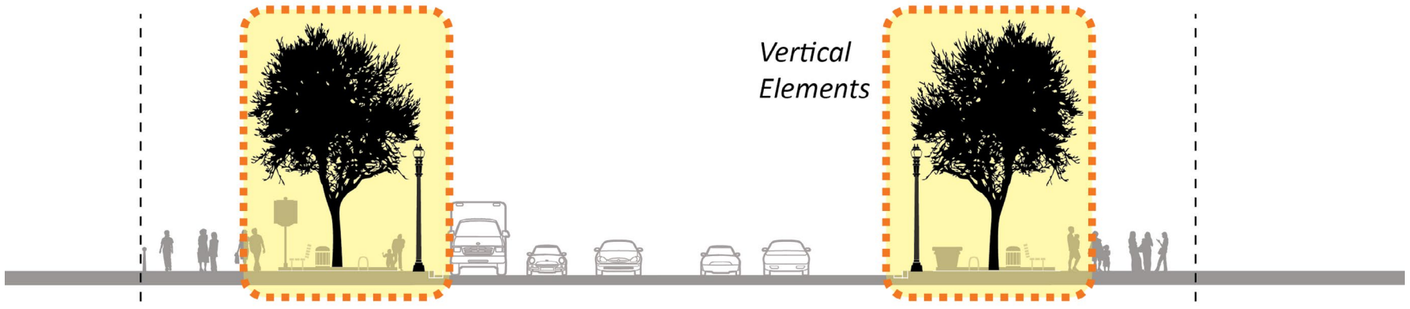
Part 2: Streetscape Design Guidelines
Vertical Elements

Introduction: Vertical elements, such as streetlights and trees, provide structure and organization to the monumental core's streetscapes. As some of the most visible of the streetscape elements, they help shape streetscape corridors, frame important vistas, and build consistency across blocks. They create a safe and comfortable public realm and assist in unifying the monumental core and city.

Vertical Elements
Streetlights



Resilience and Disaster Response:
Guidelines that focus on environmental health and adaptability include:

Streetlight guideline S-4 supports mitigating urban sky glow.

Tree guidelines T-1, T-6, T-13, T-14, T-21, T-22, T-27, T-28, T-41, T-42, T-43, and T-44 support increased tree canopy cover, species biodiversity and native trees, tree health and resilience, managing stormwater, mitigating heat island and urban sky glow.

Introduction

This guidance addresses streetlight fixtures[5] (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 are contributing to the character of the capital city's historic districts[6] and cultural landscapes,[7] 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 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 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 or have streetscape elements contributing to the character of historic districts, cultural landscapes, or special areas.

Detailed drawings and descriptions of several streetlight fixtures referenced in this section can be found in the Streetscape Manual – Interagency Initiative for National Mall Road Improvement Program (2013). ***Note:*** *The Construction Manual update is currently underway and will include revised details and specifications.*

Principle:

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

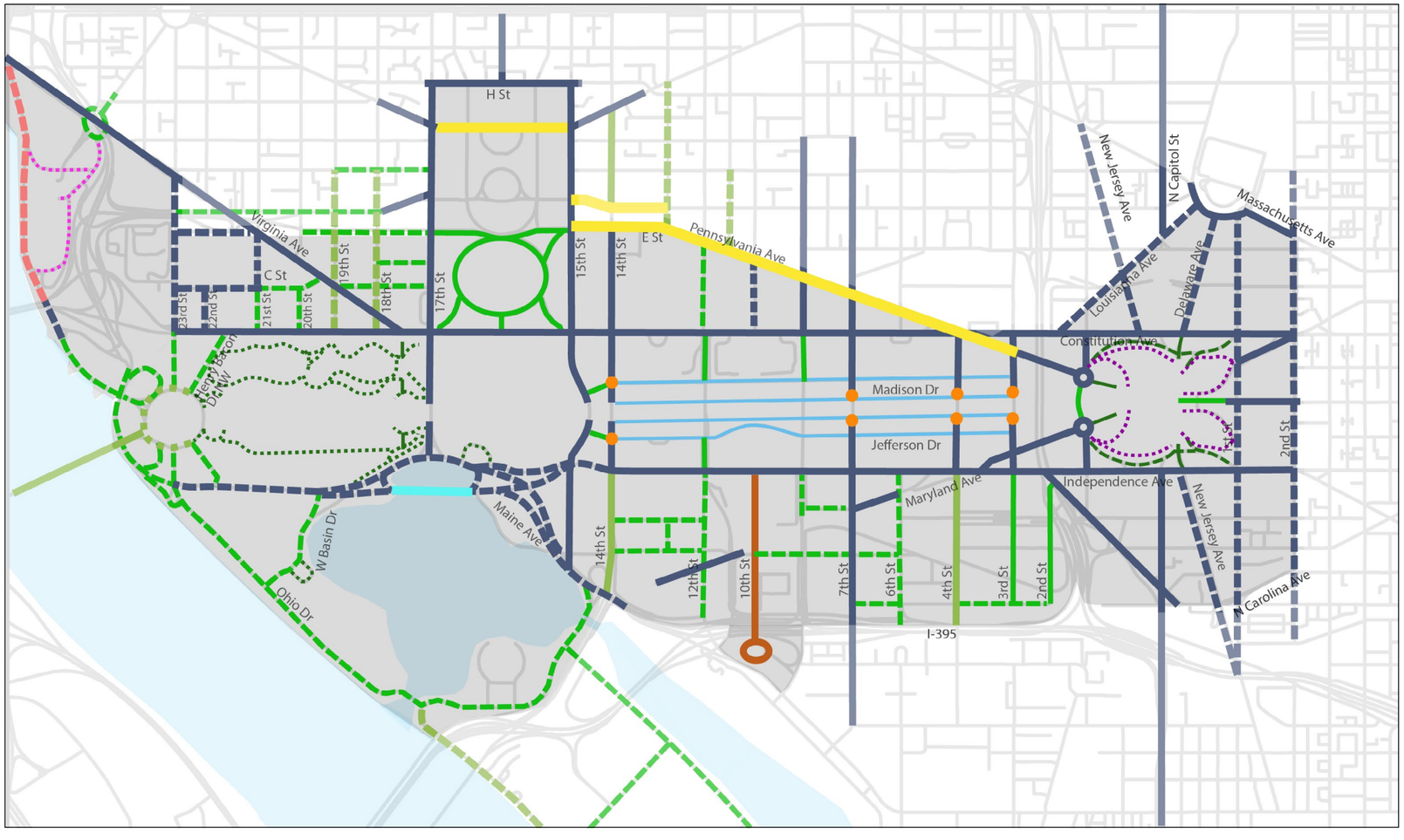
Streetlight Fixture Types and Descriptions:

- **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.
- **Washington Globe Fixture:** Designed in 1910 by Francis D. Millet (CFA member) to unify Washington's city streets. They range in heights from 14-18 feet.[8]
- **Twin-Twenty Fixture:** Designed in 1923 by Henry Bacon (CFA member) to express the dignity of the federal city.[9]
- **Olmsted Fixture:** Designed in 1935 by J. W. Gosling (designer employed by General Electric laboratories) to enhance the National Mall vista.[10] They are named after Frederick Law Olmsted, Jr., a landscape architect who developed and guided the McMillan Plan.
- **Kutz Bridge Saratoga Lights:** Designed as part of the Public Works Administration (PWA) restorations, they are similar to the Olmsted fixtures.[11]
- **Tenth Street, SW Lights:** Designed in 1966 by architect Araldo A. Cossutta and installed along 10th Street, SW or L'Enfant Promenade, They feature five spherical globes mounted on twin poles.[12]
- **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.[13]
- **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.

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.

Map S-1: Streetlight Fixtures



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

Figure S-1: Existing Condition of the National Mall: Single line of lights flank the sides of the center panel.

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.

Image: Architect of the Capitol

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 intersecting 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:

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.[14] Improvements should focus lighting 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.

Vertical Elements
Trees

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 (pg. 22) and Map T-2: Recommended Tree Rows (pg. 25).**

Importance and Background:

Street trees contribute 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, softening building facades, and positive effects on the built environment such as shading walkways and buildings.

In the 1870s, Washington, D.C. 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 American Elms chosen for the National Mall, which form a large cathedral-like canopy over the pedestrian walkways and National Mall panels. Today, re-establishing a robust and visually pleasing tree canopy is important for aesthetic and environmental reasons. Trees help manage stormwater, mitigate urban heat islands, improve air quality, promote public 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:** Addresses:
  - 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 trees across the street such as opposite or staggered configurations.
- **Tree Soils:** Addresses minimum soil volumes, use of structural soils, and improvement of soil profiles.
- **Tree Health and Function:** Addresses:
  - 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 landscaped 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; and
g. Areas with highest particulate matter levels in the air.

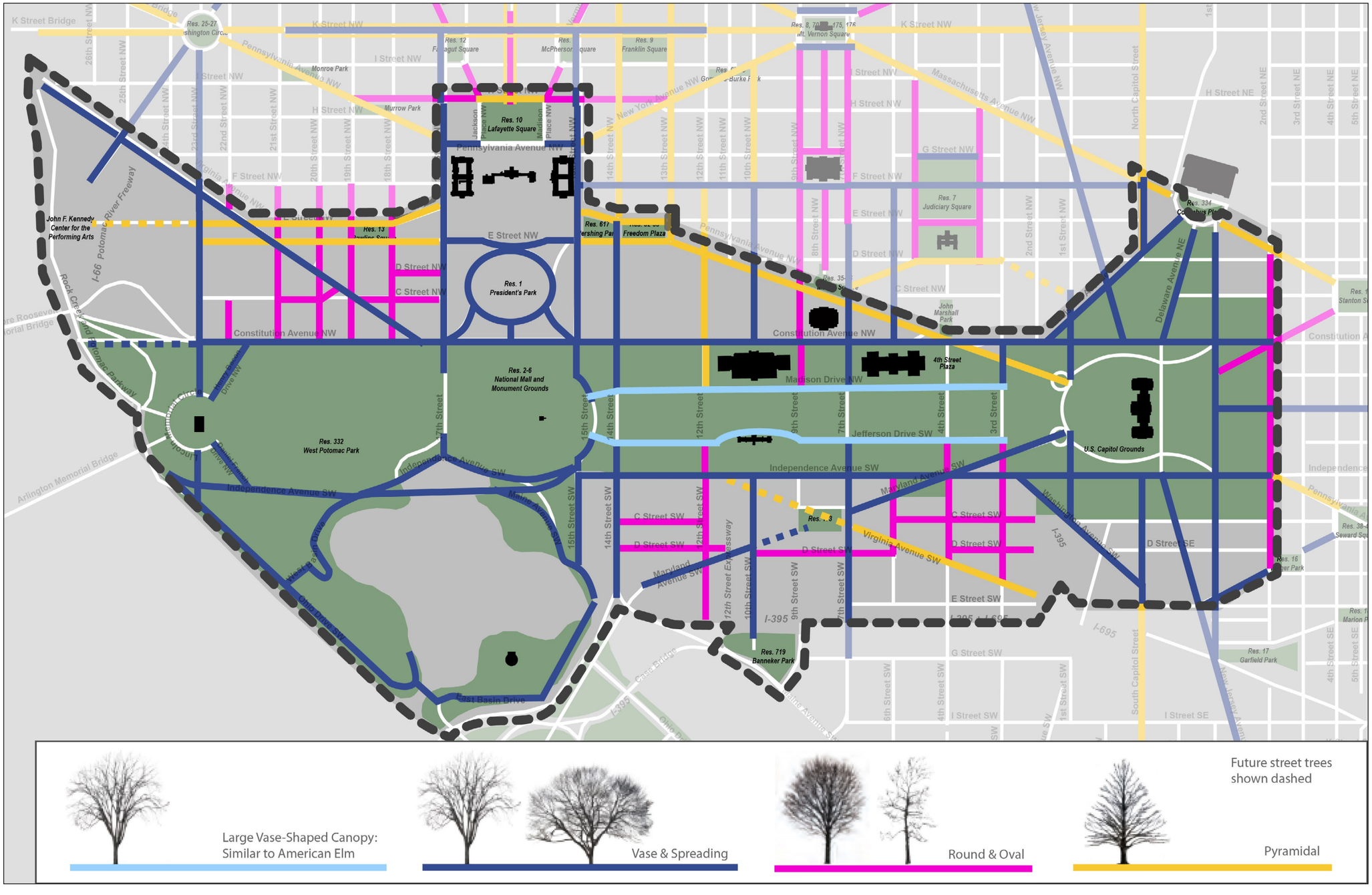
T-2. Plan and manage for trees of the largest appropriate size for a space subject to:

a. Design considerations such as viewsheds;
b. Available tree canopy and planting area;
c. Site design and the respective tree's adaptability and suitability to site conditions such as soils, sun exposure, and stormwater and salt tolerance; and
d. 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 consultation to determine agency responsibility for street trees and coordinate to ensure that street trees are properly replanted and maintained.

Map T-1: Recommended Tree Form



Tree Form, Sensory Attributes, and Planting Pattern

Principle:

Choose trees with form, sensory attributes, and planting patterns that reinforce nationally and symbolically important 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 and Edging Streets* and *Connecting and 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[15] 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[16] 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 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[17] (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.

T-10. When selecting tree species, consider vistas and viewsheds, ROW dimensions, landscaped 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 landscaped public parking widths can accommodate broader-formed, larger sized trees, trimmed vertically up to eight (8) 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[18] 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.

Figure T-1: Elm species and hybrids (such as Accolade Elm, Triumph Elm, Patriot Elm) offer improved disease-resistance and desirable tree architecture. Other tree species (such as Hackberry and male 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-14. Restore double and triple rows of trees, as documented in the historic city plans,[19] 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:

  16th Street, NW,

  Constitution Avenue, NW,

  Delaware Avenue, NE,

  East Capitol Street,

  Independence Avenue, SW[20]

  K Street, NW

  Maryland Avenue, NE

  Maryland Avenue, SW

  Massachusetts Avenue, NE,

  Massachusetts Avenue, NW,

  New Jersey Avenue, NW,

  New Jersey Avenue, SE,

  New York Avenue, NW,

  North Carolina Avenue, SE

  Pennsylvania Avenue, SE, and

  South Capitol Street.

T-15. Consider available space in the ROW and adjacent landscaped 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 landscaped 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 landscaped 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 landscaped public parking areas or building yards and achieve double rows of trees on axial avenues and streets.

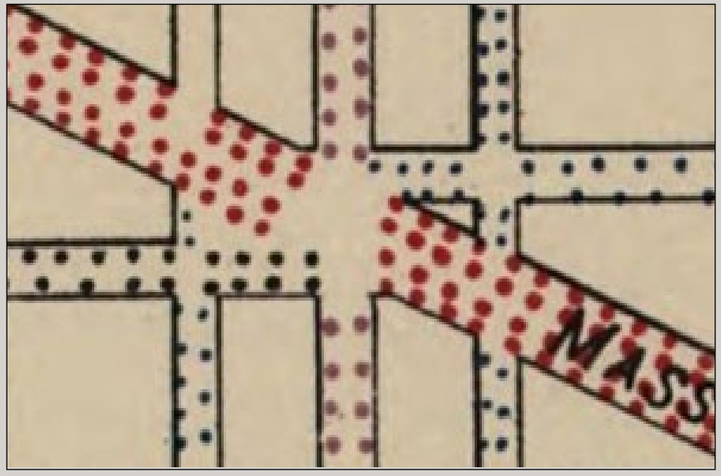


Figure T-2: ***Street Intersection Guidance*** Example from the 1880 Plan showing Massachusetts Avenue, NW street trees dominating through intersections with various grid streets (East-West Street: L Street, NW; North-South Streets: 10th through 13th Streets, NW).

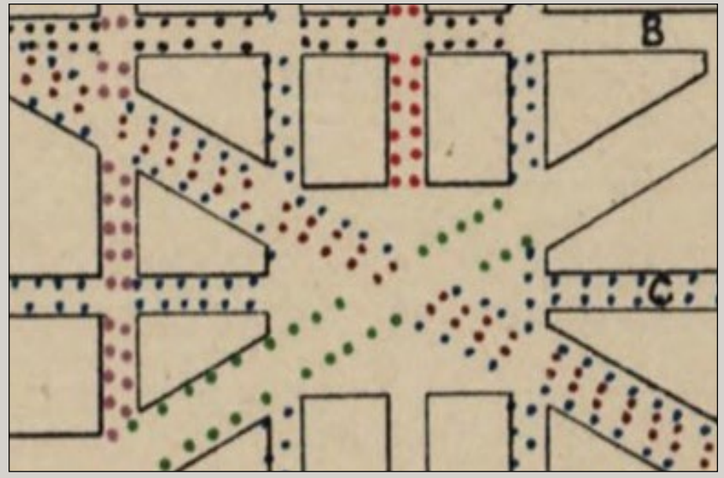


Figure T-3: ***Park Intersection Guidance*** Example from the 1880 Plan showing Pennsylvania Avenue, SE crossing through Seward Square to reinforce the Pennsylvania Avenue alignment through the park.

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:** ***Street Intersection Guidance.***

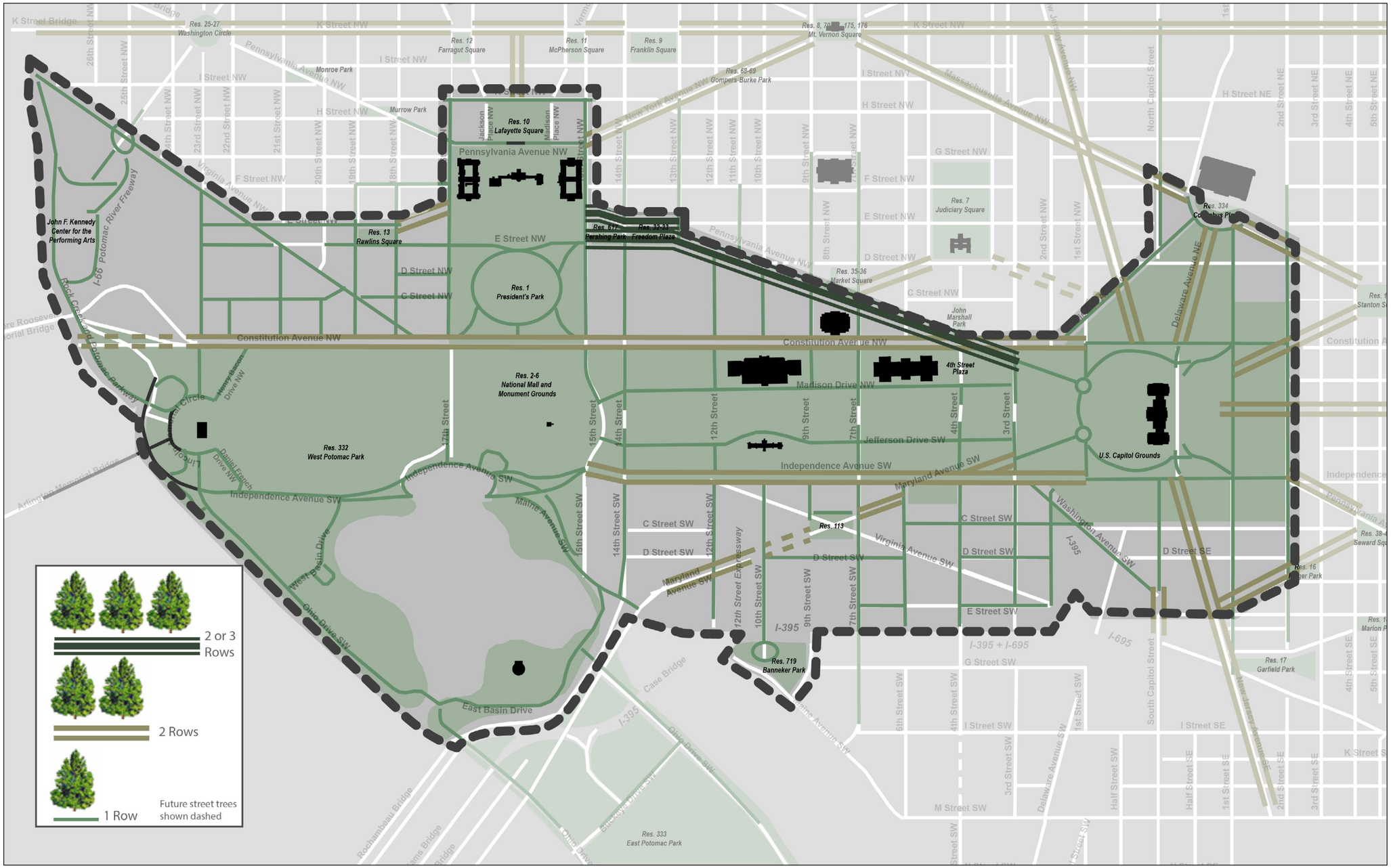
T-20. Enhance views and vistas along streets within or between parks and open spaces by either:

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.*

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).

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 feet tall): 1,500 cubic feet of soil within a 27-foot radius
- Medium Trees (40 to 60 feet tall): 1,000 cubic feet of soil within a 22-foot radius
- Small Trees (less than 40 feet 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. *(See example in **Figure T-4.**)*

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.

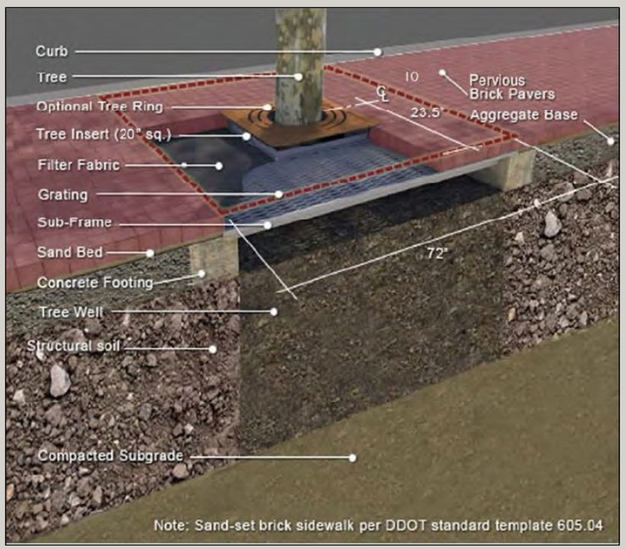


Image: IRONSMITH

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). See Virginia Tech's Urban Forestry website for Soil Profile Rebuilding information.

Tree Health and 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.[21]

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. Minimize disruption of avian and mammal habitat when removing, trimming, or mowing trees or landscape vegetation. National Mall and National Mall and Memorial Parks (NAMA) areas 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 large and long-lived, resistant to breakage, and 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 near benches or placing benches near trees, to provide shaded seating and resting areas.

T-40. Enhance pedestrian comfort by planting trees nearby bus stops to provide shade for pedestrians while not visually obscuring the bus stop sign and/or shelter.

T-41. Plant trees that will significantly contribute to stormwater best management practices. See Stormwater Management Guidelines for more information.

T-42. 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-43. Plant large shade trees in areas with higher daytime temperatures, dark impervious surfaces (e.g. surface parking lots), and/or other sites with high heat exposure to improve quality-of-life and reduce the urban heat island effect.

T-44. Where possible, mitigate both urban heat island effect and urban sky glow by planting street trees that both shade roadways from 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's Guidance for Planting Trees within 40 feet of wires or street lights.
c. Roadway and sidewalk lighting levels required for vehicular and pedestrian safety.
d. Pruning and maintenance needed to ensure street trees do not block downward light emitted from streetlights.
e. Coordination between agencies responsible for streetlights and street trees.

T-45. Plant trees in areas with high levels of particulate matter to improve air quality and community health.

T-46. Promote tree canopy expansion and healthy tree growth by minimizing conflicts with tree roots and utilities.

T-47. 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.*

T-48. Consider projected tree root growth to avoid roots lifting sidewalks or multi-use trails, which create a hazard to pedestrians.

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-49. 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-50. Maintain landscape consistency along streetscape corridors by using consistent tree box materials and designs, and consistent planting height, density, and character.

T-51. 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-52. 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.

Socially-Oriented Design:

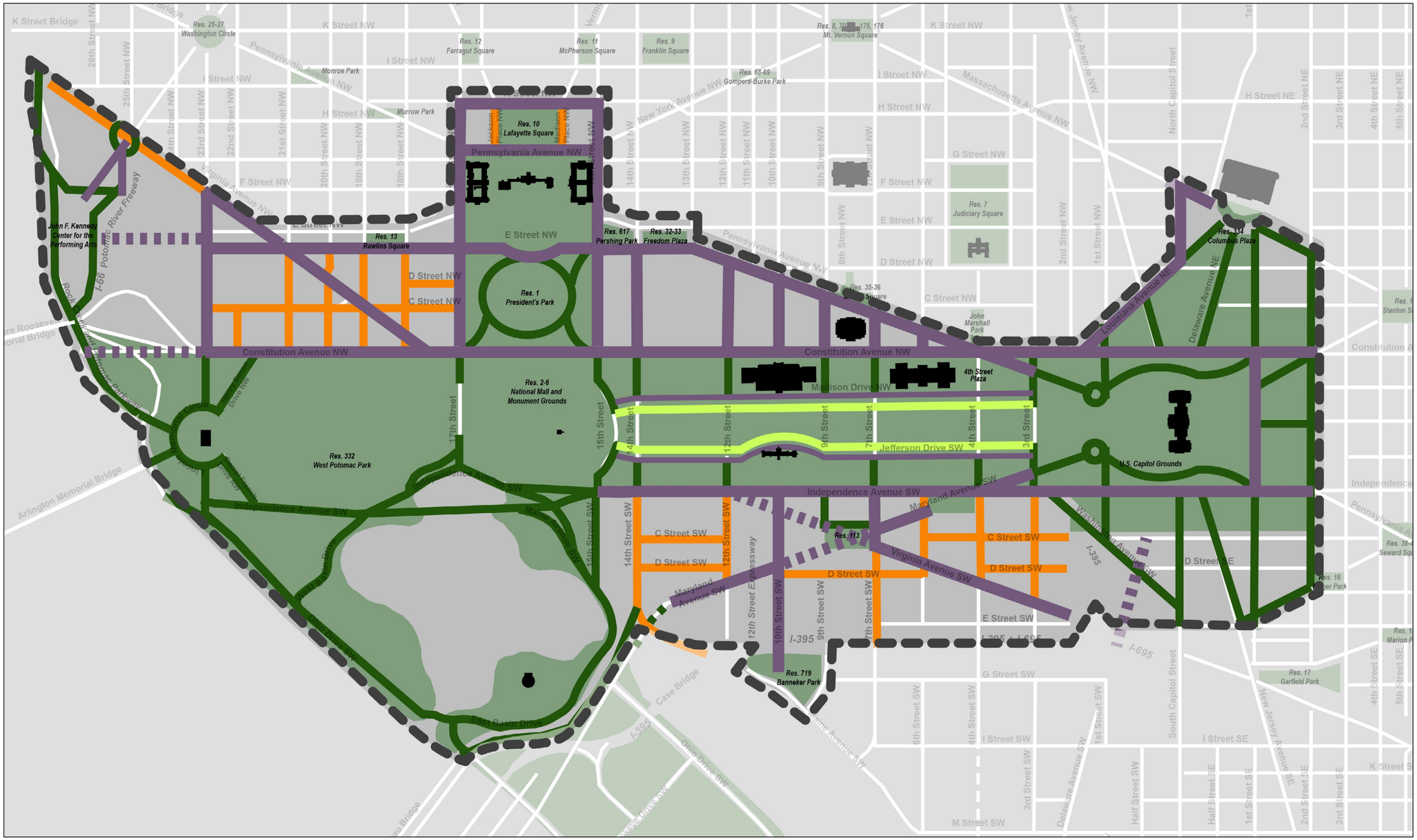
Guidelines that focus on the public's comfort, safety, and experience include:

Streetlight guidelines S-1 and S-4 support safety and human scale.

Trees guidelines T-38, T-39, T-40, T-43, and T-45 support trees contributing to quality-of-life, emotional and community health, and enhance pedestrian comfort.

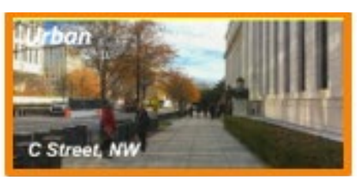
Pedestrian Circulation guidelines PC-5, PC-8, PC-9, PC-11, PC-13, and PC-31 support pedestrian circulation for both everyday and event-based use, universal accessibility, and pedestrian level of comfort including low-stress circulation routes.

Map T-3: Streetscape and Landscape Character



Legend

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



T-53. 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 landscaped public parking.
- **Building Yard:** Located within civic settings, serving cultural and institutional land uses. These areas often include building yards and/or landscaped 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 south side of Madison Drive and the north side of Jefferson Drive) serving cultural and institutional land uses. These areas often have continuous tree boxes containing grass or pea gravel.

T-54. Select tree box designs and materials based on the following criteria and guidance:

a. Streetscape and Landscape Character (see **Map T-3: Streetscape and Landscape Character**);
b. Pedestrian Volumes *(see* **A-Map B-1: Daytime Pedestrian Volumes** *in Small-Scale Element Design Guidelines);*
c. Bioretention or Non-bioretention Functions (based on local site conditions); and
d. Tree Box Treatment Matrix *(see* **Chart T-1: Tree Box Treatment Matrix***).*

T-55. 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-56. 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 four (4) feet wide to accommodate healthy tree root systems.

T-57. Pedestrian crossings of continuous tree boxes and open planting strips (or verges [22]) 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-58. Locate tree boxes to allow for a 24-inch-wide curbside step-out[23] 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-59. Tree box areas shall maintain a clear distance of three (3) feet from a crosswalk or paved bus stop landing, six (6) feet from an entrance to an alley or street corner, and four (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).

T-60. Tree boxes shall maintain at least six (6) feet of separation from adjacent beautified areas[24] 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-61. When designing tree boxes, make the best possible effort to preserve existing, mature, healthy canopy trees because of their important role in stormwater retention.

Important References:

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.

FUNCTION AND PERFORMANCE

T-62. 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.*

T-63. 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-64. 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 five (5) feet.

T-65. 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**.**

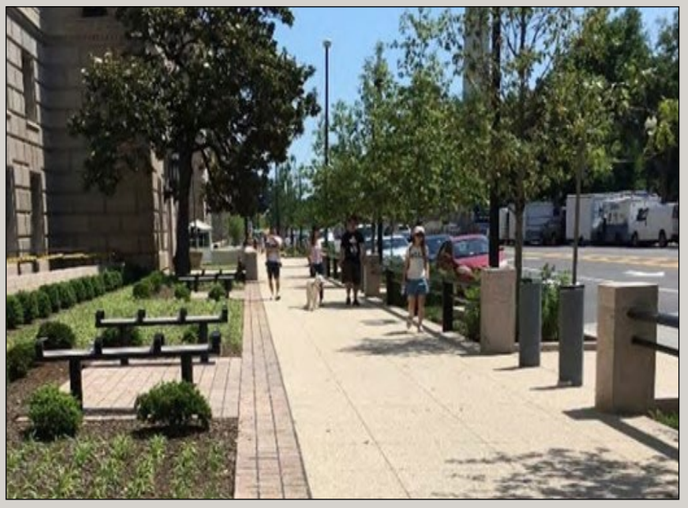


Figure T-5: The Herbert C. Hoover Building (U.S. Department of Commerce) streetscape integrates stormwater management and perimeter security.

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.

T-66. Maximize surface area and volume of tree boxes and minimize paving in landscaped public parking areas to increase the amount of permeable surface. Prior to designing stormwater management in landscaped public parking areas, consult with adjacent property owners and regulatory entity to ensure regrading is possible.

T-67. Connect tree boxes where possible to expand and create a continuous pervious surface to maximize retention.

MATERIALS

T-68. 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-69. 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-70. Metal tree grates may be used as a longer-term solution to protect both tree roots and pedestrian where pedestrian volume is high and/or where sidewalks are narrow. New projects should consider and evaluate tree grate cost and ongoing maintenance in design proposals.

T-71. Flexible porous pavement (such as Flexi-Pave, Porous Pave, and Rubberway) is permitted for temporary[25] 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 near building entrance areas.

T-72. 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.

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.*

T-73. Protect tree box soils from compaction and unwanted pedestrian traffic in high-use areas through use of the following treatments and details.[26] *(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 for more information)
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-74. 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-75. 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

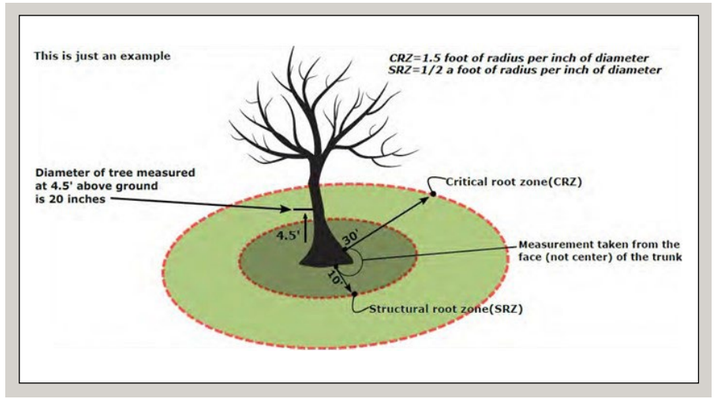
RECOMMENDED PRACTICES

T-76. When designing landscapes, consult DOEE's GAR Guidebook (Chapter 5) for additional guidance on mulching, plant selection, soils, and soil amendments.

T-77. Use best practices, such as appropriate subbase, root barriers, and curbing to minimize conflicts between tree planting and infrastructure.

T-78. Tree boxes and surrounding ROW should be designed to limit impacts to critical and structural root zones of existing trees (shown in ***Figure T-8: Root Zone Diagram***).
(Coordinate with Stormwater Management Guidelines: Environmental Function and Design Guideline [33].)

Figure T-8: Root Zone Diagram



Tree Box Understory Plantings

PLANTING CONFIGURATIONS AND MATERIALS

T-79. See Chart L-1: Maximum Planting Heights for tree box understory planting height guidance.

T-80. Tree box plantings shall remain contained within the tree box area and not extend over the curb or the sidewalk. See DDOT's DEM (§37.3.2) and the District's PRDM (§3.6.4).

T-81. 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-82. Plantings should be a minimum of two (2) feet from the root flare[27] of the street tree to protect feeder and anchor roots from damage. See the District's PRDM (§3.6.4).

T-83. Tree box understory plantings should be completed at the time of street tree plantings to avoid root damage to established street trees.

T-84. When planting around existing trees, use appropriately sized plant containers to minimize tree root damage. *Example: Use one gallon or smaller pots based on proximity to structural roots.*

T-85. 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-86. Avoid use of annual understory plantings that will require seasonal disturbance of street trees.

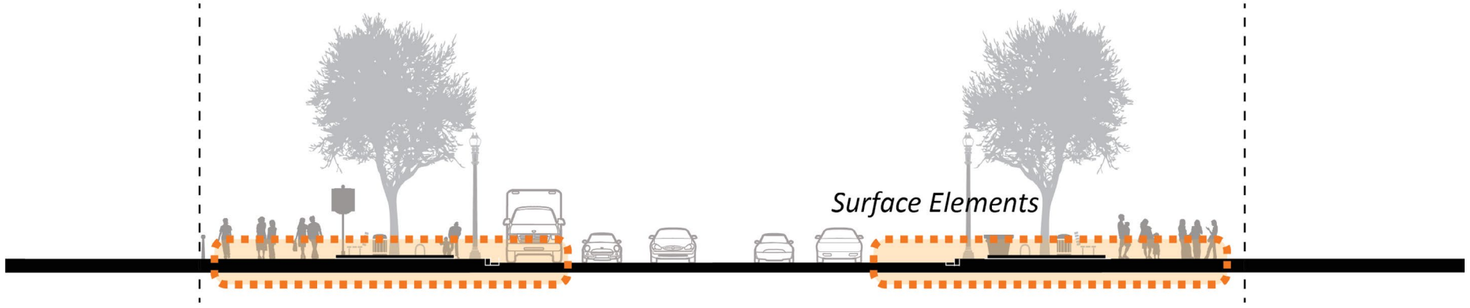
Important References:

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

Part 2: Streetscape Design Guidelines
Surface Elements

Introduction: Surface elements - including landscapes and plantings, stormwater management, and pavement materials - enhance vistas, contribute to streetscape character, and create a more engaging pedestrian experience. They also provide ecological and environmental benefits through the creation of habitat and the management and treatment of stormwater runoff. As surface elements have greater variability than vertical elements such as trees and streetlights, they can establish an area as unique from others or create a visual and material transition among different character areas.

Landscapes and Plantings



Resilience and Disaster Response:
Guidelines that focus on environmental health and adaptability include:

Landscapes and Plantings Guidelines L-1, L-19, L-20, L-21, L-22, and L-23 support regional, native, and pollinator-friendly plants.

Stormwater Management Guidelines SM-1, SM-2, SM-3, SM-4, SM-5, SM-6, SM-25, SM-32 support use of BMPs to reduce flooding and improve water infiltration and quality.

Pavement Guidelines P-25, P-41, P-42, P-43, and P-44 support pavements that improve stormwater infiltration and reduce the heat island effect.

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:

- **Landscaped 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:**[22] Landscape areas between the curb and sidewalk that may include street trees, low plantings, street furnishings, and/or step-out[23] 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. They 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 also 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.
- **Landscaped 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[28] compatible with the streetscape and landscape character (*see* **Map T-3: Streetscape and Landscape Character***)* and function, and complementary to street tree canopy, vistas, and viewsheds as identified in **Chart L-1: Maximum Planting Heights.**

Important References:
D.C. Municipal Regulations (DCMR) Section 24-102, provides regulations for Landscaped 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 ROWs and landscaped 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.

Note: *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: Streetscape and Landscaped Character**) and function in accordance with the Urban Design Streetscape Framework 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*.

Note: *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, water stations, public art, signage, parking meters, trash and recycling receptacles, fire hydrants, utility boxes, and cellular equipment. Maximize planting areas where appropriate. *Coordinate with Stormwater Management Guidelines: Urban Design Considerations, Guideline 12.*

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.

Landscaped Public Parking

Principle:

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

Chart L-1: Maximum Planting Heights

	Right-of-Way Space				
Street Type	Landscaped 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

Figure L-1: Diagram of Landscaped Public Parking

Source: The District's Public Realm Design Manual

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

L-8. Plantings in landscaped 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 landscaped public parking should consider historic preservation. If landscaped public parking is adjacent to historic landscapes, streetscapes, or buildings, plantings should be compatible with contributing historic elements.

L-10. Trees located within landscaped public parking should be pruned to enhance viewsheds, improve pedestrian circulation, ensure public safety, prevent trees from touching building facades, and provide and maintain secure and comfortable environments. Lower limbs of canopy trees in landscaped public parking should be trimmed to a height of eight (8) feet to: coordinate with street trees, maintain open site lines, enhance views to important structures and open spaces, and provide overhead clearance for pedestrians. Additionally, to maintain open sight lines through landscaped 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 landscaped public parking areas adjacent to the sidewalk or roadway where possible. ***Note:*** *Coordinate with Street Tree Guidelines: Tree Form, Sensory Attributes, and Planting Pattern guidelines T-10 to T-14, including* ***Map T-2: Recommended Tree Rows.***

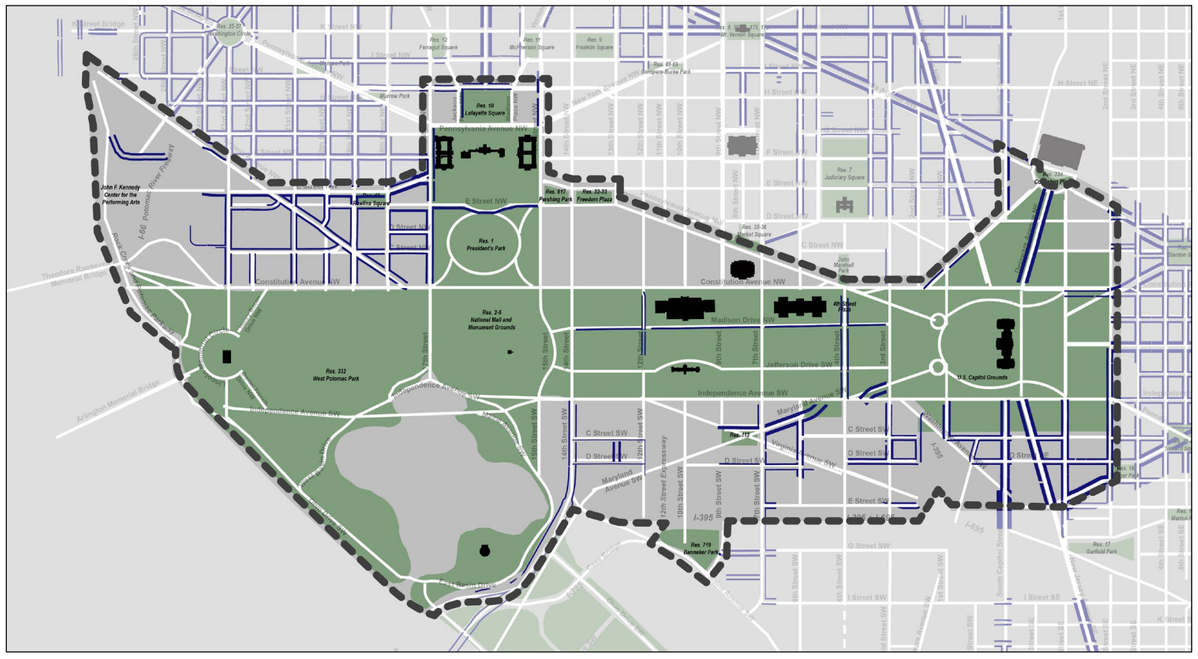
Verges

Principle:

Use verges[22] 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.

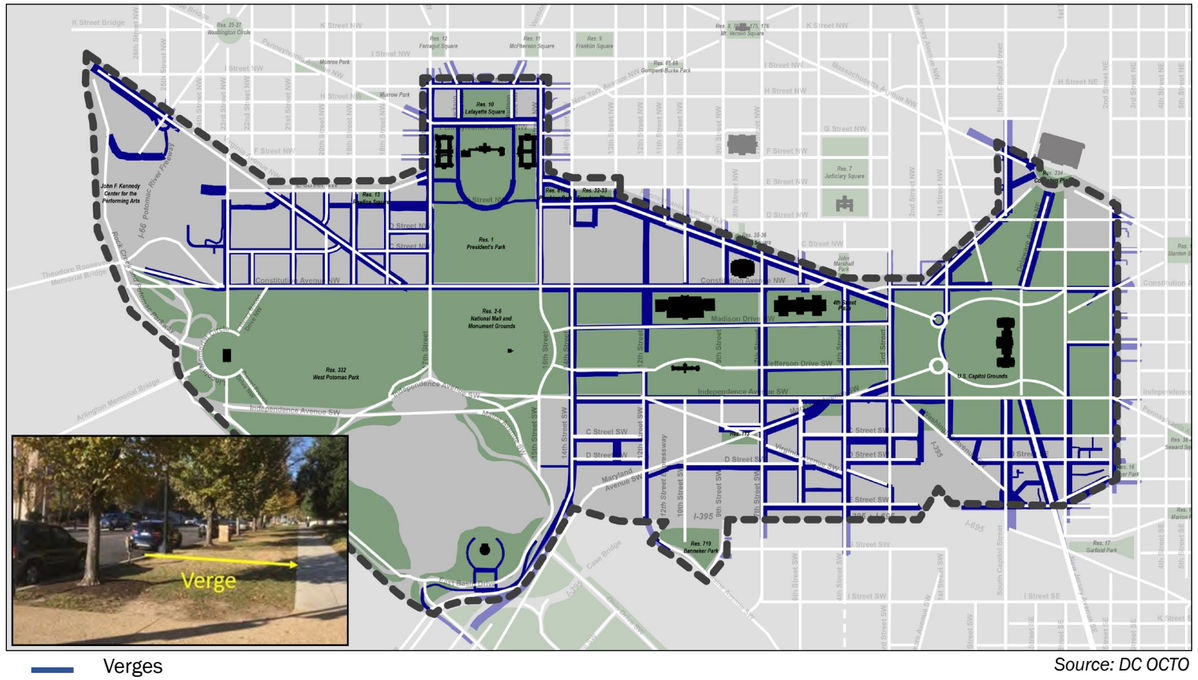
Map L-1: Landscaped Public Parking Locations



Landscaped Public Parking

Source: DC OCTO

Map L-2: Verge Locations



Verges

Source: DC OCTO

L-13. Limit verge lengths as follows:

- Twenty (20) feet at vehicle pick up and drop off areas
- Sixty (60) feet at bus pick up and drop off areas

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

L-15. Do not install plant material other than grass within verges along streets crossing the National Mall, between Madison Drive and Jefferson Drive, to retain unobstructed streetscape views and vistas.

Note: *Coordinate with Stormwater Guidelines: Urban Design Considerations, Guideline SM 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 Virginia Tech's Urban Forestry website for Soil Profile Rebuilding information.

Note: *Coordinate with Street Tree Guidelines: Tree Health and Function, Guideline T-30.*

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

Note: *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 native plants within streetscape plantings to advance pollinator health and habitats and to support natural ecosystem functions. Select plants to support the forage, reproduction, shelter, and/or hibernation of pollinators specific to the ecoregion. Balance practices to improve pollinator health with other considerations, such as environmental, cultural, aesthetic, recreational, safety, and security considerations inherent to each landscape.[29]

Example: Plant Common or Poke Milkweed (Asclepias syriaca or exultata) in suitable areas to help restore declining monarch butterfly populations.

L-22. 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:

a. Bloom value;
b. Bloom diversity of form and color;
c. Material size and structural diversity; and
d. Pollinator positive plant quantity.

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

L-23. Encourage pollinator-friendly plant palettes by planting a minimum of three 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-24. Plant selection and maintenance should consider changing uses in the monumental core, including increased dog walking and the additional wear that this activity places on plantings.

Surface Elements
Stormwater Management

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

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 Best Management Practices (BMPs):** Identifies priority areas and best practices for stormwater management in the monumental core.
- **Application of Stormwater BMPs:** Applies stormwater BMPs considering street categories, vistas and viewsheds, circulation, cultural and historic resources, and aesthetics.
- **Environmental Function and Design:** Addresses the design of stormwater BMPs to maximize the function of green infrastructure[18] and the water management system.
- **Maintenance:** Addresses maintenance responsibilities and refers to maintenance best practices.

Green Infrastructure Maintenance:
Guidelines that focus on stormwater BMP upkeep include: Stormwater Management Guidelines SM-37, SM-38, and SM-39 address maintenance of stormwater management BMPs.

Stormwater Best Management Practices

Principle:

Use Stormwater Best Management 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 stormwater BMPs 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 and 500-Year Floodplains, and Anacostia Waterfront Development Zone.**

SM-3. Maximize use of retention and filtration stormwater practices to capture, slow, and clean stormwater within MS4 and to capture and slow stormwater within 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[30] with subsurface retention as the BMPs to retain stormwater and slow the rate at which stormwater enters the storm sewer system.

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 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 SM-1: Urban Design Matrix**):

a. Views and vistas (**Map SM-1: Important Streetscape Vistas**);
b. Historic and cultural streetscapes and landscapes;
c. Use and design of adjacent buildings, building yards, and width of ROW and landscaped 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.

Note: *Coordinate with Landscape Guidelines: Urban Design guideline L-3.*

M-8. Design green infrastructure[18] to be compatible with streetscape function and character in accordance with the Urban Design Streetscape Framework 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 Streets*, and *Local Streets*.

Note: *Coordinate with Landscape Guidelines: Urban Design Guidelines UD-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.

a. *Radiating and Edging Streets* should maintain low plantings (less than 18 inches) with more formal appearance.
b. *Connecting and Traversing Streets* can maintain taller (less than 36 inches) 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, until the landscape is redesigned.

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, water stations, public art, signage, parking meters, trash and recycling receptacles, fire hydrants, utility boxes, and cellular equipment. Maximize stormwater management areas where appropriate. *Note: Coordinate with Landscape Guidelines: Urban Design guideline UD-5.*

Chart SM-1: Urban Design Matrix

		Retention			Conveyance		Filtration	
		Streetscape Bioretention	Vegetated Filtration Strip	Cistern*	Bioswale	Dry Swale	Filtering System	Permeable Pavers
Streetscape Categories	Radiating & Edging Streets							
	Connecting & Traversing Streets							
	Local Streets							
Streetscape Vistas	Reciprocal Vista							
	Radiating Vista							
	Edging Vista							
	National Mall Crossing							
Street Landscape Character	Landscape							
	Building Yard							
	Urban							
Circulation	High Curbside Use							
	Moderate Curbside Use							
	Low Curbside Use							
	Narrow Sidewalk							
	Moderate Sidewalk							
	Wide Sidewalk							
	High Pedestrian Volume							
	Moderate Pedestrian Volume							
	Low Pedestrian Volume							

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

SM-14. Design landscaped public parking[4] 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 (See **Map SM-1: Important Streetscape Vistas**);
b. Where curbside use is high; or
c. Where sidewalks are too narrow.

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. ***Note:*** *DDOT does not reuse stormwater or use irrigation systems in public space.*

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.

Chart SM-1: Important Streetscape Vistas

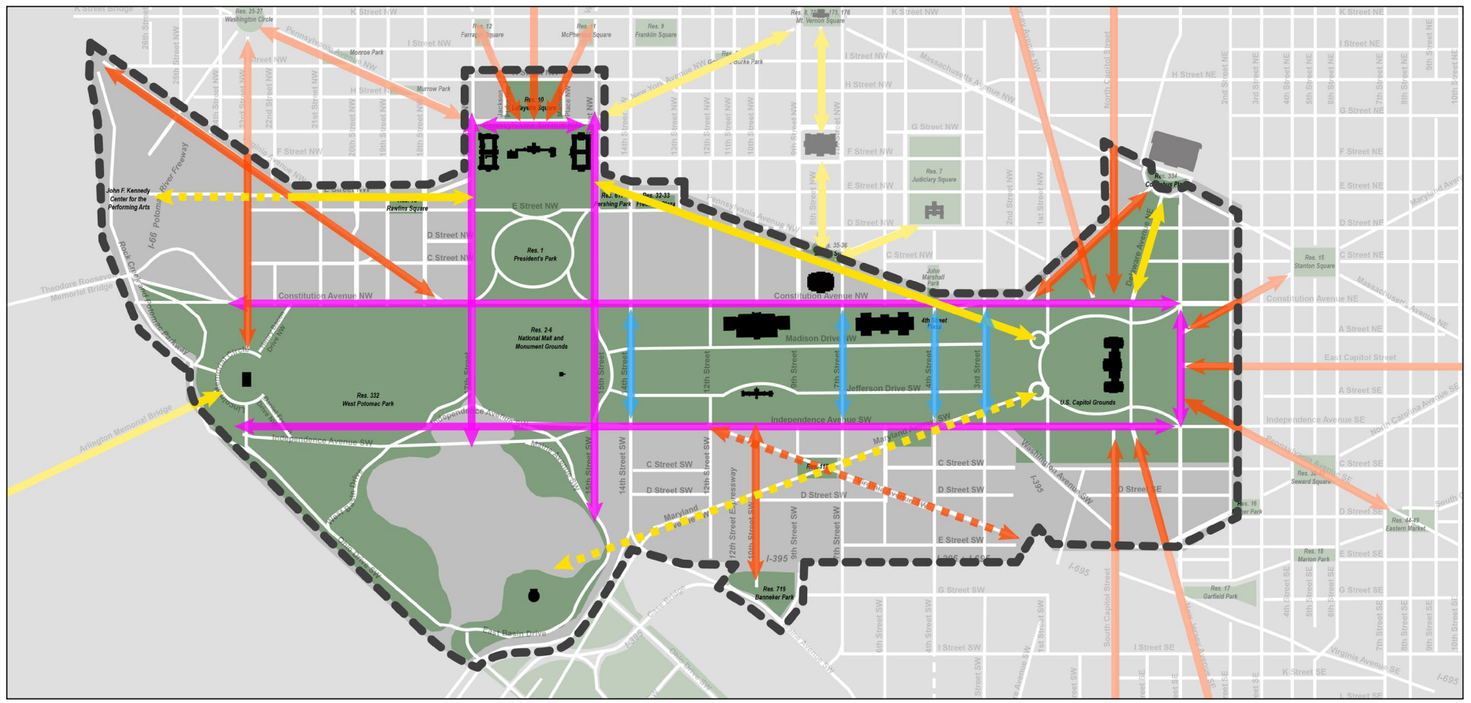
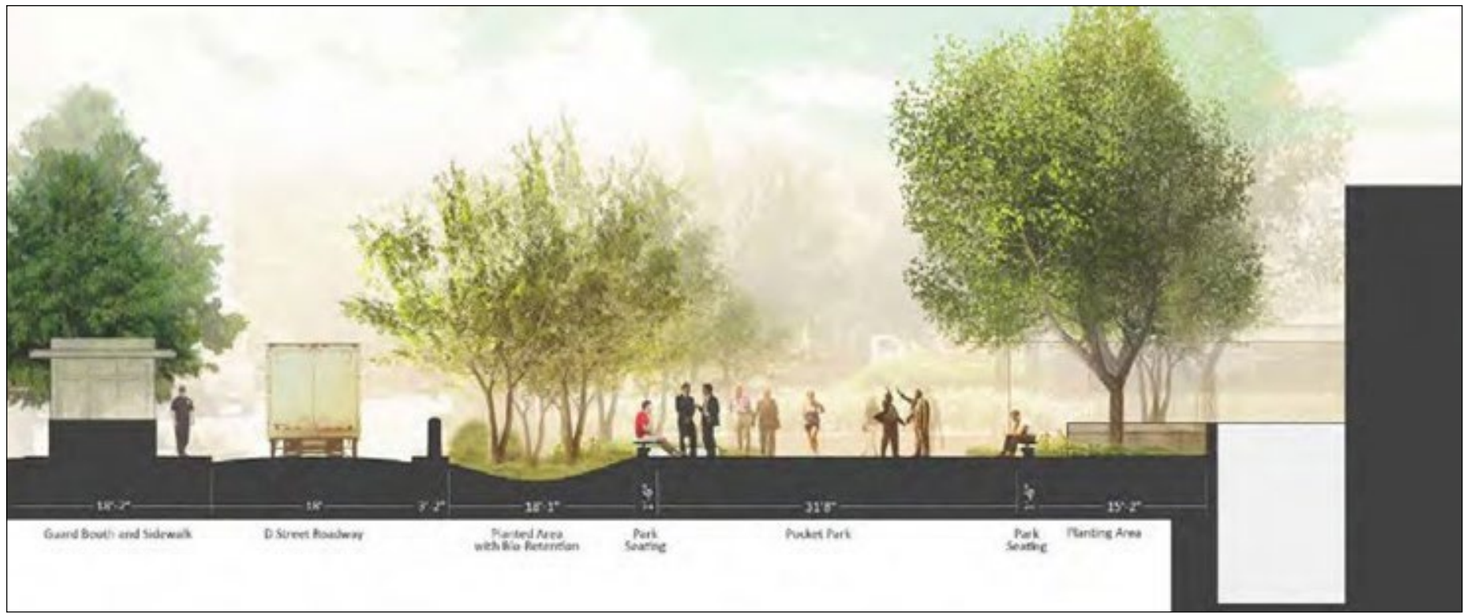


Figure SM-2: Bioretention within a pocket park at the Harry S. Truman Building (Department of State Headquarters) on D Street, NW

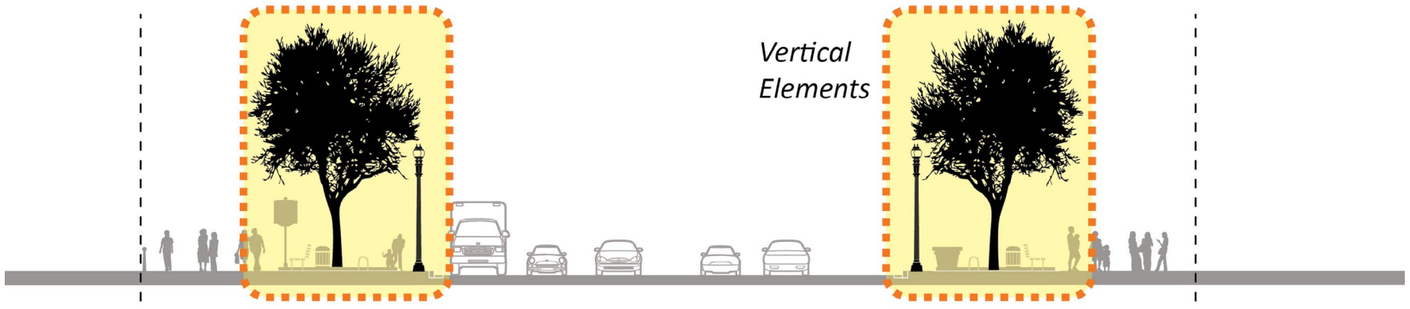


Source: Harry S. Truman Building (Department of State Headquarters) Perimeter Security Improvements

Part 2: Streetscape Design Guidelines
Vertical Elements

Introduction: Vertical elements, such as streetlights and trees, provide structure and organization to the monumental core's streetscapes. As some of the most visible of the streetscape elements, they help shape streetscape corridors, frame important vistas, and build consistency across blocks. They create a safe and comfortable public realm and assist in unifying the monumental core and city.

Vertical Elements
Streetlights



Resilience and Disaster Response:
Guidelines that focus on environmental health and adaptability include:

Streetlight guideline S-4 supports mitigating urban sky glow.

Tree guidelines T-1, T-6, T-13, T-14, T-21, T-22, T-27, T-28, T-41, T-42, T-43, and T-44 support increased tree canopy cover, species biodiversity and native trees, tree health and resilience, managing stormwater, mitigating heat island and urban sky glow.

Introduction

This guidance addresses streetlight fixtures[5] (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 are contributing to the character of the capital city's historic districts[6] and cultural landscapes,[7] 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 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 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 or have streetscape elements contributing to the character of historic districts, cultural landscapes, or special areas.

Detailed drawings and descriptions of several streetlight fixtures referenced in this section can be found in the Streetscape Manual – Interagency Initiative for National Mall Road Improvement Program (2013). ***Note:*** *The Construction Manual update is currently underway and will include revised details and specifications.*

Principle:

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

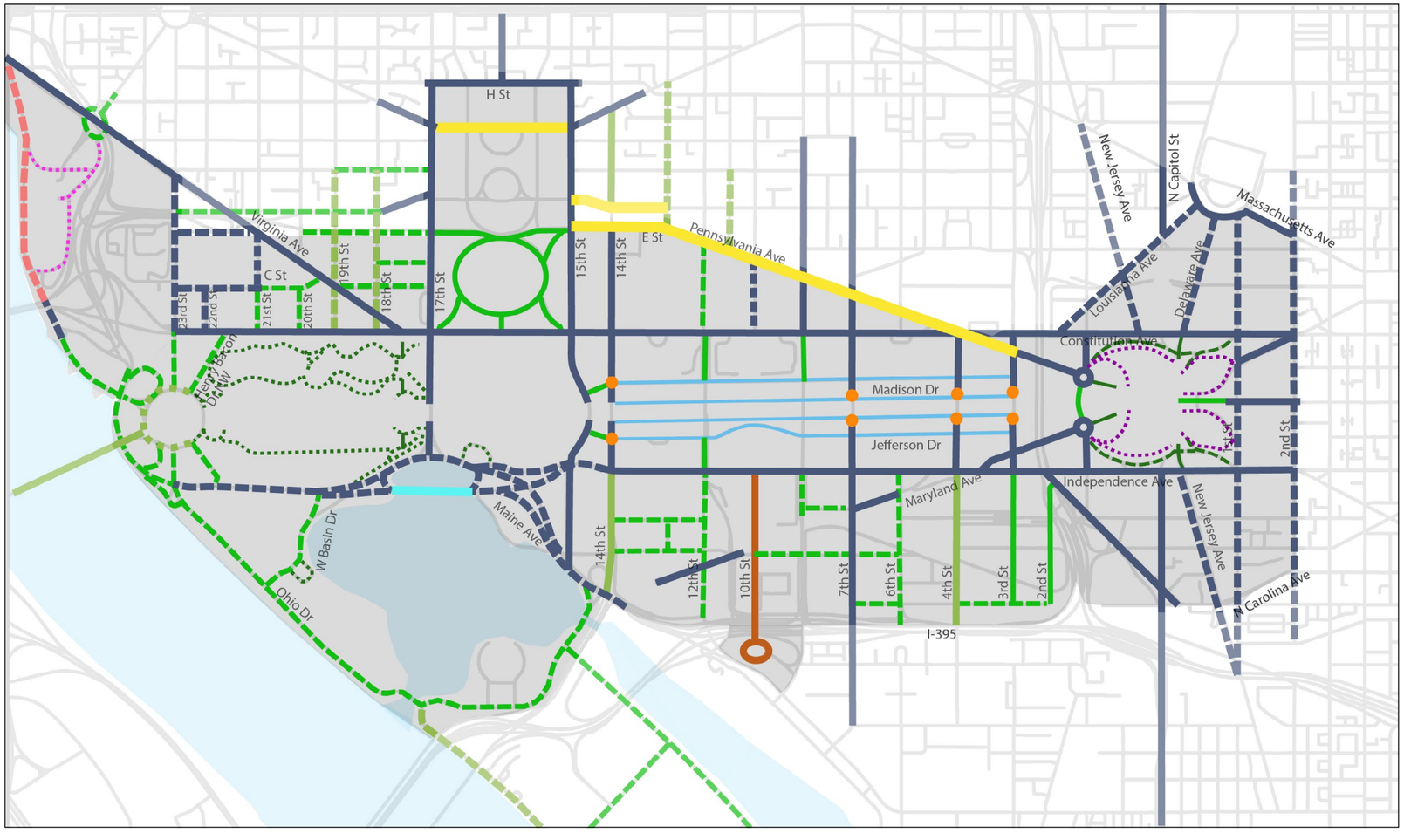
Streetlight Fixture Types and Descriptions:

- **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.
- **Washington Globe Fixture:** Designed in 1910 by Francis D. Millet (CFA member) to unify Washington's city streets. They range in heights from 14-18 feet.[8]
- **Twin-Twenty Fixture:** Designed in 1923 by Henry Bacon (CFA member) to express the dignity of the federal city.[9]
- **Olmsted Fixture:** Designed in 1935 by J. W. Gosling (designer employed by General Electric laboratories) to enhance the National Mall vista.[10] They are named after Frederick Law Olmsted, Jr., a landscape architect who developed and guided the McMillan Plan.
- **Kutz Bridge Saratoga Lights:** Designed as part of the Public Works Administration (PWA) restorations, they are similar to the Olmsted fixtures.[11]
- **Tenth Street, SW Lights:** Designed in 1966 by architect Araldo A. Cossutta and installed along 10th Street, SW or L'Enfant Promenade, They feature five spherical globes mounted on twin poles.[12]
- **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.[13]
- **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.

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.

Map S-1: Streetlight Fixtures



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

Figure S-1: Existing Condition of the National Mall: Single line of lights flank the sides of the center panel.

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.

Image: Architect of the Capitol

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 intersecting 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:

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.[14] Improvements should focus lighting 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.

Vertical Elements
Trees

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 (pg. 22) and Map T-2: Recommended Tree Rows (pg. 25).**

Importance and Background:

Street trees contribute 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, softening building facades, and positive effects on the built environment such as shading walkways and buildings.

In the 1870s, Washington, D.C. 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 American Elms chosen for the National Mall, which form a large cathedral-like canopy over the pedestrian walkways and National Mall panels. Today, re-establishing a robust and visually pleasing tree canopy is important for aesthetic and environmental reasons. Trees help manage stormwater, mitigate urban heat islands, improve air quality, promote public 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:** Addresses:
  - 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 trees across the street such as opposite or staggered configurations.
- **Tree Soils:** Addresses minimum soil volumes, use of structural soils, and improvement of soil profiles.
- **Tree Health and Function:** Addresses:
  - 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 landscaped 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; and
g. Areas with highest particulate matter levels in the air.

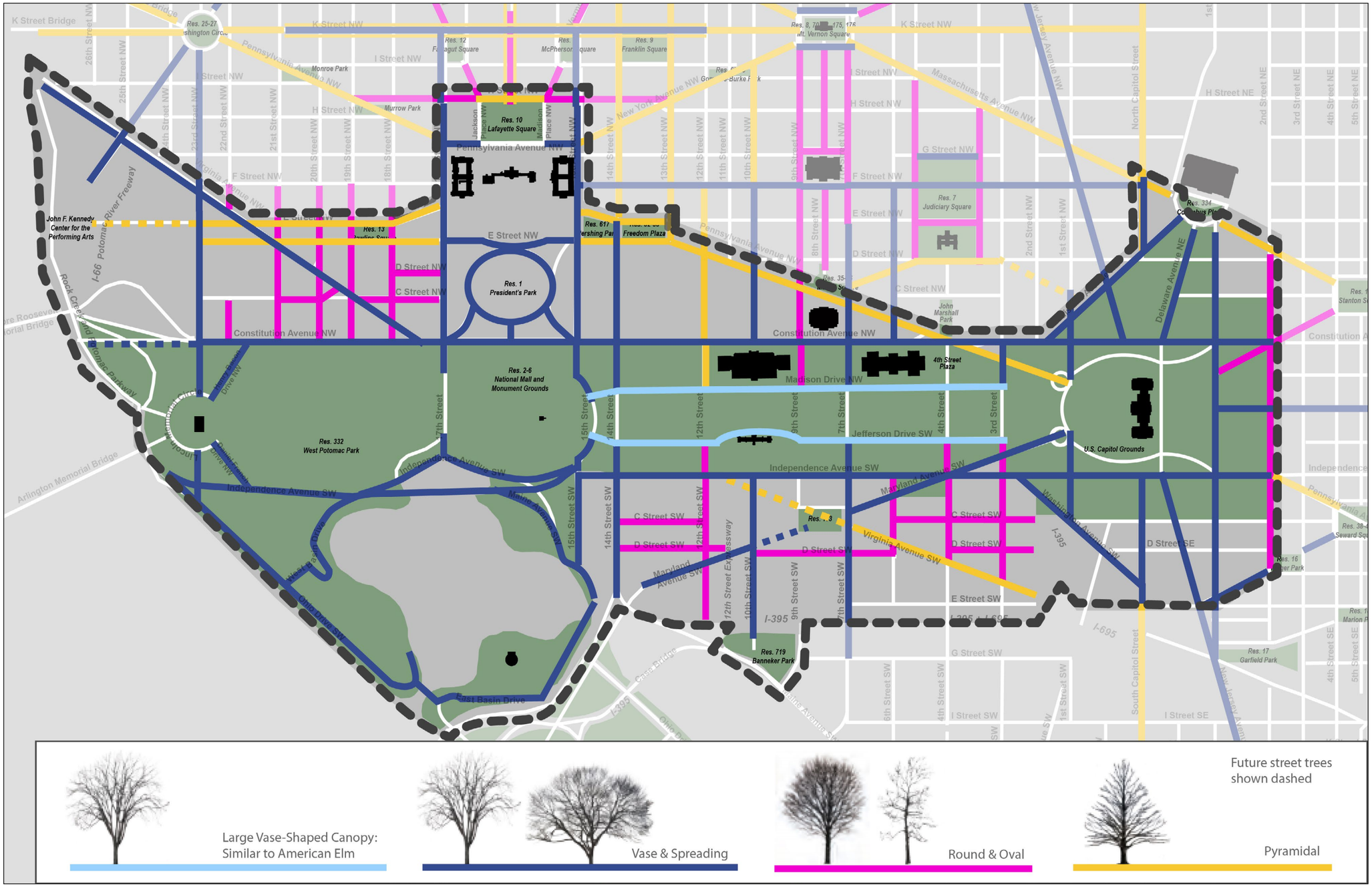
T-2. Plan and manage for trees of the largest appropriate size for a space subject to:

a. Design considerations such as viewsheds;
b. Available tree canopy and planting area;
c. Site design and the respective tree's adaptability and suitability to site conditions such as soils, sun exposure, and stormwater and salt tolerance; and
d. 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 consultation to determine agency responsibility for street trees and coordinate to ensure that street trees are properly replanted and maintained.

Map T-1: Recommended Tree Form



Tree Form, Sensory Attributes, and Planting Pattern

Principle:

Choose trees with form, sensory attributes, and planting patterns that reinforce nationally and symbolically important 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 and Edging Streets* and *Connecting and 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[15] 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[16] 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 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[17] (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.

T-10. When selecting tree species, consider vistas and viewsheds, ROW dimensions, landscaped 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 landscaped public parking widths can accommodate broader-formed, larger sized trees, trimmed vertically up to eight (8) 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[18] 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.

Figure T-1: Elm species and hybrids (such as Accolade Elm, Triumph Elm, Patriot Elm) offer improved disease-resistance and desirable tree architecture. Other tree species (such as Hackberry and male 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-14. Restore double and triple rows of trees, as documented in the historic city plans,[19] 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:

  16th Street, NW,

  Constitution Avenue, NW,

  Delaware Avenue, NE,

  East Capitol Street,

  Independence Avenue, SW[20]

  K Street, NW

  Maryland Avenue, NE

  Maryland Avenue, SW

  Massachusetts Avenue, NE,

  Massachusetts Avenue, NW,

  New Jersey Avenue, NW,

  New Jersey Avenue, SE,

  New York Avenue, NW,

  North Carolina Avenue, SE

  Pennsylvania Avenue, SE, and

  South Capitol Street.

T-15. Consider available space in the ROW and adjacent landscaped 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 landscaped 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 landscaped 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 landscaped public parking areas or building yards and achieve double rows of trees on axial avenues and streets.

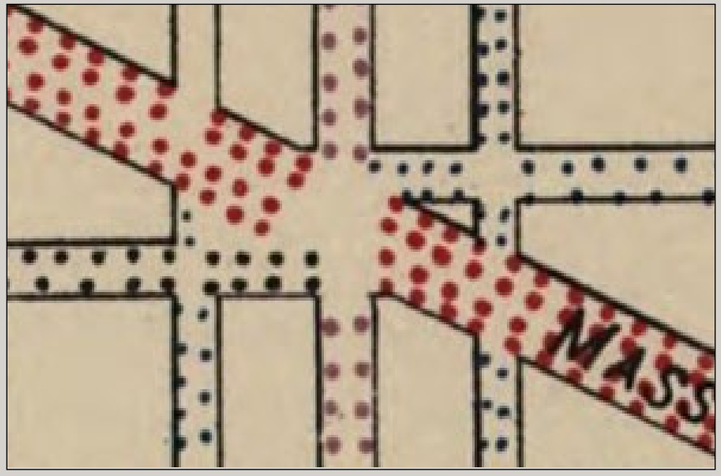


Figure T-2: ***Street Intersection Guidance*** Example from the 1880 Plan showing Massachusetts Avenue, NW street trees dominating through intersections with various grid streets (East-West Street: L Street, NW; North-South Streets: 10th through 13th Streets, NW).

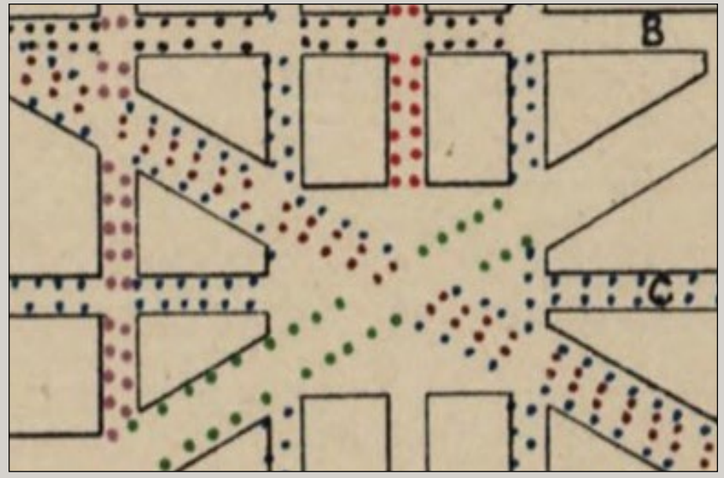


Figure T-3: ***Park Intersection Guidance*** Example from the 1880 Plan showing Pennsylvania Avenue, SE crossing through Seward Square to reinforce the Pennsylvania Avenue alignment through the park.

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:** ***Street Intersection Guidance.***

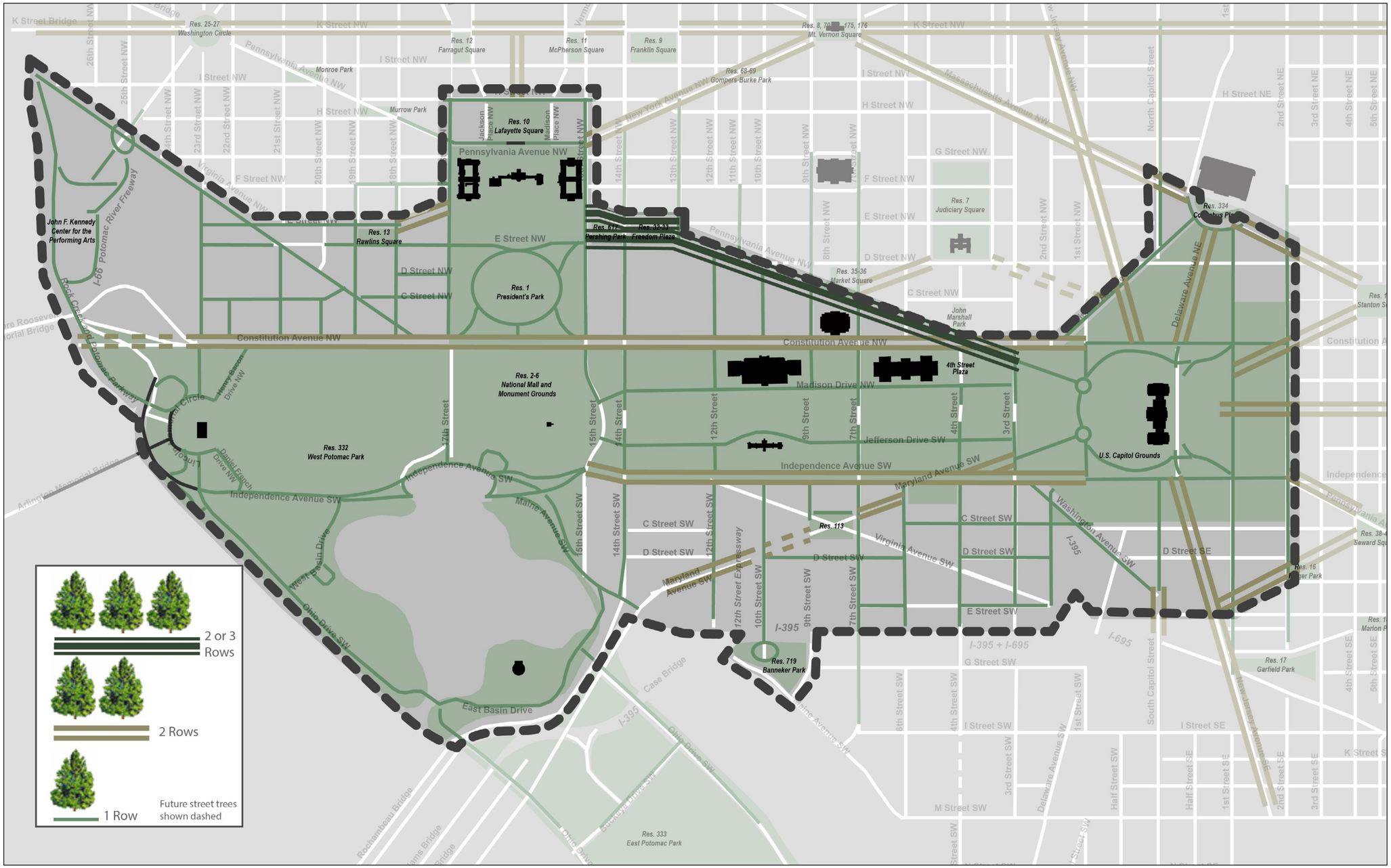
T-20. Enhance views and vistas along streets within or between parks and open spaces by either:

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.*

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).

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 feet tall): 1,500 cubic feet of soil within a 27-foot radius
- Medium Trees (40 to 60 feet tall): 1,000 cubic feet of soil within a 22-foot radius
- Small Trees (less than 40 feet 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. *(See example in **Figure T-4.**)*

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.

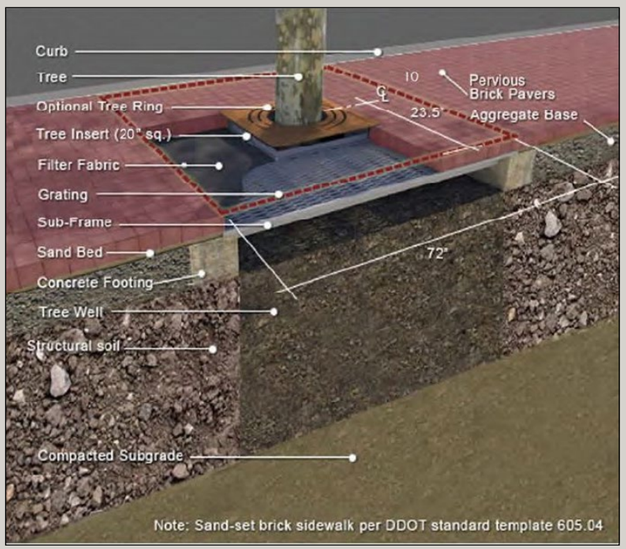


Image: IRONSMITH

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). See Virginia Tech's Urban Forestry website for Soil Profile Rebuilding information.

Tree Health and 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.[21]

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. Minimize disruption of avian and mammal habitat when removing, trimming, or mowing trees or landscape vegetation. National Mall and National Mall and Memorial Parks (NAMA) areas 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 large and long-lived, resistant to breakage, and 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 near benches or placing benches near trees, to provide shaded seating and resting areas.

T-40. Enhance pedestrian comfort by planting trees nearby bus stops to provide shade for pedestrians while not visually obscuring the bus stop sign and/or shelter.

T-41. Plant trees that will significantly contribute to stormwater best management practices. See Stormwater Management Guidelines for more information.

T-42. 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-43. Plant large shade trees in areas with higher daytime temperatures, dark impervious surfaces (e.g. surface parking lots), and/or other sites with high heat exposure to improve quality-of-life and reduce the urban heat island effect.

T-44. Where possible, mitigate both urban heat island effect and urban sky glow by planting street trees that both shade roadways from 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's Guidance for Planting Trees within 40 feet of wires or street lights.
c. Roadway and sidewalk lighting levels required for vehicular and pedestrian safety.
d. Pruning and maintenance needed to ensure street trees do not block downward light emitted from streetlights.
e. Coordination between agencies responsible for streetlights and street trees.

T-45. Plant trees in areas with high levels of particulate matter to improve air quality and community health.

T-46. Promote tree canopy expansion and healthy tree growth by minimizing conflicts with tree roots and utilities.

T-47. 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.*

T-48. Consider projected tree root growth to avoid roots lifting sidewalks or multi-use trails, which create a hazard to pedestrians.

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-49. 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-50. Maintain landscape consistency along streetscape corridors by using consistent tree box materials and designs, and consistent planting height, density, and character.

T-51. 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-52. 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.

Socially-Oriented Design:

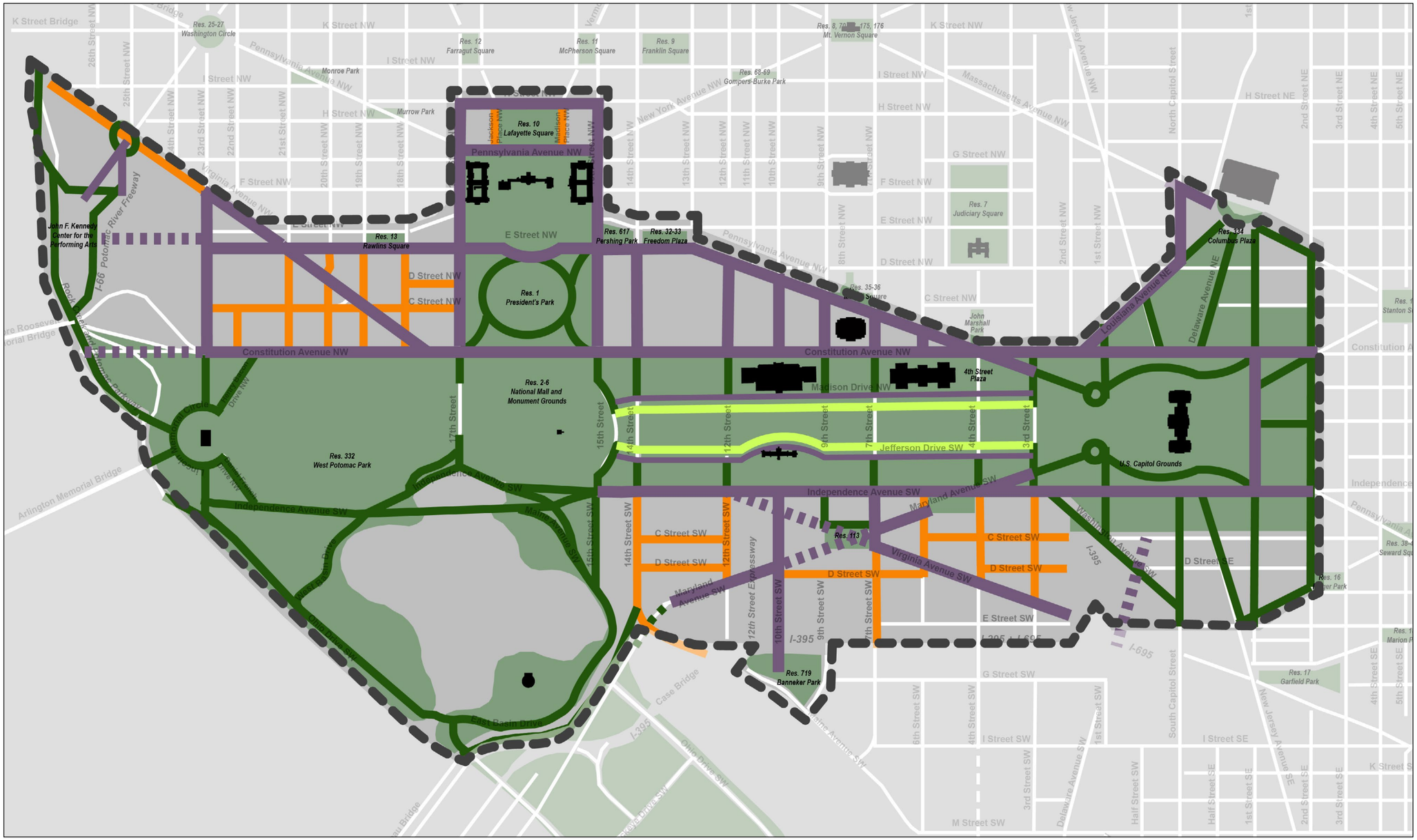
Guidelines that focus on the public's comfort, safety, and experience include:

Streetlight guidelines S-1 and S-4 support safety and human scale.

Trees guidelines T-38, T-39, T-40, T-43, and T-45 support trees contributing to quality-of-life, emotional and community health, and enhance pedestrian comfort.

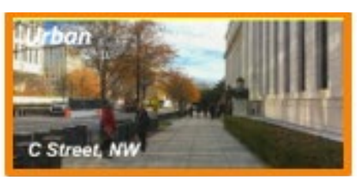
Pedestrian Circulation guidelines PC-5, PC-8, PC-9, PC-11, PC-13, and PC-31 support pedestrian circulation for both everyday and event-based use, universal accessibility, and pedestrian level of comfort including low-stress circulation routes.

Map T-3: Streetscape and Landscape Character



Legend

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



T-53. 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 landscaped public parking.
- **Building Yard:** Located within civic settings, serving cultural and institutional land uses. These areas often include building yards and/or landscaped 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 south side of Madison Drive and the north side of Jefferson Drive) serving cultural and institutional land uses. These areas often have continuous tree boxes containing grass or pea gravel.

T-54. Select tree box designs and materials based on the following criteria and guidance:

a. Streetscape and Landscape Character (see **Map T-3: Streetscape and Landscape Character**);
b. Pedestrian Volumes *(see* **A-Map B-1: Daytime Pedestrian Volumes** *in Small-Scale Element Design Guidelines);*
c. Bioretention or Non-bioretention Functions (based on local site conditions); and
d. Tree Box Treatment Matrix *(see* **Chart T-1: Tree Box Treatment Matrix***).*

T-55. 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-56. 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 four (4) feet wide to accommodate healthy tree root systems.

T-57. Pedestrian crossings of continuous tree boxes and open planting strips (or verges [22]) 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-58. Locate tree boxes to allow for a 24-inch-wide curbside step-out[23] 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-59. Tree box areas shall maintain a clear distance of three (3) feet from a crosswalk or paved bus stop landing, six (6) feet from an entrance to an alley or street corner, and four (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).

T-60. Tree boxes shall maintain at least six (6) feet of separation from adjacent beautified areas[24] 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-61. When designing tree boxes, make the best possible effort to preserve existing, mature, healthy canopy trees because of their important role in stormwater retention.

Important References:

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.

FUNCTION AND PERFORMANCE

T-62. 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.*

T-63. 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-64. 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 five (5) feet.

T-65. 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**.**

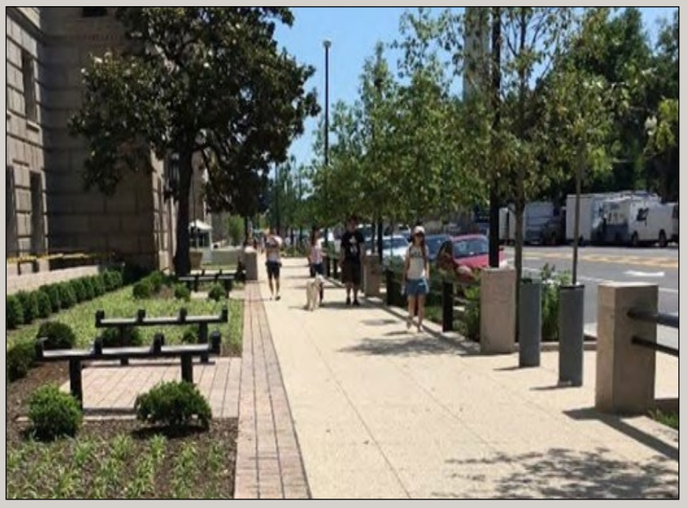


Figure T-5: The Herbert C. Hoover Building (U.S. Department of Commerce) streetscape integrates stormwater management and perimeter security.

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.

T-66. Maximize surface area and volume of tree boxes and minimize paving in landscaped public parking areas to increase the amount of permeable surface. Prior to designing stormwater management in landscaped public parking areas, consult with adjacent property owners and regulatory entity to ensure regrading is possible.

T-67. Connect tree boxes where possible to expand and create a continuous pervious surface to maximize retention.

MATERIALS

T-68. 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-69. 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-70. Metal tree grates may be used as a longer-term solution to protect both tree roots and pedestrian where pedestrian volume is high and/or where sidewalks are narrow. New projects should consider and evaluate tree grate cost and ongoing maintenance in design proposals.

T-71. Flexible porous pavement (such as Flexi-Pave, Porous Pave, and Rubberway) is permitted for temporary[25] 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 near building entrance areas.

T-72. 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.

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.*

T-73. Protect tree box soils from compaction and unwanted pedestrian traffic in high-use areas through use of the following treatments and details.[26] *(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 for more information)
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-74. 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-75. 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

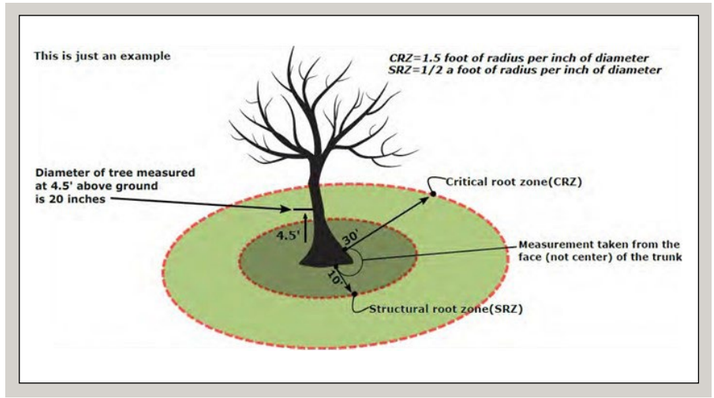
RECOMMENDED PRACTICES

T-76. When designing landscapes, consult DOEE's GAR Guidebook (Chapter 5) for additional guidance on mulching, plant selection, soils, and soil amendments.

T-77. Use best practices, such as appropriate subbase, root barriers, and curbing to minimize conflicts between tree planting and infrastructure.

T-78. Tree boxes and surrounding ROW should be designed to limit impacts to critical and structural root zones of existing trees (shown in ***Figure T-8: Root Zone Diagram***).
(Coordinate with Stormwater Management Guidelines: Environmental Function and Design Guideline [33].)

Figure T-8: Root Zone Diagram



Tree Box Understory Plantings

PLANTING CONFIGURATIONS AND MATERIALS

T-79. See Chart L-1: Maximum Planting Heights for tree box understory planting height guidance.

T-80. Tree box plantings shall remain contained within the tree box area and not extend over the curb or the sidewalk. See DDOT's DEM (§37.3.2) and the District's PRDM (§3.6.4).

T-81. 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-82. Plantings should be a minimum of two (2) feet from the root flare[27] of the street tree to protect feeder and anchor roots from damage. See the District's PRDM (§3.6.4).

T-83. Tree box understory plantings should be completed at the time of street tree plantings to avoid root damage to established street trees.

T-84. When planting around existing trees, use appropriately sized plant containers to minimize tree root damage. *Example: Use one gallon or smaller pots based on proximity to structural roots.*

T-85. 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-86. Avoid use of annual understory plantings that will require seasonal disturbance of street trees.

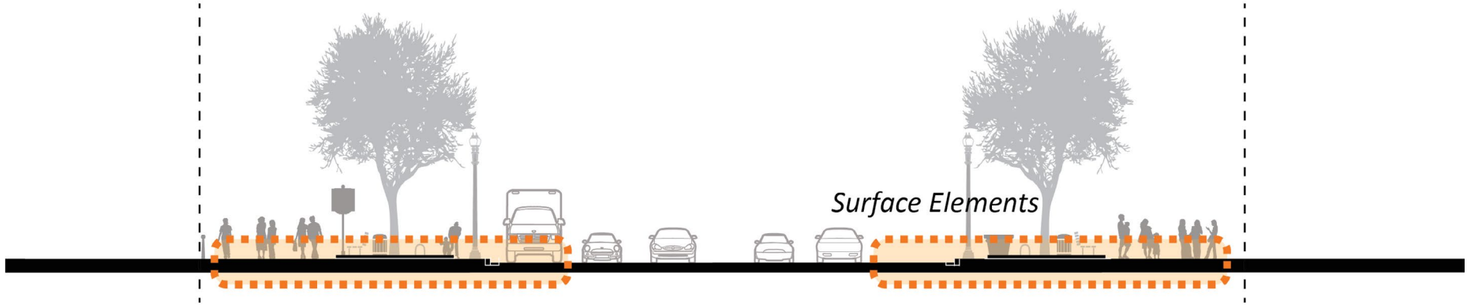
Important References:

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

Part 2: Streetscape Design Guidelines
Surface Elements

Introduction: Surface elements - including landscapes and plantings, stormwater management, and pavement materials - enhance vistas, contribute to streetscape character, and create a more engaging pedestrian experience. They also provide ecological and environmental benefits through the creation of habitat and the management and treatment of stormwater runoff. As surface elements have greater variability than vertical elements such as trees and streetlights, they can establish an area as unique from others or create a visual and material transition among different character areas.

Landscapes and Plantings



Resilience and Disaster Response:
Guidelines that focus on environmental health and adaptability include:

Landscapes and Plantings Guidelines L-1, L-19, L-20, L-21, L-22, and L-23 support regional, native, and pollinator-friendly plants.

Stormwater Management Guidelines SM-1, SM-2, SM-3, SM-4, SM-5, SM-6, SM-25, SM-32 support use of BMPs to reduce flooding and improve water infiltration and quality.

Pavement Guidelines P-25, P-41, P-42, P-43, and P-44 support pavements that improve stormwater infiltration and reduce the heat island effect.

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:

- **Landscaped 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:**[22] Landscape areas between the curb and sidewalk that may include street trees, low plantings, street furnishings, and/or step-out[23] 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. They 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 also 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.
- **Landscaped 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[28] compatible with the streetscape and landscape character (*see* **Map T-3: Streetscape and Landscape Character***)* and function, and complementary to street tree canopy, vistas, and viewsheds as identified in **Chart L-1: Maximum Planting Heights.**

Important References:
D.C. Municipal Regulations (DCMR) Section 24-102, provides regulations for Landscaped 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 ROWs and landscaped 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.

Note: *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: Streetscape and Landscaped Character**) and function in accordance with the Urban Design Streetscape Framework 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*.

Note: *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, water stations, public art, signage, parking meters, trash and recycling receptacles, fire hydrants, utility boxes, and cellular equipment. Maximize planting areas where appropriate. *Coordinate with Stormwater Management Guidelines: Urban Design Considerations, Guideline 12.*

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.

Landscaped Public Parking

Principle:

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

Chart L-1: Maximum Planting Heights

	Right-of-Way Space				
Street Type	Landscaped 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

Figure L-1: Diagram of Landscaped Public Parking

Source: The District's Public Realm Design Manual

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

L-8. Plantings in landscaped 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 landscaped public parking should consider historic preservation. If landscaped public parking is adjacent to historic landscapes, streetscapes, or buildings, plantings should be compatible with contributing historic elements.

L-10. Trees located within landscaped public parking should be pruned to enhance viewsheds, improve pedestrian circulation, ensure public safety, prevent trees from touching building facades, and provide and maintain secure and comfortable environments. Lower limbs of canopy trees in landscaped public parking should be trimmed to a height of eight (8) feet to: coordinate with street trees, maintain open site lines, enhance views to important structures and open spaces, and provide overhead clearance for pedestrians. Additionally, to maintain open sight lines through landscaped 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 landscaped public parking areas adjacent to the sidewalk or roadway where possible. ***Note:*** *Coordinate with Street Tree Guidelines: Tree Form, Sensory Attributes, and Planting Pattern guidelines T-10 to T-14, including* ***Map T-2: Recommended Tree Rows.***

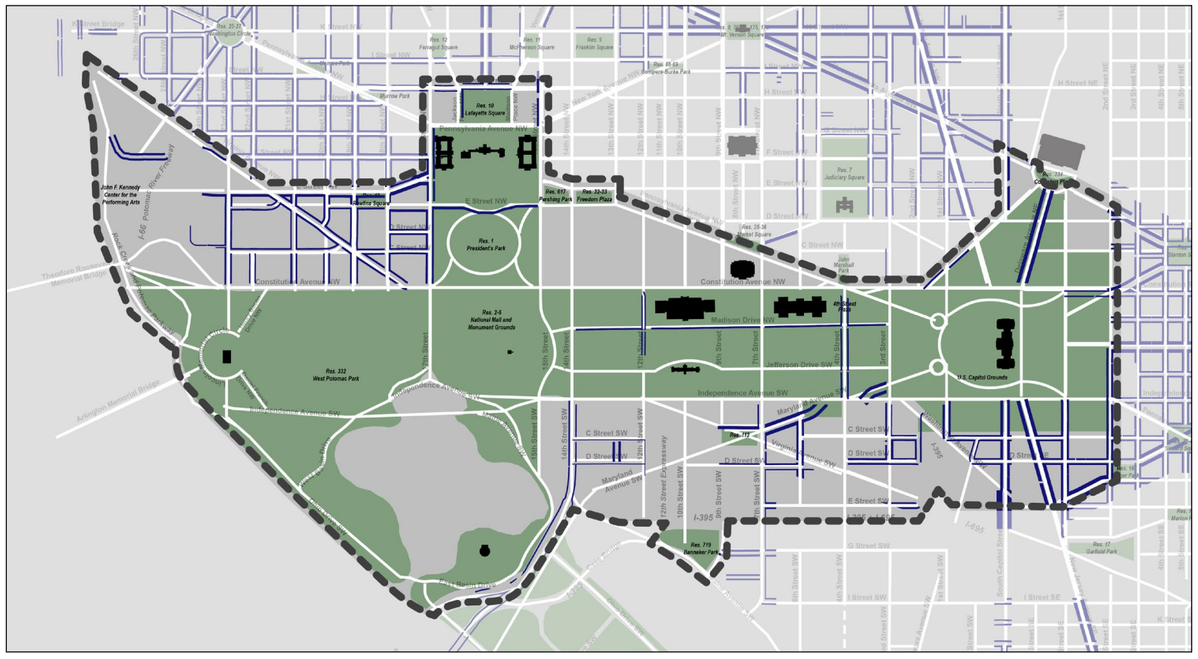
Verges

Principle:

Use verges[22] 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.

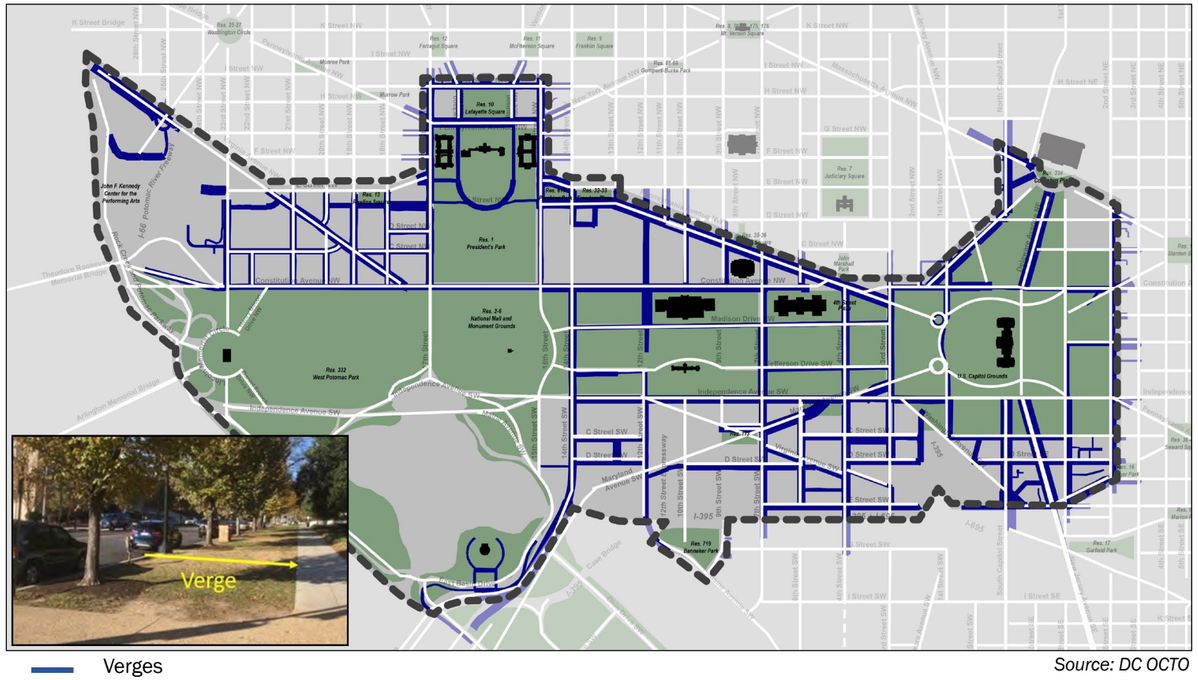
Map L-1: Landscaped Public Parking Locations



Landscaped Public Parking

Source: DC OCTO

Map L-2: Verge Locations



Verges

Source: DC OCTO

L-13. Limit verge lengths as follows:

- Twenty (20) feet at vehicle pick up and drop off areas
- Sixty (60) feet at bus pick up and drop off areas

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

L-15. Do not install plant material other than grass within verges along streets crossing the National Mall, between Madison Drive and Jefferson Drive, to retain unobstructed streetscape views and vistas.

Note: *Coordinate with Stormwater Guidelines: Urban Design Considerations, Guideline SM 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 Virginia Tech's Urban Forestry website for Soil Profile Rebuilding information.

Note: *Coordinate with Street Tree Guidelines: Tree Health and Function, Guideline T-30.*

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

Note: *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 native plants within streetscape plantings to advance pollinator health and habitats and to support natural ecosystem functions. Select plants to support the forage, reproduction, shelter, and/or hibernation of pollinators specific to the ecoregion. Balance practices to improve pollinator health with other considerations, such as environmental, cultural, aesthetic, recreational, safety, and security considerations inherent to each landscape.[29]

Example: Plant Common or Poke Milkweed (Asclepias syriaca or exultata) in suitable areas to help restore declining monarch butterfly populations.

L-22. 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:

a. Bloom value;
b. Bloom diversity of form and color;
c. Material size and structural diversity; and
d. Pollinator positive plant quantity.

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

L-23. Encourage pollinator-friendly plant palettes by planting a minimum of three 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-24. Plant selection and maintenance should consider changing uses in the monumental core, including increased dog walking and the additional wear that this activity places on plantings.

Surface Elements
Stormwater Management

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

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 Best Management Practices (BMPs):** Identifies priority areas and best practices for stormwater management in the monumental core.
- **Application of Stormwater BMPs:** Applies stormwater BMPs considering street categories, vistas and viewsheds, circulation, cultural and historic resources, and aesthetics.
- **Environmental Function and Design:** Addresses the design of stormwater BMPs to maximize the function of green infrastructure[18] and the water management system.
- **Maintenance:** Addresses maintenance responsibilities and refers to maintenance best practices.

Green Infrastructure Maintenance:
Guidelines that focus on stormwater BMP upkeep include: Stormwater Management Guidelines SM-37, SM-38, and SM-39 address maintenance of stormwater management BMPs.

Stormwater Best Management Practices

Principle:

Use Stormwater Best Management 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 stormwater BMPs 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 and 500-Year Floodplains, and Anacostia Waterfront Development Zone.**

SM-3. Maximize use of retention and filtration stormwater practices to capture, slow, and clean stormwater within MS4 and to capture and slow stormwater within 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[30] with subsurface retention as the BMPs to retain stormwater and slow the rate at which stormwater enters the storm sewer system.

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 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 SM-1: Urban Design Matrix**):

a. Views and vistas (**Map SM-1: Important Streetscape Vistas**);
b. Historic and cultural streetscapes and landscapes;
c. Use and design of adjacent buildings, building yards, and width of ROW and landscaped 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.

Note: *Coordinate with Landscape Guidelines: Urban Design guideline L-3.*

M-8. Design green infrastructure[18] to be compatible with streetscape function and character in accordance with the Urban Design Streetscape Framework 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 Streets*, and *Local Streets*.

Note: *Coordinate with Landscape Guidelines: Urban Design Guidelines UD-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.

a. *Radiating and Edging Streets* should maintain low plantings (less than 18 inches) with more formal appearance.
b. *Connecting and Traversing Streets* can maintain taller (less than 36 inches) 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, until the landscape is redesigned.

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, water stations, public art, signage, parking meters, trash and recycling receptacles, fire hydrants, utility boxes, and cellular equipment. Maximize stormwater management areas where appropriate. *Note: Coordinate with Landscape Guidelines: Urban Design guideline UD-5.*

Chart SM-1: Urban Design Matrix

		Retention			Conveyance		Filtration	
		Streetscape Bioretention	Vegetated Filtration Strip	Cistern*	Bioswale	Dry Swale	Filtering System	Permeable Pavers
Streetscape Categories	Radiating & Edging Streets							
	Connecting & Traversing Streets							
	Local Streets							
Streetscape Vistas	Reciprocal Vista							
	Radiating Vista							
	Edging Vista							
	National Mall Crossing							
Street Landscape Character	Landscape							
	Building Yard							
	Urban							
Circulation	High Curbside Use							
	Moderate Curbside Use							
	Low Curbside Use							
	Narrow Sidewalk							
	Moderate Sidewalk							
	Wide Sidewalk							
	High Pedestrian Volume							
	Moderate Pedestrian Volume							
	Low Pedestrian Volume							

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

SM-14. Design landscaped public parking[4] 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 (See **Map SM-1: Important Streetscape Vistas**);
b. Where curbside use is high; or
c. Where sidewalks are too narrow.

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. ***Note:*** *DDOT does not reuse stormwater or use irrigation systems in public space.*

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.

Chart SM-1: Important Streetscape Vistas

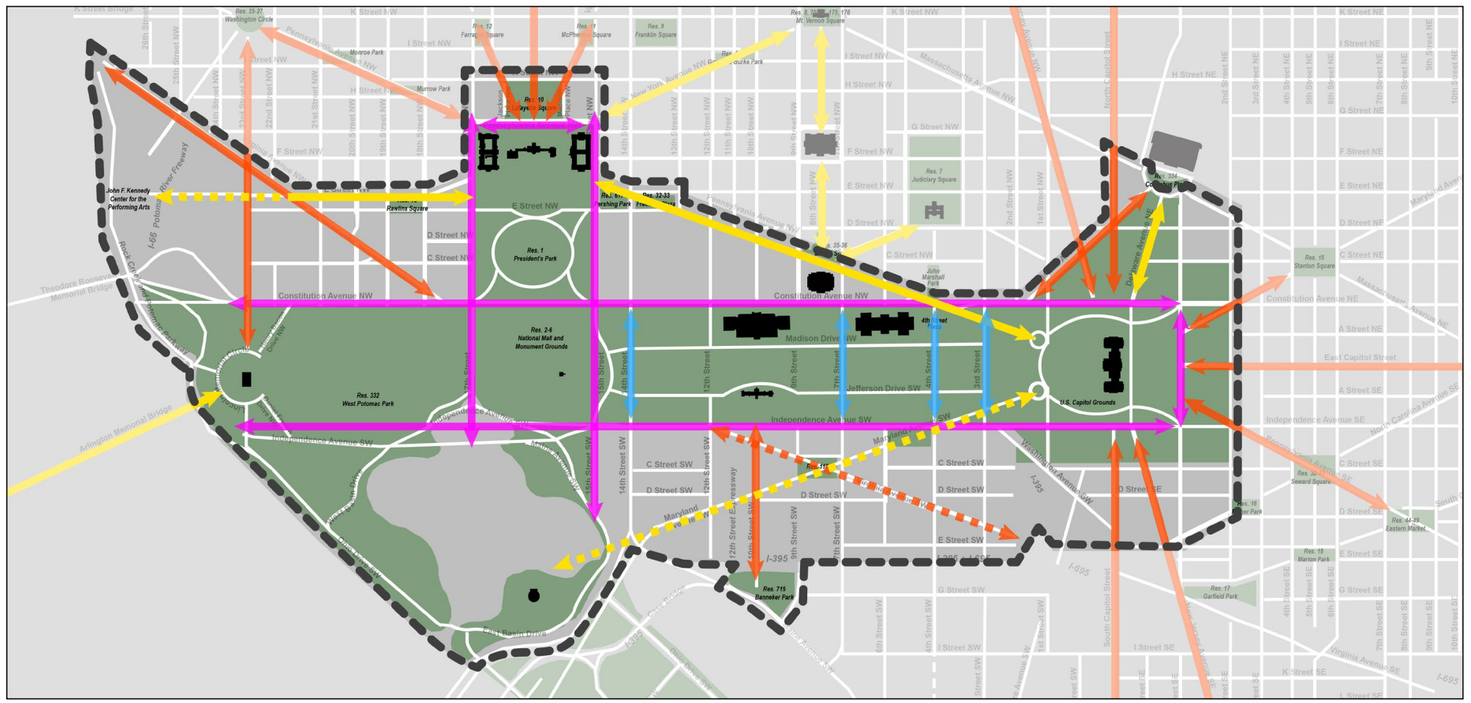
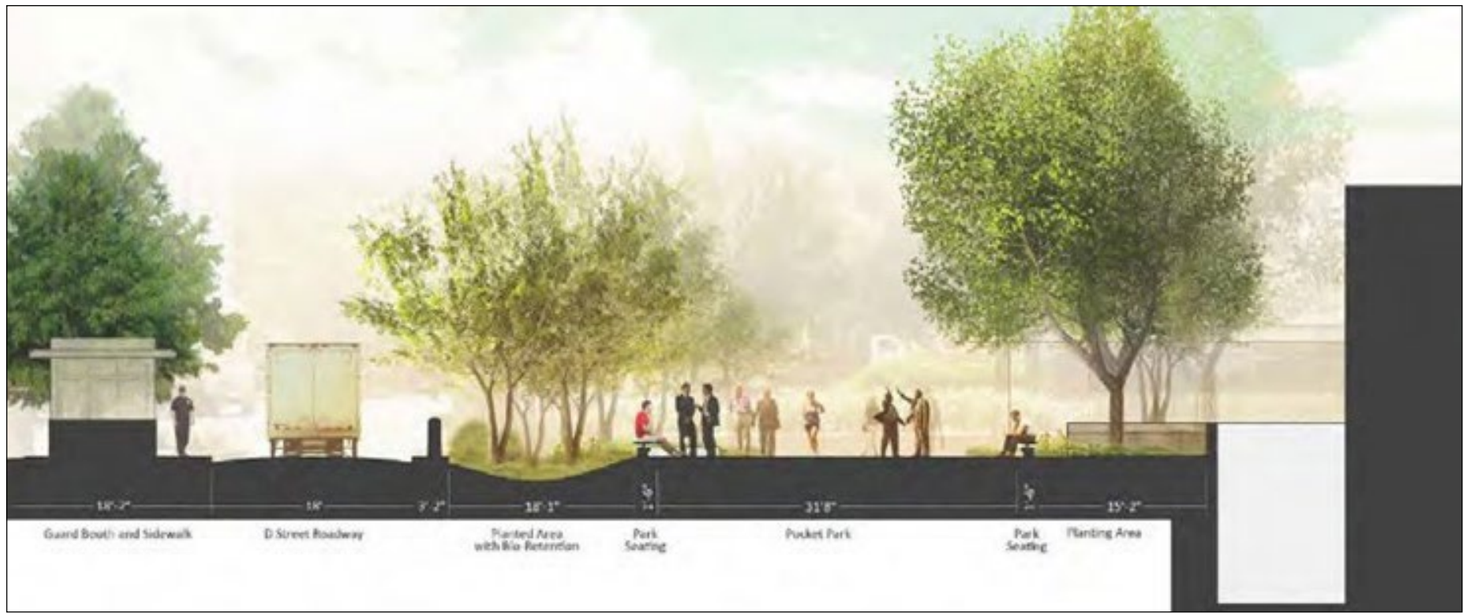


Figure SM-2: Bioretention within a pocket park at the Harry S. Truman Building (Department of State Headquarters) on D Street, NW



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

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

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 BMPs provide for universal accessibility while preventing or limiting the accumulation of water on pedestrian circulation routes. Stormwater BMPs should avoid creating dangerous elevation changes or runoff on sidewalks. The addition of stormwater management elements should not limit accessibility for all pedestrians in the ROW, especially those with visual impairments or mobility limitations.

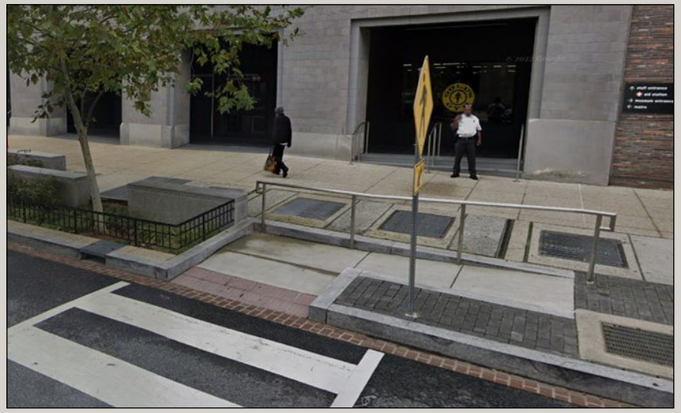


Figure SM-5: Green Infrastructure planter with universally accessible mid-block circulation ramp connecting the curb to the sidewalk along D Street, SW between 3rd and 4th Streets.

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[18] 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 landscaped public parking[4] areas and ROW open spaces to increase the amount of permeable surface. Prior to designing stormwater management in landscaped public parking areas and ROW open spaces, consult with adjacent property owners and regulatory entities to ensure regrading is possible.

SM-28. Bioretention tree boxes should have a minimum internal width of four (4) feet, as measured perpendicular to the curb and between inside edges of the tree box.

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 BMPs 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.

Storm Water Management *continued*

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 BMPs.

SM-38. Refer to Sustainable SITES (§8 Operations and 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 BMPs since they typically require more maintenance and cleaning. See **Appendix A-SM-3: Sample Maintenance Agreements for more information..**

Important References:

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

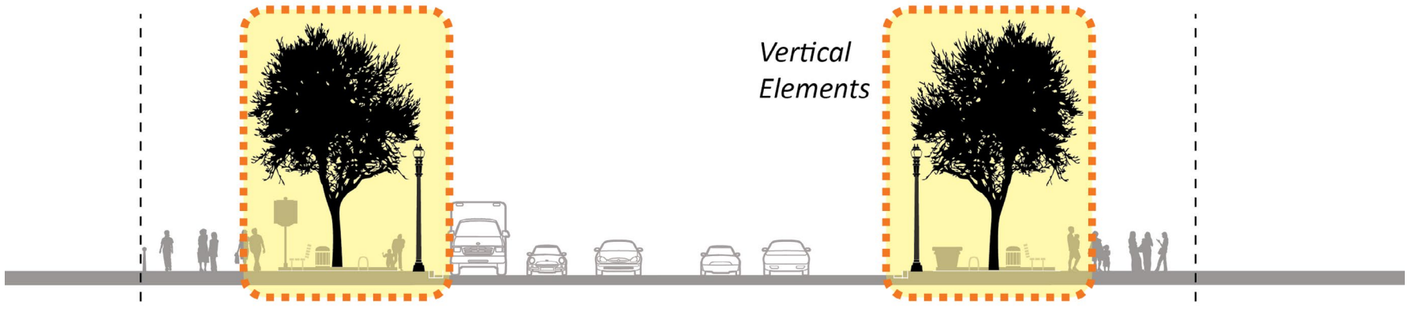
The DDOT Green Infrastructure Standards (GIS) focuses on the development of stormwater management infrastructure such as bioretention.

Surface Elements
Pavements

Part 2: Streetscape Design Guidelines
Vertical Elements

Introduction: Vertical elements, such as streetlights and trees, provide structure and organization to the monumental core's streetscapes. As some of the most visible of the streetscape elements, they help shape streetscape corridors, frame important vistas, and build consistency across blocks. They create a safe and comfortable public realm and assist in unifying the monumental core and city.

Vertical Elements
Streetlights



Resilience and Disaster Response:
Guidelines that focus on environmental health and adaptability include:

Streetlight guideline S-4 supports mitigating urban sky glow.

Tree guidelines T-1, T-6, T-13, T-14, T-21, T-22, T-27, T-28, T-41, T-42, T-43, and T-44 support increased tree canopy cover, species biodiversity and native trees, tree health and resilience, managing stormwater, mitigating heat island and urban sky glow.

Introduction

This guidance addresses streetlight fixtures[5] (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 are contributing to the character of the capital city's historic districts[6] and cultural landscapes,[7] 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 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 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 or have streetscape elements contributing to the character of historic districts, cultural landscapes, or special areas.

Detailed drawings and descriptions of several streetlight fixtures referenced in this section can be found in the Streetscape Manual – Interagency Initiative for National Mall Road Improvement Program (2013). ***Note:*** *The Construction Manual update is currently underway and will include revised details and specifications.*

Principle:

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

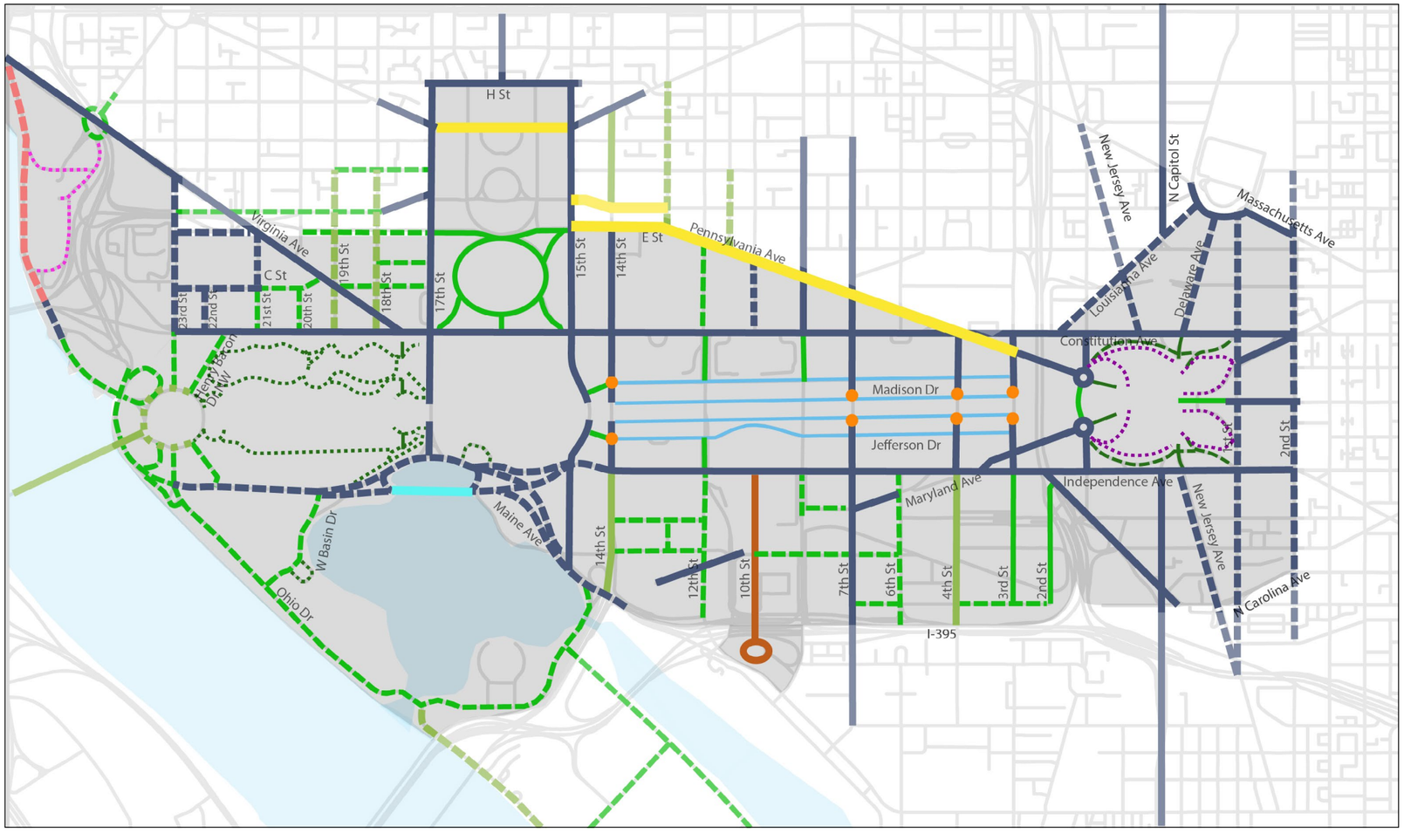
Streetlight Fixture Types and Descriptions:

- **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.
- **Washington Globe Fixture:** Designed in 1910 by Francis D. Millet (CFA member) to unify Washington's city streets. They range in heights from 14-18 feet.[8]
- **Twin-Twenty Fixture:** Designed in 1923 by Henry Bacon (CFA member) to express the dignity of the federal city.[9]
- **Olmsted Fixture:** Designed in 1935 by J. W. Gosling (designer employed by General Electric laboratories) to enhance the National Mall vista.[10] They are named after Frederick Law Olmsted, Jr., a landscape architect who developed and guided the McMillan Plan.
- **Kutz Bridge Saratoga Lights:** Designed as part of the Public Works Administration (PWA) restorations, they are similar to the Olmsted fixtures.[11]
- **Tenth Street, SW Lights:** Designed in 1966 by architect Araldo A. Cossutta and installed along 10th Street, SW or L'Enfant Promenade, They feature five spherical globes mounted on twin poles.[12]
- **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.[13]
- **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.

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.

Map S-1: Streetlight Fixtures



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

Figure S-1: Existing Condition of the National Mall: Single line of lights flank the sides of the center panel.

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.

Image: Architect of the Capitol

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 intersecting 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:

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.[14] Improvements should focus lighting 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.

Vertical Elements
Trees

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 (pg. 22) and Map T-2: Recommended Tree Rows (pg. 25).**

Importance and Background:

Street trees contribute 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, softening building facades, and positive effects on the built environment such as shading walkways and buildings.

In the 1870s, Washington, D.C. 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 American Elms chosen for the National Mall, which form a large cathedral-like canopy over the pedestrian walkways and National Mall panels. Today, re-establishing a robust and visually pleasing tree canopy is important for aesthetic and environmental reasons. Trees help manage stormwater, mitigate urban heat islands, improve air quality, promote public 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:** Addresses:
  - 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 trees across the street such as opposite or staggered configurations.
- **Tree Soils:** Addresses minimum soil volumes, use of structural soils, and improvement of soil profiles.
- **Tree Health and Function:** Addresses:
  - 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 landscaped 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; and
g. Areas with highest particulate matter levels in the air.

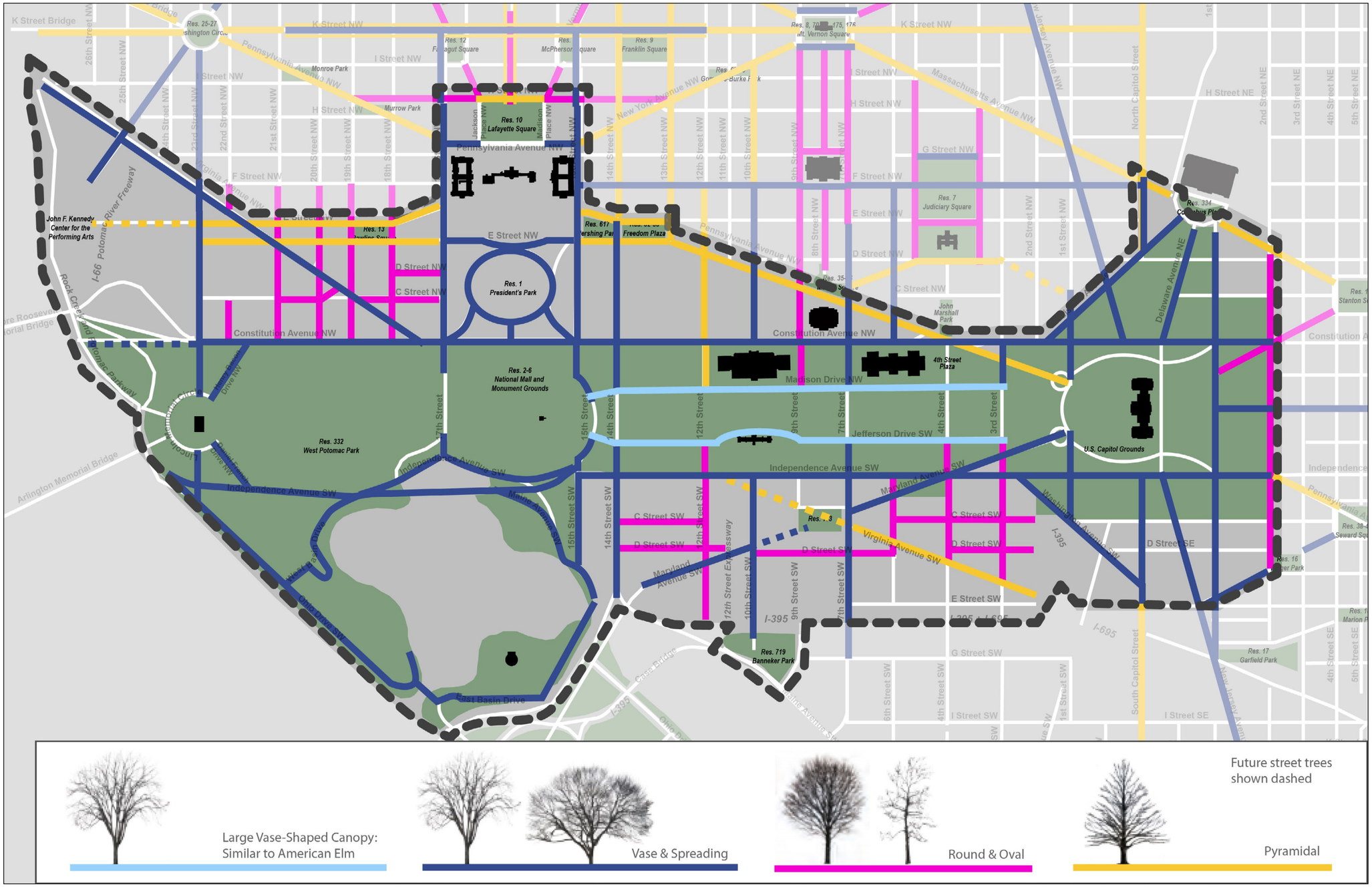
T-2. Plan and manage for trees of the largest appropriate size for a space subject to:

a. Design considerations such as viewsheds;
b. Available tree canopy and planting area;
c. Site design and the respective tree's adaptability and suitability to site conditions such as soils, sun exposure, and stormwater and salt tolerance; and
d. 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 consultation to determine agency responsibility for street trees and coordinate to ensure that street trees are properly replanted and maintained.

Map T-1: Recommended Tree Form



Tree Form, Sensory Attributes, and Planting Pattern

Principle:

Choose trees with form, sensory attributes, and planting patterns that reinforce nationally and symbolically important 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 and Edging Streets* and *Connecting and 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[15] 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[16] 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 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[17] (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.

T-10. When selecting tree species, consider vistas and viewsheds, ROW dimensions, landscaped 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 landscaped public parking widths can accommodate broader-formed, larger sized trees, trimmed vertically up to eight (8) 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[18] 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.

Figure T-1: Elm species and hybrids (such as Accolade Elm, Triumph Elm, Patriot Elm) offer improved disease-resistance and desirable tree architecture. Other tree species (such as Hackberry and male 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-14. Restore double and triple rows of trees, as documented in the historic city plans,[19] 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:

  16th Street, NW,

  Constitution Avenue, NW,

  Delaware Avenue, NE,

  East Capitol Street,

  Independence Avenue, SW[20]

  K Street, NW

  Maryland Avenue, NE

  Maryland Avenue, SW

  Massachusetts Avenue, NE,

  Massachusetts Avenue, NW,

  New Jersey Avenue, NW,

  New Jersey Avenue, SE,

  New York Avenue, NW,

  North Carolina Avenue, SE

  Pennsylvania Avenue, SE, and

  South Capitol Street.

T-15. Consider available space in the ROW and adjacent landscaped 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 landscaped 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 landscaped 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 landscaped public parking areas or building yards and achieve double rows of trees on axial avenues and streets.

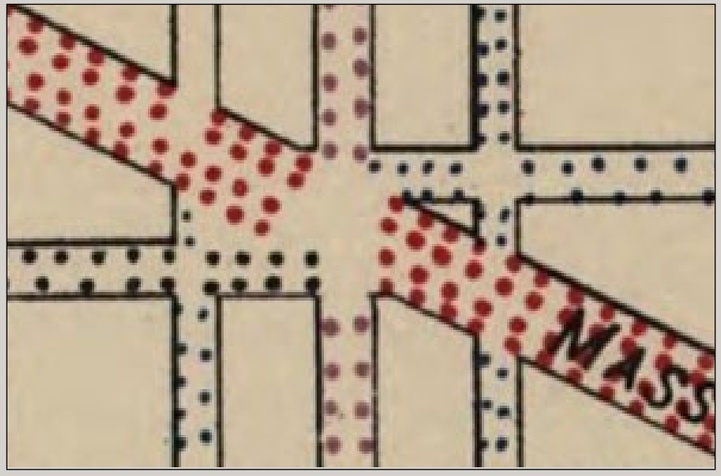


Figure T-2: ***Street Intersection Guidance*** Example from the 1880 Plan showing Massachusetts Avenue, NW street trees dominating through intersections with various grid streets (East-West Street: L Street, NW; North-South Streets: 10th through 13th Streets, NW).

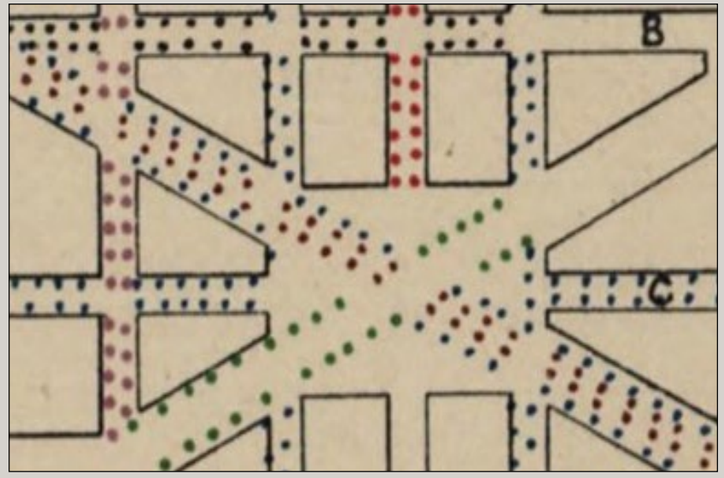


Figure T-3: ***Park Intersection Guidance*** Example from the 1880 Plan showing Pennsylvania Avenue, SE crossing through Seward Square to reinforce the Pennsylvania Avenue alignment through the park.

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:** ***Street Intersection Guidance.***

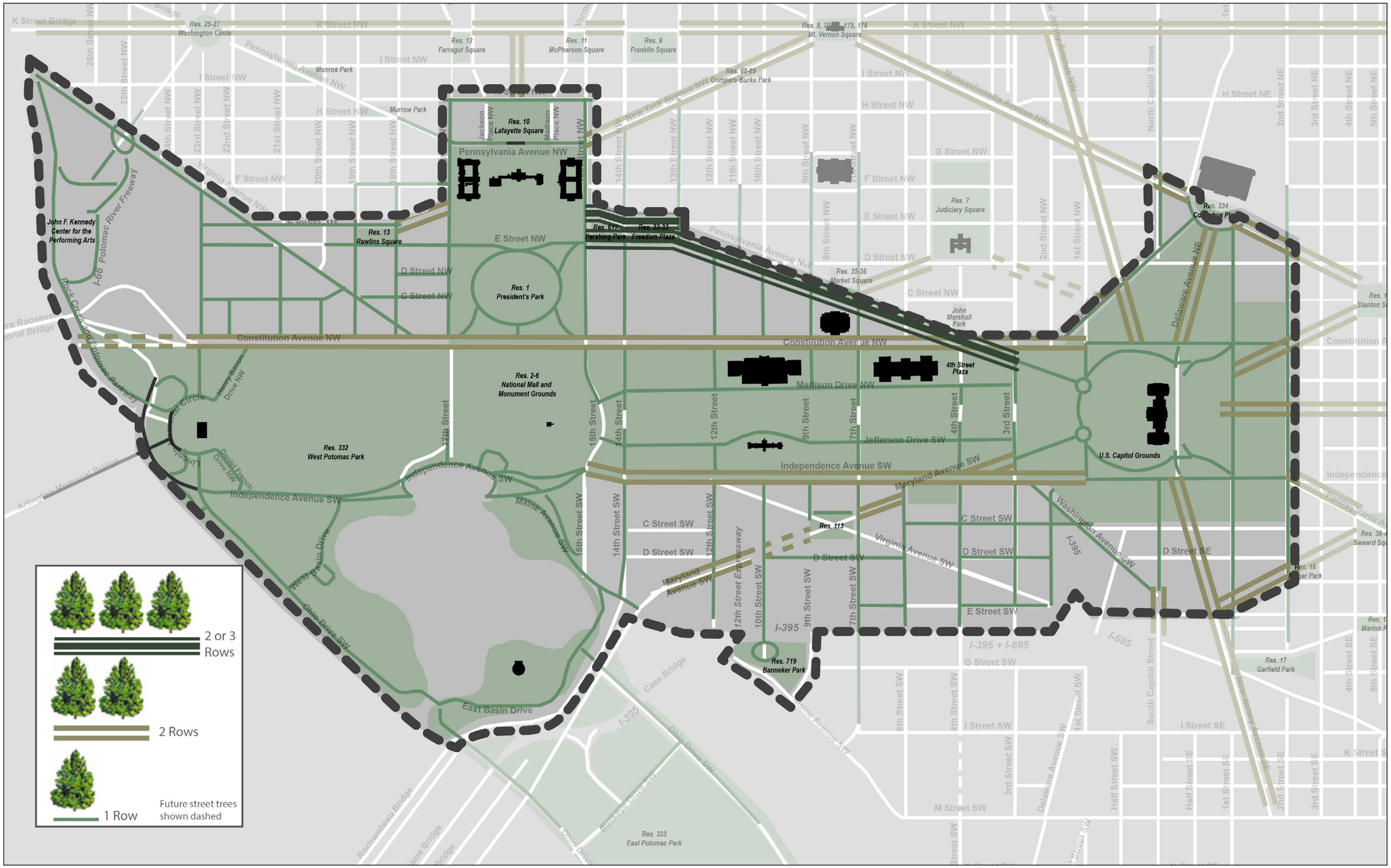
T-20. Enhance views and vistas along streets within or between parks and open spaces by either:

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.*

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).

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 feet tall): 1,500 cubic feet of soil within a 27-foot radius
- Medium Trees (40 to 60 feet tall): 1,000 cubic feet of soil within a 22-foot radius
- Small Trees (less than 40 feet 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. *(See example in **Figure T-4.**)*

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.

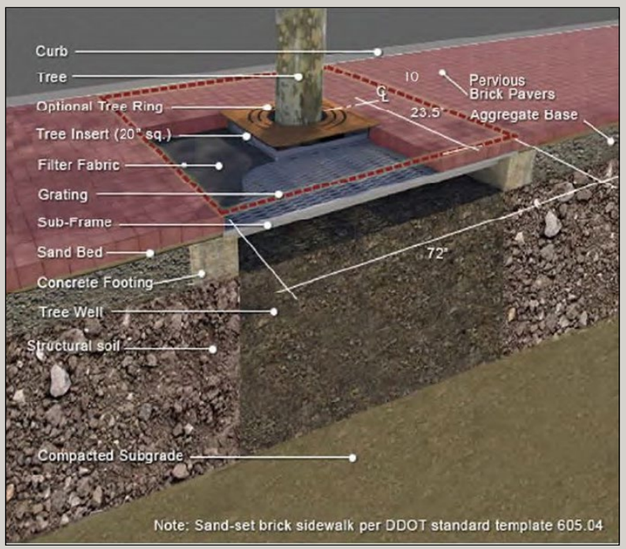


Image: IRONSMITH

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). See Virginia Tech's Urban Forestry website for Soil Profile Rebuilding information.

Tree Health and 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.[21]

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. Minimize disruption of avian and mammal habitat when removing, trimming, or mowing trees or landscape vegetation. National Mall and National Mall and Memorial Parks (NAMA) areas 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 large and long-lived, resistant to breakage, and 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 near benches or placing benches near trees, to provide shaded seating and resting areas.

T-40. Enhance pedestrian comfort by planting trees nearby bus stops to provide shade for pedestrians while not visually obscuring the bus stop sign and/or shelter.

T-41. Plant trees that will significantly contribute to stormwater best management practices. See Stormwater Management Guidelines for more information.

T-42. 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-43. Plant large shade trees in areas with higher daytime temperatures, dark impervious surfaces (e.g. surface parking lots), and/or other sites with high heat exposure to improve quality-of-life and reduce the urban heat island effect.

T-44. Where possible, mitigate both urban heat island effect and urban sky glow by planting street trees that both shade roadways from 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's Guidance for Planting Trees within 40 feet of wires or street lights.
c. Roadway and sidewalk lighting levels required for vehicular and pedestrian safety.
d. Pruning and maintenance needed to ensure street trees do not block downward light emitted from streetlights.
e. Coordination between agencies responsible for streetlights and street trees.

T-45. Plant trees in areas with high levels of particulate matter to improve air quality and community health.

T-46. Promote tree canopy expansion and healthy tree growth by minimizing conflicts with tree roots and utilities.

T-47. 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.*

T-48. Consider projected tree root growth to avoid roots lifting sidewalks or multi-use trails, which create a hazard to pedestrians.

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-49. 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-50. Maintain landscape consistency along streetscape corridors by using consistent tree box materials and designs, and consistent planting height, density, and character.

T-51. 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-52. 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.

Socially-Oriented Design:

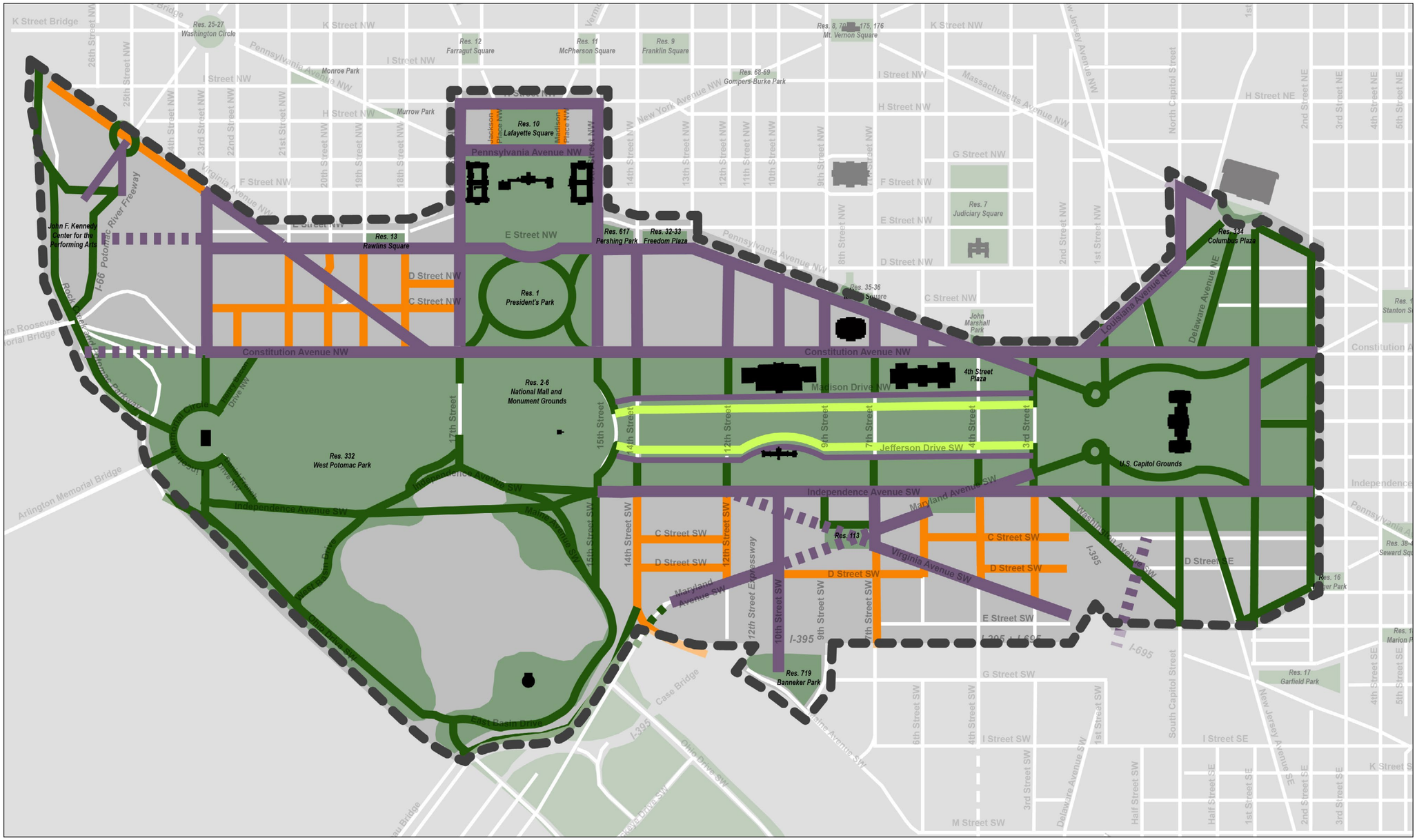
Guidelines that focus on the public's comfort, safety, and experience include:

Streetlight guidelines S-1 and S-4 support safety and human scale.

Trees guidelines T-38, T-39, T-40, T-43, and T-45 support trees contributing to quality-of-life, emotional and community health, and enhance pedestrian comfort.

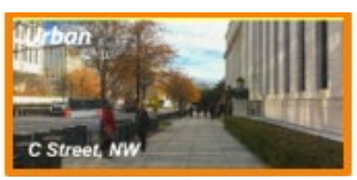
Pedestrian Circulation guidelines PC-5, PC-8, PC-9, PC-11, PC-13, and PC-31 support pedestrian circulation for both everyday and event-based use, universal accessibility, and pedestrian level of comfort including low-stress circulation routes.

Map T-3: Streetscape and Landscape Character



Legend

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



T-53. 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 landscaped public parking.
- **Building Yard:** Located within civic settings, serving cultural and institutional land uses. These areas often include building yards and/or landscaped 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 south side of Madison Drive and the north side of Jefferson Drive) serving cultural and institutional land uses. These areas often have continuous tree boxes containing grass or pea gravel.

T-54. Select tree box designs and materials based on the following criteria and guidance:

a. Streetscape and Landscape Character (see **Map T-3: Streetscape and Landscape Character**);
b. Pedestrian Volumes *(see* **A-Map B-1: Daytime Pedestrian Volumes** *in Small-Scale Element Design Guidelines);*
c. Bioretention or Non-bioretention Functions (based on local site conditions); and
d. Tree Box Treatment Matrix *(see* **Chart T-1: Tree Box Treatment Matrix***).*

T-55. 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-56. 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 four (4) feet wide to accommodate healthy tree root systems.

T-57. Pedestrian crossings of continuous tree boxes and open planting strips (or verges [22]) 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-58. Locate tree boxes to allow for a 24-inch-wide curbside step-out[23] 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-59. Tree box areas shall maintain a clear distance of three (3) feet from a crosswalk or paved bus stop landing, six (6) feet from an entrance to an alley or street corner, and four (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).

T-60. Tree boxes shall maintain at least six (6) feet of separation from adjacent beautified areas[24] 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-61. When designing tree boxes, make the best possible effort to preserve existing, mature, healthy canopy trees because of their important role in stormwater retention.

Important References:

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.

FUNCTION AND PERFORMANCE

T-62. 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.*

T-63. 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-64. 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 five (5) feet.

T-65. 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**.**

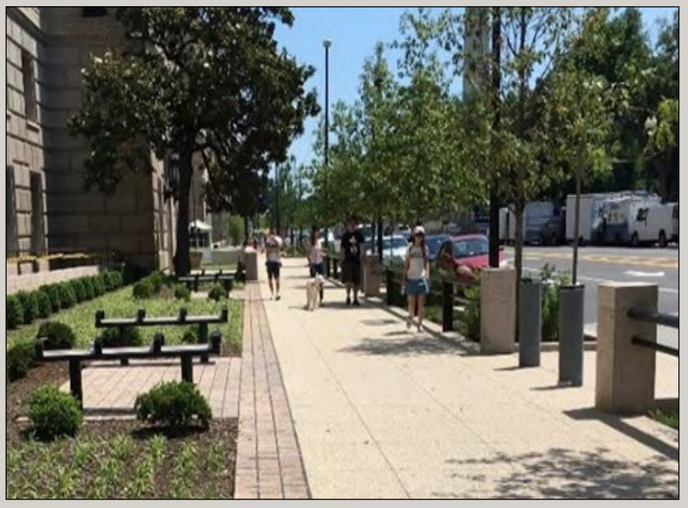


Figure T-5: The Herbert C. Hoover Building (U.S. Department of Commerce) streetscape integrates stormwater management and perimeter security.

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.

T-66. Maximize surface area and volume of tree boxes and minimize paving in landscaped public parking areas to increase the amount of permeable surface. Prior to designing stormwater management in landscaped public parking areas, consult with adjacent property owners and regulatory entity to ensure regrading is possible.

T-67. Connect tree boxes where possible to expand and create a continuous pervious surface to maximize retention.

MATERIALS

T-68. 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-69. 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-70. Metal tree grates may be used as a longer-term solution to protect both tree roots and pedestrian where pedestrian volume is high and/or where sidewalks are narrow. New projects should consider and evaluate tree grate cost and ongoing maintenance in design proposals.

T-71. Flexible porous pavement (such as Flexi-Pave, Porous Pave, and Rubberway) is permitted for temporary[25] 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 near building entrance areas.

T-72. 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.

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.*

T-73. Protect tree box soils from compaction and unwanted pedestrian traffic in high-use areas through use of the following treatments and details.[26] *(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 for more information)
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-74. 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-75. 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

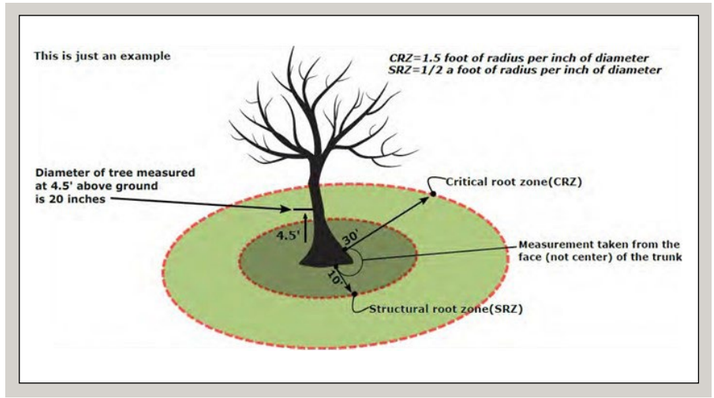
RECOMMENDED PRACTICES

T-76. When designing landscapes, consult DOEE's GAR Guidebook (Chapter 5) for additional guidance on mulching, plant selection, soils, and soil amendments.

T-77. Use best practices, such as appropriate subbase, root barriers, and curbing to minimize conflicts between tree planting and infrastructure.

T-78. Tree boxes and surrounding ROW should be designed to limit impacts to critical and structural root zones of existing trees (shown in ***Figure T-8: Root Zone Diagram***).
(Coordinate with Stormwater Management Guidelines: Environmental Function and Design Guideline [33].)

Figure T-8: Root Zone Diagram



Tree Box Understory Plantings

PLANTING CONFIGURATIONS AND MATERIALS

T-79. See Chart L-1: Maximum Planting Heights for tree box understory planting height guidance.

T-80. Tree box plantings shall remain contained within the tree box area and not extend over the curb or the sidewalk. See DDOT's DEM (§37.3.2) and the District's PRDM (§3.6.4).

T-81. 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-82. Plantings should be a minimum of two (2) feet from the root flare[27] of the street tree to protect feeder and anchor roots from damage. See the District's PRDM (§3.6.4).

T-83. Tree box understory plantings should be completed at the time of street tree plantings to avoid root damage to established street trees.

T-84. When planting around existing trees, use appropriately sized plant containers to minimize tree root damage. *Example: Use one gallon or smaller pots based on proximity to structural roots.*

T-85. 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-86. Avoid use of annual understory plantings that will require seasonal disturbance of street trees.

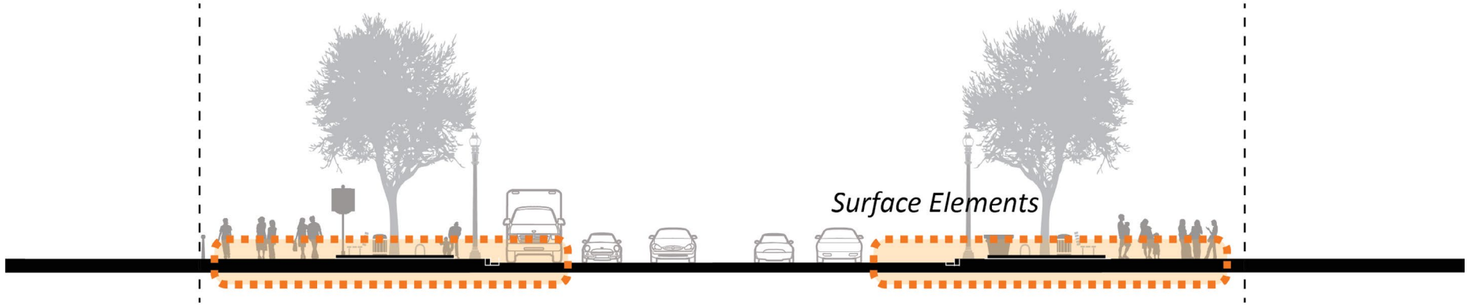
Important References:

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

Part 2: Streetscape Design Guidelines
Surface Elements

Introduction: Surface elements - including landscapes and plantings, stormwater management, and pavement materials - enhance vistas, contribute to streetscape character, and create a more engaging pedestrian experience. They also provide ecological and environmental benefits through the creation of habitat and the management and treatment of stormwater runoff. As surface elements have greater variability than vertical elements such as trees and streetlights, they can establish an area as unique from others or create a visual and material transition among different character areas.

Landscapes and Plantings



Resilience and Disaster Response:
Guidelines that focus on environmental health and adaptability include:

Landscapes and Plantings Guidelines L-1, L-19, L-20, L-21, L-22, and L-23 support regional, native, and pollinator-friendly plants.

Stormwater Management Guidelines SM-1, SM-2, SM-3, SM-4, SM-5, SM-6, SM-25, SM-32 support use of BMPs to reduce flooding and improve water infiltration and quality.

Pavement Guidelines P-25, P-41, P-42, P-43, and P-44 support pavements that improve stormwater infiltration and reduce the heat island effect.

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:

- **Landscaped 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:**[22] Landscape areas between the curb and sidewalk that may include street trees, low plantings, street furnishings, and/or step-out[23] 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. They 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 also 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.
- **Landscaped 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[28] compatible with the streetscape and landscape character (*see* **Map T-3: Streetscape and Landscape Character***)* and function, and complementary to street tree canopy, vistas, and viewsheds as identified in **Chart L-1: Maximum Planting Heights.**

Important References:
D.C. Municipal Regulations (DCMR) Section 24-102, provides regulations for Landscaped 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 ROWs and landscaped 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.

Note: *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: Streetscape and Landscaped Character**) and function in accordance with the Urban Design Streetscape Framework 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*.

Note: *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, water stations, public art, signage, parking meters, trash and recycling receptacles, fire hydrants, utility boxes, and cellular equipment. Maximize planting areas where appropriate. *Coordinate with Stormwater Management Guidelines: Urban Design Considerations, Guideline 12.*

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.

Landscaped Public Parking

Principle:

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

Chart L-1: Maximum Planting Heights

	Right-of-Way Space				
Street Type	Landscaped 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

Figure L-1: Diagram of Landscaped Public Parking

Source: The District's Public Realm Design Manual

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

L-8. Plantings in landscaped 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 landscaped public parking should consider historic preservation. If landscaped public parking is adjacent to historic landscapes, streetscapes, or buildings, plantings should be compatible with contributing historic elements.

L-10. Trees located within landscaped public parking should be pruned to enhance viewsheds, improve pedestrian circulation, ensure public safety, prevent trees from touching building facades, and provide and maintain secure and comfortable environments. Lower limbs of canopy trees in landscaped public parking should be trimmed to a height of eight (8) feet to: coordinate with street trees, maintain open site lines, enhance views to important structures and open spaces, and provide overhead clearance for pedestrians. Additionally, to maintain open sight lines through landscaped 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 landscaped public parking areas adjacent to the sidewalk or roadway where possible. ***Note:*** *Coordinate with Street Tree Guidelines: Tree Form, Sensory Attributes, and Planting Pattern guidelines T-10 to T-14, including* ***Map T-2: Recommended Tree Rows.***

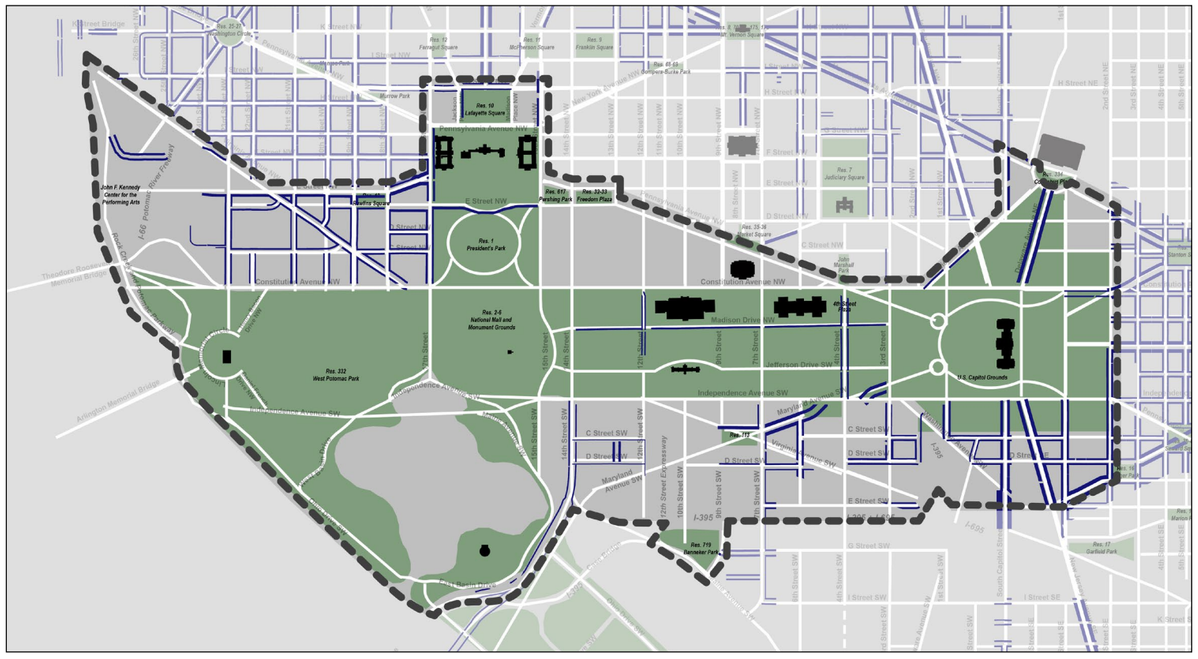
Verges

Principle:

Use verges[22] 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.

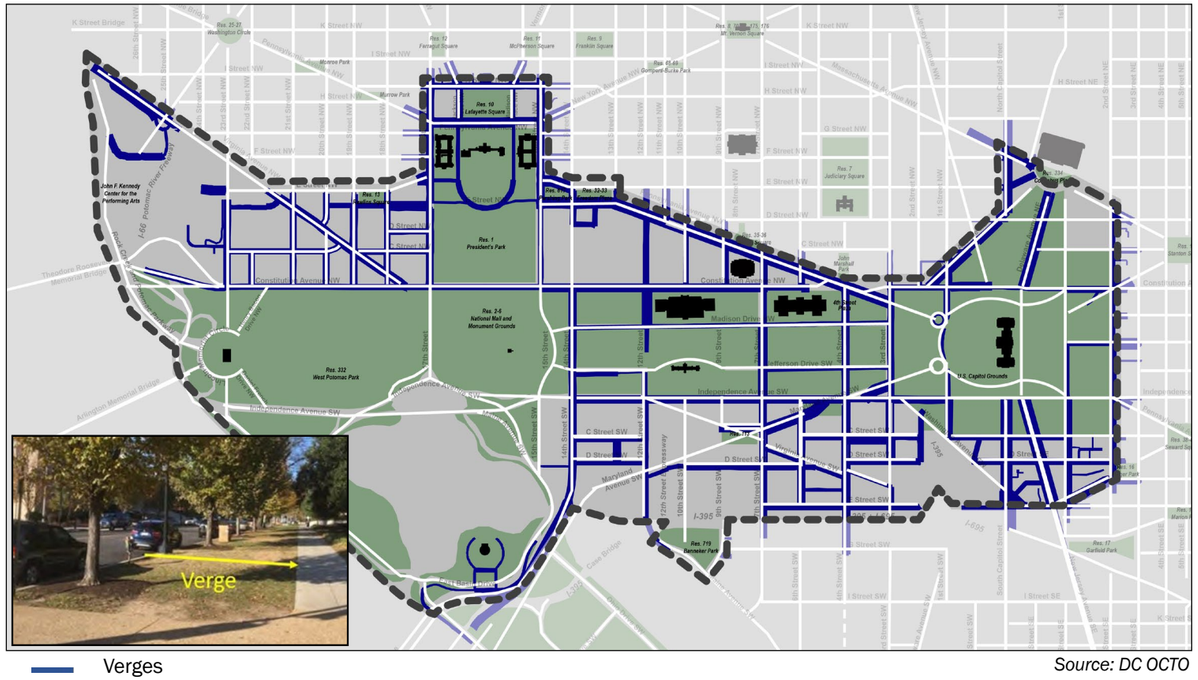
Map L-1: Landscaped Public Parking Locations



Landscaped Public Parking

Source: DC OCTO

Map L-2: Verge Locations



Verges

Source: DC OCTO

L-13. Limit verge lengths as follows:

- Twenty (20) feet at vehicle pick up and drop off areas
- Sixty (60) feet at bus pick up and drop off areas

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

L-15. Do not install plant material other than grass within verges along streets crossing the National Mall, between Madison Drive and Jefferson Drive, to retain unobstructed streetscape views and vistas.

Note: *Coordinate with Stormwater Guidelines: Urban Design Considerations, Guideline SM 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 Virginia Tech's Urban Forestry website for Soil Profile Rebuilding information.

Note: *Coordinate with Street Tree Guidelines: Tree Health and Function, Guideline T-30.*

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

Note: *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 native plants within streetscape plantings to advance pollinator health and habitats and to support natural ecosystem functions. Select plants to support the forage, reproduction, shelter, and/or hibernation of pollinators specific to the ecoregion. Balance practices to improve pollinator health with other considerations, such as environmental, cultural, aesthetic, recreational, safety, and security considerations inherent to each landscape.[29]

Example: Plant Common or Poke Milkweed (Asclepias syriaca or exultata) in suitable areas to help restore declining monarch butterfly populations.

L-22. 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:

a. Bloom value;
b. Bloom diversity of form and color;
c. Material size and structural diversity; and
d. Pollinator positive plant quantity.

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

L-23. Encourage pollinator-friendly plant palettes by planting a minimum of three 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-24. Plant selection and maintenance should consider changing uses in the monumental core, including increased dog walking and the additional wear that this activity places on plantings.

Surface Elements
Stormwater Management

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

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 Best Management Practices (BMPs):** Identifies priority areas and best practices for stormwater management in the monumental core.
- **Application of Stormwater BMPs:** Applies stormwater BMPs considering street categories, vistas and viewsheds, circulation, cultural and historic resources, and aesthetics.
- **Environmental Function and Design:** Addresses the design of stormwater BMPs to maximize the function of green infrastructure[18] and the water management system.
- **Maintenance:** Addresses maintenance responsibilities and refers to maintenance best practices.

Green Infrastructure Maintenance:
Guidelines that focus on stormwater BMP upkeep include: Stormwater Management Guidelines SM-37, SM-38, and SM-39 address maintenance of stormwater management BMPs.

Stormwater Best Management Practices

Principle:

Use Stormwater Best Management 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 stormwater BMPs 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 and 500-Year Floodplains, and Anacostia Waterfront Development Zone.**

SM-3. Maximize use of retention and filtration stormwater practices to capture, slow, and clean stormwater within MS4 and to capture and slow stormwater within 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[30] with subsurface retention as the BMPs to retain stormwater and slow the rate at which stormwater enters the storm sewer system.

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 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 SM-1: Urban Design Matrix**):

a. Views and vistas (**Map SM-1: Important Streetscape Vistas**);
b. Historic and cultural streetscapes and landscapes;
c. Use and design of adjacent buildings, building yards, and width of ROW and landscaped 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.

Note: *Coordinate with Landscape Guidelines: Urban Design guideline L-3.*

M-8. Design green infrastructure[18] to be compatible with streetscape function and character in accordance with the Urban Design Streetscape Framework 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 Streets*, and *Local Streets*.

Note: *Coordinate with Landscape Guidelines: Urban Design Guidelines UD-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.

a. *Radiating and Edging Streets* should maintain low plantings (less than 18 inches) with more formal appearance.
b. *Connecting and Traversing Streets* can maintain taller (less than 36 inches) 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, until the landscape is redesigned.

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, water stations, public art, signage, parking meters, trash and recycling receptacles, fire hydrants, utility boxes, and cellular equipment. Maximize stormwater management areas where appropriate. *Note: Coordinate with Landscape Guidelines: Urban Design guideline UD-5.*

Chart SM-1: Urban Design Matrix

		Retention			Conveyance		Filtration	
		Streetscape Bioretention	Vegetated Filtration Strip	Cistern*	Bioswale	Dry Swale	Filtering System	Permeable Pavers
Streetscape Categories	Radiating & Edging Streets							
	Connecting & Traversing Streets							
	Local Streets							
Streetscape Vistas	Reciprocal Vista							
	Radiating Vista							
	Edging Vista							
	National Mall Crossing							
Street Landscape Character	Landscape							
	Building Yard							
	Urban							
Circulation	High Curbside Use							
	Moderate Curbside Use							
	Low Curbside Use							
	Narrow Sidewalk							
	Moderate Sidewalk							
	Wide Sidewalk							
	High Pedestrian Volume							
	Moderate Pedestrian Volume							
	Low Pedestrian Volume							

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

SM-14. Design landscaped public parking[4] 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 (See **Map SM-1: Important Streetscape Vistas**);
b. Where curbside use is high; or
c. Where sidewalks are too narrow.

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. ***Note:*** *DDOT does not reuse stormwater or use irrigation systems in public space.*

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.

Chart SM-1: Important Streetscape Vistas

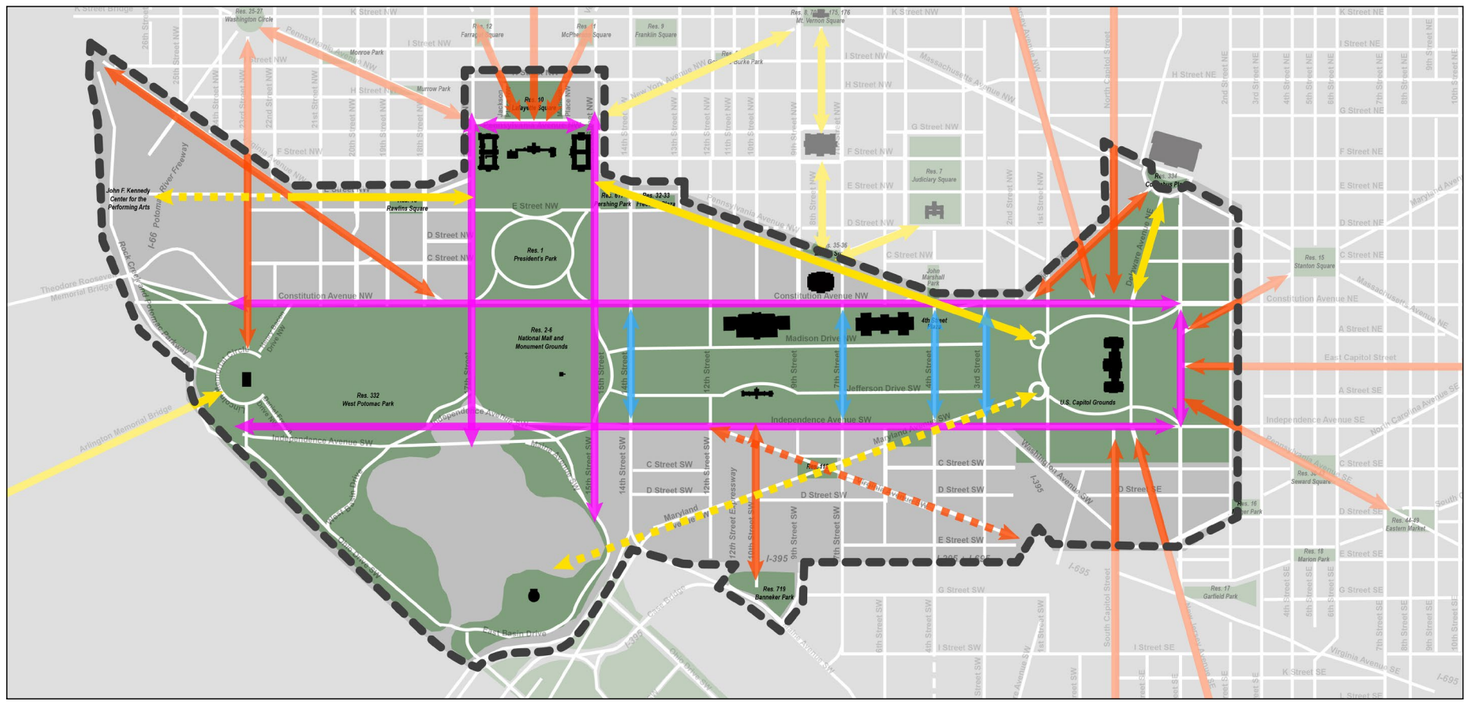
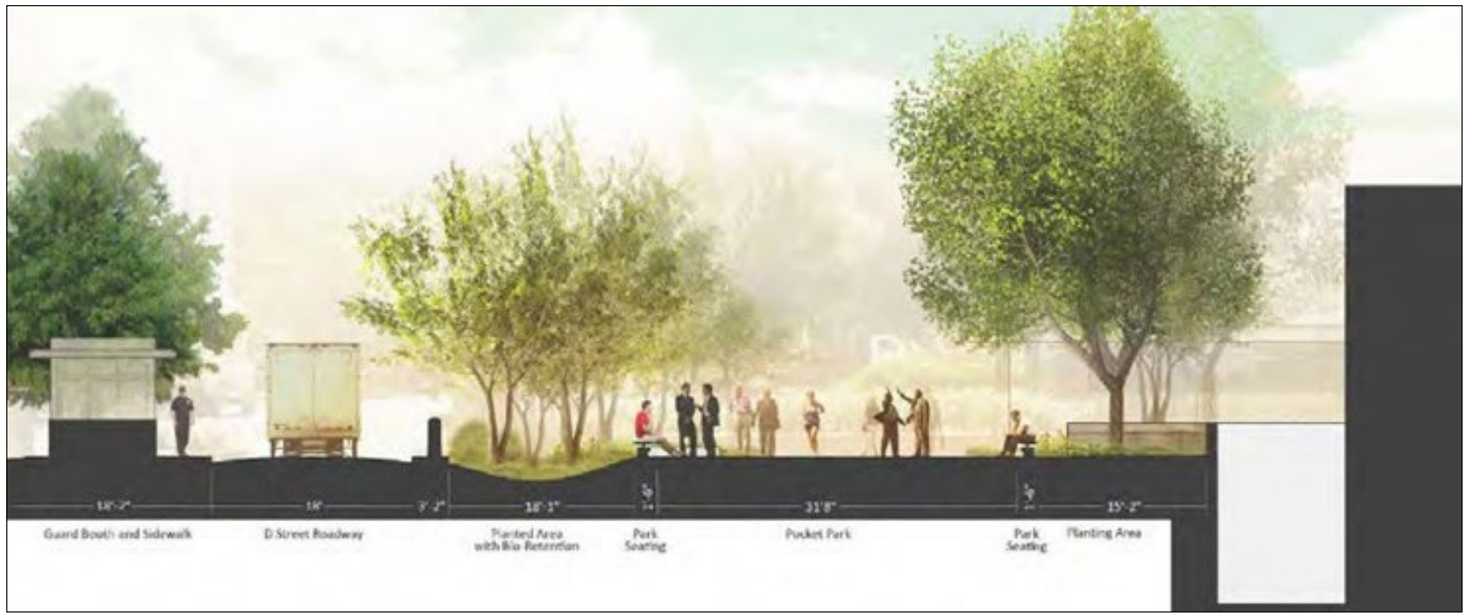


Figure SM-2: Bioretention within a pocket park at the Harry S. Truman Building (Department of State Headquarters) on D Street, NW



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

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

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 BMPs provide for universal accessibility while preventing or limiting the accumulation of water on pedestrian circulation routes. Stormwater BMPs should avoid creating dangerous elevation changes or runoff on sidewalks. The addition of stormwater management elements should not limit accessibility for all pedestrians in the ROW, especially those with visual impairments or mobility limitations.

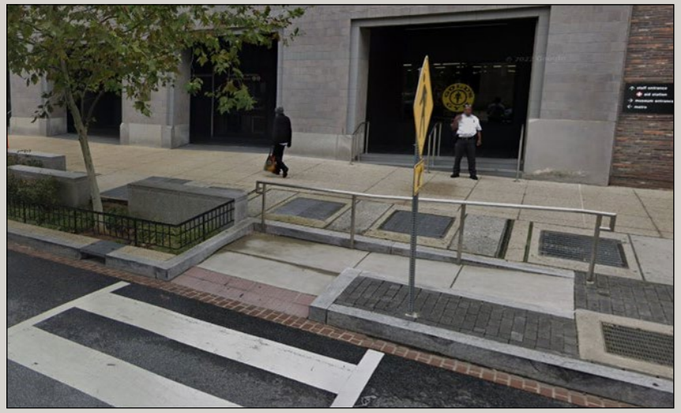


Figure SM-5: Green Infrastructure planter with universally accessible mid-block circulation ramp connecting the curb to the sidewalk along D Street, SW between 3rd and 4th Streets.

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[18] 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 landscaped public parking[4] areas and ROW open spaces to increase the amount of permeable surface. Prior to designing stormwater management in landscaped public parking areas and ROW open spaces, consult with adjacent property owners and regulatory entities to ensure regrading is possible.

SM-28. Bioretention tree boxes should have a minimum internal width of four (4) feet, as measured perpendicular to the curb and between inside edges of the tree box.

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 BMPs 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.

Storm Water Management *continued*

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 BMPs.

SM-38. Refer to Sustainable SITES (§8 Operations and 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 BMPs since they typically require more maintenance and cleaning. See **Appendix A-SM-3: Sample Maintenance Agreements for more information..**

Important References:

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.

Surface Elements
Pavements

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, micromobility vehicles[40], 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; contribute to universal accessibility (including meeting ABAAS, ADA, and PROWAG standards); and influence the direction of pedestrian circulation patterns.

Topics Addressed by the 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 effect 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[32] including:

- President's Park (gray 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 at 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.

P-6. Within important viewsheds, such as the Mall's central vista, provide visual safety indicators at bicycle and bus lanes while protecting historic views by:

- Using unobtrusive white/yellow roadway pavement markings and low-height physical barriers to demarcate bicycle and bus lanes;
- Discouraging continuous colored roadway pavement markings within bicycle and bus lanes when possible; and
- Indicating intersections and other potential conflict zones between vehicles, bicycles, and pedestrians with colored roadway pavement markings.

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-7. Unify sidewalks in and around the National Mall by prioritizing exposed aggregate sidewalk pavement material on *Radiating and 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 Construction Manual update is currently underway and will include revised details and specifications.*

P-8. 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-9. 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.

P-10. 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.
See **Figures P-1 and P-2**.

P-11. Use various scoring patterns to convey scale, texture, and hierarchy. See **Figure P-3**.

P-12. 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-13. Promote streetscape consistency at L'Enfant Plan circles and squares by using the same sidewalk pavement material along the entire perimeter[33] of the circle or square. See the red highlight in **Figure P-4**.

P-14. 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 red highlight in **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.*

P-15. On National Mall streets, step-out[23] pavement material should be the same as adjacent sidewalk pavement.

P-16. 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.

P-17. Where appropriate, allow custom paving at building entrances up to one-third (1/3) the width of the distance between property line and curb. For custom paving at building entrances within DDOT ROW, see DPW's DSR (§1105.9). ***Note:*** *Custom paving is subject to approval by the Public Space Committee and requires a covenant of maintenance.*

P-18. 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 National Archives Building).*

P-19. 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.

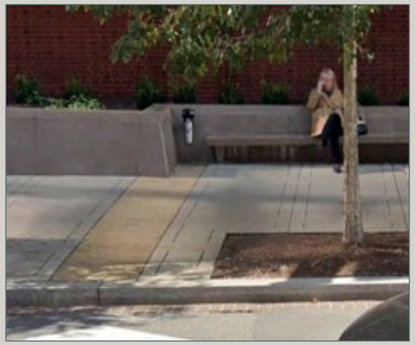


Figure P-1: Exposed aggregate accent pavement outside the New Executive Office Building on 17th Street, NW.

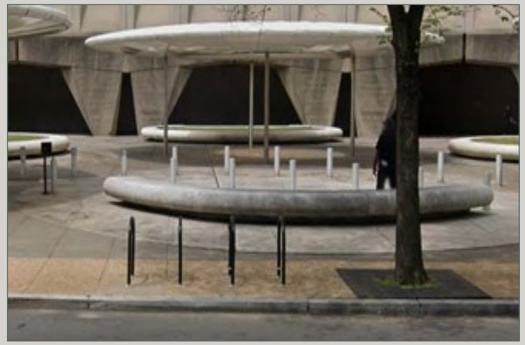


Figure P-2: Exposed aggregate accent pavement outside the Housing and Urban Development (HUD) Building on 7th Street, SW.

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

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.

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

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

P-20. Preserve custom paving at public building and plaza entrances that highlight important public spaces, and the 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 Waldorf Astoria 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-21. Provide universal accessibility by considering the most recent ADA, ABAAS, and PROWAG standards for circulation and pavement design, material selection, and construction during project design, document review, and implementation phases.

Curb and Gutter

P-22. Enhance the material quality and unify the streetscape by using granite curbs with red brick gutters on streets within the Streetscape Manual Boundary, except the following locations:

- NPS roads on the National Mall use granite curbs without gutters (roadway asphalt abuts the curb). See **Figure P-8.**
- AOC roads around Capital Square use granite curbs with yellow brick gutters.

P-23. Preserve historic bluestone curbs whenever possible by resetting and reusing the curbs or salvaging the bluestone material.

Medians

PAVED MEDIANS

P-24. Medians less than five (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-25. Consider permeable or porous pavement for medians to enhance stormwater management.

P-26. Where appropriate, provide pedestrian refuges at least six (6) feet wide [eight (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). and **Figure P-9.**

PLANTED MEDIANS

P-27. Medians greater than five (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-28. Limit plant heights to no more than three (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, pedestrian crosswalks, and mid-block crossings.

P-29. Encourage healthy tree growth by planting and/or maintaining existing trees in elevated medians that are ten (10) feet wide or greater (DDOT DEM §37.3.3). See **Figure P-10.**

P-30. 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 forty (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 eight (8) feet.
c. Place trees to ensure drivers can see all regulatory signs.

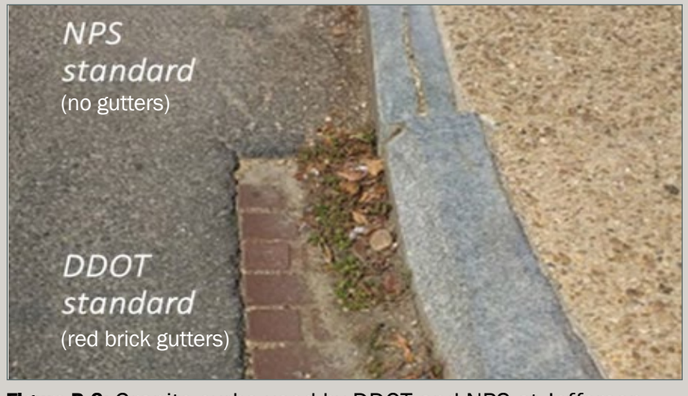


Figure P-8: Granite curbs used by DDOT and NPS at Jefferson Drive and 7th Street, SW.

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

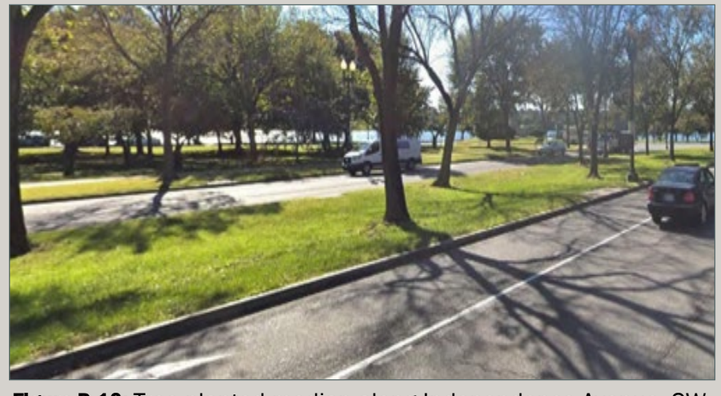


Figure P-10: Tree planted median along Independence Avenue, SW.

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.

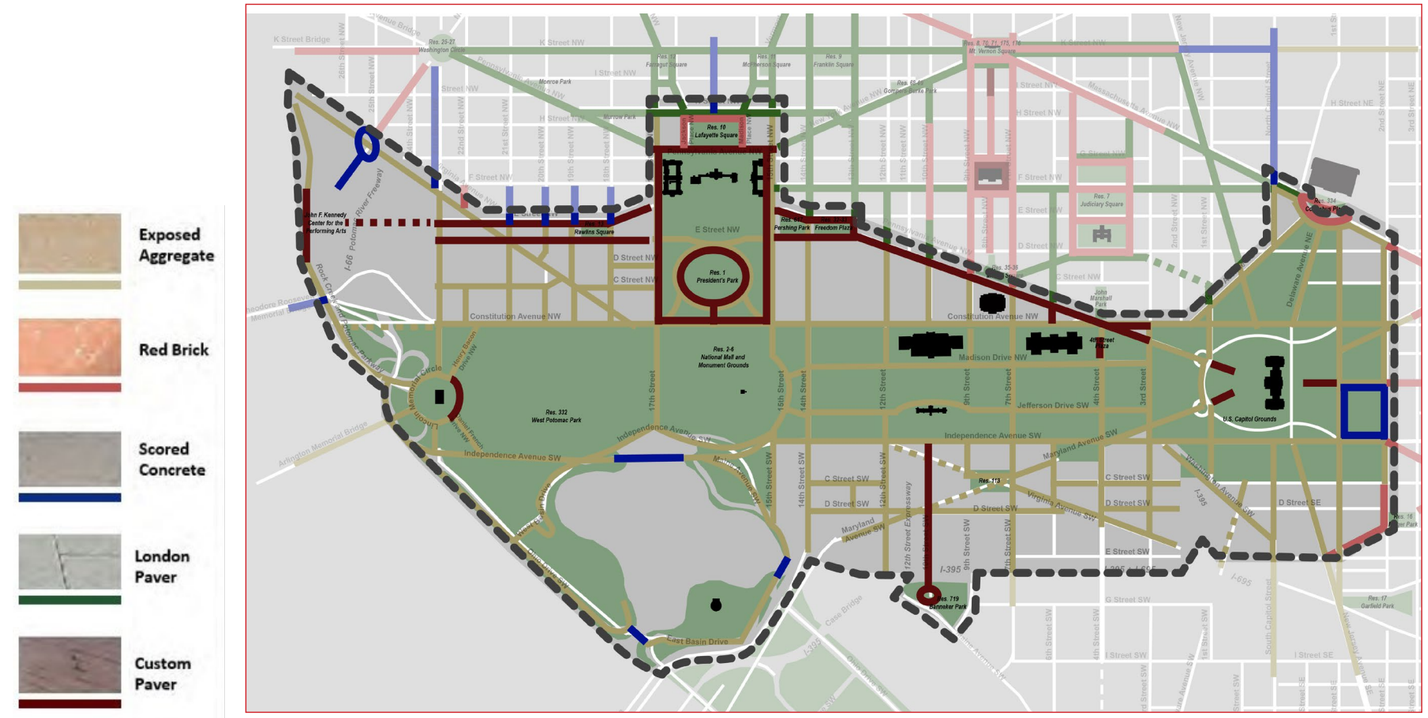
Street Intersections and Sidewalk Corners

P-31. 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-32. When two or more sidewalk pavement materials abut, improve material transitions by using:

- Edging bands; (see **Figure P-11**) or
- Complementary colors or material patterns. (see **Figure P-12**)

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's goal of connecting the Kennedy Center with the White House and President's Park with a linear park.

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

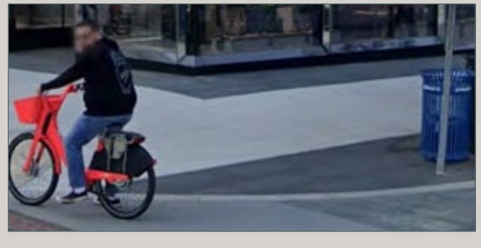


Figure P-12: Complementary pavement colors at 10th and I Street, NW.

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.[34]

Curb Ramps and Crosswalks

P-33. Promote pedestrian safety by providing curb ramps for each crosswalk that aligned with the crosswalk to allow a straight line of travel for pedestrians crossing the street. (see **Figures P-13 and P-14**) ***Note:*** *Singular curb ramps may be appropriate for some non-perpendicular roadway intersections with acute angled corners.*

P-34. Encourage the use of granite curb ramps with visually contrasting-colored tactile warning materials (truncated domes) to enhance the streetscape quality when federal entities provide funding. (see **Figure P-15**) Discourage use of tactile inset mats as these may detach from the curb ramp.

P-35. Where granite curb ramps are not applied, curb ramp material should match the adjacent sidewalk material and finish. Tactile warning materials should use visually contrasting colors that complement granite curbs. *Example: U.S.Capitol Grounds applies exposed aggregate curb ramps along exposed aggregate sidewalks.*

P-36. Support agency efforts to upgrade and retrofit existing curb ramps to meet current ADA/ABAAS standards, including the application of non-slip finishes and tactile warning materials.

P-37. Crosswalks should promote pedestrian visibility and safe roadway crossing by using highly visible materials with high contrast (ADA §406), where appropriate, including the following:

- High contrast (white) rigid tactile strip (ADA §406);
- Painted white thermoplastic (with or without stripes);
- Other high visibility pavement materials (ADA §406);
- Special crosswalk patterns or materials such as brick or other stone pavers (within special or notable spaces) that conform to ADA, ABAAS, PROWAG, and other accessibility and 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.

P-38. Design crosswalk drainage to integrate sidewalk and roadway drainage and maximize universal accessibility.

Driveway Aprons

P-39. 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) and **Figure P-16.**

P-40. 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; or
b. Where driveway heating and/or ice melt systems are needed.

Figure P-15: Example of granite curb ramps at the Dwight D. Eisenhower Memorial.

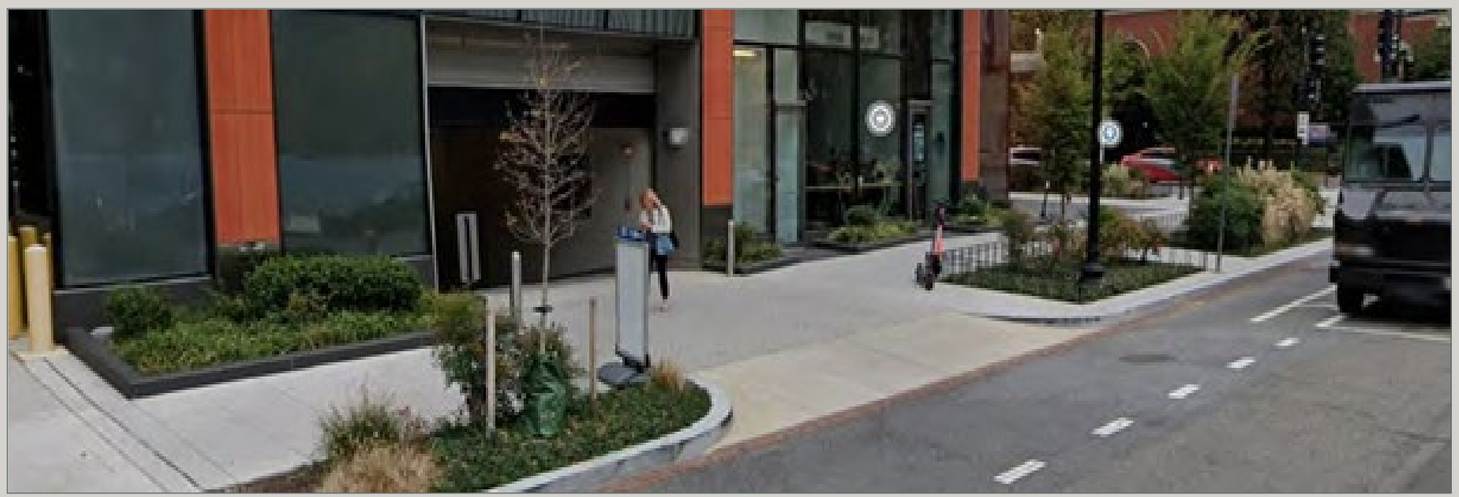


Figure P-16: Visually continuous sidewalk material crossing the driveway apron near 1200 17th Street, NW.

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-41. Where appropriate for the character and setting, use lighter color pavements with high albedo[35] or solar reflectance to mitigate the urban heat island effect.

P-42. As roadway pavements age, consider maintenance techniques such as microsurfacing (using a thin sealing layer) with light-colored materials to increase surface albedo[35] and mitigate the urban heat island effect.

P-43. Where appropriate for the character and setting, and feasible and effective for improving stormwater management, apply permeable, porous,[36] and pervious[37] sidewalk and/or roadway pavement[38] as follows:

a. 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. In low-volume roadways. The District does not currently allow these pavements on collectors, arterials, and freeways.
c. Avoid in areas with high curbside uses, bus and vehicle loading, and parking due to excessive oil dripping in these areas.
d. Avoid 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).

P-44. Where possible and appropriate for the character and setting, prioritize pervious pavement within furnishing and tree box zones where pedestrian volume is high to deliver air and water to tree roots.

Figure P-17: 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

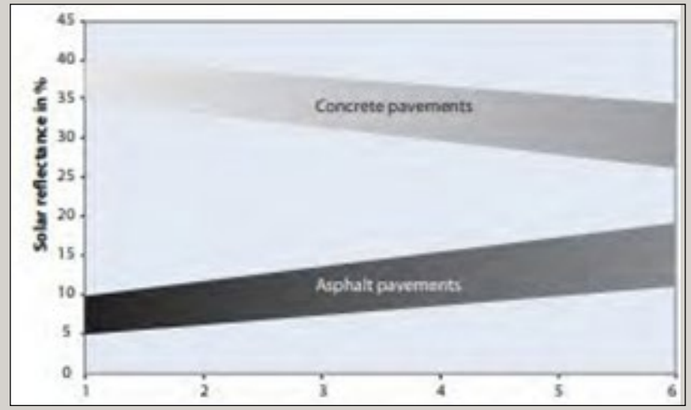
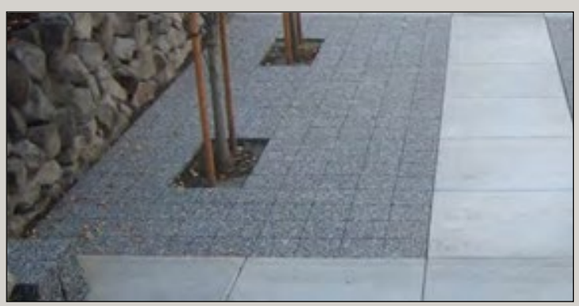


Figure P-18: *Examples of pavement types to improve stormwater management.*

Permeable Pavers

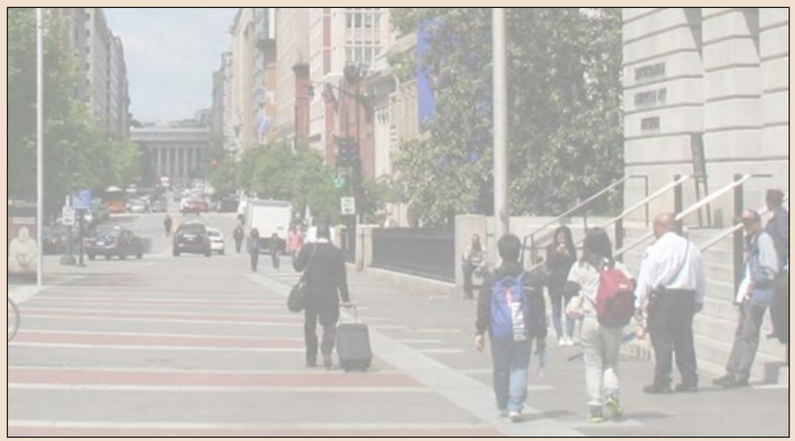
Porous Pavers

Pervious Pavement



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

Surface Elements
Pedestrian Circulation



Introduction

This guidance addresses pedestrian[14] circulation space along sidewalks and multi-use trails[39] 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[40] 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, 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[41] *(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 vehicles such as dockless bicycles and scooters create new opportunities and challenges. To improve pedestrian circulation and reduce conflicts with vehicles, bicycles, and micromobility vehicles, 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 to inform the public 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[42] Zone
- **Coordination with Other Travel Modes:** Addresses coordination of pedestrian circulation space with bicycles, scooters, and other micromobility vehicles.

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 connect and coordinate circulation routes for all modes (pedestrian, bicycle, and micromobility vehicles) and 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;[43]
- Pedestrian Level of Comfort (PLOC)[44] 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.*

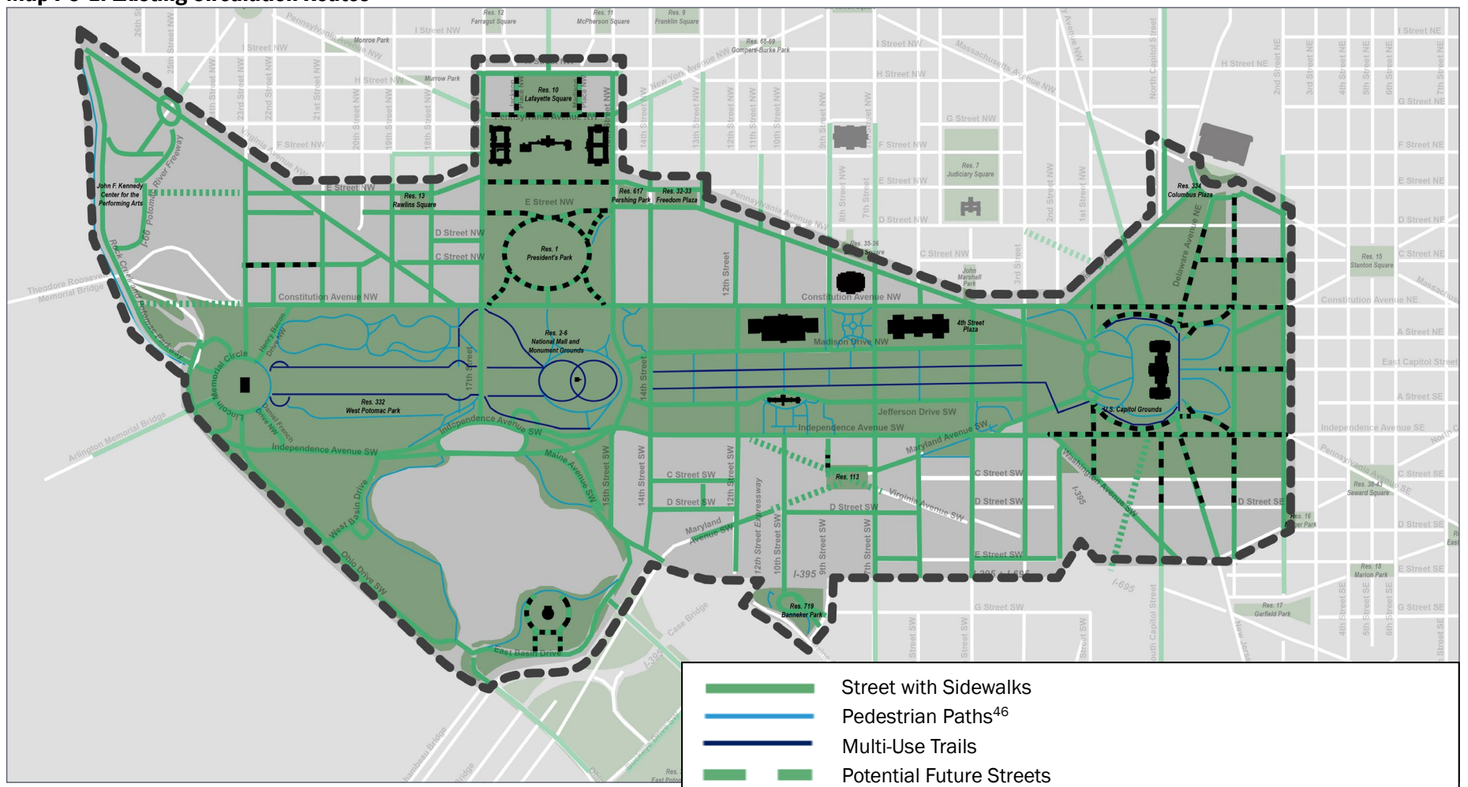
PC-6. Consider upgrades where existing circulation routes and connections are below standards to support increasing pedestrian demand on existing infrastructure.

Examples:

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

PC-7. Support continuous pedestrian access along waterfront areas within the monumental core and avoid interrupting potential continuous waterfront connections between Georgetown and the National Arboretum.

Map PC-1: Existing Circulation Routes



Source: DC OCTO, NPS, SI, AOC

PC-8. 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 Management, and Pavement Guidelines.*

Unique Land Uses and Special Event Locations

Principle:

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

PC-9. Ensure circulation routes (sidewalks and multi-use trails) support everyday pedestrian circulation and are appropriate for the unique collection of cultural, commemorative, and institutional land uses, as well as the volumes and types of visitors and commuters within the National Mall and surrounding area.

PC-10. 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-11. Consider both permanent and activity-based public access restrictions that impact pedestrian connectivity. *See* **Map PC-1: Existing Circulation Route**. *Examples: President's Park and U.S. Capitol 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-12. Efforts should be made to prioritize universal accessibility when considering the space needed for pedestrian circulation, historic preservation goals, and security concerns.

PC-13. Align pedestrian circulation zones between blocks and throughout the length of street segments, where possible.

PC-14. 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 downtown monumental core, fluctuating widely based on seasons, activities, and office and museum operational hours. See **Daytime Pedestrian Volume Map** in *Small-Scale Element Guidelines*.[45]
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.

PC-15. 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.[48]

Pedestrian Safety and Accessibility:

Guidelines that focus on pedestrian safety and comfort include:

Streetlight guidelines S-1 and S-4 support improved crosswalk lighting on the National Mall.

Tree guideline T-37 supports tree boxes that promote safe pedestrian conditions.

Landscapes and Plantings guidelines L-8 and L-10 support plantings that contribute to building and public safety.

Pavement guidelines P-19, P-21, P-26, P-33, P-36, P-37, and P-39 support providing ample circulation space, use of pavements safe in various weather conditions, pedestrian refuge medians at street crossings, improved curb ramps, high visibility crosswalks, and safe pedestrian crossings at driveways, and application of recent safety standards.

Pedestrian Circulation guidelines PC-2, PC-5, PC-11, PC-14, PC-15, PC-26, PC-28 support pedestrian and bicycle safety improvements, improving circulation routes for universal accessibility and pedestrian level of comfort, meeting safety standards and requirements, providing adequate circulation space.

Chart PC-1: Minimum Widths

Location	Step-Out*	Tree/Furnishing Zone	Pedestrian Clear Zone[49] (Minimum)	Total Sidewalk Width[50] (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.

Important References:

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.*

PC-16. 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. Evaluate impacts to visual qualities and stormwater runoff when considering increasing the widths of paved areas. *See* **Map PC- 3: Narrow Circulation Routes.**

PC-17. 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-18. 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-19. 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 persons with disabilities 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-20. Exceptions to minimum widths may be appropriate where:

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

PC-21. Consider pedestrian protection,[51] 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-22. Enhance streetscape consistency by aligning streetscape zones between blocks and throughout the length of street segments, where possible. Streetscape zones include the following:

- Pedestrian Circulation: Containing unobstructed space for pedestrian circulation.
- Furnishing and Civic Infrastructure: Containing streetlights, banners, benches, trash/recycling receptacles, bicycle racks, car charging stations, parking stations, parking/traffic/regulatory signs.
- Step-Out: Containing bus stops and dedicated areas for loading/unloading.
- Building Yard and Park Frontage: Containing landscaped areas and building, exhibit, and/or wayfinding signage, and perimeter security.
- Vending: Containing temporary areas for commercial services and operations such as ordering and queuing.
- Bicycles and Micromobility Vehicles: Containing dedicated space for bicycles and micromobility vehicles,[40] where appropriate.

Figure PC-1: Streetscape Zones

Viewsheds and Vending:

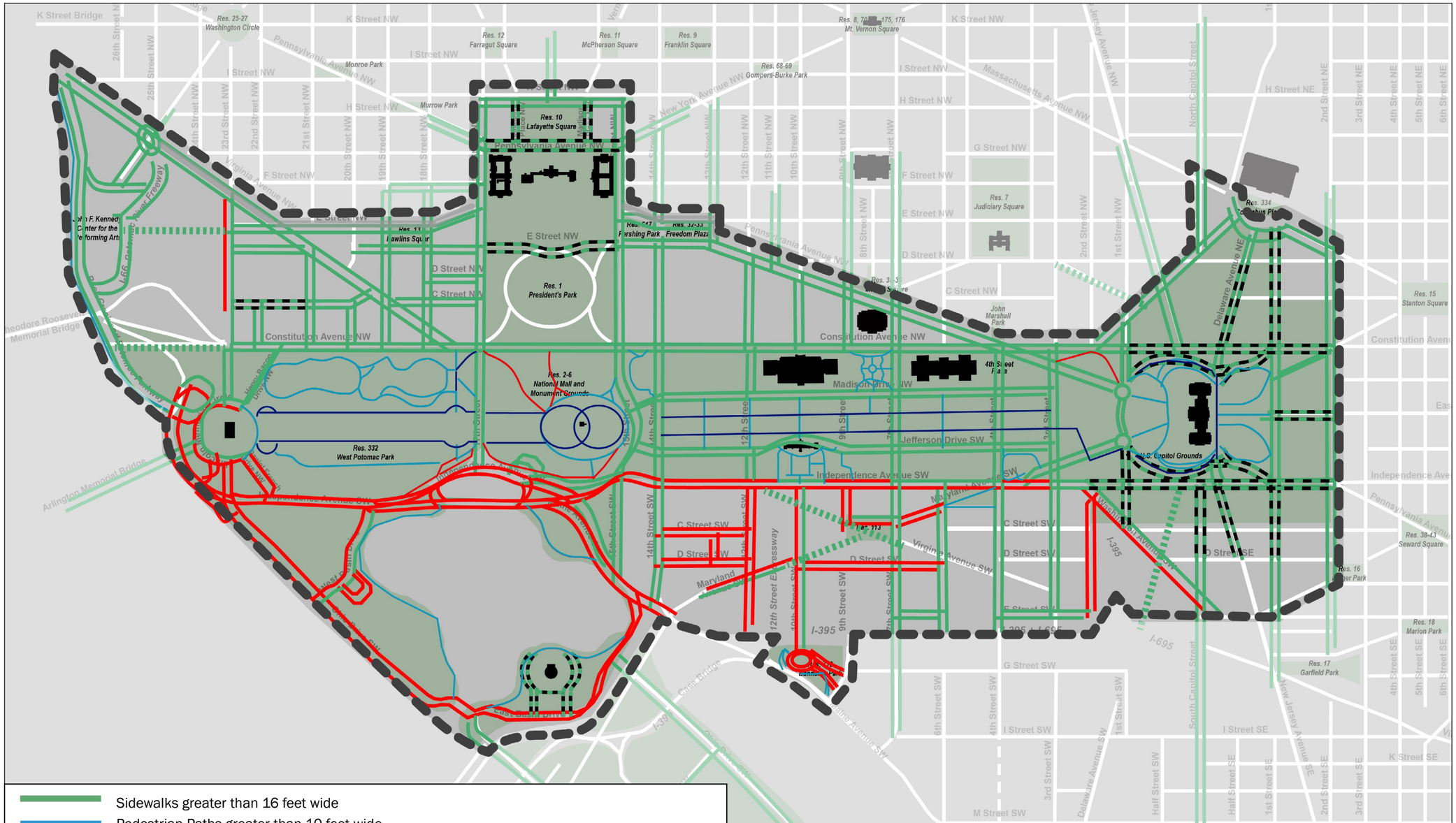
Vending is not permitted on sidewalks and roadways within the National Mall without a NPS permit per:

- Title 36 CFR 50.24 requires NPS permit for vending on NPS lands
- Title 8 DC Code 144 states NPS controls sidewalks and some roadways within the National Mall

Additionally, parking is not permitted on streets crossing the Mall.

Note: *Current conditions, as shown above, are not authorized.*

Map PC-3: Narrow Circulation Routes



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-23. 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-24. 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:
   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)

PC-25. 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-26. 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-27. 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.

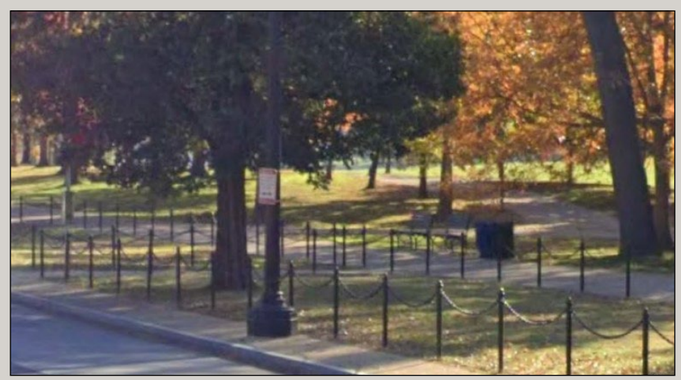
PC-28. Support federal and local agency efforts to develop guidelines regarding utility box placement, appearance, and function.
Note: *Small-Scale Element Guidelines address utility boxes in more detail.*

Step-Out Zone

PC-29. Consider applying two-foot-wide step-outs[23] (minimum) in addition to the required sidewalk widths to ensure ease of curbside access and accommodate universal accessibility and transportation infrastructure on federal roadways, and if permitted on roadways under DDOT administration.

PC-30. 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-31. 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 vehicles).

PC-32. Create dedicated space for low-stress bicycle and micromobility vehicles[40] within roadways and support NPS and DDOT efforts to develop separate facilities per the National Mall Plan recommendations and the DC Bicycle Master Plan.

PC-33. Support reducing pedestrian and bicycle conflicts within the following areas:

- NPS Memorials: Shared and private bicycles and micromobility vehicles[40] are not permitted. See **Map PC-4: Geofenced Areas**[52] **and Bicycle and Micromobility Parking.**
- Smithsonian Grounds: Shared and private bicyclists and micromobility vehicle users are required to walk wheeled vehicles.
- Capitol Grounds: Motorized bicycles are not permitted on sidewalks. Shared bicycle and micromobility vehicle parking and locking is not permitted.[53]
- Central Business District Sidewalks: Shared and private bicyclists and micromobility vehicle users are required to walk wheeled vehicles on sidewalks.[54] Riding must occur on bicycle lanes, bicycle tracks, multi-use trails, and streets.

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

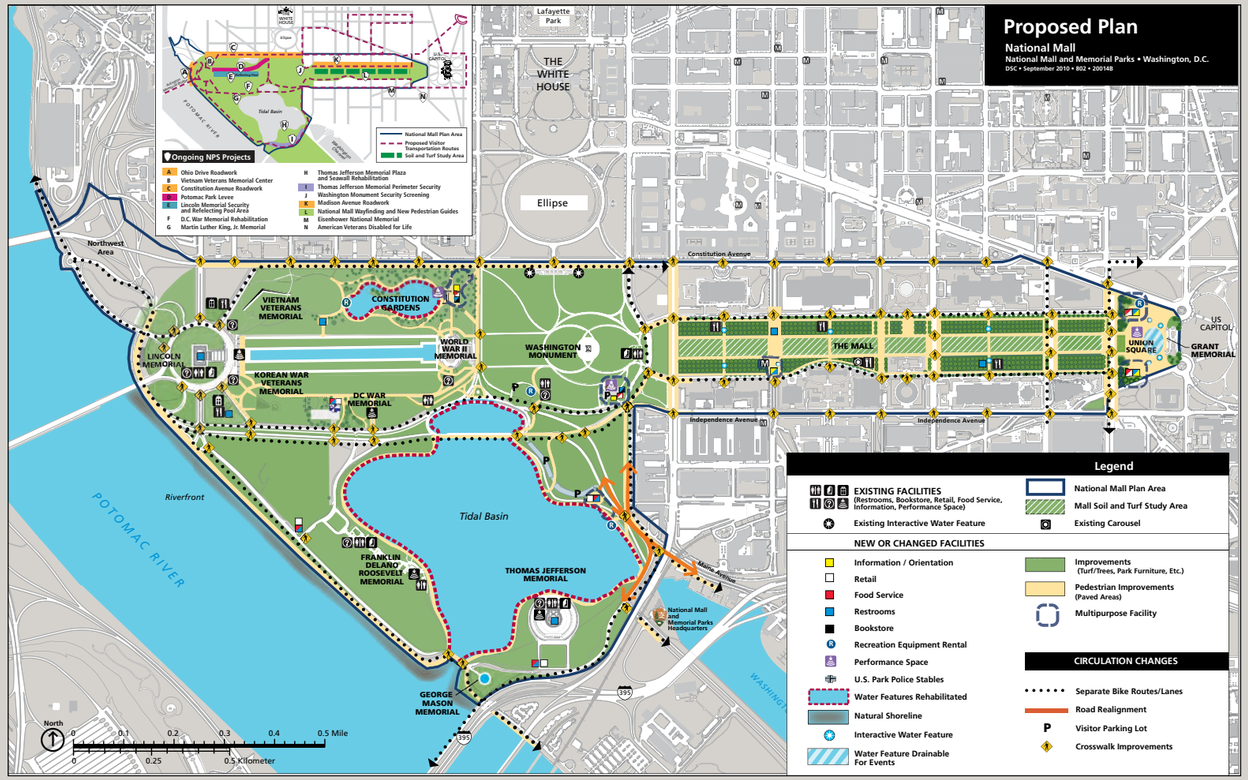
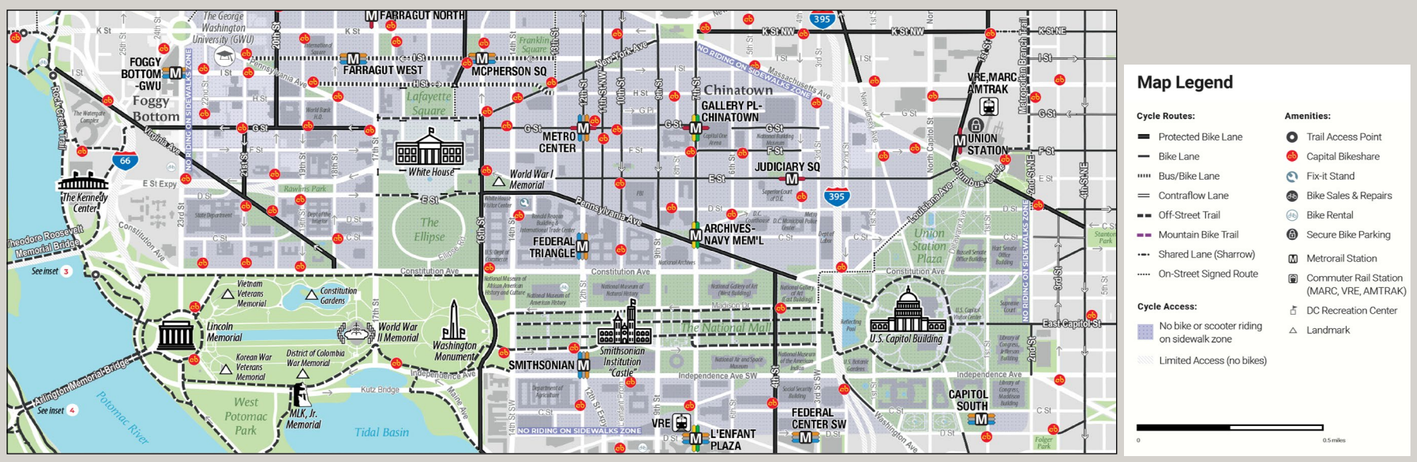


Figure PC-5: The DC Bicycle Master Plan



PC-34. 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. **See Figure PC-6.**
- 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.

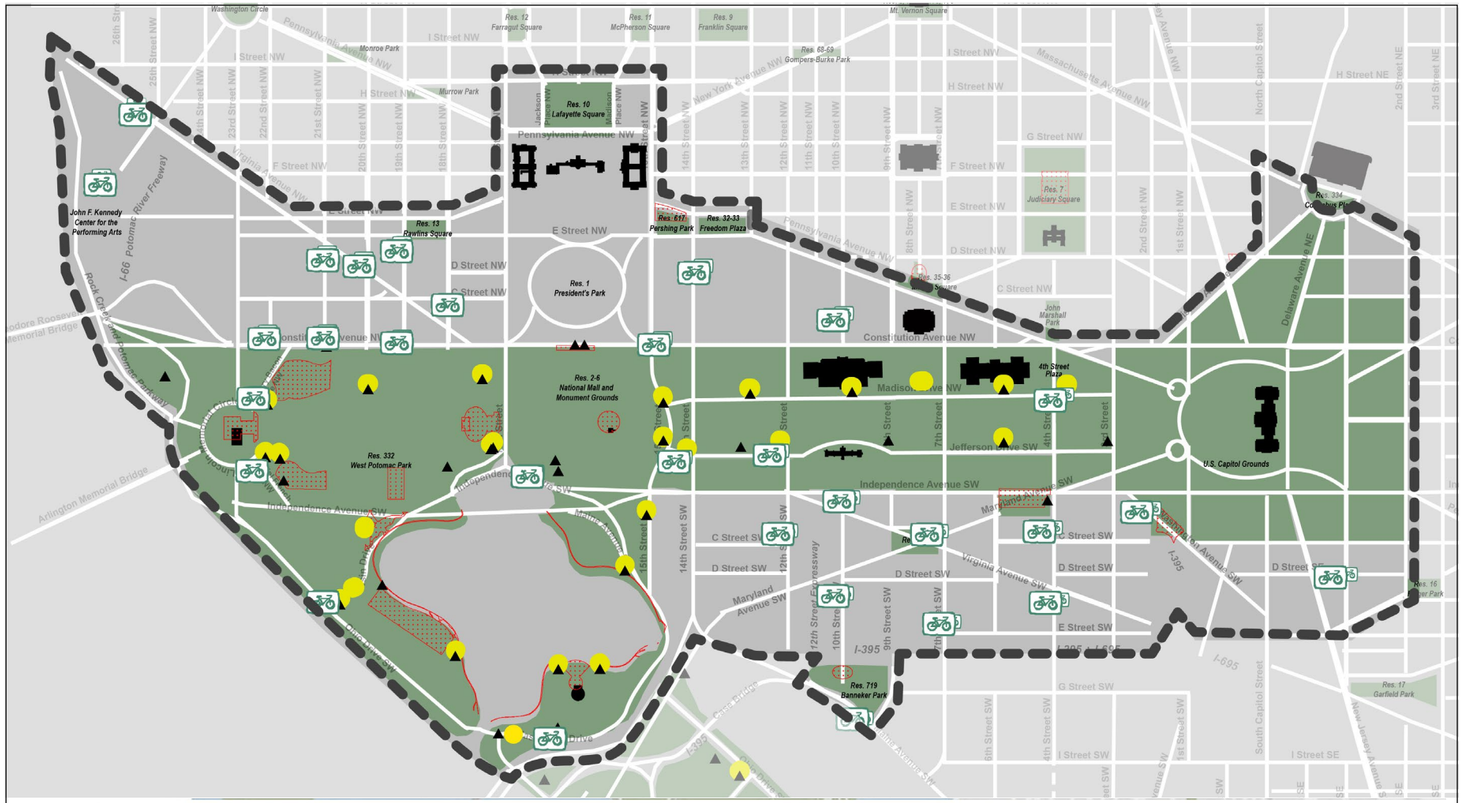
PC-35. Support agency efforts to develop clear and consistent communication, messaging, and enforcement to encourage compliance and reduce pedestrian and bicycle conflicts.

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-36. Support agency efforts to identify preferred locations and develop a common language or design for stencils indicating where bicycles and other micromobility vehicles should or should not ride. *Example: Smithsonian Garden sidewalk stencils stating, "Walk Your Wheels."*

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



Note: A geofence is a virtual perimeter around a physical geographic area. On the map above it shows areas where micromobility vehicles are restricted.

Source: DC-OCTO and NAMA

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.

Part 2: Streetscape Design Guidelines
Small-Scale Elements

Introduction: Small-scale elements - ranging from benches and waste receptacles to bicycle racks and EV charging stations - are grouped into two categories: 1) furnishings, and 2) civic infrastructure. Furnishings provide pedestrian comfort and convenience while civic infrastructure provides services to pedestrians, cyclists, and emergency services. These elements contribute to a functional and beautiful streetscape and, through their design and placement, can create unique environments within different character areas.

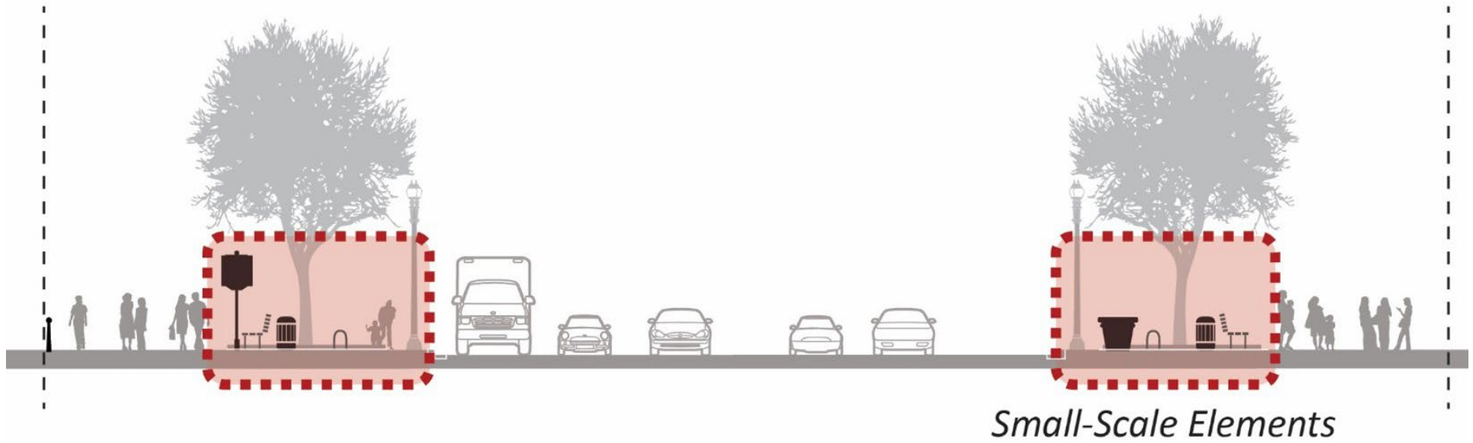
Small-Scale Elements **Furnishings**

Definition

Furnishings provide functional amenities for pedestrians and contribute vitality to the pedestrian realm. These elements are typically located within the landscape and furnishing zone.

Principle:

Furnishings provide streetscape continuity and may adapt to character areas. They may highlight a precinct's or neighborhood's unique qualities, provided they are cohesive across character areas.



Building Perimeter Security Priorities:

While the Furnishing and Civic Infrastructure guidelines do not address building perimeter security, they do consider the relationship of Furnishings and Civic Infrastructure with building perimeter security. Building perimeter security principles are addressed in the Federal and District Comprehensive Plans: Urban Design Elements. The federal elements cross reference other federal documents that address perimeter security:

- Interagency Security Committee's Manual for New Federal Office Buildings and Major Modernization Projects (DHS)
- Unified Facilities Criteria (DOD)
- National Capital Urban Design and Security Plan (NCPC)
- NCPC Comprehensive Plan, Urban Design Element (NCPC)

Socially-Oriented Design:

Guidelines that focus on the public's comfort, safety, and experience include:

Bench guidelines B-1 to B-8 and B-12, which cover placement, location, volume, accessibility, and orientation to promote social interaction.

Waste receptacle guidelines WR-2, WR-3, and WR-7, which cover placement, location, and alignment with pedestrian use and high traffic areas.

Figure F-1: The streetscape at the Smithsonian Arts & Industries building includes benches and waste receptacles.

Small-Scale Elements
Benches

Introduction

This guidance addresses benches in the public right-of-way (ROW) within the capital city's monumental core. These streets are illustrated on Map B-2: Recommended Bench Styles.

Importance and Background:

Benches are important because they improve pedestrian experience and comfort by offering places to sit, rest, observe, and wait. Benches can contribute to the character of the capital city's historic districts and cultural landscapes, and support streetscape consistency. Benches may encourage engagement and social interaction if correctly located and oriented, particularly when co-located with other pedestrian amenities.

Topics Addressed by these Guidelines:

The bench guidelines are organized into the following topics:

- **Placement:** Addresses the location of benches within the streetscape and proximity of benches to other streetscape elements.

- **Appearance:** Addresses compatibility of benches with other streetscape elements, location of bench style types, and design criteria.

- **Function:** Addresses bench materials, installation, and serviceability.

Figure B-1: Within high pedestrian traffic areas, a greater number of benches should be placed to accommodate the increased need for seating opportunities.

Figure B-2: The guidelines call for benches to be placed in the furnishing zone in areas with ample shade.

Placement

Principle:

Provide benches to improve pedestrian comfort and experience.

B-1. Determine the appropriate number of benches based on pedestrian volume and demand. Place benches based on pedestrian volume and demand, and where pedestrians are likely to be waiting, watching, and/or resting.

Note: Benches placed in District ROW require a public space permit and a covenant of maintenance, and may require the Public Space Committee review.

B-2. In areas with high pedestrian volume, place benches at minimum 200 feet apart, and where pedestrians are likely to be waiting, watching, and/or resting.

B-3. In areas with high pedestrian volume, bench locations and placement of multiple benches should account for groups of people and pedestrians using double strollers, wheelchairs, mobility scooters, service dogs, etc.

B-4. Benches should typically be located:

a. along sidewalks in the furniture zone;

b. along pedestrian paths;

c. near approved food service locations;

d. in shaded or other comfortable areas, when possible;

e. outside of nationally significant vistas or viewsheds;

e. near areas of high pedestrian volume such as civic, commercial, and transit destinations; and

f. at bus stops.

B-5. Benches should not obstruct the pedestrian clear zone.

B-6. Use greater bench spacing in areas where sidewalks are crowded and/or step-out zones demand high curbside uses such as bus and vehicle loading.

B-7. Benches placed parallel to the curb should generally face these directions:

a. toward buildings when located in the furnishings zone (near the curb), or

b. toward roadways when located in the building or park frontage zone (near the back of sidewalk or property line).

Note: Benches integrated with perimeter security may deviate from this guidance.

B-8. Benches placed perpendicular to the curb should:

a. orient benches to encourage face-to-face social interaction;

b. limit the placement of other streetscape elements between pairs of benches facing each other;

c. avoid placing other streetscape elements within ten (10) feet in front of the bench;

d. limit the bench length to the depth of the adjacent tree box; and

e. permit access to tree boxes for equipment for maintenance and snow removal.

Appearance

Principle:

Benches should be compatible and complementary with other streetscape elements and may reflect the qualities of the character area provided they are cohesive across character areas.

B-9. Apply bench styles to the streetscape as illustrated on Map B-1: Recommended Bench Styles.

B-10. Use consistent bench styles within a character area or sub-area that are visually cohesive along streetscape corridors.

B-11. Before considering introducing a new bench design, collaborate with the IWG and use the following guidance to identify or develop bench designs. The bench designs:

a. must be compatible with historic benches in adjacent areas, such as the National Mall (designed by National Capital Parks in 1934-1935) and Pennsylvania Avenue (designed by Sasaki and Associates in 1981);

b. should harmonize existing and proposed bench designs and be compatible and complementary with other streetscape elements;

c. should complement multiple architectural styles of the National Mall and monumental core such as Victorian, Neoclassical, and Modern;

d. should unify and be appropriate for the National Mall and capital city's monumental core character and setting; and

e. should distinguish the National Mall and capital city's monumental core character from the surrounding downtown urban fabric.

Function

Principle:

Provide durable, convenient, and serviceable seating for people of all ages and abilities.

B-12. Benches shall meet the following criteria:

a. anchored to bench pad or paving;

b. length is eight (8) feet or less when placed parallel to the street;

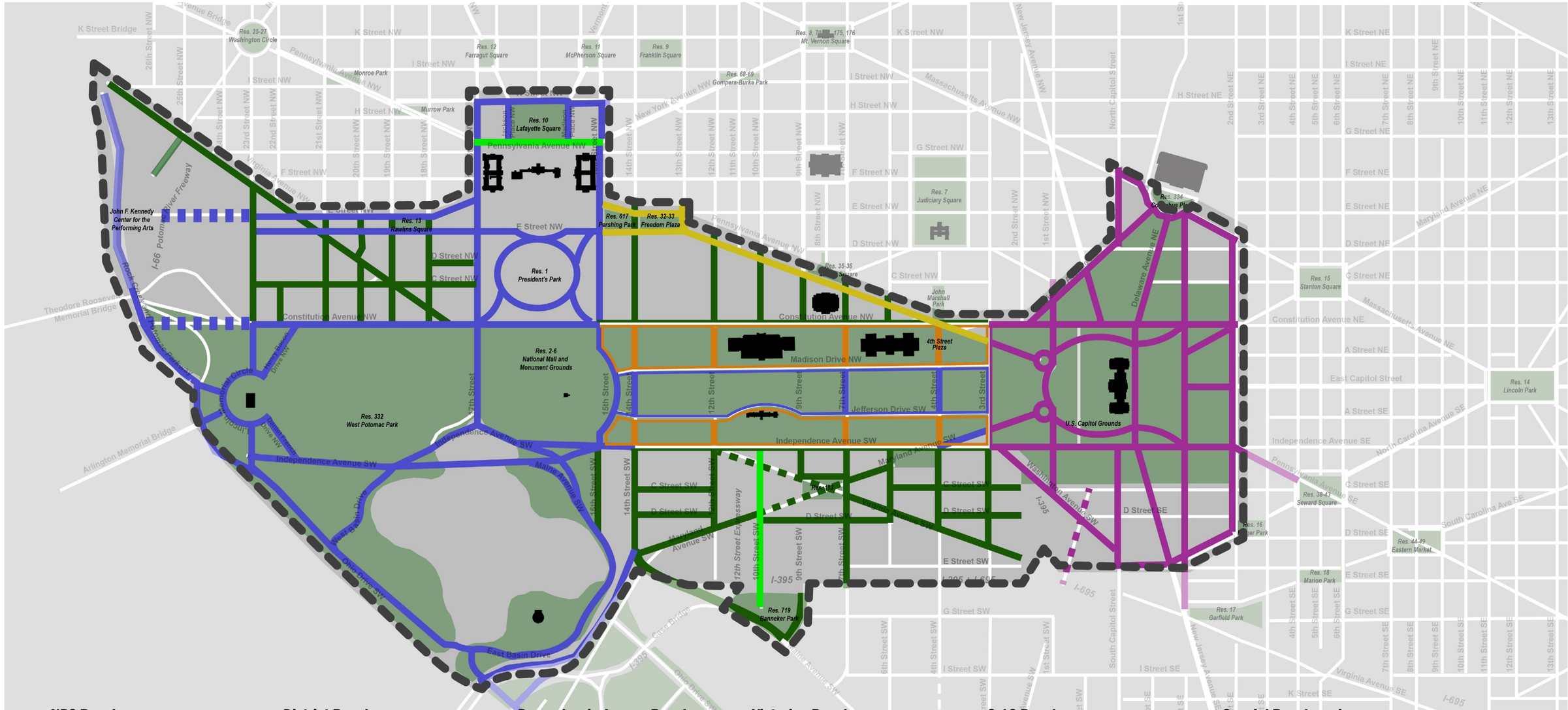
c. length is less than the depth of a tree box when placed perpendicular to the street;

d. limit the use of a center armrest;

e. meet ADA and ABAAS requirements; and

f. constructed of durable materials such as stone, wood, and/or metal.

Map B-1: Recommended Bench Styles



NPS Bench

District Bench

Pennsylvania Avenue Bench

Victorian Bench

C-12 Bench

Special Bench: varies

Note 1: Map B-1 shows currently approved bench designs. The IWG may consider new bench design proposals in the future.
Note 2: While benches on federal properties are made of similar materials (wood and metal), different bench styles are designated for specific areas to reinforce the character of a particular area.

Small-Scale Elements

Waste Receptacles

Figure W-1: Paired trash can and recycling receptacle located at the National Museum of the Native American.

Introduction

This guidance addresses recycling, trash, and other waste receptacles in the public ROW within the capital city's monumental core. These streets are illustrated on Map WR-1: Recommended Waste Receptacles.

Importance and Background:

Receptacles for recycling, trash, and other waste are important because they contribute to the aesthetic, functional, and environmental quality of the streetscape. Waste receptacles contribute to the character and consistency of streetscapes in the monumental core and may adapt to character areas, highlighting unique qualities of a precinct or neighborhood. Waste receptacles also contribute to the pedestrian experience and improve environmental quality by limiting litter and promoting appropriate waste management, including waste diversion through recycling.

These guidelines include two types of receptacles: round and box. The majority of receptacles currently in use throughout the monumental core are round. These cylindrical bins typically contain a central top opening. Examples of these receptacles include the Victor Stanley S-Series and the Original PADC design (see Map R-1). Newer box receptacles are rectangular in shape and designed to be pest resistant. They may also include waste-compacting and smart features to accommodate a higher volume of waste and sensors to alert when service is needed to empty the receptacle. An example of this type of receptacle is the Big Belly bin (see Map WR-1).

Topics Addressed by these Guidelines:

The waste receptacle guidelines are organized into the following topics:

- **Placement:** Addresses the location of waste receptacles within the streetscape, and the proximity of waste receptacles to other streetscape elements.
- **Appearance:** Addresses receptacle styles, compatibility of waste receptacles with other streetscape elements, and design criteria for streetscapes and character areas.
- **Function:** Addresses improved receptacle function to mitigate pests and support efficient waste removal.

Placement

Principle:

Provide conveniently located receptacles for recycling, trash, and other waste to prevent the spread of litter, promote recycling, and create a beautiful and welcoming streetscape that minimizes pedestrian conflicts and streetscape clutter.

WR-1. Where possible, consolidate waste receptacles with other small-scale elements to avoid cluttering the streetscape.

WR-2. Waste receptacles should typically be located:

a. along pedestrian paths; and

b. along sidewalks in the furnishing zone.

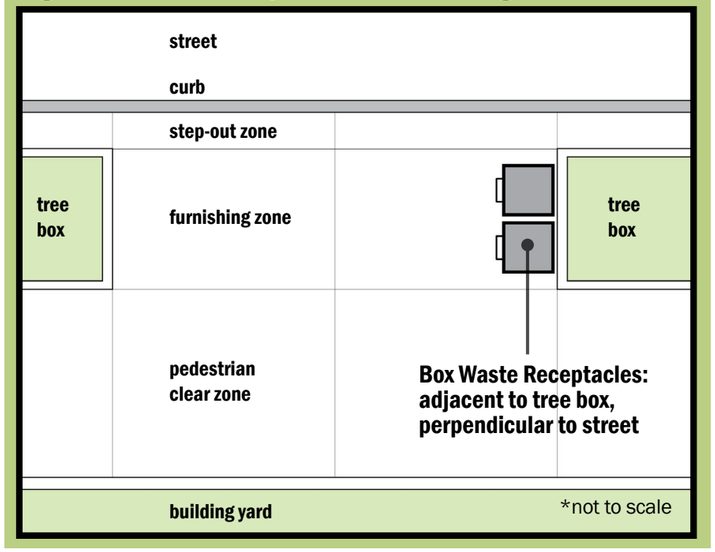
   1. When box waste receptacles are located in the furnishing zone, orient their back side adjacent to tree boxes, perpendicular to the adjacent street.
   2. If there is no furnishing zone, box waste receptacles should be placed in the building yard.

c. near pedestrian crossings, at street corners or mid-block crossings;

d. near areas of high pedestrian traffic or activity such as authorized food service locations, bus stops, and major civic, commercial, and transit destinations; and

e. outside of nationally significant vistas or viewsheds.

Figure W-2: Box Receptacle Location Diagram



WR-3. Waste receptacles should not obstruct the pedestrian clear zone.

a. Box waste receptacles should not be used along sidewalks and pedestrian paths where the pedestrian clear zone is under 10' and where they may impede circulation in areas with high pedestrian volume.

WR-4. Encourage co-locating recycling, trash, and other waste receptacles to promote recycling and support appropriate waste management.

a. Box waste receptacles for trash and recyclables should be placed adjacent to one another. Single Box waste receptacles may be used based on site conditions and project requirements.

WR-5. Ideal spacing between waste receptacles, or groups of waste receptacles, should be 200 feet, or as needed to appropriately locate waste receptacles in urban areas (NACTO).

For example: Consider using lesser spacing in areas of high pedestrian traffic to handle higher waste volumes and using greater spacing in natural or visually sensitive areas with low/infrequent pedestrian traffic.

WR-6. For block lengths:

a. 200 feet or greater, provide at least two pairs of recycling and trash receptacles.

b. less than 200 feet, provide at least one pair of recycling and trash receptacles.

WR-7. Consider placing waste receptacles more than ten (10) feet away from benches to avoid unpleasant odors near seating areas.

WR-8. Box waste receptacles should not be located:

a. along the frontage of structures designated as a National Historic Landmark;

b. along the frontage of structures listed on the National Register of Historic Places where:

   1. no furnishing zone exists; or
   2. the building yard is under 20' in depth.

Appearance

Principle:

Waste receptacles should be compatible and complementary with other streetscape elements and may reflect the qualities of the character area provided they are cohesive across character areas.

WR-9. Waste receptacle styles should be consistent within designated areas as illustrated on Map R-1 : Recommended Waste Receptacles.

WR-10.Waste receptacle appearance should be compatible and complementary with other streetscape elements and may adapt to character area qualities as appropriate.

WR-11. To achieve cohesiveness across character areas, existing and proposed waste receptacle designs, except box waste receptacles, should include the following:

a. cylindrical body with vertical metal elements;

b. central top opening(s); and

c. unified and universally understood colors and/or signage/symbols to indicate waste types.

WR-12. Box waste receptacles shall meet the following requirements:

a. Size:

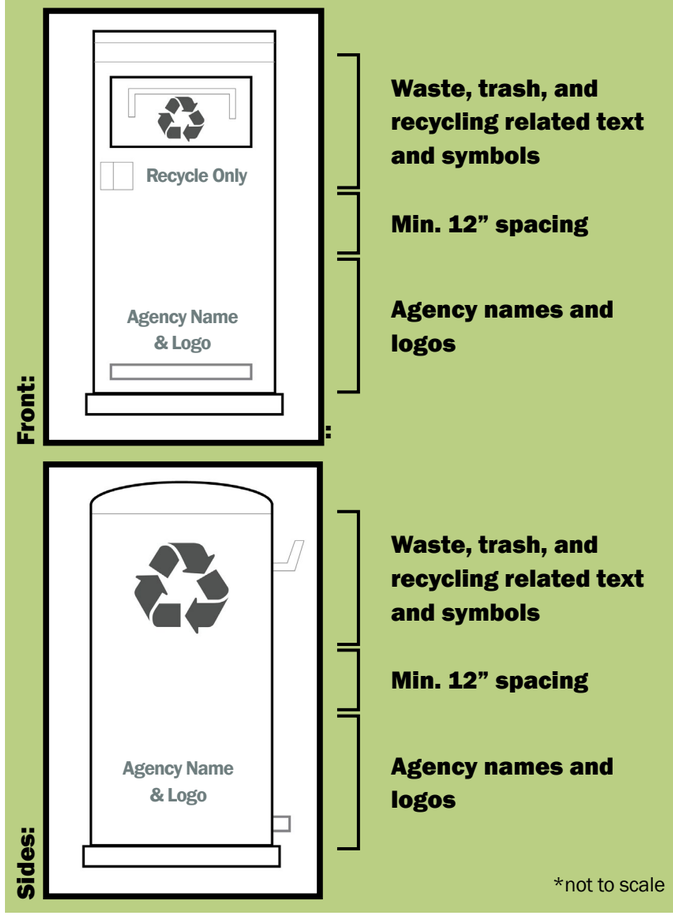
   1. Maximum Height: 50"
   2. Maximum Width: 25"
   3. Maximum Depth: 27"

b. Color and finish: Receptacles shall be black powder-coated steel without adhesive wraps, vinyl wraps, advertising, or attached signage.

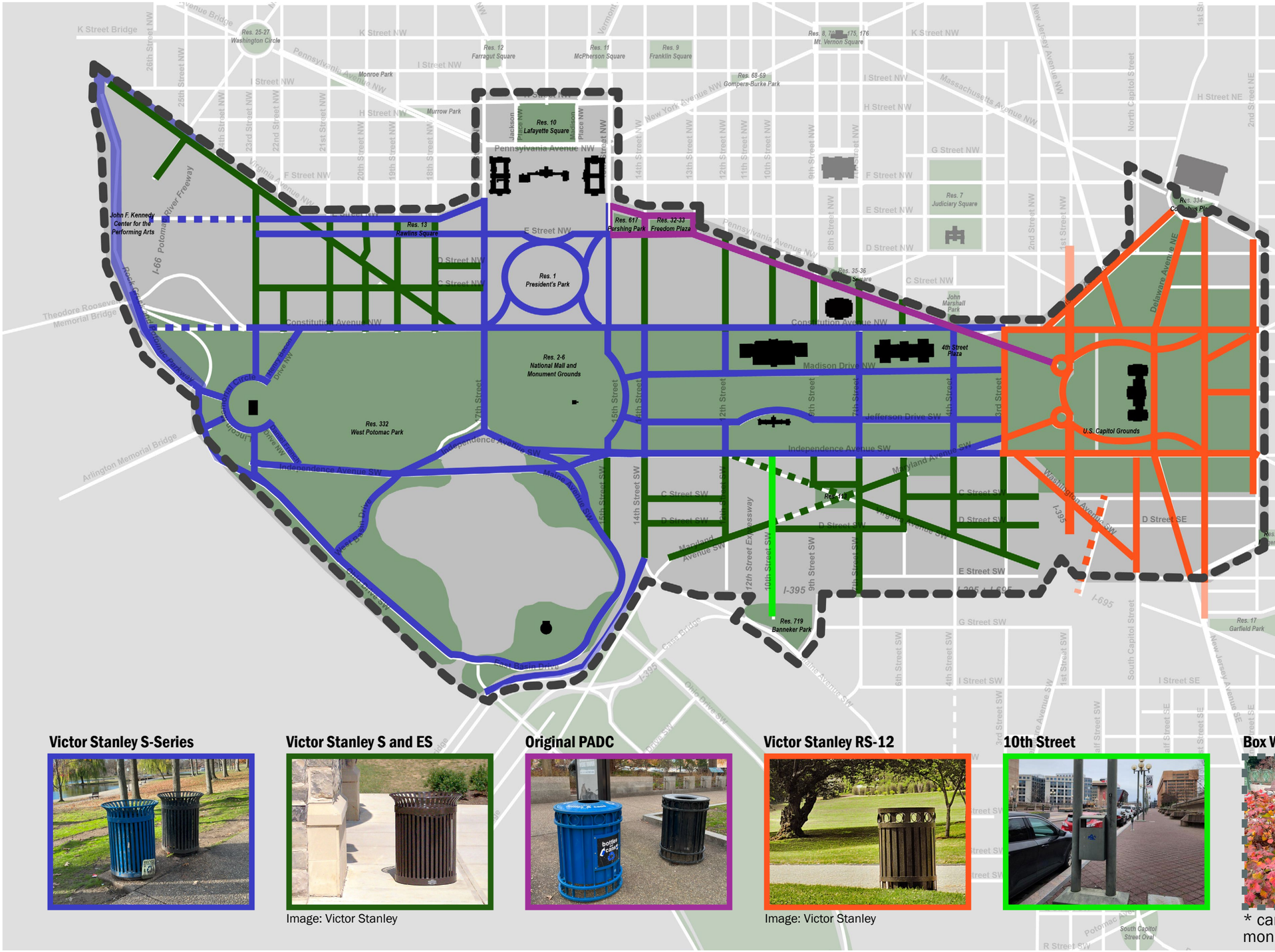
c. Symbols and text:

   1. Text and symbols shall be limited to agency names and logos and unified and universally understood waste and recycling-related symbols and instructions.
   2. All text and symbols shall be white.
   3. Waste, trash, and recycling-related text and symbols should be placed in the top half of the receptacle, as shown in illustration W-3.
   4. Agency name and logos, if used, should be placed located at the bottom half of the receptacle, as shown in Illustration W-3.
   5. Text height should not exceed 3".
   6. A minimum of 12" should separate agency text/logos from waste and recycling text/symbols.
   7. If only one text/symbol group is used (i.e. either an agency name or waste and recycling text) on a particular side of the receptacle, guidelines WR-12-c-3 and c-4 do not apply, and the text and symbols may be placed anywhere on that side.

Figure W-3: Box Receptacle Design Diagram



Map WR-1: Recommended Waste Receptacles



Note 1: Map WR-1 shows approved waste receptacle designs as of April 2024. The IWG may consider new receptacle design proposals in the future.

Note 2: While waste receptacle styles may vary to complement the character of the designated area, the same style must be used throughout the designated character area.

Note 3: Box waste receptacles may be used throughout the monumental core in areas of high pedestrian volume. All box waste receptacle guidance, including WR-4a, WR-8, WR-12, and WR-21, should be followed when determining where to locate these receptacles.

Victor Stanley S-Series

Victor Stanley S and ES

Image: Victor Stanley

Original PADC

Victor Stanley RS-12

Image: Victor Stanley

10th Street

Box Waste Receptacle*

* can be located throughout monumental core

WR-13. Design and color of historic waste receptacles (a receptacle that contributes to historic district's or cultural landscapes) should follow the historic design intent.

WR-14. Before considering introducing a new waste receptacle design, collaborate with the IWG and use the following guidance to identify or develop receptacle designs for the National Mall and the monumental core. The waste receptacle designs should:

a. be visually cohesive and harmonious along streetscape corridors;
b. harmonize the proposed receptacle design with existing waste receptacles and to be compatible and complementary with other streetscape elements. See WR-11 and WR-12 for waste receptacle appearance criteria;
c. complement multiple architectural styles of the National Mall and monumental core such as Victorian, Neoclassical, and Modern;
d. unify and be appropriate for the National Mall and monumental core character and setting;
e. distinguish the National Mall and monumental core character from the surrounding downtown urban fabric;
f. consider diverse waste types, including recycling, trash, compost, and pet waste; and
g. improve function, including promoting recycling, pest mitigation, and efficient waste removal operations.

WR-15. Areas with the need for multiple waste streams ("waste hubs") should consider a unified system that complies with design provisions in WR-14. To minimize visual impacts, signage, and symbols should be coordinated and simple. For example, the use of colored rims or tops can indicate waste type. A unified system may deviate from the waste receptacle appearance criteria in WR-11.

Function

Principle:

Waste receptacles should improve the pedestrian experience by limiting litter, promoting waste diversion through recycling, mitigating pests, and facilitating efficient waste removal operations.

WR-16. Permanently mount waste receptacles to prevent them from being moved, with the exception of temporary or event-related receptacles, or certain box waste receptacles that do not require mounting per manufacturer's recommendations.

WR-17. Waste receptacle material, finish, and color selection should be graffiti resistant.

WR-18. Waste receptacles should mitigate pest access, including rodents and insects, especially in areas with large gatherings or food service.

WR-19. Consider replacing or retrofitting waste receptacles with smart technology to track waste generation, enable "as-needed" collection basis, and support waste removal operations.

WR-20. Encourage IWG coordination and partnership to promote timely waste removal operations in areas with authorized food service and high pedestrian traffic or activity such as major civic, commercial, and transit destinations.

WR-21. Box waste receptacles are intended to supplement traditional waste receptacles in high pedestrian volume areas and should only be installed in locations where agencies have the capacity and resources for their ongoing maintenance. Maintenance responsibilities should be determined prior to installation.

Figure W-6: Waste and recycle receptacles should be co-located where possible.

Figures W-4 and W-5: The box waste receptacles at the National Gallery of Art's Sculpture Garden provide a template for the graphic identity for future box waste receptacle designs. See illustration W-3 for additional information on graphic design guidance for box waste receptacles.

Small-Scale Elements **Civic Infrastructure**

Definition

Civic infrastructure provides service to pedestrians, bicyclists, or emergency services, or forms part of the connected utility system. These elements are typically located near the curb, within the step-out zone, or verge.

Principle:

Civic infrastructure elements support the function of the city, unify the monumental core and city, and contribute to the capital city's identity.

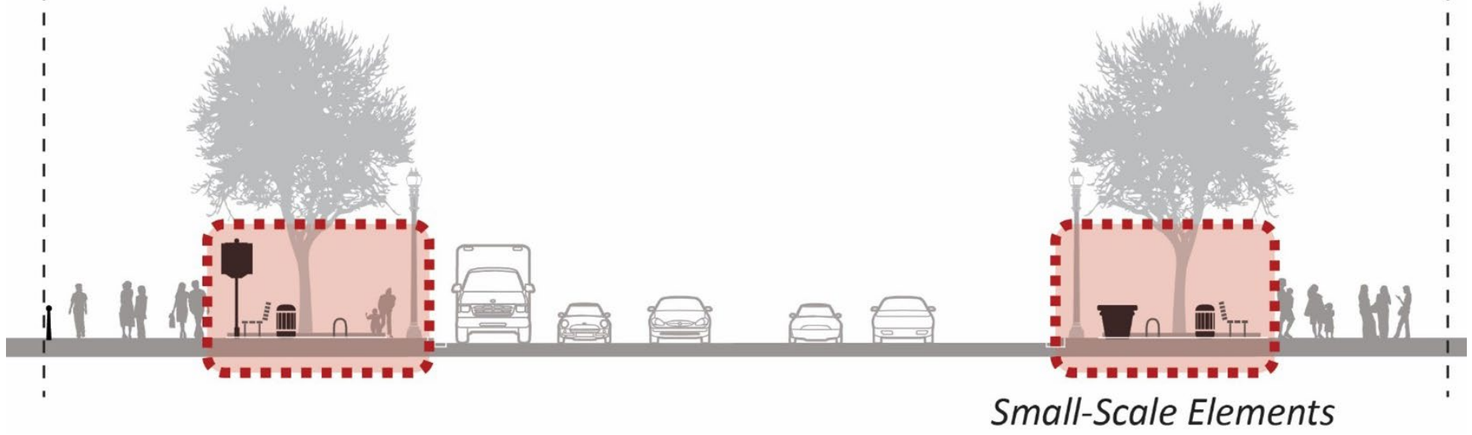


Figure C-1: Post-and-chain helps protect trees and landscape plantings along pedestrian paths.

Figure C-2: Parking pay stations should not negatively impact pedestrian circulation space or significant viewsheds or vistas.

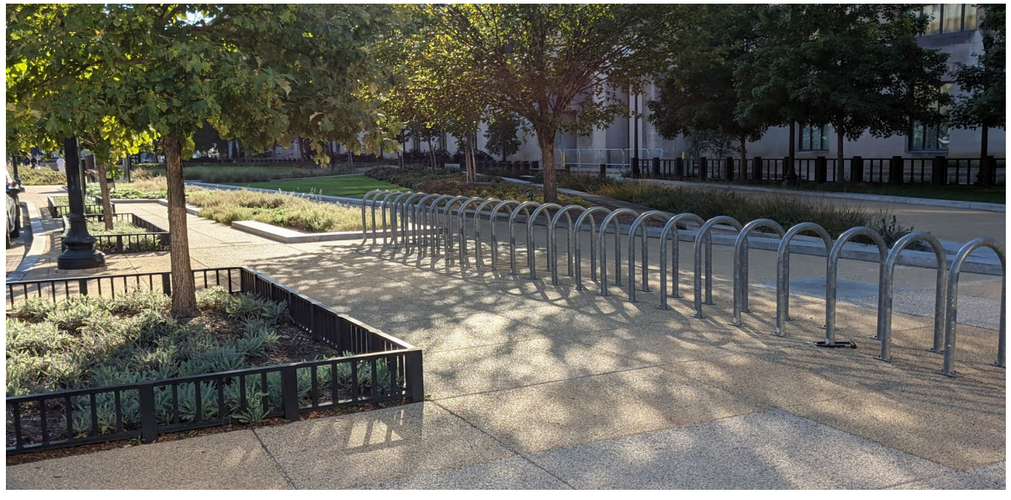


Figure C-3: Large groupings of bicycle racks accomodate the high number of bicycles and micromobility vehicles found throughout the monumental core.

Small-Scale Elements

Bicycle Racks

Figure BR-1: Allocating an appropriate amount of streetscape space to bicycle and micromobility parking is necessary to help prevent dockless bikes from blocking active walking and pedestrian areas, as seen here on Pennsylvania Avenue.

Introduction

This guidance addresses bicycle racks in the public ROW within the capital city's monumental core.

Importance and Background:

Bicycle racks are important because they support multi-modal transportation options, provide civic infrastructure for parking and securing bicycles and micromobility vehicles (e.g. bicycles, scooters), and reduce streetscape clutter. They also contribute to streetscape consistency.

Topics Addressed by these Guidelines:

The bicycle rack guidelines are organized into the following topics:

- **Placement:** Addresses bicycle rack locations within the streetscape and proximity to other streetscape elements.
- **Appearance:** Addresses bicycle rack compatibility with other streetscape elements, location of rack types, and design criteria.
- **Function:** Addresses bicycle rack materials and installation.

Civic Infrastructure: Bicycle Docking Stations

The Bicycle Rack Guidelines should be used to inform placement of Bicycle Docking Stations. Bicycle docks should not be placed within significant viewsheds, nor placed in a manner to impede pedestrian circulation space or other elements or functions within the streetscape.

Placement

Principle:

Provide bicycle racks to support multi-modal transportation options and provide civic infrastructure to secure bicycles and other micromobility vehicles in appropriate locations.

BR-1. Locate bicycle racks within the furnishing and tree box zone.

BR-2. Place bicycle racks such that secured micromobility vehicles do not obstruct pedestrian circulation space or building and storefront entryways, and do not clutter nationally significant vistas or viewsheds.

BR-3. Space bicycle racks to maximize the number of micromobility vehicles that can safely and conveniently be parked.

BR-4. Avoid placing bicycle racks closely together which limits micromobility parking capacity.

BR-5. Place bicycle racks:

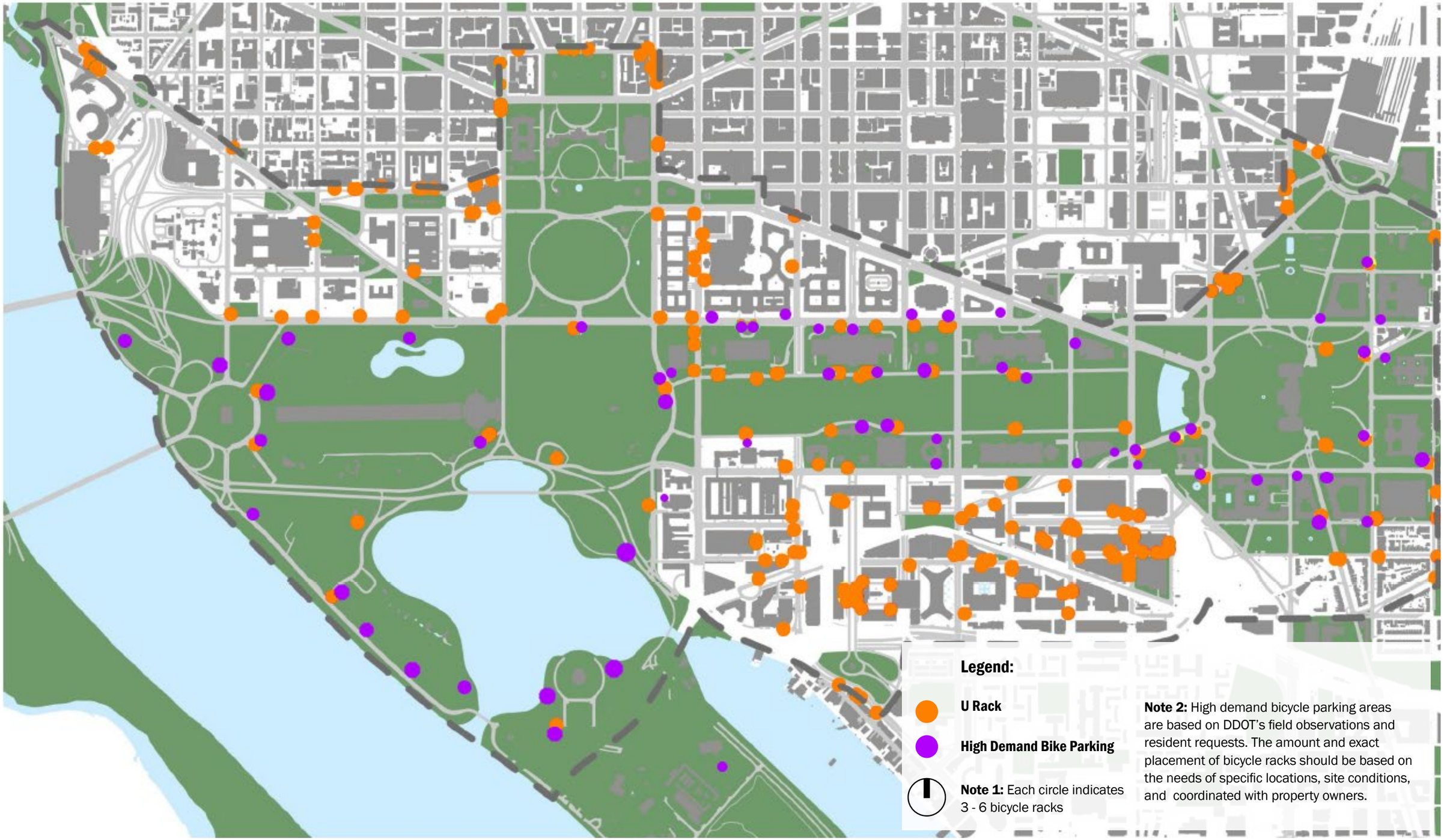
a. at least two (2) feet from buildings;
b. at least three (3) feet from the curb (from center of bicycle rack);
c. at least three (3) feet from parking meters, newspaper boxes, mailboxes, street light poles, sign poles, tree boxes, trash and recycling receptacles, parking pay stations, and other street furniture and civic infrastructure;
d. at least four (4) feet from loading zones, bus stops, bus shelters, and bus benches;
e. at least five (5) feet from fire hydrants and crosswalks;
f. at least two-and-a-half (2½) feet apart [four (4) feet preferred] when oriented side-by-side and perpendicular to the curb;
g. at least eight (8) feet apart [ten (10) feet preferred] when oriented end-to-end and parallel to the curb; and
h. to maintain at least six (6) feet of clear pedestrian sidewalk space (see DDOT's DEM 29.5.4; DDOT's Bicycle Facility Design Guide; DDOT's Bike Parking Guide).

BR-6. Ensure personnel responsible for snow removal are consulted on bicycle rack placement.

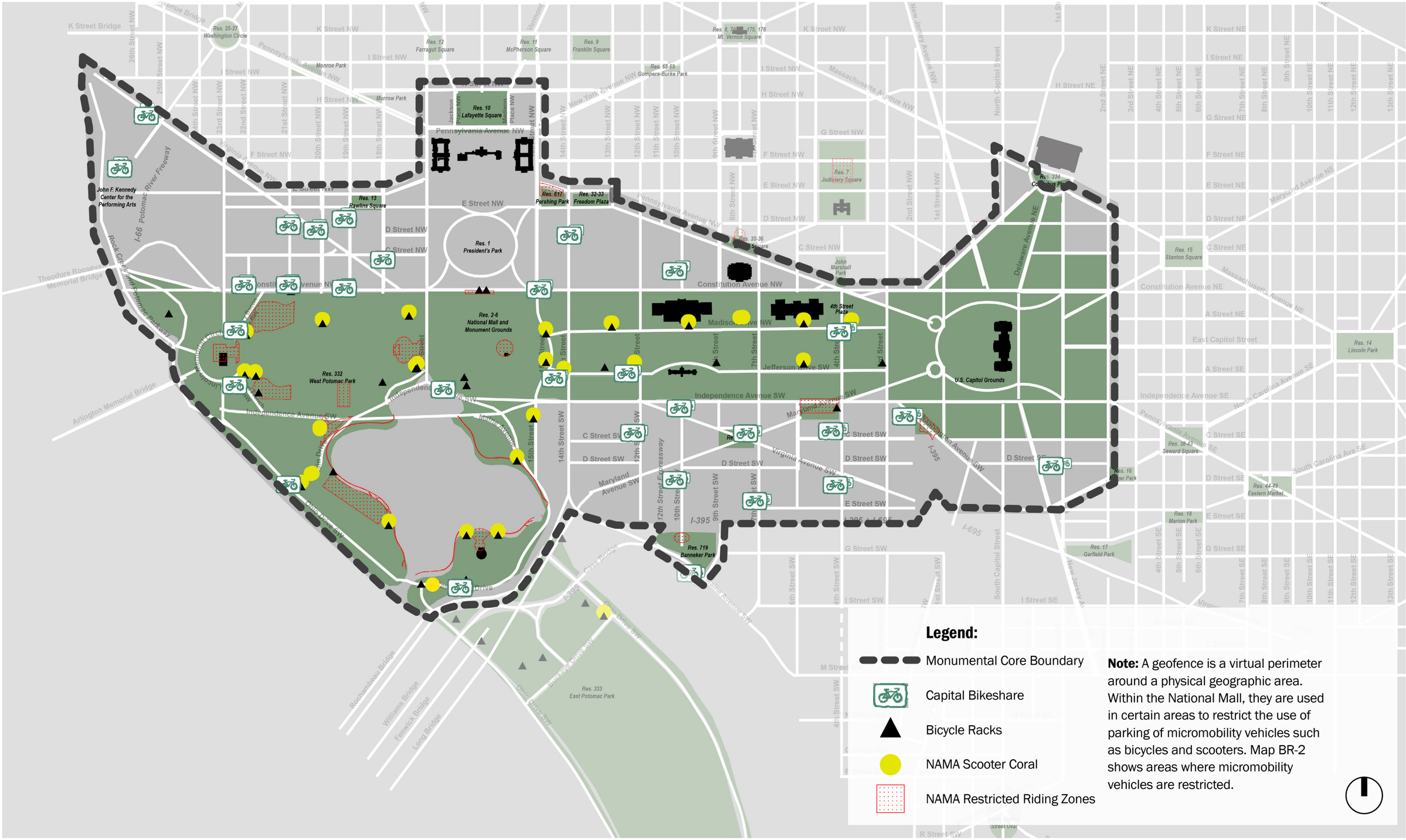
BR-7. Encourage installation of additional bicycle racks in high-demand areas and at the periphery of geofenced locations to address the demand and requirement for locking parked micromobility vehicles to bicycle racks.

See Map BR-1 : High-Demand Bicycle and Micromobility Parking Areas and Map BR-2 : Geofenced Areas and Bicycle and Micromobility Parking.

Map BR-1: High Demand Bicycle and Micromobility Parking Areas



Map BR-2: Geofenced Areas and Micromobility Parking



Appearance

Principle:

Bicycle rack design should be simple, user-friendly, and compatible and complementary with other streetscape elements.

BR-8. Apply the "inverted-U" bicycle rack style to:

a. accommodate multiple parking spaces per rack and consolidate bicycle parking within streetscapes;
b. support the bicycle frame in at least two places;
c. allow the frame and wheel to be locked using a U-lock or cable lock;
d. prevent the bicycle from tipping over;
e. allow front-in or back-in parking; and
f. allow scooters and a variety of bicycles, including children's bicycles, tandems, and recumbents to be secured (District's PRDM 3.7.2; DDOT's Bicycle Facility Design Guide 3.5.1; DDOT's Bike Parking Guide).

BR-9. Discourage use of "wave" style racks.

BR-10. When replacing or installing new bicycle racks, encourage use of the "inverted-U" bicycle rack style.

BR-11. Select or apply black material or paint for bicycle racks.

Function

Principle:

Provide durable and serviceable bicycle racks.

BR-12. Securely anchor bicycle racks to paving or pads using tamper proof hardware.

BR-13. Use a durable material such as galvanized or stainless steel for bicycle rack construction (required for racks on public property).

BR-14. Bicycle racks must be coated with rubberized PVC or thermoplastic (DDOT's Bike Parking Guide).

Figure BR-2: Additional bicycle racks are needed to prevent high volume and overcrowding of bicycles and micromobility vehicles, as shown here at the Smithsonian National Museum of American History.

Small-Scale Elements

Post - and - Chain

Figure PC-1: Post-and-chain, adjacent to a pathway on the National Mall.

Introduction

This guidance addresses post-and-chain in the public ROW within the capital city's monumental core.

Importance and Background:

Landscapes and plantings are important for their ecological function and post-and-chain is important because it guides pedestrian movement and protects trees and vegetation from pedestrian foot traffic. Post-and-chain is generally applied along NPS and other federal properties and contributes to streetscape character and consistency.

Topics Addressed by these Guidelines:

The post-and-chain guidelines are organized into the following topics:

- **Placement:** Addresses post-and-chain uses and locations within the streetscape.
- **Appearance:** Addresses post-and-chain design criteria.

Placement

Principle:

Use post-and-chain to guide pedestrian movement and to protect sensitive environments where appropriate.

PAC-1. Use post-and-chain to:

a. guide pedestrian circulation;
b. protect planting beds and prevent trampling vegetation;
c. prevent small and micromobility vehicle access (such as maintenance vehicles and special event set-up vehicles); and
d. provide low barriers while avoiding visual impacts in sensitive areas (such as commemorative sites).

Note: Post-and-chain placed in District ROW requires a covenant of maintenance.

PAC-2. Place post-and-chain at the backside edges of pedestrian walkways and sidewalks to maintain open circulation space and avoid hazards to pedestrians.

Appearance

Principle:

Design post-and-chain barriers to be compatible and complementary with other streetscape elements.

PAC-3. Apply consistent post-and-chain height within the public ROW.

Note: The Streetscape Construction Manual specifies a height of 3'-1".

PAC-4. Size post-and-chain posts as follows:

a. One-inch diameter posts along interior pedestrian walkways.
b. Two-inch diameter posts along roadways.

PAC-5. Select or apply black color paint or material for post-and-chain.

Figure PC-2: Post-and-chain along the pathway protects the root systems of adjacent trees.

Small-Scale Elements

Electric Vehicle Charging Stations

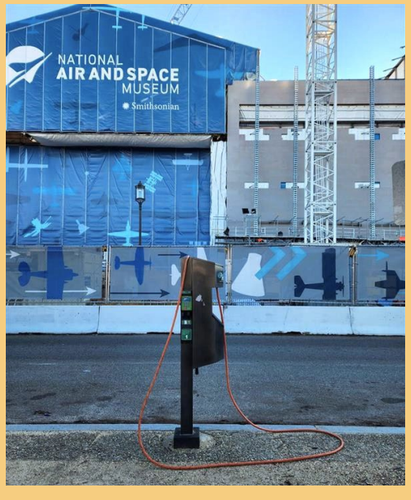


Figure EV-1: An existing EV charging station located in front of the National Air and Space Museum. The guidelines require proposed EV charging stations to include retractable cords to prevent tripping hazards and barrier to accessibility.

Introduction

Electric vehicle (EV) charging stations are classified into three categories as currently defined by the U.S. Department of Transportation. The categories are based on how the power output is delivered by the EV charging stations which correspondingly impacts the speed at which the station will charge an electric vehicle.

- **Level 1 –** use a residential 120-volt outlet and can take 40-50 hours to charge an EV battery from empty to 80%.
- **Level 2 –** use either 208-volt or 240-volt outlet and can take 4-10 hours to charge an EV battery from empty to 80%.
- **Level 3 –** use direct current (DC); are also called fast charging stations.

Due to the land uses and historic resources in the monumental core, Level 1 and Level 3 EV chargers are not permitted within the right-of-way in the monumental core. While this guidance addresses Level 2 chargers in the public ROW, their placement is restricted.

Importance and Background:

Electric vehicles help advance sustainability goals by reducing greenhouse gas emissions. EV charging station stations will become more common and prominent as EV infrastructure expands nationwide in response to rapid adoption of EVs by consumers, better technology, and federal investment.

EV charging stations must be located adjacent to vehicle parking. In urban areas this is often along the curbside of streets, which competes with the primary use of the right-of-way: to move people, goods, and services; curbside bike and bus lanes; and loading and unloading operations. It is important that the introduction of these new elements consider local urban transportation policies to promote a mode shift from personal vehicles to transit and other micromobility transportation modes, thereby encouraging EV charging stations to be placed in publicly accessible parking locations such as libraries, schools, and grocery stores.

Topics Address by these Guidelines:

The EV charging station guidelines are organized into the following topics:

- **Placement:** Addresses the location of EV charging stations within the streetscape and the proximity of charging stations to other streetscape elements.
- **Appearance:** Addresses compatibility of EV charging stations with other streetscape elements.
- **Function:** Addresses maintaining EV charging station functionality and performance while minimizing potential hazards in public space.

EV Chargers: An Emerging Technology

As an emerging technology, best practices for publicly accessible EV charging stations are still being developed, tested, and refined in many communities. Agencies should closely follow advancements in EV charging technology and be adaptive as technologies advance.

Placement

Principle:

Limit and carefully site EV charging stations to discourage conflicts with other streetscape elements, coordinate with other curbside uses, and align with adjacent institutional missions or identities.

EV-1. Level 2 EV chargers are limited to streetscapes adjacent to agencies or institutions whose mission, identity, or educational objectives align with promoting alternative fuel technologies.

EV-2. Level 2 EV chargers should be co-located along a block, at metered parking spaces, and be placed within the furnishing zone, adjacent to the step-out zone where least disruptive to the streetscape and curbside uses in accordance with DDOT's Electric Vehicle Charging Stations Permit Application Process.

EV-3. Level 2 EV chargers should not be placed along radial streets.

EV-4. Level 2 EV chargers may be placed along edging, traversing, or connecting streets, except where these chargers' impact:

a. historic nationally significant resources, vistas, or viewsheds;

b. current and future uses of the right-of-way, such as emergency evacuation routes, routes that must accommodate peak demand traffic, or curbside uses;

d. impact pedestrian movement, such as high foot traffic or important circulation functions; and

f. impact public space, ecologically significant areas, existing tree health or future tree plantings; and

g. align with building and storefront entryways.

EV-5. Level 2 EV chargers shall not be placed, at a minimum, within:

a. ten (10) feet of clear pedestrian paths within the Central Business District and six (6) feet from the clear pedestrian paths throughout the rest of the monumental core;

b. ten (10) feet of clearance from a fire hydrant;

c. twenty-five (25) feet from a marked or unmarked intersection;

d. two (2) feet of clearance from the curb;

e. two (2) feet of clearance from the outermost edge of curb ramp flares and within a five (5) foot radius from the top edge of curb ramps;

f. three (3) feet of clearance from light poles, utility poles, traffic signals, and bike racks;

g. five (5) feet from an alley, driveway, stop bar (line extended), and each end of a Capital Bikeshare station; and

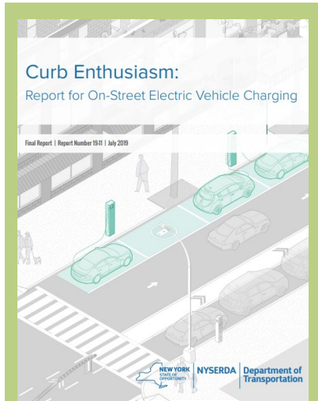
h. six (6) feet of clearance from the rear wheel of a docked Capital Bikeshare bicycle.

EV-6. Level 2 EV chargers must comply with DDOT's Standard Specifications for Highways and Structures (2013 or most recent version) for tree and root protection (Section 608) and trees and utilities (Section 207). Any new conduits for charging stations shall be:

a. outside the drip line Tree Protection Zone for all existing street trees; the drip line shall be determined based upon the projected drip line at tree maturity.

b. within fifteen (15) feet of any open tree planting space that will prevent the siting of a new street tree according to the records of DDOT's Urban Forestry Division.

EV-7. On one-way streets with parallel parking, place EV chargers on the driver's side where most charging ports are located.



NYC Curb Enthusiasm

New York City's 2019 Curb Enthusiasm: Report for On-Street Electric Vehicle Charging provides guidance for the design and planning of publicly accessible EV charging infrastructure, including case studies from New York and across the globe.

Link: Curb Enthusiasm EV Charging Report

Appearance

Principle:

EV charging stations should be compatible and complementary with other streetscape elements.

EV-8. EV charging stations should have minimal profile; the size and bulk of EV charging stations shall be compatible with pedestrian-scaled elements.

EV-9. The color of EV charging stations should be gray and compatible with parking pay stations.

EV-10. EV charging stations should not show any logo, branding, decal, signage, or advertising, including digital screens or audio.

EV-11. Any lighting indicators shall be minimal in appearance and limited to its operation and charging status.

Function

Principle:

EV charging stations should be designed and located to be convenient to drivers and minimize potential disruptions in public space.

EV-12. EV charging stations must follow ADA/ABA standards. The height of the user interface should be between 42-48 inches to be reachable by a person on a mobility device.

EV-13. EV charging cables/cords must be designed to:

a. be convenient for user operation;

b. be retractable to limit potential tripping hazards (National Electrical Code 625.17); and

c. avoid crossing sidewalks and pathways within the public ROW.

Figure EV-2: EV charging station located on the National Mall, with retracted cord.

EV-14. EV charging stations should only be installed in locations where agencies have the capacity and resources for ongoing maintenance. Maintenance responsibilities should be determined prior to installation.

EV-15. Encourage IWG collaboration regarding how to incorporate EV charging stations within existing streetscape elements such as telecommunication poles to minimize streetscape clutter.

Figure EV-3: EV charging station located on the National Mall.

Small-Scale Elements

Parking Pay Stations

Figure PS-1: Multi-space parking pay stations reduce the need for parking meters at individual parking spaces.

Introduction

This guidance addresses multi-space parking pay stations in the public ROW within the capital city's monumental core.

Importance and Background:

Multi-space parking pay stations are important because they provide a convenient curbside parking payment option and limit streetscape clutter by reducing the need for multiple individual-space parking meters. Parking pay stations should be usable by people of all abilities, contribute to streetscape consistency, and not impede the pedestrian experience.

Topics Address by these Guidelines:

The parking pay station guidelines are organized into the following topics:

- **Placement:** Addresses the location of parking pay stations within the streetscape, proximity of parking pay stations to other streetscape elements, orientation of parking pay stations, and accessibility of parking pay stations.
- **Appearance:** Addresses compatibility of parking pay stations with other streetscape elements.
- **Function:** Addresses parking pay station installation and serviceability.

Placement

Principle:

Provide parking pay stations to reduce streetscape clutter, provide convenience for drivers, and improve the pedestrian experience.

PS-1. Consider surrounding land uses and parking demand, duration, supply, type, and enforcement when locating parking pay stations.

PS-2. Encourage use of multi-space parking pay stations and reduce use of individual parking meters, which clutter the streetscape.

PS-3. Place parking pay stations:

a. To avoid:
i. Impacting pedestrian circulation space;
ii. Aligning with building and storefronts entryways; and
iii. Cluttering nationally significant vistas or viewsheds.
b. Near parking spaces linked to the pay station as follows:
i. No more than six (6) car lengths on DDOT roadways;
ii. No more than ten (10) car lengths on NPS roadways;
c. Facing away from the street to improve user safety;
d. Thirty (30) inches from the curb to minimize conflicts with vehicle doors;
e. Three (3) feet from other streetscape furnishings such as bicycle racks, light posts, trash and recycling receptacles, and benches;
f. Four (4) feet from tree boxes (District's PRDM, DDOT's DEM).

Appearance

Principle:

Parking pay stations should be compatible and complementary with other streetscape elements.

PS-4. Select titanium gray as parking pay station color to be compatible with EV charging stations and surrounding streetscape furnishings.

Function

Principle:

Provide convenient and serviceable parking pay stations for people of all abilities.

PS-5. Multi-space parking pay stations and individual parking space meters must follow ADA/ABAAS standards.

PS-6. Provide universally accessible parking pay stations or individual parking space meters for designated universally accessible parking spaces in accordance with PROWAG, US Access Board, or local standards.

Note: District roads typically provide one universally accessible parking space per block face.

PS-7. Provide an accessible path from the universally accessible parking space to the corresponding pay station or meter.

Note: Universally accessible parking spaces are indicated with signage using ADA symbols.

Small-Scale Elements

Water Stations

Introduction

This guidance addresses water stations in the public ROW within the capital city's monumental core.

Importance and Background:

Water stations are important because they provide public drinking water, which improves pedestrian comfort, enjoyment, and safety within public spaces. Water stations include both water fountains and water bottle filling stations. Water stations should be usable by people of all abilities, contribute to streetscape consistency, and not negatively impact the pedestrian experience.

Topics Address by these Guidelines:

The water station guidelines are organized into the following topics:

- **Placement:** Addresses the location and access to water stations within the streetscape and the proximity of water stations to other streetscape elements.
- **Appearance:** Addresses compatibility of water stations with other streetscape elements.
- **Function:** Addresses water station installation and serviceability.

Placement

Principle:

Increase availability of water stations to enhance pedestrian comfort throughout the monumental core, particularly in areas with large pedestrian volumes.

WS-1. Encourage installing more water stations throughout the monumental core.

WS-2. Place water stations in areas with high pedestrian volumes and where large groups gather.

WS-3. Locate water stations to avoid conflicts with universally accessible pedestrian circulation and with a universally accessible connection from the main circulation route.

WS-4. Locate water stations at least two (2) feet from the face of curb.

WS-5. Place water stations in well-lit areas with open sightlines, and outside of nationally significant vistas or viewsheds.

WS-6. Locate water stations away from trees to prevent damage from tree roots.

Appearance

Principle:

Water stations should be compatible and complementary with other streetscape elements and consistent across character areas.

WS-7. Water station design should be universal and user-friendly.

WS-8. Select or paint water stations black to harmonize with other pedestrian-scaled streetscape elements such as waste receptacles and post-and-chain.

Function

Principle:

Provide universally accessible and serviceable water stations.

Figure WS-1: Water stations are designed for accessibility.

WS-9. Water stations should be accessible from 180 degrees to serve both left- and right-handed users of all abilities.

WS-10. The universally accessible side of the water station must be oriented adjacent to a minimum five (5)-foot wide paved path with connectivity to the main pedestrian travel path.

WS-11. Install water stations on a hardscape surface with less than a two (2) percent slope in any direction.

WS-12. Design and install water stations to prevent wet and/or slippery areas around water stations.

WS-13. Encourage timely maintenance of water stations to ensure public access to drinking water.

Small-Scale Elements

Fire Hydrants

Introduction

This guidance addresses fire hydrants in the public ROW within the capital city's monumental core. Fire hydrants should contribute to the consistency of the streetscape and public safety, and not impede the pedestrian experience.

Importance and Background:

Fire hydrants are important because they provide access to water supply for public safety.

Topics Address by these Guidelines:

The fire hydrant guidelines are organized into the following topics:

- **Placement:** Addresses the location of fire hydrants within the streetscape.
- **Appearance:** Addresses visual compatibility of fire hydrants with other streetscape elements.
- **Function:** Addresses functional requirements for fire hydrants.

Placement

Principle:

Provide fire hydrants for access to water supply for public safety.

FH-1. Place fire hydrants two (2) feet from the face of curbs, or one-and-a-half (1½) feet minimum from the back edge of a sidewalk, or ten (10) feet minimum from edge of pavement if no curb is present. In addition, the water line must be located such that the valves are not in the wheel path of the street lane (DDOT's DEM 9.5.2).

FH-2. Place fire hydrant at least ten (10) feet from trees (DDOT's DEM 37.5.2).

FH-3. Place fire hydrants at least six (6) feet from streetlights (DDOT's DEM 43.2.1.5).

FH-4. On the sidewalk side, provide a three (3)-foot minimum clearance around hydrants (DDOT's DEM 28.8.4.4).

FH-5. On the street side, provide a ten (10)-foot clearance in each direction longitudinally along the street, and a four (4)-foot clearance into the street to create a four (4)-foot by twenty (20)-foot access area. This access area may be paved with permeable pavement (DDOT's DEM 28.8.4.4).

FH-6. Do not place fire hydrants less than two (2) feet from the face of curb or in any location that would obstruct sight distance, unless approved otherwise by relevant agencies (DDOT's DEM 30.13.6).

FH-7. Make every effort to place fire hydrants to achieve a minimum sidewalk clear width of at least four (4) feet to allow wheelchair passage. (DDOT's DEM 31.2.1.1).

FH-8. Fire hydrants must be of the breakaway type or located as far from the traveled way as possible. However, they must be located where they will always be readily accessible. Where a guard rail is required and will be in front of a hydrant, the preferred treatment is to raise the hydrant so that connection can be made over the guide rail (DDOT's DEM 36.2.8).

Appearance

Principle:

Fire hydrant designs should be compatible with other streetscape elements and meet color safety codes.

FH-9. Select or paint the fire hydrant body color green per DC Water and DC Fire and Emergency Medical Services Department standards. Refer to the Construction Manual for fire hydrant color specifications. See Appendices (A-Map F-1) for color of fire hydrants in the monumental core area as of June 2022.

Note: Black and grey painted hydrants are out of service or privately owned.

FH-10. Use fire hydrant tops, outlet caps, or band colors to indicate water pressure. Bands may be reflective to enhance nighttime visibility.

Figure FH-1: Green fire hydrants signal that the hydrant is operational. Black hydrants signage the fire hydrant is not operational.

Function

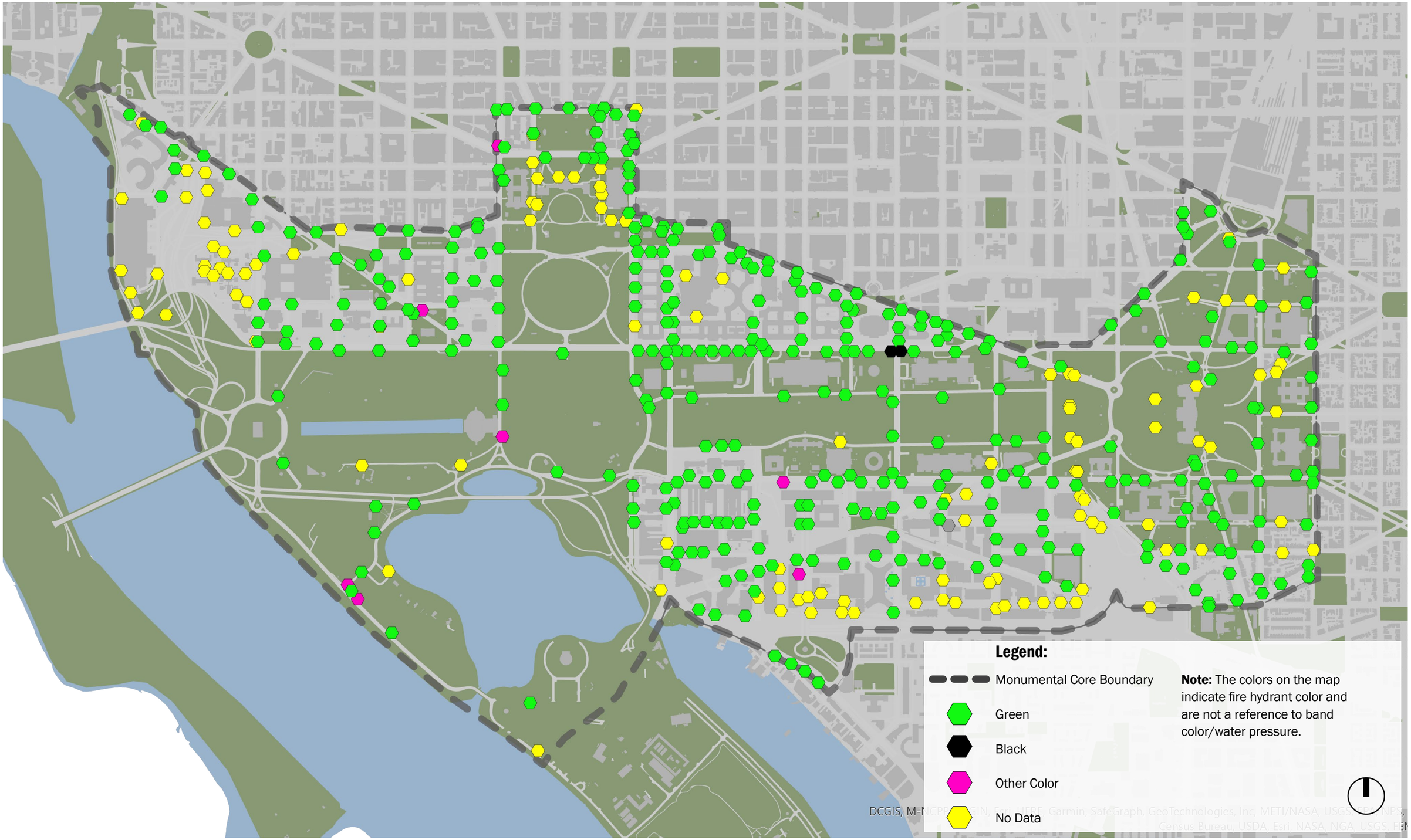
Principle:

Fire hydrants should maintain safe and efficient operations and maintenance.

FH-11. Maintain a no parking zone in front of a fire hydrant or within ten (10) feet in either direction from the centerline of the fire hydrant (DDOT's DEM 45.1.5).

FH-12. Ensure 360-degree accessibility to fire hydrants for maintenance flushing and emergency response by fire fighters.

Map FH-1: Fire Hydrant Colors



Small-Scale Elements

Utility Boxes

Figure UT-1: Utility box located in the monumental core. Utility boxes should be located in a way that does not block visibility.

Introduction

This guidance addresses utility boxes in the public ROW within the capital city's monumental core. Utility boxes should blend in with streetscape surroundings and not impede the pedestrian experience.

Importance and Background:

Utility boxes are important because they support critical networks of civic infrastructure:

- **Traffic and communications utility boxes** facilitate safe pedestrian and vehicular traffic movement and communications operations, including cellular, Wi-Fi, and cable.
- **Electric utility boxes** such as meters, transformers, and manhole covers; and water utility boxes such as auto flushers, backflow preventers, sensor instruments, and manhole covers facilitate basic energy and water utility operations.

Note: Security communication systems have their own standards and may have unique requirements not addressed in the following guidelines. Wireless communications, such as 5G small cell, are addressed under the topic of Small Cell Cross References. See Table UT-1 for different types of utility boxes and utility providers.

Topics Address by these Guidelines:

The utility box guidelines are organized into the following topics:

- **Placement:** Addresses the location of utility boxes within the streetscape.
- **Appearance:** Addresses visual compatibility of utility boxes with other streetscape elements.
- **Function:** Addresses functional requirements for utility equipment, system components, and containers .

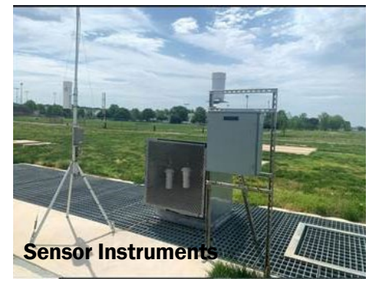
Utility Types

Traffic (DDOT)

Communications (DDOT)

Electric (Pepco)

Water (DC Water)



Note: The guidelines address the location, size, and materials of utility boxes, which varies by their function.

Placement

Principle:

Accommodate utility boxes within the streetscape while minimizing impacts to pedestrian circulation and public space.

All Utility Boxes

UT-1. Place utility boxes:

a. adjacent to other streetscape elements to minimize streetscape clutter;
b. to maximize space for stormwater management, planting, and placement of street furnishings;
c. to not interfere with the planting of required trees;
d. to avoid impacting pedestrian circulation space, building entry/exit or storefronts, and vistas or viewsheds;
e. to avoid creating visual obstacles at intersections – see DDOT's DEM 30.5.1 Sight Distance;
f. closer to buildings to maintain a pedestrian clear zone when space is limited;
g. to allow necessary access for maintenance and emergencies; and
h. to not interfere with snow removal and other maintenance equipment navigating the sidewalk.

UT-2. To the maximum extent practicable, avoid placing utility boxes within the step-out zone and pedestrian clear zone to support unencumbered pedestrian circulation along the curbside and sidewalk areas.

UT-3. Utility boxes placed within grassy areas should use a concrete foundation.

UT-4. Utility boxes placed within roadways should be installed below-grade and flush with the roadbed to mitigate conflicts with snow removal and other maintenance equipment.

UT-5. Encourage IWG coordination with utility providers during design, planning, and construction stages to locate utilities in a manner that avoids or minimizes impacts to the streetscape.

Traffic and Communications Utilities

UT-6. Place traffic and communications utility boxes within the furnishing zone, and three (3) feet from a building, and four (4) feet from the curb, where possible.

UT-7. Place traffic control boxes so that maintenance and repair technicians can view both traffic control box access doors and pedestrian and vehicular movements within a signalized intersection, to avoid traffic conflicts when working on traffic signals.

Electric and Water Utilities

UT-8. Incorporate electrical and water utility boxes into landscape designs and screen utility boxes with vegetation, where possible.

UT-9. Electrical transformer pad-mounts should have a minimum clearance of ten (10) feet in front and three (3) feet on the sides. See Pepco's ESH (Clearance Requirements for Oil Filled Equipment, Figure #30C).

UT-10. Place electrical control boxes, sensor instruments, auto flushers (and backflow preventers) within their enclosures as inconspicuous to the public as reasonably possible, away from pedestrian and vehicular traffic zones, and at accessible locations for maintenance and repair technicians.

Appearance

Principle:

Principle: Utility boxes should blend in with surroundings and not detract from viewsheds and vistas or other streetscape elements.

All Utility Boxes

UT-11. Appearance of utility boxes should blend in with surroundings and mitigate solar heat gain.

UT-12. Coordinate with utility providers on changes to the standard color of utility box enclosures, access doors, hatches, and manhole covers.

Traffic and Communications Utilities

UT-13. Select or paint traffic and communications utility boxes as follows:

a. Light grey in urban areas.
b. Dark green in natural and landscaped areas shaded by trees.

UT-14. Traffic box beautification and art is prohibited within National Mall and Memorial Park, and NPS reservations.

UT-15. For areas outside of the National Mall and Memorial Parks and NPS reservations, Encourage development of design criteria and review process for beautification and art on traffic and communications utility boxes in the District ROW in coordination with DDOT's beautification program.

Figure UT-2: The guidelines discourage utility boxes from being located in the step-out zone or in pedestrian clear zones.

Electric and Water Utilities

UT-16. Select or paint electrical and water utility boxes as follows:

a. Light grey in urban areas.
b. Dark green to blend in with natural and landscaped areas.

UT-17. Sensor/instrumentation controls boxes should be shaded by trees if dark green.

UT-18. Backflow preventers should have an enclosure to avoid exposed piping and blend in with the surroundings.

UT-19. Vault covers should have the following appearance based on location:

a. Sidewalk: should match the adjacent sidewalk pavement material and color.
b. Landscaped Public Parking: should be surrounded by landscaping buffer on all sides facing a ROW. See DDOT's PRDM 5.4.2.2 Vault Placement and Covers.

UT-20. Manhole covers should be in metal/cast iron color. See DDOT's SSHS 309.03 Sewer Manholes.

UT-24. Uninterrupted power supply boxes (battery packs) attached to traffic and communications utility boxes should have a slim profile and be selected or painted the same color to appear as one cohesive unit.

Electric and Water Utilities

UT-25. Select fiberglass or composite plastic material for water utility boxes for durability and ability for telemetric readings. Select fiberglass material for electric utility boxes for durability and ability for telemetric readings.

UT-26. Install auto flushers where necessary to maintain water quality and chlorine residual and/or as directed by DC Water.

UT-27. Backflow preventer enclosures shall be insulated weatherproof and anchored to a concrete base. Pedestrians shall not use enclosures as a means of support.

Note: Refer to District's Plumbing Codes and DC Water's SS for more information on assemblies and installation.

Function

Principle:

Utility boxes should maintain safe and efficient operations and maintenance.

All Utility Boxes

UT-21. Paint utility boxes with graffiti resistant and easy to clean paint.

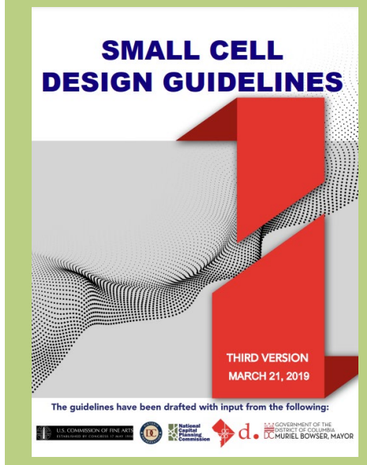
UT-22. Encourage use of a tamper proof access door lock to discourage unintended access to utility boxes.

Traffic and Communications Utilities

UT-23. Select aluminum material for traffic and communications utility boxes for durability and easy maintenance. See Model 336-SS cabinets with base adapter specifications in DDOT's SSHS (Section 825.01.03).

Small-Scale Elements

Small - Cell Cross References



DDOT's Small Cell Design Guidelines (2019)

The District's Small Cell Design Guidelines (2019) were developed in collaboration with CFA, DCSHPO, DDOT, and NCPC.

Link: Small Cell Design Guidelines

Information on maintenance of small-cell facilities is available within the Master License Agreement.

Link: Master License Agreement

Introduction

These cross references address small-cell or wireless communications technologies in the public ROW within the capital city's monumental core.

Importance and Background:

Wireless communications technology is important for providing daily and emergency-event communication to residents, workers, visitors, and emergency response and security providers. Cellular providers propose to increase the capacity of their networks by deploying small-cell infrastructure (small-cell), a new lower-powered antenna technology to reduce data traffic load on roof mounted equipment and larger cell towers.

Cross References

Quantity and Placement in District Rights-of-Way:

The District Department of Transportation (DDOT) is the lead agency and liaison with cellular providers and is responsible for permitting small cell facilities within District rights-of-way. In March 2019, the NCPC Commission approved DDOT developed Small Cell Infrastructure Guidelines that address quantity and placement of these facilities along District rights-of-way. These guidelines include a Federal Core Interest Area Map (Map SC-1) of potential locations for small cell facilities in areas around the federal core, excluding the National Mall.

As of March 2024, DDOT is working with NCPC, the U.S. Commission of Fine Arts, other District agencies and carriers to develop a design for a standalone small cell pole that will accommodate different wireless carrier antennas and equipment in District rights-of-way. The design of this infrastructure is critically important as it will potentially affect the aesthetics and function of public streets and spaces. The concept design, shown in Figure SC-1, below, is in design development based on review by federal and District agencies. Once approved, the proposed standalone small cell pole will be used District-wide.

Quantity and Placement on Federal Lands :

The Department of Homeland Security (DHS) is leading an inter-agency discussion about the quantity and placement of standalone small cell poles on the National Mall and the immediate vicinity. The National Park Service is preparing an Environmental Assessment that will consider the wireless capacity and coverage needs on the Mall, and the resulting quantity and placement of small cell poles needed to address deficiencies. The federal agencies will have an opportunity to review and comment on the proposed placement and design of these small cell poles. Any proposed facilities on federal land within the District requires submission by the land-holding federal agency to NCPC for review and approval.

Once completed, the Monumental Core Streetscape Manual will be updated to include or appropriately reference the District and federal guidelines and small cell pole design.

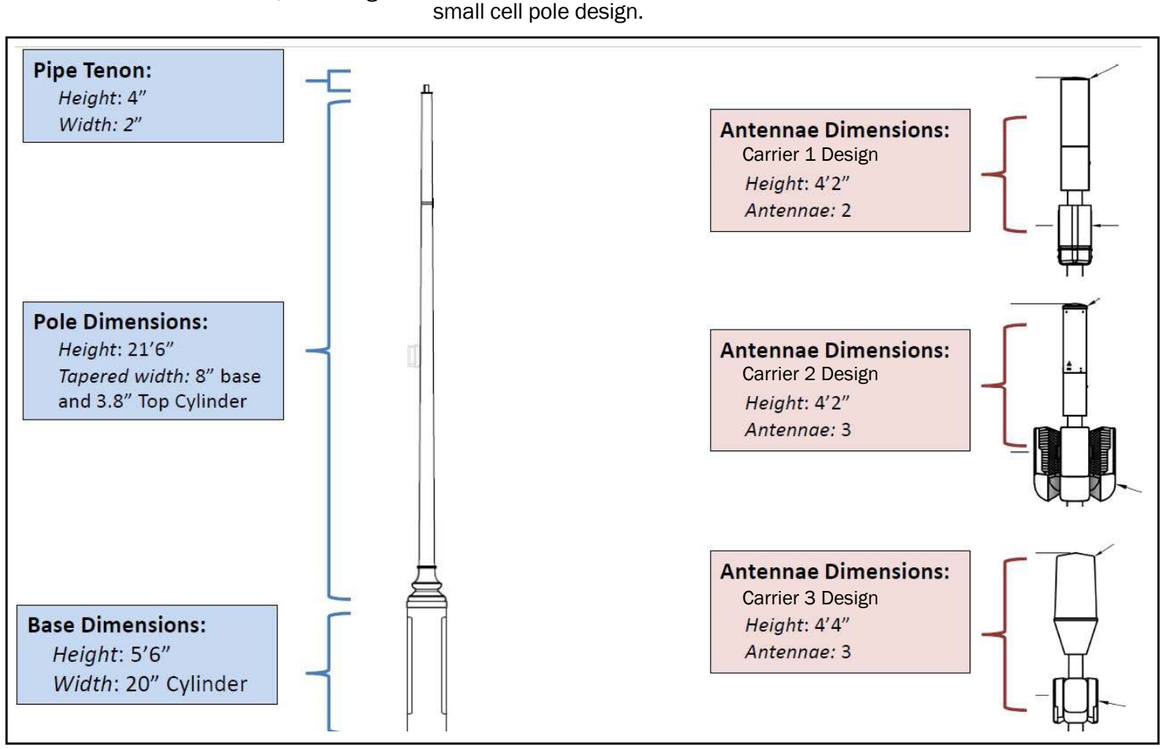


Figure SC-1: Concept design for small-cell poles and antennaes. Different carriers have different antennae designs; however, all carriers will use the same pole design for consistency throughout the streetscape.

Map SC-1: Potential Small-Cell Locations