 4(f) resources described in Section 5. Any differences among the Build Alternatives are noted. In general, the Project would require the demolition of existing Virginia Avenue Tunnel. It would require temporary occupancy of Virginia Avenue Park and relatively small portions of the L'Enfant Plan and, Capitol Hill Historic District due to the proposed limits of disturbance (LOD) need for construction.

### 8.1 Virginia Avenue Tunnel

The Section 4(f) "use" would involve the demolition of the tunnel in order to accomplish its reconstruction. The demolition and rebuilding of the tunnel would constitute a permanent incorporation into a reconstructed transportation facility and would therefore be a "use" within the meaning of 23 CFR 774.17. The demolition also would likely result in a Section 106 "adverse effect" determinations in accordance with the National Historic Preservation Act Section 106 process. As the result of the Section 106 adverse effect, the Section 4(f) "use"

would not be considered de minimis. The reconstruction of the Virginia Avenue Tunnel would also not qualify for an exception from Section 4(f) under 23 CFR 774.13(a)(1) in that the tunnel would be completely rebuilt, not merely restored, rehabilitated or maintained with its potential historic qualities preserved.

Under Alternative 1, the No Build, the tunnel would eventually need to be rebuilt or undergo major rehabilitation. Even with CSX's active maintenance and inspection program, a major structural deficiency similar to what occurred in 1985 could possibly materialize over the next few decades due to the continued aging of the tunnel's masonry structure. This event would be "unplanned" and result in emergency construction that may likely require at least a partial demolition of the tunnel.

## 8.2 L'Enfant Plan of Washington, DC

The Section 4(f) "use" of the L'Enfant Plan would involve temporary longitudinal trenching on a L'Enfant Plan identified street -- Virginia Avenue SE -- during the period of construction. Therefore, the Section 4(f) "use" of this resource would be a temporary occupancy type of "use". Construction for each of the three Build Alternatives involves longitudinal trenching along this street. As Alternative 4 does not include a runaround track (as in Alternative 2) or a new south side tunnel with the same alignment as the runaround track (as in Alternative 3), its LOD along Virginia Avenue SE would be a few feet narrower. The trenching work on Virginia Avenue SE would not qualify for a temporary occupancy exception from Section 4(f) as defined under 23 CFR 774.13(d) because the temporary occupancy of the land would not be minimal and the scope of construction work would not be minor. However, the street would be restored to a condition at least as good as that which existed prior to construction, and CSX has committed to making enhancements and upgrades to the street in consultation with stakeholders.

The Section 4(f) "use" would also not be considered a de minimis impact. The trenching needed by the Build Alternatives would not be minor and the use would be adverse within the meaning of de minimis impact contained in 23 CFR 774.17. In particular, potential is great that a Section 106 "adverse effect" determination would be rendered in part due to the temporary occupancy of a contributing element (Virginia Avenue SE) to the L'Enfant Plan.

## 8.3 Capitol Hill Historic District

The LOD occupies a relatively small section of the Capitol Hill Historic District (CHHD). It is within Virginia Avenue Park, a contributing resource to the CHHD. Each Build Alternative requires a temporary occupancy "use" of a portion of the Virginia Avenue Park because the park was established above the tunnel. The scope of work, although temporary, would not be minor in that local residents would not be able to make use of the affected area of the park during construction on that segment of the Project.

The Project would involve the "use" of the park (both as an historic property and a recreational resource) as a 4(f) property within the meaning of 23 CFR 774.17. The "use" would be a

temporary occupancy (only needed during construction), and may need an approval from the NPS for construction-period access to this property. Notably, this temporary occupancy would not qualify for an exception of Section 4(f) requirements in accordance with 23 CFR 774.13(d). In addition, the Section 4(f) "use" of the CHHD would not be considered a de minimis impact because a Section 106 "adverse effect" determination is anticipated in part due to the construction impacts on the park as a contributing historic resource to CHHD. Occupancy of the park for construction and temporary rail operations would encompass the entire duration of the overall construction or a substantial proportion depending on the Alternative selected.

Alternative 4 would temporarily require the use of a portion of the park for the construction of the tunnel. Alternatives 2 and 3 would also require use of a portion of the park during construction. However, since the temporary runaround track under Alternative 2 and the permanent new south side tunnel that under Alternative 3 would be located further south of the existing alignment, the LOD in the park would be larger under these two alternatives. Under each of the Build Alternatives, a large swath of open grassy field and the fenced dog area would not be available during construction. The Virginia Avenue Community Garden would not be displaced by construction under any of the Build Alternatives. The garden would remain open during construction for users. The park benches and picnic tables in the park near Potomac Avenue SE would not be displaced. Temporary construction activities could be perceived as substantially reducing the experience of garden users and park visitors.

The park would be fully returned to a condition at least as good as that which existed prior to the construction, and CSX has committed to provide enhancements and upgraded amenities.

#### 8.4 Virginia Avenue Park

The Project's Section 4(f) "use" of Virginia Avenue Park would be the same as the "use" of the park as a contributing resource to the CHHD. Because the park would be restored at the conclusion of construction, the Build Alternatives would not result in any long-term Section 4(f) "use" of or impacts to Virginia Avenue Park.

### 9 Evaluation of Section 4(f) Properties

The use of each of the four Section 4(f) properties identified in Section 5 was evaluated to:

1. Determine whether there is any feasible and prudent avoidance alternative to the use of land from the Section 4(f) property;
2. If there were no feasible and prudent avoidance alternative, determine which of the alternatives described in Section 7 would result in the least overall harm to the Section 4(f) property; and
3. Identify the planning and actions to be taken to minimize harm to the property resulting from the Section 4(f) use.

## 9.1 Virginia Avenue Tunnel

### 9.1.1 Avoidance Alternatives

#### 9.1.1.1 Avoidance Alternatives Considered

In the initial phases of project development, 12 concepts were developed and analyzed to determine whether they would meet the Project's Purpose and Need. These concepts were based on a preliminary assessment of the engineering and physical constraints along the alignment of the existing tunnel, and input from federal and District of Columbia agencies, interested parties and the general public. These 12 preliminary concepts include:

- Concept 1, the no action or no build condition;
- Concepts 2 through 7 (includes a Concept 3A or seven total concepts under this category) involve the reconstruction of Virginia Avenue Tunnel; and
- Concepts 8 through 11 involve rerouting the main rail line outside of the existing Virginia Avenue SE, but the tunnel would remain to service Washington Metropolitan Area regional customers.

Because Concept 1 is the no build condition, it was later renamed as Alternative 1 and would be automatically carried through EIS process. By definition, Alternative 1 would avoid the use of Section 4(f) properties, and in particular, it would not require the immediate demolition of Virginia Avenue Tunnel, but it would also not meet the Purpose and Need of the Project. For example, it would not resolve the deficiencies of the existing tunnel.

Concepts 2 through 7 all require demolishing the existing tunnel in order to reconstruct a new two railroad track tunnel. Therefore, none of them would be considered a potential feasible and prudent alternative. These rebuild concepts are:

- Concept 2: Rebuild, Temporary South Side Runaround
- Concept 3: Rebuild, Temporary North Side Runaround
- Concept 3A: Rebuild, Permanent Two Tunnels (New Tunnel on North Side of Existing Virginia Avenue Tunnel)
- Concept 4: Rebuild, Temporary Combination Runaround
- Concept 5: Rebuild, Permanent Two Tunnels (New Tunnel on South Side of Existing Virginia Avenue Tunnel)
- Concept 6: Rebuild with On-Line Construction
- Concept 7: Rebuild, Temporary Reroute

The rebuild concepts differ on how each would accommodate freight rail operations during construction, which influenced the final alignment of the reconstructed tunnel. Nevertheless, under each of these concepts, the new tunnel would essentially maintain the same alignment and would occupy at least the majority of the existing tunnel alignment. The existing Virginia Avenue SE right-of-way does not have enough space to construct a new tunnel without affecting the old one. The concepts that involve reconstructing Virginia Avenue Tunnel did not consider moving the alignment south of the public right-of-way (avoiding the demolition of the existing tunnel) because this would involve use of private properties, including those containing

residences, which would result in a severe community disruption. These concepts also did not consider moving the alignment north of the Virginia Avenue SE right-of-way (avoiding the demolition of the existing tunnel) because this would require the closure and reconstruction of I-695, which is located immediately north of Virginia Avenue SE. This would also result in a severe community disruption.

As noted in Section 7, Concepts 2, 5 and 6 were selected for further evaluation and were developed as Alternatives 2, 3 and 4.

Concepts 8 through 11 would all avoid use of Virginia Avenue Tunnel, but as noted above, the existing tunnel would remain to service Washington Metropolitan Area regional customers. In addition to Concept 1/Alternative 1, the reroute concepts identified below were evaluated as potential feasible and prudent alternatives to avoid the Section 4(f) use of Virginia Avenue Tunnel:

- Concept 8: Reroute, Deep Bore Tunnel
- Concept 9: Reroute, Indian Head Alignment
- Concept 10: Reroute, Dahlgren Alignment
- Concept 11: Permanent Reroute

As described in Sections 9.2.1, 9.3.1 and 9.4.1, these concepts were also evaluated as potential feasible and prudent alternatives to avoid the other three Section 4(f) properties. They would avoid all four Section 4(f) properties described in Section 5.

#### 9.1.1.2 Feasibility and Prudence Test

As noted in Section 8.1, the Section 4(f) use of Virginia Avenue Tunnel would involve the demolition of the tunnel, which is required to construct a new tunnel along generally the same alignment. This Section 4(f) use applies to all three Build Alternatives.

The five potential avoidance alternatives were evaluated in terms of feasibility and prudence (see Section 4.1) in meeting the Purpose and Need of the Project and still avoid the Section 4(f) use of Virginia Avenue Tunnel.

Concept 1 or Alternative 1, the no build alternative; would not address the Project's Purpose and Need as described in Section 2. Alternative 1 would not address the deficiencies of operational and structural deficiencies of Virginia Avenue Tunnel, nor would it prepare for anticipated increases in freight transportation demand. Therefore, Alternative 1 was not considered a prudent alternative to avoid the Section 4(f) use of Virginia Avenue Tunnel.

Concept 8 would involve construction of a nine-mile long tunnel stretching from Alexandria, VA to Deanwood, near the eastern border between the District and Maryland. Concept 8 is estimated to cost at least \$2 billion. In comparison, the costs for the non-avoidance Alternatives 2, 3 and 4 are estimated to range from \$168 to \$208 million. In addition, Concept 8 would not address the structural deficiency of the existing tunnel, which would remain open under this concept in order to serve local customers. Therefore, in consideration of Concept 8's

cost of extraordinary magnitude, and because it would not fully address the Project's Purpose and Need, Concept 8 was determined not to be a prudent alternative to avoid the Section 4(f) use of Virginia Avenue Tunnel.

Concept 9 and 10 would require dozens of miles of new and expanded railroad tracks and a new bridge over the Potomac River. The National Capital Planning Commission (NCPC), which introduced Concepts 9 and 10 in an earlier study, estimated these concepts would cost between \$3.2 to 4.2 billion and \$3.5 and 4.7 billion, respectively. In comparison, the costs for the non-avoidance Alternatives 2, 3 and 4 are estimated to range from \$168 to \$208 million. Like Concept 8, Concepts 9 and 10 would not address the structural deficiency of the existing tunnel even though the tunnel would remain open for local customers. Therefore, in consideration of Concept 9 and 10's costs of extraordinary magnitude, and because they would not fully address the Project's Purpose and Need, Concepts 9 and 10 were determined not to be prudent alternatives to avoid the Section 4(f) use of Virginia Avenue Tunnel.

Concept 11 would require several hundreds of miles of new and expanded railroad tracks within several states along the eastern seaboard and Midwest. Although no cost estimate was made, Concept 11 would be even more expensive than Concepts 8, 9 and 10 as it would require substantial investments to expand rail corridors stretching from Georgia to Pennsylvania and Ohio. Similar to Concepts 8 through 10, Concept 11 would not address the structural deficiency of the existing tunnel. Therefore, in consideration of Concept 11's cost of extraordinary magnitude, and because it would not fully address the Project's Purpose and Need, Concept 11 was determined not to be a prudent alternative to avoid the Section 4(f) use of Virginia Avenue Tunnel.

#### 9.1.1.3 Remaining Build Alternatives

Alternatives 2, 3 and 4 remain as the only Build Alternatives that would address the Purpose and Need described in Section 2, but would still result in the Section 4(f) use of Virginia Avenue Tunnel. Any of the reroute concepts would compromise the Project to a degree that it would be unreasonable to proceed with the Project in light of its Purpose and Need. They would require additional construction costs of an extraordinary magnitude. They could also possibly cause other unique problems or unusual factors, such as requiring extensive planning efforts across multiple local and state jurisdictions.

In summary, the rebuild concepts, which were considered as possible avoidance alternatives to the Section 4(f) use of Virginia Avenue Tunnel as well as to the other three Section 4(f) properties, would have construction costs of extraordinary magnitude and would not fully address the Project's Purpose and Need. Alternative 1 would not address Project's Purpose and Need. For these reasons, the conclusion was reached that there is no feasible and prudent alternative to the Section 4(f) use of Virginia Avenue Tunnel.



### 9.1.2 Least Harm

There is no feasible and prudent alternative that avoids the Section 4(f) use of Virginia Avenue Tunnel as well as the other three Section 4(f) properties identified in Section 5. Therefore, it must then be determined which of the three remaining Build Alternatives (Alternatives 2, 3 and 4) would cause the least harm based on seven factors identified in 23 CFR 774.3(c)(1), which are listed in Section 4.1. Also noted in Section 4.1 is that only the alternative that causes the least overall harm may be approved. If two or more alternatives are substantially equal in terms of harm to the 4(f) property(ies), any one of these alternatives may be selected.

Virginia Avenue Tunnel is one of four Section 4(f) properties affected by the Project, and each of them was evaluated separately in terms of the factors that determine a least harm alternative. The four Section 4(f) properties were then evaluated as a group to determine which alternative has the least overall harm with regards to all four properties. This overall evaluation is provided in Section 10.

The analysis herein provided considered proposed mitigation measures and the severity and location of the Section 4(f) use among the three Build Alternatives. As noted 5.1, Virginia Avenue Tunnel is an historic property and in addition to Section 4(f), is protected under Section 106. The Section 106 consultation process is ongoing and the resolution of this process would inform which of the three remaining alternatives would result in the least harm to Virginia Avenue Tunnel in terms of the seven factors listed in 23 CFR 774.3(c)(1). Any conclusions regarding the application of these seven factors cannot be made until the Section 106 process is completed or when the MOA is signed.

Factor 1: The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property).

Alternatives 2, 3, and 4 would all result in the demolition and replacement of Virginia Avenue Tunnel. As noted in Section 8.1, an adverse effect determination in accordance with Section 106 would likely be rendered, and therefore, a Memorandum of Agreement (MOA) would be prepared, which would resolve, among other things, the adverse effect from the demolition of the existing tunnel. The MOA would include mitigation measures to address the demolition of the tunnel, which may include, but not necessarily limited to, formal recordation of the existing tunnel's historic characteristics, installation of an interpretive sign or plaque at a publicly accessible area noting the history of tunnel, and offering tunnel stones to interested organizations, such as Friends of Garfield Park. Upon completion of the Section 106 process, the mitigation measures identified in the MOA would inform which of the three Build Alternatives in terms of Factor 1 would result in the least harm to Virginia Avenue Tunnel.

Factor 2: The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection.

As noted above, each of the Build Alternatives would result in the demolition and replacement of Virginia Avenue Tunnel to meet the Purpose and Need of the project. Upon demolition of the tunnel, the attributes and features that qualify it as an historic property would no longer exist. Regardless of the Build Alternatives selected, mitigation measures as defined in the MOA would be implemented, which may lessen the severity of the harm to the resource. Similar to what is noted under Factor 1, the conclusion of the Section 106 consultation process would inform which of the three Build Alternatives in terms of Factor 2 would result in the least harm to Virginia Avenue Tunnel.

Factor 3: The relative significance of each Section 4(f) property.

Virginia Avenue Tunnel is among three other Section 4(f) properties that would be affected by the Project, regardless of the Build Alternatives selected. Its relative significance in comparison to the other three Section 4(f) properties is addressed in Section 10 in the overall determination of least harm.

Factor 4: The views of the official(s) with jurisdiction over each Section 4(f) property.

The officials with jurisdiction over Virginia Avenue Tunnel are the DC State Historic Preservation Officer (SHPO) and the owner of the facility, CSX. CSX has determined that Virginia Avenue Tunnel needs to be demolished and rebuilt to maintain CSX's long-term ability to provide efficient freight transportation services. To date, the SHPO has not stated a preference for an alternative, but is anticipated to concur with the upcoming Section 106 adverse effect determination. The Section 106 effect determination and SHPO concurrence will be documented in the final Section 4(f) evaluation regarding Build Alternatives. The conclusion of the Section 106 consultation process may inform which of the three Build Alternatives in terms of Factor 4 would result in the least harm to Virginia Avenue Tunnel.

Factor 5: The degree to which each alternative meets the purpose and need for the project.

Upon completion and regardless of the Build Alternative, the rebuilt Virginia Avenue Tunnel would meet the freight rail transportation needs over the next several decades. All three Build Alternatives would provide adequate provisions to maintain freight rail operations throughout construction. However, there are greater risks of service disruptions under Alternative 4 because temporary train operations and reconstruction of the tunnel would occur within the same trench. In terms of Factor 5, the Build Alternatives appear to be equal, except with respect to potential disruptions to rail service during the construction under Alternative 4.

Factor 6: After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f).

During construction, the LOD is limited to Virginia Avenue SE, Virginia Avenue Park, other public right-of-way associated with the 11th Street Bridges, CSX rail right-of-way and the Marine Corps Recreation Facility. No recreational elements of the Marine Corps facility would be affected. All of these properties would be restored to at least pre-construction conditions at the end of construction. When construction is completed, and the rebuilt Virginia Avenue Tunnel becomes fully operational, the LOD and the surrounding areas (both Section 4(f) and non-Section 4(f) resources) would revert back to the environmental conditions that existed prior to construction. The Project is essentially rebuilding existing transportation infrastructure. Therefore, in terms of Factor 6, the Build Alternatives appear to be equal.

Factor 7: Substantial differences in costs among the alternatives.

The costs for Alternatives 2 and 3 would be similar at approximately \$175 and \$168 million, respectively. At approximately \$208 million, the cost for Alternative 4 would be approximately 20 to 24 percent higher than Alternatives 2 and 3, respectively. One of the major factors affecting the higher cost of Alternative 4 is the more complicated construction phasing / temporary freight rail operations, which would also substantially extend the construction duration. Therefore, in terms of Factor 7, Alternative 4 would have a substantially higher cost than Alternatives 2 or 3.

### 9.1.3 Planning and Measures to Minimize Harm

Virginia Avenue Tunnel qualifies as a Section 4(f) property because it is also an historic property. An historic property is any district, site, building, structure or object that is on or eligible for listing on the National Register of Historic Places. NHPA Section 106 requires federal agencies, such as FHWA, to take into account the effects of their undertakings or actions on historic properties. The federal approvals needed to allow the Project to proceed are considered as federal undertakings or actions.

The Section 106 process requires that the federal agency first determine whether the undertaking could affect historic properties. If so, the federal agency must consult with the SHPO and others, which may involve the public and consulting parties (those with a particular interest in historic preservation). If not, federal agency would have no further Section 106 obligations with respect to the undertaking by rendering a "no historic properties affected" determination. If historic properties are affected, the federal agency would render either an "adverse effect" or "no adverse effect" determination.

The Section 106 process for the Project was formally initiated on November 4, 2011. The Section 106 process for the Project is ongoing, and has involved three consulting parties meetings to date. A Section 106 "adverse effect" determination for the Project is expected, partially due to the required demolition of Virginia Avenue Tunnel (the Project is likely to have

an adverse effect to the L'Enfant Plan the CHHD). The results of the Section 106 consultations for the Project will inform the Section 4(f) evaluation by:

- Obtaining the views of the SHPO and CSX, the officials with jurisdiction over Virginia Avenue Tunnel;
- Identifying the measures to minimize harm that could preserve the historic activities, features, or attributes of Virginia Avenue Tunnel in consultation with the SHPO and CSX in accordance with the consultation process under 36 CFR part 800; and
- Understanding whether the measures to minimize harm to Virginia Avenue Tunnel would result in any impacts or benefits to the surrounding community or environmental resources outside of the Virginia Avenue Tunnel corridor.

Regardless of the Build Alternative, mitigation measures to address the adverse effects to Virginia Avenue Tunnel would be outlined in a MOA prepared in accordance with Section 106. The MOA mitigation measures specifically on Virginia Avenue Tunnel would be subject to input from CSX, the SHPO and the consulting parties, and the final version would be signed at a minimum by the FHWA and SHPO. The measure to minimize harm to Virginia Avenue Tunnel in the MOA may include, but not necessarily limited to, formal recordation of the existing tunnel's historic characteristics, installation of an interpretive sign or plaque at a publicly accessible area noting the history of tunnel, and offering tunnel stones to interested organizations, such as Friends of Garfield Park.

The Project's complete Section 106 consultation process, which will inform the Section 4(f) evaluation regarding the minimization of harm to the Virginia Avenue Tunnel, will be fully disclosed in the Final EIS. The Final Section 4(f) Evaluation will be based upon the conclusion of the Section 106 consultation.

## 9.2 L'Enfant Plan of Washington, DC

### 9.2.1 Avoidance Alternatives

#### 9.2.1.1 Avoidance Alternatives Considered

In addition to Concept 1/Alternative 1 or the no build condition, the reroute concepts identified below were evaluated as potential feasible and prudent alternatives to avoid the Section 4(f) use of the L'Enfant Plan:

- Concept 8: Reroute, Deep Bore Tunnel
- Concept 9: Reroute, Indian Head Alignment
- Concept 10: Reroute, Dahlgren Alignment
- Concept 11: Permanent Reroute

As described in Sections 9.1.1, 9.3.1 and 9.4.1, these concepts were also evaluated as potential feasible and prudent alternatives to avoid the other three Section 4(f) properties. They would avoid all four Section 4(f) properties described in Section 5.

### 9.2.1.2 Feasibility and Prudence Test

As noted in Section 8.2, the Section 4(f) use of the L'Enfant Plan involves the temporary trenching along Virginia Avenue SE between 2<sup>nd</sup> and 9<sup>th</sup> Streets during construction, which would apply to all three Build Alternatives. Virginia Avenue SE is a named street in the L'Enfant Plan. No Section 4(f) use would occur after construction.

The five potential avoidance alternatives were evaluated in terms of feasibility and prudence (see Section 4.1) in meeting the Purpose and Need of the Project and still avoid the Section 4(f) use of the L'Enfant Plan.

Concept 1 or Alternative 1, the no build alternative; would not address the Project's Purpose and Need as described in Section 2. Alternative 1 would not address the deficiencies of operational and structural deficiencies of Virginia Avenue Tunnel, nor would it prepare for anticipated increases in freight transportation demand. Therefore, Alternative 1 was not considered a prudent alternative to avoid the Section 4(f) use of the L'Enfant Plan.

Concept 8 would involve construction of a nine-mile long tunnel stretching from Alexandria, VA to Deanwood, near the eastern border between the District and Maryland. Concept 8 is estimated to cost at least \$2 billion. In comparison, the costs for the non-avoidance Alternatives 2, 3 and 4 are estimated to range from \$168 to \$208 million. In addition, Concept 8 would not address the structural deficiency of the existing tunnel, which would remain open under this concept in order to serve local customers. Therefore, in consideration of Concept 8's cost of extraordinary magnitude, and because it would not fully address the Project's Purpose and Need, Concept 8 was determined not to be a prudent alternative to avoid the Section 4(f) use of the L'Enfant Plan.

Concept 9 and 10 would require dozens of miles of new and expanded railroad tracks and a new bridge over the Potomac River. NCPC, which introduced Concepts 9 and 10 in an earlier study, estimated these concepts would cost between \$3.2 to 4.2 billion and \$3.5 and 4.7 billion, respectively. In comparison, the costs for the non-avoidance Alternatives 2, 3 and 4 are estimated to range from \$168 to \$208 million. Like Concept 8, Concepts 9 and 10 would not address the structural deficiency of the existing tunnel even though the tunnel would remain open for local customers. Therefore, in consideration of Concept 9 and 10's costs of extraordinary magnitude, and because they would not fully address the Project's Purpose and Need, Concepts 9 and 10 were determined not to be prudent alternatives to avoid the Section 4(f) use of the L'Enfant Plan.

Concept 11 would require several hundreds of miles of new and expanded railroad tracks within several states along the eastern seaboard and Midwest. Although no cost estimate was made, Concept 11 would be even more expensive than Concepts 8, 9 and 10 as it would require substantial investments to expand rail corridors stretching from Georgia to Pennsylvania and Ohio. Similar to Concepts 8 through 10, Concept 11 would not address the structural deficiency of the existing tunnel. Therefore, in consideration of Concept 11's cost of extraordinary magnitude, and because it would not fully address the Project's Purpose and Need, Concept 11

was determined not to be a prudent alternative to avoid the Section 4(f) use of the L'Enfant Plan.

### 9.2.1.3 Remaining Build Alternatives

Alternatives 2, 3 and 4 remain as the only Build Alternatives that would address the Purpose and Need described in Section 2, but would still result in the Section 4(f) use of the L'Enfant Plan. Any of the reroute concepts would compromise the Project to a degree that it would be unreasonable to proceed with the Project in light of its Purpose and Need. They would require additional construction costs of an extraordinary magnitude. They could also possibly cause other unique problems or unusual factors, such as requiring extensive planning efforts across multiple local and state jurisdictions.

In summary, the rebuild concepts, which were considered as possible avoidance alternatives to the Section 4(f) use of L'Enfant Plan as well as to the other three Section 4(f) properties, would have construction costs of extraordinary magnitude and would not fully address the Project's Purpose and Need. Alternative 1 would not address Project's Purpose and Need. For these reasons, the conclusion was reached that there is no feasible and prudent alternative to the Section 4(f) use of L'Enfant Plan.

### 9.2.2 Least Harm

There is no feasible and prudent alternative that avoids the Section 4(f) use of L'Enfant Plan as well as the other three Section 4(f) properties identified in Section 5. Therefore, it must then be determined which of the three remaining Build Alternatives (Alternatives 2, 3 and 4) would cause the least overall harm based on seven factors identified in 23 CFR 774.3(c)(1), which are listed in Section 4.1. Also noted in Section 4.1 is that only the alternative that causes the least overall harm may be approved. If two or more alternatives are substantially equal in terms of harm to the 4(f) property(ies), any one of these alternatives may be selected.

L'Enfant Plan is one of four Section 4(f) properties affected by the Project, and each of them was evaluated separately in terms of the factors that determine a least harm alternative. The four Section 4(f) properties were then evaluated as a group to determine which alternative has the least overall harm with regards to all four properties. This overall evaluation is provided in Section 10.

The analysis herein provided considered proposed mitigation measures and the severity and location of the Section 4(f) use among the three Build Alternatives. As noted 5.2, the L'Enfant Plan is an historic property and in addition to Section 4(f), is protected under NHPA Section 106. The Section 106 consultation process is ongoing and the resolution of this process would inform which of the three remaining alternatives would result in the least harm to the L'Enfant Plan in terms of the seven factors listed in 23 CFR 774.3(c)(1). Any conclusions regarding the application of these seven factors cannot be made until the Section 106 process is completed or when the MOA is signed.

Factor 1: The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property).

The Project's impact to the L'Enfant Plan that requires Section 4(f) use is the need for temporary longitudinal trenching along Virginia Avenue SE. Although the nature of the trenching among the three Build Alternatives would vary, all three would require the closure of Virginia Avenue SE between 2nd and 9th Streets SE for substantial periods of time. Despite the differences in trenching among the Build Alternatives, the construction mitigation measures would be almost identical. The maintenance of traffic (MOT) plan would be the same although the timing of certain MOT measures would vary. In addition, the selection of a Preferred Alternative for the Project would not factor in decisions about the post-construction condition of Virginia Avenue SE. The MOA would include mitigation to address the Section 106 adverse effects from the use of Virginia Avenue SE and subsequently the L'Enfant Plan. Upon completion of the Section 106 process, the mitigation measures identified in the MOA would inform which of the three Build Alternatives would result in the least harm to the L'Enfant Plan.

Factor 2: The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection.

It should be noted that each of the Build Alternatives would have very similar impacts on the L'Enfant Plan, which would be temporary and only occurring during construction. While this still constitutes a Section 4(f) use, the conclusion of construction allows for the complete restoration of Virginia Avenue SE. As a matter of engineering, the Build Alternatives, as described in Section 7, have been developed to emphasize engineering feasibility and minimize disruption to the community affected.

The Build Alternatives differ in three important aspects: (1) the LOD along Virginia Avenue SE for Alternative 4 would be slightly narrower or smaller than Alternatives 2 and 3, which have the same LOD; (2) Alternatives 2 and 3 would be constructed more quickly than Alternative 4; (3) and Alternative 3 would operate freight trains within a tunnel throughout construction, except for a 230 foot section immediately east of the 2nd Street portal.

The narrower LOD under Alternative 4 may be relative in terms of least harm to L'Enfant Plan because the difference is just a few feet. Despite the narrower LOD under Alternative 4, the LOD within the Marine Corps property would be the same as under Alternatives 2 and 3 due to possible utility relocations.

Alternatives 2 and 3 would require between 30 and 42 months for construction, whereas Alternative 4 would require 54 to 66 months of construction. The Section 4(f) use of the L'Enfant Plan would therefore be shorter under Alternatives 2 and 3 than under Alternative 4, which is an important consideration due to community concerns about construction duration.

Maintaining freight rail operations within the same trench as the demolition and rebuilding of Virginia Avenue Tunnel, as proposed by Alternative 4, is more complicated than how

Alternatives 2 and 3 proposes to maintain freight transportation and rebuild the tunnel. In addition, having both activities within the same trench increases the risk that reconstruction of Virginia Avenue Tunnel inadvertently causes a disruption to freight transportation.

In terms of the relative severity of the harm to the L'Enfant Plan, two factors are pertinent: (1) Alternative 4 would have a substantially longer duration of construction than under Alternatives 2 and 3; and (2) Alternative 3 would keep temporary freight rail operations within a closed tunnel, in particularly along sections of Virginia Avenue SE near residences. However, the Section 106 consultation process may reveal other pertinent differences among the alternatives in terms of the relative severity of harm to the L'Enfant Plan. Therefore, the conclusion of the Section 106 consultation process would inform which of the three Build Alternatives in terms of Factor 2 would result in the least harm to the L'Enfant Plan.

Factor 3: The relative significance of each Section 4(f) property.

The L'Enfant Plan is among three other Section 4(f) properties that would be affected by the Project, regardless of the Build Alternatives selected. Its relative significance in comparison to the other three Section 4(f) properties is addressed in Section 10 in the overall determination of least harm.

Factor 4: The views of the official(s) with jurisdiction over each Section 4(f) property.

The official with jurisdiction over the L'Enfant Plan is the SHPO. The SHPO has not stated a preference for an alternative, and is anticipated to concur with the upcoming Section 106 adverse effect determination. The Section 106 effect determination and SHPO concurrence will be documented in the final Section 4(f) evaluation regarding the Build Alternatives. The conclusion of the Section 106 consultation process may inform which of the three Build Alternatives in terms of Factor 4 would result in the least harm to the L'Enfant Plan.

Factor 5: The degree to which each alternative meets the purpose and need for the project.

Upon completion and regardless of the Build Alternative, the rebuilt Virginia Avenue Tunnel would meet the freight rail transportation needs over the next several decades. All three Build Alternatives would provide adequate provisions to maintain freight rail operations throughout construction. However, there are greater risks of service disruptions under Alternative 4 because temporary train operations and reconstruction of the tunnel would occur within the same trench. In terms of Factor 5, the Build Alternatives appear to be equal, except with respect to potential disruptions to rail service during the construction under Alternative 4.

Factor 6: After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f).

During construction, the LOD is limited to Virginia Avenue SE, Virginia Avenue Park, other public right-of-way associated with the 11th Street Bridges, CSX rail right-of-way and the Marine Corps Recreation Facility. No recreational elements of the Marine Corps facility would be affected.



All of these properties would be restored to at least pre-construction conditions at the end of construction. When construction is completed, and the rebuilt Virginia Avenue Tunnel becomes fully operational, the LOD and the surrounding areas (both Section 4(f) and non-Section 4(f) resources) would revert back to the environmental conditions that existed prior to construction. The Project is essentially rebuilding existing transportation infrastructure. Therefore, in terms of Factor 6, the Build Alternatives appear to be equal.

Factor 7: Substantial differences in costs among the alternatives.

The costs for Alternatives 2 and 3 would be similar at approximately \$175 and \$168 million, respectively. At approximately \$208 million, the cost for Alternative 4 would be approximately 20 to 24 percent higher than Alternatives 2 and 3, respectively. One of the major factors affecting the higher cost of Alternative 4 is the more complicated construction phasing / temporary freight rail operations, which would also substantially extend the construction duration. Therefore, in terms of Factor 7, Alternative 4 would have a substantially higher cost than Alternatives 2 or 3.

### 9.2.3 Planning and Measures to Minimize Harm

The L'Enfant Plan qualifies as a Section 4(f) property because it is also an historic property. An historic property is any district, site, building, structure or object that is on or eligible for listing on the National Register of Historic Places. NHPA Section 106 requires federal agencies, such as FHWA, to take into account the effects of their undertakings or actions on historic properties. The federal approvals needed to allow the Project to proceed are considered as federal undertakings or actions.

The Section 106 process requires that the federal agency first determine whether the undertaking could affect historic properties. If so, the federal agency must consult with the SHPO and others, which may involve the public and consulting parties (those with a particular interest in historic preservation). If not, the federal agency would have no further Section 106 obligations with respect to the undertaking by rendering a "no historic properties affected" determination. If historic properties are affected, the federal agency would render either an "adverse effect" or "no adverse effect" determination.

The Section 106 process for the Project was formally initiated on November 4, 2011. The Section 106 process for the Project is ongoing, and has involved three consulting parties meetings to date. A Section 106 "adverse effect" determination for the Project is expected, partially due to the temporary construction impacts to a L'Enfant Plan street (Virginia Avenue SE) (the Project is likely to have an adverse effect to Virginia Avenue Tunnel and the CHHD). The results of the Section 106 consultations for the Project will inform the Section 4(f) evaluation by:

- Obtaining the views of the SHPO, the official with jurisdiction over L'Enfant Plan;
- Identifying the measures to minimize harm that could preserve the historic activities, features, or attributes of the L'Enfant Plan in consultation with the SHPO in accordance with the consultation process under 36 CFR part 800; and

- Understanding whether the measures to minimize harm to the L'Enfant Plan would result in any impacts or benefits to the surrounding community or environmental resources outside of the Virginia Avenue SE.

Regardless of the Build Alternative, mitigation measures to address the adverse effects to the L'Enfant Plan would be outlined in a MOA prepared in accordance with Section 106. The MOA mitigation measures specifically on the L'Enfant Plan would be subject to input from the SHPO and the consulting parties, and the final version would be signed at a minimum by the FHWA and SHPO.

Once the construction of the Project is concluded, traffic (including pedestrians and bicyclists) would be restored on Virginia Avenue SE. In addition, the Project could provide the following improvements to Virginia Avenue SE between 2nd and 9th Streets SE:

- Bicycle lane and/or shared-use pedestrian/bicycle path;
- Street alignment straightening between 4th and 5th/6th Streets SE (currently, the alignment bows to the south, deviating from the original L'Enfant Plan alignment);
- Additional landscaped areas;
- Reduction of lanes to encourage lower speeds;
- Provision of additional on-street parking where appropriate; and
- Improved street lighting, traffic signals and crosswalks.

The Project's complete Section 106 consultation process, which will inform the Section 4(f) evaluation regarding the minimization of harm to the L'Enfant Plan, will be fully disclosed in the Final EIS. The Final Section 4(f) Evaluation will be based upon the conclusion of the Section 106 consultation.

### 9.3 Capitol Hill Historic District

#### 9.3.1 Avoidance Alternatives

##### 9.3.1.1 Avoidance Alternatives Considered

In addition to Concept 1/Alternative 1 or the no build condition, the reroute concepts identified below were evaluated as potential feasible and prudent alternatives to avoid the Section 4(f) use of the CHHD:

- Concept 8: Reroute, Deep Bore Tunnel
- Concept 9: Reroute, Indian Head Alignment
- Concept 10: Reroute, Dahlgren Alignment
- Concept 11: Permanent Reroute

As described in Sections 9.1.1, 9.2.1 and 9.4.1, these concepts were also evaluated as potential feasible and prudent alternatives to avoid the other three Section 4(f) properties. They would avoid all four Section 4(f) properties described in Section 5.

---

### 9.3.1.2 Feasibility and Prudence Test

As noted in Section 8.3, the Section 4(f) use of the CHHD involves establishing a temporary construction area or LOD within Virginia Avenue Park, which is a contributing resource to the CHHD. This use would be same for all three Build Alternatives. However, Alternative 4's LOD would be slightly smaller than the LOD under Alternatives 2 and 3, which would be the same. No Section 4(f) use would occur after construction.

The five potential avoidance alternatives were evaluated in terms of feasibility and prudence (see Section 4.1) in meeting the Purpose and Need of the Project and still avoid the Section 4(f) use of the CHHD.

Concept 1 or Alternative 1, the no build alternative; would not address the Project's Purpose and Need as described in Section 2. Alternative 1 would not address the deficiencies of operational and structural deficiencies of Virginia Avenue Tunnel, nor would it prepare for anticipated increases in freight transportation demand. Therefore, Alternative 1 was not considered a prudent alternative to avoid the Section 4(f) use of the CHHD.

Concept 8 would involve construction of a nine-mile long tunnel stretching from Alexandria, VA to Deanwood, near the eastern border between the District and Maryland. Concept 8 is estimated to cost at least \$2 billion. In comparison, the costs for the non-avoidance Alternatives 2, 3 and 4 are estimated to range from \$168 to \$208 million. In addition, Concept 8 would not address the structural deficiency of the existing tunnel, which would remain open under this concept in order to serve local customers. Therefore, in consideration of Concept 8's cost of extraordinary magnitude, and because it would not fully address the Project's Purpose and Need, Concept 8 was determined not to be a prudent alternative to avoid the Section 4(f) use of the CHHD.

Concept 9 and 10 would require dozens of miles of new and expanded railroad tracks and a new bridge over the Potomac River. NCPC, which introduced Concepts 9 and 10 in an earlier study, estimated these concepts would cost between \$3.2 to 4.2 billion and \$3.5 and 4.7 billion, respectively. In comparison, the costs for the non-avoidance Alternatives 2, 3 and 4 are estimated to range from \$168 to \$208 million. Like Concept 8, Concepts 9 and 10 would not address the structural deficiency of the existing tunnel even though the tunnel would remain open for local customers. Therefore, in consideration of Concept 9 and 10's costs of extraordinary magnitude, and because they would not fully address the Project's Purpose and Need, Concepts 9 and 10 were determined not to be prudent alternatives to avoid the Section 4(f) use of the CHHD.

Concept 11 would require several hundreds of miles of new and expanded railroad tracks within several states along the eastern seaboard and Midwest. Although no cost estimate was made, Concept 11 would be even more expensive than Concepts 8, 9 and 10 as it would require substantial investments to expand rail corridors stretching from Georgia to Pennsylvania and Ohio. Similar to Concepts 8 through 10, Concept 11 would not address the structural deficiency of the existing tunnel. Therefore, in consideration of Concept 11's cost of extraordinary

magnitude, and because it would not fully address the Project's Purpose and Need, Concept 11 was determined not to be a prudent alternative to avoid the Section 4(f) use of the CHHD.

### 9.3.1.3 Remaining Build Alternatives

Alternatives 2, 3 and 4 remain as the only Build Alternatives that would address the Purpose and Need described in Section 2, but would still result in the Section 4(f) use of the CHHD. Any of the reroute concepts would compromise the Project to a degree that it would be unreasonable to proceed with the Project in light of its Purpose and Need. They would require additional construction costs of an extraordinary magnitude. They could also possibly cause other unique problems or unusual factors, such as requiring extensive planning efforts across multiple local and state jurisdictions.

In summary, the rebuild concepts, which were considered as possible avoidance alternatives to the Section 4(f) use of the CHHD as well as to the other three Section 4(f) properties, would have construction costs of extraordinary magnitude and would not fully address the Project's Purpose and Need. Alternative 1 would not address Project's Purpose and Need. For these reasons, the conclusion was reached that there is no feasible and prudent alternative to the Section 4(f) use of the CHHD.

### 9.3.2 Least Harm

There is no feasible and prudent alternative that avoids the Section 4(f) use of the CHHD as well as the other three Section 4(f) properties identified in Section 5. Therefore, it must then be determined which of the three remaining Build Alternatives (Alternatives 2, 3 and 4) would cause the least overall harm based on seven factors identified in 23 CFR 774.3(c)(1), which are listed in Section 4.1. Also noted in Section 4.1 is that only the alternative that causes the least overall harm may be approved. If two or more alternatives are substantially equal in terms of harm to the 4(f) property(ies), any one of these alternatives may be selected.

The CHHD is one of four Section 4(f) properties affected by the Project, and each of them was evaluated separately in terms of the factors that determine a least harm alternative. The four Section 4(f) properties were then evaluated as a group to determine which alternative has the least overall harm with regards to all four properties. This overall evaluation is provided in Section 10.

The analysis herein provided considered proposed mitigation measures and the severity and location of the Section 4(f) use among the three Build Alternatives. As noted 5.3, the CHHD is an historic property and in addition to Section 4(f), is protected under Section 106. The Section 106 consultation process is ongoing and the resolution of this process would inform which of the three remaining alternatives would result in the least harm to the CHHD in terms of the seven factors listed in 23 CFR 774.3(c)(1). Any conclusions regarding the application of these seven factors cannot be made until the Section 106 process is completed or when the MOA is signed.

Factor 1: The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property).

The Project's impact to the CHHD that requires Section 4(f) use is the need for temporary longitudinal trenching within Virginia Avenue Park, which would temporarily close a large portion of the park to the general public. Despite the differences in trenching among the Build Alternatives, the construction mitigation measures would be almost identical. The selection of a Preferred Alternative for the Project would not factor in decisions about the post-construction condition of Virginia Avenue Park. The MOA would include mitigation to address the Section 106 adverse effects from the use of the CHHD. Upon completion of the Section 106 process, the mitigation measures identified in the MOA would inform which of the three Build Alternatives would result in the least harm to the L'Enfant Plan.

Factor 2: The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection.

It should be noted that each of the Build Alternatives would have very similar impacts to the CHHD (in Virginia Avenue Park), which would be temporary and only occurring during construction. While this still constitutes a Section 4(f) use, the conclusion of construction allows for the complete restoration of Virginia Avenue Park, a contributing element of the CHHD. As a matter of engineering, the Build Alternatives, as described in Section 7, have been developed to emphasize engineering feasibility and minimize disruption to the community affected.

The Build Alternatives differ in three important aspects: (1) the LOD within Virginia Avenue Park for Alternative 4 would be smaller; (2) Alternatives 2 and 3 would complete construction in the park more quickly than Alternative 4; (3) and Alternative 3 would operate freight trains within a tunnel throughout construction within the park.

In Virginia Avenue Park, Alternative 4's temporary construction area is smaller than what is needed for Alternatives 2 and 3, primarily because of the need to split the tunnel beginning on the west side of the park for both the runaround track (Alternative 2) and the new south side tunnel (Alternative 3). All three Build Alternatives avoid displacing the community garden and park benches along Potomac Avenue SE.

Alternatives 2 and 3 would require between 30 and 42 months for construction within Virginia Avenue Park, whereas Alternative 4 would require 38 to 54 months for construction within the park. The Section 4(f) use of Virginia Avenue Park would therefore be shorter under Alternatives 2 and 3 than under Alternative 4, which is an important difference due to community concerns about construction duration.

Maintaining freight rail operations within the same trench as the demolition and rebuilding of Virginia Avenue Tunnel, as proposed by Alternative 4, is more complicated than how Alternatives 2 and 3 proposes to maintain freight transportation and rebuild the tunnel. In

addition, having both activities within the same trench increases the risk that reconstruction of Virginia Avenue Tunnel inadvertently causes a disruption to freight transportation. Under Alternative 3, at no time would trains be operating in an open trench in the park. Under Alternatives 2 and 4, trains would operate in an open trench throughout most of the construction duration, and these areas would need to be kept secured from the general public for safety reasons.

In terms of the relative severity of the harm to the CHHD, three factors are pertinent: (1) Alternative 4 would require a smaller temporary construction area in Virginia Avenue Park than under Alternatives 2 and 3; (2) Alternative 4 has a substantially longer duration of construction within the Section 4(f) properties than under Alternatives 2 and 3; and (3) during construction, Alternative 3 would keep temporary freight rail operations within a closed tunnel within Virginia Avenue Park. However, the Section 106 consultation process may reveal other pertinent differences among the alternatives in terms of the relative severity of harm to the CHHD. Therefore, the conclusion of the Section 106 consultation process would inform which of the three Build Alternatives in terms of Factor 2 would result in the least harm to the CHHD.

Factor 3: The relative significance of each Section 4(f) property.

The CHHD is among three other Section 4(f) properties that would be affected by the Project, regardless of the Build Alternatives selected. Its relative significance in comparison to the other three Section 4(f) properties is addressed in Section 10 in the overall determination of least harm.

Factor 4: The views of the official(s) with jurisdiction over each Section 4(f) property.

The official with jurisdiction over the CHHD is the DC SHPO. Other jurisdictional officials include NPS and DPR as the owner and operator, respectively, of Virginia Avenue Park. In addition to the SHPO, both agencies are participating as Section 106 cooperating agencies. The SHPO, NPS and DPR have not stated a preference for an alternative. The SHPO is anticipated to concur with the upcoming Section 106 adverse effect determination. The Section 106 effect determination and SHPO concurrence will be documented in the final Section 4(f) evaluation regarding the Build Alternatives. The conclusion of the Section 106 consultation process may inform which of the three Build Alternatives in terms of Factor 4 would result in the least harm to the CHHD.

Factor 5: The degree to which each alternative meets the purpose and need for the project.

Upon completion and regardless of the Build Alternative, the rebuilt Virginia Avenue Tunnel would meet the freight rail transportation needs over the next several decades. All three Build Alternatives would provide adequate provisions to maintain freight rail operations throughout construction. However, there are greater risks of service disruptions under Alternative 4 because temporary train operations and reconstruction of the tunnel would occur within the same trench. In terms of Factor 5, the Build Alternatives appear to be equal, except with respect to potential disruptions to rail service during the construction under Alternative 4.

Factor 6: After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f).

During construction, the LOD is limited to Virginia Avenue SE, Virginia Avenue Park, other public right-of-way associated with the 11th Street Bridges, CSX rail right-of-way and the Marine Corps Recreation Facility. No recreational elements of the Marine Corps facility would be affected. All of these properties would be restored to at least pre-construction conditions at the end of construction. When construction is completed, and the rebuilt Virginia Avenue Tunnel becomes fully operational, the LOD and the surrounding areas (both Section 4(f) and non-Section 4(f) resources) would revert back to the environmental conditions that existed prior to construction. The Project is essentially rebuilding existing transportation infrastructure. Therefore, in terms of Factor 6, the Build Alternatives appear to be equal.

Factor 7: Substantial differences in costs among the alternatives.

The costs for Alternatives 2 and 3 would be similar at approximately \$175 and \$168 million, respectively. At approximately \$208 million, the cost for Alternative 4 would be approximately 20 to 24 percent higher than Alternatives 2 and 3, respectively. One of the major factors affecting the higher cost of Alternative 4 is the more complicated construction phasing / temporary freight rail operations, which would also substantially extend the construction duration. Therefore, in terms of Factor 7, Alternative 4 would have a substantially higher cost than Alternatives 2 or 3.

### 9.3.3 Planning and Measures to Minimize Harm

The CHHD qualifies as a Section 4(f) property because it is also an historic property. An historic property is any district, site, building, structure or object that is on or eligible for listing on the National Register of Historic Places. NHPA Section 106 requires federal agencies, such as FHWA, to take into account the effects of their undertakings or actions on historic properties. The federal approvals needed to allow the Project to proceed are considered as federal undertakings or actions.

The Section 106 process requires that the federal agency first determine whether the undertaking could affect historic properties. If so, the federal agency must consult with the SHPO and others, which may involve the public and consulting parties (those with a particular interest in historic preservation). If not, the federal agency would have no further Section 106 obligations with respect to the undertaking by rendering a "no historic properties affected" determination. If historic properties are affected, the federal agency would render either an "adverse effect" or "no adverse effect" determination.

The Section 106 process for the Project was formally initiated on November 4, 2011. The Section 106 process for the Project is ongoing, and has involved three consulting parties meetings to date. A Section 106 "adverse effect" determination for the Project is expected, partially due to the temporary construction impacts to a CHHD contributing resource (Virginia Avenue Park) (the Project is likely to have an adverse effect to Virginia Avenue Tunnel and the

L'Enfant Plan). The results of the Section 106 consultations for the Project will inform the Section 4(f) evaluation by:

- Obtaining the views of the SHPO, the official with jurisdiction over CHHD;
- Identifying the measures to minimize harm that could preserve the historic activities, features, or attributes of the CHHD in consultation with the SHPO in accordance with the consultation process under 36 CFR part 800; and
- Understanding whether the measures to minimize harm to the CHHD would result in any impacts or benefits to the surrounding community or environmental resources outside of the Virginia Avenue Park.

Regardless of the Build Alternative, mitigation measures to address the adverse effects to the CHHD would be outlined in a MOA prepared in accordance with Section 106. The MOA mitigation measures specifically on the CHHD would be subject to input from the SHPO, NPS, DPR and the consulting parties, and the final version would be signed at a minimum by the FHWA and SHPO. The measure to minimize harm to the CHHD in the MOA may include the complete restoration of Virginia Avenue Park to its pre-construction conditions. In addition, the Project would commit to providing enhancements and upgraded amenities to Virginia Avenue Park in coordination with the NPS and DPR.

The Project's complete Section 106 consultation process, which will inform the Section 4(f) evaluation regarding the minimization of harm to the CHHD, will be fully disclosed in the Final EIS. The Final Section 4(f) Evaluation will be based upon the conclusion of the Section 106 consultation.

## 9.4 Virginia Avenue Park

### 9.4.1 Avoidance Alternatives

#### 9.4.1.1 Potential Avoidance Alternatives

In addition to Concept 1/Alternative 1 or the no build condition, the reroute concepts identified below were evaluated as potential feasible and prudent alternatives to avoid the Section 4(f) use of Virginia Avenue Park:

- Concept 8: Reroute, Deep Bore Tunnel
- Concept 9: Reroute, Indian Head Alignment
- Concept 10: Reroute, Dahlgren Alignment
- Concept 11: Permanent Reroute

As described in Sections 9.1.1, 9.2.1 and 9.3.1, these concepts were also evaluated as potential feasible and prudent alternatives to avoid the other three Section 4(f) properties. They would avoid all four Section 4(f) properties described in Section 5.



---

#### 9.4.1.2 Feasibility and Prudence Test

As noted in Section 8.4, the Section 4(f) use of Virginia Avenue Park involves establishing a temporary construction area or LOD within the park. This use would be same for all three Build Alternatives. However, Alternative 4's LOD would be slightly smaller than the LOD under Alternatives 2 and 3, which would be the same. No Section 4(f) use would occur after construction.

The five potential avoidance alternatives were evaluated in terms of feasibility and prudence (see Section 4.1) in meeting the Purpose and Need of the Project and still avoid the Section 4(f) use of Virginia Avenue Park.

Concept 1 or Alternative 1, the no build alternative; would not address the Project's Purpose and Need as described in Section 2. Alternative 1 would not address the deficiencies of operational and structural deficiencies of Virginia Avenue Tunnel, nor would it prepare for anticipated increases in freight transportation demand. Therefore, Alternative 1 was not considered a prudent alternative to avoid the Section 4(f) use of Virginia Avenue Park.

Concept 8 would involve construction of a nine-mile long tunnel stretching from Alexandria, VA to Deanwood, near the eastern border between the District and Maryland. Concept 8 is estimated to cost at least \$2 billion. In comparison, the costs for the non-avoidance Alternatives 2, 3 and 4 are estimated to range from \$168 to \$208 million. In addition, Concept 8 would not address the structural deficiency of the existing tunnel, which would remain open under this concept in order to serve local customers. Therefore, in consideration of Concept 8's cost of extraordinary magnitude, and because it would not fully address the Project's Purpose and Need, Concept 8 was determined not to be a prudent alternative to avoid the Section 4(f) use of Virginia Avenue Park.

Concept 9 and 10 would require dozens of miles of new and expanded railroad tracks and a new bridge over the Potomac River. NCPC, which introduced Concepts 9 and 10 in an earlier study, estimated these concepts would cost between \$3.2 to 4.2 billion and \$3.5 and 4.7 billion, respectively. In comparison, the costs for the non-avoidance Alternatives 2, 3 and 4 are estimated to range from \$168 to \$208 million. Like Concept 8, Concepts 9 and 10 would not address the structural deficiency of the existing tunnel even though the tunnel would remain open for local customers. Therefore, in consideration of Concept 9 and 10's costs of extraordinary magnitude, and because they would not fully address the Project's Purpose and Need, Concepts 9 and 10 were determined not to be prudent alternatives to avoid the Section 4(f) use of Virginia Avenue Park.

Concept 11 would require several hundreds of miles of new and expanded railroad tracks within several states along the eastern seaboard and Midwest. Although no cost estimate was made, Concept 11 would be even more expensive than Concepts 8, 9 and 10 as it would require substantial investments to expand rail corridors stretching from Georgia to Pennsylvania and Ohio. Similar to Concepts 8 through 10, Concept 11 would not address the structural deficiency of the existing tunnel. Therefore, in consideration of Concept 11's cost of extraordinary

magnitude, and because it would not fully address the Project's Purpose and Need, Concept 11 was determined not to be a prudent alternative to avoid the Section 4(f) use of Virginia Avenue Park.

#### 9.4.1.3 Remaining Build Alternatives

Alternatives 2, 3 and 4 remain as the only Build Alternatives that would address the Purpose and Need described in Section 2, but would still result in the Section 4(f) use of the CHHD. Any of the reroute concepts would compromise the Project to a degree that it would be unreasonable to proceed with the Project in light of its Purpose and Need. They would require additional construction costs of an extraordinary magnitude. They could also possibly cause other unique problems or unusual factors, such as requiring extensive planning efforts across multiple local and state jurisdictions.

In summary, the rebuild concepts, which were considered as possible avoidance alternatives to the Section 4(f) use of Virginia Avenue Park as well as to the other three Section 4(f) properties, would have construction costs of extraordinary magnitude and would not fully address the Project's Purpose and Need. Alternative 1 would not address Project's Purpose and Need. For these reasons, the conclusion was reached that there is no feasible and prudent alternative to the Section 4(f) use of Virginia Avenue Park.

#### 9.4.2 Least Harm

There is no feasible and prudent alternative that avoids the Section 4(f) use of Virginia Avenue Park as well as the other three Section 4(f) properties identified in Section 5. Therefore, it must then be determined which of the three remaining Build Alternatives (Alternatives 2, 3 and 4) would cause the least overall harm based on seven factors identified in 23 CFR 774.3(c)(1), which are listed in Section 4.1. Also noted in Section 4.1 is that only the alternative that causes the least overall harm may be approved. If two or more alternatives are substantially equal in terms of harm to the 4(f) property(ies), any one of these alternatives may be selected.

Virginia Avenue Park is one of four Section 4(f) properties affected by the Project, and each of them was evaluated separately in terms of the factors that determine a least harm alternative. The four Section 4(f) properties were then evaluated as a group to determine which alternative has the least overall harm with regards to all four properties. This overall evaluation is provided in Section 10.

The analysis herein provided considered proposed mitigation measures and the severity and location of the Section 4(f) use among the three Build Alternatives. As noted in Section 5.3, Virginia Avenue Park, in addition to being a recreational facility, is a contributing resource to the CHHD. Therefore, in addition to Section 4(f), it is protected under Section 106. The Section 106 consultation process is ongoing and the resolution of this process would inform which of the three remaining alternatives would result in the least harm to Virginia Avenue Park as a contributing resource to the CHHD in terms of the seven factors listed in 23 CFR 774.3(c)(1).

Any conclusions regarding the application of these seven factors cannot be made until the Section 106 process is completed or when the MOA is signed.

Factor 1: The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property).

The Project's impact to Virginia Avenue Park that requires Section 4(f) use is the need for temporary longitudinal trenching within the park, which would temporarily close a large portion of the park to the general public. Despite the differences in trenching among the Build Alternatives, the construction mitigation measures would be almost identical. The selection of a Preferred Alternative for the Project would not factor in decisions about the post-construction condition of Virginia Avenue Park. The MOA would include mitigation to address the Section 106 adverse effects from the use of the park as a contributing resource to the CHHD. Upon completion of the Section 106 process, the mitigation measures identified in the MOA would inform which of the three Build Alternatives would result in the least harm to the L'Enfant Plan.

Factor 2: The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection.

It should be noted that each of the Build Alternatives would have very similar impacts to Virginia Avenue Park, which would be temporary and only occurring during construction. While this still constitutes a Section 4(f) use, the conclusion of construction allows for the complete restoration of Virginia Avenue Park. As a matter of engineering, the Build Alternatives, as described in Section 7, have been developed to emphasize engineering feasibility and minimize disruption to the community affected.

The Build Alternatives differ in three important aspects: (1) the LOD within Virginia Avenue Park for Alternative 4 would be smaller; (2) Alternatives 2 and 3 would complete construction in the park more quickly than Alternative 4; (3) and Alternative 3 would operate freight trains within a tunnel throughout construction within the park.

In Virginia Avenue Park, Alternative 4's temporary construction area is smaller than what is needed for Alternatives 2 and 3, primarily because of the need to split the tunnel beginning on the west side of the park for both the runaround track (Alternative 2) and the new south side tunnel (Alternative 3). All three Build Alternatives avoid displacing the community garden and park benches along Potomac Avenue SE.

Alternatives 2 and 3 would require between 30 and 42 months for construction within Virginia Avenue Park, whereas Alternative 4 would require 38 to 54 months for construction within the park. The Section 4(f) use of Virginia Avenue Park would therefore be shorter under Alternatives 2 and 3 than under Alternative 4, which is an important difference due to community concerns about construction duration.

Maintaining freight rail operations within the same trench as the demolition and rebuilding of Virginia Avenue Tunnel, as proposed by Alternative 4, is more complicated than how Alternatives 2 and 3 proposes to maintain freight transportation and rebuild the tunnel. In addition, having both activities within the same trench increases the risk that reconstruction of Virginia Avenue Tunnel inadvertently causes a disruption to freight transportation. Under Alternative 3, at no time would trains be operating in an open trench in the park. Under Alternatives 2 and 4, trains would operate in an open trench throughout most of the construction duration, and these areas would need to be kept secured from the general public for safety reasons.

In terms of the relative severity of the harm to Virginia Avenue Park, three factors are pertinent: (1) Alternative 4 would require a smaller temporary construction area in Virginia Avenue Park than under Alternatives 2 and 3; (2) Alternative 4 has a substantially longer duration of construction within the Section 4(f) properties than under Alternatives 2 and 3; and (3) during construction, Alternative 3 would keep temporary freight rail operations within a closed tunnel within Virginia Avenue Park. However, the Section 106 consultation process may reveal other pertinent differences among the alternatives in terms of the relative severity of harm to Virginia Avenue Park as a contributing resource to the CHHD. Therefore, the conclusion of the Section 106 consultation process would inform which of the three Build Alternatives in terms of Factor 2 would result in the least harm to Virginia Avenue Park.

Factor 3: The relative significance of each Section 4(f) property.

Virginia Avenue Park is among three other Section 4(f) properties that would be affected by the Project, regardless of the Build Alternatives selected. Its relative significance in comparison to the other three Section 4(f) properties is addressed in Section 10 in the overall determination of least harm.

Factor 4: The views of the official(s) with jurisdiction over each Section 4(f) property.

The officials with jurisdiction over Virginia Avenue Park are the NPS and DPR as the owner and operator, respectively, of the park. In addition to the SHPO, both agencies are participating as Section 106 cooperating agencies. Neither has stated a preference for an alternative. The conclusion of the Section 106 consultation process may inform which of the three Build Alternatives in terms of Factor 4 would result in the least harm to the L'Enfant Plan

Factor 5: The degree to which each alternative meets the purpose and need for the project.

Upon completion and regardless of the Build Alternative, the rebuilt Virginia Avenue Tunnel would meet the freight rail transportation needs over the next several decades. All three Build Alternatives would provide adequate provisions to maintain freight rail operations throughout construction. However, there are greater risks of service disruptions under Alternative 4 because temporary train operations and reconstruction of the tunnel would occur within the same trench. In terms of Factor 5, the Build Alternatives appear to be equal, except with respect to potential disruptions to rail service during the construction under Alternative 4.

Factor 6: After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f).

During construction, the LOD is limited to Virginia Avenue SE, Virginia Avenue Park, other public right-of-way associated with the 11th Street Bridges, CSX rail right-of-way and the Marine Corps Recreation Facility. No recreational elements of the Marine Corps facility would be affected. All of these properties would be restored to at least pre-construction conditions at the end of construction. When construction is completed, and the rebuilt Virginia Avenue Tunnel becomes fully operational, the LOD and the surrounding areas (both Section 4(f) and non-Section 4(f) resources) would revert back to the environmental conditions that existed prior to construction. The Project is essentially rebuilding existing transportation infrastructure. Therefore, in terms of Factor 6, the Build Alternatives appear to be equal.

Factor 7: Substantial differences in costs among the alternatives.

The costs for Alternatives 2 and 3 would be similar at approximately \$175 and \$168 million, respectively. At approximately \$208 million, the cost for Alternative 4 would be approximately 20 to 24 percent higher than Alternatives 2 and 3, respectively. One of the major factors affecting the higher cost of Alternative 4 is the more complicated construction phasing / temporary freight rail operations, which would also substantially extend the construction duration. Therefore, in terms of Factor 7, Alternative 4 would have a substantially higher cost than Alternatives 2 or 3.

#### 9.4.3 Planning and Measures to Minimize Harm

In addition to being a contributing resource to the CHHD, Virginia Avenue Park is also a public park and recreational facility, which qualifies it as a Section 4(f) property. To initiate discussion to determine measures to minimize harm to Virginia Avenue Park, as a recreational resource, coordination with NPS has been conducted throughout the NEPA process. This included NPS's role as a cooperating agency, NPS participation in six agencies meetings held to date, and a meeting with NPS National Capital Parks-East (the NPS park agency with direct oversight over the park) to discuss the approvals needed to allow construction. In addition, a meeting with DPR was held to date to discuss District level approvals needed to allow construction in the park.

At the conclusion of construction, the Project would restore Virginia Avenue Park to its pre-construction conditions. In addition, the Project would commit to providing enhancements and upgraded amenities to Virginia Avenue Park in coordination with the NPS and DPR.

## 10 Least Overall Harm to Section 4(f) Properties

As described in Section 9, there is no feasible and prudent alternative that avoids the Section 4(f) use of Virginia Avenue Tunnel, the L'Enfant Plan, the CHHD and Virginia Avenue Park. Alternatives 2, 3 and 4 remain as the only Build Alternatives that would address the Project Purpose and Need, but would still result in the Section 4(f) use of these properties.

This section is based on regulations contained in 23 CFR 774.3(c)(1). The analysis of least overall harm compared the Build Alternatives based on the seven factors contained in this part of the Section 4(f) regulations, which are listed in Section 4.1. Also noted in Section 4.1 is that only the alternative that causes the least overall harm to all affected Section 4(f) properties may be approved. If two or more alternatives are substantially equal in terms of harm to the 4(f) property(ies), any one of these alternatives may be selected.

The analysis considered proposed mitigation measures and the severity and location of the Section 4(f) use, and the results are provided below. Three of the four Section 4(f) properties are also historic properties protected under Section 106. The fourth property, Virginia Avenue Park, qualifies as a Section 4(f) property due to being a publicly-owned, public park, but use of this property is also the reason for the Section 4(f) use of the CHHD. The Section 106 consultation process is ongoing and the resolution of this process would inform which of the three remaining Build Alternatives would result in the least overall harm to the four Section 4(f) properties in terms of the seven factors listed in 23 CFR 774.3(c)(1). Any conclusions regarding the application of these seven factors cannot be made until the Section 106 process is completed or when the MOA is signed.

## 10.1 Analysis

Factor 1: The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property).

With regard to Virginia Avenue Tunnel, Alternatives 2, 3, and 4 would all result in the demolition and replacement of the tunnel. As noted in Section 8.1, an adverse effect determination in accordance with Section 106 would likely be rendered, and therefore, an MOA would be prepared, which would resolve, among other things, the adverse effect from the demolition of the existing tunnel. The MOA would include mitigation measures to address the demolition of the tunnel, which may include, but not necessarily limited to, formal recordation of the existing tunnel's historic characteristics, installation of an interpretive sign or plaque at a publicly accessible area noting the history of tunnel, and offering tunnel stones to interested organizations, such as Friends of Garfield Park..

The Project's impact to the L'Enfant Plan that requires a Section 4(f) use is the need for temporary longitudinal trenching along Virginia Avenue SE. Although the nature of the trenching among the three Build Alternatives would vary, all three would require the closure of Virginia Avenue SE between 2nd and 9th Streets SE for substantial periods of time. Despite the differences in trenching among the Build Alternatives, the construction mitigation measures would be almost identical. The MOT plan would be the same although the timing of certain MOT measures would vary. In addition, the selection of a Preferred Alternative for the Project would not factor in decisions about the post-construction condition of Virginia Avenue SE. The MOA would include mitigation to address the Section 106 adverse effects from the use of Virginia Avenue SE and subsequently the L'Enfant Plan.

The reason for the Section 4(f) use of the CHHD and Virginia Avenue Park is very similar to the reason for the use of the L'Enfant Plan--trenching lasting dozens of months within the park--which would temporarily close a large portion of the park to the general public. Again, despite the differences in trenching among the three Build Alternatives, the construction mitigation measures would be almost identical. The selection of a Preferred Alternative for the Project would not factor in decisions about the post-construction condition of Virginia Avenue Park. The MOA would include mitigation to address the Section 106 adverse effects from the use of the CHHD.

#### Preliminary Conclusion – Factor 1

Other than construction-period mitigation, the important mitigation measures of the Project involve the post-construction restoration of Virginia Avenue SE and Virginia Avenue Park. However, the selection of a Preferred Alternative would not factor in how these measures would be implemented. Upon completion of the Section 106 process, the mitigation measures identified in the MOA would inform which of the three Build Alternatives would result in the least harm to the four Section 4(f) properties.

Factor 2: The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection.

It should be noted that each of the Build Alternatives would have very similar impacts on the four protected Section 4(f) resources identified in Section 7. For example, all three Build Alternatives require demolition and replacement of the existing tunnel to meet the Purpose and Need of the Project. Upon demolition of the tunnel, the attributes and features that qualify it for protection would no longer exist. Regardless of the Build Alternatives selected, mitigation measures as defined in the MOA would be implemented, which may lessen the severity of the harm to the resource.

The impacts to the L'Enfant Plan, CHHD, and Virginia Avenue Park would be temporary, and although they constitute a Section 4(f) use, the conclusion of construction allows for the complete restoration of these resources as noted in Section 8. As a matter of engineering, the Build Alternatives, as described in Section 7, have been developed to emphasize engineering feasibility and minimize disruption to the community affected.

The Build Alternatives differ in three important aspects. First, the LOD or temporary construction area for Alternative 4 would be slightly narrower or smaller than Alternatives 2 and 3, which have the same LOD or construction area. Secondly, Alternatives 2 and 3 would be constructed more quickly than Alternative 4. An third, Alternative 3 would operate freight trains within a tunnel throughout construction, except for a 230 foot section immediately east of the 2nd Street portal. This open trench would end west of 3rd Street SE. Under Alternatives 2 and 4, freight trains would operate within an open, but protected, trench along the entire limits of the tunnel, or between 2nd and 11th Streets SE.

The narrower LOD under Alternative 4 may not be notable in terms of least harm to L'Enfant Plan because the difference is just a few feet. Despite this narrower LOD under Alternative 4, the LOD within the Marine Corps property would be the same as under Alternatives 2 and 3 due to possible utility relocations. In Virginia Avenue Park, Alternative 4's temporary construction area is smaller than what is needed for Alternatives 2 and 3, primarily because of the need to split the tunnel beginning on the west side of the park for both the runaround track (Alternative 2) and the new south side tunnel (Alternative 3). All three Build Alternatives avoid displacing the community garden and park benches along Potomac Avenue SE.

Alternatives 2 and 3 would require between 30 and 42 months for construction (same for construction within Virginia Avenue Park), whereas Alternative 4 would require 54 to 66 months of construction (38 to 54 months for construction within Virginia Avenue Park). The Section 4(f) use of the L'Enfant Plan and Virginia Avenue Park would therefore be shorter under Alternatives 2 and 3 than under Alternative 4, which is an important difference due to community concerns about construction duration.

Maintaining freight rail operations within the same trench as the demolition and rebuilding of Virginia Avenue Tunnel, as proposed by Alternative 4, is more complicated than how Alternatives 2 and 3 proposes to maintain freight transportation and rebuild the tunnel. In addition, having both activities within the same trench increases the risk that reconstruction of Virginia Avenue Tunnel inadvertently causes a disruption to freight transportation.

The third difference is pertinent to the Section 4(f) use of Virginia Avenue Park. Under Alternative 3, at no time would trains be operating in an open trench in the park. Under Alternatives 2 and 4, trains would operate in an open trench throughout most of the construction duration, and these areas would need to be kept secured from the general public for safety reasons.

It should be noted that the Section 106 consultation process may reveal other pertinent differences among the alternatives in terms of the relative severity of harm to the L'Enfant Plan.

#### Preliminary Conclusion – Factor 2

The Build Alternatives would result in very similar impacts, including those on the four Section 4(f) properties. With the exception of impacts on Virginia Avenue Tunnel, all the uses of and impacts on 4(f) properties are temporary and would occur only during the Project's construction period. All three Build Alternatives would demolish the existing tunnel. In terms of the relative severity of the harm on the other three Section 4(f) properties (L'Enfant Plan, CHHD, and Virginia Avenue Park), three factors are pertinent: (1) Alternative 4 would require a smaller temporary construction area in Virginia Avenue Park than under Alternatives 2 and 3; (2) Alternative 4 has a substantially longer duration of construction within the Section 4(f) properties than under Alternatives 2 and 3; and (3) during construction, Alternative 3 would keep temporary freight rail operations within a closed tunnel on Section 4(f) properties, including along sections of Virginia Avenue SE near residences and within Virginia Avenue Park.



Other pertinent differences may be revealed during the ongoing Section 106 consultation process. Therefore, the conclusion of the Section 106 process would inform which of the three Build Alternatives in terms of Factor 2 would result in the least harm to the Section 4(f) properties.

Factor 3: The relative significance of each Section 4(f) property.

The parties with jurisdictional authority over the Section 4(f) properties, which includes CSX, DC SHPO, NPS and DPR and may be inclusive of the consulting parties, may determine the relative significance of each of those properties in comparison to one another. This may factor in the determination of the alternative with the least overall harm to the affected Section 4(f) properties. However, because the three Build Alternatives would all require use of the same Section 4(f) properties in nearly the same amounts, the fact that one or more of them may be relatively more significant is immaterial for the purposes of identifying the least harm alternative.

#### Preliminary Conclusion – Factor 3

The conclusion of the Section 106 consultation process may inform which of the three Build Alternatives in terms of Factor 3 would result in the least harm to the Section 4(f) properties.

Factor 4: The views of the official(s) with jurisdiction over each Section 4(f) property.

Agencies or organizations with jurisdiction over the four affected Section 4(f) resources include the DC SHPO, NPS, CSX and DPR. Because the NEPA process is still ongoing, none of these organizations have stated a preference for an alternative. CSX has determined that Virginia Avenue Tunnel needs to be demolished and rebuilt to maintain CSX's long-term ability to provide efficient freight transportation services. The SHPO is anticipated to concur with the upcoming Section 106 adverse effect determination. The Section 106 effect determination and SHPO concurrence will be documented in the final Section 4(f) evaluation regarding Build Alternatives. Any views these organizations provide will be documented in the Final Section 4(f) evaluation and will factor in the determination of the alternative with the least overall harm to the affected Section 4(f) resources.

#### Preliminary Conclusion – Factor 4

The conclusion of the Section 106 consultation process may inform which of the three Build Alternatives in terms of Factor 4 would result in the least harm to the Section 4(f) properties.

Factor 5: The degree to which each alternative meets the purpose and need for the project.

Upon completion and regardless of the Build Alternative, the rebuilt Virginia Avenue Tunnel would meet the freight rail transportation needs over the next several decades. All three Build Alternatives would provide adequate provisions to maintain freight rail operations throughout construction. However, there are greater risks of service disruptions under Alternative 4 because temporary train operations and reconstruction of the tunnel would occur within the

same trench. However, there are greater risks of service disruptions under Alternative 4 because temporary train operations and reconstruction of the tunnel would occur within the same trench.

#### Preliminary Conclusion – Factor 5

In terms of Factor 5, the Build Alternatives appear to be equal, except with respect to potential disruptions to rail service during the construction under Alternative 4.

Factor 6: After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f).

During construction, the LOD is limited to Virginia Avenue SE, Virginia Avenue Park, other public right-of-way associated with the 11th Street Bridges, CSX rail right-of-way and the Marine Corps Recreation Facility. No recreational elements of the Marine Corps facility would be affected. All of these properties would be restored to at least pre-construction conditions at the end of construction. When construction is completed, and the rebuilt Virginia Avenue Tunnel becomes fully operational, the LOD and the surrounding areas (both Section 4(f) and non-Section 4(f) resources) would revert back to the environmental conditions that existed prior to construction. The Project is essentially rebuilding existing transportation infrastructure. Therefore, in terms of Factor 6, the Build Alternatives are equal.

#### Preliminary Conclusion – Factor 6

In terms of Factor 6, the three Build Alternatives appear to be equal.

Factor 7: Substantial differences in costs among the alternatives.

The costs for Alternatives 2 and 3 would be similar at approximately \$175 and \$168 million, respectively. At approximately \$208 million, the cost for Alternative 4 would be approximately 20 to 24 percent higher than Alternatives 2 and 3, respectively. One of the major factors affecting the higher cost of Alternative 4 is the more complicated construction phasing / temporary freight rail operations, which would also substantially extend the construction duration.

#### Preliminary Conclusion – Factor 7

In terms of Factor 7, Alternative 4 would have a substantially higher cost than Alternatives 2 or 3.

### 10.2 Preliminary Conclusion

There is no feasible and prudent alternative that avoids the Section 4(f) use of Virginia Avenue Tunnel, the L'Enfant Plan, the CHHD and Virginia Avenue Park, and Alternatives 2, 3 and 4 remain as the only Build Alternatives that would address the Project Purpose and Need, but would still result in the Section 4(f) use of these properties. Therefore, in accordance with 23

---

CFR 774.3, the alternative with the least overall harm to the Section 4(f) properties must be selected.

Least overall harm for this Project is measured solely in terms of temporary construction impacts because none of the Build Alternatives would result in post-construction impacts to the remaining Section 4(f) resources (the existing Virginia Avenue Tunnel would be demolished). In comparing least overall temporary harm attributable to the three Build Alternatives, there is no clear resolution at this time largely because three of the four Section 4(f) properties are historic properties (one of which doubles as a park) protected under Section 106. The Section 106 consultation is ongoing, and its conclusion would inform the determination of the least overall harm alternative. Specifically, any conclusions under Factors 1 through 4 would depend on the results of the Section 106 consultation. Factors 5 through 7 do not depend on the Section 106 consultation. The Build Alternatives appear to be equal in terms of Factors 5 and 6, although Alternative 4 would present higher risks of freight service disruptions during construction than under Alternatives 2 or 3. In terms of Factor 7, Alternative 4 would require a substantially higher cost than Alternatives 2 or 3 to build the Project.

The final approval to “use” of the four affected Section 4(f) properties with the resulting determination of the alternative with the least overall harm may be made in the Final EIS or the Record of Decision (ROD) document.

## 11 Overall Planning and Measures to Minimize Harm

Virginia Avenue Tunnel, the L’Enfant Plan and CHHD qualify as Section 4(f) properties because they are also an historic properties. An historic property is any district, site, building, structure or object that is on or eligible for listing on the National Register of Historic Places. NHPA Section 106 requires federal agencies, such as FHWA, to take into account the effects of their undertakings or actions on historic properties. The federal approvals needed to allow the Project to proceed are considered as federal undertakings or actions.

The Section 106 process requires that the federal agency first determine whether the undertaking could affect historic properties. If so, the federal agency must consult with the SHPO and others, which may involve the public and consulting parties (those with a particular interest in historic preservation). If not, the federal agency would have no further Section 106 obligations with respect to the undertaking by rendering a “no historic properties affected” determination. If historic properties are affected, the federal agency would render either an “adverse effect” or “no adverse effect” determination.

The Section 106 process for the Project was formally initiated on November 4, 2011. The Section 106 process for the Project is ongoing, and has involved three consulting parties meetings to date. A Section 106 “adverse effect” determination for the Project is expected, partially due to the required demolition of Virginia Avenue Tunnel and the temporary construction impacts to a L’Enfant Plan street (Virginia Avenue SE) and a contributing resource

to the CHHD (Virginia Avenue Park). The results of the Section 106 consultations for the Project will inform the Section 4(f) evaluation by:

- Obtaining the views of the, the officials with jurisdiction over Virginia Avenue Tunnel, ;
- Identifying the measures to minimize harm that could preserve the historic activities, features, or attributes of Virginia Avenue Tunnel in consultation with the SHPO and CSX in accordance with the consultation process under 36 CFR part 800; and
- Understanding whether the measures to minimize harm to Virginia Avenue Tunnel would result in any impacts or benefits to the surrounding community or environmental resources outside of the Virginia Avenue Tunnel corridor.

In addition to being a contributing resource to the CHHD, Virginia Avenue Park is also a public park and recreational facility, which qualifies it as a Section 4(f) property. The officials with jurisdiction over Virginia Avenue Park, a recreational resource, are the NPS and DPR. To initiate discussion to determine measures to minimize harm to Virginia Avenue Park, as a recreational resource, coordination with NPS has been conducted throughout the NEPA process. This included NPS's role as a cooperating agency, NPS participation in six agencies meetings held to date, and a meeting with NPS National Capital Parks-East (the NPS park agency with direct oversight over the park) to discuss the approvals needed to allow construction. In addition, a meeting with DPR was held to date to discuss District level approvals needed to allow construction in the park.

Regardless of the Build Alternative, mitigation measures to address the adverse effects to Virginia Avenue Tunnel, L'Enfant Plan and CHHD would be outlined in a MOA prepared in accordance with Section 106. The MOA would be subject to input from CSX, the SHPO, NPS, DPR and the consulting parties, and the final version would be signed at a minimum by the FHWA and SHPO.

The measure to minimize harm to Virginia Avenue Tunnel in the MOA may include, but not necessarily limited to, formal recordation of the existing tunnel's historic characteristics, installation of an interpretive sign or plaque at a publicly accessible area noting the history of tunnel, and offering tunnel stones to interested organizations, such as Friends of Garfield Park.

Once the construction of the Project is concluded, traffic (including pedestrians and bicyclists) would be restored on Virginia Avenue SE. In addition, the Project could provide the following improvements to Virginia Avenue SE between 2nd and 9th Streets SE:

- Bicycle lane and/or shared-use pedestrian/bicycle path;
- Street alignment straightening between 4th and 5th/6th Streets SE (currently, the alignment bows to the south, deviating from the original L'Enfant Plan alignment);
- Additional landscaped areas;
- Reduction of lanes to encourage lower speeds;
- Provision of additional on-street parking where appropriate; and
- Improved street lighting, traffic signals and crosswalks.

At the conclusion of construction, the Project would completely restore Virginia Avenue Park to its pre-construction conditions. In addition, the Project would commit to providing enhancements and upgraded amenities to Virginia Avenue Park in coordination with the NPS and DPR.

The Project's complete Section 106 consultation process and other related Section 4(f) coordination activities, which will inform the Section 4(f) evaluation regarding the minimization of harm to the Virginia Avenue Tunnel, the L'Enfant Plan, the CHHD and Virginia Avenue Park, will be fully disclosed in the Final EIS. The Final Section 4(f) Evaluation will be based upon the conclusion of the Section 106 consultation.

## 12 Agency Coordination

The NPS, DPR, NCPC, the Commission on Fine Arts, District Office of Planning, the U.S. Marine Corps, the U.S. Department of Navy, the Advisory Council for Historic Preservation (ACHP), the DC SHPO, and other interested stakeholders, such as the Capitol Hill Restoration Society and the Virginia Avenue Community Garden, are participating as Section 106 consulting parties. The NPS is also a NEPA Cooperating Agency on the Draft EIS. In addition, dozens of briefings were held with a number of agencies, and Project interagency meetings were held. A summary of the agency coordination activities is provided in Table 1. To date, the SHPO, NPS, DPR, the Marine Corps or other agency have not stated a preference for an alternative.

## 13 Section 4(f) Conclusion

Four Section 4(f) properties will be affected by the reconstruction of the Virginia Avenue Tunnel project. They are: (1) Virginia Avenue Tunnel; (2) the L'Enfant Plan; (3) the Capitol Hill Historic District; and (4) the Virginia Avenue Park. With the exception of the Section 4(f) "use" by incorporation of the existing Virginia Avenue Tunnel, all other Section 4(f) "uses" would be temporary and would occur only during the construction period. At the conclusion of the construction, all surface areas, including the affected Section 4(f) properties, would be restored to at least their pre-construction conditions.

There is no feasible and prudent alternative, as defined in 23 CFR 774.17, to the "use" of land from the Virginia Avenue Tunnel, and the temporary occupancy of the L'Enfant Plan, Capitol Hill Historic District, and Virginia Avenue Park. The Project would include all possible planning, as defined in 23 CFR 774.17, to minimize harm to Section 4(f) properties resulting from such "use". The project sponsor, CSX, has committed to improve the function and appearance of Virginia Avenue SE and provide additional amenities at Virginia Avenue Park as part of the Project as a community benefit, and will work with the agencies with jurisdiction (DC SHPO, NPS and DPR) over these properties to identify such measures to minimize or mitigate harm and enhance the properties, as appropriate. CSX would also work with FHWA, DDOT, the community and other stakeholders to identify the appropriate enhancements and amenities. Despite these mitigation measures, some measures would not be determined until the conclusion of the Section 106 consultation process when mitigation measures are outlined in a signed MOA.

Table 1  
Summary of Agency Coordination Activities

Date	Agency	Form	Purpose
October 6, 2010	Various-Interagency	Meeting	Briefing on CSX projects in the District
July 28, 2011	Various-Interagency	Meeting	NEPA scoping
August 11, 2011	DC Fire and Emergency Medical Services Department	Letter	Provided scoping comments
August 19, 2011	U.S. Environmental Protection Agency, Region III	Email	Provided scoping comments
August 23, 2011	DC Department of Housing and Community Development	Letter	Provided scoping comments
September 6, 2011	NCPC	Letter	Provided scoping comments
September 8, 2011	DC SHPO	Letter	Provided scoping comments
November 16, 2011	Various-Interagency	Meeting	Briefing on Project concepts
November 22, 2011	DC SHPO	Letter	Section 106 initiation and comments
February 14, 2012	Various, including community organizations	Meeting	Section 106 consulting parties meeting #1: Project introduction
March 15, 2012	Various-Interagency	Meeting	Concepts screening process
March 21, 2012	DC SHPO	Meeting	Section 106 Area of Potential Effects (APE)
May 8, 2012	Various-Interagency	Meeting	Concepts evaluation
May 21, 2012	Various, including community organizations	Meeting	Section 106 consulting parties meeting #2: identification of historic properties in APE
September 11, 2012	Various-Interagency	Meeting	Briefing on fourth public meeting
September 12, 2012	DC SHPO	Meeting	Preliminary effect determinations
September 26, 2012	Various, including community organizations	Meeting	Section 106 consulting parties meeting #3: preliminary effect determinations
January 10, 2013	DC SHPO	Meeting	Potential mitigation measures
February 12, 2013	DPR	Meeting	Approvals to allow construction in Virginia Avenue Park
February 12, 2013	NPS National Capital Parks-East	Meeting	Approvals to allow construction in Virginia Avenue Park

Coordination among the FHWA, DDOT, SHPO, NPS, DPR, FRA, NCPC, U.S. Marine Corps, and other stakeholders, consulting and interested parties is ongoing, and will continue. A final determination of the least overall harm alternative in light of preservation purpose of Section 4(f) would be made by balancing the factors considered in Section 10 and the comments made by the agencies and the public. The potential key factors for discussion among the stakeholders would be: (1) a smaller temporary construction area in Virginia Avenue Park for Alternative 4, but a substantially longer construction period, and (2) a somewhat larger temporary construction area in Virginia Avenue Park for Alternatives 2 and 3, but a substantially shorter construction period.

The determination of the alternative with the least overall harm to the four affected Section 4(f) properties may be documented in the final Section 4(f) evaluation that would be contained in the Final EIS for this Project, and at the conclusion of the Section 106 consultation process. At that time, one of the alternatives will be advanced as the preferred alternative, which would also be the alternative with the least overall harm to the Section 4(f) properties. However, it is possible, that final approval to “use” the affected Section 4(f) properties may be made in the ROD.

THIS PAGE INTENTIONALLY LEFT BLANK.