Critical Work:
Innovative Green Infrastructure Regulations Transforming D.C.

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Learning Objectives:

1. Understand the factors driving environmental regulations in the District of Columbia (District).
2. Understand specific regulatory requirements of the public right of way, stormwater management and Green Area Ratio regulations.
3. Understand the typical challenges faced by projects in complex urban settings and workarounds and exceptions to environmental regulations.
4. Learn potential areas of interdisciplinary collaboration, especially between landscape architects and engineers, in early stages of the design process.
ENVIRONMENTAL REGULATION DRIVERS

What is the recipe for change and what factors will lead to success? In Washington, D.C., the combination of policy, leadership, environmental advocacy, and committed staff has created the innovative Green Infrastructure framework that exists today. One of the District’s primary environmental goals is to make the Anacostia River fishable and swimmable by 2032. This ambitious goal is the result of a collaborative vision developed by stakeholders including the District government, Federal government, environmental organizations and community leaders. Information to be discussed:

I. Federal Policy
   a. Municipal Separated Storm Sewer (MS4) Permit
   c. District of Columbia 3rd Generation MS4 Permit 2011

II. Impaired River – The Anacostia
   b. Anacostia 2032: Plan for a Fishable & Swimmable Anacostia

III. Local Elected Leadership & Policy

IV. National and Local Environmental Organizations

V. Making Change
   a. Agency leadership committed to vision
   b. Staff committed to issue and leading change at the implementation level
   c. Demonstration projects to show these techniques can be done
   d. Continued projects help mature designs and train staff
   e. Create regulations and design standards

VI. Keys to Success
   a. Stormwater is a local issue
   b. Cooperative relationships between regulators, implementers, public and private sectors will lead to success
The District’s extreme level of imperviousness (43%) results in increased stormwater runoff that places a burden on sewer systems and degrades aquatic resources when it is not managed adequately. Responding to federal, local, and scientific leadership on this issue, the District first adopted stormwater management regulations in 1988. In 2013 the District introduced new regulations that significantly improve and expand protection for District waterbodies by effectuating a fundamental shift in the management of stormwater runoff from a timing and quality approach to a stricter retention requirement. The new rule allows regulated sites the option of achieving a portion of their stormwater retention requirement off site, but still within the District, without having to first prove that on-site retention is infeasible. Information to be discussed:

I. Stormwater regulation’s essential role in achieving the vision of fishable and swimmable District waterbodies
   a. 2009 National Research Council National Academy of Sciences urban stormwater program review
   b. 2006 and 2011 Natural Resources Defense Council Rooftops to Rivers
   c. Swimmable Fishable by 2032
   d. Anacostia Waterfront Framework of 2003

II. Key retention requirements and MS4 permit
   a. Obligations applied uniformly across all stakeholders including public and private, residential and commercial, no exemptions or variances
   b. Triggers
      i. Major Land Disturbance
      ii. Major Substantial Improvements
c. Maximum Extent Practicable (MEP) for the reconstruction of existing Public Right of Way

III. Emphasis on design practicality and flexibility in meeting retention requirements
   a. Land abstraction,
   b. Best Management Practices (BMPs)
   c. Floors and ceilings for onsite and offsite management,

IV. Connecting stormwater management obligations with sustainability goals for improved environmental outcomes

V. Using stormwater credit trading and off-site retention to incentivize projects in lower cost, environmentally vulnerable areas of the city

VI. Implementing a regulatory process that is transparent, responsive, and fair to all stakeholders
   a. Scientifically defensible criteria applied equally across stakeholders
   b. Multiple rounds of comment and response
   c. Flexible compliance pathways
   d. Short transition periods
   e. Frequent and free, general and technical training

*Bioretention at 1200 1st St NE – DOEE Headquarters*
GREEN AREA RATIO

Site development in the District is typically characterized by large building footprints surrounded by impervious surfaces at the expense of vegetation and other green infrastructure alternatives. This approach results in adverse environmental consequences such as urban heat island effect, poor air quality and polluted runoff. The Green Area Ratio (GAR) is a zoning regulation that integrates sustainable landscape elements into parcel site design. The GAR sets minimum lot-coverage standards for landscape and site design features to promote greater livability, ecological function, improved aesthetics and climate adaptation in the urban environment.

Information to be discussed:

I. GAR defined
   a. A flexible green site design requirement that varies by zone.
   b. GAR is met by incorporating a standard set of landscape elements into the proposed site design such as: permeable paving, green roofs, plants (preserving existing and proposed), green facades, stormwater harvesting.
   c. Site must meet a minimum GAR score depending on zone.

II. Score calculation
   a. Each landscape element is translated into a square foot equivalent. The landscape elements are summed and divided by the square footage of the lot to calculate the score.

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   \text{GAR} = \frac{(\text{area of landscape element } 1 \times \text{multiplier}) + (\text{area of landscape element } 2 \times \text{multiplier}) + \ldots}{\text{Lot Area}}
   \]

   b. Elements are ‘stackable’ so credit may be received for multiple elements within a single footprint.
c. Projects that trigger a GAR submission:
   i. Most new construction and some renovations that require a certificate of occupancy.
   ii. Some exceptions apply to federal properties, projects with approvals prior to rule passage, projects with a special designation (e.g. historic resource). Check the Guidebook for additional details on exceptions.

III. Submissions must be signed by a Certified Landscape Expert (CLE) as defined by the regulation:
   a. Maryland or Virginia licensed Landscape Architect
   b. International Society of Arboriculture Certified Arborist
   c. Maryland certified Professional Horticulturist
   d. Landscape Contractors Assoc. MD-DC-VA certified Landscape Technician

IV. Submittal requirements: landscape plans and details for all landscape elements and a maintenance plan.

V. GAR submittal timing
   a. Submit GAR plans for new buildings during the foundation-to-grade (FD) or Civil (BCIV) permit to allow coordination with stormwater plan review.
   b. Submit GAR plans for additions or interior renovations during the Building Permit (B).

VI. CLE must be present for post-construction inspection and confirm the project has been constructed per plan.
DDOT GREEN STREETS STANDARDS

The 1791 L'Enfant Plan included wide city streets lined with trees as part of the capital city’s design. This tradition was expanded in 1870 when the District designated the public space between the sidewalk and property lines as green space and included it as part of the city’s park system. To build on this legacy, DDOT has issued Green Infrastructure Standards to incorporate green infrastructure practices into the public right of way. These standards will help clean the air, cool the city, provide habitat for wildlife, add green maintenance jobs, and help the District become the healthiest, greenest and most livable city in the nation. Information to be discussed:

I. Green infrastructure (GI) streetscape tools
   a. Bioretention & vegetated system variations
   b. Permeable Pavement
   c. Enhanced Tree Space Design

II. Designing to the “Maximum Extent Practicable” (MEP)
   a. Layout the GI first
   b. ID Opportunities
   c. ID Conflicts
   d. Submit detailed plans at each phase of design and concurrence to proceed
   e. Creating an Integrated Streetscape and Road design
   f. Multiple Benefits to MEP

III. Areas for special focus
   a. Utility coordination – GI can coexist with utilities
   b. Structure design
   c. Pedestrian and vehicle safety
   d. Water flow

IV. Funding & Maintenance strategies in a public agency
REFERENCES

Green Area Ratio information including Guidebook, forms, submittal requirements and training opportunities: http://doee.dc.gov/gar

Green Area Ratio training presentation: http://doee.dc.gov/node/814982

Stormwater Management database: http://doee.dc.gov/swdb

Stormwater Retention Credit trading program: http://doee.dc.gov/src

Stormwater Management Rule and Guidebook: http://doee.dc.gov/swregs

Green Streets Standards: http://ddot.dc.gov/greeninfrastructure