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Monumental Core Streetscape Design Guidelines: Vertical and Surface Elements

February 2022

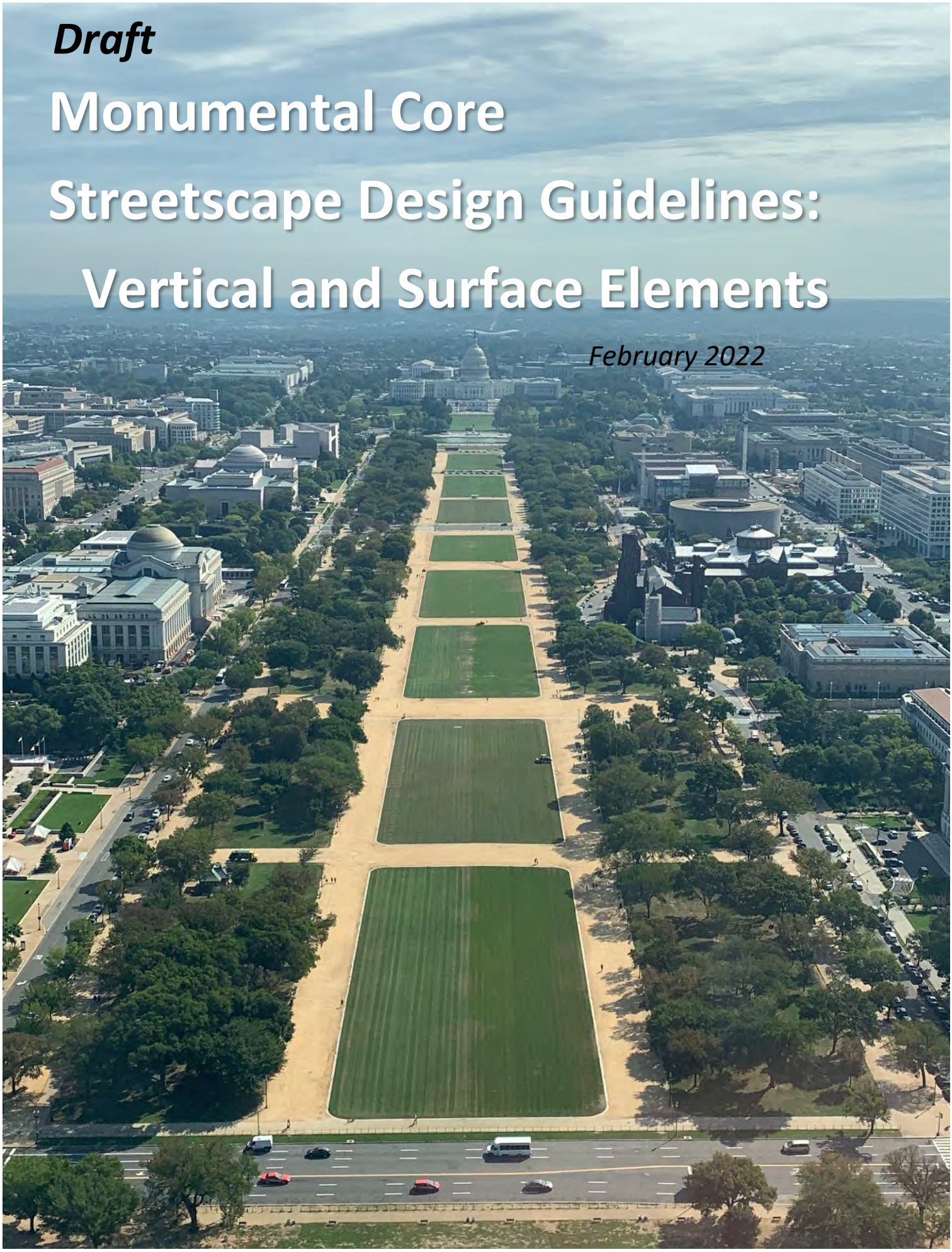


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Preface

The National Capital Planning Commission (NCPC), in coordination with the National Mall Interagency Working Group (IWG), prepared the Streetscape Design Guidelines: Vertical and Surface Elements. The IWG consists of eleven federal and local agencies including:

- Architect of the Capitol (AOC)
- U.S. Commission of Fine Arts (CFA)
- District of Columbia Office of Planning (DCOP)
- Government of the District of Columbia, District Department of Transportation (DDOT)
- U.S. Department of Transportation Federal Highway Administration (FHWA)
- U.S. General Services Administration (GSA)
- John F. Kennedy Center for the Performing Arts (Kennedy Center)
- National Capital Planning Commission (NCPC)
- National Gallery of Art (NGA)
- U.S. Department of the Interior, National Park Service, National Capital Region (NPS)
- Smithsonian Institution (SI)

The Streetscape Design Guidelines cross references federal and local policies, guidance, standards, and regulations current to the period of guideline development, including but not limited to the following:

- Americans with Disabilities Act Accessibility Guidelines (2010)
- Architectural Barriers Act Accessibility Standards (2014)
- DC Public Realm Design Manual Version 2.1 (2019)
- DDOT Design and Engineering Manual (2019)
- DDOT Green Infrastructure Standards (2014)
- DDOT Streetlight Policy and Design Guidelines (2013)
- DOEE Stormwater Management Guidebook (2020)
- International Building Code (2021)
- (Proposed) Public Rights-of-Way Accessibility Guidelines (2013)
- Uniform Federal Accessibility Guidelines (2004)

Because federal and local guidance change over time, always refer to current guidance. See agency publications for most current guidance.

Acronyms

AASHTO – American Association of State Highway and Transportation Officials
ABAAS – Architectural Barriers Act Accessibility Standard
ADA – Americans with Disabilities Act
ANSI – American National Standards Institute
AOC – Architect of the Capitol
AWDZ – Anacostia Waterfront Development Zone
BMP – Best Management Practice(s)
CFA – U.S. Commission of Fina Arts
CSRG – Companion Streetscape Review Guide
CSO – Combined Sewer Overflow
DCMR – District of Columbia Municipal Regulations
DCOP – District of Columbia Office of Planning
DDOT – District Department of Transportation
DEM – Design and Engineering Manual
DPW – Department of Public Works
DOEE – Department of Energy and Environment
DSR – Downtown Streetscape Regulations
EISA – Energy Independence and Security Act
FHWA – Federal Highway Administration
GAR – (DOEE) Green Area Ratio
GIS – (DDOT) Green Infrastructure Standards
GSA – General Services Administration
IBC – International Building Code
IEBC – International Existing Building Code
IWG – Interagency Working Group
MOU – Memorandum of Understanding
MS4 – Municipal Separate Storm Sewer System
NACTO – National Association of City Transportation Officials
NAMA – National Mall and Memorial Parks
NCPC – National Capital Planning Commission
NCR – National Capital Region
NFPA – National Fire Protection Association
NGA – National Gallery of Art
NPS – National Park Service
OCTO – Office of the Chief Technology Officer
PLOC – Pedestrian Level of Comfort
PRDM – Public Realm Design Manual
PROWAG – Public Rights-of-Way Accessibility Guidelines
PWA-Public Works Administration
ROW – Right(s)-of-Way
SI – Smithsonian Institution
SMG – (DOEE) Stormwater Management Guidebook
UFD – Urban Forestry Division
WMATA – Washington Metropolitan Area Transit Authority

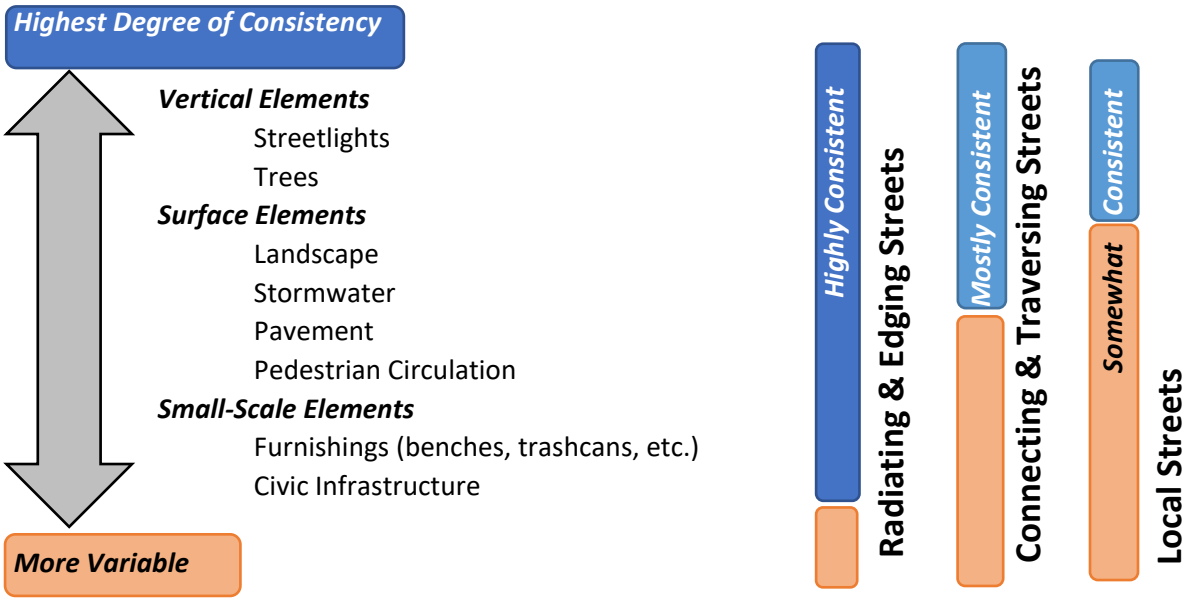
Introduction

Purpose: The purpose of this document is to provide **guidance for coordinated and consistent streetscape treatment for roadways[1] in the National Mall and vicinity within Washington, D.C.'s downtown monumental core.**[2] This work effort fulfills tasks set forth in a Memorandum of Understanding (MOU) signed in 2020 among eleven federal and local National Mall Interagency Working Group (IWG) members.[3]

Importance: This guidance is important for developing streetscape consistency along nationally and locally significant corridors, many of which frame views to nationally significant structures and open spaces within the capital city as identified by the National Capital Planning Commission's (NCPC) Urban Design Streetscape Framework. The Streetscape Framework categorizes monumental core streets and provides guiding principles that reinforce streetscape consistency among vertical, surface, and small-scale elements.

Diagram of Streetscape Framework Elements and Principles:

The following diagram illustrates how the streetscape elements relate to the street category principles, which inform the degree of streetscape consistency.



The Streetscape Design Guidelines, the focus of this document:

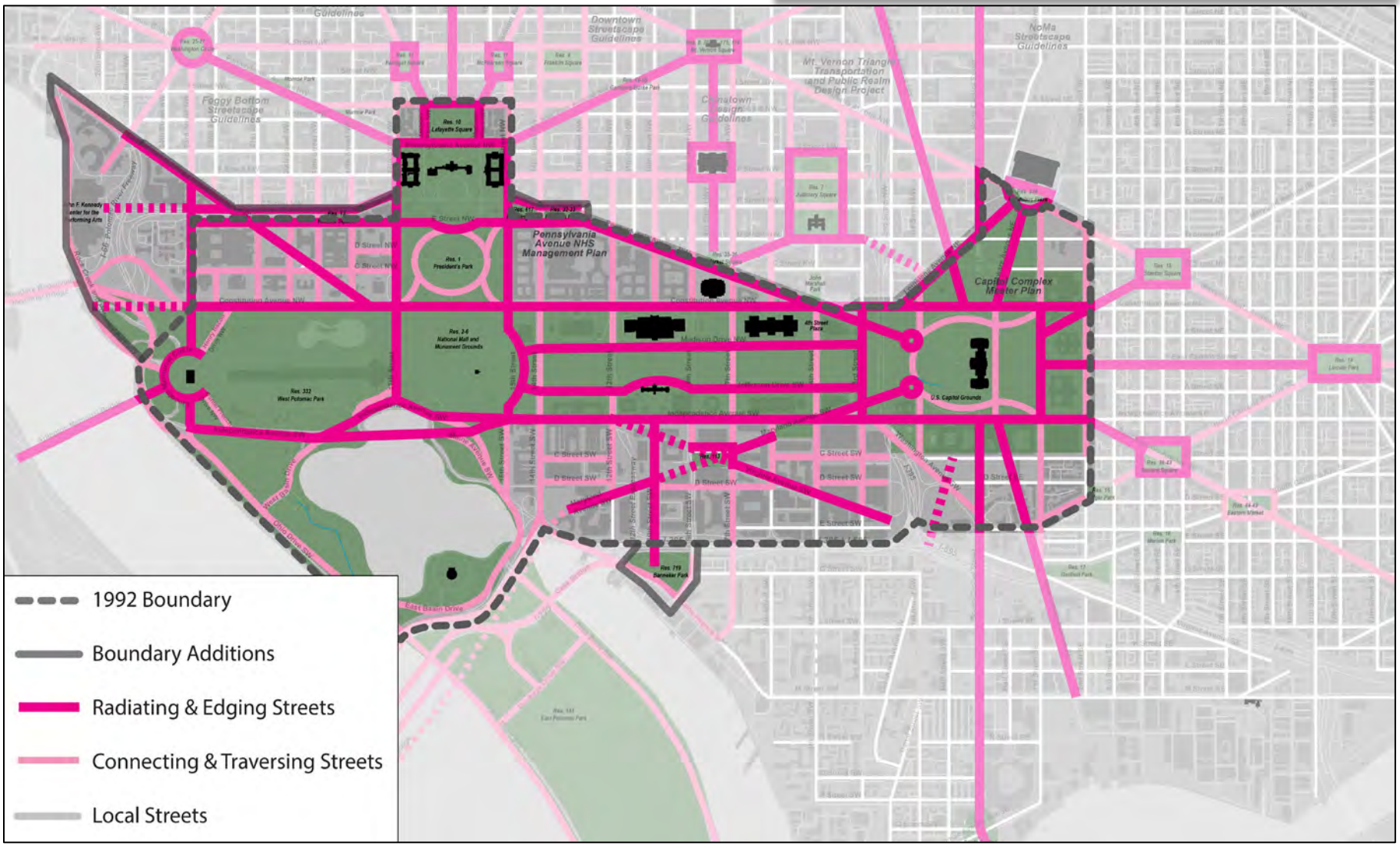
- Build on the Streetscape Framework's principles including the need for highly consistent streetscapes on Radiating and Edging Streets and moderately consistent streetscapes on Connecting and Traversing streets.
- Provide guidance for streetscape design character and physical quality including the configuration, placement, and alignment of vertical and surface streetscape elements such as streetlights, trees, landscape, and pavement.

Boundary: This document addresses the geographic area defined by the 1992 Streetscape Manual Boundary, which is amended to include:

- Banneker Park, a National Park Service (NPS) property.
- Kennedy Center and surrounding areas, including the Virginia Avenue corridor.
- E Street, NW within the 1974 Pennsylvania Avenue Plan and Monumental Core Framework Plan.

Map 1: Streetscape Guide and Manual Boundary

For the purposes of this document, the area is referred to as the Streetscape Guide and Manual Boundary (the Boundary).



Note: *Interstates, freeways, tunnels, and other similar infrastructure are exempted from the Streetscape Guide and Manual.*

Overview

: The Streetscape Guide and Manual includes four components, each intended for different users, and currently at varying stages of completion as follows:

1. **Urban Design Streetscape Framework**: Categorizes streets and identifies urban design principles and night lighting policies for urban planners and designers. The Framework should be used when project plans impact streetscapes and public space. *(The Framework was completed in 2019.)*

2. **Streetscape Design Guidelines**: Provides streetscape guidance and recommendations for urban planners and designers, landscape architects, and architects. The Guidelines should be used when planning and designing streetscape projects, improvements, or repairs. *(The Guidelines are two-thirds complete and will be finalized in late 2022/early 2023.)*

3. **Construction Manual:** Provides construction details, specifications, and standards for landscape architects, architects, engineers, and construction and facilities managers. The Manual must be used when planning and constructing streetscape projects, improvements, or repairs. *(The Manual update will be initiated, and work to finalize LED Lighting specifications will begin in early 2022.)*

4. **MOU:** Identifies roles and responsibilities for federal and local agencies comprising the IWG, to coordinate and implement the Streetscape Guide and Manual. *(The MOU update will occur once the Streetscape Guidelines and Manual are complete.)*

Note: *Once completed, the Streetscape Guide and Manual will require periodic updates to incorporate new streetscape standards, address evolving technologies, meet current needs, and/or achieve current performance standards or best practices.*

Applicability

: The Streetscape Guide and Manual apply to federal and District roadways inside the Boundary and on both sides of the street along the Boundary's perimeter. Application is dependent on geographic area and jurisdiction as outlined below:

Federal and District Roadways Inside the Boundary: The Boundary area includes both federal and District roadways. In general, the Streetscape Design Guidelines and Construction Manual incorporate District Department of Transportation (DDOT) standards and coordinate them with federal standards to achieve visually cohesive streetscapes.

Federal Roadways: Roadway projects, improvements, and repairs should meet Architect of the Capitol (AOC) and/or NPS standards, based on jurisdictional administration of the roadway, and as directed in the Streetscape Guide and Manual, and coordinated among the IWG.

District Roadways: Roadway projects, improvements, and repairs should meet DDOT standards, based on jurisdictional administration of the roadway, and as directed in the Streetscape Guide and Manual, and coordinated among the IWG.

District Roadways Outside the Boundary: Federal and local agencies share an interest in ensuring streetscape consistency along important streetscape corridors that frame views to nationally significant structures and open spaces and connect local and federal neighborhoods. To improve streetscape consistency along important corridors, to document established District standards and practices, and to coordinate with federal guidance, District of Columbia Office of Planning (DCOP), DDOT, and NCPC are developing guidelines that will be packaged

into a user-friendly guide called the Companion Streetscape Review Guide (CSRG). (The first three *streetscape guidelines for 16th Street NW, South Capitol Street, and Massachusetts Avenue will be finalized in early 2022.*)
Outside of the Boundary, roadway improvements and repairs should meet DDOT standards, based on jurisdictional administration of the roadway, for all construction elements including but not limited to stormwater infrastructure, tree boxes, and streetlighting.

Note: *The Streetscape Guide and Manual address permanent streetscape elements. They do not address temporary streetscape elements such as those used for special events or perimeter security. The Federal Comprehensive Plan: Urban Design Element provides guidance on perimeter security.*

Administration

: The Streetscape Guide and Manual should be used by applicants during project planning and development and by Federal and District staff during project review. Administration is dependent on geographic area and jurisdictional requirements and procedures as outlined below:

Federal and District Roadways Inside the Boundary: The Boundary area includes roadways under both federal and District administration. Streetscape projects, improvements, and repairs on federal and District roadways should be planned and implemented in coordination and consultation with the IWG using the Streetscape Guide and Manual.

Federal Roadways: Streetscape projects and improvements must be reviewed by:

- **U.S. Commission of Fine Arts (CFA):** Reviews streetscape projects and improvements as determined in consultation with CFA. CFA staff will use the Streetscape Guide and Manual during project review.
- **National Capital Planning Commission (NCPC):** Reviews streetscape projects and improvements on federal land. Project review guidance is provided within NCPC's Submission Guidelines. NCPC staff will use the Streetscape Guide and Manual during project review.

District Roadways: Streetscape projects and improvements must be reviewed by:

- **CFA:** Reviews streetscape projects and improvements as determined in consultation with CFA. CFA staff will use the Streetscape Guide and Manual during project review.
- **NCPC:** Reviews streetscape projects and improvements associated with federal site development projects. At the request of the applicant, NCPC reviews streetscape projects and improvements not associated with federal site development projects. NCPC staff will use the Streetscape Guide and Manual during both required and discretionary project reviews.
- **DDOT:** Reviews streetscape projects, improvements, and repairs. Projects that occupy, construct, and/or install in or on publicly owned space between the property lines of a street (including roadway, tree space, sidewalk, or public parking[4] between such property lines) must apply for a Public Space Permit. The District determines whether Public Space Committee review is required.
- **Public Space Committee:** Reviews non-DDOT-standard streetscape treatments. A maintenance agreement is required for any non-standard elements.

District Roadways Outside the Boundary: Outside the Boundary, roadway improvements and repairs should meet DDOT and Public Space Committee review requirements and federal review requirements where relevant:

- **DDOT:** Reviews streetscape projects, improvements, and repairs. Projects that occupy, construct, and/or install in or on publicly owned space between the property lines of a street (including roadway, tree space, sidewalk, or public parking[5] between such property lines) must apply for a Public Space Permit. The District determines whether Public Space Committee review is required.

- **Public Space Committee:** Reviews non-DDOT-standard streetscape treatments. A maintenance agreement is required for any non-standard elements.
- **Federal Reviews (where relevant):**
  - **CFA:** Reviews streetscape projects and improvements as determined in consultation with CFA.
  - **NCPC:** Reviews streetscape projects and improvements associated with federal site development projects. At the request of the applicant, NCPC reviews streetscape projects and improvements not associated with federal site development projects.
- **Companion Streetscape Review Guide (CSRG):** For important streets with shared federal and local interest, District and federal staff will reference the Companion Streetscape Review Guide during project review.

Resolution Process: If the Streetscape Guide and Manual recommendations and standards cannot be achieved for any reason, the applicant should consult with federal and/or local review agencies, coordinating with the IWG as needed, to resolve issues in a manner that both meets the Guide and Manual intent and accounts for limitations or constraints.

Administrative Limits: The Streetscape Guide and Manual does not:

- Expand or alter CFA or NCPC review authorities
- Plan capital improvement projects
- Address roadway funding priorities
- Address transportation engineering or operations

Phasing and Implementation:

The Streetscape Guide and Manual will be implemented over time as streetscape and public realm projects are completed, or as agency's major capital improvement projects are funded and implemented. Therefore, the Guide's vision will be realized as projects are implemented over time. The Streetscape Guide and Manual will introduce new elements or modify older elements to incorporate new streetscape standards, address evolving technologies, meet current needs, and/or achieve current performance standards or best practices (such as for improved energy and stormwater management). New elements will be selected, and older elements will be modified to complement and harmonize with existing elements. Therefore, old, modified, and new elements will be in place at the same time, but there will be a complementary family of streetscape elements to ensure visually consistent streetscape corridors.

Special Circumstances:

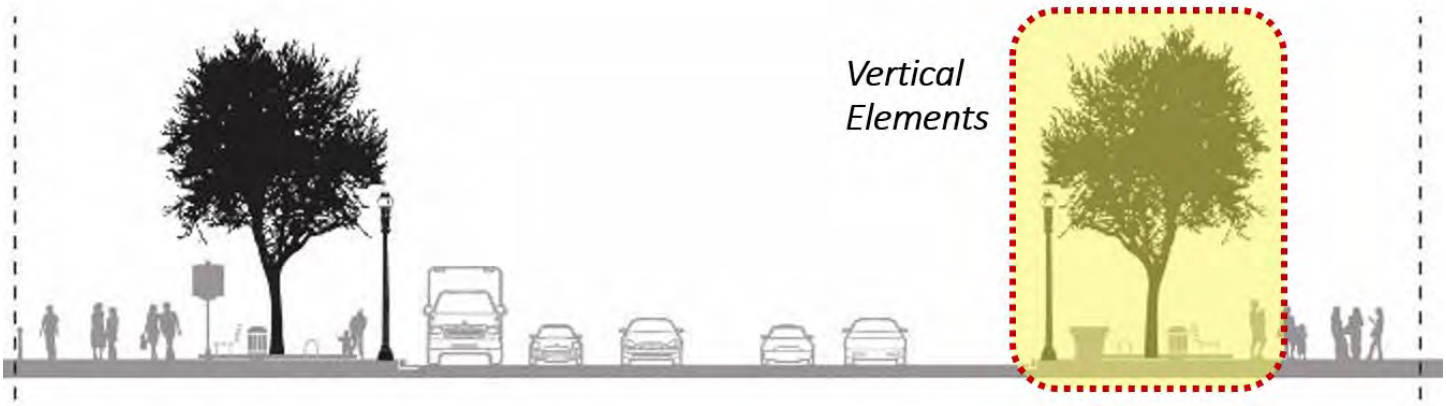
Select locations have unique conditions where:

- Above and below ground buildings, structures, roadways, or tunnels are near one another.
- Interagency coordination may be needed to address potential constraints.

The Streetscape Guide and Manual do not address unique conditions, such as:

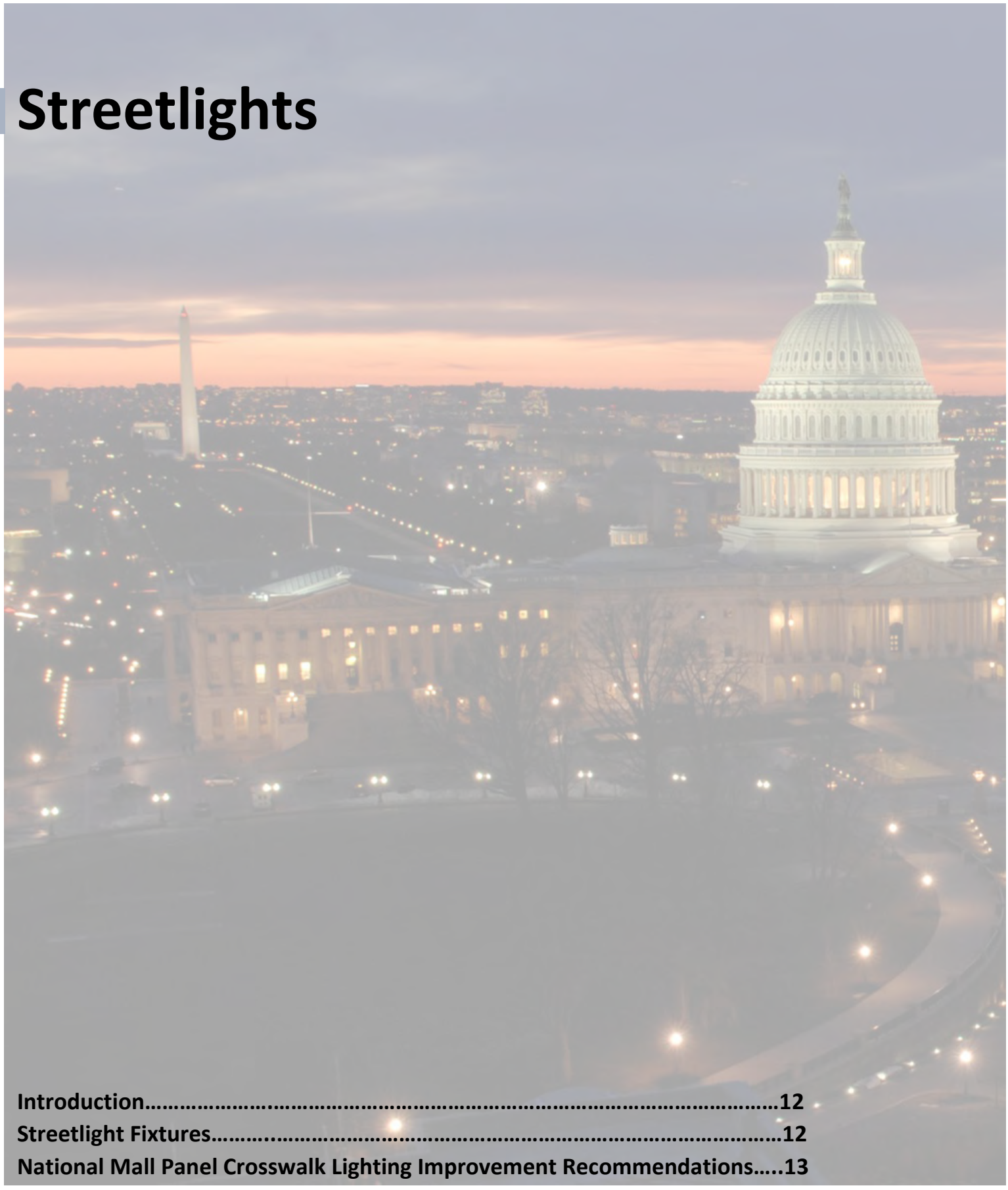
- Fourth Street, NW functions as the entry plaza between the East Building and West Building of the National Gallery of Art. A below-grade building connects the two buildings beneath Fourth Street.
- Jefferson Drive, SW has a below-grade tunnel connecting the Hirshhorn Gallery to the Sculpture Garden.
- Third, Ninth, and Twelfth Streets tunnel below the National Mall, museums, and gardens. Certain work above or near tunnels may be constrained.
- Interstates, freeways, tunnels, and other similar infrastructure.

Vertical Elements



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Streetlights



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Introduction

This guidance addresses streetlight fixtures[6] (or streetlight poles) along roads, sidewalks, and pedestrian walkways within areas of the capital city's monumental core. These streets are illustrated on **Map S-1: Streetlight Fixtures**. Because federal and local agencies are at various stages of retrofitting and replacing luminaires with LED (light-emitting diode) light sources to improve energy efficiency, this guidance does not address the quality and character of light emitted from streetlights. This guidance only addresses the placement and type of streetlight fixtures within the monumental core.

Importance and Background:
Streetlight fixtures (or streetlight poles) are contributing to the character of the capital city's historic districts[7] and cultural landscapes[8], and are important elements of the avenues, streets, reservations, and vistas that contribute to the historic Plan of the City of Washington. The design of streetlighting is important for safe illumination of streets and sidewalks, effects on illumination of buildings and landscapes, and effects on nighttime views and ambiance.

Topics Addressed by these Guidelines:
The Streetlight Guidelines address the following topics:

- **Streetlight Fixtures:** Identifies streetlight fixture (or streetlight pole) location, type, height, and configuration.
- **National Mall Panel Crosswalk Lighting Improvement Recommendations**: Provides guidance for potential new streetlight fixtures for the purpose of improving pedestrian crosswalk illumination on the National Mall.

Streetlight Fixtures

The streetlight fixture (or streetlight pole) locations are shown on **Map S-1: Streetlight Fixtures** and identify placements, heights, and spatial configurations for Washington's historic and distinctive streetlight fixture types. Streetlights are located in a manner that enhances the expression of the capital city's street hierarchy and distinguishes character areas. Some streetlight fixtures are intended to stand out from the rest, because they are either preeminent roads from the historic Plan of the City of Washington, DC, or have streetscape elements contributing to the character of historic districts, cultural landscapes, or special areas.

Detailed drawings and descriptions of several streetlight fixtures (or streetlight poles) referenced in this section can be found in the Streetscape Manual – Interagency Initiative for National Mall Road Improvement Program (2013).

Principle: Streetlight fixtures should unify Washington's city streets, express the dignity of the federal city, and highlight unique areas with special fixtures.

Streetlight Fixture Types: Descriptions of each streetlight fixture type (or streetlight pole) follow:

- **Twin-Twenty Fixture:** Designed in 1923 by Henry Bacon (member of the U.S. Commission of Fine Arts) to express the dignity of the federal city.[9]
- **Washington Globe Fixture:** Designed in 1910 by Francis D. Millet (member of the U.S. Commission of Fine Arts) to unify Washington's city streets. Washington Globes range in heights from 18ft to 14ft.[10]
- **Olmsted Fixture:** Designed in 1935 by J. W. Gosling (designer employed by General Electric laboratories) to enhance the National Mall vista.[11] The Olmsted fixtures are named after Frederick Law Olmsted Jr., a landscape architect who developed and guided the McMillan Plan.

- **Pennsylvania Avenue Three-Tiered Lighting Suite:** Designed in 1977 by Raymond Grenald Associates of Philadelphia to solidify the avenue's linearity and emphasize its two significant terminuses; the U.S. Capitol building and White House. The three-tiered suite includes high-mast cobraheads to illuminate the streets, historic Washington Globe lights with eagle finials to tie the avenue into the surrounding historic urban fabric, and twin-headed pedestrian-scaled lights modeled after Albert Paley's street tree grates to illuminate the avenue's sidewalks.[12]
- **Capitol Square Ladder Rest Globes:** Designed in 1880 by Frederick Law Olmsted to illuminate the curvilinear walkways within the lawns of the U.S. Capitol Grounds, they have two bracket arms or ladder rests for manually lighting and extinguishing the formerly gas-lit lanterns.
- **Kutz Bridge Saratoga Lights:** Designed as part of Public Works Administration (PWA) restorations, they are similar to the Olmsted fixtures.[13]
- **Tenth Street, SW Lights:** Designed in 1966 by architect Araldo A. Cossutta and installed along 10th Street, SW or L'Enfant Promenade, these fixtures feature five spherical globes mounted on twin poles.[14]
- **Kennedy Center Lighting Suite:** Installed during the 2004 Garage Expansion and Site Improvements Project, the two-tiered suite includes tall post top lights to illuminate streets, and pedestrian-scaled down lights to illuminate sidewalks.

National Mall Panel Crosswalk Lighting Improvement Recommendations

Principle: Improve nighttime crosswalk safety while retaining the character of the National Mall and protecting environmental and cultural resources.

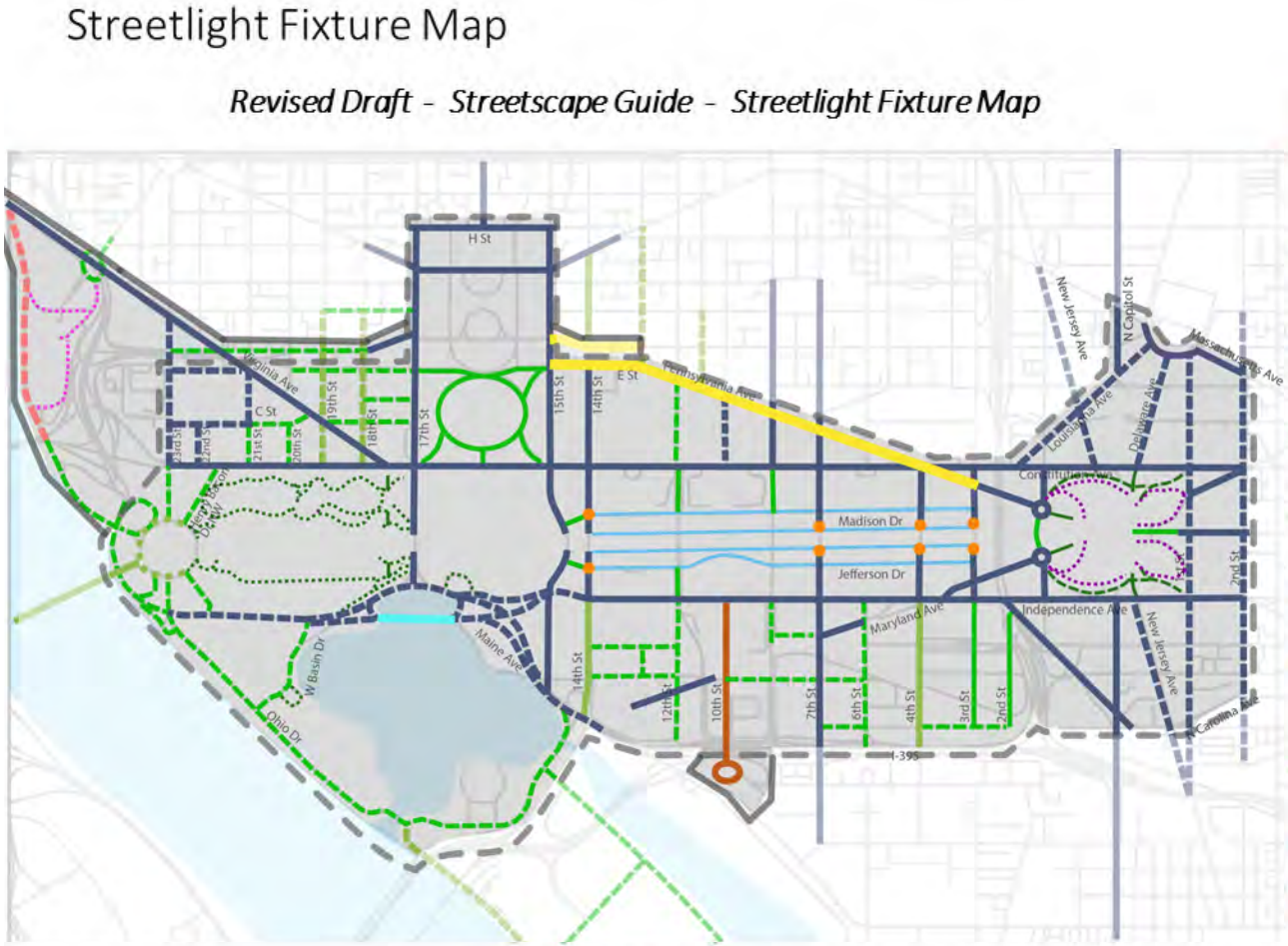
Context for the Central National Mall Panel and Viewshed Area: The area of the National Mall including the central National Mall panels and viewshed west of the U.S. Capitol building (located between the pedestrian mid-block crossings at 3rd, 4th, 7th, 14th, 15th, and 17th Streets) is of historic national significance and shall remain open and clear of obstructions. Therefore, the roadways which intersect this protected viewshed shall be omitted when analyzed for roadway lighting. However, pedestrian crosswalks shall be illuminated to ensure safety within this area based on the following recommendations:



Figure S-2: Existing Condition of the National Mall: Single line of lights flank the sides of the center panel.

Map S-1: Streetlight Fixtures

Principle: To achieve a consistent streetlight fixture palette on the National Mall, use Twin-Twenty fixtures on above-grade streets that edge or cross the National Mall.



* Heights shown are approximate fixture mounting heights (as measured from light source to roadway surface). See section drawings within the Streetscape Manual for actual dimensions.

Streetlight Fixture	Height*	Configuration
Cobrahead	30	Staggered
Twin-Twenty (including State Dept)	20 ft	Opposite Staggered
Washington Globe	18 ft	Opposite Staggered 1-Sided
Washington Globe	16 ft	Opposite Staggered
Washington Globe (historic areas)	14 ft	Opposite Staggered 1-Sided
Olmsted	24 ft	Opposite
Penn Ave Cobrahead Penn Ave Pedestrian Penn Ave Eagle Globe	40 ft 8' – 6" 16 ft	Opposite Opposite Opposite
Capitol Square Ladder Rest Globe	13 ft	1-Sided
Kutz Bridge Saratoga	19 ft	Opposite
10th Street, SW (L'Enfant Promenade)	20 ft	Opposite
Kennedy Ctr Post Top Kennedy Ctr Pedestrian	30 ft 12 ft	1-Sided 1-Sided
Crosswalk Fixture (See Recommendations)	TBD	Placed at Crosswalks (See Recommendations)

Streetlights

S-1. Improve nighttime pedestrian safety while retaining the civic, monumental, and historic character of the National Mall: Additional lighting may be added adjacent to the National Mall panel crosswalks to improve nighttime safety and visibility for drivers, bicyclists, and pedestrians[15]. Improvements should focus light only onto crosswalks - not adjacent roadways - to preserve the existing low light level within the central National Mall panel, which is the primary vista west of the U.S. Capitol building. The existing low light level is important to conveying the civic, monumental, and historic character of the National Mall and retaining its complementary relationship to nationally iconic structures, which reinforces a dignified expression of the federal city. Therefore, any additional lighting on the National Mall should have low ambient light levels to support a dark backdrop for highlighted monuments, memorials, and civic buildings.

S-2. Minimize crosswalk lighting impacts on viewsheds: The scale, character, and placement of any additional crosswalk lighting shall minimally impact viewsheds and the pedestrian experience during day and night. Therefore, the placement of any additional crosswalk lighting fixtures should align with existing light fixtures for a continuous row of lights flanking both edges of the center panel. Additional lights should not intrude into the center panel area within the primary vista west of the U.S. Capitol building. The height of any additional crosswalk lighting fixtures should be proportionate to pedestrians and similar to the heights of historic street and park light fixtures (particularly the Olmsted fixtures which are 24 feet high and 22 feet to height of light source).

S-3. Crosswalk lighting fixtures should be compatible with the historic character of streetlights: Any additional lighting for crosswalk illumination should be compatible with historic streetlights including Washington Globe and Twin-Twenty fixtures. Additional lighting should be compatible with the existing streetlight palette, rather than park lighting. Any compatible high-performance fixture should achieve ground level illuminance equal to or better than historic light fixtures. Pendant pole fixtures used elsewhere in the District, such as Teardrops and Cobraheads, are not acceptable for the National Mall due to their excessive height.

S-4. Focus crosswalk light downward to protect environmental and cultural resources: Any additional lighting for crosswalk illumination should focus light primarily downward to improve nighttime safety while minimizing up-light and glare. Up-light negatively impacts the night sky. Glare negatively impacts the National Mall's nighttime character and viewsheds, as well as driver, bicyclist, and pedestrian visibility.

Trees



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Introduction

This guidance addresses street trees along roads, sidewalks, and pedestrian walkways within areas of the capital city's monumental core. These streets are illustrated on **Map T-1: Recommended Tree Form** and **Map T-2: Recommended Tree Rows.**

Importance and Background:

Street trees are contributing to the character of the capital city's historic districts and cultural landscapes, and are important elements of the avenues, streets, reservations, and vistas that contribute to the historic Plan of the City of Washington. Street trees are important for ecological function, pedestrian comfort and enjoyment, visually framing vistas and viewsheds, and positive effects on the built environment, such as shading walkways and buildings

In the 1870s, Washington, DC was known as the "city of trees" because a verdant and robust tree canopy lined the avenues and streets. Trees were selected for specific attributes and formal characteristics, such as the American Elms chosen for the National Mall, which form a large cathedral-like canopy over the pedestrian walks and National Mall panels. Today, re-establishing a robust and visually pleasing tree canopy is important for aesthetic and environmental reasons. Trees help to manage stormwater, mitigate urban heat islands, improve air quality, promote health, and are valuable assets in the built environment.

Topics Addressed by these Guidelines:

The Tree Guidelines are organized into the following topics:

- **Tree Canopy:** Addresses improvements to tree canopy cover in the monumental core area.
- **Tree Form, Sensory Attributes, and Planting Pattern:** Identifies the following
    - Tree Form: The growth habit, branching structure, height, and canopy shape of trees.
    - Sensory Attributes: The ephemeral characteristics of trees including their seasonal color, smell, and fruiting and flowering.
    - Planting Pattern: The spatial arrangement of trees within the streetscape including the number of tree rows, the spatial relationship between tree rows and between trees across the street such as opposite or staggered configurations.
- **Tree Soils**: Addresses minimum soils volumes, use of structural soils, and improvement of soil profiles.
- **Tree Health and Function:** Addresses the following
    - Tree Health: The selection of tree species and planting locations that optimize tree health in the urban streetscape environment.
    - Function: Tree performance and benefits for environmental and human health.
- **Tree Box Treatments:** Addresses how to protect and contain the tree box zone in an aesthetically pleasing and safe manner that also promotes tree health.

Tree Canopy

Principle: Increase tree canopy coverage to support the District's goal of 40% canopy by 2032 to achieve the environmental and aesthetic benefits that a healthy urban forest produces.

T-1. Prioritize expanding the tree canopy in the following locations:

a. Within vacant tree boxes;
b. Along treeless streets and/or blocks;
c. Within wide Rights-of-Way (ROW) and/or public parking[4] dimensions, particularly for large trees or multiple rows of trees;
d. Within 100- and 500-year floodplains;
e. Within Municipal Separate Storm Sewer Systems (MS4 sewersheds);
f. Areas with highest daytime temperatures, such as areas with dark impervious surfaces, reflective heating, and south facing exposures;
g. Areas with highest particulate matter levels in the air.

T-2. Plan and manage for trees of the largest appropriate size, for a space, subject to: design considerations such as viewsheds; available tree canopy and planting area; site design and the respective tree's adaptability and suitability to site conditions, such as soils, sun exposure, and stormwater and salt tolerance; and maintenance requirements.

T-3. Conserve space for additional tree planting by co-locating or consolidating civic infrastructure elements such as streetlights, bicycle racks, parking meters, trash and recycling receptacles, fire hydrants, and utilities.

T-4. During project planning, encourage federal and local IWG members to consult to determine agency responsibility for street trees and coordinate to ensure that street trees are properly replanted and maintained.

Tree Form, Sensory Attributes, & Planting Pattern

Principle: Choose trees with form and sensory attributes and plant in patterns that reinforce the nationally symbolic importance of streets, structures, and open spaces to maximize well-framed vistas and views, while improving biodiversity and enhancing the streetscape experience.

T-5. Plant trees on Radiating & Edging Streets and Connecting & Traversing Streets to be:

a. Vase, Spreading, Round, Oval, or Pyramidal tree forms as indicated on **Map T-1: Recommended Tree Form**.
b. Symmetrical (same tree form and mature height [16]on both sides of street); and
c. Consistent in form and planting pattern for entire streetscape segments between important destinations (across multiple blocks).

T-6. Plant a diversity of tree species with similar forms and mature heights to achieve a biodiverse[17] and resilient tree canopy that is formally consistent and creates visually cohesive streetscape corridors with well-framed views and vistas, as indicated on **Map T-1: Recommended Tree Form**.

T-7. Select trees from the large and medium street tree list (see Appendix A-T-1: Tree List); except to accommodate infrastructure conditions, such as overhead utility lines or elevated structures (bridges and overpasses), where it is appropriate to plant smaller trees.

T-8. Plant trees with large vase-shaped canopies (similar to American Elm) on streets designated in light blue on **Map T-1: Recommended Tree Form**, to reinforce the design intent and historic importance of the use of American Elm trees on and along the National Mall. If it is not possible to locate large vase-shaped Elm cultivars, then use other vase shaped large canopy trees that meet the historic design intent.

- These streets are: Madison Drive from 15th Street NW to 3rd Street NW, and Jefferson Drive from 15th Street NW to 3rd Street NW.

T-9. Use best management practices and latest science to manage streetscapes predominantly planted with American Elms while recognizing the historical importance of this species and its structural character to the design of the monumental core. Plant or replace American Elms [18](disease resistant) with trees that have a form, growth pattern, and mature height that closely resemble the mature specimens of wild-type American Elm species present on the National Mall and adjacent parkland and streetscapes.



Figure T-1: Elm species and hybrids (such as the Accolade Elm, Triumph Elm, Patriot Elm) offer improved disease-resistance and desirable tree architecture. Other tree species (such as the Hackberry and Kentucky Coffee Tree) offer similarly desirable tree architecture and the benefits of urban forest diversity.

Some cultivars of American Elm (most notably, Jefferson Elms) offer similar character, while other cultivars of American Elm (most notably, Princeton Elms) may conflict with historical design intent of the National Mall landscape.

T-10. When selecting tree species consider vistas and viewsheds, ROW dimensions, public parking widths, building lines or building restriction lines, street tree mature heights and planting patterns, optimal root zone area, and adjacent building yard and landscape trees. Wider ROW dimensions and wider public parking widths can accommodate broader-formed, larger sized trees, trimmed (vertically up to eight feet) to enhance vistas and viewsheds.

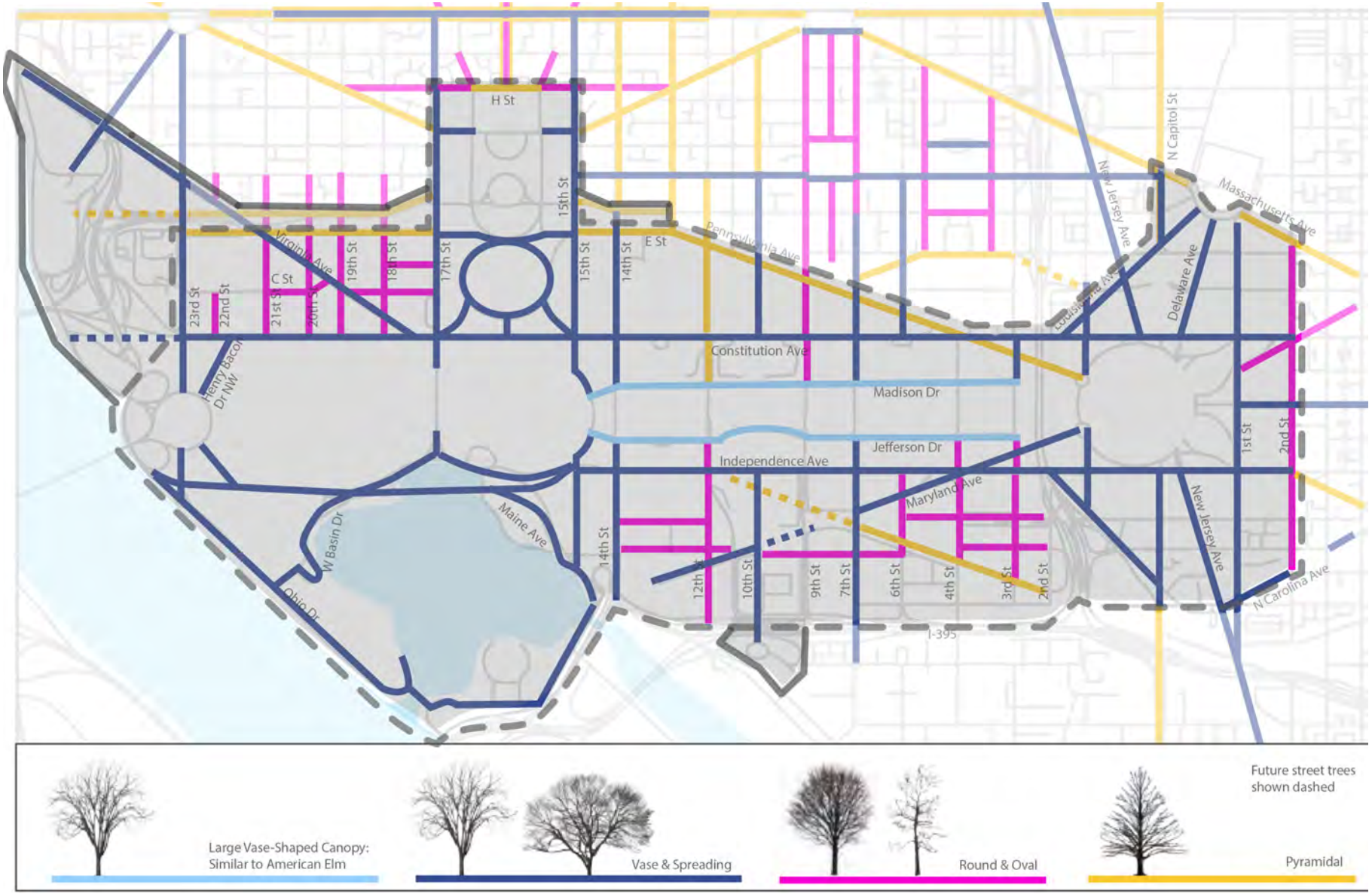
T-11. Plant trees of the largest mature height and size, where space allows, to increase canopy and urban forestry benefits.

T-12. Select trees with seasonal interest to enhance the visual and sensory experience along streetscapes, where appropriate. Discourage selection of trees with adverse attributes such as thorns or fruits.

T-13. When implementing green infrastructure [19] retrofit projects on street segments or blocks:

a. Select trees with a canopy form and a mature height that will match the mature height of trees along the same corridor to achieve visual consistency and create well-framed vistas, while accounting for variable tree planting grades.
b. Select tree species to optimize stormwater function. Green infrastructure retrofit projects are critical for improving stormwater management systems but are typically implemented on a site-by-site basis.

Map T-1: Recommended Tree Form



T-14. Restore double and triple rows of trees, as documented in historic city plans,[20] the 1974 Pennsylvania Avenue Plan, and 1980 Constitution and Independence Avenue Urban Design Study, as indicated on **Map T-2: Recommended Tree Rows**.

These streets include:

- Double and Triple Rows: Pennsylvania Avenue, NW, as applicable
- Double Row: Constitution Avenue, NW; Independence Avenue, SW[21]; Pennsylvania Avenue, SE; Massachusetts Avenue, NW; Massachusetts Avenue, NE; New York Avenue, NW; New Jersey Avenue, NW; New Jersey Avenue, SE; Delaware Avenue, NE; Maryland Avenue, NE; Maryland Avenue, SW; North Carolina Avenue, SE; East Capitol Street; South Capitol Street; K Street, NW; and 16th Street, NW.

T-15. Consider available space in the ROW and adjacent public parking area or building yards when determining the feasibility of planting two rows of trees. ***Note:*** *coordination with adjacent property owners is required as trees within public parking areas and buildings yards are maintained by the adjacent property owner.*

T-16. Plant double rows of trees on avenues where possible (utilizing space in the ROW and adjacent public parking area or building yards) to improve pedestrian scale and comfort and highlight the importance of axial avenues and streets in the city's historic urban design framework.

T-17. Identify and work with partners and programs to plant a second row of trees within available public parking areas or building yards and achieve double rows of trees on axial avenues and streets.

T-18. Street segments adjacent to a L'Enfant reservation or an existing designed landscape within a park or building yard may be exempt or deviate from street tree planting guidelines that would alter the design intent of the landscape.

a. Planting a double row of trees may not be appropriate adjacent to all existing designed landscapes. *Example: Maryland Avenue adjacent to the National Museum of the American Indian.*
b. Along some streetscapes it may be appropriate to plant the same species to achieve a specific design intent. *Example: The formal tree allée along Pennsylvania Avenue in front of the White House.*

T-19. At intersections, plant trees with the same form and mature height in a planting pattern that is consistent along the dominant street to achieve visual continuity and reinforce street hierarchy, as diagrammed in **Figure T-2: Intersection Guidance**.

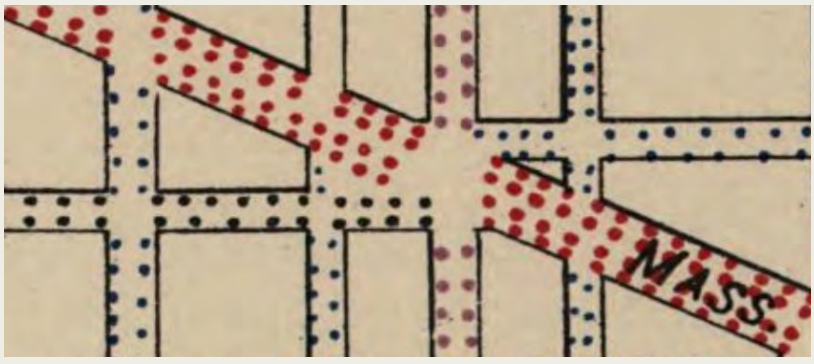
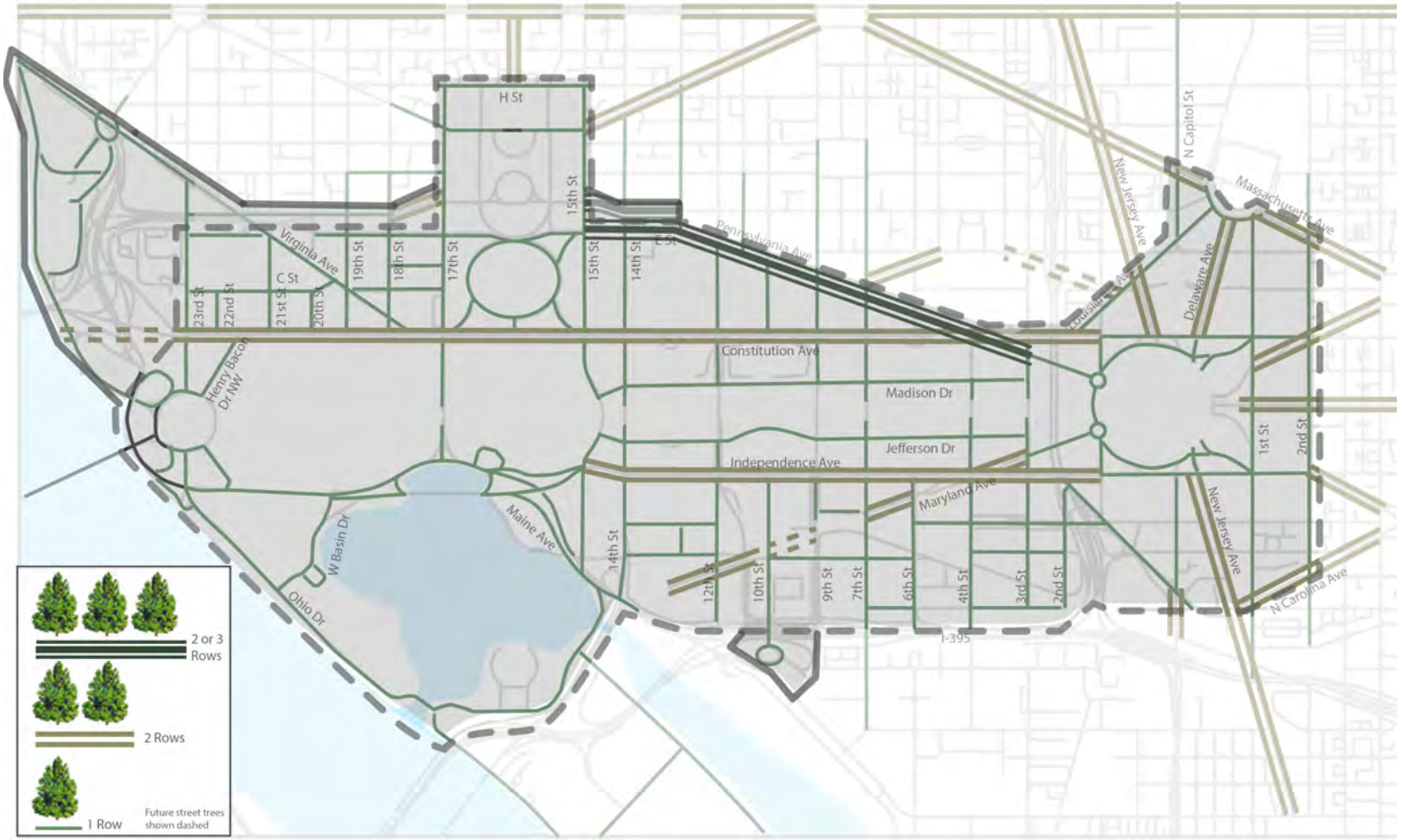


Figure T-2: Intersection Guidance Example from 1880 Plan showing Massachusetts Avenue, NW street trees dominating through intersections with various grid street (East-West Street: L Street, NW; North-South Streets: 10th through 13th Streets, NW)

Map T-2: Recommended Tree Rows



***Note**: The diagram above shows where double and triple rows of trees were intended by the L'Enfant Plan (1791), President Thomas Jefferson's plan for Pennsylvania Avenue, NW (1803), DC Commissioner's Shade Tree Plan (1880), the Olmsted Brothers intent for 16th Street, NW (1903), the Pennsylvania Avenue Plan (1974), and the Constitution and Independence Avenue Urban Design Study (1980).*

T-20. Enhance views and vistas along streets within or between parks and open spaces by either:

a. Planting trees with the same form and mature height in the same tree planting pattern.

b. Planting additional trees to reinforce vistas along streetscape corridors within parks, as diagrammed in **Figure T-3: Park Intersection Guidance**. *Example: the Eisenhower Memorial reinforces the Maryland Avenue corridor with linear tree plantings aligned with the avenue's ROW.*

c. Omitting trees along streets to retain or enhance visual connections between Nationally and/or locally important structures or open spaces. *Example: C Street NW omits trees within the 4th Street, NW view corridor to support the visual connection between the National Mall and Judiciary Square's Old DC Courthouse / original City Hall building.*

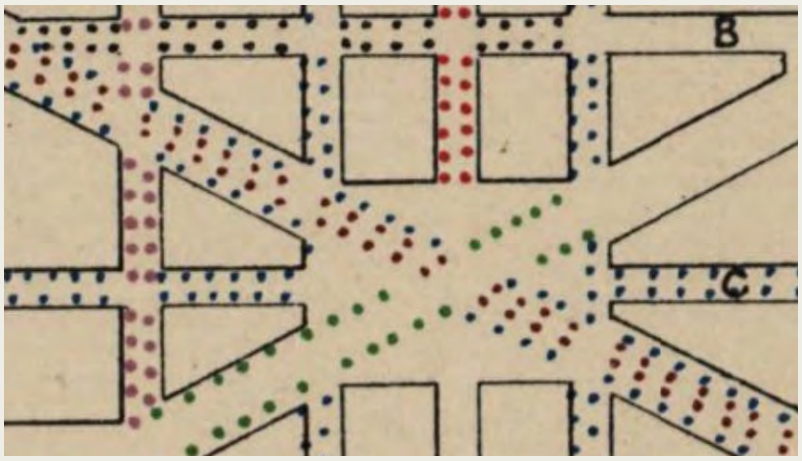


Figure T-3: Park Intersection Guidance Example from 1880 Plan showing Pennsylvania Avenue, SE crossing through Seward Square to reinforce the Pennsylvania Avenue alignment through the park.

Tree Soils

T-21. To the maximum extent practicable, tree box size and soil volume should meet recommended minimums. See DDOT's GIS (§47.7.1) and PRDM (§3.6).

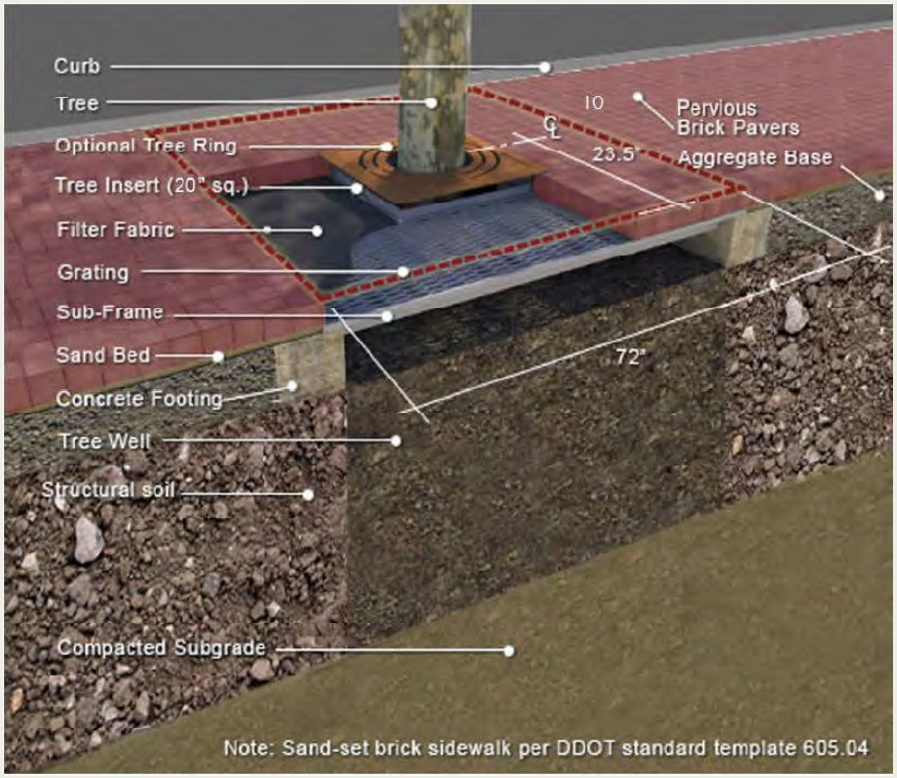
Minimum Soil Volumes:

- Large Trees (60' to 80' tall): 1,500 cubic feet of soil within a 27-foot radius
- Medium Trees (40' to 60' tall): 1,000 cubic feet of soil within a 22-foot radius
- Small Trees (less than 40' tall): 600 cubic feet of soil within a 16-foot radius.

T-22. Maximize soil volume where possible. Design for continuous above ground planting areas to expand tree soils as well as continuous below ground soils to accommodate root paths beneath sidewalks by using suspended pavement and structural cell systems (such as Silva Cells, Strata Cells, and Strata Vaults) and structural soils (such as Cornel, Stalite, and Sand Based Soils).

T-23. Strongly encourage use of suspended pavement and structural systems to promote optimal tree health and growth.

Figure T-4: The Dolley Madison House, part of the Howard T. Markey National Courts Building Complex, enhances tree growth with suspended sidewalk pavements, which create space beneath the sidewalk for tree root growth.



Source: Howard T. Markey National Courts Building - Perimeter Security

T-24. Where possible and appropriate for the character and setting, prioritize enhanced tree growth with suspended pavement systems adjacent to tree box zones to deliver air and water to tree roots, and do the following:

a. Evaluate maintenance requirements during project planning and design phases.
b. See DOEE's SMG (§ 3.6.4), and DOEE's GAR Guidebook (§5.8).

T-25. Adjust minimum soil volumes to compensate for soil-medium quality and tree soil infrastructure systems to optimize tree rooting and growth conditions.

T-26. Promote rebuilding soil profiles, where appropriate such as for compacted urban soils, to improve tree growth and ecosystem services (such as stormwater management and carbon sequestration). Reference: Soil Profile Rebuilding available at Virginia Tech's Urban Forestry Website.

Tree Health & Function

Principle: Plant tree species in locations that will increase biodiversity and optimize tree health and performance to benefit environmental and human health.

T-27. Select tree species that are resilient to urban conditions and suitable for pedestrian environments by ensuring trees are salt tolerant, can withstand compacted soils, are pest and disease resistant, are strong-wooded and have a well-formed structure.

T-28. Encourage planting trees native to the mid-Atlantic region that are a food source for wildlife and benefit pollinators.

T-29. Discourage or minimize selection of tree species with known problems. See DDOT's GIS (§Green Infrastructure Plant List). *Examples: Bradford Pear and Norway Maple have weak wood; American Elm is susceptible to Dutch Elm Disease.*

T-30. Discourage tree monocultures or dominance of a singular urban tree canopy species[22].

T-31. Use best management practices in tree nursery stock production, acquisition, planting, and aftercare. Relevant industry standards include ANSI A300 (Part 6), and ANSI Z60.1 (American Standard for Nursery Stock).

T-32. Use best management practices to protect trees during construction and renovation projects. See ANSI A300 (Parts 2, 5, and 8).

T-33. Structurally prune trees on a regular basis to ensure architecturally strong trees and limit fallen tree limbs.

T-34. Prune trees to achieve arched canopies to improve views and pedestrian circulation.

T-35. Evaluate impacts to tree health when reconstructing or repairing sidewalk and roadway pavement. Large existing street trees often have structural roots extending under existing pavement. A complete evaluation of the existing conditions with regards to the adjacent street trees should be conducted prior to demolition. Ensuring the preservation of structural tree roots will help preserve tree health and the structural integrity of the adjacent street trees.

T-36. When removing, trimming, or mowing trees or landscape vegetation, minimize disruption of avian and mammal habitat National Mall and Area (NAMA) Parks are habitat for several avian and mammal species of concern. See Appendix A-T-2 NAMA Bird and Bat Best Management Practices for guidance including specific cut-off dates for tree and shrub removal; in compliance with the Migratory Bird Treaty Act (1918), The Bald and Golden Eagle Protection Act (1940), and District of Columbia regulations (2015).

T-37. Expand tree canopy coverage to maximize tree function and environmental benefits, in a manner compatible with public safety goals and the reduction of damage to infrastructure by planting trees that are:

a. Large and long-lived;
b. Resistant to breakage; and
c. Compatible with infrastructure.

T-38. Plant trees that will contribute to aesthetic, cultural, historical, quality-of-life, and emotional health objectives.

T-39. Enhance pedestrian comfort by planting trees nearby bus stops to provide to shade for pedestrians while not visually obscuring the bus stop sign and/or shelter.

T-40. Plant trees that will significantly contribute to stormwater best management practices (see Stormwater Management Guidelines for more information).

T-41. Plant inundation-tolerant tree species within the 100- and 500-year floodplains and the Anacostia Waterfront Development Zone (AWDZ) (which encompasses an area in the southeastern portion of the Monumental Core) to improve urban tree canopy resilience to flood and storm events and improve stormwater retention.

T-42. Plant large shade trees in areas with higher daytime temperatures, dark impervious surfaces (surface parking lots), and/or other sites with high heat exposure to improve quality-of-life and reduce the urban heat island effect.

T-43. Where possible, mitigate both urban heat island effect and urban sky glow by planting street trees that both shade roadways form sunlight exposure and shield upward light trespassing from streetlights into the night sky. Consider the following:

a. Heights and spacing of both streetlights and street trees, including:
    i. Where possible, select large and/or medium canopy trees that can be trained to grow over shorter streetlights (less than 20 feet tall). See Appendix A-T-1: Tree List for recommended tree species.
    ii. Provide at least 15 to 20 feet between streetlights and street trees, depending on the tree species.
b. When planting street trees 15 to 18 feet from streetlights, select trees with mature heights twice the height of streetlights. For additional spacing guidance, see: The University of Florida Landscape Plants guidance for Planting Trees within 40 feet of wires or street lights. Roadway and sidewalk lighting levels required for vehicular and pedestrian safety.
c. Pruning and maintenance needed to ensure street trees do not block downward light emitted from streetlights.
d. Coordination between agencies responsible for streetlights and street trees.

T-44. Plant trees in areas with high levels of particulate matter to improve air quality and community health.

T-45. Promote tree canopy expansion and healthy tree growth by minimizing conflicts with tree roots and utilities.

T-46. Reduce conflicts with tree planting and sidewalks, underground utilities, below grade buildings, and other infrastructure elements. ***Note:*** *Existing overhead wires are not a common condition on monumental core streets.*

Tree Box Treatments

Principle: Tree box treatments should protect and define the tree box zone, promote tree health, augment stormwater management, enhance the streetscape, provide for safe pedestrian movement, and achieve visually cohesive streetscapes.

Tree Box Treatments address the following elements:

- **Tree Box Design:** Urban design, configuration and location, function and performance, materials, and maintenance
- **Tree Box Sub-Base:** Recommended practices
- **Tree Box Plantings:** Planting configurations and materials

Tree Box Design

URBAN DESIGN

T-47. The goals for the tree box design guidelines are to:

- Achieve compatibility with the quality and character of the National Mall and monumental core.
- Provide safe pedestrian conditions.
- Protect tree root zones from pedestrian compaction.
- Protect tree boxes from negative aesthetic impacts of pedestrian use, such as eroded planting beds.
- Minimize sidewalk damage from tree roots.

T-48. Maintain landscape consistency along streetscape corridors by using consistent tree box materials and designs and consistent planting height, density, and character.

T-49. To ensure visual consistency within the National Mall and downtown monumental core (Streetscape Manual Boundary) bioretention and non-bioretention tree boxes should share a complementary design and material palette.

T-50. A single tree fence should be designed for bioretention and non-bioretention tree boxes to visually unify streetscapes in the downtown monumental core and distinguish them from elsewhere in the District. The tree fence design should:

a. Be visually cohesive and harmonious along streetscape corridors.
b. Be appropriate to the monumental core character and setting.
c. Complement the multiple architectural styles of the National Mall and monumental core such as Victorian, Neoclassical, and Modern.
d. Complement historic and existing National Mall furnishings such as streetlights, benches, and waste/recycling receptacles.
e. Have appropriate height that is clearly visible to pedestrians. ***Note:*** *the District and other municipalities use 18 inch-tall tree fences.*
f. Be distinct from DDOT's ornamental fence.

T-51. Four categories define streetscape and landscape character. See **Map T-3: Streetscape and Landscape Character** for the following locations:

- **Urban:** Located within urban settings, serving office and retail land uses. Sidewalks often extend to or near the building and have individual tree boxes containing mulch or plantings. Typically, these areas do not include building yards or public parking.
- **Building Yard:** Located within civic settings, serving cultural and institutional land uses. These areas often include building yards and/or public parking to complement monumental-scale buildings. Sidewalks often have individual tree boxes containing mulch or plantings.
- **Park and Garden:** Located within open space settings, serving cultural and institutional land uses. These areas often have continuous tree boxes containing grass or other plantings.
- **Central National Mall Panel:** Located within the open space setting of the National Mall (the National Mall side of Madison and Jefferson Drives) serving cultural and institutional land uses. These areas often have continuous tree boxes containing grass or pea gravel.

T-52. Select tree box designs and materials based on the following criteria and guidance:

a. Streetscape and Landscape Character (see Map T-3);
b. Pedestrian Volumes (see Map PC-2);
c. Bioretention or Non-bioretention functions (based on local site conditions); and
d. Tree Box Treatment Matrix (see Chart T-1).

U-53. Maximize visual consistency along street segments or blocks by designing tree boxes with similar:

a. Shapes (rectangular, square, or circular);
b. Sizes (alignment of tree box widths); and
c. Edging materials.

CONFIGURATION AND LOCATION

T-54. Continuous tree boxes should be no longer than 60 feet within areas of high and moderate curbside use, continuous tree boxes may be longer than 60 feet in areas with low curbside use. Continuous tree boxes must be at least 4 feet wide to accommodate healthy tree root systems.

T-55. Pedestrian crossings of continuous tree boxes and open planting strips (or verges[23]) adjacent to curbs shall:

a. Have a 6-foot paved area between each tree in high-volume pedestrian areas.
b. Alternate every other tree in other areas, with surface material appropriate to the surrounding area (paved, grass, mulch).

T-56. Locate tree boxes to allow for a 24-inch-wide curbside step-out24 area to allow access from vehicle to sidewalk, except where no vehicle access is permitted, such as pedestrian only areas. In no-parking and no-drop off areas, and on pedestrian-only streets, ensure that vertical streetscape elements (streetlights and street trees) are placed consistently along the length of streetscape.

T-57. Tree box areas shall maintain a clear distance of 3 feet from a crosswalk or paved bus stop landing, 6 feet from an entrance to an alley or street corner, and 4 feet from a parking meter or fire hydrant as required by the District's DCMR (§24-109.7); DCMR (§24-109.8); and PRDM (§3.6.4).

The Public Realm Design Manual (PRDM), Section 3.6 focuses on Street Tree guidance.
Section 3.6.4 focuses specifically on Tree Box Beautification.

The D.C. Municipal Regulations (DCMR), Section 24-109 are regulations for the Beautification of Tree Spaces.

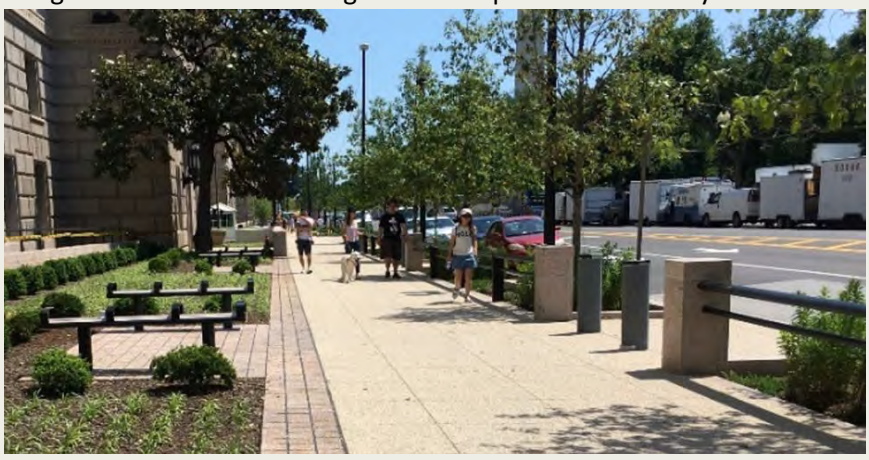
T-58. Tree boxes shall maintain at least 6 feet of separation from adjacent beautified areas[25], to maintain pedestrian space. See the District's DCMR (§24-109.6), DCMR (§24-109.7), DCMR (§24-109.8); and PRDM (§3.6.4).

T-59. When designing tree boxes make the best possible effort to preserve existing, mature, healthy canopy trees because of their important role in stormwater retention.

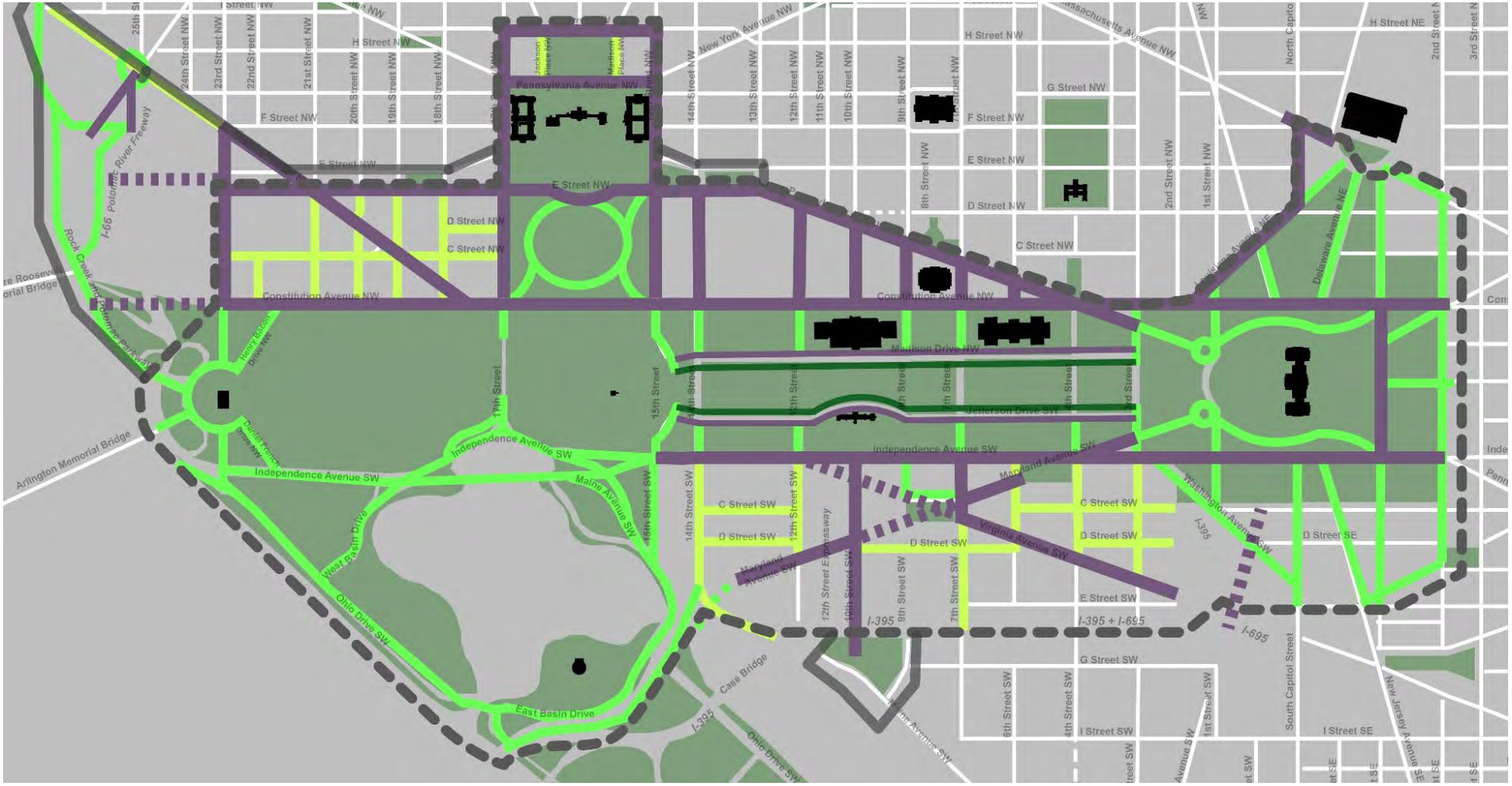
FUNCTION AND PERFORMANCE

T-60. Where possible, encourage integration of perimeter security, stormwater management facilities, and enhanced tree root growth. Use of continuous footings along planting areas is discouraged to avoid constricting root growth. *Examples: Herbert C. Hoover Building (U.S. Department of Commerce) perimeter security and streetscape; Harry S. Truman Building (U.S. Department of State Headquarters) perimeter security and streetscape; The Dolley Madison House, part of the Howard T. Markey National Courts Building Complex, perimeter security and streetscape.*

Figure T-5: The Herbert C. Hoover Building (U.S. Department of Commerce) streetscape integrates stormwater management and perimeter security.



Map T-3: Streetscape and Landscape Character



Legend

- **Urban**
- **Building Yard**
- **Park and Garden**
- **Central National Mall Panel**

Chart T-1: Tree Box Treatment Matrix

	Bioretention			Non – Bioretention		
	Flush granite edge with tree fence *	**Granite curb with inlets**	**No edge**	**Flush granite edge with optional tree fence ***	**No edge**	**Metal grate / Flexible Porous Pavement ****
Urban						
High Pedestrian Volume	X				X	X
Medium Pedestrian Volume	X				X	
Low Pedestrian Volume		X			X	
Building Yard						
High Pedestrian Volume	X			X		X
Medium Pedestrian Volume	X			X		
Low Pedestrian Volume		X		X		
Park and Garden ***						
High, Medium, and Low Pedestrian Volume			X		X	
Central National Mall Panel						
Medium Pedestrian Volume	NA	NA	NA		X	

Note 1: *To prevent pedestrian footfall within tree boxes without fences or curbs, densely plant with perennial groundcovers.*

Note 2: *Special and notable spaces and streetscapes currently use unique tree box materials, such as President's Park, Federal Triangle, and Pennsylvania Avenue (3rd to 15th Streets, NW). Consider the contributions of these materials to historic resources when evaluating potential changes to existing streetscape materials.*

** For visual consistency around continuous building perimeters or street blocks, non-bioretention tree boxes may include tree fences.*

*** This treatment is for narrow sidewalks with high pedestrian volumes. Flexible porous pavement is a temporary use only.*

**** Generally, continuous tree boxes do not contain bioretention features, however, this practice is acceptable for stormwater management where appropriate for the character and setting.*

Figure T-6: The Harry S. Truman Building (U.S. Department of State Headquarters) streetscape integrates stormwater management and perimeter security. Non-continuous perimeter security footings, create pathways for enhanced tree root growth.



Source: Harry S Truman Building (Department of State Headquarters) Perimeter Security Improvements

T-61. Plant non-bioretention street trees at the same grade as the sidewalk or lower. Grade adjacent sidewalks to allow for adequate surface water flow into tree planters.

T-62. Incorporate bioretention facilities within tree boxes to improve stormwater management, where appropriate. When planting trees in bioretention facilities, design planters with a minimum internal width of 5 feet.

T-63. Design tree boxes to maximize use of streetscape bioretention practices with the greatest surface area and/or the greatest volume possible to increase stormwater retention, where appropriate.

T-64. Maximize surface area and volume of tree boxes and minimize paving in public parking areas to increase the amount of permeable surface. Prior to designing stormwater management in public parking areas consult with adjacent property owners and regulatory entity to ensure regrading is possible.

T-65. Connect tree boxes where possible to expand and create a continuous pervious surface to maximize retention.

MATERIALS

T-66. Encourage use of raised curbing and/or edging with durable, high-quality materials such as granite, on back and side tree box planter edges. Minimize raised curbing on curbside tree box planter edges to avoid vehicle door conflicts.

T-67. Discourage use of DDOT standard ornamental low metal fencing (see Appendix A-T-3: Tree Box Treatment Examples and Details, Figure B) on streets within the National Mall and downtown monumental core area (Streetscape Manual Boundary) to differentiate their character from streets elsewhere in the District.

T-68. Metal tree grates may be used as a longer-term solution to protect both tree roots and pedestrian where pedestrian traffic is high and/or where sidewalks are narrow. New projects should consider and evaluate tree grate cost and ongoing maintenance in design proposals.

T-69. Flexible porous pavement (such as Flexi-Pave, Porous Pave, and Rubberway) is permitted for temporary[26] use within tree boxes to protect trees in areas with narrow sidewalks and high pedestrian volumes. Color hues of flexible porous pavement should complement the color of adjacent sidewalk materials, such as exposed aggregate. Contrast (lightness/darkness) of flexible porous pavement within tree boxes may differ from adjacent sidewalks to distinguish the tree box zone from pedestrian areas. Do not use flexible porous pavement within of building entrance areas.

T-70. If flexible porous pavement must be temporarily used on sidewalks within Historic Districts, such as to repair sidewalks while protecting large heritage trees, do the following:

- Match flexible porous pavement color with the adjacent sidewalk material color as closely as possible, for a seamless appearance.
- Place flexible porous pavement at right angles to mimic the shape of a tree box.
- Install flexible porous pavement beyond the immediate tree box zone, as needed, to achieve a flush surface with adjacent sidewalk pavement and minimize tripping hazards.

Figure T-7: Appropriate installation of flexible porous pavement within the Capitol Hill Historic District near Eastern Market.



T-71. Protect tree box soils from compaction and unwanted pedestrian traffic in high-use areas through use of the following treatments and details.[27] (See Appendix A-T-3: Tree Box Treatment Examples and Details for more information.)

a. Preferred tree fence design for the monumental core. **See Tree Box Design Guidelines above.**
b. Raised granite edging that allows for infiltration and capture of water run-off.
c. Post and chain.
d. Metal tree grates.
e. Loose-laid pavers or cobblestone.
f. Turf block pavers. (Requires further study in consultation with FHWA, DDOT-UFD, NPS, NGA, and SI)
g. Ground cover plantings.
h. Organic and/or alternative mulches.

MAINTENANCE

T-72. When maintaining or rehabilitating historic and legacy tree grates develop a maintenance plan that states who has the responsibility to monitor and cut out sections of grate as the tree grows to ensure preservation and proper maintenance. *Example: Pennsylvania Avenue currently has tree grates with concentric removable components.*

T-73. During planning and design phases, evaluate tree fence maintenance requirements, such as repairing, replacing, and removing tree fences if damaged. For tree fences installed within DDOT ROWs, a covenant of maintenance is required.

Tree Box Sub-Base

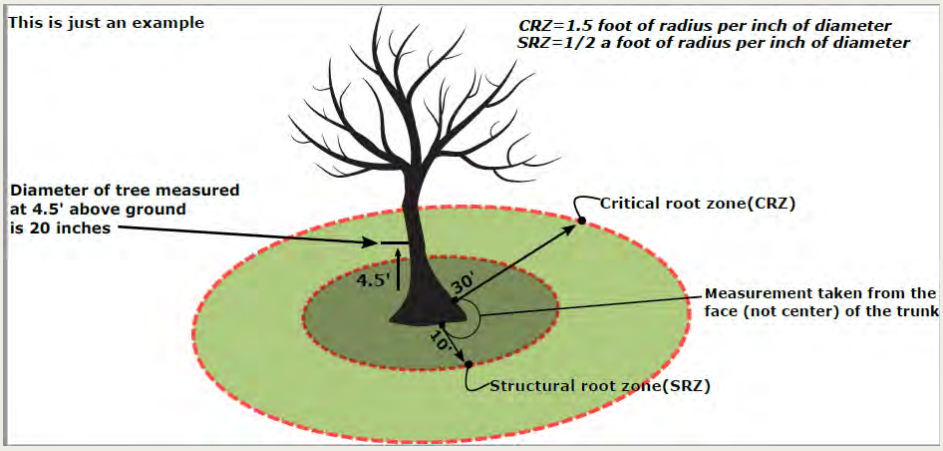
RECOMMENDED PRACTICES

T-74. When designing landscapes consult DOEE's GAR Guidebook (Chapter 5) for additional guidance on mulching, plant selection, soils, and soil amendments.

T-75. Use best practices, such as appropriate subbase, root barriers, and curbing to minimize conflicts between tree planting and infrastructure.

T-76. Tree boxes and surrounding ROW should be designed to limit impacts to critical and structural root zones[1] of existing trees (shown in **Figure 1: Root Zone Diagram**).
(Coordinate with Stormwater Management Guidelines: Environmental Function and Design guideline 33.)

Figure T-8: Root Zone Diagram



Source: DDOT-UFD Critical and Structural Root Zone Protection

Tree Box Understory Plantings

PLANTING CONFIGURATIONS AND MATERIALS

T-77. See **Chart 1: Maximum Planting Heights** for tree box understory planting height guidance.

T-78. Tree box plantings shall remain contained within the tree box area and not extend over the curb or the sidewalk (DDOT DEM (§37.3.2); and the District's PRDM (§3.6.4).

T-79. Use understory plants that have shallow root systems to reduce competition with street trees. See DDOT's DEM (§ 37.4.4); the District's DCMR (§24-109); and the District's PRDM (§3.6.4).

T-80. Plantings should be a minimum of two feet from the root flare[28] of the street tree to protect feeder and anchor roots from damage. See the District's PRDM (§3.6.4).

T-81. Tree box understory plantings should be completed at the time of street tree plantings to avoid root damage to established street trees.

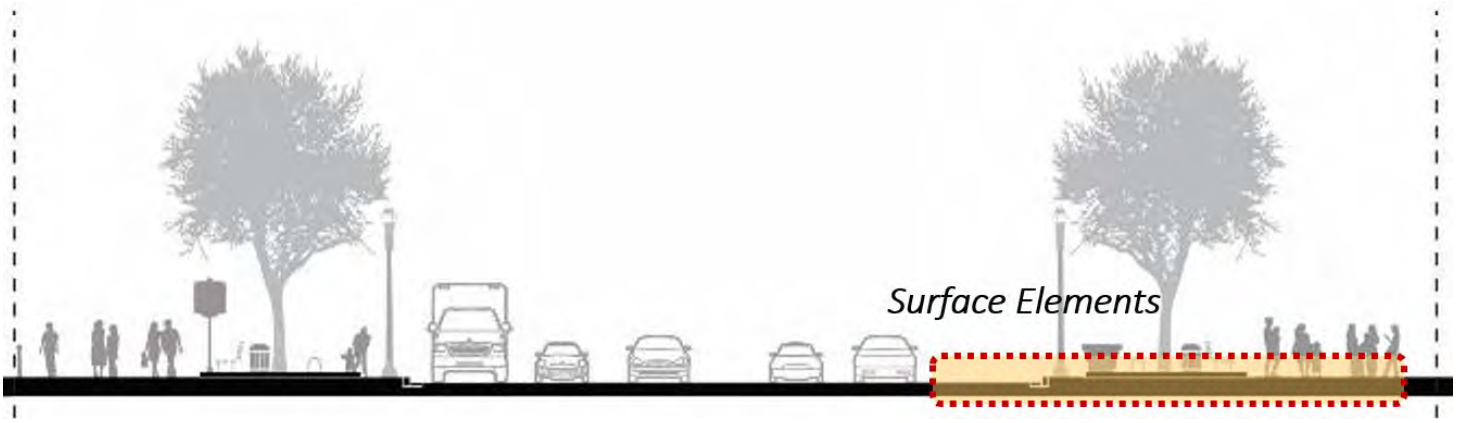
T-82. When planting around existing trees, make sure plant containers are sized appropriately so that tree root damage is minimal. *Example: Use one gallon or smaller pots based on proximity to structural roots.*

T-83. Use plants with appropriate characteristics for design and maintenance conditions. See DDOT's GIS (§Green Infrastructure Plant List) which provides examples of plants,but is not an exhaustive list of all possible plant options.

T-84. Avoid use of annual understory plantings that will require seasonal disturbance of street trees.

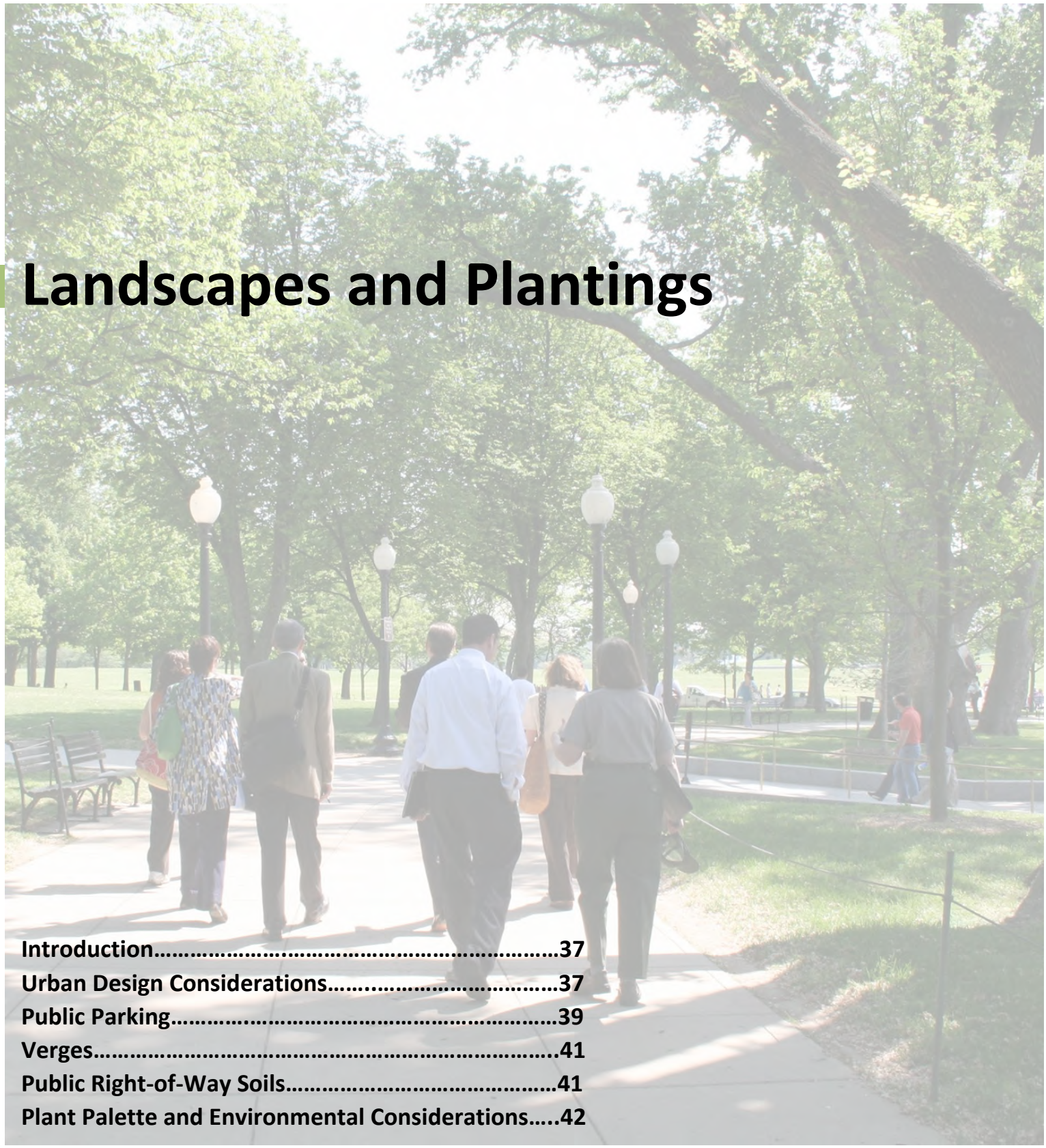
Tree box beautification guidance is contained in the District's PRDM (§3.6.4) and DCMR (§24-109).

Surface Elements



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Introduction

This guidance addresses urban landscapes in the public right-of-way (ROW) within the capital city's downtown monumental core. Washington, D.C.'s streets are verdant and generously planted because of several spaces in the ROW reserved for landscape including:

- **Public Parking[4]:** public open spaces devoted to landscape treatments which convey a park-like character along streetscapes.
- **Tree boxes:** areas within the public ROW that contain street trees, tree roots and soils, and may include low plantings, edging, or fencing.
- **Verges[23]:** landscape areas between the curb and sidewalk that may include street trees, low plantings, street furnishings, and/or step-out[24] zones.

The following landscape guidelines provide design and planting guidance to improve environmental and aesthetic quality and consistency of the public ROW.

Importance and Background:

Landscapes and plantings are important for their ecological function and softening streetscape environments with vegetation. Landscapes and plantings complement street trees, help frame vistas, contribute to verdant streetscapes with park-like character, and create comfortable and human-scale environments. Landscapes and plantings can enhance ecological function including soil and vegetative health.

Topics Addressed by these Guidelines:

The Landscape and Planting Guidelines are organized into the following topics:

- **Urban Design Considerations:** Addresses the urban landscape considering street categories, vistas and viewsheds, circulation, cultural and historic resources, aesthetics, and integration with surrounding areas and projects.
- **Public Parking:** Addresses the use of public space for enhancing streetscapes and landscapes.
- **Verges:** Addresses the configuration and design of verges for the enhancement of streetscapes and pedestrian access to sidewalks.
- **Public Right-of-Way Soils:** Addresses maintaining and improving soils, street tree, and vegetation health.
- **Plant Palette and Environmental Considerations:** Addresses use of native and pollinator-friendly plant species to support plant selections that are appropriate for the ecological region and character of the monumental core and highlight the built environment.

Urban Design Considerations

Principle: Enhance landscapes while considering existing conditions and urban design considerations, such as pedestrian circulation, views, cultural and historic resources, aesthetic character, context, environmental systems, design systems, accessibility, and public safety.

L-1. Design urban landscapes in a manner appropriate for the ecological region and character of the monumental core, and to highlight the built environment.

L-2. Use understory plantings[29] compatible with the streetscape and landscape character (**See Map T-3**) and function and complementary to street tree canopy, vistas, and viewsheds as identified in **Chart L-1: Maximum Planting Heights**.

Chart L-1: Maximum Planting Heights

	Right-of-Way Space				
Street Type	Public Parking	Tree Box	Stormwater Areas	Verge	Trees
Radiating and Edging	Less than 18 inches (also see (DCMR) 24 – 102.4) *Example: groundcovers and small shrubs*	Less than 18 inches *Example: groundcovers and small shrubs*	Less than 18 inches *Example: groundcovers and small shrubs*	Less than 6 inches *Example: lawn or low groundcover*	Large and Medium
Connecting and Traversing	Less than 36 inches (also see DCMR 24-102.4) *Example: Shrubs and medium height perennials*	Less than 18 inches *Example: groundcovers and small shrubs*	Less than 18 inches *Example: groundcovers and small shrubs*	Less than 12 inches *Example: lawn or low groundcover*	Large and Medium

D.C. Municipal Regulations (DCMR) Section 24-102, provides regulations for Public Parking: Upkeep and Plantings.

L-3. Select plant materials that are compatible and/or complementary with the following:

a. Views and vistas;
b. Historic and cultural streetscapes and landscapes;
c. Use and design of adjacent buildings, building yards, and width of rights-of-way and public parking areas;
d. Pedestrian circulation needs;
e. Streetscape elements considering the location, type, and size of sidewalks, furnishings, civic infrastructure, trees, and existing understory plantings; and
f. Visual aesthetics of adjacent blocks.

(Coordinate with Stormwater Management Guidelines: Urban Design Considerations guideline 7.)

L-4. Design landscapes to be compatible with streetscape and landscape character (**See Map T-3)** and function in accordance with the streetscape framework design principles to achieve:

a. Highly consistent streetscapes that accommodates civic and ceremonial uses along Radiating and Edging streets; and
b. Unified streetscapes that complement the character area or neighborhood along Connecting and Traversing, and Local Streets.

(Coordinate with Stormwater Management Guidelines: Urban Design Considerations guideline 8.)

L-5. Conserve adequate space for urban landscapes by co-locating or consolidating civic infrastructure and perimeter security elements such as streetlights, flagpoles, bicycle racks, benches, fountains, public art, signage, parking meters, trash and recycling receptacles, fire hydrants, utilities, and cellular equipment. Maximize planting areas where appropriate.

(Coordinate with Stormwater Management Guidelines: Urban Design Considerations guideline 12.)

Figure L-1: The National Air and Space Museum Delta Solar fountain and plinth integrate perimeter security, water feature, and art display.



Source: Smithsonian Air and Space Museum

L-6. Street segments adjacent to a L'Enfant reservation or an existing designed landscape within a park or building yard may be exempt or deviate from landscape guidelines that would alter the design intent of the designed landscape.

Public Parking

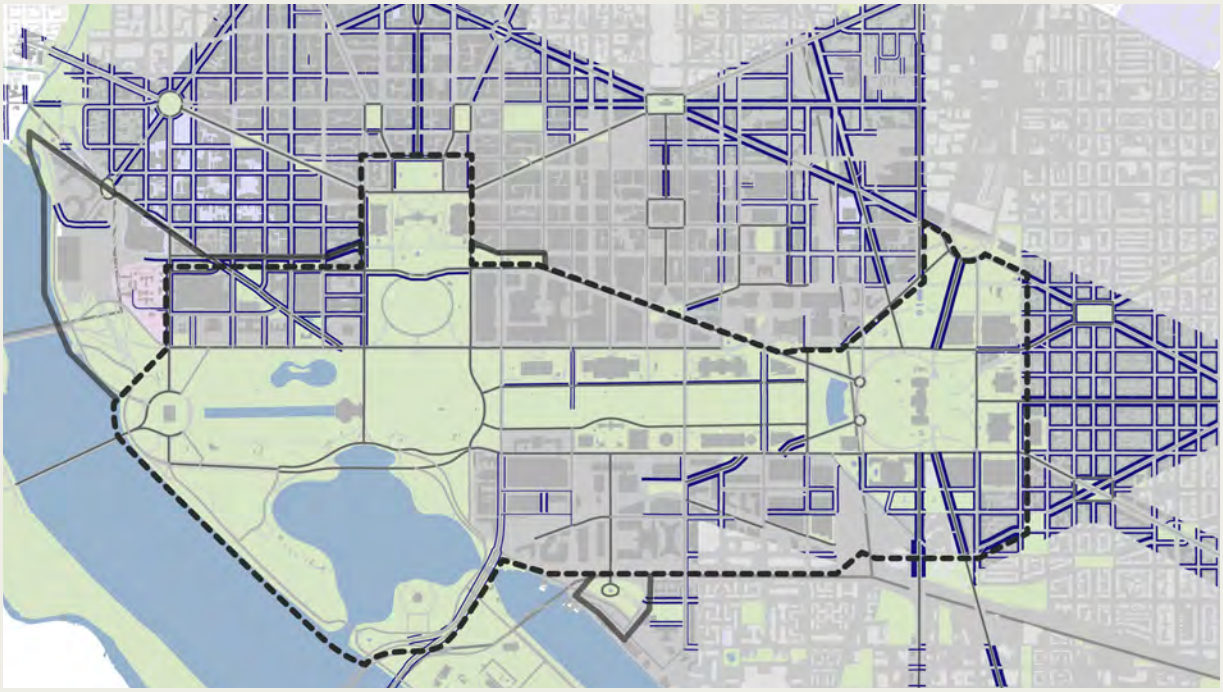
Principle: Use public parking[4] – the public space devoted to open space, greenery, or parks that greens our national capital streets - to enhance streetscapes, public landscapes, and adjacent buildings.

Figure L-2: Diagram of Landscaped Public Parking

Source: The District's Public Realm Design Manual



Map L-1: Public Parking Locations



Public Parking

Source: DC OCTO

L-7. See **Chart L-1: Maximum Planting Heights** for public parking planting height guidance.

L-8. Plantings in public parking should be:

a. Compatible with adjacent buildings and landscapes;
b. Contributing to building security and public safety; and
c. Low enough to maintain long view corridors.

See the District's DCMR (§24 – 102.4) and the District's PRDM (§4.4).

L-9. Plantings in public parking should consider historic preservation. If public parking is adjacent to historic landscapes, streetscapes, or buildings, plantings should be compatible with contributing historic elements.

L-10. Trees located within public parking should be pruned to enhance viewshed, improve pedestrian circulation, ensure public safety, prevent trees from touching building facades, and provide and maintain secure and comfortable environment. Canopy trees in public parking should be pruned to a height of 8 feet, to coordinate with street trees, to maintain open site lines, to enhance views to important structures and open spaces, and to provide overhead clearance for pedestrians. Additionally, to maintain open sight lines through public parking areas, discourage long rows of evergreen plantings over 42 inches tall, such as privacy hedges, that block views beyond the sidewalk. See DDOT's DEM (§37.5.2) and PRDM (§3.6.1).

L-11. Plant an additional row of trees in public parking areas adjacent to the sidewalk or roadway where possible.

(Coordinate with Street Tree Guidelines: Tree Form, Sensory Attributes, & Planting Pattern guidelines 10 through 14, including Map T-2: Recommended Tree Rows.)

Verges

Principle: Use verges[23] to enhance landscapes in the public ROW and provide pedestrian connections between the roadway and sidewalk.

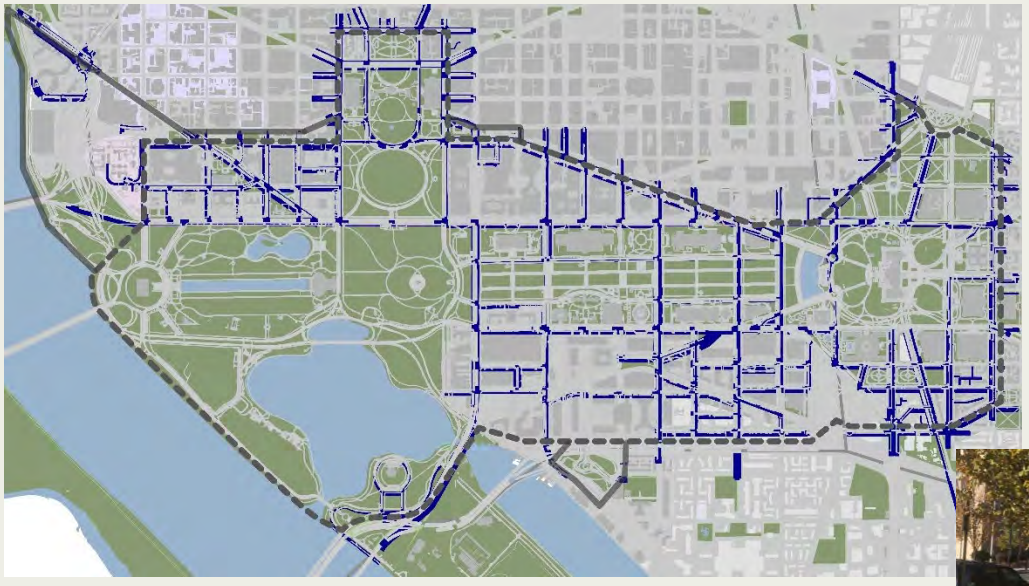
L-12. See **Chart L-1: Maximum Planting Heights** for verge planting height guidance.

L-13. Limit verge lengths as follows:

- 20 feet at vehicle pick up and drop off areas.
- 60 feet at bus pick up and drop off areas.

L-14. Paved areas between verges should be 6 feet for adequate pedestrian circulation.

Map L-2: Verge Locations



Verge

Source: DC OCTO



L-15. Do not install plant material other than grass along streets crossing the National Mall, between Madison Drive and Jefferson Drive, to retain unobstructed streetscape views and vistas.
(Coordinate with Stormwater Guidelines: Urban Design Considerations guideline 18.)

Public Right-of-Way Soils

Principle: Maintain and improve soils within the public ROW to enhance street tree and vegetation health.

L-16. Limit disturbance of healthy soil to protect soil horizons and maintain soil structure, existing hydrology, organic matter, and nutrients stored in soil.

L-17. Promote rebuilding soil profiles, where appropriate such as for compacted urban soils, to improve tree growth and ecosystem services (such as stormwater management and carbon sequestration). See Soil Profile Rebuilding available at Virginia Tech Urban Forestry.
(Coordinate with Street Tree Guidelines: Tree Health & Function guideline 30.)

L-18. Refer to DOEE's GAR Guidebook (§5.1) for additional soil volume requirements.
Refer to Tree Guidelines for additional information on soils.

Plant Palette and Environmental Considerations

Principle: Promote native and pollinator-friendly plant species by supporting plant selections that are appropriate for the ecological region and character of the monumental core and highlight the built environment.

L-19. Encourage planting native species. See DDOT's GIS (§Green Infrastructure Plant List) and DOEE's GAR Plant List.

L-20. When selecting plant species, consider the monumental core's physiographic and ecological regions and systems. The monumental core is within the physiographic region known as the "Potomac Flats" and an ecological region known as "Talbot Terrace". These areas lend themselves to specific native species, which can be found in Appendix A-L-1: Preliminary Native Plant Palette.

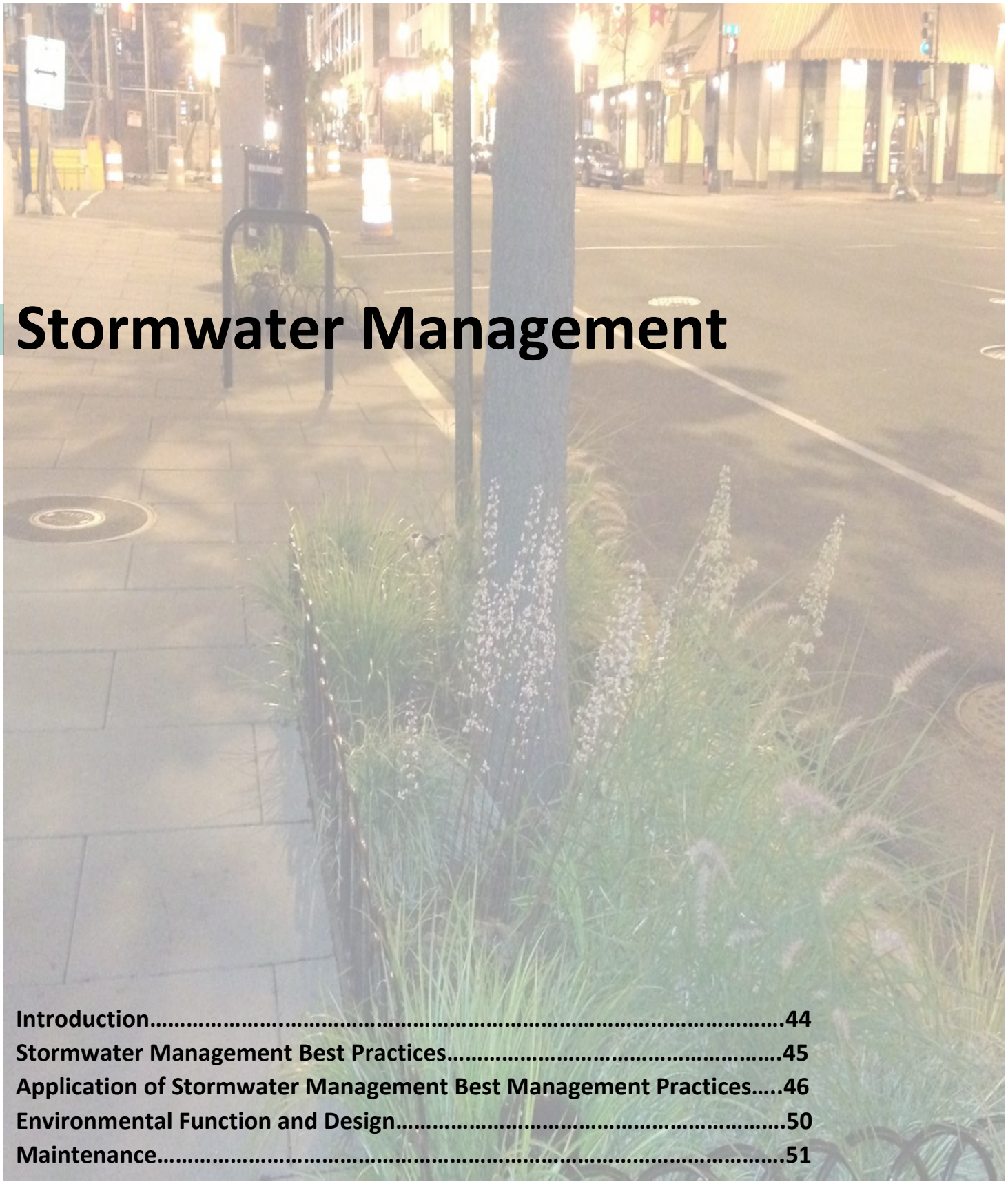
L-21. Encourage pollinator-friendly plant species by considering the four following primary aspects of the planting design to provide adequate site foraging capacity for target pollinators:

1) Bloom Value,
2) Bloom Diversity of Form and Color,
3) Material Size and Structural Diversity, and
4) Pollinator Positive Plant Quantity.

See Mid-Atlantic Region Pollinator Plants and DOEE's Native Pollinator Plants.

L-22. Encourage pollinator-friendly plant palettes by planting a minimum of 3 different plant species for each viable blooming season. Pursue a non-mandatory 20% target of pollinator positive plant material, as a percentage of all newly introduced plant material to the site. If a 20% target cannot be achieved provide written justification. All plants shall be adapted to the site's eco-region. Tree and shrub canopy diameter at maturity should be considered for the purpose of plantable area calculation. See GSA's P100 Standards (Chapter 2.4).

L-23. Plant selection and maintenance should consider changing uses in the monumental core, including increased dog walking, and the additional wear that this places on plantings.



Stormwater Management

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Introduction

This guidance addresses stormwater management in the public right-of-way (ROW) within the capital city's downtown monumental core. Stormwater management should improve environmental and aesthetic quality, contribute to the consistency of the ROW and streetscape, and enhance the streetscape using the principles established in the Urban Design Streetscape Framework.

Importance and Background:

Stormwater management contributes to the environmental quality of the streetscape. Best practices retain, detain, and convey stormwater to reduce ponding and flooding, help filter pollutants from stormwater, and take pressure off both Municipal Separate Storm Sewer System (MS4) and Combined Sewer Overflow (CSO)[30] systems. Within the Monumental Core both federal and local stormwater management requirements apply. Federal regulations require new development projects to capture and retain stormwater from a 1.7-inch rainfall event for a contributing drainage area per Section 438 of the Energy Independence and Security Act of 2007 (EISA). Local regulations require new development projects to capture and retain stormwater from a 1.2-inch to 1.7-inch rainfall event for a contributing drainage area per the District Department of Energy and Environment (DOEE) Stormwater Management Regulations and Stormwater Management Guidebook (SMG). More information regarding the District's floodplains, stormwater permits, and interagency management and maintenance agreements are included in Appendix A-SM-1, A-SM-2, and A-SM-3.

Topics Address by these Guidelines:

The Stormwater Management Guidelines are organized into the following topics:

- **Stormwater Management Best Practices**: Identifies priority areas and best practices for stormwater management in the monumental core.

- **Application of Stormwater Management Best Management Practices**: Applies stormwater management best practices considering street categories, vistas and viewsheds, circulation, cultural and historic resources, and aesthetics.

- **Environmental Function and Design**: Addresses the design of stormwater management best practices to maximize the function of green infrastructure[18] and the water management system.

- **Maintenance:** Addresses maintenance responsibilities and refers to maintenance best practices.

Stormwater Management Best Practices

Principle: Use Stormwater Management Best Practices (BMPs) to maximize retention, conveyance, and filtration of stormwater within monumental core area ROWs to address the most significant flooding or water quality issues considering the natural and man-made conditions within a given watershed.

SM-1. Prioritize best management practices that work with existing topography and integrate with existing stormwater management elements to establish a more efficient stormwater system.

SM-2. Maximize use of retention, conveyance, and detention (prioritizing retention and conveyance) stormwater management practices to capture stormwater and reduce flood risk within the 100-year floodplain, 500-year floodplain, and Anacostia Waterfront Development Zone (AWDZ). See appendix A-SM-1: 100-Year & 500-Year Floodplains, & Anacostia Waterfront Development Zone.

SM-3. Maximize use of retention and filtration stormwater practices to capture, slow, and clean stormwater within Municipal Separate Storm Sewer System (MS4) and to capture and slow stormwater within Combined Sewer Overflow (CSO) areas outside the 100-year and 500-year floodplains, and to reduce pressure on infrastructure within the AWDZ.

SM-4. Use streetscape bioretention, vegetated filtration strips, and permeable pavers[31][32] with subsurface retention as the best practices to retain stormwater and slow the rate at which stormwater enters the storm sewer system.



Figure SM-1:
Bioretention outside Herbert C. Hoover Building (U.S. Commerce Department) along 14th Street, NW.

SM-5. Use bioswales and dry swales as the best practices to capture and convey stormwater to the storm sewer system.

SM-6. Use sand filter systems and permeable surface materials as the best practices to filter pollutants from stormwater and to capture stormwater, slowing the pace at which it enters the sewer system.

Application of Stormwater Management Best Management Practices

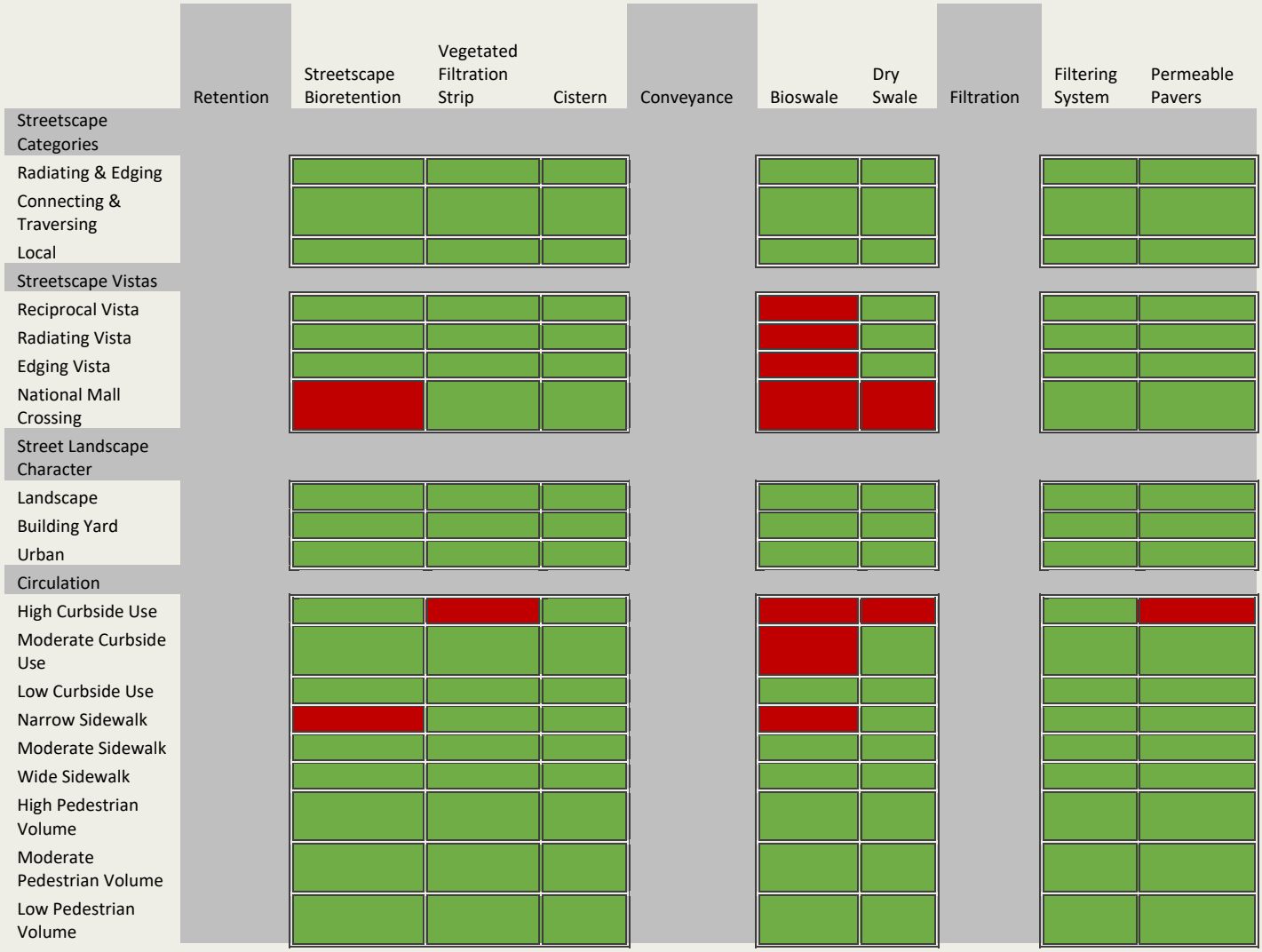
Principle: Manage stormwater while considering existing conditions and urban design considerations, such as pedestrian circulation, views, cultural and historic resources, and aesthetic character.

SM-7. Select stormwater management practices that can be designed to be compatible and/or complementary with the following (as summarized in **Chart SW-1: Urban Design Matrix**):

a. Views and vistas;
b. Historic and cultural streetscapes and landscapes;
c. Use and design of adjacent buildings, building yards, and width of rights-of-way and public parking areas;
d. Pedestrian circulation needs;
e. Streetscape elements considering the location, type, and size of sidewalks, furnishings, civic infrastructure, trees, and understory plantings; and
f. Visual aesthetics of adjacent blocks.

(Coordinate with Landscape Guidelines: Urban Design Guideline 3).

Chart SM-1: Urban Design Matrix



Note: *This matrix depicts locations and appropriateness of BMPs based on urban design considerations. Green indicates an appropriate BMP. Red indicates an inappropriate BMP.*

SM-8. Design green infrastructure[18] to be compatible with streetscape function and character in accordance with the streetscape framework design principles to achieve:

a. Highly consistent streetscapes that accommodates civic and ceremonial uses along Radiating and Edging streets; and
b. Unified streetscapes that complement the character area or neighborhood along Connecting and Traversing, and Local Streets.

(Coordinate with Landscape Guidelines: Urban Design Guidelines 4.)

SM-9. Design streetscape bioretention, bioswales, and vegetated filter strips with understory plantings and street trees with a form that complement vistas and viewsheds and are compatible with the streetscape function and character.

c. Radiating and Edging Streets should maintain low plantings (less than 18”) with more formal appearance.
d. Connecting and Traversing Streets can maintain taller (less than 36”) and denser plantings with a less formal appearance.

SM-10. Street segments adjacent to a L’Enfant reservation or to an existing designed landscape within a park or building yard may be exempt or deviate from stormwater guidelines that would alter the design intent of the designed landscape.

SM-11. Design green infrastructure in historically sensitive areas to be reversable, and in such a manner that if removed in the future the essential form and integrity of the historic property and its environment would be unimpaired.

SM-12. Conserve adequate space for stormwater management by co-locating or consolidating civic infrastructure and perimeter security elements such as streetlights, flagpoles, bicycle racks, benches, fountains, public art, signage, parking meters, trash and recycling receptacles, fire hydrants, utilities, and cellular equipment. Maximize stormwater management areas where appropriate.

(Coordinate with Landscape Guidelines: Urban Design Guideline 5.)

SM-13. Maximize use of streetscape bioretention on sidewalks that retains sufficient area for pedestrian circulation, street furnishings, and infrastructure.



Figure SM-2: Bioretention within a pocket park at the Harry S. Truman Building (Department of State Headquarters) on D Street, NW

Source: Harry S Truman Building (Department of State Headquarters) Perimeter Security Improvements

SM-14. Design public parking areas as a bioswales or filter strips when sidewalks are too narrow to accommodate bioretention, wherever possible.

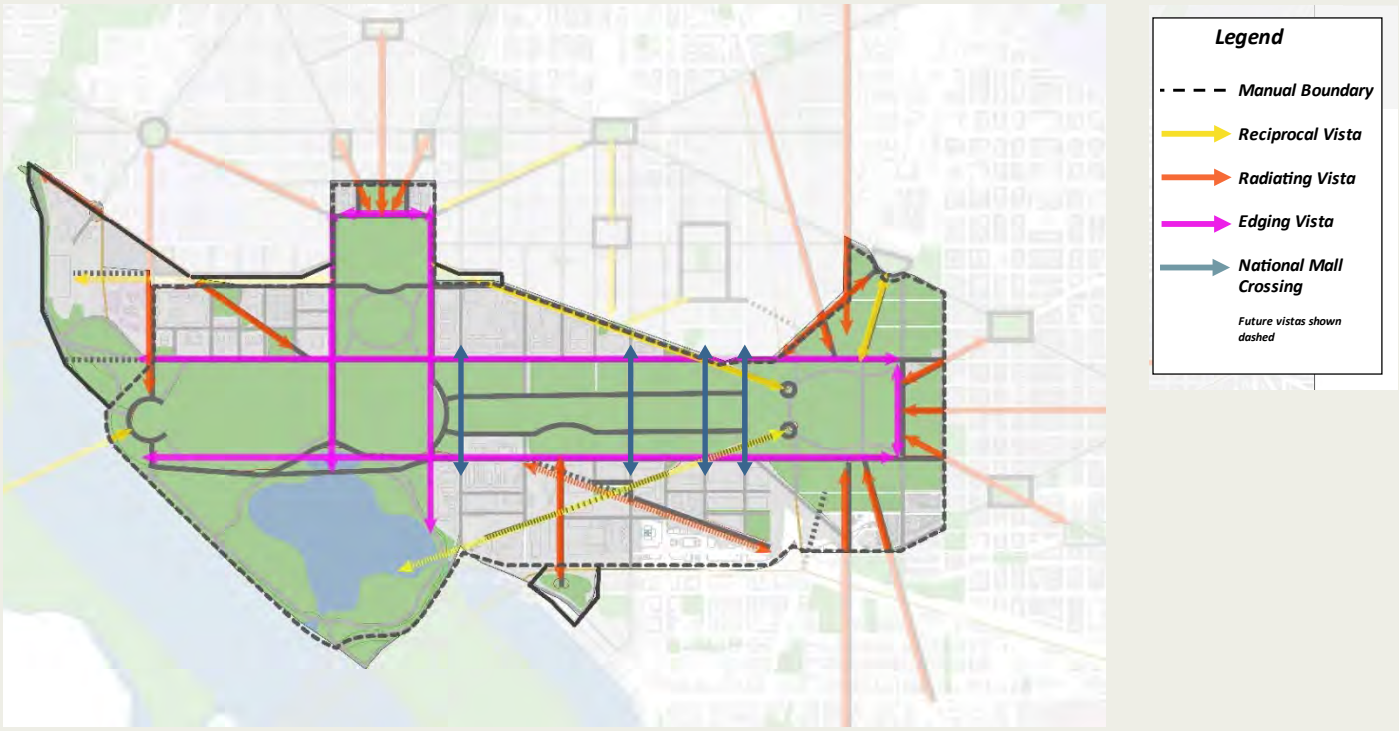
SM-15. Use vegetated filter strips (grass only), dry swales, or below grade practices (such as cisterns and sand filtering systems), as appropriate, in areas where bioretention or bioswales are inappropriate or cannot be accommodated, such as:

a. Along areas with important vistas and viewsheds (as illustrated in **Map SM-1: Important Streetscape Vistas**);
b. Where curbside use is high; or
c. Where sidewalks are too narrow.



Figure SM-3: Dry swale outside Mary Switzer Building along C Street, SW.

Map SM-1: Important Streetscape Vistas



SM-16. Stormwater for reuse (irrigation), must be cleaned to acceptable standards via soil medium. If necessary, additional biological or chemical means may supplement filtering strategies and soil medium to achieve acceptable water quality.

SM-17. Consider use of permeable surface materials when complementary with adjacent pavements and when they do not impact contributing historic features. Encourage use of permeable block pavers rather than permeable pavement to maximize compatibility with adjacent pavers, aesthetics, and design quality.

SM-18. Do not install streetscape bioretention along streets crossing the National Mall to retain unobstructed vistas and streetscapes, or where sidewalks are too narrow to accommodate pedestrian use.

SM-19. Do not install vegetated filtration strips, bioswales, or dry swales along sidewalks with high pedestrian use to accommodate circulation.

SM-20. Do not install bioswales along Radiating and Edging Streets, reciprocal vistas, radiating vistas, edging vistas, or National Mall crossings due to the informal character of bioswales.

SM-21. Do not install permeable pavers along areas of high curbside use to retain continuous flat surfaces along curbsides.

SM-22. Consider potential vehicle uses, if any, and the necessary structural strength, when installing permeable paving.

SM-23. Where possible, integrate stormwater management practices with perimeter security.

Figure SM-4: Green Infrastructure integrated with perimeter security outside the Herbert C. Hoover Building (U.S. Commerce Department) along 15th Street, NW.



SM-24. Ensure stormwater management practices enhance universal accessibility. The addition of stormwater management elements should increase accessibility for all people in the ROW, especially those with visual impairments or mobility limitations.

Environmental Function and Design

Principle: Use and design stormwater management practices to capture stormwater, mitigate flooding, and reduce pollutants in stormwater runoff according to federal and local standards

SM-25. Design green infrastructure to maximize retention and filtration, with a goal of capturing a minimum 1.7-inch storm event for the contributing drainage area per federal standards (EISA 438). Design to local jurisdiction's standards if federal capture rate is not achievable. Provide justification if capture rate is not achievable.

SM-26. Use Anacostia Waterfront Environmental Standards Amendment Act of 2012 for additional stormwater management regulations within the Anacostia Waterfront Development Zone.

SM-27. Minimize paving in public parking areas to increase the amount of permeable surface. Prior to designing stormwater management in public parking areas consult with adjacent property owners and regulatory entity to ensure regrading is possible.

SM-28. Bioretention tree boxes should have a minimum internal width of 4 feet.

SM-29. Bioretention tree boxes with a soil level below the surrounding sidewalk surface must have a curb or other edge to contain the bioretention tree box zone and protect pedestrians from sunken bioretention areas.

SM-30. For visual consistency within the downtown monumental core area (Streetscape Manual Boundary), bioretention tree boxes should use granite edging or curbing with inlets for water inflow (at sidewalk or curb level). Granite, type, and color should be visually consistent with roadside granite curbs.

SM-31. Stormwater management practices should be designed to limit impacts to critical and structural root zones of existing trees (shown in **Figure T-8: Root Zone Diagram**).

SM-32. Connect green infrastructure to the storm sewer system (MS4 or CSO) to convey stormwater away from monumental core to reduce flood risk, wherever possible.

SM-33. Maximize use of permeable surface materials, (preferably permeable block pavers) to decrease amount of stormwater conveyed directly to the storm sewer system.

SM-34. Plant inundation tolerant trees to maximize viability of tree health within green infrastructure, which experiences sustained presence of water.

SM-35. Plant native species whenever possible to increase plant health and reduce risk from invasive species.

SM-36. Refer to current DOEE's SMG, DDOT's GIS, and DDOT's DEM for design and construction guidance.

Maintenance

Principle: Ensure that stormwater management facilities are properly maintained for functionality and longevity.

SM-37. Refer to DOEE's SMG (Chapter 3) for standard maintenance schedule and activities for stormwater best management practices.

SM-38. Refer to Sustainable SITES (§8 Operations + Maintenance) for prerequisites and credits as a guide for planning and implementing stormwater maintenance practices to supplement DOEE guidance.

SM-39. Encourage interagency partnerships to share maintenance responsibilities or to collaborate to clarify maintenance responsibilities of stormwater management BMPs, since these typically require more maintenance and cleaning. See Appendix A-SM-3: Sample Maintenance Agreements for more information.

The DOEE Stormwater Management Guidebook (SMG), focuses on stormwater management guidance. Section 3.6.4 focuses specifically on Tree Box Beautification.

The DDOT Green Infrastructure Standards (GIS), focuses on the development of stormwater management infrastructure such as bioretention.



Pavements

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Introduction

This guidance addresses pavement of roads, sidewalks, and pedestrian walkways within areas of the capital city's monumental core. These areas are illustrated on **Map P-1: Recommended Sidewalk Pavements**.

Importance and Background:
Street and sidewalk pavements are important for vehicular, bicycle, scooter, and pedestrian circulation, as well as for visual continuity. Sidewalk pavement can contribute to the character of the capital city's historic districts and cultural landscapes. Pavements also enhance neighborhood character; provide texture, line, rhythm, and scale; and influence the direction of pedestrian circulation patterns.

Topics Addressed by these Guidelines:
The Pavement Guidelines are organized into the following topics:

- **Vision and Character:** Addresses the broader vision for how pavement contributes to character within the downtown monumental core area.
- **Pavement Materials:** Addresses the material type and quality for the following elements:
  - Sidewalks
  - Curb and Gutter
  - Medians
- **Pavement Transitions**: Addresses how materials come together at the following conditions:
  - Street Intersections and Sidewalk Corners
  - Curb Ramps and Crosswalks
  - Driveway Aprons
- **Environmental Considerations:** Addresses how pavement materials and designs influence urban heat island effects and stormwater management, including:
  - Pavement color and reflectivity
  - Permeable, pervious, and porous pavements

Vision and Character

Principle: Unify monumental core streets through consistent pavement and material transitions between federal and local areas.

P-1. Pavement materials in and around the National Mall should reflect a high-quality, durable, timeless, welcoming, and civic character.

P-2. Use higher quality pavement to delineate special or notable spaces and streetscapes in and around the National Mall[33] including:

- President's Park (grey and black granite)
- Federal Triangle (exposed aggregate with brick edging)
- Pennsylvania Avenue, NW between 3rd and 15th Streets (brown square paver)
- Pennsylvania Avenue, NW between 15th and 17th Streets (special treatment for roadway pavement, sidewalks, and curb/gutters, sidewalk corner aprons)
- Madison Place and Jackson Place, NW (special roadway pavement and brick sidewalks)
- Fourth Street Plaza, 4th Street, NW between Madison Drive and Pennsylvania Avenue (granite cobblestone)
- L'Enfant Promenade / 10th Street, SW between Independence Avenue and Banneker Overlook (custom paver with pink granite)

P-3. Use pavement to reflect the hierarchy and character of space, considering the scale, size, alignment, orientation, and texture of materials.

P-4. Unify pavement materials in and around the National Mall to create a pedestrian network with intuitive connections.

P-5. Use pavement materials to both provide continuity and indicate transitions between the National Mall and local areas.

Pavement Materials

Principle: Use appropriate pavement materials for monumental core sidewalks, curb and gutter, and medians to achieve the desired Vision and Character, and provide for safe pedestrian movement, and achieve visually cohesive streetscapes.

SIDEWALKS

P-6. Unify sidewalks in and around the National Mall by prioritizing exposed aggregate sidewalk pavement material on Radiating & Edging streets as shown on **Map P-1: Recommended Sidewalk Pavements**. See the Streetscape Manual (2013) for exposed aggregate pavement details and specifications. ***Note:*** *The exposed aggregate details and specifications will be updated in the future.*

P-7. Encourage application of exposed aggregate sidewalks on streets within NW and SW Rectangles alongside generous setbacks and building yards to enhance the garden-like quality on these streets and to improve transitions between federal and local areas.

P-8. Create visually continuous exposed aggregate sidewalks by using the same or similar exposed aggregate type, size, texture, and color within the Streetscape Guide and Manual Boundary. See the exposed aggregate specifications within the Streetscape Manual for detailed information. ***Note:*** *these specifications will be updated in the future.*

P-9. Provide continuity and indicate transitions between the National Mall and local areas by encouraging use of exposed aggregate sidewalk pavement (entirely or as an accent to other pavement materials) on Connecting and Traversing Streets, within federal precincts, and adjacent to federal properties.

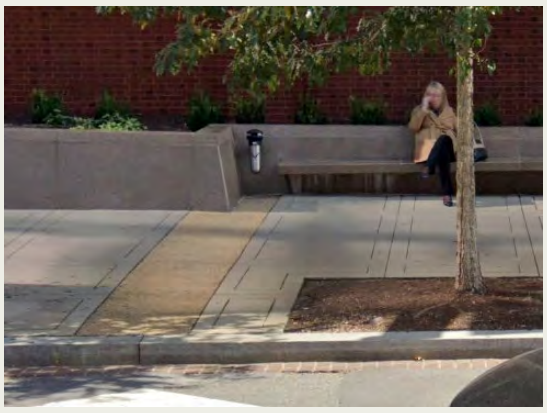


Figure P-1: Exposed aggregate accent pavement outside the New Executive Office Building on 17th Street, NW.



Figure P-2: Exposed aggregate accent pavement outside the Housing and Urban Development Building on 7th Street, SW.

P-10. Use various scoring patterns to convey scale, texture, and hierarchy.



Figure P-3: Unique exposed aggregate scoring pattern by Bartholdi Park on Washington Avenue, SW.

P-11. Promote streetscape consistency and continuity by using the same sidewalk pavement material on both sides of the street, unless a higher quality material is needed to define the perimeter or entryway of a special area, precinct, or park. *Examples: President's Park and Judiciary Square.*

P-12. Promote streetscape consistency at L'Enfant Plan circles and squares by using the same sidewalk pavement material along the entire perimeter[34] of the circle or square. See **Figure P-4**.

P-13. As appropriate opportunities arise, unify streetscapes around L'Enfant Plan circles and squares, particularly where multiple roadways converge, by using the same or similar pavement material on both sides of the street; along the entire perimeter of the circle or square and along sidewalks across the roadway from the circle or square. **See Figure P-5**. *Example: Mt. Vernon Square's perimeter sidewalk material is red brick. However, sidewalk pavement materials across the street are diverse (concrete, London pavers, and red brick) and could be more unified.*



Figure P-4: Diagram showing the same sidewalk pavement applied along perimeter of the square.



Figure P-5: Diagram showing the same pavement along sidewalks across the roadway from the square.

P-14. On National Mall streets, step-out[22] pavement material should be the same as adjacent sidewalk pavement.

P-15. Where appropriate on streets beyond the National Mall, use distinct pavement to designate furnishing zones. Furnishing zone pavements should be continuous along streetscape corridors and should not vary within a block or from block to block.



Figure P-6: Distinct furnishing zone pavement near 17th and K Street, NW.

P-16. Where appropriate, allow custom paving at building entrances up to 1/3 the width of the distance between property line and curb. For custom paving at building entrances within DDOT Rights-of-Way (ROW), see DPW's DSR (§1105.9).



Figure P-7: Example of custom paving extending 1/3 the width of the distance between property line and curb, K and 18th Street, NW.

P-17. Allow custom paving at entrances of public buildings that occupy an entire city block to extend closer to the curb where the custom paving:

a. Integrates with a designed landscape associated with the public building such as a museum (*Example: National Museum of the American Indian*); or
b. Contributes to a unique wayfinding or orientation feature within a large public gathering space such as a museum campus or special district/site (*Example: Plazas and adjoining sidewalks between the Navy Memorial and Archives building*).

P-18. Ensure custom paving at entrances:

a. Is appropriate for the urban context and compatible with design of adjoining streetscape paving elements;
b. Is limited to a portion of the building's overall street frontage; and
c. Applies a high quality, durable pavement material that will be properly maintained and safe for pedestrians in various weather conditions.

P-19. Preserve custom paving at public building and plaza entrances that highlight important public spaces and visual and physical connections between civic buildings, plazas, and/or open spaces. These locations include:

- The 4th Street, NW plaza at the East and West Buildings of the National Gallery of Art. This pavement visually and physically connects these two buildings.
- Pennsylvania Avenue, NW sidewalks at the National Archives Building and Navy Memorial Plaza. This pavement visually connects these spaces and reinforces the 8th Street north-south cross axis of the L'Enfant Plan.
- Pennsylvania Avenue, NW sidewalk at the Old Post Office Building (the Trump International Hotel). This pavement visually highlights the public space with special artistic treatment.
- F Street and 9th Street, NW sidewalks at the Smithsonian American Art Museum and National Portrait Gallery. This pavement visually highlights the public spaces around the museum.

P-20. Enhance universal accessibility by considering the most recent ADA and ABAAS standards for circulation and pavement design, material selection, and construction during project design, document review, and implementation phases.

CURB & GUTTER

P-21. Elevate the material quality and unify the streetscape by using granite curbs with red brick gutters on streets within the Boundary, except the following locations:

- NPS roads on the National Mall use granite curbs without gutters (roadway asphalt abuts the curb).
- AOC roads around Capital Square use granite curbs with yellow brick gutters.



Figure P-8: Granite curbs used by DDOT and NPS at Jefferson Drive and 7th Street, SW.

P-22. Preserve historic bluestone curbs whenever possible by resetting and reusing the curbs or salvaging the bluestone material.

MEDIANS

PAVED MEDIANS

P-23. Medians less than 5 feet wide should be paved where there is high risk and cost in maintaining landscaping. Promote streetscape consistency by paving medians with the adjacent sidewalk material. Exposed aggregate is the typical sidewalk material in the Streetscape Manual Boundary.

P-24. Consider permeable or porous pavement for medians to enhance stormwater management.

P-25. Where appropriate, provide pedestrian refuges at least 6 feet wide (8 feet is recommended) at wide roadway crossings and other locations to improve the safety of pedestrians crossing the street. See DDOT's DEM (§30.13).

Figure P-9: Paved pedestrian refuge and median at Washington and Independence Avenues, SW.



PLANTED MEDIANS

P-26. Medians greater than 5 feet wide should be planted**,** unless used for pedestrian refuges or transit services such as bus stops. Refer to DDOT's DEM (§37.3.3) for additional planting design guidance.

P-27. Limit plant heights to no more than 3 feet high (District PRDM §3-17 and DDOT DEM §37.5.2) within medians to maintain clear driver visibility and sight lines at intersections and pedestrian crosswalks and mid-block crossings.

P-28. Encourage healthy tree growth by planting and/or maintaining existing trees in elevated medians 10 feet wide or greater (DDOT DEM §37.3.3).



Figure P-10: Tree planted median along Independence Avenue, SW.

P-29. Ensure that trees within medians do not interfere with driver and pedestrian visibility**,** by encouraging application of the District's guidance. See DDOT's DEM (§37.5.2):

a. Do not plant trees within 40 feet of a controlled intersection or other traffic control device (this does not include "No Parking" signs).
b. Within the sight distance triangle, limb trees up to a height of at least 8 feet.
c. Place trees to ensure drivers can see all regulatory signs.

Pavement Transitions

Principle: Encourage pavement transitions among sidewalk corners, intersections, and driveway aprons that enhance national and local areas, augment the pedestrian experience, and consider material quality and construction. Simplify how materials come together and avoid a patchwork of diverse materials with awkward alignments, abutments, and joints.

STREET INTERSECTIONS AND SIDEWALK CORNERS

P-30. At street and sidewalk intersections, use the dominant street's roadway and sidewalk pavement material to achieve visual continuity and reinforce street hierarchy. *Example: At the Pennsylvania and Constitution Avenue, NW intersection, Pennsylvania Avenue is the dominant street. Pennsylvania Avenue's brown square brick pavers, granite curbs, granite curb ramps, and unique crosswalk materials are applied continuously through the Pennsylvania Avenue ROW including the sidewalk corner aprons.*

P-31. When two or more sidewalk pavement materials abut, improve material transitions by using:

- Edging bands or
- Complementary colors or material patterns.

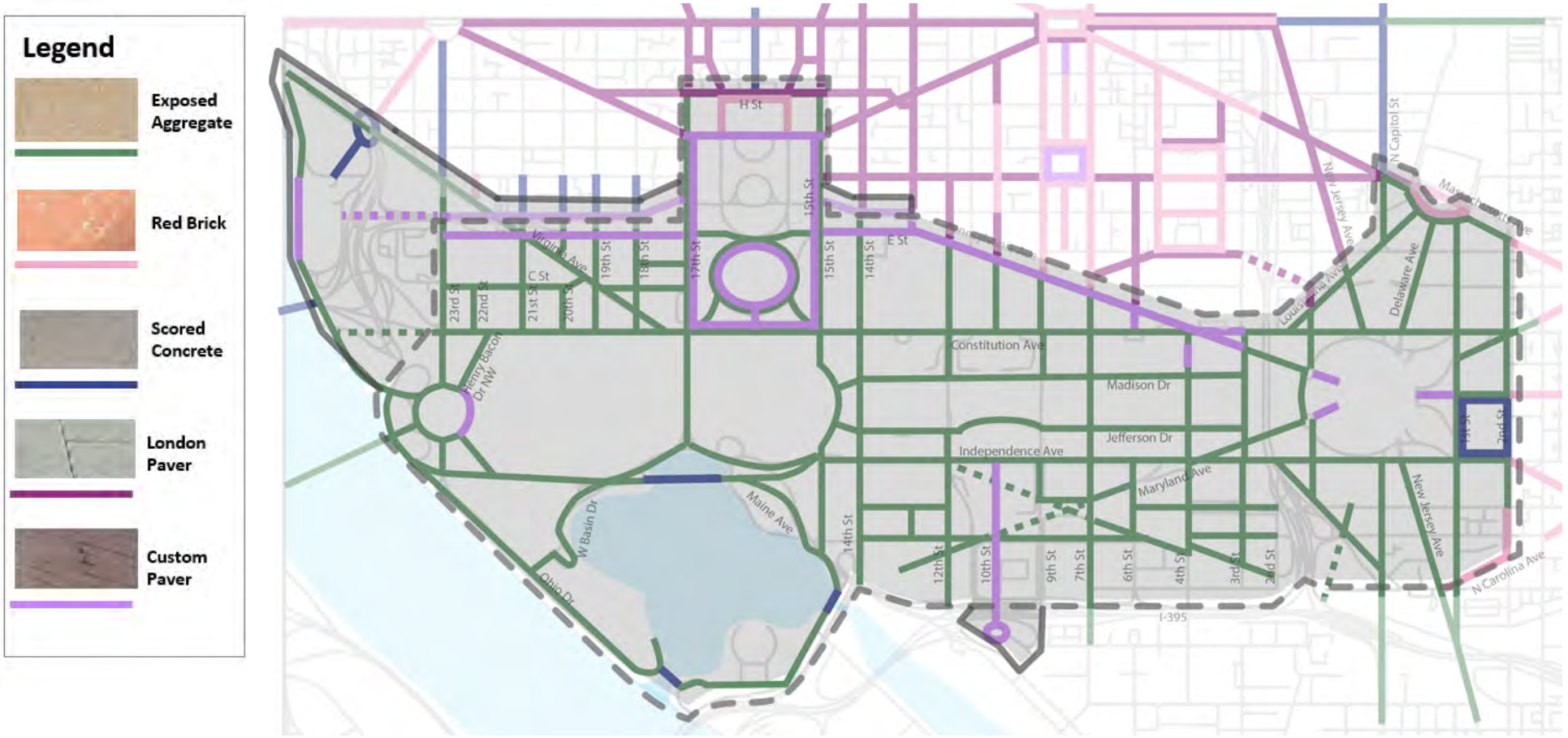


Figure P-11: Edging bands at 500 C Street, SW.



Figure P-12: Complementary pavement colors at 10th and I Street, NW.

Map P-1: Recommended Sidewalk Pavements



Note: *Custom Pavers reflect existing conditions and planned projects including the President's Park South design competition and future E Street, NW corridor improvements to achieve the Monumental Core Framework Plan goal of connecting the Kennedy Center with the White House and President's Park with a linear park.*

CURB RAMPS AND CROSSWALKS

P-32. Promote pedestrian safety by providing curb ramps for each crosswalk, aligned with the crosswalk to allow a straight line of travel for pedestrians across the street.



Figure P-13: Use two perpendicular curb ramps at each intersection, aligned with crosswalks.



Figure P-14: Do not use one blended transition curb ramp oriented towards the middle of an intersection, unless specifically designed as a Barnes-Dance intersection.[35]

P-33. Use federal-local partnerships to elevate streetscape quality, including consistently using granite curb ramps with truncated domes within the Boundary area. Discourage use of tactile inset mats as these may detach from the curb ramp.

P-34. Crosswalks should promote pedestrian visibility and safe roadway crossing by using highly visible materials, where appropriate, including the following:

- Painted white thermoplastic (with or without stripes);
- Other high visibility pavement material;
- Special crosswalk patterns or materials such as brick or other stone pavers (within special or notable spaces) that conform to safety standards; and
- Consider raised crosswalk tables if appropriate to calm traffic, such as at mid-block crossings. For any raised crosswalk installations, evaluate the following:
    a. Durability and maintenance of materials;
    b. Traffic speeds and volumes;
    c. Designated emergency routes;
    d. Vehicle and bus routes;
    e. Roadway drainage patterns; and
    f. Snow plowing.

DRIVEWAY APRONS

P-35. To prioritize pedestrian safety, promote continuous sidewalks across driveways to alert drivers to pedestrian movement. Driveway paving materials shall continue the paving color, texture, and scoring or pattern of the adjoining sidewalk. See DDOT's DEM (§ 31.5).



Figure P-15: Visually continuous sidewalk material crossing the driveway apron near 1200 17th Street, NW.

P-36. While driveway aprons should appear visually continuous with the adjoining sidewalk (by using similar color, texture, and scoring or pattern), driveway paving materials may differ from continuous sidewalk paving materials in the following conditions:

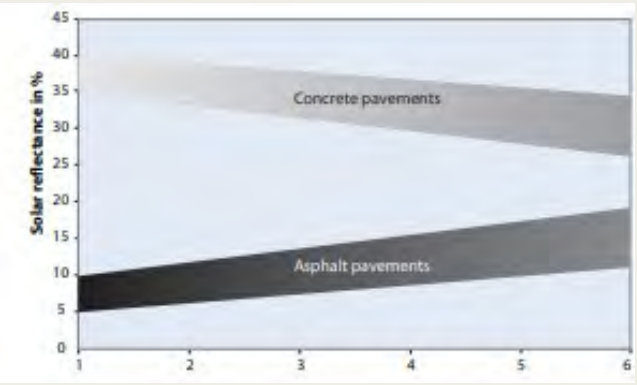
a. Where stronger paving materials are needed to support driveway loads and vehicle weights.
b. Where driveway heating and/or ice melt systems are needed.

Environmental Considerations

Principle: Choose pavement materials that improve stormwater management and mitigate urban heat island effect to benefit environmental and human health and enhance the streetscape experience.

P-37. Where appropriate for the character and setting, use lighter color pavements with high albedo[36] or solar reflectance to mitigate the urban heat island effect.

Figure P-16: Typical Solar Reflectance of Asphalt and Concrete Pavements Over Time



Due to weathering and the accumulation of dirt, the solar reflectance of conventional asphalt and concrete tend to change over time. Asphalt consists largely of petroleum derivates as a binder mixed with sand or stone aggregate. Asphalt tends to lighten as the binder oxidizes and more aggregate is exposed through wear. Concrete also uses sand and stone aggregate, but in contrast to asphalt, typically uses Portland cement as a binder. Foot and vehicle traffic generally dirty the cement causing it to darken over time.

Source: NACTO Reducing Urban Heat Island : Compendium of Strategies

P-38. As roadway pavements age, consider maintenance techniques such as microsurfacing (using a thin sealing layer) with light-colored materials to increase surface albedo and mitigate the urban heat island effect.

P-39. Where appropriate for the character and setting, and feasible and effective for improving stormwater management, apply permeable, porous[37][38], and pervious[39][40] sidewalk and/or roadway pavement. Consider the following:

a. Apply the above pavement types on sidewalks and/or tree boxes while meeting ADA, ABAAS, and AASHTO requirements for firmness, stability, and slip-resistance, as well as to avoid stickiness.
b. Apply the above pavement types in low-volume roadways. The District does not currently allow these pavements on collectors, arterials, and freeways.
c. Avoid applying the above pavement types in areas with high curbside uses, bus and vehicle loading, and parking due to excessive oil dripping in these areas.
d. Avoid applying the above pavement types in areas trafficked by heavy-duty vehicles such as city transit buses, cement mixers, and tractors, to prevent pavement damage.
e. Evaluate maintenance requirements during project planning and design phases. See DDOT's GIS (§ M-1))

Figure P-17: Examples of pavement types to improve stormwater management

Permeable Pavers



Porous Pavers



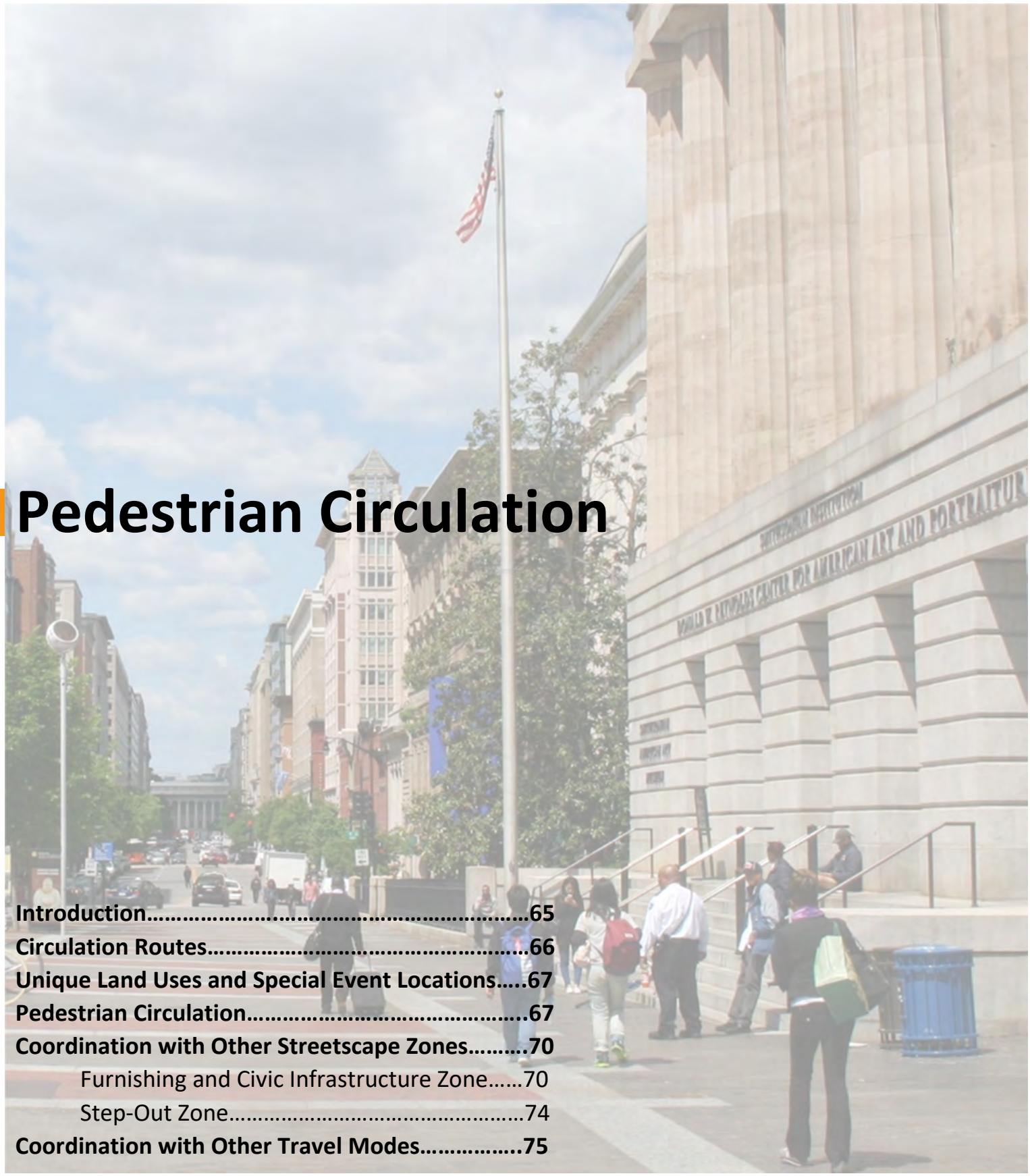
Pervious Pavement



Source: Are Pervious, Permeable, and Porous Pavers Really the Same?

P-40. Where possible and appropriate for the character and setting, prioritize pervious pavement within furnishing and tree box zones where pedestrian traffic is high, to deliver air and water to tree roots.

Pedestrian Circulation



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Introduction

This guidance addresses pedestrian[14] circulation space along sidewalks and multi-use trails[41] within areas of the capital city's monumental core. These circulation routes are illustrated on **Map PC-1: Existing Circulation Routes**.

Importance and Background:

Circulation routes (sidewalks and multi-use trails) are important for pedestrian, bicycle, and micromobility[42] circulation, access to public transit, and connectivity between destinations. Spatial organization of sidewalks, multi-use trails, and elements within them contribute to the safety, movement, comfort, and enjoyment of pedestrians and micromobility users.

These guidelines focus on pedestrian circulation within the unique setting of the downtown monumental core. The National Mall and surrounding areas host a unique collection of cultural, commemorative, and institutional land uses unlike elsewhere in the District, region, and nation. These land uses and associated activities attract unique visitor populations including tour and school groups that circulate through the area forming clusters or groups as well as visitors using wheelchairs or walking aides and pushing strollers. Occasionally, these areas host high volumes of pedestrians during special events such as festivals, marches, and parades. Therefore, it is important to provide pedestrian circulation guidance that addresses the areas' unique conditions and supports safe and universally accessible routes for visitors of all ages and abilities.

While these guidelines focus on pedestrian circulation, it is important to coordinate with federal and local transportation and mobility plans and programs that address pedestrian circulation and promote pedestrian safety[43] (see Appendix A-PC-2 for a list of relevant plans). Transportation is evolving, recognizing that people are walking and cycling more and driving less. The emergence of shared micromobility modes such as dockless bicycles and scooters create new opportunities and challenges. To improve pedestrian circulation and reduce conflicts with vehicles, bicycles, and micromobility modes, the following guidelines:

- Build on the NPS's National Mall Plan goals to implement improved and separated circulation for pedestrians and bicyclists.
- Encourage agency coordination of mobility plans and clear and consistent messaging so that the public are informed where they can walk versus ride.

Topics Addressed by these Guidelines:

The Pedestrian Circulation Guidelines are organized into the following topics:

- **Circulation Routes**: Addresses considerations for circulation route improvements.
- **Unique Land Uses and Special Event Locations:** Addresses the unique cultural, commemorative, and institutional land uses and events within the National Mall and surrounding areas.
- **Pedestrian Circulation:** Addresses circulation alignment and minimum dimensions to accommodate pedestrian volumes and unique movement patterns.
- **Coordination with Other Streetscape Zones:** Addresses coordination of pedestrian circulation space with the following streetscape zones:
    - **Furnishing and Civic Infrastructure**
    - **Step-Out**[44]
- **Coordination with Other Travel Modes:** Addresses coordination of pedestrian circulation space with bicycles, scooters, and other micromobility travel modes.

Circulation Routes

Principle: Enhance circulation routes and provide adequate space for safe, comfortable, and enjoyable pedestrian movement.

PC-1. Support circulation infrastructure serving evolving transportation modes; recognizing that more people are walking and bicycling**.**

PC-2. Support agency efforts to improve pedestrian and bicycle safety. *Examples: FHWA's Pedestrian Safety Action Plan, FHWA's Pedestrian and Bicycle Safety program, and DDOT's Vision Zero Initiative.*

PC-3. Coordinate among agency mobility plans and studies to:

a. Coordinate and connect circulation routes for all modes (pedestrian, bicycle, and micromobility), and
b. Create a consistent and seamless user experience.

PC-4. Consider both streetscape continuity and site context when balancing multiple elements competing for space within the right-of-way (ROW) and streetscape zones such as:

a. Vehicular and pedestrian circulation;
b. Tree canopy;
c. Step-outs;
d. Furnishing and civic infrastructure; and
e. Opportunities to restore or complement historic fabric.

PC-5. When possible and appropriate, improve existing circulation routes to enhance:

- **Universal accessibility** to better serve people of all ages and abilities;[45]
- **Pedestrian Level of Comfort (PLOC)**[46] to reduce level of traffic stress;
- **Pedestrian circulation and connectivity** to improve connections between destinations; and
- Curbside access, where volumes and intensities of curbside use are high.

See **Map PC-1: Existing Circulation Routes** and Appendix A-PC-3: Transit Locations**.**

Note: *Other aspects of pedestrian comfort are addressed in the Streetlight, Tree, and Pavement Guidelines.*

PC-6. Consider upgrades where existing circulation routes and connections are below standards to support increasing pedestrian demand on existing infrastructure.

Examples:

- *Missing connections such as lack of crosswalks or mid-block crossings:*
  - *Connecting the Potomac Riverfront to the Lincoln Memorial across Lincoln Memorial Circle.*
  - *Connecting 18th Street, NW to Constitution Gardens across Constitution Avenue, NW.*
  - *Connecting the DC War Memorial and MLK Memorial along Independence Avenue, SW.*
- *Existing social trails or informal walkways supporting desired connections.*
- *Narrow circulation routes (see Map 3: Narrow Circulation Routes)*

PC-7. Consider visual qualities of the pedestrian experience**,** in coordination with other roles of the streetscape, to support visibility of nearby sites (both structures and landscapes), including historically and architecturally significant sites, and metro and transit hubs, which serve as wayfinding tools. Refer to the Federal Urban Design Element for important viewshed and vista locations. Refer to Tree Guidelines for guidance on tree planting.

Note: *Other roles of the streetscape are addressed in the Streetlight, Tree, Landscape, Stormwater, and Pavement Guidelines.*

Unique Land Uses and Special Event Locations

Principle: Support safe, comfortable, and enjoyable access to unique cultural, commemorative, and institutional destinations and events with the monumental core.

PC-8. Ensure circulation routes (sidewalks and multi-use trails) support everyday pedestrian circulation and are appropriate for the unique:

a. Collection of cultural, commemorative, and institutional land uses; and
b. Volumes and types of visitors and commuters within the National Mall and surrounding area.

PC-9. Consider special event locations, uses, and event-based features. Event-based features should not obstruct everyday pedestrian circulation when events are not occurring. Many special events such as festivals, parades, marches, and inaugural activities are located on the National Mall and surrounding areas. See current special event permitting requirements:

- **National Mall and Memorial Parks Special Event Permits:** https://www.nps.gov/nama/planyourvisit/special-events.htm
- **District of Columbia Special Events:** https://dc-special-events-dcgis.hub.arcgis.com/
- **U.S. Capitol Police Permits:** https://www.uscp.gov/visiting-capitol-hill/activities-requiring-permits

PC-10. Consider both permanent and activity-based public access restrictions**,** as these impact pedestrian connectivity. See **Map PC-1**. *Examples: President's Park and AOC Grounds restrict public access for certain events and activities.*

Pedestrian Circulation

Principle: Ensure pedestrian circulation spaces are consistently aligned and can accommodate pedestrian volumes, visitor populations, and movement patterns unique to the National Mall and surrounding areas.

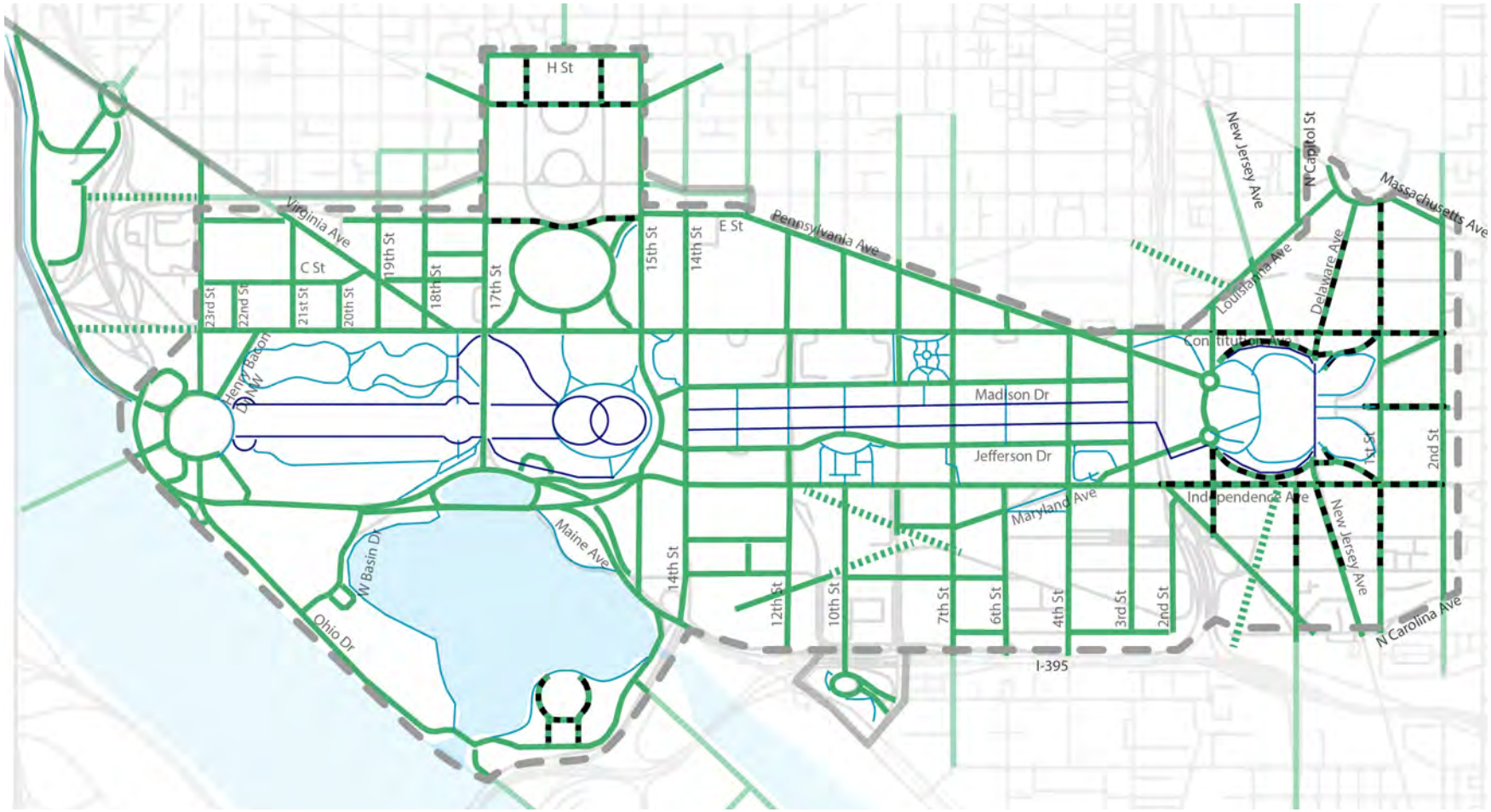
PC-11. Efforts should be made to prioritize universal accessibility when considering the space needed for pedestrian circulation, historic preservation goals, and security concerns.

PC-12. Align pedestrian circulation zones between blocks and throughout the length of street segments, where possible.

PC-13. Ensure pedestrian circulation routes are adequately sized to accommodate typical pedestrian volumes and movement patterns unique to the National Mall and surrounding areas, where appropriate.

a. **Typical pedestrian volumes:** Pedestrian volumes vary within the study area, fluctuating widely based on seasons, activities, and office and museum operational hours. See **Map PC-2: Daytime Pedestrian Volumes**.[47]
b. **Pedestrian movement patterns unique to the National Mall:** The National Mall and surrounding areas attract diverse visitor populations including school groups, tour groups, and large crowds who may form clusters or groupings as they move through these areas.

Map PC-1: Existing Circulation Routes



Street with Sidewalks
Pedestrian Paths[48]
Multi-Use Trails
Potential Future Streets
Restricted Access Roadway[49]
Driveways, Alleys, and Freeways (and Streets outside the Boundary)
Streetscape Guide and Manual Boundary[50]

Source: DC OCTO, NPS, SI, AOC

PC-14. Ensure circulation routes meet minimum standards and requirements:

a. Meet most current universal accessibility and safety standards and requirements, including transportation infrastructure;
b. Meet minimum widths on roadways under federal administration (See **Chart PC-1: Minimum Widths**);
c. Coordinate with the District's guidance on roadways under DDOT administration (See the District's DEM Table 31-1: Minimum Sidewalk Widths); and
d. Coordinate with WMATA's Station Area Planning Guide[51]

Universal Accessibility and Safety Standards and Requirements

ABAAS: Architectural Barriers Act Accessibility Standard

ADA: Americans with Disabilities Act

IBC: International Building Code

IEBC: International Existing Building Code

Life Safety Code or National Fire Protection Association 101 (NFPA 101)

PROWAG: Public Rights-of-Way Accessibility Guidelines

Note: *Typically, federal areas apply ABAAS and District areas apply ADA.*

Chart PC-1: Minimum Widths

Location	Step-Out*	Tree/Furnishing Zone	Pedestrian Clear Zone[52] (Minimum)	Total Sidewalk Width[53] (Minimum)
National Mall Streetscape Manual Boundary	2 feet minimum	4-10 feet	10 feet	16 feet**

***** Step-outs must be provided where permitted by DDOT and if accessible parking spaces are provided in accordance with the proportions set forth in the Federal Public Rights-of-Way Accessibility Guidelines (PROWAG).
**Total sidewalk width may vary based on available Public ROW and should reference the DDOT Design and Engineering Manual for guidance on DDOT owned roadways.

PC-15. Consider expanding narrow circulation routes and pinch-points (that are currently below minimum widths) to meet pedestrian demands and improve safety, when possible and appropriate for the character and setting. See **Map PC-3: Narrow Circulation Routes**.

PC-16. Consider consolidating or rearranging furnishing and civic infrastructure elements to expand narrow circulation routes and pinch-points where space is limited. *Example: The Herbert C. Hoover Building (Department of Commerce) streetscape includes hardened flagpoles with integrated lighting, as well as seating walls, that serve as perimeter security along 14th Street, NW to minimize clutter.*

PC-17. If available, evaluate pedestrian and bicycle count data to determine appropriate circulation route designs and widths. ***Note:*** *widths may be greater than minimum dimensions stated in Chart PC-1: Minimum Widths.*

PC-18. As needed, consider exceeding minimum widths where:

a. Adjacent land uses and density generate higher pedestrian volumes; and/or
b. Types of users demand exceeding ADA and ABAAS minimums.
Examples: Locations popular with disabled persons and families that may have increased wheelchair and/or stroller traffic such as the WWII Memorial, American Veterans Disabled for Life Memorial, and National Children's Museum.

PC-19. Exceptions to minimum widths may be appropriate where:

a. Existing conditions and historic resources cannot accommodate greater widths (existing heritage tree); and/or
b. WMATA infrastructure (elevators, escalators, etc.) is existing.

PC-20. Consider pedestrian protection[54], where appropriate for the location and setting.

Coordination with Other Streetscape Zones

Principle: Improve pedestrian circulation and enhance streetscape consistency by coordinating pedestrian circulation zones with other streetscape zones.

PC-21. Enhance streetscape consistency by aligning streetscape zones between blocks and throughout the length of street segments, where possible. Streetscape zones include the following:

a. **Pedestrian Circulation**: Containing unobstructed space for pedestrian circulation.
b. **Furnishing and Civic Infrastructure:** Containing streetlights, banners, benches, trash/recycling receptacles, bicycle racks, car charging stations, parking stations, parking/traffic/regulatory signs
c. **Step-Out:** Containing bus stops and dedicated areas for loading/unloading
d. **Building Yard and Park Frontage:** Containing landscaped areas and building, exhibit, and/or wayfinding signage, and perimeter security
e. **Vending:** Containing temporary areas for commercial services and operations, such as ordering and queuing

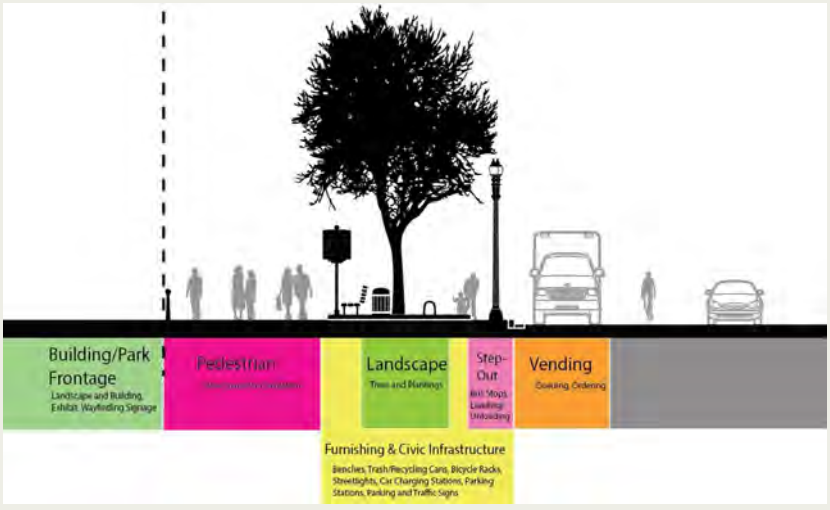


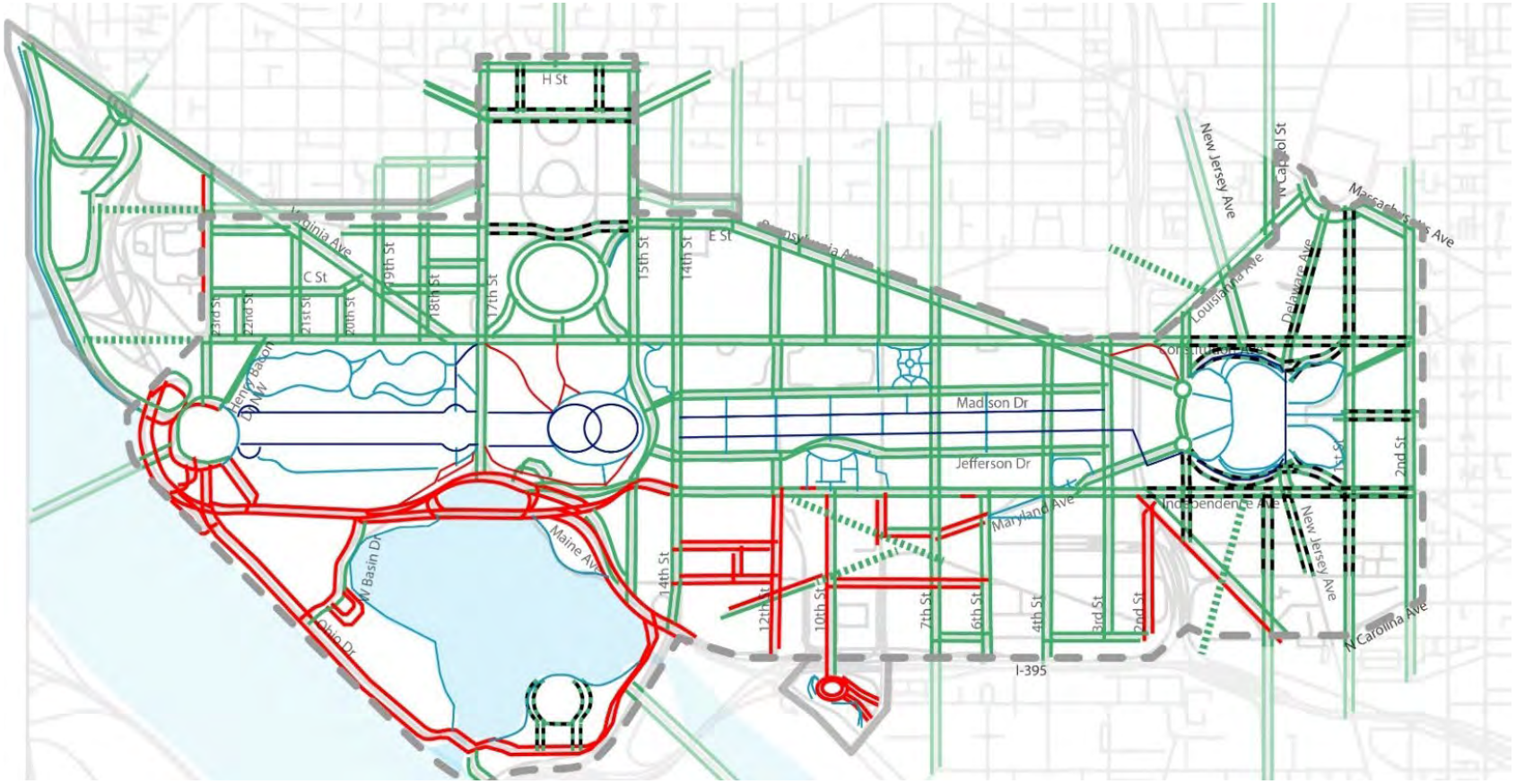
Figure PC-1: Streetscape Zones

Map PC-2: Daytime Pedestrian Volumes



Source: This map documents landholding agency observations of average annual daytime pedestrian volumes and high-volume trails per the NPS Paved Trail Study: August 2016. This map is not based on pedestrian counts or other quantitative data.

Map PC-3: Narrow Circulation Routes



- Sidewalks greater than 16 feet wide
- Pedestrian Paths greater than 10 feet wide
- Multi-Use Trails greater than 10 feet wide
- Potential Future Streets
- Restricted Access Roadway
- Sidewalks less than 16 feet wide; Pedestrian Paths and Multi-Use Trails less than 10 feet wide
- Driveways, Alleys, and Freeways (and Streets outside the Boundary)
- Streetscape Guide and Manual Boundary

Source: This map analyzes existing sidewalk and pedestrian path widths based on Google Earth Pro measurements and a compilation of District GIS data (see Appendix A-PC-1: Existing Sidewalk and Pedestrian Path/Multi-Use Trail Widths for additional information).

FURNISHING AND CIVIC INFRASTRUCTURE ZONE

Principle: Ensure pedestrian circulation space is unobstructed by furnishings and civic infrastructure.

PC-22. Consolidate and align furnishings and civic infrastructure between blocks and throughout the length of street segments to ensure continuous streetscapes with adequate space for pedestrian circulation.

PC-23. Ensure that pedestrian-oriented wayfinding signs and elements are properly located in a manner that:

a. Spatially orients the reader to surroundings;
b. Is accessible and legible to pedestrians of all ages and abilities;
c. Does not obstruct pedestrian circulation space; and
d. Is coordinated with agency signage programs and regulations including but not limited to the following (Small-Scale Element Guidelines will address signage in more detail):
    i. District signage regulations. See DCMR 12.A.N.01.
    ii. National Mall Wayfinding and New Pedestrian Guides.
    iii. Smithsonian wayfinding guidance
    iv. GSA-NCR Exterior Building Signage Program.
    v. WMATA Wayfinding guidance. See Chapter 8 – Wayfinding and Landscape Design of the Station Area Planning Guide available at:

PC-24. Ensure that perimeter security elements do not obstruct pedestrian circulation. For additional guidance and information see:

- Federal Urban Design Element section UD.C.3.
- National Capital Urban Design and Security Plan.
- DDOT Policy for the Use of Public Right of Way for Security Related Purposes
- ISC Standards.

PC-25. Minimize the physical and visual impact of utilitarian measures within public space such as garage entrances, mechanical equipment, loading zones, security barriers, and screening to maintain a coherent and consistent streetscape.





Figure PC-2: Beam barriers are an alternative to more intrusive wedge vehicular barriers and higher-maintenance retractable bollards.

Source: Lyndon B. Johnson Building (Department of Education), GSA.

PC-26. Consult and coordinate with the District's Design and Engineering Manual for guidance regarding minimum dimensions and spacing between elements on roadways under District administration including:

a. Preventing obstacles from obstructing sidewalk widths dedicated to pedestrian circulation;
b. Placement of utility vaults, grates, or other utility elements;
c. Multi-use trail dimensions;
d. Minimum widths adjacent to bus stops;
e. Minimum setbacks for sidewalk furnishings and civic infrastructure;
f. Universal accessibility requirements;
g. Cross and longitudinal slope requirements;
h. Horizontal and vertical curve requirements;
i. Vertical clearances requirements;
j. Requirements for sidewalk cafes; and
k. Limits to protruding objects

See DDOT's DEM 31.2. Sidewalks for more information.

PC-27. Support federal and local agency efforts to develop guidelines regarding utility box placement and housing design. (Small-Scale Element Guidelines may address utility boxes in more detail)

STEP-OUT ZONE

Principle: Ensure ease of connection between pedestrian circulation spaces and curbsides, where appropriate.

PC-28. Consider applying two-foot-wide step-outs[24] (minimum) in addition to required sidewalk widths to accommodate universal accessibility and transportation infrastructure, and ensure ease of curbside access, on federal roadways and if permitted on roadways under DDOT administration.

PC-29. Coordinate with agencies to apply two-foot-wide step-outs on Radiating and Edging streets where this does not prevent meeting pedestrian clear zone and tree/furnishing zone minimum widths, to ensure consistent streetscapes and views.

Figure PC-3: Many existing streets use two-foot-wide step-out zones, per Streetscape Construction Manual guidance.



Constitution Avenue, NW step-out zones.

Coordination with Other Travel Modes:

Principle: Ensure pedestrian circulation space is unobstructed and well-coordinated and connected with other travel modes and related infrastructure. See Appendix A-PC-2: Federal and Local Transportation and Mobility Plans.

PC-30. Prioritize pedestrian movement along sidewalks and multi-use trails within the Streetscape Manual Boundary area by:

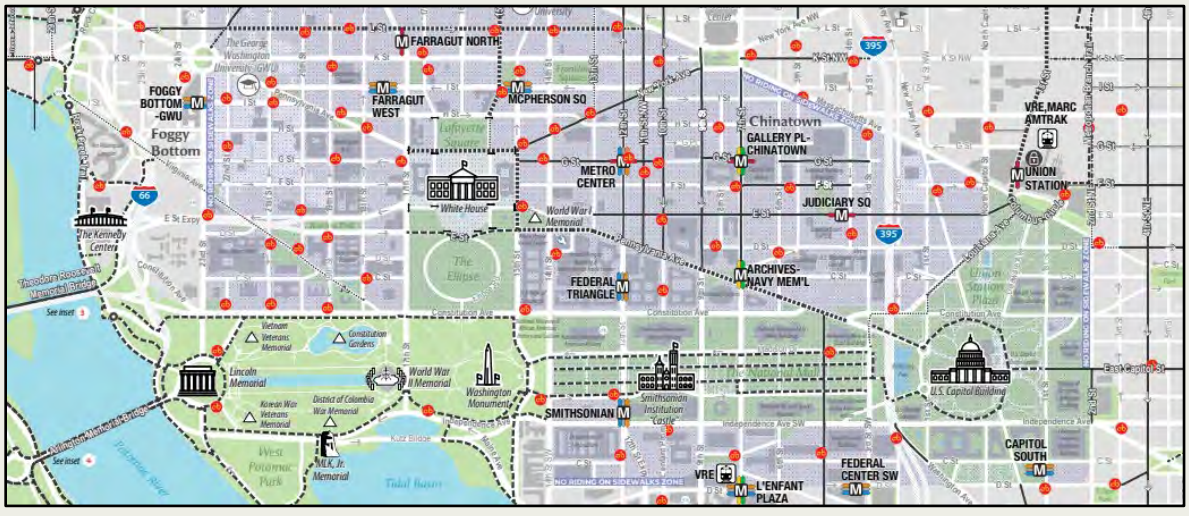
- Allocating adequate space for pedestrian circulation (including minimum total sidewalk widths and unobstructed widths for circulation).
- Allocating 12-foot-wide multi-use trails to accommodate multiple user types (pedestrians, bicyclists, and micromobility modes).

PC-31. Create dedicated space for low-stress bicycle and micromobility travel modes within roadways and support NPS and DDOT efforts to develop separate facilities per the National Mall Plan recommendations and the DC Bicycle Master Plan.

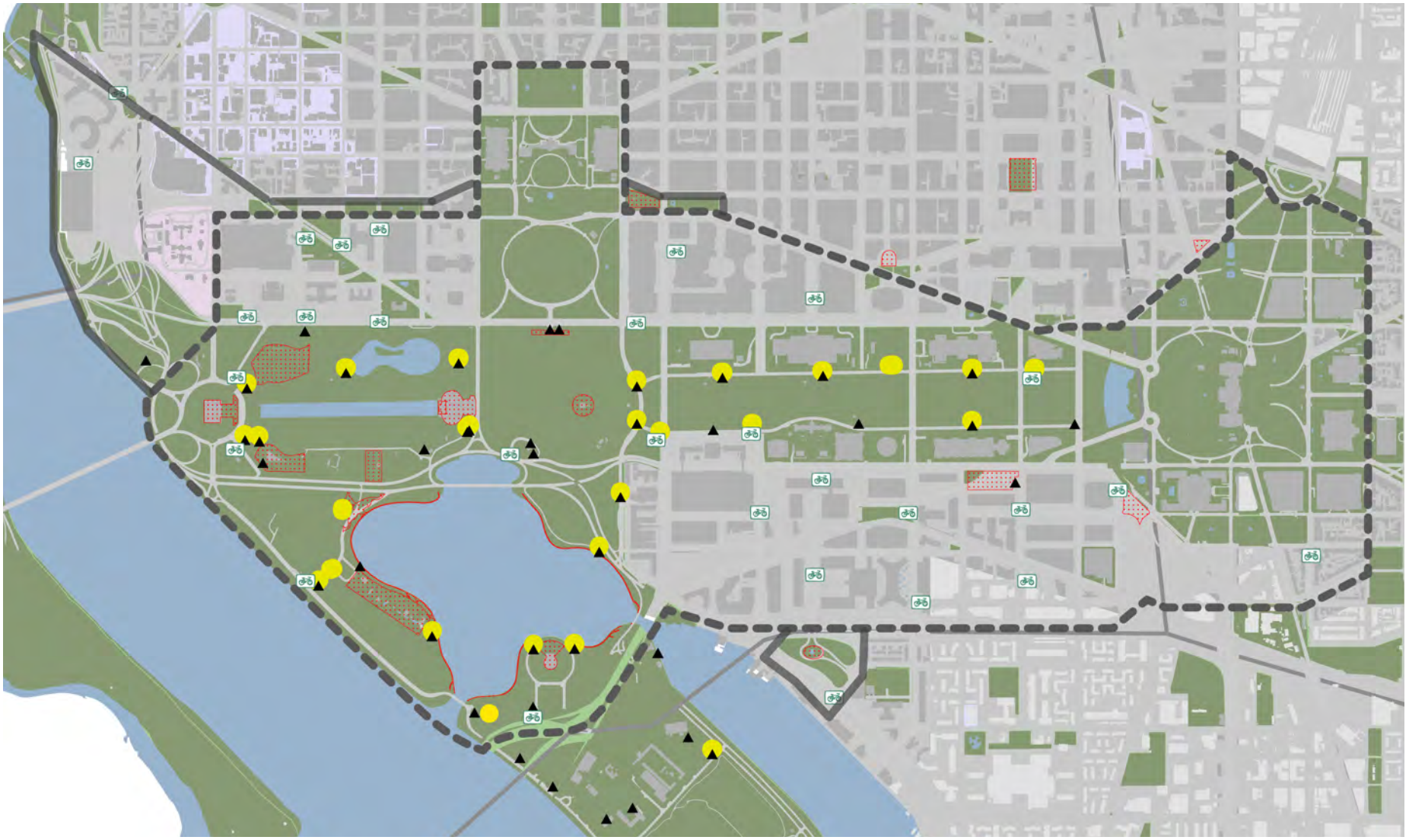
Figure PC-4: The National Mall Plan recommends developing separate facilities for bicycles and other travel modes. See dotted black lines.



Figure PC-5: The DC Bicycle Master Plan



Map PC-4: Geofenced Areas and Bicycle and Micromobility Parking



Source: DC-OCTO & NAMA

PC-32. Support reducing pedestrian and bicycle conflicts within the following areas:

- **NPS Memorials:** Not permitting shared and private bicycles and micromobility modes within NPS memorials. See **Map PC-4: Geofenced Areas and Bicycle and Micromobility Parking**
- **Smithsonian Grounds:** Requiring shared and private bicyclists and micromobility users to walk wheeled vehicles within Smithsonian Grounds.
- **Capitol Grounds:** Not permitting motorized bicycles on Capitol Grounds sidewalks. Not permitting parking and locking of shared bicycles or micromobility modes on Capitol Grounds.[55]
- **Central Business District:** Requiring shared and private bicyclists and micromobility users to walk wheeled vehicles on sidewalks.[56] Riding must occur on bicycle lanes, bicycle tracks, and multi-use trails.

PC-33. Support agency efforts to coordinate with dockless vehicle providers and DDOT to:

- Continue to develop preferred locations and designs for dockless vehicle staging and parking.
- Encourage locking to scooter corrals when available and bicycle racks if corrals not available in support of D.C. Law 23-203 / D.C. Official Code subsection 50-2201.03C.

Figure PC-6: Cities are developing solutions for dockless vehicle parking that do not obstruct pedestrian circulation space. This image shows a dockless scooter parking space in a roadway in Alexandria, VA.

Source: Roadway in Alexandria, VA.



PC-34. Support agency efforts to develop clear and consistent communication, messaging, and enforcement to encourage compliance and reduce pedestrian and bicycle conflicts.

Example: Alert public about changes to transportation options and/or preferred behaviors through:

- *Physical means such as signage and sidewalks stencils.*
- *Digital means such as social media, emails, or agency webpages.*

PC-35. Support agency efforts to identify preferred locations and develop a common language or design for stencils indicating where bicycles and other modes should or should not ride. *Example: Smithsonian Garden sidewalk stencils stating, "Walk Your Wheels."*

Endnotes

[1] Roadways include various elements within the public right-of-way including but not limited to travel lanes, sidewalks, and public open spaces. For the purposes of this document the terms roadways and streets or streetscapes are used interchangeably.

[2] The monumental core is the spatial and symbolic center of the city, which includes the U.S. Capitol Grounds, the White House, Arlington National Cemetery, the National Mall, Federal Triangle, and the surrounding government offices and civic, cultural, and symbolic structures. The monumental core is most closely linked to the distinctive image of the capital city and the functions of federal government. While the major landmarks and resources within the core are perceived, it does not have a rigid geographic or jurisdictional boundary and continues to evolve.

[3] Interagency Working Group Members include: Architect of the Capitol (AOC); U.S. Commission of Fine Arts (CFA); District of Columbia Office of Planning (DCOP); Government of the District of Columbia, District Department of Transportation (DDOT); U.S. Department of Transportation Federal Highway Administration (FHWA); U.S. General Services Administration (GSA); John F. Kennedy Center for the Performing Arts (Kennedy Center); National Capital Planning Commission (NCPC); National Gallery of Art (NGA); U.S. Department of the Interior, National Park Service, National Capital Region (NPS); and Smithsonian Institution (SI).

[4] "Public Parking" is the area of public space devoted to open space, greenery, parks, or parking that lies between the property line, which may or may not coincide with the building restriction line, and the edge of the actual or planned sidewalk that is nearer to the property line, as the property line and sidewalk are shown on the records of the District. This area often includes spaces that appear to be front yards with private landscaping that create park-like settings on residential streets.

[5] "Public Parking" is the area of public space devoted to open space, greenery, parks, or parking that lies between the property line, which may or may not coincide with the building restriction line, and the edge of the actual or planned sidewalk that is nearer to the property line, as the property line and sidewalk are shown on the records of the District. This area often includes spaces that appear to be front yards with private landscaping that create park-like settings on residential streets.

[6] Streetlight fixtures are also referred to as streetlighting units.

[7] The monumental core area contains 17 Historic Districts: 1) National Mall, 2) Washington Monument Grounds, 3) East and West Potomac Parks, 4) Northwest Rectangle, 5) GWU/Old West End, 6) Foggy Bottom, 7) Seventeenth Street, 8) Lafayette Square, 9) Sixteenth Street, 10) Financial, 11) Pennsylvania Avenue, 12) Federal Triangle, 13) Downtown, 14) Judiciary Square, 15) Mount Vernon Triangle, 16) Mount Vernon Square, and 17) Capitol Hill.

[8] Streetlight fixtures are contributing elements to the following Cultural Landscapes: Capitol Square, Library of Congress, Lincoln Memorial Grounds, National Mall, Pennsylvania Avenue, President's Park South, Senate Parks, Union Square, Washington Monument Grounds.

[9] Noreen, Sarah Pressey. *Public Street Illumination in Washington, D.C*. GW Washington Studies Series, No. 2. Washington, D.C.: George Washington University, 1975.

[10] Ibid.

[11] The Mall: National Mall and Memorial Parks Cultural Landscape Inventory, NPS (2006).

[12] Pennsylvania Avenue Cultural Landscape Inventory, NPS (2016).

[13] East and West Potomac Parks Historic District Nomination, NPS (1999).

[14] Benjamin Banneker Park Cultural Landscape Inventory, NPS (2013).

[15] Pedestrian is defined as a person who is on foot or who is operating a self-propelled wheelchair, motorized tricycle, or motorized quadricycle and, by reason of physical disability, is otherwise unable to walk about. A pedestrian does not include persons using self- or electric- propelled, bicycles, scooters, segways, skateboards, or other micromobility travel modes.

[16] Refers to height reached by the tree species upon maturity. Does not refer to tree height upon installation.

[17] Use multiple tree species with similar shapes, branching structures, and mature heights to develop a species polyculture rather than monoculture.

[18] American Elms are susceptible to Dutch Elm Disease, Elm Yellows, and the Elm Leaf Beetle.

[19] Green Infrastructure is stormwater management practices designed to reduce and treat stormwater at its source using plant or soil systems, permeable pavement, or other permeable surfaces.

[20] The L'Enfant Plan for the city of Washington (1791) called for a double row of trees on 160-foot-wide avenues. President Thomas Jefferson's plan for Pennsylvania Avenue, NW (1803) called for a double row of Lombardy Poplar trees. The DC Commissioner's Shade Tree Plan (1880) identified double rows of trees on K Street NW and NE, Massachusetts Avenue NW and NE, New York Avenue NW, and Pennsylvania Avenue SE. The Olmsted Brothers (1903) recommended a double row of trees on 16th Street, NW to frame the White House vista.

[21] Planting a double row of trees on Independence Avenue, SW would require significant changes. Further study is needed to balance the aspiration for additional tree canopy with other planning considerations such as roadway reduction, demand for pedestrian walking space and curbside drop-offs, universal accessibility, additional travel modes, and stormwater management.
[22] (Red Maples are currently plentiful in Washington, DC)
[23] Verges are landscape areas between the curb and sidewalk and may include street trees, landscape plantings, street furnishings, and step-out zones.
[24] A step-out or is a narrow strip of sidewalk along the back of curbs that provide space to step out of a vehicle parked adjacent to a furnishing zone.
[25] Beautified areas may include, but are not limited to, other tree boxes, stormwater management, public parking, or building yards.
[26] Temporary use of flexible porous pavement is defined as the length of construction requiring flexible porous pavement to maintain open sidewalk, or not lasting more than five to ten years, while a more durable long-term plan is implemented.
[27] Detail drawings can be found in DDOT's Standard Drawings 2015. Some details are in progress as the IWG advances work to update the *Streetscape Construction Manual*.
[28] The root flare is the area at the base of a tree where the trunk transitions from trunk and bark tissues into the root system.
[29] Understory plantings refers to plants that may be planted under trees as well as shrubs, perennials, groundcovers, and grass that may be planted in landscape design either under trees or not.
[30] A combined sewer overflow is a sewer system which collects rainwater runoff, domestic sewage, and wastewater into one pipe.
[31] Due to maintenance challenges, permeable pavers are recommended because they are the most durable and easiest to maintain amongst permeable, porous, and pervious types of paving.
[32] Permeable pavers are a paver system which uses solid pavers with joins that allow water to infiltrate in between pavers, and into the sub surface system below.
[33] These areas are under federal jurisdiction, except L'Enfant Promenade / 10th Street, SW and the at-grade roadway through the 4th Street Plaza, which are under the District's jurisdiction. Note, the National Gallery of Art below-grade building is underneath the 4th Street Plaza.
[34] Typically, at L'Enfant Plan circles and squares, a quarter-round curb circumscribes lands under NPS jurisdiction. Often, the sidewalks outside the quarter-round curb are under the District's jurisdiction.
[35] A Barnes-Dance intersection or pedestrian scramble is a type of intersection where car traffic halts so that pedestrians can cross in all directions including diagonally.
[36] Albedo (al-bee-doh) is a measure of how much light that hits a surface is reflected without being absorbed. Albedo is typically measured on a scale of zero to one. Something that appears white reflects most of the light that hits it and has a high albedo, while something that looks dark absorbs most of the light that hits it, indicating a low albedo**.** Pavements with lower albedo tend to absorb more solar energy, resulting in higher pavement temperatures, whereas pavements with higher albedo typically absorb less solar energy, resulting in cooler pavement temperatures.
[37] Porous asphalt is a pavement surface, which uses courser medium than traditional asphalt to allow water filtration over a continuous surface.
[38] Porous pavers are paver blocks made of a cellular grid system with the gaps filled with soil, sand, or gravel, which allows water infiltration.
[39] More information about the differences and uses for permeable, porous, and pervious pavements available at: https://stormwater.wef.org/2013/10/pervious-permeable-porous-pavers-really/
[40] Pervious pavers are paver materials, which allows water to flow directly through the paver material.
[41] Multi-use trails typically carry pedestrians, bicyclists, and other micromobility travel modes. On the National Mall, NPS plans to change the use of the multi-use trails to prioritize pedestrian circulation and provide separate dedicated facilities for bicycles and other travel modes.
[42] Micromobility is defined as shared or private electric scooters, bikeshare, or other small, lightweight, wheeled conveyances that typically travel at high- to mid- speeds (faster than pedestrian travel).
[43] For more information on pedestrian safety improvements, see https://highways.dot.gov/sites/fhwa.dot.gov/files/2020-11/FHWA_PedSafety_ActionPlan_Nov2020.pdf.
[44] Step-Out areas are also referred to as Curb Walk areas in the District's Design and Engineering Manual.
[45] For more information, see:

- (Proposed) Public Rights-of-Way Accessibility Guidelines (PROWAG) available at: https://www.access-board.gov/prowag/ and

- Public Rights-of-Way Access Advisory Committee (PROWACC) Accessible Public Rights-of-Way: Planning and Designing for Alterations available at: https://www.access-board.gov/files/prowag/planning-and-design-for-alterations.pdf

[46] Pedestrian level of comfort (PLOC), developed by the Montgomery County Planning Department, describes how comfortable pedestrians feel when circulating along sidewalks and pathways. PLOC can be assessed based on factors such as traffic speed, number of lanes, and whether there is a buffer between the street and the pedestrian.

[47] To establish a baseline understanding of typical pedestrian circulation and inform the application of Streetscape Guidelines (see Tree Box Treatments), landholding agencies documented observed annual average daytime pedestrian volumes. These observations are not based on pedestrian counts or other quantitative data.

[48] Pedestrian Paths show pedestrian connections within public ROWs and areas outside of public ROWs that are generally open to the public. Pedestrian Paths outside of public ROWs are shown for context and are not subject to the Pedestrian Circulation Guidelines.

[49] Restricted Access Roadways limit vehicle circulation, often controlled by security checkpoints and retractable vehicle barriers. Typically, pedestrian circulation is permitted through restricted access roadways.

[50] Agencies are working to determine the Boundary alignment to include Banneker Park and Kennedy Center areas.

[51] WMATA's Station Area Planning Guide, available at: https://www.wmata.com/business/real-estate/upload/Station-Area-Planning-Guide-October-2017.pdf

[52] Pedestrian Clear Zone refers to the space within the sidewalk area that is clear of any and all obstructions for pedestrian use.

[53] Total Sidewalk Width refers to the sidewalk area inclusive of the step-out, tree/furnishing zone, and Pedestrian Clear Zone. This does not include Public Parking.

[54] Pedestrian protection means buffering pedestrians located on sidewalks, medians, refuge islands, walkways, or pedestrian pathways or trails from vehicle conflicts.

[55] See Traffic Regulations for the U.S. Capitol Grounds (2019) for more information: https://www.uscp.gov/sites/uscapitolpolice.house.gov/files/wysiwyg_uploaded/US%20Capitol%20Grounds%20Traffic%20Regulations_Amended%20February%202019.pdf

[56] Unless designated as multi-use trail.

Appendices

The Appendices contain resources that support the Streetscape Design Guidelines: Vertical and Surface Elements.

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Streetlights



A-S-1: DDOT's Streetlight Policy and Design Guidelines(2013)…..3

A-S-1: DDOT's Streetlight Policy and Design Guidelines (2013)

The following excerpt reflects federal-local interagency coordination to develop streetlight fixture guidance. The Boundary area is exempt from DDOT's guidance. However, the following excerpt is included to address transitions between the monumental core and other areas of the city. The excerpt includes the map of Special and Historic streets as well as tables identifying appropriate streetlight fixtures for these street designations. Generally, the monumental core area has underground power lines.

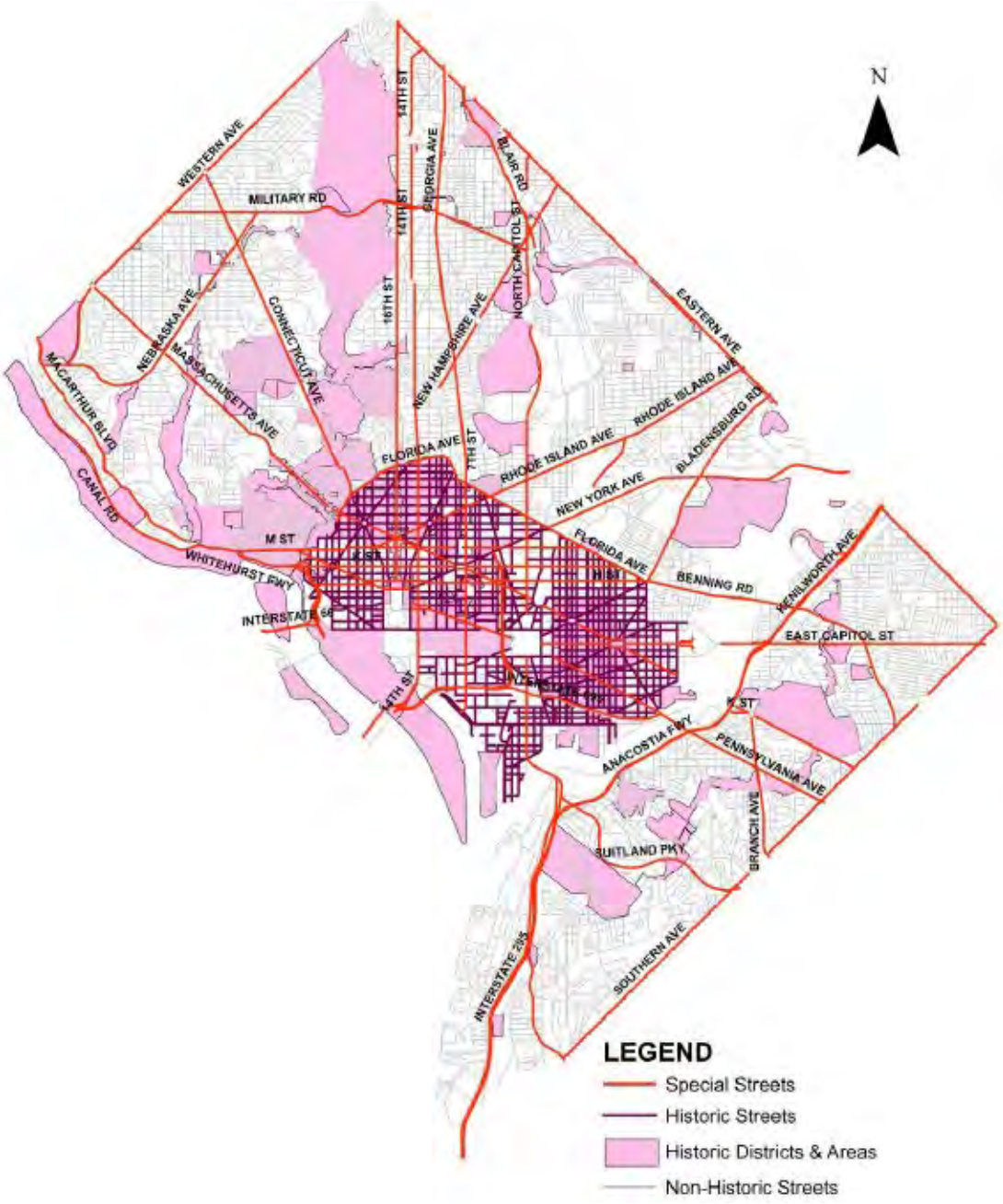


Figure 12. Special and Historic Streets in Washington, DC

Table 20. Standards for Historic Streets with Underground Power Lines

Criteria	Roadway/Area Type			Bridges[c]	Alley	Freeway	Tunnels/ Underpasses	Comments
	Commercial	Intermediate (Mixed Use)	Residential					
Lighting Hardware Type	#14, #16, #18, Twin 20[b]	#14, #16, #18, Twin 20[b]	#14, #16, #18	#14, #16, #18, Twin 20[b] *(Note: Replace Historic Upright in kind)*	Cobra-head (5A)	Cobra-head	▪ Wall packs or other viable options (Note 4) for vehicular Tunnels ▪ #14, #16, #18 for pedestrian tunnels	Upright poles are currently used for historic areas. They are truly historical to DC and aesthetically more pleasing
Cutoff Criteria	Full Cutoff or Cutoff	Full Cutoff or Cutoff	Full Cutoff or Cutoff	Full Cutoff or Cutoff	Full Cutoff or Cutoff	Full Cutoff or Cutoff	N/A	
Color of Pole	Black	Black	Black	Depends on Bridge Design	Black	Black	N/A	▪ Existing color
Preferred Orientation	Staggered	Staggered	Staggered	Opposite	Staggered	Staggered	N/A	▪ Staggered chosen because of uniformity of light ▪ Opposite for bridge for aesthetics and symmetry
Min Spacing between Poles[a]	60 ft min (on one side) – all orientations						N/A	
Height of Pole	Depends on Pole Type						N/A	
Base of Pole	Depends on Pole Type						N/A	
Material of Pole	Depends on the prevailing technology						N/A	

a For Special Case, the spacing can be less than recommended, but it must be justified. Minimum spacing between the poles (60 ft) is not a recommendation but only an absolute minimum.
b Twin 20 not necessarily desirable unless it is a Special Case.
c Bridges may deviate from these guidelines and may be designed with special decorative streetlight hardware to signify their importance, especially in the entry to the City.

Notes:
1. For Signalized Intersections, if mast arm is not required, for upright poles (#14, #16 & #18), #18 combination pole should be used; and for Twin 20, the same should be used as combination pole.
2. For Signalized Intersections, if mast arm is required, Pendant pole should be used as combination pole; decorative arm with Teardrop fixture can be used.
3. For Unsignalized Intersections, the same pole should be used at the intersections. If the selected pole doesn't illuminate the intersection uniformly, the next taller pole that illuminates the intersection uniformly should be selected.
4. DDOT-Approved LED fixtures, if available, are an option for all above-mentioned lighting alternatives.

Table 22. Standards for Special Streets with Underground Power Lines

Criteria	Roadway/Area Type			Bridges[c]	Alley	Freeway	Tunnels/ Underpasses	Comments
	Commercial	Intermediate (Mixed Use)	Residential					
Lighting Hardware Type	Twin 20	Cobrahead (Alt. Decorative Teardrop[a])	Cobrahead (Alt. Decorative Teardrop[a])	Twin 20	N/A	Cobrahead (Alt. Decorative Teardrop[a])	▪ Wall packs or other viable options (Note 4) for vehicular Tunnels ▪ #14, #16, #18 for pedestrian tunnels	▪ Twin 20s are DC signature poles and aesthetically more pleasing
Cutoff Criteria	Full Cutoff or Cutoff	Full Cutoff or Cutoff	Full Cutoff or Cutoff	Full Cutoff or Cutoff	N/A	Full Cutoff or Cutoff	N/A	
Color of Pole	Black	Black	Black	Depends on Bridge Design	N/A	Black	N/A	
Preferred Orientation	Opposite	Opposite	Opposite	Opposite	N/A	Staggered	N/A	▪ Opposite may be aesthetically more pleasing
Min Spacing between Poles[b]	60 ft, min (on one side) - all orientations				N/A	60 ft, min (on one side) - all orientations	N/A	
Height of Pole	Depends on Pole Type				N/A	Depends on Pole Type	N/A	
Base of Pole	Depends on Pole Type				N/A	Depends on Pole Type	N/A	
Material of Pole	Depends on the prevailing technology				N/A	Depends on the prevailing technology	N/A	

a Although Teardrop has aesthetic appeal, Cobrahead should be considered in cost-prohibitive situations and for viable LED implementations.
b For Special Case, the spacing can be less than recommended, but it must be justified. Minimum spacing between the poles (60 ft) is not a recommendation but only an absolute minimum.
c Bridges may deviate from these guidelines and may be designed with special decorative streetlight hardware to signify their importance, especially in the entry to the City.

Note:
1. For Signalized Intersections, if mast arm is not required, Twin 20 should be used as combination pole.
2. For Signalized Intersections, if mast arm is required, Pendant pole should be used as combination pole; decorative arm with Teardrop fixture can be used.
3. For Unsignalized Intersections, the same pole should be used at the intersections. If the selected pole doesn't illuminate the intersection uniformly, the next taller pole that illuminates the intersection uniformly should be selected.
4. DDOT-Approved LED fixtures, if available, are an option for all above-mentioned lighting alternatives.

Trees



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A-T-1: Tree List

Table 1: Street Tree List

Trees in the following table are good examples of urban-tolerant street trees to plant in each form category, as shown on **Map T-1: Recommended Tree Form**. It is more important for street trees to have the recommended tree form characteristics, than match the exact species listed in the Table. The Tree List is not exclusive, and other tree species may be identified that match the intended form characteristics.

Tree forms include Large Vase-Shaped Canopy: Similar to American Elm, Vase and Spreading, Pyramidal, and Round and Oval. The tree height reflects the mature height of a species: large (60-80 feet tall); medium (40-60 feet tall); small (less than 40 feet tall). Trees listed in bold letters are inundation tolerant and suitable for bioretention facilities according to DDOT and DOEE. Trees listed in italics are large vase-shaped trees that are similar to the American Elm and recommended for the National Mall according to *The State of the Elms on the National Mall in Washington, D.C. Operations and Maintenance Guide (March 2019).*

Trees are categorized by form and height according to the *Manual of Woody Landscape Plants: Their Identification, Ornamental Characteristics, Culture, Propagation, and Uses 6th Ed. 2009* by Michael A. Dirr, *Urban Tree Selection Guide: A Designer's List of Appropriate Trees for the Urban Mid-Atlantic 2015* by Casey Trees, and consultations with federal arborists.

TABLE T-1: STREET TREE LIST

LARGE VASE-SHAPED CANOPY: SIMILAR TO AMERICAN ELM		
Large (60-80 feet mature height)	**Medium (40-60 feet mature height)**	**Small (less than 40 feet mature height)**
Ulmus japonica x wilsoniana [Accolade] / Accolade Elm	*Ulmus [Morton Glossy] / Triumph Elm*	
Ulmus Americana [Jefferson]	*Ulmus [Patriot] / Patriot Elm*	
	Zelkova serrata [Green Vase] / Green Vase Zelkova	
VASE & SPREADING		
Large (60-80 feet mature height)	**Medium (40-60 feet mature height)**	**Small (less than 40 feet mature height)**
Celtis laevigata / Sugar Hackberry	**Celtis occidentalis / Common Hackberry**	Amelanchier species and cultivars
Ulmus americana [Colonial Spirit]	Chionanthus retusus and cultivars	Cercis canadensis and cultivars
Ulmus Americana [Jefferson]	*Eucommia ulmoides / Hardy Rubber Tree*	Crataegus viridis 'Winter King'
Ulmus americana 'New Harmony'	**Gleditsia triacanthos / Thornless Honeylocust**	**Koelreuteria paniculata / Golden Raintree**
Ulmus americana 'Valley Forge'	**Gymnocladus dioicus / Kentucky Coffee Tree**	**Lagerstroemia indica / Common Crapemyrtle**
Ulmus japonica x wilsoniana [Accolade] / Accolade Elm	*Gymnocladus dioicus [Espresso-JFS] / Espresso Kentucky Coffee Tree*	Prunus serrulata / Japanese Cherry [Kwanzan]
Ulmus parvifolia / Chinese Elm	*Ulmus [Morton Glossy] / Triumph Elm*	Prunus x yedoensis / Yoshino Cherry
Zelkova serrata / Japanese zelkova	*Ulmus [Patriot] / Patriot Elm*	
	Zelkova serrata [Green Vase] / Green Vase Zelkova	
PYRAMIDAL		
Large (60-80 feet mature height)	**Medium (40-60 feet mature height)**	**Small (less than 40 feet mature height)**
Ginkgo biloba / Maiden hair tree	**Betula nigra / River Birch**	Illex x atenuata / Topal Holly
Liriodendron tulipifera / Tulip Poplar	**Ilex opaca / American Holly**	Magnolia virginiana / Sweetbay Magnolia
Magnolia grandiflora / Southern Magnolia	**Liquidambar styraciflua / American sweetgum**	
Metasequoia glyptostroboides / Dawn Redwood	**Nyssa sylvatica / Black Tupelo**	
Platanus x acerifolia / London Planetree	Quercus bicolor / Swamp White Oak	
Platanus occidentalis / American Sycamore	Quercus lyrata / Overcup Oak	
Quercus coccinea / Scarlet Oak	Tilia tomentosa / Silver Linden	
Quercus falcata / Southern Red Oak		
Quercus imbricaria / Shingle Oak		
Quercus nigra / Water Oak		
Quercus nuttalli / Nuttall Oak		
Quercus palustris / Pin Oak		
Quercus phellos / Willow Oak		
Quercus rubra / Red Oak		

Quercus shumardii / Shumard Oak		
Taxodium distichum / Common Baldcypress		
Tilia americana / American Linden		
Tilia cordata / Littleleaf Linden		
ROUND & OVAL		
Large (60-80 feet mature height)	**Medium (40-60 feet mature height)**	**Small (less than 40 feet mature height)**
Acer saccharinum / Silver Maple	Acer buergerianum and cultivars	Acer barbatum / Florida Maple
Acer saccharum / Sugar Maple cultivars that do well in this region	**Acer rubrum / Red Maple**	Acer campestre / Hedge Maple [Queen Elizabeth]
Aesculus flava / Yellow Buckeye	Catalpa speciosa / Northern Catalpa	Carpinus caroliniana / American Hornbeam
Aesculus hippocastanum / Common Horse Chestnut	**Celtis occidentalis / Common Hackberry**	Catalpa bignonioides / Southern Catalpa
Quercus coccinea / Scarlet Oak	Cladrastis kentukea / American Yellowwood	Chionanthus virginicus / White Fringetree
Quercus macrocarpa / Bur Oak	**Diospyros virginiana / Common Persimmon**	Magnolia stellata / Star Magnolia
Quercus robur / English Oak	Pistacia chinensis and cultivars / Chinese pistache	Prunus x incamp / Okame Cherry [Okame]
Quercus rubra / Red Oak	Quercus bicolor / Swamp White Oak	Malus x arnoldiana / Flowering crabapple
Sophora japonica or Styphnolobium japonicum / Japanese Pagodatree	Quercus lyrata / Overcup Oak	Magnolia virginiana / Swamp Magnolia
		Prunus virginiana / Common chokecherry

A-T-2: National Mall and Memorial Parks Bird and Bat Best Management Practices

The National Mall and Memorial Parks (NAMA) supports several District of Columbia (DC) avian and mammal species of concern (Table 1). Most birds at NAMA are protected by the Migratory Bird Act. In addition Executive Order 13186 (2009), directs Federal agencies to minimize negative impact to birds and promote conservation. Since birds nest in locations other than trees, such as bare ground and shrubs, construction projects should consider the entire project area and inspect for nesting birds and other denned/roosted wildlife. Table 2, not only highlights the U.S. Fish and Wildlife Services'list of birds of conservational concern, but where these species nest. Although NAMA is not occupied byany federally threatened or endangered species it is adjacent to critical habitat for the endangered AtlanticSturgeon (*Acipenser oxyrinchus oxyrinchus*).

We suggest the following recommendations for tree/shrub removal to ensure compliance withThe Migratory Bird Act (1918), The Bald and Golden Eagle Protection Act (1940), and District of Columbia regulations (2015):

To protect migratory birds, tree/shrub removal should not occur between March 15 – August 15. If this can not be accommodated, a survey will be conducted to ensure that the trees/shrubs to be removeddo not contain any nesting birds (eggs/nestlings). There are also species specific guidelines:

- Bald eagle: December 15th – July 15th, 0.25 mile buffer around the nest, during breeding season, restricting vehicle/pedestrian access.
- Black-crowned night heron: (listed as Tier Priority 1 for D.C. Species of Greatest Conservation Need 2015 see Table 1) nesting restrictions are April 1 – August 15, activities should be restricted within 0.25 miles of the rookery and maintain undisturbed vegetated buffer of at least 500' around rookery.

To protect bats in the area, between June 1st and July 31st, roosting trees and a 150-foot radius buffer will have no tree removal, or other disturbance within the zone. If this can not be accommodated asurvey will be conducted to ensure that the trees to be removed are not utilized by roosting bats. Please see Appendix A for additional information regarding construction and bird conservation provided by the U.S. Fish and Wildlife Service.

Scientific Name	Common Name	Tier Priority
Icterus galbula	Baltimore Oriole	1
Nycticorax nycticorax	Black-crowned Night Heron	1
Empidonax trailii	Willow flycatcher	1
Hylocichla mustelina	Wood Thrush	1
Myotis lucifugus	Little Brown Bat	1
Perimyotis subflavus	Tri-colored Bat	1
Lasiurus cinereus	Hoary Bat	1
Lasiurus borealis	Eastern Red Bat	1
Eptesicus fuscus	Big Brown Bat	1
Lasionycteris notivagans	Silver Haired Bat	1

Table 1. District of Columbia Listed Species of Concern (Last Updated 2015).

Scientific Name	Common Name	Category of Concern*	Status	Nest Location
Haliaeetus leucocephalus	Bald Eagle	Non-BCC Vulnerable	Year round	Tree
Coccyzus erythropthalmus	Black-billed Cuckoo	BCC Rangewide (CON)	Migration	Tree
Dolichonyx oryzivorus	Bobolink	BCC Rangewide (CON)	Migration	Ground
Cardellina Canadensis	Canada Warbler	BCC Rangewide (CON)	Migration	Ground
Dendroica cerulean	Cerulean Warbler	BCC Rangewide (CON)	Breeding	Tree
Calidris alpine arcticola	Dunlin	BCC-BCR	Migration	Ground N/A
Antrostomus vociferous	Eastern Whip-poor-will	BCC Rangewide (CON)	Not Found Past 10yrs	Ground
Aquila chrysaetos	Golden Eagle	Non-BCC Vulnerable	Migration	Cliff N/A
Vermivora chrysoptera	Golden-winged Warbler	BCC Rangewide (CON)	Migration	Ground
Oporonis formosus	Kentucky Warbler	BCC Rangewide (CON)	Breeding	Ground
Sterna antillarum	Least Tern	BCC-BCR	Breeding nearby	Ground N/A
Tringa flavipes	Lesser Yellowlegs	BCC Rangewide (CON)	Migration	Ground
Dendroica discolor	Prairie Warbler	BCC Rangewide (CON)	Breeding	Shrub
Protonotaria citrea	Prothonotary Warbler	BCC Rangewide (CON)	Breeding	Cavity
Melanerpes erythrocephalus	Red-headed Woodpecker	BCC Rangewide (CON)	Breeding & wintering	Cavity
Gavia stellata	Red-throated Loon	BCC Rangewide (CON)	Nonbreeding	Ground N/A

Arenaria interpres morinella	Ruddy Turnstone	BCC-BCR	Nonbreeding	Ground N/A
Euphagus carolinus	Rusty Blackbird	BCC Rangewide (CON)	Nonbreeding	Tree N/A
Calidris pusilla	Semipalmated Sandpiper	BCC Rangewide (CON)	Migration	Ground N/A
Limnodromus griseus	Short-billed Dowitcher	BCC Rangewide (CON)	Migration	Ground N/A
Bubo scandiacus	Snowy Owl	BCC Rangewide (CON)	Winter (irruptive)	Ground N/A
Numenius phaeopus	Whimbrel	BCC Rangewide (CON)	Migration	Ground N/A
Tringa semipalmata	Willet	BCC Rangewide (CON)	Not Found Past 10yrs	Ground N/A
Hylocichla mustelina	Wood Thrush	BCC Rangewide (CON)	Breeding	Tree

Table 2. U.S. Fish and Wildlife Service Birds of Conservation Concern at the National Mall and Memorial Parks (from Information for Planning and Consultation [IPaC] 2018).

*Category for Concern

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Pruning trees and shrubs

When pruning, you should modify your work to not disturb, injure, or kill protected wildlife (Tree Care Industry Association, 2017). The following information on tree and shrub pruning has been adapted from “Tree Care for Birds & Other Wildlife, Best Management Practices in California” (2018) and “Avoiding Impacts on Nesting Birds, Best Management Practices, Vegetation and Construction Projects” (2016). Dates for pruning follow the guidelines for tree/shrub removal listed above.

1. Plan work accordingly to avoid bird/bat breeding season (March 15 – August 15, for most bird species).
    a. Birds and other wildlife not only utilize tree/shrub limbs as breeding/resting/foraging areas, but use tree cavities, leaves, bark, and standing dead trees (Figure 1). Regardless if a nest is present the tree/shrub may be providing nesting/denning habitat for wildlife.



Figure 1. Common nest locations (Illustration from Tree Care for Birds & Other Wildlife, 2018).

b. Nests and wildlife dens/habitat can also be found in human structures, and should be considered when planning construction and other projects (Figure 2).

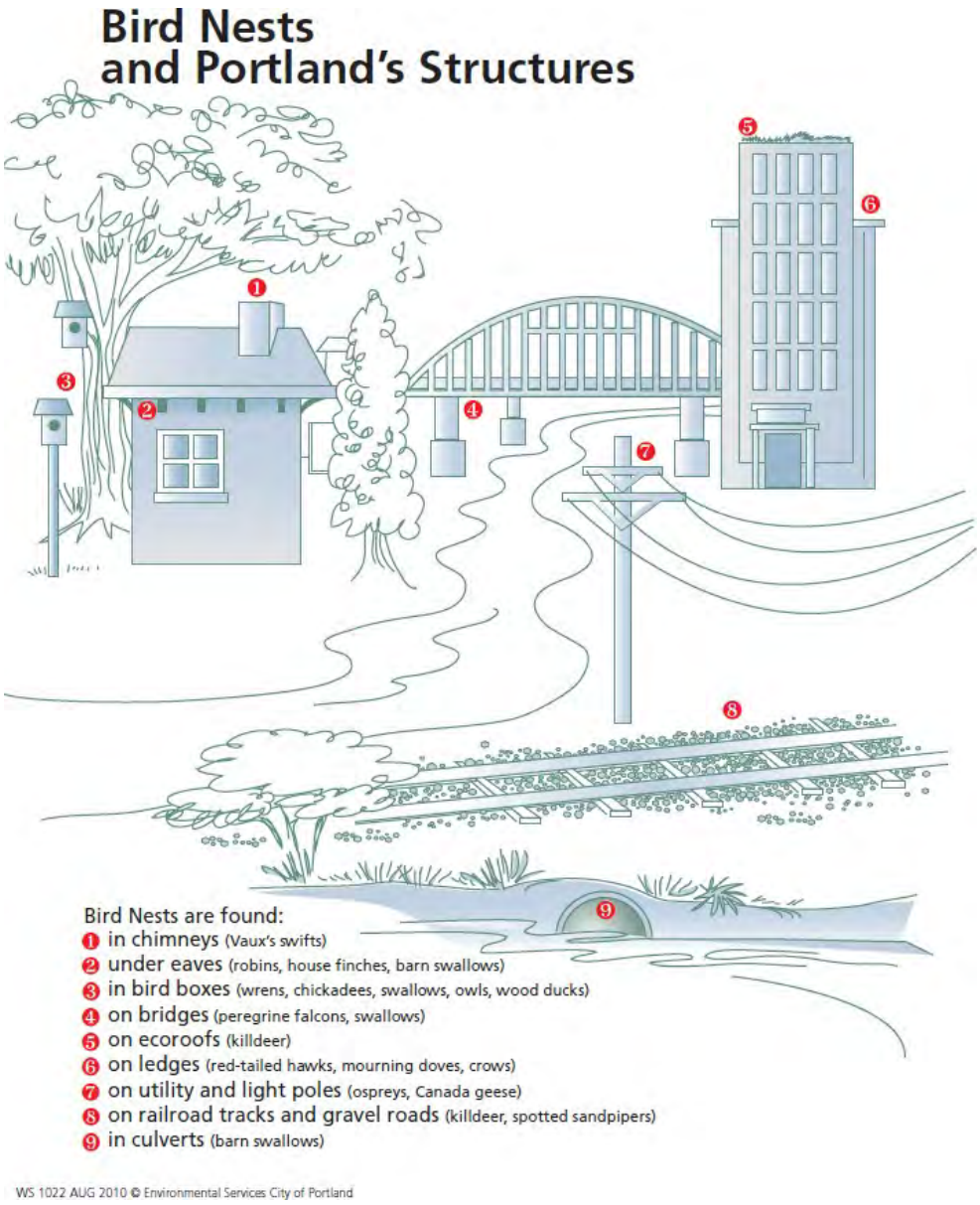


Figure 2. Human structure related bird nest/wildlife habitat locations (Illustration from Avoiding Impacts on Nesting Birds, Best Management Practices, Vegetation and Construction Projects, 2016)

2. If work is near a nesting bird/wildlife den, minimize disturbance in the area, especially during inclement weather.
3. If risk is managed and human safety is not an issue, consider keeping dead or dying trees since they provide habitat for insects/birds/wildlife. Different pruning techniques can be used to reduce the risk to human safety while still preserving the snag for wildlife habitat (Figure 3). If all branches are unsafe, remove the branches and leave the trunk.

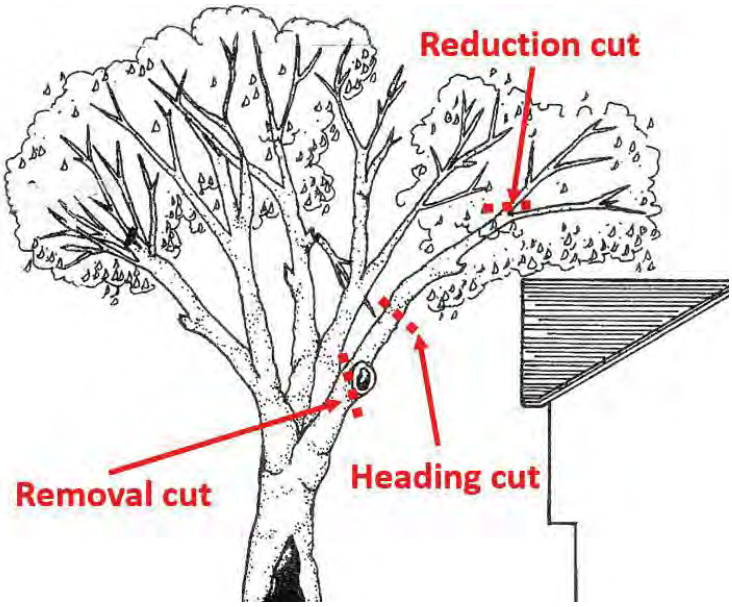


Figure 3. Different cuts used to remove the hazard but retain the dead/dying tree (Illustration from Tree Care for Birds & Other Wildlife, 2018).

Literature Cited

City of Portland Environmental Services. 2016. Avoiding Impacts on Nesting Birds:Best Management Practices for Vegetation and Construction Projects. City of Portland, Portland, OR.

District of Columbia Department of Energy and Environment. 2015. District ofColumbia Wildlife Action Plan. Government of the District of Columbia.

Donohue, K., R. Gilpin, and C. Bassett. 2018. Tree Care for Birds & Other Wildlife,Best Management Practices in California.

Tree Care Industry Association. 2017. American National Standard, Tree, Shrub, andOther Woody Plant Management – Standard Practices (Pruning).

Laws Protecting Birds

Migratory Bird Treaty Act (1918): Makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter any migratory bird, or the parts, nests,or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations.

The Bald and Golden Eagle Protection Act (1940): Prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. There are criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner any bald eagle… [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act also defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

Executive Order 13186 (2001): Support bird conservation by enhancing or restoring habitat, reducing negative impacts, integrate migratory birds in educational activities, etc. A memorandum of understanding between the National Park Service and Fish and Wildlife Service was signed 04/10/2010.

District of Columbia Regulations (2015): Chapter 15 Title 19 Section 1574.5

A migratory bird shall be controlled only in accordance with the federal Migratory Bird Treaty Act (16 U.S.C. §§ 703-712) and its' implementing regulations, and as follows:

(a) A nest with eggs or young may not be moved, relocated, destroyed, or altered in any way without first obtaining a federal permit.

(b) A nest with no eggs or young may be removed from structures such as boats, docks, and construction equipment, or relocated without a federal permit.

Appendix A. Nationwide Standard Conservation Measures for Construction Sites, U.S. Fish and Wildlife Service.

NATIONWIDE STANDARD CONSERVATION MEASURES

Listed below are effective measures that should be employed at all project development sites nationwide with the goal of reducing impacts to birds and their habitats. These measures are grouped into three categories: General, Habitat Protection, and Stressor Management. These measures may be updated through time. We recommend checking the Conservation Measures website regularly for the most up-to-date list.

1. General Measures

a. Educate all employees, contractors, and/or site visitors of relevant rules and regulations that protect wildlife. See the Service webpage on Regulations and Policies for more information on regulations that protect migratory birds.

b. Prior to removal of an inactive nest, ensure that the nest is not protected under the Endangered Species Act (ESA) or the Bald and Golden Eagle Protection Act (BGEPA). Nests protected under ESA or BGEPA cannot be removed without a valid permit.

    i. See the Service Nest Destruction Policy

c. Do not collect birds (live or dead) or their parts (e.g., feathers) or nests without a valid permit. Please visit the Service permits page for more information on permits and permit applications.

d. Provide enclosed solid waste receptacles at all project areas. Non-hazardous solid waste (trash) would be collected and deposited in the on-site receptacles. Solid waste would be collected and disposed of by a local waste disposal contractor. For more information about solid waste and how to properly dispose of it, see the EPA Non-Hazardous Waste website.

e. Report any incidental take of a migratory bird, to the local Service Office of Law Enforcement.

f. Consult and follow applicable Service industry guidance.

2. Habitat Protection

a. Minimize project creep by clearly delineating and maintaining project boundaries (including staging areas).

b. Consult all local, State, and Federal regulations for the development of an appropriate buffer distance between development site and any wetland or waterway. For more information on wetland protection regulations see the Clean Water Act sections 401 and 404.

c. Maximize use of disturbed land for all project activities (i.e., siting, lay-down areas, and construction).

d. Implement standard soil erosion and dust control measures. For example:

    i. Establish vegetation cover to stabilize soil

    ii. Use erosion blankets to prevent soil loss

    iii. Water bare soil to prevent wind erosion and dust issues

3. Stressor Management

Stressor: Vegetation Removal

Conservation Goal: Avoid direct take of adults, chicks, or eggs.

Conservation Measure 1: Schedule all vegetation removal, trimming, and grading of vegetated areas outside of the peak bird breeding season to the maximum extent practicable. Use available resources, such as internet-based tools (e.g., the FWS's Information, Planning and Conservation system and Avian Knowledge Network) to identify peak breeding months for local bird species; or, contact local Service Migratory Bird Program Office for breeding bird information.

Conservation Measure 2: When project activities cannot occur outside the bird nesting season, conduct surveys prior to scheduled activity to determine if active nests are present within the area of impact and buffer any nesting locations found during surveys.

1) Generally, the surveys should be conducted no more than five days prior to scheduled activity.
2) Timing and dimensions of the area to be surveyed vary and will depend on the nature of the project, location, and expected level of vegetation disturbance.
3) If active nests or breeding behavior (e.g., courtship, nest building, territorial defense, etc.) are detected during these surveys, no vegetation removal activities should be conducted until nestlings have fledged or the nest fails or breeding behaviors are no longer observed. If the activity must occur, establish a buffer zone around the nest and no activities will occur within that zone until nestlings have fledged and left the nest area. The dimension of the buffer zone will depend on the proposed activity, habitat type, and species present and should be coordinated with the local or regional Service office.
4) When establishing a buffer zone, construct a barrier (e.g., plastic fencing) to protect the area. If the fence is knocked down or destroyed, work will suspend wholly, or in part, until the fence is satisfactorily repaired.
5) When establishing a buffer zone, a qualified biologist will be present onsite to serve as a biological monitor during vegetation clearing and grading activities to ensure no take of migratory birds occurs. Prior to vegetation clearing, the monitor will ensure that the limits of construction have been properly staked and are readily identifiable. Any associated project activities that are inconsistent with the applicable conservation measures, and activities that may result in the take of migratory birds will be immediately halted and reported to the appropriate Service office within 24 hours.
6) If establishing a buffer zone is not feasible, contact the Service for guidance to minimize impacts to migratory birds associated with the proposed project or removal of an active nest. Active nests may only be removed if you receive a permit from your local Migratory Bird Permit Office. A permit may authorize active nest removal by a qualified biologist with bird handling experience or by a permitted bird rehabilitator.

Conservation Measure 3: Prepare a vegetation maintenance plan that outlines vegetation maintenance activities and schedules so that direct bird impacts do not occur.

Stressor: Invasive Species Introduction

Conservation Goal: Prevent the introduction of invasive plants.

Conservation Measure 1: Prepare a weed abatement plan that outlines the areas where weed abatementis required and the schedule and method of activities to ensure bird impacts are avoided.

Conservation Measure 2: For temporary and permanent habitat restoration/enhancement, use only native and local (when possible) seed and plant stock.

Conservation Measure 3: Consider creating vehicle wash stations prior to entering sensitive habitat areas to prevent accidental introduction of non-native plants.

Conservation Measure 4: Remove invasive/exotic species that pose an attractive nuisance to migratory birds.

Stressor: Artificial Lighting

Conservation Goal: Prevent increase in lighting of native habitats during the bird breeding season.

Conservation Measure 1: To the maximum extent practicable, limit construction activities to the time between dawn and dusk to avoid the illumination of adjacent habitat areas.

Conservation Measure 2: If construction activity time restrictions are not possible, use down shielding or directional lighting to avoid light trespass into bird habitat (i.e., use a 'Cobra' style light rather than an omnidirectional light system to direct light down to the roadbed). To the maximum extent practicable, while allowing for public safety, low intensity energy saving lighting (e.g. low pressure sodium lamps) will be used.

Conservation Measure 3: Minimize illumination of lighting on associated construction or operation structures by using motion sensors or heat sensors.
Conservation Measure 5: Bright white light, such as metal halide, halogen, fluorescent, mercury vapor and incandescent lamps should *not* be used.
Stressor: Human Disturbance
Conservation Goal: Minimize prolonged human presence near nesting birds during construction and maintenance actions.
Conservation Measure 1: Restrict unauthorized access to natural areas adjacent to the project site by erecting a barrier and/or avoidance buffers (e.g., gate, fence, wall) to minimize foot traffic and off-road vehicle uses.

Stressor: Collision
Conservation Goal: Minimize collision risk with project infrastructure and vehicles.
Conservation Measure 1: Minimize collision risk with project infrastructure (e.g., temporary and permanent) by increasing visibility through appropriate marking and design features (e.g., lighting, wire marking, etc.).
Conservation Measure 2: On bridge crossing areas with adjacent riparian, beach, estuary, or other bird habitat, use fencing or metal bridge poles (Sebastian Poles) that extend to the height of the tallest vehicles that will use the structure.
Conservation Measure 3: Install wildlife friendly culverts so rodents and small mammals can travel under any new roadways instead of over them. This may help reduce raptor deaths associated with being struck while tracking prey or scavenging road kill on the roadway.
Conservation Measure 4: Remove road-kill carcasses regularly to prevent scavenging and bird congregations along roadways.
Conservation Measure 5: Avoid planting “desirable” fruited or preferred nesting vegetation in medians or Rights of Way.
Conservation Measure 6: Eliminate use of steady burning lights on tall structures (e.g., >200 ft).

Stressor: Entrapment
Conservation Goal: Prevent birds from becoming trapped in project structures or perching and nestingin project areas that may endanger them.
Conservation Measure 1: Minimize entrapment and entanglement hazards through project design measures that may include:

1. Installing anti-perching devices on facilities/equipment where birds may commonly nest or perch
2. Covering or enclosing all potential nesting surfaces on the structure with mesh netting, chicken wire fencing, or other suitable exclusion material prior to the nesting season to prevent birds from establishing new nests. The netting, fencing, or other material must have no opening or mesh size greater than 19 mm and must be maintained until the structure is removed.
3. Cap pipes and cover/seal all small dark spaces where birds may enter and become trapped.

Conservation Measure 2: Use the appropriate deterrents to prevent birds from nesting on structures where they cause conflicts, may endanger themselves, or create a human health and safety hazard.

1. During the time that the birds are trying to build or occupy their nests (generally , between April and August, depending on the geographic location), potential nesting surfaces should be monitored at least once every three days for any nesting activity, especially where bird use of structures is likely to cause take. It is permissible to remove non-active nests (without birds or eggs), partially completed nests, or new nests as they are built (prior to occupation). If birds have started to build any nests, the nests shall be removed before they are completed. Water shall not be used to remove the nests if nests are located within 50 feet of any surface waters.

2. If an active nest becomes established (i.e., there are eggs or young in the nest), all work that could result in abandonment or destruction of the nest shall be avoided until the young have fledged or the nest is unoccupied. Construction activities that may displace birds after they have laid their eggs and before the young have fledged should not be permitted. If the project continues into the following spring, this cycle shall be repeated. When work on the structure is complete, all netting shall be removed and properlydisposed of.

Stressor: Noise

Conservation Goal: Prevent the increase in noise above ambient levels during the nesting bird breedingseason.
Conservation Measure 1: Minimize an increase in noise above ambient levels during projectconstruction by installing temporary structural barriers such as sand bags.
Conservation Measure 2: Avoid permanent additions to ambient noise levels from the proposed projectby using baffle boxes or sound walls.

Stressor: Chemical Contamination

Conservation Goal: Prevent the introduction of chemicals contaminants into the environment. **Conservation Measure 1:** Avoid chemical contamination of the project area by implementing aHazardous Materials Plan. For more information on hazardous waste and how to properly managehazardous waste, see the EPA Hazardous Waste website.
Conservation Measure 2: Avoid soil contamination by using drip pans underneath equipment andcontainment zones at construction sites and when refueling vehicles or equipment.
Conservation Measure 3: Avoid contaminating natural aquatic and wetland systems with runoff bylimiting all equipment maintenance, staging laydown, and dispensing of fuel, oil, etc., to designated upland areas.
Conservation Measure 4: Any use of pesticides or rodenticides shall comply with the applicableFederal and State laws.

1. Choose non-chemical alternatives when appropriate
2. Pesticides shall be used only in accordance with their registered uses and in accordance with the manufacturer's instructions to limit access to non-target species.
3. For general measures to reducing wildlife exposure to pesticides, see EPA's Pesticides: EnvironmentalEffects website.

Stressor: Fire

Conservation Goal: Minimize fire potential from project-related activities.
Conservation Measure 1: Reduce fire hazards from vehicles and human activities (e.g., use sparkarrestors on power equipment, avoid driving vehicles off road).
Conservation Measure 2: Consider fire potential when developing vegetation management plans by planting temporary impact areas with a palate of low-growing, sparse, fire resistant native species thatmeet with the approval of the County Fire Department and local FWS Office.

A-T-3: Tree Box Treatment Examples and Details

The following details are from the Districts' Standard Drawings 2015 and Streetscape Manual 2013. They provide examples of details mentioned in the guidelines. Details for ideal tree box treatments for the monumental core will be incorporated into the Construction Manual.

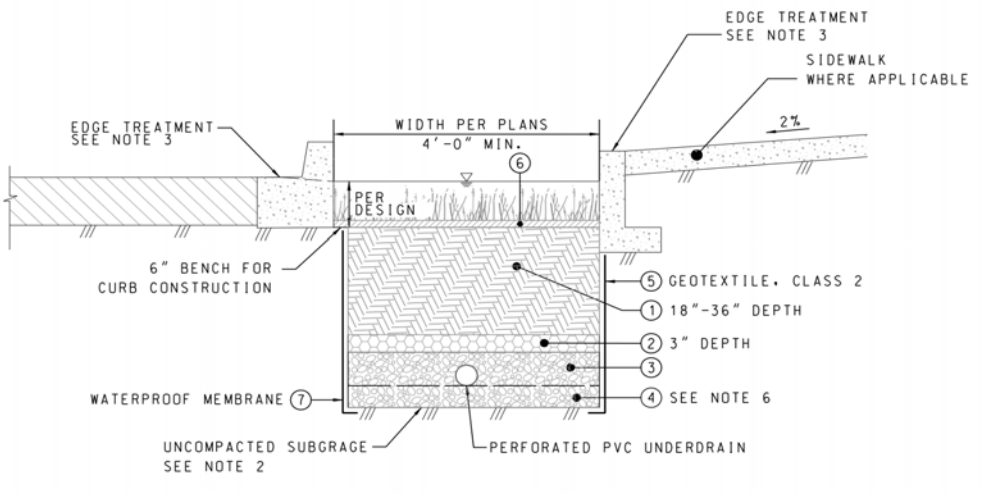


Figure A: Bioretention Planter

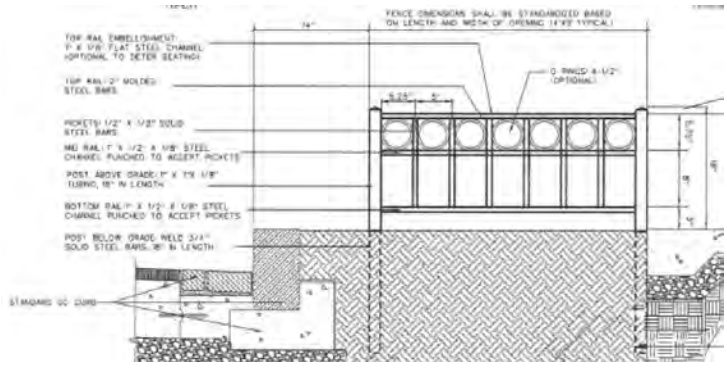


Figure B: Low Metal Fencing

[Note: The IWG will need to discuss a preferred metal tree fence design. The above image is included for reference only.]

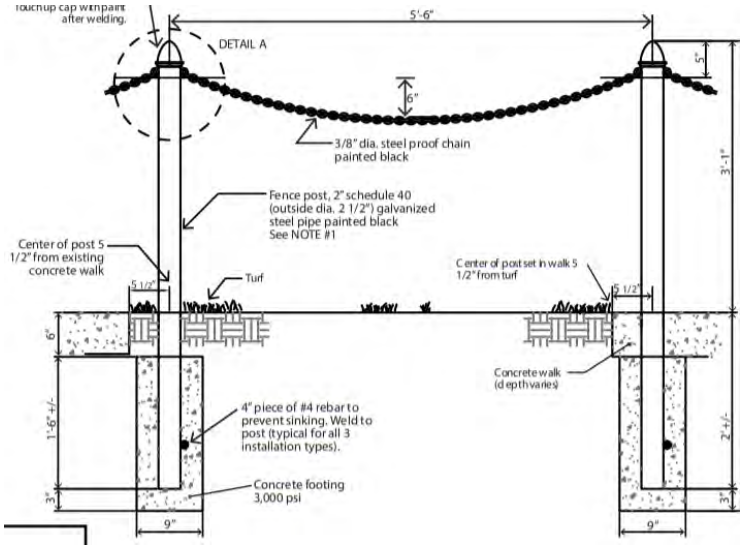


Figure C: Post and Chain

[Note: Post and chain is a NPS standard and is not intended for bioretention tree boxes.]

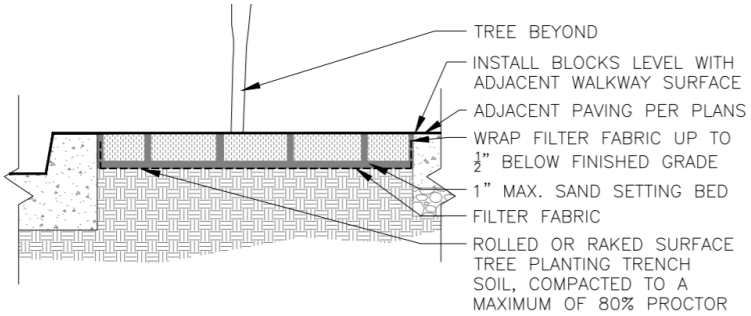


Figure D: Loose-laid Pavers or Cobblestone

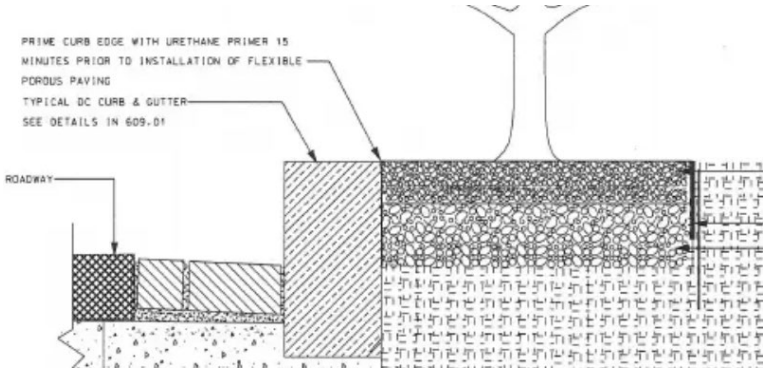


Figure E: Flexible Porous Pavement

Landscapes and Plantings



A-L-1: Preliminary Native Plant Palette…..23

A-L-1: Preliminary Native Plant Palette

Plant following native plant list incorporates recommendations from Toward a Comprehensive Landscape Plan for Washington, D.C. by the firm Wallace, Mcharg, Roberts, and Todd, 1967.

CANOPY TREES

Liquidambar stryaciflua	Sweetgum
Acer rubrum	Red maple
Quercus imbricaria	Shingle oak
Quercus phellos	Willow oak
Quercus bicolor	Swamp oak
Platanus occidentalis	Sycamore
Salix nigra	Black willow
Fagus grandiflora	American beech
Carya (spp .)	Hickories
Fraxinus Americana	White ash
Nyssa Sylvatica	Sour gum
Liriodendron Tulipifera	Tulip tree
Ulmus Americana	White elm

UNDERSTORY TREES

Carpinus Caroliniana	Ironwood
Celtis laevigata	Sugarberry
Alnus rugosa	Speckled alder

SHRUBS

Sambucus canadensis	Sweet elder
Cephalanthus occidentalis	Common buttonbush
llex verticillata	Black alder
Clethra alnifolia	Sweet pepper bush



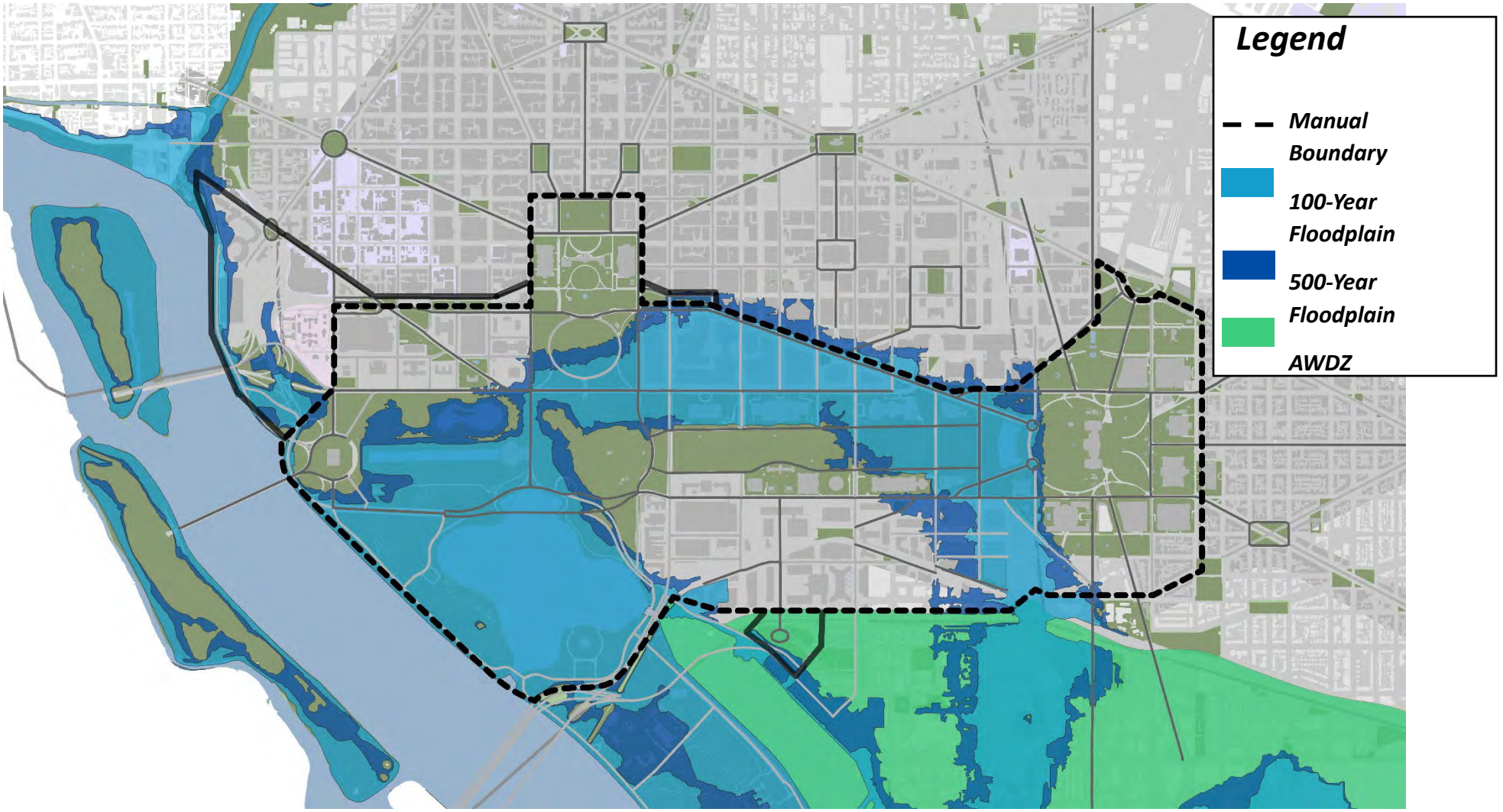
Stormwater Management

A-SM-1: 100-Year & 500-Year Floodplains, & Anacostia Waterfront Development Zone…..25

A-SM-2: District of Columbia Government Stormwater Permitting……..26

A-SM-3: Sample Maintenance Agreements……27

A-SM-1: 100-Year & 500-Year Floodplains, & Anacostia Waterfront Development Zone



Note: *This map shows the locations of the 100-year floodplain, the 500-year floodplain, and the Anacostia Waterfront Development Zone to provide reference for locations of stormwater Best Management Practices.*

A-SM-2: District of Columbia Government Stormwater Permitting

Construction of Green Infrastructure in a DDOT right-of-way requires several permits from the District of Columbia. For ease of reference, they are listed here. Permitting requirements may change, please consult the District of Columbia Government's website or with a District agency when preparing to submit for a permit.

1. DCRA Building Permit, https://dcra.dc.gov/service/get-building-permit-0
2. DDOT Occupancy Permit for Construction Activities, https://tops.ddot.dc.gov/DDOTPermitSystem/DDOTPermitOnline/Reports/PublicOccupancyPermitReport.aspx?appType=OPA
3. DDOT Construction Permit, https://tops.ddot.dc.gov/DDOTPermitSystem/DDOTPermitOnline/Reports/PublicConstructionPermitReport.aspx
4. DOEE Erosion and Sediment Control Plan, https://doee.dc.gov/node/619312
5. DOEE Stormwater Management Plan, https://octo.quickbase.com/up/bjezqjzuy/g/rbe/eg/va/Log_In.html
6. DCWater Water and Sewer Availability Certificate, https://www.dcwater.com/water-and-sewer-availability-certificate

A-SM-3: Sample Maintenance Agreements

Introduction:

Federal and local agencies sometimes share maintenance responsibilities on monumental core streets. For example, Smithsonian may trim street trees or plow snow on sidewalks that are under NPS jurisdiction. Like other streetscape elements, stormwater facilities require regular maintenance to function effectively.
On monumental core streets, agencies may need an interagency maintenance agreement when implementing stormwater management in a section of the right-of-way that is not under their jurisdiction, or an area of the right-of-way where they have agreed to share responsibilities with another agency. This appendix contains sample maintenance agreements for agencies to use as a reference when developing new interagency stormwater maintenance agreements wherein maintenance responsibilities are transferred to or shared with other agencies.

Table of Contents:

2.A District Department of Transportation Covenant for Maintenance of Stormwater Facilities in Public Space

2.B Department of Energy and Environment Covenant for Maintenance of Stormwater Facilities in Public Space

2.C Cooperative Management Agreement between the National Park Service and the District of Columbia for the Revitalization of Franklin Park (Excerpt regarding maintenance and operation)

2.A DISTRICT DEPARTMENT OF TRANSPORTATION COVENANT FOR MAINTENANCE OF STORMWATER FACILITIES IN PUBLIC SPACE

GOVERNMENT OF THE DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION
WASHINGTON, D.C.

COVENANT FOR MAINTENANCE OF STORMWATER FACILITIES IN PUBLIC SPACE

KNOW ALL PERSONS BY THESE PRESENTS:

WHEREAS, _____ _____ is the Owner of the following described property in Washington, D.C., located at the following street address: _____. Lot _____, Square _____ hereafter referred to as "said property"; and

WHEREAS, the Owner of said property has, either on his/her on behalf or through the efforts of his/her duly authorized agent, applied to the District for the issuance of a public space permit in accordance with the provisions of 24, DCMR Chapter 1 100.1 et seq. (1985), as amended; and

WHEREAS, the Owner of said property has requested that the District authorize stormwater facilities in public space, hereinafter referred to as "abutting public space", as described in Exhibit A and shown on Exhibit B attached hereto; and

WHEREAS, the Owner of said property has submitted a site plan and application, hereinafter referred to as "the proposal" attached hereto as Exhibit C, for the use of said abutting public space; and

WHEREAS, the rules and regulations of the District of Columbia authorize the Mayor, or his agent, designee, or representative to impose such conditions on the issuance of said permit as the Mayor may require, 24 DCMR Chapter 1, §100 et seq. (1985), as amended; and

WHEREAS, the District has reviewed and accepted said proposal (as amended); and

WHEREAS, the Owner of said property desires to meet the conditions and requests of the District by complying with all of the terms and conditions of said permit.

NOW, THEREFORE, in consideration of the foregoing and in consideration of the issuance of the permit for construction, the Owner, for themselves, their heirs, successors and assigns does hereby declare that said property shall be held, transferred, sold and conveyed subject to the restrictions herein set forth to wit:

1. That no right, title, or interest of the public is thereby acquired, waived or abridged.
2. That the Owner shall construct the stormwater facilities in accordance with the requirements set forth in the permit conditions and in accordance with the proposal attached hereto as Exhibit C.
3. That the District has the legal right to authorize work and/or issue permits for cuts to be made in the said stormwater facilities and will do so without the permission of, or notice to, the property owner.
4. That, without prior notice from the District of Columbia, the Owner shall maintain and repair the abutting public space in accordance with the maintenance schedule as described

and attached hereto as Exhibit D, until such time, and upon such conditions as the District may require to extinguish said covenant;

5. That the Owner shall maintain and keep abutting public space in a clean and safe condition at all times, without the need for prior notice by the District.

6. That repair(s) of aforesaid public space undertaken by the Owner shall be made pursuant to a permit issued by the District of Columbia. Repairs shall be made by and at the expense and risk of the Owner.

7. That whenever the Mayor finds that said stormwater facilities is in such condition as to be imminently dangerous to persons or property, upon notice so to do, the Owner will make the stormwater facilities safe and secure within 72 hours of the date said notice is served. That in a case where the public safety requires immediate action, the Mayor may use such materials, equipment, workmen, and assistants as may be necessary, to make the stormwater facilities safe and secure.

8. That if the District must authorize excavations in said public space for the purpose of maintaining, repairing, or installing utilities in said abutting public space, or for any other purpose, the excavating party must restore the system to its existing condition

9. That if the District must perform excavations in said public space for any purpose, the District may choose to restore the system or replace the system with standard materials.

10. That the Owner hereby relieves the District of all duty to repair or maintain said abutting public space in a safe condition. Upon the failure of the Owner to repair or maintain said abutting public space in a safe condition, the District has the right to cause temporary or permanent repairs using standard materials.

11. That the Owner shall reimburse the District for any reasonable expense the District incurs in making any repairs to the abutting public space by virtue of Owner's default of its obligations set forth herein.

12. That the Owner shall indemnify and save harmless the District and all of its officers, agents, and servants against any and all claims or liability from whatever source whatsoever, arising from, based on or, as a result of any negligence or willful misconduct of the Owner in designing, constructing, paving, maintaining, installing or repairing said abutting public space.

13. That the District shall have the right, after reasonable prior written notice to the Owner (which shall not be less than 90 days), to extinguish this Covenant at any time, and replace or remove, at the District's sole cost and expense, the stormwater facilities using District standard materials at the District's sole discretion.

14. That the written consent of the District shall be required prior to the extinguishment of any of the covenants described herein in a document recordable at the office of the Recorder of Deeds for the District of Columbia and recorded at no expense to the District. Such consent to extinguishment shall be given at such time as the District shall issue a permit enabling the

Owner to replace the stormwater facilities with District standard materials. If Owner requests that District consent to extinguishment pursuant to this Section 14, the cost of replacement of said abutting public space with standard District materials shall be borne by the Owner.

15. That the covenants contained herein shall be deemed real covenants and shall run with the land and shall bind the Owner and their heirs, successors and assigns. The extinguishment of this Covenant pursuant to Section 13 and 14 hereof shall terminate all obligations of Owner set forth in this Covenant.

16. That the District shall have the right to specifically enforce this Declaration.

[SIGNATURES ON FOLLOWING PAGE]

[SIGNATURE PAGE – Individual Owner(s)]

IN WITNESS WHEREOF, the undersigned owner(s) of Lot _____ in Square _____ has (have) caused these presents to be executed.

WITNESS:

_____

_____
Owner

_____
Owner

DISTRICT OF COLUMBIA, ss:

I, _____, a Notary Public, in and for the District of Columbia, do hereby certify that _____ party(ies) to the foregoing attached Covenant bearing the date of the _____ day of _____, 200 ___, being personally well-known to me as the owner(s) of Lot _____ in Square _____ appeared before me and acknowledged said Declaration to be (his) (her) or (their) act and deed.

Given under my hand and seal this _____ day of _____ 20____.

_____
Notary Public

My Commission expires _____.

[SIGNATURE PAGE – L.L.C., a Limited Liability Company]

IN WITNESS WHEREOF, the undersigned limited liability company, the owner of Lot(s) _____ in Square _____ has caused these presents to be executed in its name, and does hereby constitute and appoint _____ as its true and lawful attorney-in-fact for itself and in its name to appear before any officer authorized by law to take and certify acknowledgements and then and there to acknowledge and deliver these presents as its act and deed.

WITNESS:

_____
L.L.C., a Limited Liability Company

_____
Secretary

By: _____
Title

DISTRICT OF COLUMBIA, ss:

I, _____, a Notary Public, in and for the District of Columbia, do hereby certify that _____ the authorized representative of _____ L.L.C., a limited liability company, a party to the foregoing attached Covenant bearing the date of the _____ day of _____, 200 ___, being personally well-known to me as the owner of Lot ____ in Square ____ appeared before me and acknowledged said Declaration to be the limited liability company's act and deed.

Given under my hand and seal this _____ day of _____ 20____.

_____
Notary Public

My Commission expires _____

235930

[SIGNATURE PAGE – Corporation]

IN WITNESS WHEREOF, the undersigned corporation, the owner of Lot(s) _____ in Square _____ has caused these presents to be executed in its name, and does hereby constitute and appoint _____ as its true and lawful attorney-in-fact for itself and in its name to appear before any officer authorized by law to take and certify acknowledgements and then and there to acknowledge and deliver these presents as its act and deed.

WITNESS:

_____
Corporation

_____
Secretary

By: _____
Title

(Corporate Seal)

DISTRICT OF COLUMBIA, ss:

I, _____, a Notary Public, in and for the District of Columbia, do hereby certify that _____ the authorized representative of _____ a corporation, a party to the foregoing attached Covenant bearing the date of the _____ day of _____, 200 ___, being personally well-known to me as the owner of Lot(s) _____ in Square _____ appeared before me and acknowledged said Declaration to be the corporation's act and deed.

Given under my hand and seal this _____ day of _____ 20____.

_____
Notary Public

My Commission expires _____

[SIGNATURE PAGE – Joint Venture]

IN WITNESS WHEREOF, the undersigned joint venture, the owner of Lot(s) _____ in Square _____ has caused these presents to be executed in its name, and does hereby constitute and appoint _____ as its true and lawful attorney-in-fact for itself and in its name to appear before any officer authorized by law to take and certify acknowledgements and then and there to acknowledge and deliver these presents as its act and deed.

Witness:

_____ _____
Joint Venture

Corporate Seal (if applicable) By: _____
Title

Witness:

By: _____
_____ Title

Corporate Seal (if applicable)

DISTRICT OF COLUMBIA, ss:

I, _____, a Notary Public, in and for the District of Columbia, do hereby certify that _____ the authorized representative of _____ a joint venture, a party to the foregoing attached Covenant bearing the date of the _____ day of _____, 200 ___, being personally well-known to me as the owner of Lot(s) _____ in Square _____ appeared before me and acknowledged said Declaration to be the joint venture's act and deed.

Given under my hand and seal this _____ day of _____ 20____.

_____
Notary Public

My Commission expires _____

[SIGNATURE PAGE – Limited Partnership]

IN WITNESS WHEREOF, the undersigned limited partnership, the owner of Lot(s) _____ in Square _____ has caused these presents to be executed in its name, and does hereby constitute and appoint _____ as its true and lawful attorney-in-fact for itself and in its name to appear before any officer authorized by law to take and certify acknowledgements and then and there to acknowledge and deliver these presents as its act and deed.

WITNESS:

_____

_____
Limited Partnership

By:
_____
General Partner

DISTRICT OF COLUMBIA, ss:

I, _____, a Notary Public, in and for the District of Columbia, do hereby certify that _____ the authorized representative of _____ a limited partnership, a party to the foregoing attached Covenant bearing the date of the _____ day of _____, 200 ___, being personally well-known to me as the owner of Lot(s) _____ in Square _____ appeared before me and acknowledged said Declaration to be the limited partnership's act and deed.

Given under my hand and seal this _____ day of _____ 20____.

_____
Notary Public

My Commission expires _____

[SIGNATURE PAGE – Partnership]

IN WITNESS WHEREOF, the undersigned partnership, the owner of Lot(s) _____ in Square _____ has caused these presents to be executed in its name, and does hereby constitute and appoint _____ as its true and lawful attorney-in-fact for itself and in its name to appear before any officer authorized by law to take and certify acknowledgements and then and there to acknowledge and deliver these presents as its act and deed.

WITNESS:

_____

_____
Partnership

By: _____
Partner

By: _____
Partner

By: _____
Partner

DISTRICT OF COLUMBIA, ss:

I, _____, a Notary Public, in and for the District of Columbia, do hereby certify that _____ the authorized representative of _____ a partnership, a party to the foregoing attached Covenant bearing the date of the _____ day of _____, 200 ___, being personally well-known to me as the owner of Lot(s) _____ in Square _____ appeared before me and acknowledged said Declaration to be the partnership's act and deed.

Given under my hand and seal this _____ day of _____ 20____.

_____
Notary Public

My Commission expires _____

2.B DEPARTMENT OF ENERGY AND ENVIRONMENT COVENANT FOR MAINTENANCE OF STORMWATER FACILITIES IN PUBLIC SPACE

GOVERNMENT OF THE DISTRICT OF COLUMBIA

Department of Energy and Environment
NATURAL RESOURCES ADMINISTRATION
REGULATORY REVIEW DIVISION

DECLARATION OF COVENANTS
For a Stormwater Management Facility

THIS DECLARATION OF COVENANTS (the "**Declaration**") is made as of this _____ day of _____, 20__, by and between NAME OF PROPERTY OWNER, a LIST TYPE OF CORPORATE ENTITY (if applicable), and its successors and assigns ("**Owner**"), for the benefit of the DISTRICT OF COLUMBIA, a municipal corporation (the "**District**").

RECITALS

A. The Owner is the owner in fee simple of certain real property and improvements (collectively, the "**Property**") located in the District of Columbia and more particularly described in **Exhibit A** attached hereto and made a part hereof. No other person or entity has an ownership interest in the Property.

B. In order to manage stormwater flow conditions resulting from certain improvements Owner will make to the Property, the regulations of the District, found at Title 21, Chapter 5, of the District of Columbia Municipal Regulations ("DCMR") require that Owner develop and submit for approval a Stormwater Management Plan ("SWMP") for the installation and maintenance of all stormwater best management practices ("BMPs"), stormwater infrastructure, and land covers on the Property (collectively, the "Facility"), and including any obligation to achieve Off-Site Retention Volume (Offv).

C. Section 529 of Title 21 of the DCMR requires that Owner execute and record, with the District of Columbia Recorder of Deeds, a declaration of covenants running with the land that set forth Owner's responsibilities under the SWMP.

NOW, THEREFORE, for and in consideration of the issuance of building permits and approval of Owner's plans by the District, and other good and valuable consideration the sufficiency of which is hereby acknowledged, for the benefit of and limitation upon Owner and all future owners of the Property, and for the benefit of the District, Owner for itself, its successors and assigns, does hereby acknowledge, represent, covenant, agree, and warrant to the District as follows:

1. The foregoing Recitals and attached Exhibits are all hereby incorporated in and made a part of this Declaration to the same extent as if herein set forth in full, provided however, that said Recitals shall not be deemed to modify the express provisions hereinafter set forth.

2. The Facility and any responsibility to achieve Off-Site Retention Volume (Offv), as stated in gallons, is shown on the plans approved by the District attached hereto as **Exhibit B**, the Site Plan, as the same may be amended pursuant to the District's approval.

3. Owner, at its sole expense, shall construct and perpetually operate and maintain the Facility in such manner as to comply with the provisions of Title 21, Chapter 5 of the DCMR and in strict accordance with the SWMP, including the Maintenance Plan, attached hereto as **Exhibit C**, as the same may be amended pursuant to the District's approval.

4. Owner shall, at its sole expense, make such changes or modifications to the Facility as the District, in its discretion, may determine necessary to ensure that the Facility is maintained in good condition and continues to operate as designed and approved.

5. The District and its agents, employees, and contractors shall have the right to enter the Property for the purpose of inspecting the Facility in accordance with established inspection procedures and Section 16 of the Water Pollution Control Act of 1984 (D.C. Law 5-188; 32 DCR 919; D.C. Official Code § 8-103.01, *et seq.* (2013 Repl.), as amended (the "Act"), at reasonable times and in a reasonable manner, in order to ensure that the Facility is being properly maintained and is continuing to perform in the manner approved by the District.

6. Should Owner fail to perform its responsibilities as required herein, or fail to operate and restore the Facility in accordance with approved design standards, as the same may be amended from time to time, the District shall be entitled to pursue any and all enforcement actions available to it pursuant to the Act, and Title 21, Chapter 22 of the DCMR, as the same may be amended from time to time. Without limiting the generality of the foregoing, in the event that a discharge or threat of discharge from the Facility poses an imminent and substantial danger to the environment or the public health or welfare, the District may take immediate action against Owner pursuant to D.C. Official Code § 8-103.08(b).

7. If Owner's failure or refusal to maintain the Facility in accordance with the covenants and warranties contained in this Declaration ultimately results in corrective action by the District, Owner shall bear all costs incurred by the District for such corrective measures, such costs may be assessed against the Property, and Owner may be fined in accordance with the Act and Title 21, Chapter 5 of the DCMR.

8. The provisions of this Declaration shall be deemed warranties by Owner and covenants running with the land and shall bind and inure to the benefit of Owner and the District, their respective heirs, successors and/or assigns. When Owner ceases to own an interest in the Property, the rights, warranties, and obligations under this Declaration shall become the rights, warranties, and obligations of the successor-in-ownership and interest to the Property.

9. Owner shall, at its cost and expense, properly record this Declaration with the Recorder of Deeds and provide the District's Department of the Environment with a copy of this Declaration, certified by the Recorder of Deeds as a true copy of the recorded instrument.

10. Owner shall indemnify, save harmless, and defend the District, and all its officers, agents, and employees from and against all claims or liabilities that may arise out of or in connection with, either directly or indirectly, any of Owner's actions or omissions with regard to the construction, operation, maintenance and/or restoration of the Facility.

11. Owner warrants, and shall ensure, that all prior liens recorded against the Property are subordinate to this Declaration. Failure to subordinate liens shall, at the District's sole

election, give rise to termination of any building permits and/or invalidation of any certificate of occupancy relating to the Property.

12. Owner shall, at its sole expense, comply with all provisions of this Declaration regardless of any conflicting requirements in any other covenant, easement, or other legal document recorded or unrecorded against the Property. Neither the entering into of this Declaration nor performance hereunder will constitute or result in a violation or breach by Owner of any other agreement or order that is binding on Owner.

13. To the extent Owner is an entity, Owner warrants that it: (i) is duly organized, validly existing and in good standing under the laws of its state of organization; (ii) is qualified to do business in, and is in good standing under, the laws of the District of Columbia; (iii) is authorized to perform under this Declaration; and (iv) has all necessary power to execute and deliver this Declaration.

14. The form of this Declaration has been approved by the District of Columbia Office of the Attorney General ("OAG") for legal sufficiency pursuant to Title 21, Section 529.3 of the DCMR. This Declaration, and the provisions contained herein, may not be modified, amended, or terminated without the prior written consent of the District and legal sufficiency approval by OAG, such agreement to be evidenced by a document duly executed and delivered in recordable form and recorded with the Recorder of Deeds at no expense to the District.

15. The District has the right to specifically enforce this Declaration.

16. This Declaration shall be governed by, construed under, and enforced in accordance with, the laws of the District of Columbia.

17. This Declaration has been duly executed and delivered by Owner, and constitutes the legal, valid, and binding obligations of Owner, enforceable against Owner and its successors and assigns, in accordance with its terms.

18. If any of the covenants, warranties, conditions or terms of this Declaration shall be found void or unenforceable for whatever reason by any court of law or of equity, then every other covenant, condition or term herein set forth shall remain valid and binding.

[SIGNATURES FOLLOW]

IN WITNESS WHEREOF, Owner has, as of the day and year first above written, caused this Declaration of Covenants to be signed by NAME AND TITLE OF PERSON SIGNING ON BEHALF OF OWNER.

By: _____
NAME, TITLE

ACKNOWLEDGMENT

_____LIST STATE_____)
) ss:
_____LIST COUNTY_____)

I, NAME OF NOTARY, a Notary Public in and for the jurisdiction aforesaid, do hereby certify that NAME OF PERSON SIGNING ON BEHALF OF OWNER, who is personally well known (or satisfactorily proven) to me, and being authorized to do so, executed the foregoing Declaration of Covenants and has acknowledged the same to be the act and deed of NAME OF OWNER, and that s/he delivered the same as such.

GIVEN under my hand and seal this ____ day of _____, 20__.

_____
Notary Public

My commission expires:

[NOTARIAL SEAL]

APPROVED AS TO TECHNICAL SUFFICIENCY:

District of Columbia Department of Energy and Environment
Natural Resources Administration
Regulatory Review Division

By: _____
Name: _____
Title: _____
Date: _____

APPROVED AS TO LEGAL SUFFICIENCY:

District of Columbia Office of the Attorney General
Commercial Division

By: _____
Assistant Attorney General
Date: _____

Property Address [include Square and Lot(s)]:

2.C COOPERATIVE MANAGEMENT AGREEMENT BETWEEN THE NATIONAL PARK SERVICE AND THE DISTRICT OF COLUMBIA FOR THE REVITALIZATION OF FRANKLIN PARK (Excerpt regarding maintenance and operation)

This excerpt provides an example of a Cooperative Management Agreement. While this excerpt does not reference stormwater specifically, the structure of the agreement is flexible and could include stormwater. The agreement clearly identifies responsibilities, and the process for developing a maintenance plan.

Cooperative Management Agreement
Between
the National Park Service,
United States Department of the Interior
and
the District of Columbia Government
for the
Revitalization of Franklin Park

C. Operation and maintenance

1. The parties contemplate that an entity approved in writing by both parties (Park Manager) will operate, maintain, and manage the Park on a day-to-day basis, including making all necessary non-capital repairs to Park facilities, so that the Park will be operated and maintained in a safe and attractive condition during the term of this Agreement. Further, the parties contemplate that revenue generated from approved programming or other approved activities conducted by the District or the Park Manager will be used to fund ongoing operation and maintenance of, and improvements to, the Park in accordance with the Operation and Maintenance Plan described in provision III.C.2 below.

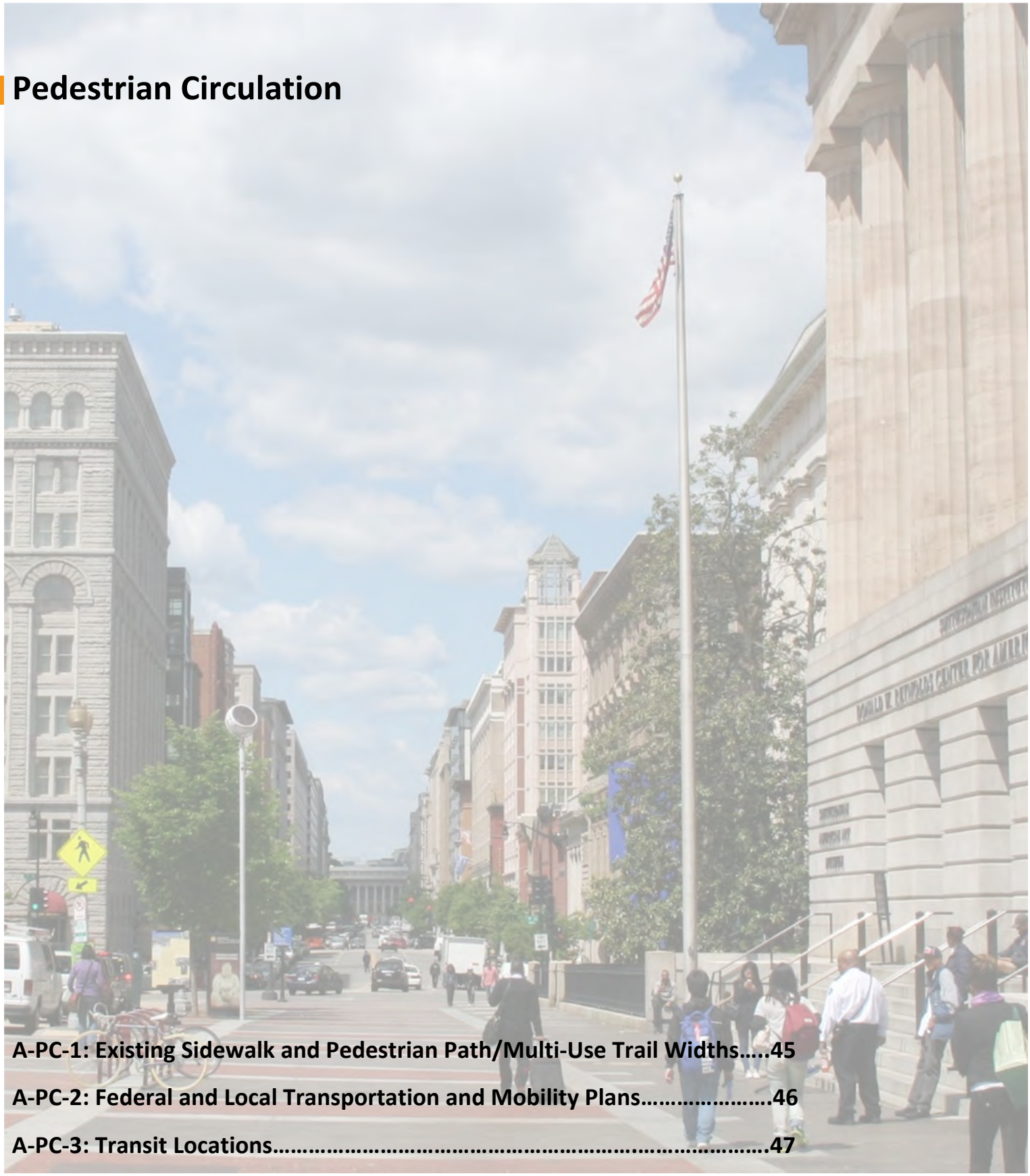
2. Before the District awards the contract to construct the agreed-upon improvements to the Park, the parties will develop and execute an Operation and Maintenance Plan that will provide long-term guidance for the cooperative management of the Park. The Operation and Maintenance Plan will include the following components:

    a. Description of required day-to-day maintenance and cyclical maintenance of the open-air Park area, water features, and children's play area;
    b. Description of required day-to-day maintenance and cyclical maintenance of the café (if one is constructed) and restrooms;
    c. Description of the normal hours of operation of the open-air Park area and the café (if one is constructed) and restrooms;
    d. Description of expected minor and major capital repairs during the term of this Agreement;
    e. Description of regularly scheduled interpretive and other programming;
    f. Other matters related to the operation and maintenance of the Park on an ongoing, long-term basis;
    g. Any contracting plan for the provision of services;
    h. Estimated budget and projected revenue sources and amount of anticipated monetary support by each party;
    i. Assignment of responsibility to one or both of the parties for implementing each component of the Operation and Maintenance Plan; and
    j. Description of specific minimum threshold of annual programming use, as mutually agreed to by the parties, and which will be included in each Annual Work Plan, as hereinafter defined.

3. Before October 1 of each year the parties will develop and execute a written work plan (Annual Work Plan) for the federal fiscal year beginning on October 1 that, at a minimum, (a) identifies the maintenance or repair projects that the parties agree to undertake in a specific year; (b) specifies the respective roles of the parties in carrying out the identified projects; and (c) sets a calendar of programming and activities to occur at the Park, which may include certain special events conducted or hosted by the District or the Park Manager. At any time during the applicable fiscal year the parties may modify the Annual Work Plan by executing a written amendment by both parties. The parties will meet before the end of June of each year during the term of this Agreement to discuss and begin to finalize the plan that will be effective on October 1 of that calendar year. The Annual Work Plan template is attached hereto as Exhibit E.

4. The parties will work together to ensure that the Park is operated, maintained, and managed in accordance with the standards of quality seen in comparable public parks in the Washington, D.C., metropolitan area and in compliance with applicable laws and regulations.

Pedestrian Circulation

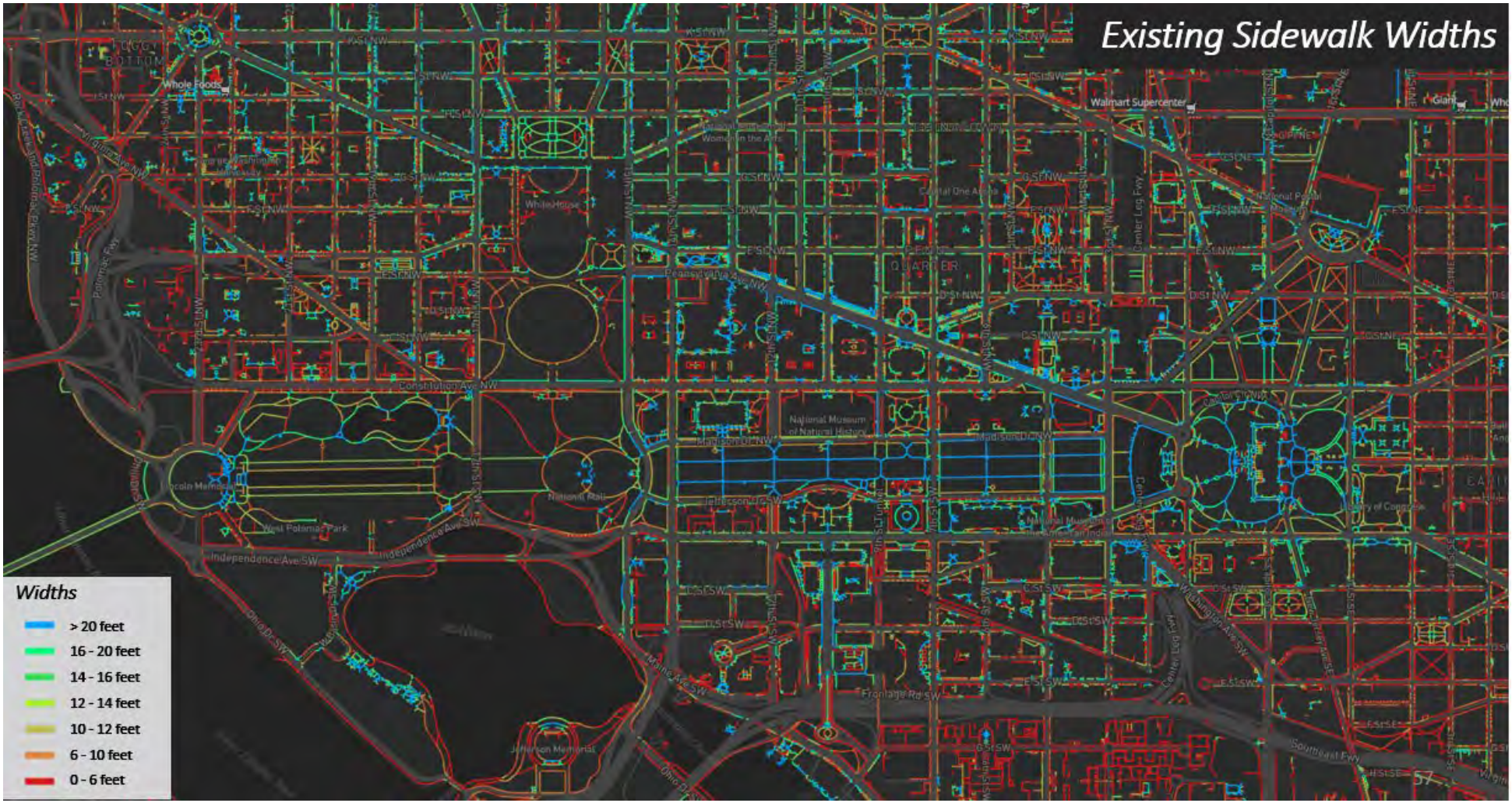


A-PC-1: Existing Sidewalk and Pedestrian Path/Multi-Use Trail Widths…..45

A-PC-2: Federal and Local Transportation and Mobility Plans……..46

A-PC-3: Transit Locations……..47

A-PC-1: Existing Sidewalk and Pedestrian Path/Multi-Use Trail Widths



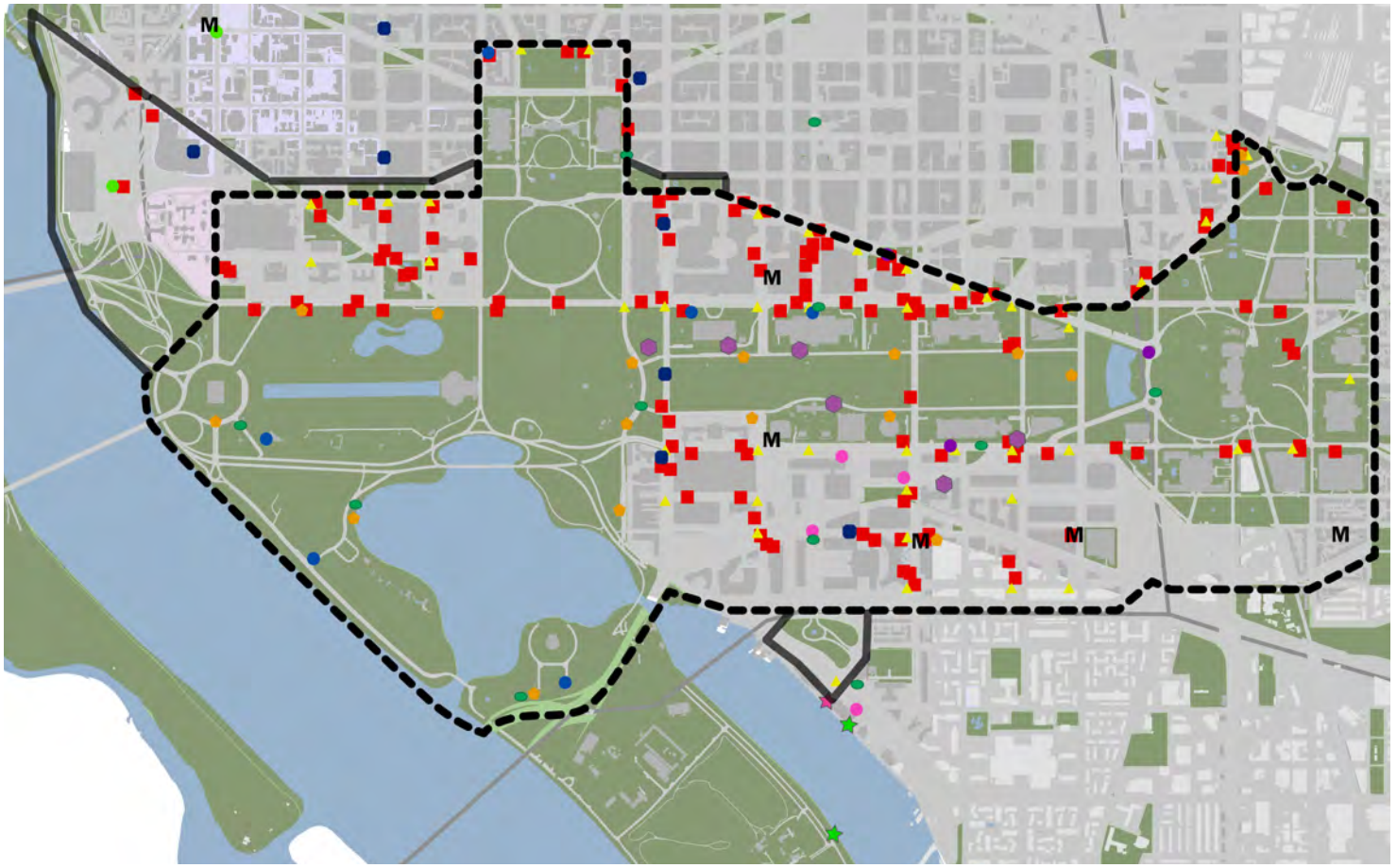
Data Source: This map was created during the Coronavirus pandemic and shows sidewalk and pedestrian path/multi-use trail widths categorized by ease of social/physical distancing. The map is available here: https://holdenmt11.github.io/Sidewalk-Width-DC/#15/38.9072/-77.0369

A-PC-2: Federal and Local Transportation and Mobility Plans

Pedestrian circulation should be coordinated with federal and local transportation and mobility plans and guidance including (listed chronologically):

- District Comprehensive Plan: Transportation Element (2020)
- Federal Comprehensive Plan: Transportation Element (2020)
- NPS Paved Trails Study (2016)
- Move DC (2014)
- WMCOG/TPB Bicycle and Pedestrian Plan (2014)
- NPS National Mall Plan (2010)

A-PC-3: Transit Locations



Legend

- Manual Boundary

Regional

- M MetroRail Station
- Metro Bus Stop
- DC Circulator Stop
- Commuter Bus Location
- Slug Line
- Potomac River Taxi

Local

- Big Bus
- Southwest Shuttle
- Smithsonian Shuttle
- Kennedy Center Shuttle
- Old Town Trolley DC Duck
- Old Town Trolley National Mall & Downtown Loop
- Wharf Jitney

Note: The map shows local, regional, and commuter transit stop locations.

Source: DC OCTO, NAMA, Smithsonian Institution, Wharf website, Southwest BID, Big Bus website