

# GIVING GREEN STREETS THE GREEN LIGHT:

## Improving Water Quality Through Capital Improvement Policies

June 2019





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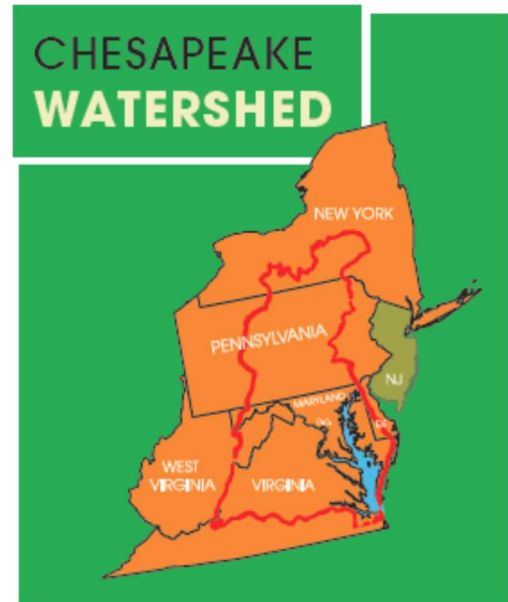
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## Executive Summary

The Chesapeake Bay watershed is recognized as a national treasure.<sup>1</sup> The watershed is home to 18 million people, extends over 64,000 square miles,<sup>2</sup> and is credited with a \$1 trillion economic value.<sup>3</sup>

At the same time, the Chesapeake Bay watershed is considered an impaired water body due to pollution,<sup>4</sup> with nitrogen and phosphorus loadings, in particular, at excessive levels. Federal, state, and local governments are working collaboratively to address the problem. In 2010, the U.S. Environmental Protection Agency (EPA) established a Total Maximum Daily Load (TMDL)—a “pollution diet”—to meet pollution reduction goals for nitrogen, phosphorus, and sediment discharged into the Chesapeake Bay and its tributaries.<sup>5</sup>

These issues are not unique to the Chesapeake Bay watershed. In fact, the vast majority of assessed water bodies across the United States are designated as impaired.<sup>6</sup>



Developed areas are a significant source of water pollution because of the high quantity of runoff produced by impermeable surfaces, such as asphalt and concrete. The percentage of impervious cover is significantly higher in urban areas; the average urban impervious cover in the United States is estimated at 25 percent, and this can be higher in densely populated areas.<sup>7</sup> The U.S. also features a high proportion of urban land use allocated to roads and surface car parks, as paved surfaces, compared to cities in other nations.<sup>8</sup> In fact, the Federal Highway Administration (FHA) estimates that more than 20 percent of U.S. roads are in urban areas.<sup>9</sup> In 2008, the EPA also estimated that urban roads—along with sidewalks and parking lots—constituted almost two-thirds of the total impervious cover and contributed a similar ratio of runoff.<sup>10</sup> These surfaces prevent water from being absorbed into the ground and naturally filtered.<sup>11</sup> Unmanaged stormwater can cause erosion, more localized flooding, and greater amounts of pollutants entering into waterways, as stormwater—rain or snowmelt flowing over these hard surfaces—collects pollutants on its way to the storm sewer system.<sup>12</sup>

<sup>1</sup> Exec. Order No. 13,508, 75 Fed. Reg. 23,099 (May 12, 2009) (stating the Chesapeake Bay is a “national treasure”).

<sup>2</sup> Facts & Figures, CHESAPEAKE BAY PROGRAM, <https://www.chesapeakebay.net/discover/facts> (last visited June 5, 2019).

<sup>3</sup> CHESAPEAKE BAY FOUNDATION. THE ECONOMIC ARGUMENT FOR CLEANING UP THE CHESAPEAKE BAY AND ITS RIVERS 1 (2012).

<sup>4</sup> *What is Killing the Bay?* CHESAPEAKE BAY FOUNDATION, <https://www.cbf.org/how-we-save-the-bay/chesapeake-clean-water-blueprint/what-is-killing-the-bay.html> (last visited June 3, 2019).

<sup>5</sup> *Addressing Nutrient Pollution in the Chesapeake Bay*, EPA, <https://www.epa.gov/nutrient-policy-data/addressing-nutrient-pollution-chesapeake-bay> (last visited June 3, 2019).

<sup>6</sup> *National Summary of State Information*, EPA, [https://ofmpub.epa.gov/waters10/attains\\_nation\\_cy.control#total\\_assessed\\_waters](https://ofmpub.epa.gov/waters10/attains_nation_cy.control#total_assessed_waters) (last visited June 3, 2019).

<sup>7</sup> David J. Nowak & Eric J. Greenfield, *Tree and Impervious Cover in the United States*, 107 LANDSCAPE & URB. PLAN. 21, 28 (2012).

<sup>8</sup> John Black et al., *Mainstreaming Green Infrastructure Elements into the Design of Public Road Reserves: Challenges for Road Authorities*, 6 INT’L J. ENVTL. PROTECTION 1, 3 (2016) (explaining Chicago’s PROW represents 23% of the city’s land area and San Francisco’s PROW comprises 25% of the city’s land area).

<sup>9</sup> EPA, EPA-833-F-08-009, MANAGING WET WEATHER WITH GREEN INFRASTRUCTURE. 1 (2008).

<sup>10</sup> *Id.*

<sup>11</sup> *See Nonpoint Source: Urban Areas*, EPA, <https://www.epa.gov/nps/nonpoint-source-urban-areas> (last visited June 3, 2019).

<sup>12</sup> *Id.*

The conventional strategy for managing urban stormwater is through “gray infrastructure” practices, such as gutters, pipes, and basins, which are designed to efficiently convey stormwater to local water bodies.<sup>13</sup> In a Municipal Separate Storm Sewer System (MS4), the stormwater is conveyed through dedicated storm sewers and discharged

Green Infrastructure Practices
Bioretention areas and vegetated swales
Direction of sheetflow to conservation areas
Dry wells
Enhanced filters
Green roofs
Infiltration trenches
Landscaped medians
Permeable paving materials
Preserving natural features, resources & drainageways
Reinforced turf
Disconnection of impervious surfaces
Parkways
Planter boxes
Rain gardens
Rainwater harvesting
Street trees
Submerged gravel wetlands
Underground detention

to waterways without treatment. In a Combined Sewer System (CSS), stormwater is collected and conveyed together with wastewater from homes and businesses via combined sewer mains to a sewage treatment plant. Storm events can result in the sewer system and treatment plant exceeding their capacity, ultimately causing sewer overflows and discharges of untreated co-mingled stormwater and wastewater into the environment.<sup>14</sup>

Many localities are turning to “green infrastructure” practices: conserving or mimicking green spaces and natural processes to retain and infiltrate stormwater where it is generated.<sup>15</sup> The goal is to prevent runoff from entering MS4s or CSSs, or to slow the rate of runoff introduction into these systems. The benefits have been extensively studied and include reduced stormwater volume, pollution prevention, and groundwater replenishment.<sup>16</sup>

Green Streets, in particular, constitute one method for addressing polluted urban runoff, by directly mitigating the environmental impact of roadways. **Green streets are public rights-of-way that incorporate green infrastructure in order to improve water quality** by providing for reduction and on-site pretreatment of stormwater prior to eventual release into local waterways. Green Streets reduce and mitigate the stormwater and other environmental impacts of surface transportation, and provide ancillary environmental, economic, and social benefits.<sup>17</sup>

A number of forward-thinking localities are implementing **Green Streets policies, or robust mandates to integrate infrastructure every time a municipality undertakes a capital project or significant maintenance work in the public right-of-way.** This establishes a programmatic method for transforming, over time, a substantial portion of transportation corridors into Green Streets.

Benefits of Green Streets Policies
<ul style="list-style-type: none"> <li>• Effective targeting for stormwater runoff control</li> <li>• Drives the overall adoption of green infrastructure in a systematic manner</li> <li>• Reduces the inconvenience of installing green infrastructure separately, by taking advantage of planned construction projects</li> <li>• Renders moot the problem of underground utilities (by upgrading those at the same time)</li> <li>• Cost savings (incorporation of green infrastructure features during reconstruction at a lower marginal cost than building those features alone)</li> </ul>

The Environmental Law Institute’s (ELI) goal in developing this white paper was to **determine best practices for local governments considering adopting policies to incorporate green infrastructure into all public right-of-way construction/reconstruction projects**, where feasible. ELI synthesized its findings into a **model ordinance** that is customizable—taking into consideration different local priorities and capacities—and that local governments can use as a pragmatic resource.

<sup>13</sup> See *Benefits of Green Infrastructure*, EPA, <https://www.epa.gov/green-infrastructure/benefits-green-infrastructure> (last visited June 3, 2019).

<sup>14</sup> See *National Pollutant Discharge Elimination System (NPDES): Combined Sewer Overflows (CSOs)*, EPA, <https://www.epa.gov/npdes/combined-sewer-overflows-csos> (last visited June 14, 2019); see also 40 C.F.R. § 122.2 (2018).

<sup>15</sup> Green infrastructure is also referred to as “environmental site design,” “low impact development,” and “non-structural best management practices.”

<sup>16</sup> *Benefits of Green Infrastructure*, *supra* note 13.

<sup>17</sup> *Id.*

ELI developed a clear definition of what constitutes a Green Streets policy in order to frame the analysis and offer guidance for Chesapeake Bay jurisdictions. There are four key elements:

1. The policy must be formally **adopted by a local government** and connected with its capital improvement program. The **type of instrument** (ordinance, resolution, executive order, non-binding policy, guidance) and its formal name (“Green Streets,” “Living Streets,” “Green and Complete Streets,” etc.) is less important than the content of the policy. Jurisdictions apply a variety of names and titles to their policies.
2. The policy must include a **trigger**, such that whenever construction/reconstruction occurs in the **existing** public right-of-way, green infrastructure elements are integrated. The policy *must* apply to preexisting roads and streets in order to have a measurable impact on water quality; ELI eliminated several jurisdictions from its review because their policies were limited to new roadway construction only.
3. The policy specifies green infrastructure is being integrated explicitly for the purpose of **better managing stormwater and mitigating water pollution**. A number of jurisdictions adopted “Complete Streets” policies—pertaining to multi-modal transportation corridors—which merely reference generic sustainability considerations.
4. The policy should be **systematic** in nature, creating a framework whereby **green infrastructure elements are incorporated whenever triggered**, and not on a piecemeal project basis—for example, when an agency receives one-time funding for green infrastructure.

ELI next canvassed local governments, directly contacting over 200 jurisdictions nationwide and over 500 jurisdictions in the Chesapeake Bay watershed alone. The nationwide review focused on the 100 most populous cities and the 100 most populous counties, in addition to a targeted search for any locality reputed to have adopted a Green Streets policy. The threshold population for the Chesapeake Bay watershed localities was 15,000 or more.

ELI ultimately identified **fourteen jurisdictions** of representative localities currently implementing Green Streets policies meeting the stringent definition. While only one jurisdiction in the Chesapeake Bay watershed—Prince George’s County—met ELI’s criteria, all localities in the watershed can benefit from the experiences of the other 13 municipalities from across the nation.

ELI then distributed a **survey** (Appendix B) to all 14 Green Streets jurisdictions and prepared **case studies** based on information gathered from the surveys, telephone interviews, and independent research.

Green Streets Jurisdictions
Ann Arbor, MI
Central Falls, RI
Cleveland, OH
Cleveland Heights, OH
Dallas, TX
Edina, MN
Fairbanks, AK
Kansas City, MO
Maplewood, MN
Nashville, TN
North St. Paul, MN
Portland, OR
Prince George’s County, MD
Tucson, AZ

ELI’s analysis produced the following set of **thirteen recommendations** for crafting a robust and effective Green Streets policy, which ELI incorporated into the Model Ordinance (Appendix A). This white paper discusses each recommendation in detail, notes how each Green Streets jurisdiction performs in applying that recommendation, and provides specific examples.



### Thirteen Green Street Policy Recommendations

- 1. Statement of intent**  
Clearly express the rationale for adopting the policy, and vision for carrying it out.
- 2. Clear definitions of key terminology**  
Provide precise, unambiguous definitions of key terms, such as *Green Streets*, *green infrastructure*, *maintenance*, and *public right-of-way*.
- 3. Straightforward guidelines for applicability**  
Set an explicit threshold for the types of projects that trigger the policy.
- 4. Narrowly-defined exemptions, providing for transparent decision-making process and oversight**  
Provide decision-makers with clear guidelines on what project categories may be excluded. The decision-making process should be transparent, well-documented, and subject to oversight by agency/executive leadership or the legislature.
- 5. Sustainable funding source**  
Identify long-term funding sources for both capital and maintenance costs.
- 6. Guidelines for inter-departmental and inter-agency coordination**  
Lay out protocols for coordinating Green Streets projects among all municipal bureaus and departments. Partner with watershed districts and neighboring jurisdictions to meet multiple water-quality goals on a regional basis by collaborating on projects and leveraging joint funding. Address potential conflicts with utilities and promote collaboration with other agencies sharing interests in the public right-of-way.
- 7. Robust accountability (implementation and monitoring)**  
Require key benchmarks and performance measures, specific indicators, monitoring protocols, and regular reporting.
- 8. Maintenance guidelines**  
Develop a maintenance plan, adopt clear protocols for grading the condition of Green Streets facilities, provide appropriate training, and ensure sufficient oversight and quality control/assurance.
- 9. Reliance on/reference to Green Streets/green infrastructure design guidelines and best practices**  
Either develop Green Streets design guidelines or refer to existing manuals of best practices and best available design standards that are respected by the industry and customizable to local conditions.
- 10. Incorporate Green Streets into relevant City/County planning, design standards, and other documents**  
Examples include the municipal code, Capital Improvement Program, transportation, land use, and other plans, manuals, internal policies and guidelines, checklists, decision trees, rules, regulations, and programs. Consider how various planning documents relate to each other.
- 11. Deploy pilot projects**  
Successful examples build support for Green Streets among City leadership, agency staff, and residents/ratepayers.
- 12. Professional staff development and training (capital and maintenance)**  
Training in designing, building, and maintaining Green Streets facilities ensures they are sited and designed appropriately and function properly.
- 13. Public education, engagement, and outreach**  
Legitimize adoption of a Green Streets policy to ratepayers by engaging both neighborhoods affected by specific projects and the community at large.

Public officials and agency staff provided invaluable information about “**lessons learned**” from their jurisdictions’ experience implementing their respective policies. Five such lessons in particular stand out, along with three additional **takeaways** ELI identified in conducting its research and analysis of Green Streets policies and implementation:

### Five “Lessons Learned” in Adopting Green Streets Policies

- 1. Determine the best method for promoting the policy**  
Green Streets advocates must gain the support of three key stakeholder groups: Public officials, agency staff, and the community, or ratepayers. This requires articulating and quantifying the benefits of green infrastructure. The stated goal may be to meet regulatory mandates under a TMDL, MS4 Permit, Combined Sewer Overflow (CSO) Control Plan, or a

consent decree. If there is no such mandate, promoters can illustrate the need by effectively leveraging data on how stormwater runoff, contributed by the public right-of-way, impacts local water quality. The more environmentally conscious the community, the more straightforward this effort will be. Some localities credited successful pilot projects with garnering support, by providing a visual example. One local official advised starting with an internal working group at the staff level to identify and address potential technical challenges before making a proposal to local officials and stakeholder organizations.

**2. Ensure sufficient flexibility in implementing and updating the policy based on experience**

A locality needs to decide whether the best strategy is to make its policy legally binding, such as by incorporating it into the municipal code. Some Green Streets jurisdictions found it simpler to gain political and public support by structuring their policy as a set of nonbinding guidelines. A valuable tactic available to regional planning and transportation agencies that award grants to local jurisdictions is to incentivize integration of green infrastructure into public right-of-way projects when awarding funding.

A number of localities stressed the importance of taking into account the local physical context of each jurisdiction. The policy should accommodate the infiltration capacity of local soils and provide for exemptions when integrating green infrastructure is impracticable for technical or financial reasons. However, the policy should require exemptions be justified, documented, and reported, so that they do not swallow the rule. The process should be clear and transparent and require agency staff to develop alternative approaches for meeting stormwater runoff requirements when on-site conditions do not allow for installing green infrastructure. For example, the policy could require stormwater runoff mitigation off-site or contributing funding to regional efforts aimed at improving water quality.

Localities benefiting from several years' experience in implementing their policies advised reevaluating Green Streets policies and plans as living documents. This permits course-corrections. For example, a locality may shift from an early strategy of incorporating green infrastructure whenever possible, to a more holistic, regional approach or to evaluating individual projects to determine when Green Streets are the best "tool" for accomplishing stormwater and watershed goals.

**3. Designate a reliable funding source**

Localities reported greater adherence to the spirit and letter of their Green Streets policies when they could rely on a sustainable source of funding. The most reliable option is an established stormwater utility, often to repay general obligation bonds. Nearly as critical is identifying a reliable source of funding for maintenance to ensure green infrastructure facilities are sustainable over the long-term. When implementing a combined Complete and Green Streets policy, it is vital to allocate funding specific to the green infrastructure elements.

**4. Coordinate across all agencies with an interest in the PROW**

Responsibility for public right-of-way capital projects and operations/maintenance may fall under the jurisdiction of multiple City agencies. Localities should outline a clear project design, planning, construction, and post-construction process to ensure incorporation of green infrastructure at every step of capital development and during the subsequent operation and maintenance period. Design work should be a combined effort of project engineers, hydrologists, and landscape architects. Localities should also align their goals and strategies with the governing watershed district, and find opportunities to meet multiple goals by partnering on projects.

**5. Recognize the importance of public engagement**

Several Green Streets jurisdictions stressed the importance of investing sufficient time, effort, and resources into community education in order to win public support for the policy and for proposed projects. Localities should engage with the public as early as possible on projects and take a context-sensitive approach in designing projects, looking at site conditions, neighborhood characteristics, and community values. For example, residents may react negatively to projects that narrow streets and eliminate parking. This means being flexible and willing to adjust projects in order to obtain community buy-in. While the resulting project may not include all desired Green Streets elements, every component included in the final project provides a benefit.

### Three Additional Takeaways on Green Streets Policies

1. **Substantial discretion to issue exceptions and lack of a dedicated funding source sometimes resulted in Green Street elements being value engineered out of projects**

Limit agency discretion to issue exceptions to the policy in order to preserve the priority of Green Streets elements.

2. **Few jurisdictions considered, early on, methods for tracking progress in implementing their policies and in attaining water quality goals**

Green Streets policies should require agency staff to measure quantifiable outputs and outcomes, and issue annual reports. Performance measures should track success in incorporating green infrastructure elements into the public right-of-way over time, changes in water quality indicators, and progress in meeting mandates under MS4 Permits, CSO Long Term Control Plans (LTCPs), consent decrees, and TMDLs. This information should be publicly available and easily accessible, such as on a website.

These efforts should also track the costs and benefits of Green Streets. Most jurisdictions ELI contacted could not provide specific data on green infrastructure components of Green Streets projects; for example, project costs associated with green infrastructure. Helpful information includes both capital and maintenance costs, and the cost-savings, over time, associated with Green Streets compared with costs associated with gray infrastructure and traditional street infrastructure, as well as with meeting water quality improvement goals.

Accountability to ratepayers and to meeting the policy's long-term goals also requires sufficient oversight by City leadership over the long-term—across successive administrations and legislatures—to ensure City agencies implement the policy systematically and according to its intent.

3. **Combining Green Streets and Complete Streets policies may place the “green” components at risk of being excluded from projects**

It may be more efficient to address both issues when upgrading the public right-of-way: simultaneously providing for multi-modal use while addressing stormwater runoff and other environmental problems. However, in some instances the Complete Streets component overshadowed the Green Streets component. Drafters should structure any combined policy so as to explicitly address and mandate both elements.

This report includes sections focusing on the impacts of impervious surface area on watersheds, the financing and financial benefits of Green Streets, and a review of the Americans with Disabilities Act and its regulations as an analogous example of systematically requiring local governments to integrate additional improvements when upgrading public facilities. Notably, the still-nascent literature on Green Streets finds that localities can realize cost-savings by programmatically incorporating green infrastructure with other planned infrastructure improvements. Studies anticipate that the initial upfront costs will be largely offset over time by both reducing costs associated with otherwise necessary, additional stormwater infrastructure, and the costs of complying with regulatory requirements, such as those under the Clean Water Act.

Finally, this report includes a comprehensive discussion of the relevant regulatory context governing stormwater management. This encompasses the federal regulatory framework, stormwater management in each of the seven Chesapeake Bay watershed districts, and tribal “treatment as a state” provisions under the Clean Water Act.

ELI anticipates that this report and model ordinance will contribute to the conversation, only now beginning, about Green Streets policies: their benefits, costs, and associated best practices—both within the Chesapeake Bay watershed and across the United States. Much work remains to be accomplished, including developing more robust data on Green Streets costs—including up-front capital and life-cycle maintenance—contrasted with gray infrastructure and the costs of complying with regulatory mandates. Future discussions may also include public engagement and outreach, and training agency personnel in best practices associated with designing, planning, installing, and maintaining green infrastructure facilities. The goal—protecting and enhancing our watersheds and their economic, social, cultural, and community benefits—is certainly one worthy of the effort.

## Acronyms

BMP	Best Management Practice
CIP	Capital Improvement Program
CS	Complete Streets
CSO	Combined Sewer Overflow
CSS	Combined Sewer System
CWA	Clean Water Act
EPA	Environmental Protection Agency
ERU	Equivalent Residential Unit
ESD	Environmental Site Design (green infrastructure)
GI	Green Infrastructure
LID	Low-Impact Design (green infrastructure)
LTCP	Long Term Control Plan
MCM	Minimum Control Measure
MEP	Maximum Extent Practicable
MPO	Metropolitan Planning Organization
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
O&M	Operation and maintenance
PROW	Public Right-of-Way
SWMP	Storm Water Management Plan/Program
TAS	Treatment as a State
TMDL	Total Maximum Daily Load
WIP	Watershed Implementation Plan
WLA	Wasteload Allocation
WOTUS	Waters of the United States
WQS	Water Quality Standards



## Glossary

**Best Management Practices (BMPs)**, as referenced in the Virginia Stormwater Management Program regulations, means “schedules of activities, prohibitions of practices, maintenance procedures, and other management practices, including both structural and nonstructural practices, to prevent or reduce the pollution of surface waters and groundwater systems.”<sup>18</sup>

**Combined Sewer System (CSS)** is a wastewater collection system owned by a state or municipality that conveys municipal sewage and stormwater through a single-pipe system to a Publicly Owned Treatment Works (POTW) Treatment Plant.<sup>19</sup> CSSs must obtain NPDES permits.<sup>20</sup> Whereas a Municipal Separate Storm Sewer System (MS4; see below) conveys stormwater separately from wastewater, often directly to a receiving waterbody and bypassing treatment, a CSS incorporates both flows into the same system destined ultimately for a treatment plant. This same-system incorporation means that a wet weather event can cause system back-ups and overflows which will release both stormwater and wastewater into the environment. Such an event is termed a “**combined sewer overflow**” (CSO), or a discharge from a CSS before reaching the POTW.<sup>21</sup>

**Complete Streets**, as described by the National Complete Streets Coalition, are “designed and operated to enable safe access for all users [of the public right-of-way], including pedestrians, bicyclists, motorists and transit riders of all ages and abilities.”<sup>22</sup> A Complete Street might include bike lanes, safe crossing opportunities, accessible public transportation stops, and other features for safety and accessibility.

A **Complete Streets Policy**, in turn, facilitates the systematic integration of Complete Streets elements, inclusive of and beyond the aforementioned, into the public right-of-way, therefore helping to provide safe access for all users, regardless of ability, age, or mode of transportation. A Complete Streets Policy includes a trigger, such that, when construction or reconstruction occurs in the existing public right-of-way, Complete Streets elements are integrated.

**Environmental Site Design (ESD)**, as utilized in the Maryland Stormwater Management Act, “means using small-scale stormwater management practices, nonstructural techniques, and better site planning to mimic natural hydrologic runoff characteristics and minimize the impact of land development on water resources.”<sup>23</sup>

ESD is, functionally, a subset of BMPs; specifically, nonstructural BMPs.

**Green Infrastructure** describes neighborhood or site-level practices, techniques, and engineered structures for managing stormwater that mimic natural hydrological systems and are designed to be environmentally friendly. This definition of green infrastructure is often synonymous with “environmental site design,” “low-impact development,” and “non-structural best management practices.”<sup>24</sup> Specific examples include: permeable pavement, reinforced turf,

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<sup>18</sup> 9 VA. ADMIN. CODE § 25-870-10 (2019).

<sup>19</sup> 40 C.F.R. § 122.2 (2018).

<sup>20</sup> *Id.* at §122.26 (a)(7) (“Conveyances that discharge storm water runoff combined with municipal sewage are point sources that must obtain NPDES permits in accordance with the procedures of §122.21 and are not subject to the provisions of this section.”).

<sup>21</sup> *Id.* at § 122.2.

<sup>22</sup> *What are Complete Streets?*, SMART GROWTH AMERICA, <https://smartgrowthamerica.org/program/national-complete-streets-coalition/publications/what-are-complete-streets/> (last visited June 3, 2019).

<sup>23</sup> MD. CODE ANN., ENVIR. § 4-201.1(b) (LexisNexis 2019) (including (c)(1) Optimizing conservation of natural features (e.g., drainage patterns, soil, vegetation); (2) minimizing impervious surfaces (e.g., pavement, concrete channels, roofs); (3) slowing down runoff to maintain discharge timing and to increase infiltration and evapotranspiration; and (4) using other nonstructural practices or innovative technologies approved by the Department of the Environment); *see also* MD. DEP’T OF THE ENV’T, MARYLAND STORMWATER DESIGN MANUAL 5.2 (2009).

<sup>24</sup> MD. DEP’T OF THE ENV’T, MARYLAND STORMWATER DESIGN MANUAL 5.2 (2009).

disconnection of impervious surfaces, direction of sheetflow to conservation areas, rainwater harvesting, submerged gravel wetlands, landscape infiltration and berms, dry wells, micro-bioretenion, rain gardens, green roofs, bioswales, and enhanced filters.<sup>25</sup>

**Green Streets** are public rights-of-way that incorporate green infrastructure elements in order to improve water quality by reducing and pre-treating on-site stormwater that will eventually be released into local waterways. Green Streets reduce and mitigate the environmental impacts of surface transportation and provide ancillary environmental, economic, and social benefits.

A **Green Streets Policy** refers to an instrument—an ordinance, resolution, executive order, non-binding policy, guidance, or otherwise—at the local level that includes a “trigger” such that, every time a municipality undertakes a capital project or significant maintenance work in the existing public right-of-way, green infrastructure elements are integrated explicitly for the purpose of better managing stormwater and mitigating resultant water pollution. A Green Streets policy is systematic in nature, establishing a programmatic method for transforming, over time, a substantial portion of transportation corridors into Green Streets.

**Living Streets** emphasize a combination of elements from both Complete and Green Streets, including improvements to the public right-of-way for better stormwater management and pollution mitigation, as well as safe access for all users.<sup>26</sup>

A **Living Streets Policy** refers to an instrument—an ordinance, resolution, executive order, non-binding policy, guidance, or otherwise—at the local level that includes a “trigger” such that, when construction or reconstruction occurs in the existing public right-of-way, elements are integrated that encourage better stormwater management and safe access for all users.

**Maximum Extent Practicable (MEP)** is often used both in federal and state documents in reference to stormwater management.<sup>27</sup> This legal term generally describes the extent to which private developers, or government agencies when regulating development activities, must implement stormwater control strategies to protect water quality. It may also specifically mean the extent to which these parties must implement green infrastructure as the primary method for managing stormwater. According to the Maryland stormwater regulations, “[t]he MEP standard is met when channel stability and 100 percent of the average annual predevelopment groundwater recharge are maintained, nonpoint source pollution is minimized, and structural stormwater management practices are used only if determined to be absolutely necessary.”<sup>28</sup> Virginia’s stormwater regulations define MEP as a technology-based standard, achieved, in part, “by selecting and implementing effective structural and nonstructural BMPs and

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<sup>25</sup> See *What is Green Infrastructure?*, EPA, <https://www.epa.gov/green-infrastructure/what-green-infrastructure> (last visited June 4, 2019) (defining “green infrastructure” as “a cost-effective, resilient approach to managing wet weather impacts that provides many community benefits . . . Green infrastructure uses vegetation, soils, and other elements and practices to restore some of the natural processes required to manage water and create healthier urban environments. At the city or county scale, green infrastructure is a patchwork of natural areas that provides habitat, flood protection, cleaner air, and cleaner water. At the neighborhood or site scale, stormwater management systems that mimic nature soak up and store water.”) (citing examples of downspout disconnection, rainwater harvesting, rain gardens, planter boxes, bioswales, permeable pavements, green parking, green roofs, urban tree canopy, and land conservation).

<sup>26</sup> Michael Thompson. City of Maplewood. Living Streets Policy 4 (2013).

<sup>27</sup> 33 U.S.C. § 1342(p)(3)(B) (2018) (“Permits for discharges from municipal storm sewers. . . (iii) shall require controls to reduce the discharge of pollutants to the *maximum extent practicable*, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.”) (emphasis added).

<sup>28</sup> MD. CODE REGS. 26.17.02.06(A)(2) (2019).

rejecting ineffective BMPs . . . an iterative standard, which evolves over time as urban runoff management knowledge increases.”<sup>29</sup>

A **Municipal Separate Storm Sewer System (MS4)** is a conveyance or system of conveyances in which stormwater is carried through dedicated storm sewers and discharged to waterways without treatment. Unlike a combined sewer system, an MS4 is not part of a sewage treatment plant or publically owned treatment works.<sup>30</sup>

The **Public Right-of-Way (PROW)** refers to corridors or strips of land that are typically acquired and developed by public entities<sup>31</sup> and through which the public has the right to travel. These include public streets, roads, alleys, sidewalks, bridges, pedestrian paths, greenways, and similar surface transportation infrastructure.

**Reconstruction**, in this report, means the comprehensive rebuilding to new condition of a significant portion or the entirety of a street. This generally consists of excavating and replacing asphalt and underlying rock,<sup>32</sup> redoing adjacent curbs,<sup>33</sup> and replacing sidewalks.<sup>34</sup> Reconstruction may include installation of utility lines within the road right-of-way, changes to width and grading,<sup>35</sup> and improvements to signage, marking, lighting, and planting or street trees.<sup>36</sup>

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<sup>29</sup> 9 VA. ADMIN. CODE. § 25-870-10 (2019).

<sup>30</sup> Stormwater Discharges from Municipal Sources, <https://www.epa.gov/npdes/stormwater-discharges-municipal-sources> (last visited June 8, 2019)

<sup>31</sup> PAUL DEVANEY, RIGHTS-OF-WAY MANAGEMENT 1-1–2 (2001).

<sup>32</sup> *Definitions of Types of Street Repair*, CITY OF BERKELEY, CAL., DEP’T PUBLIC WORKS, [https://www.cityofberkeley.info/Public\\_Works/Sidewalks-Streets-Utility/Definitions\\_of\\_Types\\_of\\_Street\\_Repair.aspx#reconstruct](https://www.cityofberkeley.info/Public_Works/Sidewalks-Streets-Utility/Definitions_of_Types_of_Street_Repair.aspx#reconstruct) (last visited June 10, 2019).

<sup>33</sup> *Engineering – Road Work FAQs*, CITY OF BURNSVILLE, MINN., <https://www.burnsville.org/Faq.aspx?QID=163> (last visited June 10, 2019).

<sup>34</sup> *Street and Roadway Construction*, CITY OF NEW YORK, N.Y., DEP’T OF TRANSP., <https://www1.nyc.gov/html/dot/html/infrastructure/construction.shtml> (last visited June 10, 2019).

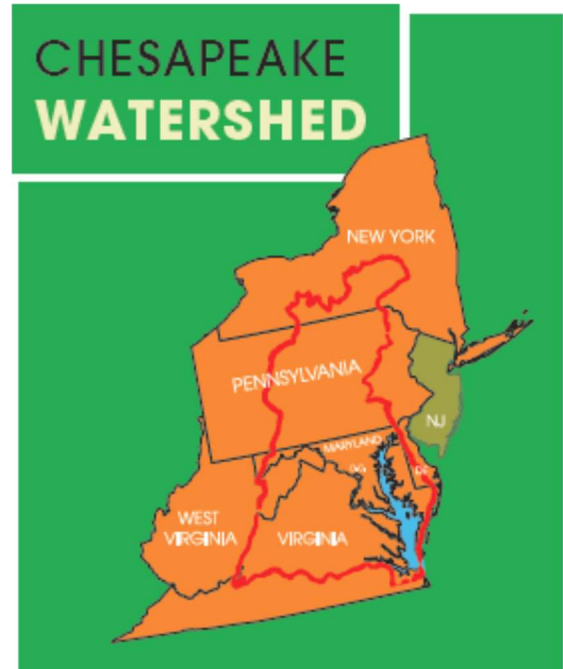
<sup>35</sup> Glossary of Terms for DOJ/FHWA Joint Technical Assistance on the ADA Title II Requirements to Provide Curb Ramps When Streets Roads or Highways are Altered Through Resurfacing, [https://www.fhwa.dot.gov/civilrights/programs/doj\\_fhwa\\_ta\\_glossary.cfm](https://www.fhwa.dot.gov/civilrights/programs/doj_fhwa_ta_glossary.cfm) (last visited June 10, 2019).

<sup>36</sup> Street and Roadway Construction, City of New York Dept. of Transportation, <https://www1.nyc.gov/html/dot/html/infrastructure/construction.shtml> (last visited June 10, 2019).

## Introduction

The Chesapeake Bay watershed extends through six states and the District of Columbia and is home to more than 18 million people—10 million of whom live along or near the coastline. The 64,000-square mile watershed stretches over 11,684 miles of shoreline and encompasses 150 major rivers and streams.<sup>37</sup> According to the Chesapeake Bay Foundation, the bay has a \$1 trillion economic value in related fishing, tourism, property values, and shipping activities.<sup>38</sup>

While recognized as a national treasure,<sup>39</sup> the Chesapeake Bay watershed is considered an impaired water body due to pollution.<sup>40</sup> Nitrogen and phosphorus loadings, in particular, have increased to excessive levels over the last few decades, creating a regional water quality concern. These nutrients derive from both point and nonpoint sources, causing hypoxia and harmful algal blooms, and negatively impact important species. Federal, state, and local governments are working collaboratively to address the problem. In 2010, the U.S. Environmental Protection Agency (EPA) established a Total Maximum Daily Load (TMDL)—a “pollution diet”—to meet pollution reduction goals for nitrogen, phosphorus, and sediment discharged into the Chesapeake Bay and its tributaries.<sup>41</sup>



These issues are not unique to the Chesapeake Bay watershed. The vast majority of assessed water bodies across the United States are designated as impaired. This includes 52.9 percent of our rivers and streams, 70.9 percent of our lakes, reservoirs, and ponds, and 79.5 percent of our bays and estuaries. Nutrients—like nitrogen and phosphorus—and sediment comprise top contributors to water pollution.<sup>42</sup>

Developed areas are a significant source of water pollution because of the high quantity of runoff produced by impermeable surfaces, such as asphalt and concrete. The percentage of impervious cover is significantly higher in urban areas; the average urban impervious cover in the United States is estimated at 25 percent, and this can be higher in densely populated areas.<sup>43</sup> The U.S. also features a high proportion of urban land use allocated to roads and surface car parks, as paved surfaces, compared to cities in other nations.<sup>44</sup> In fact, the Federal Highway Administration (FHWA) estimates that more than 20 percent of U.S. roads are in urban areas.<sup>45</sup> In 2008, the EPA also estimated that urban roads—along with sidewalks and parking lots—constituted almost two-thirds of the total

<sup>37</sup> Facts & Figures, CHESAPEAKE BAY PROGRAM, <https://www.chesapeakebay.net/discover/facts> (last visited June 5, 2019).

<sup>38</sup> CHESAPEAKE BAY FOUNDATION. THE ECONOMIC ARGUMENT FOR CLEANING UP THE CHESAPEAKE BAY AND ITS RIVERS 1 (2012).

<sup>39</sup> Exec. Order No. 13,508, 75 Fed. Reg. 23,099 (May 12, 2009) (stating the Chesapeake Bay is a “national treasure”).

<sup>40</sup> *What is Killing the Bay?* CHESAPEAKE BAY FOUNDATION, <https://www.cbf.org/how-we-save-the-bay/chesapeake-clean-water-blueprint/what-is-killing-the-bay.html> (last visited June 3, 2019).

<sup>41</sup> *Addressing Nutrient Pollution in the Chesapeake Bay*, EPA, <https://www.epa.gov/nutrient-policy-data/addressing-nutrient-pollution-chesapeake-bay> (last visited June 3, 2019).

<sup>42</sup> *National Summary of State Information*, EPA, [https://ofmpub.epa.gov/waters10/attains\\_nation\\_cy.control#total\\_assessed\\_waters](https://ofmpub.epa.gov/waters10/attains_nation_cy.control#total_assessed_waters) (last visited June 3, 2019).

<sup>43</sup> Nowak & Greenfield, *supra* note 7 at 28.

<sup>44</sup> Black et al., *supra* note 8 at 1, 3 (explaining Chicago’s PROW represents 23% of the city’s land area and San Francisco’s PROW comprises 25% of the city’s land area).

<sup>45</sup> EPA, EPA-833-F-08-009, MANAGING WET WEATHER WITH GREEN INFRASTRUCTURE 1 (2008).



impervious cover and contributed a similar ratio of runoff.<sup>46</sup> These surfaces prevent water from being absorbed into the ground and naturally filtered.<sup>47</sup> Unmanaged stormwater can cause erosion, more localized flooding, and greater amounts of pollutants entering into waterways, as stormwater—rain or snowmelt flowing over these hard surfaces—collects pollutants on its way to the storm sewer system.<sup>48</sup>

The conventional strategy for managing urban stormwater is through “gray infrastructure” practices, such as gutters, pipes, and basins, which are designed to efficiently convey stormwater to local water bodies.<sup>49</sup> In a Municipal Separate Storm Sewer System (MS4), the stormwater is conveyed through dedicated storm sewers and discharged to waterways without treatment. In a Combined Sewer System (CSS), stormwater is collected and conveyed together with wastewater from homes and businesses via combined sewer mains to a sewage treatment plant. Storm events can result in the sewer system and treatment plant exceeding their capacity, ultimately causing sewer overflows and discharges of untreated co-mingled stormwater and wastewater into the environment.<sup>50</sup>

Many localities are turning to “green infrastructure” practices:<sup>51</sup> conserving or mimicking green spaces and natural processes to retain and infiltrate stormwater where it is generated. The goal is to prevent runoff from entering MS4s or CSSs, or to slow the rate of runoff introduction into these systems. The benefits have been extensively studied and include reduced stormwater volume, pollution prevention, and groundwater replenishment.<sup>52</sup>

Green Streets, in particular, constitute one method for addressing polluted urban runoff, by directly mitigating the environmental impact of roadways. **Green streets are public rights-of-way that incorporate green infrastructure in order to improve water quality** by providing for reduction and on-site pretreatment of stormwater prior to eventual release into local waterways. Green Streets reduce and mitigate the stormwater and other environmental impacts of surface transportation, and provide ancillary environmental, economic, and social benefits.<sup>53</sup>

Green Infrastructure Practices
Bioretention areas and vegetated swales
Direction of sheetflow to conservation areas
Dry wells
Enhanced filters
Green roofs
Infiltration trenches
Landscaped medians
Permeable paving materials
Preserving natural features, resources & drainageways
Reinforced turf
Disconnection of impervious surfaces
Parkways
Planter boxes
Rain gardens
Rainwater harvesting
Street trees
Submerged gravel wetlands
Underground detention

A number of forward-thinking localities are implementing **Green Streets policies, or robust mandates to integrate infrastructure every time a municipality undertakes a capital project or significant maintenance work in the public right-of-way.** This establishes a programmatic method for transforming, over time, a substantial portion of transportation corridors into Green Streets.

<sup>46</sup> *Id.*

<sup>47</sup> See *Nonpoint Source: Urban Areas*, EPA, <https://www.epa.gov/nps/nonpoint-source-urban-areas> (last visited June 3, 2019).

<sup>48</sup> *Id.*

<sup>49</sup> See *Benefits of Green Infrastructure*, *supra* note 13.

<sup>50</sup> See *National Pollutant Discharge Elimination System (NPDES): Combined Sewer Overflows (CSOs)*, EPA, <https://www.epa.gov/npdes/combined-sewer-overflows-csos> (last visited June 14, 2019); see also 40 C.F.R. § 122.2 (2018).

<sup>51</sup> Green infrastructure is also referred to as “environmental site design,” “low impact development,” and “non-structural best management practices.”

<sup>52</sup> *Benefits of Green Infrastructure*, *supra* note 13.

<sup>53</sup> *Id.*

## Project Approach

The Environmental Law Institute's (ELI) goal in developing this white paper was to **determine best practices for local governments considering adopting policies to incorporate green infrastructure into all public right-of-way construction/reconstruction projects**, where feasible.

ELI developed a clear definition of what constitutes a Green Streets policy in order to frame the analysis and offer guidance for Chesapeake Bay jurisdictions. There are four key elements:

1. The policy must be formally **adopted by a local government** and connected with its capital improvement program. The **type of instrument** (ordinance, resolution, executive order, non-binding policy, guidance) and its formal name ("Green Streets," "Living Streets," "Green and Complete Streets," etc.) is less important than the content of the policy. Jurisdictions apply a variety of names and titles to their policies.
2. The policy must include a **trigger**, such that whenever construction/reconstruction occurs in the **existing** public right-of-way, green infrastructure elements are integrated. The policy *must* apply to preexisting roads and streets in order to have a measurable impact on water quality; ELI eliminated several jurisdictions from its review because their policies were limited to new roadway construction only.
3. The policy specifies green infrastructure is being integrated explicitly for the purpose of **better managing stormwater and mitigating water pollution**. A number of jurisdictions adopted "Complete Streets" policies—pertaining to multi-modal transportation corridors—which merely reference generic sustainability considerations.
4. The policy should be **systematic** in nature, creating a framework whereby **green infrastructure elements are incorporated whenever triggered**, and not on a piecemeal project basis—for example, when an agency receives one-time funding for green infrastructure.

ELI next canvassed local governments, directly contacting over 200 jurisdictions nationwide and over 500 jurisdictions in the Chesapeake Bay watershed alone. The nationwide review focused on the 100 most populous cities and the 100 most populous counties, in addition to a targeted search for any locality reputed to have adopted a Green Streets policy. The threshold population for the Chesapeake Bay watershed localities was 15,000 or more.

ELI ultimately identified **fourteen jurisdictions** of representative localities currently implementing Green Streets policies meeting the stringent definition. While only one jurisdiction in the Chesapeake Bay watershed—Prince George's County—met ELI's criteria, all localities in the watershed can benefit from the experiences of the other 13 municipalities from across the nation.

ELI then distributed a **survey** (Appendix B) to all 14 Green Streets jurisdictions and drafted **case studies** based on information gathered from the surveys, telephone interviews, and independent research.

ELI used this information to develop a series of detailed case studies, presented in this report. Each case study includes detailed descriptions of the Green Streets policy, information on implementation, and lessons learned. Based on these case studies, ELI developed **thirteen recommendations** for effective Green Streets policies.

ELI synthesized its findings into a **model ordinance** (Appendix A) that is customizable—taking into consideration different local priorities and capacities—and that local governments can use as a pragmatic resource.

## Recommendations

This section presents thirteen recommendations based on ELI's research. Each of these considerations is key to developing and successfully implementing an effective Green Streets policy. These recommendations are intended to assist localities considering adopting a Green Streets policy, as well as those seeking to improve an existing policy.

These recommendations constitute "best practices" derived from Green Streets policies ELI analyzed. ELI evaluated the language of the policies themselves, in addition to guidance and other supporting documents, government records, and media reports. ELI also reviewed information, provided by the localities, on how the policies operate in practice and their post-implementation experience. Other sources of information include the scholarly and trade literature available on the subjects of Green Streets and green infrastructure.

The **table** below indicates which, of the fourteen case study communities ELI evaluated, have put these recommendations into practice and to what degree. Specific examples are drawn from the Green Streets policies evaluated for this report.

There is no one ideal approach for incorporating these recommendations. Most importantly, localities should customize their policies to their specific needs and with pragmatic consideration of the human and fiscal resources available to implement the policy. Smaller localities may need to prioritize among their public right-of-way (PROW) projects in order to best leverage resources and obtain the highest return of investment in terms of water quality improvement and other ancillary benefits of Green Streets.

Local governments may also prefer maintaining consistency with a regional policy. For example, Chesapeake Bay Watershed municipalities within the jurisdiction of the National Capital Region Transportation Planning Board may choose to take an approach in accordance with the Green Streets Policy for the National Capital Region.<sup>54</sup>

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<sup>54</sup> National Capital Region Transportation Planning Board Green Streets Policy for the National Capital Region (2014). Some elements of the Board's recommended approach to developing an effective Green Street Streets policy accord with ELI's findings, and are discussed with greater specificity in this report.

JURISDICTIONS APPLYING RECOMMENDATIONS/BEST PRACTICES FOR GREEN STREETS POLICIES														
√ = Best practice implemented, but weakly                        ☑ = Best practice implemented                        ⬤ = Robust example of best practice                        Blank = Policy does not follow best practice/not reported by locality Abbreviations: AR = Annual Report, CS = Complete Streets, GS = Green Streets, PM = Performance measures, SW = Stormwater														
	ANN ARBOR	CENTRAL FALLS	CLEVELAND	CLEVELAND HEIGHTS	DALLAS	EDINA	FAIRBANKS / FMATS	KANSAS CITY	MAPLEWOOD	NASHVILLE	NORTH ST. PAUL	PORTLAND	PG COUNTY	TUCSON
<b>Rec #1. Statement of vision/purpose and intent</b>														
		☑	☑	√ Does not explicitly address SW		CS subsumes GS elements	⬤	√ Applies mostly to CS elements	☑	☑	√	√		√
<b>Rec. #2. Clearly define key terms</b>														
		☑		√	☑	√	☑		√	☑	☑	⬤	⬤	⬤
<b>Rec. #3. Clear guidelines for applicability that are broad in scope</b>														
	☑ Narrow	⬤ Broad	☑ Broad scope but significant agency discretion	☑ Broad scope but applies to CS and not GS	☑	☑	☑	⬤	☑ In practice	√ Broad language but limited in practice		⬤ More selective over time		√ Clearly defined but limited
<b>Rec. #4. Narrowly-defined exemptions, providing for transparent decision-making process and oversight</b>														
	√	⬤ Strong oversight	⬤ Strong oversight, clear categories	⬤ Borrows heavily from Central Falls	√	☑		√ Applies mostly to CS elements		☑		No specific categories; based on discretion	☑	Exceptions made in practice; not transparent
<b>Rec. #5. Sustainable funding source</b>														
	☑				☑	☑	⬤ Incentive-based	☑	☑		☑	⬤	☑	☑
<b>Rec. #6. Guidelines for inter-departmental and inter-agency coordination</b>														
		☑ Small staff simplifies process		☑	☑ Incl. agency roles, strategies, design rev. process			⬤	⬤		√	√		⬤



**GIVING GREEN STREETS THE GREEN LIGHT**

IMPROVING WATER QUALITY THROUGH CAPITAL IMPROVEMENT POLICIES

<b>Rec. #7. Robust accountability (implementation and monitoring)</b>													
		★ Measurable outputs and outcomes	☑ AR includes outputs, outcomes	★ Borrows heavily from Central Falls	CS-only PM; outputs-only	√	Advises ongoing monitoring	Applies mostly to CS elements		√ Requires AR and developing PM		√	Stated PM are design criteria for GS facilities
<b>Rec. #8. Maintenance guidelines</b>													
	☑		☑		☑						√	☑ Following City Auditor recs	★
<b>Rec. #9. Reliance on/reference to Green Streets/green infrastructure design guidelines and best practices</b>													
	☑	★	★	√	★	GS Plan ch. discusses pros/cons of various GI practices	★	Applies mostly to CS elements		☑		☑ SW Mgt. Manual	√
<b>Rec. #10. Incorporation of Green Streets into relevant City/County planning, design standards, and other documents</b>													
		★		☑	☑		√	Applies mostly to CS elements	★	☑		√	☑
<b>Rec. #11. Deploy pilot projects</b>													
	☑			☑		Pilot projects focused on CS				☑		√ Resident resistance to initial project, but due to CS and not GS features	☑
<b>Rec. #12. Professional staff development and training (capital and maintenance)</b>													
		√		★						√			
<b>Rec. #13. Public education, engagement and outreach</b>													
		√		★			☑	Applies mostly to CS elements	√		★	☑	Detailed in concept but not fully executed

### ***Recommendation #1: Statement of vision/purpose and intent***

**Clearly express the rationale for adopting the policy and vision for carrying it out.** The rationale should be stated in an “Intent” section. Policy goals and drivers are often laid out in the preamble of an ordinance or resolution (“whereases”) but are stronger when stated in the instrument’s operative text (“now, therefore”).

The policy has three key audiences. The first is the general public—the taxpayers and ratepayers funding Green Streets capital projects and maintenance. The second comprises agency staff who will implement the policy—the engineers, project managers, landscape architects, and designers responsible for construction, and the stormwater crews responsible for maintaining Green Street facilities. The third audience is the executive and legislative leadership, including both the current administration that must agree to adopt the policy, and future administrations who must recognize Green Streets as a priority in order to provide effective oversight over the long-term.

The policy goal may be to simply reduce the impacts of stormwater runoff on water quality and address flooding. Goals and objectives should be tailored to each locality’s priorities. For example, requirements under a MS4 Permit, CSO Long Term Control Plan (LTCP), TMDL Watershed Implementation Plan (WIP), or consent decree may be significant drivers in adopting a Green Streets policy. Goals may include ancillary benefits of Green Streets, such reducing air pollution, increasing green space, and beautification.

The statement of intent should also summarize how Green Streets will achieve these goals—by programmatically integrating green infrastructure into all applicable transportation projects involving new construction or improving the existing public right-of-way, whenever practicable.

#### **Fairbanks Metropolitan Area Transportation System (FMATS)**

All projects financed and approved by FMATS should, where practicable, use native and site-adapted vegetation, landscaping and related environmental site design features to capture and filter stormwater runoff within the right-of-way, in a manner appropriate to the function and context of the facility. Green Streets is an essential part of the urbanized ecosystem that not only enhances the aesthetics of the street, but also help protect water quality of the Chena River, Noyes Slough, Chena Slough, and other local water bodies.<sup>55</sup>

#### **Cleveland, Ohio**

Complete and Green Streets address the livability and environmental needs of our community with multipurpose streets that better accommodate walkers, cyclists, and public transportation while reducing the environmental impact of our transportation infrastructure by incorporating green infrastructure strategies to reduce waste, storm water run-off and energy consumption [This language appears above the operative text of the policy. It illustrates effective wording for a statement of vision and intent. Ideally, however, it would be prescriptive and would appear in the operative portion of the policy.]<sup>56</sup>

### ***Recommendation #2: Establish clear definitions of key terminology***

**Provide straightforward definitions of keys term, such as *Green Streets*, *green infrastructure*, *maintenance*, and *public right-of-way*.** Helpful definitions of *Green Streets* explain their function and provide specific examples of facilities and practices. Policies may also reference existing definitions, found in other documents such as the Municipal Code or stormwater design manuals.

#### **GREEN INFRASTRUCTURE**

##### **Tucson, Arizona**

Green Infrastructure: Landscape and engineering features that utilize soils and vegetation to manage stormwater for multiple environmental and community benefits. These features, as described in *Pima County and City of*

<sup>55</sup> Fairbanks Metropolitan Area Transportation System. No. 10 Green Streets 1 (2016).

<sup>56</sup> CLEVELAND, OHIO ORDINANCE NO. 798-11 (2011).

*Tucson Guidance Manual for Low Impact Development and Green Infrastructure* (in process), include but are not limited to, curb scuppers, curb depressions, core drills, water harvesting basins, swales, bio-retention basins, berms, check dams, infiltration trenches, and active water harvesting/storage systems.<sup>57</sup>

## **GREEN STREETS**

### **Portland, Oregon**

Green Streets are small rain gardens that collect stormwater runoff from streets, slow its flow and allow water to soak into the ground as the soil and vegetation filter pollutants. There are a variety of types of Green Streets, and their design is continuing to evolve. Generally, they: are located immediately adjacent to paved streets; are vegetated with specially selected species; contain a specified soil blend; often include a drain rock layer under the soil layer; usually infiltrate water into the ground but may be lined with impervious material to prevent infiltration if needed. Lined Green Streets have a perforated pipe underdrain to prevent problems from standing water.<sup>58</sup>

### **Prince George's County, Maryland**

Green Street means a street or road that safely and adequately accommodates and incorporates best management practices of environmental site design for addressing stormwater runoff, including using small scale stormwater management practices, nonstructural techniques, and better site planning to minimize the impact of road and sidewalk development on water resources.<sup>59</sup>

## **MAINTENANCE**

### **Disabled access (alterations)**

[M]aintenance activities include actions that are intended to preserve the system, retard future deterioration, and maintain the functional condition of the roadway without increasing the structural capacity. These activities include, but are not limited to, joint repair, pavement patching (filling potholes), shoulder repair, signing, striping, minor signal upgrades, and repairs to drainage systems.<sup>60</sup>

## **PUBLIC RIGHT-OF-WAY**

### **Prince George's County, Maryland**

Right-of-Way [is a]ny land area which has been dedicated to public use by a plat of subdivision or other instrument recorded in the land records of the County; also, any land area deeded to or acquired by the County for road or transportation purposes; also, any land area which has been conveyed to a public agency by easement for public use for road or transportation purposes; also, any land area which has been declared by competent authority to be a public right-of-way through use or through prescriptive usage in accordance with Maryland law; also, any land area along a County-maintained road which falls within the traveled way or the actively maintained shoulders and side ditches of the County-maintained road. With respect to a private road conforming to this Code, any land area contained in an easement or private right-of-way recorded in the land records of the County for ingress and egress, access, or terms of similar meaning. With respect to storm water management facilities, any land area contained in an easement or right-of-way recorded in the land records of the County for the installation, operation, or maintenance of the said facilities.<sup>61</sup>

### **Nashville, Tennessee**

Public Ways are public streets, roads, alleys, sidewalks, greenways and similar infrastructure.<sup>62</sup>

<sup>57</sup> CITY OF TUCSON, ARIZ., DEP'T OF TRANSP., ACTIVE PRACTICES GUIDELINES (A) (2013) [hereinafter APG] (emphasis in original) (defining "Green Streets" as "[r]oadways that incorporate the use of Green Infrastructure.").

<sup>58</sup> CITY OF PORTLAND, STORMWATER OPERATIONS & MAINTENANCE MANUAL: 2012-2013 EDITION (providing information and guidelines for managing each type of stormwater facility and laying out criteria and standards for inspection, maintenance, and repair) [hereinafter PORTLAND O&M MANUAL].

<sup>59</sup> PRINCE GEORGE'S COUNTY, MD., CODE OF ORDINANCES § 23-102(8.1).

<sup>60</sup> *Questions and Answers about ADA/Section 504*, U.S. DEPT. OF TRANSP. 18, [https://www.fhwa.dot.gov/civilrights/programs/ada/ada\\_sect504qa.cfm#q1](https://www.fhwa.dot.gov/civilrights/programs/ada/ada_sect504qa.cfm#q1) (last visited June 14, 2019).

<sup>61</sup> PRINCE GEORGE'S COUNTY, MD., CODE OF ORDINANCES § 23-102(16).

<sup>62</sup> CITY OF NASHVILLE, Exec. Order No. 040(II) (2010).

### ***Recommendation #3: Clear guidelines for applicability***

**The policy should set an explicit threshold for the types of projects triggering the policy.** Ideally, the policy should apply to the widest possible range of capital improvement projects implemented in the existing public right-of-way, in order to incorporate green infrastructure into as many PROW improvement projects as practicable.

ELI found many policies use ambiguous language to define the policy’s scope. This often results in many suitable projects never incorporating green infrastructure. Several policies apply only to new roadway construction and significant reconstruction involving road widening; these types of projects rarely occur in urban areas, which are often built out. Even where the policy clearly applies to the existing PROW, it remains unclear what types of roadway improvement projects trigger the policy or what the scale of the project needs to be to meet that threshold. Confusing the matter further, engineers and policymakers may not share the same understanding of terms such as *reconstruction*, *rehabilitation*, and *resurfacing*.<sup>63</sup> The locality should decide whether the policy applies to projects that do not affect grading and, if so, to what extent. “Routine maintenance” should be defined and excluded.

Where Green Streets are not required—either because a PROW project does not trigger the policy, or because it is excluded—the policy can still mandate improving stormwater management through offsite green infrastructure, payment of fees into a Green Streets fund, or a combination of the two.

Green Streets policies can include a hierarchy of prioritization, in order to ensure limited funds are directed first to projects with the greatest return on investment. Policies may also acknowledge Green Streets may not be the best “tool” for improving stormwater management in a particular project. In this case, City staff should explain the reason for taking an alternative approach.

Localities combining Green and Complete Streets policies should ensure the “Green” element is not overshadowed. ELI noted a tendency in this case to treat Green Streets as an afterthought, resulting in missed opportunities for improving stormwater management.

#### **Central Falls, Rhode Island**

##### Scope of Applicability.<sup>64</sup>

- (a) All City-owned transportation facilities in the public right-of-way including, but not limited to, streets and all other connecting pathways, as well as parking lots on City-owned land . . .
- (b) Privately constructed streets and parking lots shall adhere to this ordinance.
- (d) The City shall approach every transportation improvement and project phase as an opportunity to create safer, more accessible streets for all users that are more attractive and better manage stormwater. The design of new, rehabilitated or reconstructed facilities should anticipate likely future demand for bicycling, walking, transit, and motorist use, beautification elements, and storm water runoff and should not preclude the provision of future improvements. These phases include, but are not limited to: planning, programming, design, right-of-way acquisition, construction, construction engineering, reconstruction, operation and maintenance. Other changes to transportation facilities on streets and rights-of-way, including capital improvements, re-channelization projects and major maintenance, must also be included.
- (f) [ . . . ]All transportation infrastructure and street design projects in [Central Falls] (including those completed by the State of Rhode Island or other public companies, including utilities) shall adhere to this [Green and Complete Streets Ordinance].

<sup>63</sup> See, e.g., *Kinney v. Yerusalim* 9 F.3d 1067, 1070 (3rd Cir. 1993), cert. denied, 62 U.S.L.W. 3690 (U.S. Apr. 18, 1994) (No. 93-1439) (“The most extensive form of resurfacing is “reconstruction,” which involves removal and replacement of both the asphalt and the concrete or stone layers.”); *Questions and Answers about ADA/Section 504*, supra note 60 at 17 (clarifying that alterations include reconstruction, rehabilitation, widening, resurfacing, signal installation and upgrades, and projects of similar scale and effect under the ADA).

<sup>64</sup> CITY OF CENTRAL FALLS, R.I., MUNICIPAL CODE § 32-312 (2018).

**Kansas City, Missouri**

Scope of complete streets applicability

The City shall implement Complete Street elements within the general scope of roadway maintenance projects, which are not considered as major maintenance, and at no significant additional costs.<sup>65</sup>

"Major Maintenance" means any construction or repair activity which removes more than 50 percent of the pavement structure for a given street segment.<sup>66</sup>

**Portland, Oregon**

Incorporate green street facilities into all City of Portland funded development, redevelopment or enhancement projects as required by the City's September 2004 (or updated) Stormwater Management Manual [SWMM].<sup>67</sup>

*The SWMM stormwater management requirements, including those prioritizing vegetated facilities, are triggered by capital projects in the PROW creating more than 500 square feet of new or redeveloped impervious surface.*<sup>68</sup>

***Recommendation #4: Narrowly-defined exemptions, providing for transparent decision-making process and oversight***

**The policy should provide decision-makers with clear guidelines on what project categories may be excluded. The decision-making process should be transparent, well-documented, and subject to oversight by agency/executive leadership or the legislature.**

Some PROW improvement projects otherwise triggering application of the policy should be excluded. Public safety is the most critical category of exclusions. A common category is ordinary maintenance activities, which should be clearly defined. Another category is infeasibility, encompassing concerns involving topography, historical and cultural sites, natural resources, insufficient right-of-way, unresolvable utility conflicts, flood hazard areas, groundwater contamination, and slope/grade. Additional reasons for excluding projects from the policy may relate to low-traffic streets where the drainage discharges to a sump or where larger off-street facilities provide greater benefit.

Localities may also exclude projects where incorporating green infrastructure involves disproportionate cost. The term should be quantified, such as by a percentage of total project cost. This narrows staff discretion and prevents Green Streets from being inappropriately "costed out" of promising projects.

Information on exceptions and rationales should be easily accessible by members of the public. In smaller jurisdictions, it may be practicable to escalate the final decision to the legislature, with staff recommendation. In larger jurisdictions, agency staff with the requisite technical expertise can determine exceptions, subject to sign-off by an agency official and review by the appropriate City oversight board (such as the Planning Commission). In either case, the process should be documented with publicly available, supporting information.

**CLEAR CATEGORIES FOR EXEMPTIONS**

**Cleveland, Ohio**

That exemptions to be considered include, but are not limited to, the following items: [ . . . ]

- (b) financial hardship to the project sponsor. Financial hardship exists when compliance with Complete and Green policies and guidelines constitutes a minimum of twenty (20) per cent of the total project cost, but in no event more than one million dollars;
- (c) severe topographic or natural resource constraints;
- (d) existing structures do not allow for implementation of Complete and Green Street elements; [ . . . ]

<sup>65</sup> KANSAS CITY, MO., CODE OF ORDINANCES § 64-43(b) (2017).

<sup>66</sup> *Id.* at § 64-42 (2017) (emphasis in original).

<sup>67</sup> CITY OF PORTLAND, GREEN STREETS POLICY 1 (2007).

<sup>68</sup> *See id.*

(e) inclusion of Complete and Green Street elements could result in threats to the safety and welfare of pedestrians, cyclists, or motorists[.]<sup>69</sup>

**Central Falls, Rhode Island**

The City Council shall weigh the following when considering applications for waivers or exceptions: [ . . . ]

- (2) The activities are ordinary maintenance activities designed to keep assets in serviceable condition (including, but not limited to, mowing, cleaning, sweeping, spot repair and surface treatments such as chip seal or interim measures);
- (3) The director of the department of public works issues a recommendation that the application of the Green and Complete Streets ordinance is unnecessary or unduly cost prohibitive.
- (4) Other available means or factors indicate an absence of need, including future need.<sup>70</sup>

**STRONG OVERSIGHT AND TRANSPARENCY**

**Central Falls, Rhode Island.**

- (a) Applications for waivers or exceptions shall be reviewed and approved by the City Council, with a recommendation from the planning board. All documentation regarding any waiver or exception application shall be publicly available. [ . . . ]
- (c) Notwithstanding the provisions of sub-section (a), the Director of Public Safety may issue a waiver or an exception in the form of an executive order if application of the Green and Complete Streets ordinance would be contrary to public safety, with notice given to the City Council within two business days.<sup>71</sup>

**Cleveland, Ohio**

That the Director of Capital Projects shall be authorized to consult an advisory committee to include representatives of all effected [sic] City Departments, Northeast Ohio Regional Sewer District, Greater Cleveland Regional Transit Authority, and the Northeast Ohio Areawide Coordinating Agency to review the improvement and any requests for exemptions from the Complete and Green Streets guidelines and, upon consultation with other City Departments, approve exemptions where appropriate. The Director of Capital Projects shall provide notice of all exemption requests to the City Council member or members whose ward or wards include a project seeking an exemption.<sup>72</sup>

**ENSURING STORMWATER MITIGATION WHEN EXCEPTIONS APPLY (ALTERNATIVES, IN-LIEU OF FEES)**

**Portland, Oregon**

- (a) If a green street facility (infiltrating or flow through) is not incorporated into the Infrastructure Project, or only partial management is achieved, then an off-site project or off-site management fee will be required.
- (b) Any City of Portland funded development, redevelopment or enhancement project, that does not trigger the Stormwater Manual but requires a street opening permit or occurs in the right of way, shall pay into a “% for Green” Street fund. The amount shall be 1% of the construction costs for the project.<sup>73</sup>

***Recommendation #5: Sustainable funding source***

**Identify long-term funding sources for both Green Streets capital and maintenance costs.** General obligation bonds—often repaid by stormwater utility fees—are a common funding source for Green Streets capital costs, while stormwater utility fees are the most reliable for funding maintenance. Other sources may include gas tax revenue and regional transportation funding. Grants can provide intermittent but not stable funding.

<sup>69</sup> CITY OF CLEVELAND, OHIO, ORDINANCE NO. 798-11 § 6 (2011).

<sup>70</sup> CITY OF CENTRAL FALLS, R.I., MUNICIPAL CODE § 32-313(b) (2018).

<sup>71</sup> *Id.* at § 32-313.

<sup>72</sup> CITY OF CLEVELAND, OHIO, ORDINANCE NO. 798-11 § 6 (2011).

<sup>73</sup> CITY OF PORTLAND, GREEN STREETS POLICY 1 (2007) (listing exceptions to contributions to the “% for Green” street fund, which includes minor repairs).



Localities implementing Green Streets must plan for long-term and rising maintenance and operations costs, particularly as the number of assets the City is responsible for managing increase. However, localities should calculate the potential for cost-savings from substituting Green Streets for traditional gray infrastructure. This includes reducing expenses associated with repaving and snowplowing, avoiding flooding and CSOs, and meeting mandates under MS4 Permits, CSO Control Plans, TMDL Implementation Plans, and consent decrees.

#### CAPITAL

##### Portland, Oregon

According to Portland's CIP budget, general obligation bonds fund construction, and are repaid by stormwater and sewer rates and fees. The residential stormwater utility fee is a flat charge for off-site charge and on-site charge per user or per dwelling, but per 1,000 sq. ft. impervious area for developments of 5+ units. The nonresidential rate is per 1,000 sq. ft. impervious area. Offsite Stormwater Management Fees and the "Percent for Green" charges are assessed against eligible capital improvements constructed within the right-of-way and provide another source of funding.<sup>74</sup>

##### Fairbanks Metropolitan Area Transportation System (FMATS)

FMATS offers a potential model for regional transportation planning agencies that award funds to constituent jurisdictions, although the context is unique to Alaska. FMATS leverages a reliable and flexible source of federal funding, Community Transportation Program (CTP) funding from the Federal Highway Administration (FHWA), which Alaska is uniquely permitted to apply to any public road in the State, regardless of classification. Green Streets projects constitute eligible environmental measures under the program, with the caveat that green infrastructure elements do not exceed 20 percent of the total project cost.

FMATS follows an incentive-based method for encouraging localities to implement the policy by incorporating green elements into PROW projects. Road project nominations submitted to the MPO are scored, with Green Streets elements awarded additional points. This increases the likelihood of Green Streets projects receiving funding. Localities must identify sufficient funding from their own budgets to address maintenance.<sup>75</sup>

#### MAINTENANCE

##### Portland, Oregon

The City has over a decade of experience robustly implementing its Green Streets, meaning a significant increase in the number of Green Streets assets and associated costs. The Cross-Bureau Team in 2007 expected the programmatic implementation of Green Streets into PROW projects would amount to only "incremental" costs, but also anticipated initial upfront costs would be largely offset over time by: (1) reduced costs for additional infrastructure because, with Green Streets, stormwater is being "taken off the system;" and (2) reduced cost of complying with stormwater and environmental cleanup regulatory requirements such as CWA mandates.<sup>76</sup>

### ***Recommendation #6: Guidelines for inter-departmental and inter-agency coordination***

**Lay out protocols for coordinating Green Streets projects among all municipal bureaus and departments** with an interest in activities occurring in the PROW throughout the design, planning, construction, and post-construction process. **Partner with watershed districts and neighboring jurisdictions** to meet multiple water-quality goals on a regional basis by collaborating on projects and leveraging joint funding. **Address potential conflicts with utilities and promote collaboration with other agencies sharing interests in the PROW.** Clearly designate and delegate

<sup>74</sup> CITY OF PORTLAND, OR., ADOPTED BUDGET FISCAL YEAR 2018–2019: CITY FUNDS AND CAPITAL PROJECTS, 177 (anticipating a \$1.8 million five-year total project cost).

<sup>75</sup> E-mail from Andrew Ackerman, Envtl. Manager, City of Fairbanks, Alaska, to Cynthia R. Harris, Staff Att'y, Envtl. Law Inst. (May 28, 2019 19:00 EST) (on file with author) (confirming the City of Fairbanks funds stormwater operations and maintenance via its General Fund, as no utility fee and designated fund is available for FMATS' activities).

<sup>76</sup> CITY OF PORTLAND, OR., GREEN STREETS: CROSS-BUREAU TEAM REPORT PHASE 2 33 (2007).

sufficient authority to an official or staff in charge of coordination. Officials should direct agency staff to develop and complete a guidance document, ideally by a deadline preceding full policy rollout.

#### **INTERNAL COORDINATION**

##### **Dallas, Texas**

The Complete Streets Design Manual includes discussion of agency roles pertaining to the PROW, strategies for coordination, and lays out a section titled *Detailed Complete Streets Design Review Process*, which outlines a three-phase development process.<sup>77</sup>

##### **Tucson, Arizona**

The Active Practices Guidelines (APG) direct the Tucson Department of Transportation to develop a permanent project review team including planning, engineering landscape, and the design/construction manager. The APG lays out a detailed protocol to ensure incorporation of green infrastructure into roadways, and effective coordination between key City staff, consultants, and utilities through every stage of the project and post-construction. The APG provides guidelines for working with utility companies on compatibility with green infrastructure at each stage, including identifying opportunity for green infrastructure facilities, potential conflicts with existing utilities, planning new/rerouted utilities to avoid conflicts, and assigning responsibilities for avoiding/addressing conflicts at certain points in the process.<sup>78</sup>

#### **INTER-AGENCY COORDINATION**

##### **Kansas City, Missouri**

The City shall coordinate with, and enforce when applicable, the State of Missouri, counties, public transportation providers, and neighboring jurisdictions to ensure that streets, bridges, and all other sidewalks and pathways connecting to other jurisdictions comply with the intent of Complete Streets. School districts, community improvement districts, and other special taxing districts shall comply with this Complete Streets ordinance to ensure that streets, bridges, and all other connecting sidewalks and pathways not owned by the City but which are within the City limits comply with the intent of Complete Streets.<sup>79</sup>

#### **PARTNERING WITH REGIONAL WATERSHED DISTRICTS**

##### **Maplewood, Minnesota**

Maplewood's stormwater ordinance and regulations provide options for off-site mitigation. One such option is coordinating with the local watershed district to pay into a district-managed stormwater impact fund.<sup>80</sup> The City contributes funding to a regional project, managed by the Ramsey-Washington Metro Watershed District, when a Living Streets site proves not conducive to incorporating stormwater BMPs meeting the infiltration standard. This collaboration has proven successful, resulting in projects like the Gladstone Phase 3 Corridor Improvements.<sup>81</sup>

<sup>77</sup> CITY OF DALL., TEX., COMPLETE STREETS DESIGN MANUAL 26–30 (2016).

<sup>78</sup> APG, *supra* note 57 at (E), (G).

<sup>79</sup> KANSAS CITY, MO., CODE OF ORDINANCES § 64-43(d) (2017).

See CITY OF MAPLEWOOD, MINN., CODE OF ORDINANCES § 18-271(2)(b) ("For projects where infiltration or filtration is not feasible, or is prohibited as described in the M[aplewood] S[tormwater] M[anagement] S[tandards], the project must meet the mitigation provision of the MSMS."); see also CITY OF MAPLEWOOD, MINN., ENG'G REGS, Maplewood Stormwater Management Standards §2(c)(9)(2015) ("As a last alternative, on projects that are required to meet the post construction management for water quality treatment with a proposed disturbed area of 1 acre or greater, the applicant shall coordinate with the City and the appropriate watershed district to pay into a stormwater impact fund managed by the watershed district.").

<sup>81</sup> See CITY OF MAPLEWOOD, MINN., 2019-2023 CAPITAL IMPROVEMENT PLAN 109 (2018) (listing the Watershed District as one of the project's primary funding sources).

**Recommendation #7: Robust accountability (implementation and monitoring)**

The policy should require key benchmarks and performance measures, specific indicators, monitoring protocols, and regular reporting.

Benchmarks and performance measures constitute specific goals for the short-, mid-, and long-term. The policy may explicitly list these goals, or direct City staff or a commission to develop them. In the latter case, instructions should establish a clear timeframe for reporting back to City/County leadership.

Indicators comprise specific outputs and outcomes to record, measure, and evaluate, and should be quantifiable. Localities should not overly focus on *outputs* and instead should favor specific water quality and other *outcomes*. Examples of key indicators for **Green Streets implementation** (outputs) and **water quality improvements** (outcomes) are listed in the boxes to the right. Localities should also track maintenance activities, as well as financial expenditures and impacts. This includes the total dollar amount spent on Green Streets capital and maintenance, a cost breakdown of the green infrastructure elements included in PROW capital projects, and cost-savings/financial return on investment attributed to Green Streets. Localities may also adopt performance measures specific to each Green Streets project. Key to successfully tracking outputs and outcomes is robust asset management, including maintaining an updated inventory of all Green Streets elements.

Monitoring should be regular and follow consistent practices. The responsible agency should report results at least annually, with this information available to and easily accessible by the public. Localities benefit from regularly reviewing the policy to improve implementation.

Localities must decide whether to make their policy legally binding and, if so, enforceable by members of the public. This adds another level of assurance the policy will be implemented. Ordinances—which have force of law—signal stronger commitment to the policy than resolutions, which often constitute a formal expression of the government body’s opinion or will, and do not enact a statute, law, or rule.

Notably, at least one locality, Ann Arbor, Michigan, purposefully avoided a legally binding policy, which reportedly increased support for adoption of the resolution and smoothed implementation. The Fairbanks Metropolitan Area Transportation System, a regional transportation agency, took an incentive-based approach in promoting adoption of its Green Streets policy by its constituent jurisdictions.

Green Streets implementation (outputs)
Number of assets
Amount of impervious area restored
Acreage drained
Miles of PROW incorporating green infrastructure
Percent of impervious area
Number of street trees
Gallons managed
Number of capital projects completed and in progress
Number and categories of exceptions and waivers, and rationales

Water quality improvements (outcomes)
Contaminants (bacteria and trace metal pollution, nutrients)
Progress to meeting TMDL milestones
Number of days per year water advisories are posted
CSOs
Flood events

**DELEGATION OF ESTABLISHING PERFORMANCE MEASURES**

**Nashville, Tennessee**

“The Metropolitan Government shall measure the success of this Green and Complete Streets policy using performance measures selected by the Planning Commission, and as-derived from NashvilleNext Guiding Principles including measures around equity. The performance measures shall be annually reported to the public at-large via a widely-accessible format, such as Nashville.gov and Metro’s Open Data Portal.<sup>82</sup>

<sup>82</sup> CITY OF NASHVILLE, TENN., Exec. Order. No. 031 § 3(e) (2016).

**MEASURABLE OUTPUTS AND OUTCOMES, ANNUAL REPORTING**

**Central Falls, Rhode Island**

Performance Measures and Reporting. An annual report shall be annually submitted to the City Council and placed on the city’s website by the directors of public works and planning. The annual report shall document the annual increase or decrease for each of the following performance measures. . . .

- (g) Number of street trees
- (h) Maintenance activities of existing Green and Complete Streets facilities . . .
- (m) Total dollar amount spent on Green and Complete Streets activities
- (n) Percent of impervious surface area in the City
- (o) Water quality (bacteria and trace metal pollution) of each stormwater (non-sanitary) outfall located in the City.<sup>83</sup>

**ANNUAL REPORTING**

**Cleveland, Ohio**

[T]he Director of Capital Projects shall provide an annual progress report to Council on the implementation of the Complete and Green Streets Policy.<sup>84</sup>

**REGULAR REVIEW**

**Kansas City, Missouri**

The City shall review this policy every three years and adopt changes as technologies and design standards evolve.<sup>85</sup>

**Maplewood, MN**

[S]taff shall update the Living Streets Policy from time to time to ensure its relevance and effectiveness in meeting the identified goals of the Policy.<sup>86</sup>

***Recommendation #8: Maintenance guidelines***

**Develop a maintenance plan, adopt clear protocols for grading the condition of Green Streets facilities, provide appropriate training, and ensure sufficient oversight and quality control/assurance.**

Localities may rely on contractors, in-house maintenance crews, or a combination of the two to inspect and maintain Green Streets facilities. Maintenance personnel should be trained on the specifics of inspecting and maintaining green infrastructure, including on maintenance concerns peculiar to green infrastructure facilities. Some localities, such as North St. Paul, Minnesota, rely on adjacent property owners to provide long-term maintenance of rain gardens and other similar Green Streets practices; however, this may be impractical where there is reduced community buy-in or in neighborhoods with high rental rates/resident turnover.

Planning for Green Streets maintenance begins early in capital project planning. Project designers should determine maintenance requirements and costs for each Green Streets project during design and planning.

Sound maintenance plans provide a clear set of protocols and timelines for regular inspection and maintenance. Plans incorporate maintenance best practices to ensure each facility can achieve the stated performance goals.<sup>87</sup> This includes a system for recording and grading the condition of Green Streets facilities, including making

<sup>83</sup> CITY OF CENTRAL FALLS, R.I., MUNICIPAL CODE § 32-315 (2018).

<sup>84</sup> CITY OF CLEVELAND, OHIO, ORDINANCE NO. 798-11 § 8 (2011).

<sup>85</sup> KANSAS CITY, MO., CODE OF ORDINANCES § 64-47(a) (2017).

<sup>86</sup> CITY OF MAPLEWOOD, MINN., RESOLUTION ADOPTING LIVING STREETS POLICY (2013).

<sup>87</sup> WATERSHED MANAGEMENT GROUP & PIMA COUNTY REGIONAL FLOOD CONTROL DISTRICT, SOLVING FLOODING CHALLENGES WITH GREEN STORMWATER INFRASTRUCTURE IN THE AIRPORT WASH AREA, 42–44 (2015).

determinations whether they are in functional condition. Supervisors provide quality assurance and control, and the responsible agency reviews and updates these guidelines at regular intervals.

#### ANTICIPATING MAINTENANCE REQUIREMENTS

##### Tucson, Arizona

At 90% submittal, the Landscape Consultant shall provide . . . [e]stimated water and maintenance cost based upon a scope described in the design contract.

The Landscape Architect shall monitor the maintenance of the green infrastructure elements during the two-year Landscape Establishment period.

The Landscape Architect shall review the green infrastructure elements with the Streets Maintenance Section prior to turn over and final acceptance.<sup>88</sup>

#### MAINTENANCE PLANS

##### Ann Arbor, Michigan

All infiltration facilities require the development of a maintenance plan coordinated with the Field Operations Staff.<sup>89</sup>

##### Cleveland, Ohio

[A]ll projects approved under the Complete and Green Streets policy include provisions for ongoing maintenance of the improvements. A life cycle cost analysis may be used to determine the feasibility of the improvements. Alternative maintenance arrangements may be utilized to reduce the costs to the City for ongoing maintenance, such as maintenance agreements with adjacent property owners."<sup>90</sup>

##### Portland, Oregon

Portland's Green Streets Policy requires the City to "[m]aintain [Green Streets] facilities according to the May 2006 (or updated) Green Streets Maintenance Policy" and "[e]stablish standard maintenance techniques and monitoring protocols for green street facilities across bureaus, and across groups within bureaus."<sup>91</sup>

Portland developed detailed maintenance guidelines, which include inspection requirements, special issues affecting Green Streets, key components essential to the proper functioning of Green Streets structures, a step-by-step maintenance process, and residuals disposal (for sediment, vegetative debris, and large trash).<sup>92</sup> However, in fall 2018, the City Auditor identified several deficiencies—in particular, that the Bureau of Environmental Services (BES) lacked a method for calculating condition scores for reporting or monitoring GS facility conditions.<sup>93</sup> Portland's maintenance crew reported counts of inspections and maintenance activities—outputs—rather than whether Green Streets facilities were in a functional condition—outcomes.<sup>94</sup> The majority of GI facilities—53 percent—were not inspected in spring 2018, manual standards were out of date, and no party was responsible for oversight or keeping track of whether individual facilities met the operations and maintenance (O&M) criteria. The City Auditor advised BES implement a framework to prioritize projects, and to inventory, verify, and share data about outcomes. BES is implementing recommendations to provide reliable reports about Green Streets facility condition, define quantifiable standards to describe functioning conditions, update its O&M guidelines, and create oversight procedures to ensure staff follow O&M guidelines.<sup>95</sup>

<sup>88</sup> APG, *supra* note 57 at (G) 6, 9–10.

<sup>89</sup> CITY OF ANN ARBOR, MICH., RESOLUTION NO. 14-0071, (2014).

<sup>90</sup> CITY OF CLEVELAND, OHIO, ORDINANCE NO. 798-11 § 7 (2011).

<sup>91</sup> CITY OF PORTLAND, OR., GREEN STREETS POLICY 1(a), 4(b) (2007).

<sup>92</sup> PORTLAND O&M MANUAL, *supra* note 58 at n 39-41 (providing information and guidelines for managing each type of stormwater facility and laying out criteria and standards for inspection, maintenance, and repair).

<sup>93</sup> PORTLAND CITY AUDITOR, RESTORATION PROJECTS AND GREEN STREETS: PLANNING AND EVALUATION NEEDED TO CONFIRM SUCCESS 10 (2018).

<sup>94</sup> *Id.* at 11.

<sup>95</sup> *Id.* at 14–15.

### ***Recommendation #9: Reliance on/reference to Green Streets/green infrastructure design guidelines and best practices***

Localities should either develop Green Streets design guidelines or refer to existing manuals of best practices and best available design standards that are respected by the industry and customizable to local conditions. Localities may create their own manuals and guidebooks.

#### **REFERENCE TO DESIGN STANDARDS**

##### **Central Falls, Rhode Island**

Design Standards. The City shall follow accepted or adopted design standards and use the best and latest design standards available. These standards include, but are not limited to . . . D[epartment of] E[nvironmental] M[anagement]'s LID [Low Impact Development] standards as reflected in its Stormwater Design Manual (2015) and LID Guide (2011). In recognition of context sensitivity, public input and the needs of many users, a flexible, innovative and balanced approach that follows other appropriate design standards may be considered, provided that a comparable level of safety for all users is present.<sup>96</sup>

##### **Cleveland, Ohio**

That Green Street elements are based on guidelines contained in the following documents or organization policies: Cleveland Water Pollution Control guidelines, Engineering and Construction Specifications, Cleveland Public Power Streetlight Guidelines, Traffic Engineering Signal Guidelines, the Streetscape Design Guidelines Handbook, the Northeast Ohio Regional Sewer District stormwater plans, the Ohio Department of Transportation and Ohio Environmental Protection Agency Best Management Practices for Green Streets, and other guidelines that may be developed.<sup>97</sup>

#### **DEVELOPMENT OF DESIGN STANDARDS**

##### **Cleveland, Ohio**

The City developed its own Typologies Plan, a toolbox for both designers and citizens. The Typologies Plan provides designers with examples of appropriate design elements and dimensions used in unison, and demonstrates what treatments can be applied to Cleveland's streets without changing the street's curb-to-curb width. Typology types are based on different transportation modes and green treatment priorities.<sup>98</sup>

##### **Dallas, Texas**

Green Streets constitutes a separate chapter in the City's Complete Streets Design Manual.<sup>99</sup>

##### **Fairbanks, Alaska (FMATS)**

The City of Fairbanks is developing a Green Streets Plan that provides design recommendations for Green Streets facilities that are suited to the Fairbanks environment and to provide site-specific green infrastructure recommendations for incorporation into select future projects in the Metropolitan Planning Area.<sup>100</sup>

### ***Recommendation #10: Incorporation of Green Streets into relevant City/County planning, design standards, and other documents***

Localities integrate Green Streets into how they conduct business by **incorporating key aspects of the policy into relevant documents**, such as the municipal code, Capital Improvement Program, transportation, land use, and other

<sup>96</sup> CITY OF CENTRAL FALLS, R.I., MUNICIPAL CODE § 32-314 (2018).

<sup>97</sup> CITY OF CLEVELAND, OHIO, ORDINANCE NO. 798-11 § 3 (2011).

<sup>98</sup> CITY OF CLEVELAND, OHIO, CLEVELAND COMPLETE AND GREEN STREETS: TYPOLOGIES PLAN 6, 10 (2013).

<sup>99</sup> See CITY OF DALL., TEX., COMPLETE STREETS DESIGN MANUAL 201–213 (2016).

<sup>100</sup> AWR ENGINEERING, LLC, CITY OF FAIRBANKS, ALASKA: DRAFT GREEN STREETS PLAN 1 (2019) [hereinafter FAIRBANKS DRAFT PLAN].



plans, manuals, internal policies and guidelines, checklists, decision trees, rules, regulations, and programs. **Consider how various planning documents relate to each other**, particularly how making changes to one plan affects others.

#### IMPLEMENTATION

##### Central Falls, Rhode Island

- (a) The department of public works and other relevant departments, agencies, or committees will incorporate Green and Complete Streets principles into all existing plans, manuals, checklists, decision-trees, rules, regulations, and programs as appropriate (including, but not limited to any short-term, medium-term, and long-term capital plans).
- (b) The department of public works and other relevant departments, agencies, or committees will review current design standards to ensure that they reflect the best available design standards and guidelines, and effectively implement Green and Complete Streets, where feasible.<sup>101</sup>

##### Maplewood, MN

The Living Streets Policy provides a comprehensive list of recommended amendments and revisions to the Comprehensive Plan, City Code, and Engineering Specifications and Standards.<sup>102</sup>

#### LAND USE AND CONTEXT SENSITIVITY

##### Cleveland Heights, Ohio

The City shall require specific evidence in all new or revised land use policies, plans, zoning ordinances or equivalent documents how they support the City's Complete and Green Streets Vision. The projects must be sensitive to the surrounding context including current and planned buildings, parks, trails, as well as its current and expected transportation needs. Land use policies and zoning ordinances must support Complete and Green Streets, promoting dense, mixed-use, transit-oriented development.<sup>103</sup>

### ***Recommendation #11: Deploy pilot projects***

Pilot projects build support for Green Streets among City leadership, City staff, and ratepayers. This is particularly vital when Green Streets are not driven by requirements under permits, CSO Long Term Control Plans, consent decrees, or TMDLs. Localities should demonstrate the environmental benefits and ancillary benefits of Green Streets.

##### Portland, Oregon

An EPA Innovative Wet Weather Grant funded a demonstration and test project, providing an opportunity for educating City engineers, politicians, and the public about the benefits of Green Streets.<sup>104</sup>

### ***Recommendation #12: Professional staff development and training (capital and maintenance)***

**Training in designing, building, and maintaining Green Streets facilities ensures they are sited and designed appropriately and function properly**, and ultimately help the locality meet its stated goals. Training activities include conferences, classes, seminars, and workshops, as well as hands-on instruction. While a number of policies encourage staff professional development and training on Green Streets infrastructure, few mandate training. Funding may present one obstacle.

<sup>101</sup> CITY OF CENTRAL FALLS, R.I., MUNICIPAL CODE § 32-3167 (2018).

<sup>102</sup> CITY OF MAPLEWOOD, MINN., RESOLUTION ADOPTING LIVING STREETS POLICY 46-49 (2013).

<sup>103</sup> CITY OF CLEVELAND HEIGHTS, OHIO, Resolution No. 37-2018 (HT), 7.1 (2018).

<sup>104</sup> See *Bureau of Environmental Services: Innovative Wet Weather Program*, CITY OF PORTLAND, OR., <https://www.portlandoregon.gov/bes/35941> (last visited June 14, 2019).

**Cleveland, Ohio**

The [City of Cleveland's] Office of Sustainability received a grant to develop green infrastructure maintenance training, which 15 employees received in 2016.<sup>105</sup>

**Cleveland Heights, OH**

The City shall fund and encourage staff professional development and training to be fully conversant about Complete and Green Streets issues including motorized and non-motorized transportation conferences, classes, seminars, and workshops. Staff working on such projects shall attend at least ten hours of continuing education and/or documented research on best practices. City staff shall provide educational opportunities for City boards, committees and commissions, business districts, schools, and other institutions so that everyone understands the importance of the Complete and Green Streets Vision.<sup>106</sup>

**Recommendation #13: Public education, engagement and outreach**

Similar to pilot projects, **general public education and outreach** legitimize adoption of a Green Streets policy to ratepayers. Localities can inform the public about water quality problems, publicize the Green Streets policy and specific projects, and promote success in achieving performance goals. Outreach includes media and community relations, open houses, doorhangers, tours, site markers, town halls, lectures, newsletters, letters, and social media.

**Context sensitivity** also proved key in the cases of Cleveland Heights and the Minnesota localities of North St. Paul, Maplewood, and Edina. Other communities noted neighborhood character in their policies. This concern is incorporated in this recommendation as an element of **community engagement**, although it also requires attention to historic and cultural elements, and long-term plans for building out parkland, transit/bicycle/pedestrian routes, and other improvements. These items may be included in a locality's planning and community documents.

**PUBLIC OUTREACH****Cleveland Heights, OH**

The City Planning Department shall annually measure and report . . . the following performance measures:

8.1.15. Report on project effectiveness of engaging those who are underrepresented, consideration of their suggestions, and documentation of improvements that resulted from their input[.]

8.1.16. Evaluation of plans and improvements to assure they are equitably distributed with respect to factors including but not limited to income, race, vehicle access, and planning district[.]<sup>107</sup>

City staff of Capital Projects Public Works, Planning, and Community Services shall create a community engagement plan with specific strategies for when and how public engagement will occur and with whom. Effective strategies include enlisting survey helpers from the group whose input is sought, holding public meetings at accessible times and places, collecting input at community gathering spaces (such as school and City playgrounds, parks and libraries) and hosting and attending community meetings and events coincident with people's daily routines. Input should be augmented by easy-to-use, online methods of participation, like the MetroQuest survey for the University Circle-Cleveland Heights Bicycle Network Study. Outreach would include the City email newsletter, social media and neighborhood emailing systems such as Next Door.<sup>108</sup>

**Portland, Oregon**

Public involvement staff conduct outreach, mail letters, and hold open houses on proposed projects. The City initially produced a Green Street newsletter issued to neighbors adjacent to projects, but discontinued the practice. Maintenance staff continue to leave behind doorhangers, and BES places a metal medallion on every

<sup>105</sup> CITY OF CLEVELAND, OHIO, COMPLETE & GREEN STREETS PROGRESS REPORT 6 (2016).

<sup>106</sup> CITY OF CLEVELAND HEIGHTS, OHIO, Resolution No. 37-2018 (HT), § 10.4 (2018).

<sup>107</sup> *Id.* at § 8.1.

<sup>108</sup> *Id.* at § 10.8.

Green Street facility. Additional outreach includes an “Art of Stormwater” rotating photo exhibit, developing publicity materials, tabling at community events, conducting tours, and providing lectures. Portland also manages a Green Street Steward Program, through which community members assist in maintaining the City’s Green Streets assets.<sup>109</sup>

#### **North St. Paul, MN**

The City’s Living Streets Communications Plan outlines several specific actions items, including: creating key messages, direct communications and outreach efforts to target audiences by key message, building coalitions and collecting endorsements, leveraging special events to build awareness, and developing materials such as a Fact Sheet.<sup>110</sup> In practice, the City is implementing only certain components of the plan, as opposed to the full, coordinated strategy.<sup>111</sup>

#### **CONTEXT SENSITIVITY**

##### **Cleveland Heights, OH**

Land Use and context sensitivity

All Complete and Green Streets’ solutions must be appropriate and sensitive to the context and intended character as proposed in the Cleveland Heights Master Plan, the University Circle Cleveland Heights Bicycle Network Study, other NOACA [Northeast Ohio Areawide Coordinating Agency] Transportation for Livable Communities Initiative studies and other forward-thinking plans and studies. Unintended consequences such as involuntary displacement shall be avoided when possible or addressed with equity and fairness to the affected party.

Roadway, trail, bus stop and sidewalk design decisions shall include public outreach and input and be sensitive to values of Cleveland Heights as a walkable, vibrant, sustainable, and bike friendly community. Projects shall be designed at a human scale for the needs and comfort of all people, with due consideration of issues such as street design and width, lane width, desired motorists’ operating speed, hierarchy of streets, mode balance, and connectivity.

Design criteria shall be based on the thoughtful application of engineering, architectural and urban design principles such that all projects shall make the City a more appealing, enjoyable, and sustainable place in which to live and work.

Projects in districts listed on the National Register of Historic Places shall be designed to enhance the district’s historic character. Examples of contributing design elements include stone curbs, signage, street furniture, trees, and streetlights.<sup>112</sup>

<sup>109</sup> Env’tl. Law Inst. Green Streets Survey response from Kristen Acock, Stormwater System Division Manager, Bureau of Environmental Services, City of Portland, Or. (Apr. 1, 2019) (on file with author).

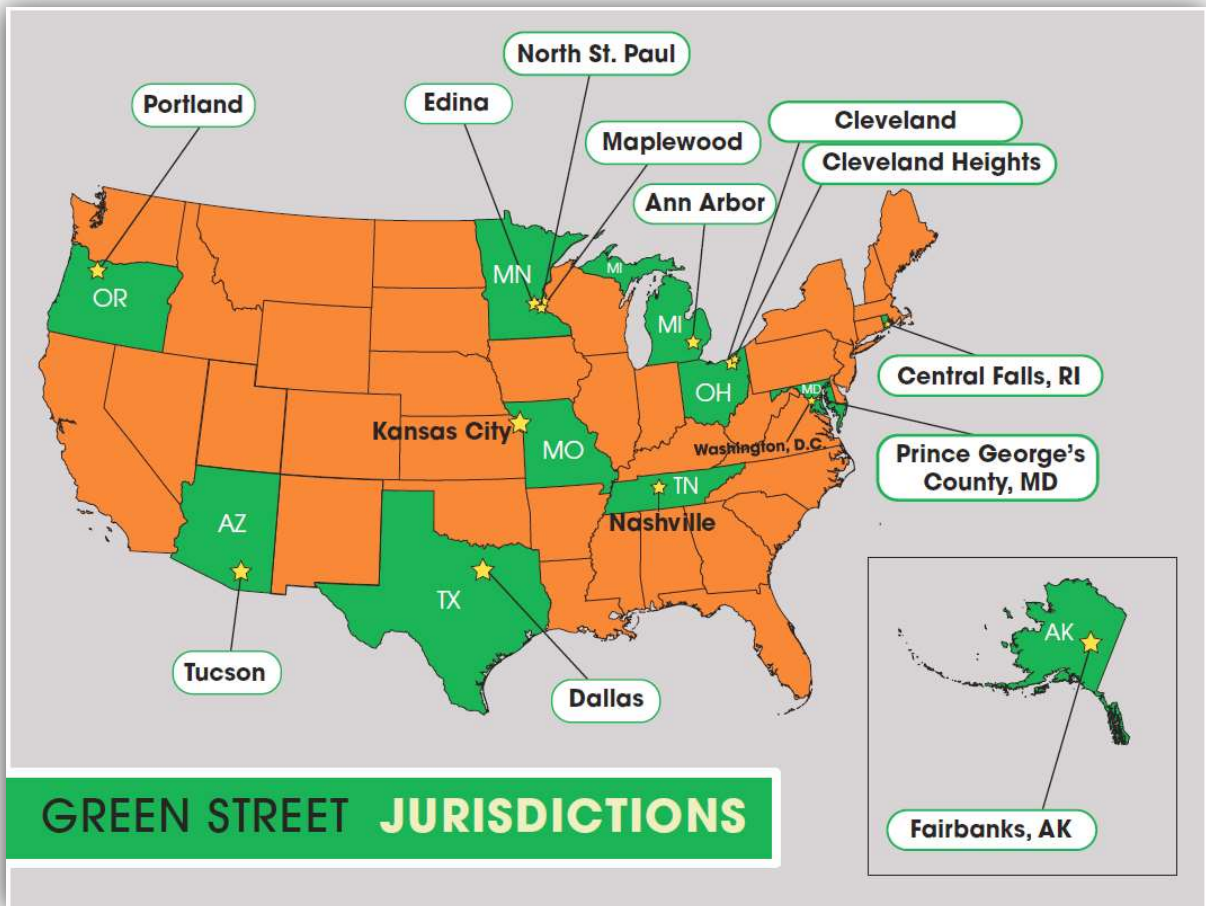
<sup>110</sup> BARR ENG’G CO., CITY OF N. ST. PAUL, MINN. & RAMSEY-WASHINGTON METRO WATERSHED DIST., LIVING STREETS PLAN B-1–B-3 (2011) (appending the Living Streets Communications Plan).

<sup>111</sup> Telephone Interview with Morgan Dawley, Municipal Senior Project Manager, WSB Eng’g Group (City Engineer for the City of North St. Paul, Minnesota) (May 13, 2019).

<sup>112</sup> CITY OF CLEVELAND HEIGHTS, OHIO, Resolution No. 37-2018 (HT), § 7 (2018).

## Case studies

The recommendations and findings of this white paper are based on detailed case studies from the following 14 jurisdictions. These meet the rigorous definition of adopted and implemented Green Streets policies for the public right-of-way. Each case study identifies where the jurisdiction is, what kind of policy instrument it uses, when the policy was adopted, and any lessons learned. The narrative section of each case study identifies the relevant stormwater management requirements and the Green Streets policy characteristics, which include: Historical Context, Funding, Applicability, Coordination, Maintenance, Accountability, Outcomes, and, in some instances, Challenges.



Case Study: Ann Arbor



**Chesapeake Watershed Jurisdiction:** NO  
**Green Streets Policy adopted:** 2014  
**Policy Type:** Non-legally binding resolution/Guidelines  
**Applicability:** New and significant reconstruction only

Municipal Characteristics
<b>Jurisdiction type:</b> City
<b>Population:</b> 121,890
<b>Total area:</b> 28.74 mi <sup>2</sup>
<b>Water area:</b> 0.87 mi <sup>2</sup>
<b>Land area:</b> 27.83 mi <sup>2</sup> <sup>113</sup>
<b>PROW:</b> 200 mi. residential streets, 100 mi. major roads, 13 bridges, 540 mi. stormwater conveyance (including 23,000 inlets and catch basins) <sup>114</sup>
<b>Average annual precipitation:</b> 35.43 in. <sup>115</sup>
<b>FY 2019 budget:</b> <sup>116</sup>
\$395,945,339 total expenditures
\$106,619,313 general fund
\$37,822,147 CIP
\$9,520,678 stormwater sewer system

- Lessons Learned**
- **Determine the best way to promote the policy**, particularly when there is no mandate under a TMDL, permit, CSO, or consent decree. Ann Arbor effectively leveraged data on the amount of stormwater runoff contributed by the PROW to illustrate the need for the policy. The City’s environmentally conscious population reacted positively.
  - **Ensure sufficient flexibility in implementing the policy.** Ann Arbor decided not to incorporate its policy into its municipal code.
  - **Identify a designated funding source.** Ann Arbor has a long-established stormwater utility fee, and recently instituted a rate hike.

**STORMWATER MANAGEMENT:**

Ann Arbor is a Phase I MS4 currently under a General Permit. The Michigan Department of Environmental Quality is in the process of issuing the City an Individual Permit, anticipated in 2019.<sup>117</sup> The City’s Storm Water Management Plan (SWMP) does not specifically address or require green infrastructure or Green Streets, although it does mention

<sup>113</sup> U.S. Census Bureau, *Population, Housing Units, Area, and Density: 2010 - United States -- Places by State*, AMERICAN FACTFINDER (downloaded June 7, 2019) (search “Ann Arbor”).

<sup>114</sup> Email Survey with Jerry Hancock, Stormwater and Floodplain Programs Coordinator, City of Ann Arbor, Mich., 1 (Mar. 7, 2019).

<sup>115</sup> Data Tools: 1981-2010 Normals, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/cdo-web/datatools/normals> (select “Michigan” and averaged precipitation totals of “Ann Arbor Municipal Airport, MI US,” “Ann Arbor SE, MI US,” and “Ann Arbor U of Mich, MI US”) (last visited June 6, 2019).

<sup>116</sup> CITY OF ANN ARBOR, MICH., FY 2019 ADOPTED BUDGET 93, 98, 120, 416 (2018).

<sup>117</sup> E-mail from Christie Alwin, Water Res. Div., Mich. Dep’t of Env’tl. Quality to Cynthia R. Harris, Staff Att’y, Env’tl. Law Inst. (Mar. 7, 2019, 11:03 EST) (on file with author).

reducing pollution from streets.<sup>118</sup> The City is subject to TMDLs for phosphorus, E. coli, and biota; the implementation plan discusses green infrastructure as a measure for controlling stormwater pollution.<sup>119</sup>

The City's Systems Planning staff oversees stormwater planning, while the Engineering and Public Works Departments are responsible for capital project implementation and maintenance activities, respectively. The City has enacted a stormwater ordinance, which mentions green infrastructure in reference to stormwater credits, although it does not discuss Green Streets specifically.<sup>120</sup>

Approximately 15 percent of Southeast Michigan is paved, according to a land cover analysis conducted as part of the Southeast Michigan Council of Governments' (SEMCOG) regional green infrastructure vision. In Ann Arbor, City roads account for 26 percent of all impervious surfaces in the City, generating an estimated 50 percent of all storm water runoff.<sup>121</sup>

## GREEN STREETS POLICY

In 2014, Ann Arbor's City Council approved a resolution adopting Stormwater Management Guidelines for Public Streets Construction and Reconstruction.<sup>122</sup> The Guidelines are not incorporated into the municipal code, but the City plans on further adopting the Guidelines into its Standard Specifications Book, which dictates requirements for new infrastructure projects.

### Historical context/impetus

On completing development of a stormwater ordinance addressing private property, the Water Committee of the Ann Arbor Environmental Commission noted the lack of a substantive policy covering the PROW's impact on stormwater management and water quality impairment. The Committee considered this significant, as City staff estimates 50 percent of stormwater runoff derives from the PROW. In 2012, the City Council directed City staff to work with the Environmental Commission on the issue; staff reviewed policies from Seattle, Washington and Portland, Oregon in developing a Green Streets policy for Ann Arbor.

### Funding

The City's **stormwater utility fee**, established in 1980 and recently increased, pays for project design, capital costs, and operation and maintenance activities. The fee is calculated on the measurement of impervious area based on a computer analysis of aerial infrared photography, subject to customers' ability to challenge this. There are two rate categories: single-family (four tiers), and commercial and other properties.

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<sup>118</sup> CITY OF ANN ARBOR, MICH., STORM WATER MANAGEMENT PROGRAM (2011) (citing the appended Public Education Plan Template 10 (2010)).

<sup>119</sup> See *Id.* (including TMDLs for phosphorus and bacteria in the surface waters of the Middle Huron Watershed and total suspended solids in Mallett's Creek).

<sup>120</sup> See CITY OF ANN ARBOR, MICH., MUNICIPAL CODE Ch. 33, § 2:211 (2019) (referencing the Washtenaw County Water Resource Commissioner Rules in its stormwater credit program); See also RULES AND GUIDELINES: PROCEDURES & DESIGN CRITERIA FOR STORMWATER MANAGEMENT SYSTEMS, WASHTENAW COUNTY WATER RESOURCE COMMISSIONER 4, 50 (2016) (requiring a discussion of the changes and benefits of green infrastructure, listing environmental site design practices, and applying Low Impact Design stormwater Best Management Practices to design all retention and detention facilities).

<sup>121</sup> Nina Holden, *The Downside of all that Pavement in Southeast Michigan Cities*, CRAIN'S DETROIT BUS. (Oct. 8, 2013, 12:00 PM), <https://www.craindetroit.com/article/20131008/BLOG112/131009874/the-downside-of-all-that-pavement-in-southeast-michigan-cities> (last visited June 6, 2019).

<sup>122</sup> See CITY OF ANN ARBOR, MICH., RESOLUTION NO. 14-0071, (2014).



### Applicability

The City's policy applies only to construction and significant reconstruction, and does not apply to maintenance or resurfacing. Infiltration standards are based on each project site's ability to infiltrate stormwater—namely, on the soil infiltration rate, whether the site is located within a floodplain, and whether the slope is less or greater than 20 percent. City staff will utilize the highest feasible standard if site conditions suggest multiple infiltration standards.<sup>123</sup>

**Exceptions** to implementing Green Streets are based on *infeasibility*. Factors determining feasibility of incorporating green infrastructure include presence of groundwater within five feet, contaminated soil, and other limiting conditions. City staff must first provide written justification to the Public Services administrator for approval, which is discretionary.<sup>124</sup>

### Coordination

The departments collaboratively implement the Green Streets policy and street construction work. Projects triggering the policy are flagged early in the process of being added to the CIP.

### Maintenance

The policy requires development of maintenance plans for all infiltration facilities, in coordination with Field Operations staff.<sup>125</sup>

### Accountability

Ann Arbor's policy does not include any reporting or tracking requirements.

### Outcomes

*Reaction and outreach:* City staff reports the policy has been warmly welcomed by the generally pro-environment public.

*Successes:* Several PROW projects applying the policy have been implemented.<sup>126</sup> The City does not systematically trace improvements in local water quality back to GS policy, but City staff reports noticing improvement in the quality of the local impaired surface waters.

*Challenges:* The City recently implemented a stormwater fee rate hike, although the increase was not solely due to Green Streets costs.

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<sup>123</sup> See CITY OF ANN ARBOR, MICH., RESOLUTION NO. 14-0071 (2014) (citing attached Stormwater Management Guidelines for Public Street Construction and Reconstruction at 1).

<sup>124</sup> *Id.*

<sup>125</sup> *Id.*

<sup>126</sup> No cost breakout for the green infrastructure elements is available.

Case Study: Central Falls



**Chesapeake Watershed Jurisdiction:** NO  
**Green Streets Policy adopted:** 2018  
**Policy Type:** Ordinance/Combined Complete & Green Streets  
**Applicability:** New and existing PROW

Municipal Characteristics
<b>Jurisdiction type:</b> City
<b>Population:</b> 19,376
<b>Total area:</b> 1.27 mi <sup>2</sup>
<b>Water area:</b> 0.08 mi <sup>2</sup>
<b>Land area:</b> 1.2 mi <sup>2</sup> <sup>127</sup>
<b>PROW:</b> 27 mi <sup>128</sup>
<b>Average annual precipitation:</b> 47.18 in. <sup>129</sup>
<b>FY 2019 budget:</b> <sup>130</sup>
\$\$18,624,967 total/general fund
\$300,000 CIP
N/A stormwater sewer system

Lessons Learned
➤ N/A. Policy too recently adopted.

**STORMWATER MANAGEMENT:**

Central Falls is a very small jurisdiction, with approximately 548 acres of impervious area, or 66.4 percent of total land area.<sup>131</sup> Stormwater runoff is collected via a combined sewer system (CSS). The Narragansett Bay Commission (NBC) controls Central Falls’ main sewer and storm water network; the City controls the laterals connecting to the network. The Department of Public Works is the agency responsible for the PROW, and for stormwater management falling outside NBC’s purview. The City has enacted a stormwater ordinance, which primarily governs post-construction stormwater control, and does not reference either green infrastructure or Green Streets.<sup>132</sup>

NBC’s CSO Plan covers overflows in Providence, Pawtucket, and Central Falls. The City entered into a partnership with NBC to separate storm and sewer; this is primarily through green infrastructure, in order to infiltrate more runoff. Phase III of NBC’s CSO Plan incorporates green infrastructure elements. NBC is subject to a consent decree with the Rhode Island Department of Environmental Management for failure to comply with conditions of its MS4 Permit; however, Central Falls is not a permittee. Central Falls is not subject to any TMDL requirements.

<sup>127</sup> U.S. Census Bureau, *Population, Housing Units, Area, and Density: 2010 - United States -- Places by State*, AMERICAN FACTFINDER (downloaded June 7, 2019) (search “Central Falls”).

<sup>128</sup> AMEC ENV’T & INFRASTRUCTURE, INC., UPPER NARRAGANSETT BAY REGIONAL STORMWATER UTILITY FEASIBILITY STUDY PHASE I, 24 (2014).

<sup>129</sup> Data Tools: 1981-2010 Normals, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/cdo-web/datatools/normals> (select “Rhode Island” and “Providence”) (last visited June 6, 2019).

<sup>130</sup> CITY OF CENTRAL FALLS, R.I., ADOPTED BUDGET FISCAL YEAR 2019 7, 24 (2018).

<sup>131</sup> AMEC ENV’T & INFRASTRUCTURE, INC., *supra* note 128 at 20.

<sup>132</sup> CENTRAL FALLS, R.I., CODE OF ORDINANCES ch. 18, art. V (2009).

## GREEN STREETS POLICY

In 2017, Central Falls' City Council approved an ordinance creating the City's Green and Complete Streets Initiative, effective 2018. The ordinance amends the municipal code.<sup>133</sup>

### Historical context/impetus

Central Falls' policy is New England's first Green and Complete Streets ordinance. The main goal was achieving multi-modal transportation. The policy originated with a coalition of local stakeholders, including Grow Smart Rhode Island, the Rhode Island Bicycle Coalition, Rhode Island Department of Health, Pawtucket/Central Falls Health Equity Zone, and the Local Initiatives Support Corporation. The Green Streets elements comprised part of a larger push to more effectively manage stormwater. The City Council approved the bill unanimously.

### Funding

Central Falls has a very small budget, and will install green infrastructure only when sufficient funding is available. The City anticipates green infrastructure will be funded through bonding, partnerships, and/or grants. Voters recently approved a \$3 million bond issue for roads and green infrastructure. The City is currently in the process of hiring an engineer to assist with determining priorities.

### Applicability

The City's policy applies to every transportation improvement project and phase—including transportation and street design projects completed by the State and by public companies, such as utilities—as an opportunity for incorporating green infrastructure. Pragmatically, execution of the policy is subject to available funding. The policy explicitly references new, rehabilitated, and reconstructed facilities, and projects spanning capital improvements, re-channelization, and "major maintenance" (undefined). City staff will utilize annual performance measures, including water quality indicators, to identify additional improvement projects for inclusion in the City's CIP.

**Exceptions and waivers** are approved by the City Council with a recommendation from the Planning Board. The City Council weighs the following: (1) the PROW project constitutes ordinary maintenance activity; (2) a recommendation from the Department of Public Works that applying the policy is unnecessary or unduly cost prohibitive; and (3) other information indicating an absence of present and future need. All related documentation is made publicly available. The policy authorizes the Director of Public Safety to issue a waiver or an exception if the project is contrary to public safety; the Director must notify the City Council within two business days.<sup>134</sup>

### Coordination

Central Falls is a very small municipality, with a commensurately small staff. This simplifies the process for Public Works and Planning Departments to work together directly to coordinate Green Streets projects. The ordinance also directs promotion of inter-departmental project coordination to better use fiscal resources.<sup>135</sup> The policy instructs City staff to follow the best and latest design standards, specifically referencing the Rhode Island Department of

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<sup>133</sup> *Id.* at ch. 32, art. IX (2018) (adding "Streets, Sidewalks and Other Public Places").

<sup>134</sup> *Id.* at § 32-313.

<sup>135</sup> *Id.* at § 32-316(e).

Environmental Management (DEM) LID standards, and to update City standards.<sup>136</sup> Green and Complete Streets principles are to be incorporated into all existing plans, manuals, and other relevant City documents.<sup>137</sup>

#### Maintenance

The policy does not directly address maintenance.

#### Accountability

The ordinance directs City staff to submit an annual report, documenting increases and decreases for a listed set of performance measures, which includes water quality.<sup>138</sup>

#### Outcomes

*Reaction and outreach:* No significant opposition has been reported or identified.

*Successes:* Too early to determine.

*Challenges:* Too early to determine.

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<sup>136</sup> *Id.* at 32-314.

<sup>137</sup> *Id.* at 32-316(a).

<sup>138</sup> *Id.* at 32-315(o).

Case Study: Cleveland

**Chesapeake Watershed Jurisdiction: NO**

**Green Streets Policy adopted: 2012**

**Policy Type: Ordinance/Combined Complete & Green Streets**

**Applicability: New, reconstruction, and improvements**



Municipal Characteristics	
<b>Jurisdiction type:</b>	City
<b>Population:</b>	383,793
<b>Total area:</b>	82.47 mi <sup>2</sup>
<b>Water area:</b>	4.77 mi <sup>2</sup>
<b>Land area:</b>	77.7 mi <sup>2</sup> <sup>139</sup>
<b>PROW:</b>	1,200 mi <sup>140</sup>
<b>Average annual precipitation:</b>	37.75 in. <sup>141</sup>
<b>FY 2019 budget:</b> <sup>142</sup>	
	\$1,830,570,160 total expenditures
	\$651,135,031 general fund
	\$236,607,014 CIP
	\$30,194,535 water pollution control

- Lessons Learned**
- **Substantial discretion to issue exceptions and lack of a dedicated funding source** has resulted in Complete & Green Street elements to be value engineered out of projects.
  - **Annual progress reports** including **quantifiable outputs and outcomes** allow officials and the public to track progress. Currently, the reports include a few specific outputs, such as PROW miles newly incorporating Green Streets and water quality indicators.

**STORMWATER MANAGEMENT**

Cleveland’s storm sewer system is a combination CSS and MS4. The Ohio Environmental Protection Agency (OEPA) issued the City’s current Phase II General Permit in 2014. The Permit mentions green infrastructure in the context of post-construction stormwater management in new and redevelopment projects.<sup>143</sup> The City’s Cuyahoga River Watershed is subject to TMDLs for total phosphorus and habitat; the implementation plan does not specifically reference green infrastructure or Green Streets.

The Northeast Ohio Regional Sewer District (NEORS) oversees the CSS portion of the system, and is subject to both a CSO Control Plan and a consent decree. NEORS submitted a Green infrastructure Plan in 2012 for EPA and Ohio

<sup>139</sup> U.S. Census Bureau, *Population, Housing Units, Area, and Density: 2010 - United States -- Places by State*, AMERICAN FACTFINDER (downloaded June 7, 2019) (search “R19405).

<sup>140</sup> E-mail from Shelton Coleman, Asst. Cmm’r, Div. of Streets, City of Cleveland, Ohio, to Cynthia R. Harris, Staff Att’y, Env’tl. Law Inst. (Mar. 11, 2019 11:40 EST) (on file with author).

<sup>141</sup> Data Tools: 1981-2010 Normals, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/cdo-web/datatools/normals> (select “Ohio” then “Cleveland Burke Lakefront Airport, OH US” and “Cleveland Hopkins International Airport, OH US” averaging precipitation totals) (last visited June 6, 2019).

<sup>142</sup> CITY OF CLEVELAND, OHIO, 2019 BUDGET BOOK 3, 54, 75, 411 (2019).

<sup>143</sup> Authorization for Small MS4s to Discharge Storm Water under the NPDES, NDPES Permit No. OHQ000003 13 (Ohio EPA Sept. 12, 2014) (requiring rationale statements prepared during the decision process discuss any non-structural and structural BMPs included in stormwater management programs, including, as appropriate, green infrastructure).

EPA approval in 2012, pursuant to the consent decree. The Plan references Green Streets project implementation in Cleveland, noting the City incorporated green infrastructure in areas where the City's CIP included roadway rehabilitation projects.<sup>144</sup>

The City's Department of Public Utilities, Division of Water Pollution Control oversees stormwater planning. Cleveland has not enacted a formal stormwater ordinance, although various stormwater requirements are incorporated into the municipal code.

## GREEN STREETS POLICY

In 2011, Cleveland's City Council approved an ordinance creating the City's Green and Complete Streets Initiative, effective 2012.<sup>145</sup> The ordinance did not amend the municipal code.

### Historical context/impetus

In 2011, the City formed a Complete and Green Streets task force to draft a policy.<sup>146</sup> Stormwater control and accessibility were the two main drivers. The 2010 consent decree between NEORS and EPA was a contributing factor, with the large amount of impervious surfaces identified as a main cause of the overburden on the CSO sewer system, particularly as it impacted Lake Erie.<sup>147</sup> The task force reviewed policies from St. Paul, Minnesota, Seattle, Washington, Buffalo, New York, and St. Louis, Missouri, in developing a policy for Cleveland.

### Funding

Stormwater management is funded by a utility fee, which is based on each parcel's impervious surface area Equivalent Residential Units (ERU). However, the City lacks a dedicated funding source for implementing its policy. The allocation of funding toward different Complete and Green Streets elements is determined on a project-by-project basis, and is impacted by site constraints, community needs, and project budgets. Available sources of funding for stormwater/green infrastructure projects, generally, include: (1) USEPA through the Great Lakes Restoration Initiative (GLRI) grant program; (2) NEORS's Green Infrastructure Grant program; and (3) the City's Community Cost Share Program, a funding source available to all communities serviced by NEORS.

### Applicability

The ordinance is worded to *authorize* the Director of Capital Projects to implement and enforce Green Streets policies and guidelines, but does not directly *require* incorporation of green infrastructure into the PROW. While narrow in stringency, the policy's scope is broad, in that it applies to new construction, reconstruction, rehabilitation, resurfacing, and streetscape enhancements. Incorporation of green elements into the latter two—resurfacing and roadway enhancement projects—is limited to “minimal impact improvements,” meaning projects that do not affect the street's sub base, curbs, sidewalks, or other elements outside of the main project.<sup>148</sup>

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<sup>144</sup> Northeast Ohio Regional Sewer District, Green Infrastructure Plan 3-18, F-1, F-6 (2012) (noting that planning-level green street costs typically equate to 20 to 40 percent of the overall roadway rehabilitation budget and NEORS will develop and study green infrastructure control measures feasibility).

<sup>145</sup> See CITY OF CLEVELAND, OHIO, ORDINANCE NO. 798-11 (2011).

<sup>146</sup> The only reported opposition pertained to the “Complete” aspect of the policy, originating from a local bicycle advocacy group promoting accessibility for non-motorized vehicles. A member of the group was invited to serve on the task force.

<sup>147</sup> CITY OF CLEVELAND, OHIO, COMPLETE AND GREEN STREETS: TYPOLOGIES PLAN 16 (2013).

<sup>148</sup> Complete and Green Streets Ordinance. Ordinance No. 798-11 § 4 (2011).



The ordinance directs City staff to base Green Streets elements on guidelines contained in specific documents and organization policies. These guidance documents include: the Cleveland Water Pollution Control guidelines, Engineering and Construction Specifications, Cleveland Public Power Streetlight Guidelines, Traffic Engineering Signal Guidelines, the Streetscape Design Guidelines Handbook, the Northeast Ohio Regional Sewer District stormwater plans, and the Ohio Department of Transportation and Ohio Environmental Protection Agency Best Management Practices for Green Streets. Additionally, other guidelines may be developed.<sup>149</sup>

**Exemptions** are at the discretion of the Public Works Department. The ordinance provides a nonexclusive list of potential rationales for issuing exemptions, including, but not limited to: (1) financial hardship to the project sponsor, met when compliance constitutes a minimum of 20 percent of the total project cost, with a total ceiling of \$1 million (calculating feasibility using a life cycle analysis); (2) severe topographic or natural resource constraints; (3) where existing structures do not permit implementation; and (4) where implementation could result in threats to the safety and welfare of pedestrians, cyclists, or motorists.<sup>150</sup> The Director of Capital Projects may approve exemptions after consulting with affected City Departments and may consult an advisory committee comprising representatives of all affected City Departments and regional bodies. The Director must provide notice of all exemption requests to the City Council member(s) whose ward(s) include a project seeking an exemption.<sup>151</sup>

#### Coordination

The ordinance does not provide explicit instruction to City agencies and staff for coordinating implementation of the policy. In 2013, a Complete & Green Streets Typology Plan was drafted to create an agreed upon framework for decision-making in the right-of-way. However, the Typology Plan focuses primarily on design standards and the selection of green infrastructure treatments, rather than on inter-agency coordination.<sup>152</sup>

#### Maintenance

Cleveland's ordinance specifically addresses maintenance; all approved projects must include provisions for ongoing maintenance of the improvements. The policy permits utilizing alternative maintenance agreements to reduce costs to the City, such as entering into maintenance agreements with adjacent property owners.<sup>153</sup>

#### Accountability

The Director of Capital Projects is obligated to provide an annual progress report to the City Council on implementation of the policy. The City's Complete & Green Streets Progress Report lists specific outputs and outcomes.<sup>154</sup> These include the number of days each year that water advisories are posted on Lake Erie beaches.<sup>155</sup>

#### Outcomes

*Reaction and outreach:* None reported.

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<sup>149</sup> *Id.* at § 2.

<sup>150</sup> *Id.* at § 6, 7 (2011).

<sup>151</sup> *Id.* at § 5 (2011).

<sup>152</sup> See CITY OF CLEVELAND, OHIO, COMPLETE AND GREEN STREETS: TYPOLOGIES PLAN (2013).

<sup>153</sup> CITY OF CLEVELAND, OHIO, ORDINANCE NO. 798-11 § 7 (2011).

<sup>154</sup> See CITY OF CLEVELAND, OHIO, COMPLETE & GREEN STREETS PROGRESS REPORT 7–12 (2016).

<sup>155</sup> *Id.* at 10.

*Successes:* The City successfully implemented a small number of PROW projects in 2016 and 2017. This includes the \$7.7 million Fleet Avenue Project, which incorporated a \$1 million green infrastructure project—specifically, landscaped swales, funded by NEORS. In 2016, at least four projects incorporated permeable pavement, and 15 City staff received training in green infrastructure, funded by a grant awarded to the City’s Office of Sustainability.<sup>156</sup> While the number of water advisories have declined overall since 2009, the number increased from 2016 to 2017, to over 15.<sup>157</sup>

*Challenges:* The number of Green Streets projects actually implemented is limited, a fact ascribed to the number of exceptions built into the policy and the lack of a dedicated funding source. City officials also point to an absence of a detailed plan for green infrastructure.<sup>158</sup>

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<sup>156</sup> *Id.* at 6.

<sup>157</sup> CITY OF CLEVELAND, OHIO, COMPLETE & GREEN STREETS PROGRESS REPORT 11 (2017).

<sup>158</sup> Steven Litt, *Cleveland Earns Mixed Grades on 'Complete and Green Streets' Three Full Years into Historic Program*, CLEVELAND.COM (Jan. 13, 2015), [https://www.cleveland.com/architecture/2015/01/cleveland\\_earns\\_mixed\\_report\\_c.html](https://www.cleveland.com/architecture/2015/01/cleveland_earns_mixed_report_c.html).

Case Study: Cleveland Heights

**Chesapeake Watershed Jurisdiction: NO**

**Green Streets Policy adopted: 2018**

**Policy Type: Resolution adopting policy/Combined Complete & Green Streets**

**Applicability: New and Reconstruction**



Municipal Characteristics
<b>Jurisdiction type:</b> City
<b>Population:</b> 44,373
<b>Total area:</b> 8.12 mi <sup>2</sup>
<b>Water area:</b> 0.02 mi <sup>2</sup>
<b>Land area:</b> 8.11 mi <sup>2</sup> <sup>159</sup>
<b>PROW:</b> 137 mi. of streets, 150 mi. of storm sewers <sup>160</sup>
<b>Average annual precipitation:</b> 37.75 in. <sup>161</sup>
<b>FY 2019 budget:</b> <sup>162</sup>
\$6,982,000 general fund
\$518,000 sewer fund
\$425,000 CIP
\$118,000 PROW

Lessons Learned
➤ <b>N/A.</b> Policy too recently adopted.

**STORMWATER MANAGEMENT:**

Cleveland Heights is a Phase II MS4 under a General Permit. The Ohio Environmental Protection Agency issued the current permit in September 2014; the Permit expires in September 2019.<sup>163</sup> The General Permit makes a single specific reference to green infrastructure in Minimum Control Measure (MCM) 5, which governs MS4s' post-construction stormwater management programs for new development and redevelopment.<sup>164</sup>

The City is under a consent decree. In 2017, EPA filed a complaint that the City violated CWA Sections 301 and 309.<sup>165</sup> The City's sewer system includes separate trench and common trench storm and sanitary sewers. Where sanitary and storm sewers are in common trench systems, there are multiple points of connection. This results in raw sanitary sewage entering the stormwater system when either system exceeds its capacity.<sup>166</sup> EPA's complaint alleged Cleveland Heights violated both the CWA and the General Permit by discharging untreated sewage from point

<sup>159</sup> U.S. Census Bureau, *Population, Housing Units, Area, and Density: 2010 - United States -- Places by State*, AMERICAN FACTFINDER (downloaded June 7, 2019) (search "Cleveland Heights").

<sup>160</sup> CITY OF CLEVELAND HEIGHTS, OHIO, COMPREHENSIVE ANNUAL FINANCIAL REPORT S36 (2015).

<sup>161</sup> Data Tools: 1981-2010 Normals, NAT'L OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/cdo-web/datatools/normals> (select "Ohio" then "Cleveland Burke Lakefront Airport, OH US" and "Cleveland Hopkins International Airport, OH US" averaging precipitation totals) (last visited June 6, 2019).

<sup>162</sup> CITY OF CLEVELAND HEIGHTS, OHIO, ALTERNATIVE TAX BUDGET INFORMATION, 3-4 (July 17, 2019).

<sup>163</sup> Authorization for Small MS4s to Discharge Storm Water under the NPDES, NPDES Permit No. 3GQ00010\*CG 1 (Ohio EPA Sept. 12, 2014).

<sup>164</sup> *Id.* at 13 (stating any non-structural and structural BMPs, including green infrastructure, should be included in each MS4's rationale statement).

<sup>165</sup> *United States v. City of Cleveland Heights, Ohio*, No. 1:17-cv-01517 1 (N.D. Ohio July 19, 2017) (ordering a partial consent decree for violating Section 301 prohibiting the discharge of any pollutant into navigable waters except in compliance with a NPDES permit and Section 309 governing federal enforcement authority).

<sup>166</sup> *Id.* at 1-2.

sources into the Waters of the United States and the Waters of the State of Ohio.<sup>167</sup> Under the Consent Decree, Cleveland Heights agreed to develop and submit to EPA an Integrated Overflow Control Master Plan (IOCMP) by 2021.<sup>168</sup> The City must propose, in the IOCMP, remedial measures to address capacity limitations. These measures may—but are not required to—include removing Infiltration/Inflow (I/I) sources, including through the use of innovative approaches such as green infrastructure.<sup>169</sup>

The City has enacted a stormwater ordinance, encoded in Chapter 1335.<sup>170</sup> The Department of Public Works, Stormwater Management Program, manages stormwater operations. The Complete and Green Streets Policy makes the Office of Capital Projects responsible for ensuring adherence to the Policy, subject to the City Manager's oversight.<sup>171</sup>

Cleveland Heights lies within Northeast Ohio Regional Sewer District's (NEORS) stormwater service area. Beginning in 2013, customers pay a stormwater fee to support NEORS's Regional Stormwater Management Program.<sup>172</sup> This fee is based on Equivalent Residential Units (ERU), with each ERU representing 3,000 sq. ft. of impervious area per parcel, measured by digitizing impervious features from aerial photographs. As of 2016, the Stormwater Fee for residential property ranges is divided among three tiers, each subject to a \$3.09, \$5.15, or \$9.27 monthly fee. NEORS charges commercial properties \$5.15 per ERU, with a declining block fee applying once a parcel exceeds 10 ERUs.<sup>173</sup>

## GREEN STREETS POLICY

In 2018, Cleveland Heights' City Council passed a resolution adopting the Complete and Green Streets Policy. Much of the language parallels the language of Central Falls, Rhode Island's policy.<sup>174</sup>

### Historical context/impetus

Bicyclists were the main drivers behind Cleveland Heights' Policy,<sup>175</sup> with substantial efforts underway beginning in 2015.<sup>176</sup> The Transportation Advisory Committee, a coalition of residents, business owners, and other shareholders,

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<sup>167</sup> *Id.* at 2.

<sup>168</sup> *Id.* at 19.

<sup>169</sup> *Id.* at 20.

<sup>170</sup> See CITY OF CLEVELAND HEIGHTS, OHIO, CODE OF ORDINANCES, pt. 13, tit. 3, ch. 1335 (2008).

<sup>171</sup> CITY OF CLEVELAND HEIGHTS, OHIO, Resolution No. 37-2018 (HT), 10.6 (2018).

<sup>172</sup> NEWS: *Cleveland Heights and Berea Customers, Your Stormwater Bill and Sewer/Water Bills are Separate*, NORTHEAST OHIO REGIONAL SEWER DISTRICT, <https://www.neorsd.org/news-cleveland-heights-and-berea/> (last visited June 7, 2019); see also Rachel Abbey McCafferty, *Sewer District Fees for Stormwater Management to Begin in 2013*, PATCH.COM (Dec. 31, 2012 6:34 PM) <https://patch.com/ohio/clevelandheights/sewer-district-fees-for-stormwater-management-to-begi7e958f9b19> (last visited June 7, 2019) (stating a number of cities within the District protested the fee and the case went to trial in 2011, where NEORS prevailed and implemented the fee January 1, 2013).

<sup>173</sup> *Wastewater Rates and Stormwater Fees*, NORTHEAST OHIO REGIONAL SEWER DISTRICT, <https://www.neorsd.org/customers-service-page/sewer-rates-and-stormwater-fees/#rate> (last visited June 7, 2019).

<sup>174</sup> See CITY OF CLEVELAND HEIGHTS, OHIO, Resolution No. 37-2018 (HT) (2018).

<sup>175</sup> Thomas Jewell, *Cleveland Heights Nationally Recognized for Complete Streets Policy*, CLEVELAND.COM, <https://www.cleveland.com/community/2019/05/cleveland-heights-attains-national-recognition-for-complete-streets-policy.html> (May 8, 2019) (last visited June 7, 2019) (recognizing that the policy originated with Councilwoman Mary Dunbar, who also served as Vice President of the Cleveland Heights Bicycle Coalition).

<sup>176</sup> Steve Reinhardt, *Cleveland Heights Passes a Complete & Green Streets Policy*, HEIGHTS BICYCLE COALITION, <http://bikesintheheights.org/uncategorized/cleveland-heights-passes-a-complete-green-streets-policy/> (May 11, 2018) (last visited June 7, 2019).

developed the Policy.<sup>177</sup> The City's Master Plan, approved March 20, 2017, incorporated the goal of adopting a Complete and Green Streets Policy.<sup>178</sup>

### Funding

Major sources for the City's residential road program include the License Plate tax, or motor vehicle registration proceeds, and Gasoline Tax. A raise of the State gas tax of 10.5 to 38.5 cents per gallon takes effect in July 2019.<sup>179</sup> Projects may also receive matching grants from the Northeast Ohio Areawide Coordinating Agency (NOACA). The Policy directs City staff to identify all funding sources for street improvements.<sup>180</sup>

### Applicability

The Complete Streets aspect of the Policy—requiring roadways be designed, constructed, and maintained for multi-modal use—applies broadly, to “all City-owned new construction, reconstruction/retrofit, resurfacing, repaving, restriping and rehabilitation transportation projects in the public right-of-way.”<sup>181</sup> The Green Streets element arguably is also wide in scope, with the Policy instructing that every street project, in each phase, be approached “as an opportunity for water quality improvements.”<sup>182</sup> The Policy applies not only to all City-funded and -approved projects but also to private developments, projects funded by non-municipal agencies and organizations, and, to the fullest extent possible, State of Ohio streets.<sup>183</sup>

**Exceptions** apply only to the Complete Streets aspect of the Policy, at least on the face of the relevant provisions.<sup>184</sup> Permissible exceptions include: (1) when the law prevents use of an affected roadway by specified users; (2) ordinary maintenance activities; and (3) when the City Manager, after consulting with other City officials and the Transportation Advisory Committee, issues a documented exception concluding application of Complete Streets is “excessively disproportionate to the need or probable use.”<sup>185</sup> These exceptions must be justified and posted in the City's website, and at City Hall and the public libraries.<sup>186</sup>

### Coordination

The City's Policy grants the City Manager oversight of Public Works, Planning, Police, and Capital Projects staff to implement the Complete and Green Streets, and specifies methods of promoting inter-departmental communication about Complete and Green Streets topics. These methods include discussions at weekly senior staff meetings and in weekly staff activity reports to the City Manager and City Council.<sup>187</sup> The Policy also requires

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<sup>177</sup> Thomas Jewell, *Cleveland Heights Introduces Green Infrastructure Initiatives*, CLEVELAND.COM, [https://www.cleveland.com/cleveland-heights/2018/04/cleveland\\_heights\\_introduces\\_g.html](https://www.cleveland.com/cleveland-heights/2018/04/cleveland_heights_introduces_g.html) (Apr. 25, 2018) (last visited June 7, 2019).

<sup>178</sup> CITY OF CLEVELAND HEIGHTS, OHIO, CITY OF CLEVELAND HEIGHTS: MASTER PLAN 147 (2017).

<sup>179</sup> *2019 Road Program*, CITY OF CLEVELAND HEIGHTS, <https://clevelandheights.com/455/2019-Road-Program> (last visited June 7, 2019); see also TRANSPORTATION BUDGET IN BRIEF: HOUSE BILL 62 – AS ENACTED, LEGISLATIVE BUDGET OFFICE OF THE LEGISLATIVE SERVICE COMMISSION, 1 available at <https://www.lsc.ohio.gov/documents/budget/133/transportation/FI/budgetinbrief-hb62-en.pdf> (last visited June 7, 2019).

<sup>180</sup> See CITY OF CLEVELAND HEIGHTS, OHIO, Resolution No. 37-2018 (HT) § 10.6 (2018).

<sup>181</sup> *Id.* at § 3.1.

<sup>182</sup> *Id.* at § 3.4.

<sup>183</sup> *Id.* at §§ 5.1–5.5.

<sup>184</sup> *Id.* at § 4.1 (“Exceptions for providing for all modes in each project may be authorized by the City Manager when . . .”).

<sup>185</sup> *Id.* at §§ 4.1.1–4.1.3.

<sup>186</sup> *Id.* at § 4.1.3.

<sup>187</sup> *Id.* at §§ 5.1, 10.6.

Complete and Green Streets to be included in the CIP's project evaluation and criteria scoring; green elements are not specifically addressed.<sup>188</sup>

The Policy additionally instructs City staff to promote project partnerships with other public agencies, including the State, County, neighboring communities, and business and school districts.<sup>189</sup> However, the focus again is on Complete Streets and promoting inter-jurisdictional multi-modal travel explicitly, and not on Green Streets and addressing stormwater runoff and water quality on a regional basis.

#### Incorporation

The Policy requires all applicable departments, agencies, and committees to incorporate Complete and Green Streets principles into all existing and future plans, manuals, checklists, decision-trees, rules regulations, and programs, including the Capital Improvement Program and the annual road program.<sup>190</sup>

#### Maintenance

The policy does not directly address maintenance.

#### Accountability

Cleveland Heights' reporting requirements hew closely to the language in Central Falls' policy.<sup>191</sup> The Policy lists several performance measures and directs the Planning Department to annually issue a report, evaluating implementation of Complete and Green Streets, to the Transportation Advisory Committee, the Citizens Advisory Committee, and the general public. Performance measures relevant to stormwater include: (1) square footage of new bioretention facilities; (2) square footage of pavement removed; (3) lineal feet of sanitary sewer lines newly separated from storm lines; and (4) number of streets trees added. Cleveland Heights emphasizes equity by requiring the Planning Department to report on the effectiveness of each Complete and Green Streets project in engaging and responding to underrepresented groups. Reports must be made accessible online and in hard copy at both City Hall and public libraries.<sup>192</sup>

#### Outcomes

*Reaction and outreach:* The Policy directs Capital Projects, Public Works, Planning, and Community Services staff to develop a community engagement plan. The Policy identifies effective strategies, including: (1) enlisting survey helpers from the group whose input is sought; (2) holding public meetings; (3) collecting input at community gathering spaces; (4) hosting and attending community meetings and events; and (5) leveraging e-mail and social media. The Policy emphasizes ensuring these opportunities are accessible to and convenient for members of the public, and that information exchange is mutual, with City staff incorporating resident feedback.<sup>193</sup>

Cleveland Height's Policy is unique in explicitly considering context sensitivity *ex ante*, whereas many other Green Streets jurisdictions recognize its importance only after adopting their own policies.<sup>194</sup> The Policy states projects

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<sup>188</sup> *Id.* at § 9.1.

<sup>189</sup> *Id.* at § 3.3.

<sup>190</sup> *Id.* at § 9.2.

<sup>191</sup> *Compare Id.* at § 8, with CITY OF CENTRAL FALLS, R.I., CODE OF ORDINANCES, ch. 32, art. IX, § 32-315(o) (2008).

<sup>192</sup> CITY OF CLEVELAND HEIGHTS, OHIO, Resolution No. 37-2018 (HT) § 8.2 (2018).

<sup>193</sup> *Id.* at § 10.8.

<sup>194</sup> *Id.* at § 7.1.

“must be sensitive to the surrounding context including current and planned buildings, parks, trails, as well as its current and expected transportation needs.” The context-sensitive approach includes incorporating public feedback, recognizing the values of promoting a “walkable, vibrant, sustainable, and bike friend community,” enhancing the character of districts designated as Historic, and designing projects “at a human scale for the needs and comfort of all people.”<sup>195</sup>

*Successes:* The first project to be implemented under the Policy, at the intersection of Edgemoor and Overlook Roads, began construction in April 2019 and is anticipated to be completed in July. The project will remove excess pavement to create two bioretention areas, add landscaping and a bus stop, tighten turning radii, and shorten crosswalks.<sup>196</sup> A \$100,000 Transportation for Livable Communities grant from the Northeast Ohio Areawide Coordinating Agency (NOACA) paid for the study and the implementation.<sup>197</sup> Cleveland Heights completed a demonstration project with permeable pavers in 2017.<sup>198</sup>

*Challenges:* No obstacles have been reported as of the drafting of this report.

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<sup>195</sup> *Id.* at §§ 7.1–7.3, 7.5.

<sup>196</sup> Robert Brown, *Project is Underway to Improve Safety at Busy CH Intersection*, HEIGHTS OBSERVER, <http://www.heightsobserver.org/read/2019/04/16/project-is-underway-to-improve-safety-at-busy-ch-intersection> (Apr. 16, 2019 10:17 AM).

<sup>197</sup> Marc Lefkowitz, *What Goes into a Complete Street? Ask Cleveland Heights, the Best 2018 Complete Street Policy*, GREEN CITY BLUE LAKE, <https://www.gcbl.org/blog/2019/05/what-goes-into-a-complete-street-ask-cleveland-heights-the-best-2018-complete-street-policy> (May 17, 2019 1:00 PM); Thomas Jewell, *Cleveland Heights Eyes Another \$700,000 in Annual Revenues from State Gas Tax Hike*, CLEVELAND.COM, <https://www.cleveland.com/community/2019/04/cleveland-heights-eyes-another-700000-in-annual-revenues-from-state-gas-tax-hike.html> (Apr. 10, 2019).

<sup>198</sup> Telephone Interview with Richard Wong, Planning Dir., Planning & Dev., City of Cleveland Heights, Ohio (Mar. 29, 2019).



Case Study: Dallas

**Chesapeake Watershed Jurisdiction: NO**

**Green Streets Policy adopted: 2016**

**Policy Type: Design Manual/Combined Complete & Green Streets**

**Applicability: New, reconstruction, and improvements**



Municipal Characteristics
<b>Jurisdiction type:</b> City
<b>Population:</b> 1,345,047
<b>Total area:</b> 385.84 mi <sup>2</sup>
<b>Water area:</b> 45.33 mi <sup>2</sup>
<b>Land area:</b> 340.52 mi <sup>2</sup> <sup>199</sup>
<b>PROW:</b> 11,775 mi. <sup>200</sup>
<b>Average annual precipitation:</b> 38.49 in. <sup>201</sup>
<b>FY 2019 budget:</b> <sup>202</sup>
\$3,586,199,784 total expenditures
\$1,365,966,274 general fund
\$420,377,152 CIP
\$480,348,887 storm drainage management capital

Lessons Learned
➤ <b>Pilot projects</b> are credited with garnering support for full implementation of the policy, by providing visual proof of the economic and aesthetic benefits; however, these pilot projects focused on the Complete Streets elements.

**STORMWATER MANAGEMENT**

Dallas is a Phase I MS4 currently regulated under an expired Individual Permit issued by the Texas Commission on Environmental Quality (TCEQ). The City’s Storm Water Management Plan (SWMP) interprets the Permit’s Minimum Control Measure (MCM) 2, which provides direction for post-construction controls, as referring to green infrastructure. Dallas is under consent decree. The consent decree does not mandate green infrastructure or Green Streets, although it required the City to implement two constructed wetlands projects. The City is subject to Total Maximum Daily Loads (TMDLs) for legacy pollutants and bacteria. The TMDL implementation plan identifies green infrastructure as a mitigation measure.<sup>203</sup>

Dallas Water Utilities—specifically, the Capital Design and Drainage Operations Divisions—oversee stormwater management projects and operations. The City has enacted a stormwater ordinance.<sup>204</sup> The ordinance does not

<sup>199</sup> U.S. Census Bureau, AMERICAN FACTFINDER (last visited June 12, 2019) (search “Dallas city”); U.S. Census Bureau, *Population, Housing Units, Area, and Density: 2010—United States, Places by State*, AMERICAN FACTFINDER (downloaded June 7, 2019) (search “R24882”).

<sup>200</sup> Email Survey with Susan Alvarez, Assistant Dir., Office of Envntl Quality & Sustainability, City of Dall., Tex.

<sup>201</sup> Data Tools: 1981-2010 Normals, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/cdo-web/datatools/normals> (select “Texas” and averaged precipitation totals of “Dallas FAA Airport, TX US,” “Dallas Hensley Field NAS, TX US,” and “Dallas Redbird Airport, TX US”) (last visited June 7, 2019).

<sup>202</sup> CITY OF DALL., TEX., ANNUAL BUDGET: FISCAL YEAR 2018-19 4, 582 (2018).

<sup>203</sup> See NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS, GREATER TRINITY RIVER REGION TMDL I-PLAN: IMPLEMENTATION STATUS REPORT 21 23–25 (increasing adoption, implementation, and reducing barriers to GI/LID is included as a focus of the plan’s implementation strategies. The plan discusses adoption of GI and LID by municipalities, though this is limited mostly to new construction).

<sup>204</sup> See CITY OF DALL., TEX., CITY CODE art. IX, §§ 19-110–19-118.8 (2018).

presently reference green infrastructure, but City staff anticipates requirements for green infrastructure will be incorporated into the development code and the Drainage Design Manual in the future.

## GREEN STREETS POLICY

Dallas's Green Streets policy is part of a larger Complete Streets policy. The City Council in 2016 approved a resolution adopting a new Complete Streets Design Manual as a comprehensive policy guide.<sup>205</sup> Green Streets constitute both a principle of Complete Streets and guidelines for integrating green elements into the PROW, as laid out in a separate chapter of the Manual.<sup>206</sup>

### Historical context/impetus

Dallas launched its Complete Streets Initiative in June 2011 with the goal of instituting a new approach to designing and building the PROW.<sup>207</sup> Subsequent to the City Manager directing staff to develop a Complete Streets Policy, a sustainable design task force, comprised of environmental advocates, transportation officials, planners, engineers, and developers, was charged with developing updates to the City's overall design processes to make its planning and design processes more sustainable. This spurred a four-year process, and the Complete Streets Manual was the first product to result from this effort. Green Streets elements initially were placed in a separate chapter and then were integrated into the normal design processes—and made mandatory—when the Complete Streets policy was incorporated into updated versions of the Street and Drainage Design Manuals. The task force reviewed policies from Denver, Colorado, San Francisco, California, and Fort Lauderdale, Florida in developing a Complete Streets policy for Dallas.

### Funding

The stormwater program is currently funded via a stormwater utility (Storm Drainage Management Fund). Fees are based on GIS map coverage of impervious area per parcel. The stormwater utility fee is being incrementally increased to allow for funding of drainage projects through Revenue Bonds, repaid by the drainage fees.

The Complete Streets Design Manual anticipates projects may be funded by the CIP, the enterprise fund of a particular utility, a public-private partnership, the private sector, or a combination thereof.<sup>208</sup> Capital projects currently are funded via the City's bond program, with maintenance paid for by the general fund.

### Applicability

The Complete Streets Design Manual is broad in scope, applying to both new streets and street reconstruction projects, with the latter encompassing resurfacing and rehabilitation, underground utility upgrades requiring replacing the pavement surface, or complete reconstruction. The Manual specifically references street improvement projects.<sup>209</sup> The City must apply the Manual to all bond, or public construction projects.

**Exceptions** are made when the PROW does not permit implementation and when it is not practicable to obtain the additional right-of-way.

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<sup>205</sup> CITY OF DALL. TEX., RESOLUTION 160173 § 1 (2016).

<sup>206</sup> See CITY OF DALL., TEX., COMPLETE STREETS DESIGN MANUAL 201–13 (2016) (laying out Green Streets in Chapter 7).

<sup>207</sup> *Id.* at 3.

<sup>208</sup> *Id.* at 17.

<sup>209</sup> *Id.*

### Coordination

Green Streets elements, as part of the Design Manual, are automatically required—and therefore integrated into—all PROW projects. The City utilizes proprietary sustainability software in designing capital projects.

### Maintenance

The Design Manual includes a brief section on maintenance, and provides a list of suggested items to include in a maintenance plan. This partial list includes: (1) tree inspection during warranty; (2) update of databases/asset management, such as the tree database; (3) plan for pruning and seasonal planning; and (4) plan for drain clearance and recharge basin silt removal.<sup>210</sup>

### Accountability

The Council resolution requires the development of performance measures to be reported in the City's Sustainability Plan. However, the specific performance measures listed apply only to tracking implementation of Complete Streets, and not to the Green Streets elements.<sup>211</sup>

### Outcomes

*Reaction and outreach:* The City initiated pilot projects prior to adopting the full policy, although these projects focused on Complete, and not Green, Streets.

*Successes:* Currently, most projects are pending, although Public Works reports at least two projects, including a completed bioswales project downtown and another project designed but not yet constructed.<sup>212</sup> City staff anticipate projects under the Manual will contribute toward community resiliency.

*Challenges:* No obstacles have been reported as of the drafting of this report.

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<sup>210</sup> *Id.* at 30.

<sup>211</sup> CITY OF DALL. TEX., RESOLUTION 160173 § 1(8) (2016).

<sup>212</sup> Email Interview with Jared White, Complete Streets Assistant Manager, Dep't of Transp., City of Dall., Tex. (Mar. 28, 2019).

Case Study: Edina



**Chesapeake Watershed Jurisdiction:** NO

**Green Streets Policy adopted:** Policy adopted 2013; Plan issued 2015

**Policy Type:** Non-legally binding guidelines/Combined Complete & Green Streets (“Living” Streets)

**Applicability:** New and Reconstruction

Municipal Characteristics
<b>Jurisdiction type:</b> City
<b>Population:</b> 52,490
<b>Total area:</b> 15.97 mi <sup>2</sup>
<b>Water area:</b> 0.52 mi <sup>2</sup>
<b>Land area:</b> 15.45 mi <sup>2</sup> <sup>213</sup>
<b>PROW:</b> 230 mi. roadway, 80 mi. storm sewer mains, 11 storm sewer lift stations. <sup>214</sup>
<b>Average annual precipitation:</b> 30.61 in. <sup>215</sup>
<b>FY 2019 budget:</b> <sup>216</sup>
\$116,104,581 total expenditures
\$42,895,201 general fund
\$16,597,767 CIP
N/A stormwater sewer system

- **Identify a funding source for green infrastructure elements** when implementing a combined Complete and Green Streets policy.
- **Articulate and quantify the benefits of green infrastructure** to obtain the support of both public officials and City staff.
- **Engage with the public as early as possible** on projects, including discussions about stakeholders’ values. Specific hot-button concerns include narrowing streets and removing properties in order to incorporate both Complete and Green Streets elements.
- **Regularly reevaluate** Green Streets policies and plans as living documents.

**STORMWATER MANAGEMENT:**

Edina is a Phase II MS4 operating under a General Permit.<sup>217</sup> The Minnesota Pollution Control Agency (MPCA) plans to reissue the permit in autumn 2019. The current General Permit makes a single specific reference to green infrastructure in Minimum Control Measure (MCM) 5, governing post-construction stormwater management; this section instructs that permittees’ post-construction stormwater management programs give the highest preference to Best Management Practices (BMPs) constituting green infrastructure techniques and practices.<sup>218</sup>

<sup>213</sup> U.S. Census Bureau, AMERICAN FACTFINDER (last visited June 12, 2019) (search “Edina city”); U.S. Census Bureau, *Population, Housing Units, Area, and Density: 2010—United States, Places by State*, AMERICAN FACTFINDER (downloaded June 7, 2019) (search “Edina”).

<sup>214</sup> CITY OF EDINA, MINN., 2018-2019 BUDGET 114 (2018) [hereinafter EDINA 2018-2019 BUDGET].

<sup>215</sup> Data Tools: 1981-2010 Normals, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/cdo-web/datatools/normals> (select “Minnesota” and “Minneapolis St Paul International Airport, MN US”) (last visited June 7, 2019).

<sup>216</sup> EDINA 2018-2019 BUDGET, *supra* note 214 at 40, 47, 64.

<sup>217</sup> General Permit Authorization to Discharge Stormwater Associated with Small MS4s under the NPDES/State Disposal System Permit Program, MNR04000 (Minn. Pollution Control Agency Aug. 1, 2013).

<sup>218</sup> *Id.* at § 5(a)(2).

Edina lies within the boundaries of the Nine Mile Creek and Minnehaha Creek Watershed Districts.<sup>219</sup> Stormwater runoff from Edina drains into several water bodies designated as impaired, including Lake Cornelia, Lake Edina, Nine Mile Creek, and Minnehaha Creek. TMDLs were developed for the latter two.<sup>220</sup>

Edina's Public Works Department, Utilities Division manages stormwater operations and maintenance, and the Engineering Department oversees planning, design, and construction of the system. The City has enacted a stormwater ordinance, encoded in Chapter 28, Article III of the municipal code.<sup>221</sup> MPCA selected Edina one of five cities to pilot the Minnesota Green Step Cities program; the 29 "best practices" include stormwater management.<sup>222</sup>

## GREEN STREETS POLICY

Edina's City Council in 2011 passed a resolution declaring support for establishing a Living Streets policy.<sup>223</sup> "Living Streets" combines Complete and Green Streets Principles. The City Council approved the Policy in 2013,<sup>224</sup> and the Living Streets Plan was issued in 2015.<sup>225</sup> The Living Streets Policy establishes the Living Streets framework, while the Plan provides comprehensive guidance on implementation, including street design guidelines and best practices for community engagement.

### Historical context/impetus

Edina's flood control pipe networks, built during a period of rapid growth in the 1950s and 1960s, are nearing the end of their service life. The City is undertaking major maintenance and rehabilitation projects throughout the community.<sup>226</sup> Edina currently reconstructs approximately three to four miles of streets annually.<sup>227</sup> City officials also recognize the costs of complying with its MS4 permit as a driver of its policy.<sup>228</sup>

The idea for the Policy originated with the Edina Transportation Commission (ETC), whose membership included the City of Maplewood's City Engineer.<sup>229</sup> Following the City Council's resolution in support of Living Streets in 2011, ETC formed a Living Streets Working Group. The Working Group partnered with City staff in preparing a draft Living Streets Policy, and collected feedback from five organizations, including the Environment Commission. A \$15,000 grant from Bloomington Health Department enabled Edina to hire a consultant to review current city policies and

<sup>219</sup> Minnehaha Creek Watershed District, <https://minnehahacreek.org/maps> (last visited June 7, 2019) (overlying "Municipal & County" and "MCWD" Legal Boundary while searching "Edina").

<sup>220</sup> See BARR ENG'G CO., NINE MILE CREEK WATERSHED CHLORIDE TOTAL MAXIMUM DAILY LOAD REPORT (2010); See also TETRA TECH, INC., MINNEHAHA CREEK E. COLI BACTERIA/LAKE HIAWATHA NUTRIENTS: TOTAL MAXIMUM DAILY LOAD 63, 69 (2013) (allocating Edina total phosphorous as 424 lbs. with 416.9 lbs. or 50 percent needed reduction and mentioning green infrastructure as an implementation measure); See also MINN. POLLUTION CONTROL AGENCY, APPROVED WLAs FOR MS4s-EDINA MAPLEWOOD NORTH ST. PAUL 002 (2019) (listing TMDL projects in the watershed as Minnehaha Creek Lake Hiawatha TMDL, the Nine Mile Creek Watershed TMDL Project, the South Metro Mississippi TSS TMDL, and the Twin Cities Metro Area Chloride TMDL and Management Plan) (on file with author).

<sup>221</sup> CITY OF EDINA, MINN., CODE OF ORDINANCES ch. 28, art. III (2009).

<sup>222</sup> *Minnesota GreenStep Cities: City of Edina*, MINNESOTA POLLUTION CONTROL AGENCY, [https://greenstep.pca.state.mn.us/cityInfo.cfm?ctu\\_code=2394621](https://greenstep.pca.state.mn.us/cityInfo.cfm?ctu_code=2394621) (last visited June 7, 2019).

<sup>223</sup> See CITY OF EDINA, MINN., RESOLUTION 2011-61 (2011).

<sup>224</sup> Zach Farber, *Edina Council Approves Living Streets Policy*, PATCH.COM (Aug. 21, 2013 12:42 PM) (approving the Policy on August 20, 2013).

<sup>225</sup> CITY OF EDINA, MINN., LIVING STREETS PLAN APPROVAL VI. D. (2015).

<sup>226</sup> CITY OF EDINA, MINN., LIVING STREETS PLAN 4 (2015) [hereinafter EDINA PLAN].

<sup>227</sup> E-mail from Chad Millner, Dir. of Eng'g, City of Edina, Minn., to Cynthia R. Harris, Staff Att'y, Env'tl. Law Inst. (May 24, 2019 11:45 EST) (on file with author).

<sup>228</sup> See EDINA PLAN, *supra* note 226 at 32 (noting that metro-wide storm sewer permitting costs were predicted to increase more than 30 percent).

<sup>229</sup> See *infra* Case Study: Maplewood.

provide a framework for moving forward.<sup>230</sup> Blue Cross & Blue Shield also donated a one-day Living Streets policy development workshop, held in February 2012 and organized by the National Complete Streets Coalition.<sup>231</sup> In March 2012, Edina hosted a two-part Living Streets Workshop to engage key stakeholders.<sup>232</sup>

The Policy recommended creation of an implementation plan. City staff collaborated with internal and external advisory groups to draft content for the Living Streets Plan. Sections of the Plan are modeled after the Maplewood Living Streets Policy and the “Model Design Manual for Living Streets” from Los Angeles County.<sup>233</sup> Both an internal technical group and an external advisory group assisted with the process.<sup>234</sup>

### Funding

A combination of storm water utility funds, general tax levies, and Pedestrian and Cyclist Safety Fund (PACS) monies fund Living Streets.

PACS constitutes a \$1.45 monthly franchise fee on gas and electric utility service paid by residential customers,<sup>235</sup> and is anticipated to generate approximately \$1.06 million in revenue in FY 2019.<sup>236</sup> However, this revenue stream is specifically dedicated to funding pedestrian and cyclist improvements, lighting, maintenance, and associated costs related to public outreach and education, legal and consulting services, and the purchase of real property for right-of-way for new non-motorized transportation facilities (NMTF).<sup>237</sup>

Other funding sources include special assessments, Municipal State Aid, Watermain, Sanitary Sewer, and Storm Sewer Utility Funds, and grants.<sup>238</sup> Special assessments are charges imposed on individual properties and used to pay for local improvements benefiting the property.<sup>239</sup> Generally, however, the storm water utility is the primary source of funding for stormwater facilities, including green infrastructure. Edina’s storm water utility pays for operations, maintenance, and capital costs of the storm sewer system. Single family residential properties pay a fixed \$34.81 quarterly Storm Water Drainage Charge, and commercial property owners are charged based on the amount of impervious area.<sup>240</sup>

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<sup>230</sup> Letter from Wayne D. Houle, Dir. of Eng’g, City of Edina, Minn., to Edina Transp. Commission (Feb. 21, 2013) (attaching the Draft Living Streets Policy stating Bloomington Public Health provides public health services to Bloomington, Edina, and Richfield at 4).

<sup>231</sup> *Id.*

<sup>232</sup> Memorandum from Dan Edgerton, AICP-HR Green et al. to Wayne Houle, Engineer, City of Edina, Minn. & Michael Thompson, Edina Living Streets Committee Chair, City of Edina, Minn. (Aug. 13, 2012) (regarding Edina Living Streets – Review of Existing Plans and Policies, Peer Review Lessons, and Draft Living Streets Policy Framework).

<sup>233</sup> *Model Design Manual for Living Streets*, LOS ANGELES COUNTY, <http://www.modelstreetdesignmanual.com/download.html> (last visited June 10, 2019).

<sup>234</sup> Telephone Interview with Mark Nolan, Project Lead, Landform (May 23, 2019) (former City of Edina transportation planner and primary authority of the City’s Living Streets Plan).

<sup>235</sup> *Pedestrian & Cyclist Safety (PACS) Fund*, CITY OF EDINA, <https://www.edinamn.gov/496/Pedestrian-Cyclist-Safety-PACS-Fund> (last visited June 7, 2019); *See also* CITY OF EDINA, MINN., SECOND READING ORDINANCE NO. 2012-15 FRANCHISE ORDINANCE CENTERPOINT ENERGY & SECOND READING ORDINANCE NO. 2012-16 FRANCHISE ORDINANCE XCEL VI. D. (Oct. 16, 2012) (attaching ordinances).

<sup>236</sup> CITY OF EDINA, MINN., 2019-2023 CAPITAL IMPROVEMENT PLAN 9 (2018).

<sup>237</sup> Memorandum from Mark Nolan, Transportation Planner, City of Edina, Minn., to Scott Neal, City Mgr., City of Edina, Minn., Karen Kurt, Assistant City Mgr., City of Edina, Minn., & Wayne Houle, Dir. of Eng’g, City of Edina, Minn. (July 16, 2013) (regarding Draft Pedestrian and Cyclist Safety (PACS) Fund Utilization Strategy).

<sup>238</sup> CITY OF EDINA, MINN., LIVING STREETS PROJECTS (2019) (on file with author); *see also* EDINA PLAN, *supra* note 226 at 32–33.

<sup>239</sup> BARR ENG’G CO., *supra* note 110 at 37 (referencing state law that authorizes local governments to use special assessments to pay for comprehensive list of improvements, including streets and roads and storm sewers); *see also* MINN. STAT. § 429.021 (2018).

<sup>240</sup> *Utility Rates*, CITY OF EDINA, <https://www.edinamn.gov/355/Utility-Rates> (last visited June 10, 2019); *see* CITY OF EDINA, MINN. & EHLERS, WATER, SANITARY AND STORM SEWER UTILITY RATE STUDY 15–17 (2015) (reporting the City’s quarterly rate in 2015 was \$24.26 and proposing a 10 percent annual rate increase in 2016 followed by 6.5 percent annual increases, eventually to \$34.33 in 2020).

### Applicability

The Living Streets Plan envisions implementation predominantly through the neighborhood street reconstruction program. However, the Policy and Plan apply broadly to operations, maintenance, new construction, reconstruction, retrofits, repaving, and rehabilitation, as well as to privately-built roads, sidewalks, paths and trails.<sup>241</sup> The Plan clarifies the City will incorporate Living Streets elements into three categories of streets: Local Streets, Collectors, and Minor Arterials.<sup>242</sup> The Plan also specifies stormwater BMPs will be sited in the boulevard—a 5-foot space between the sidewalk and the curb or edge of pavement—“when appropriate.”<sup>243</sup>

**Exceptions** to the Policy and Plan fall under four major categories: (1) ordinary maintenance activities designed to keep assets in serviceable condition (e.g., mowing, cleaning, sweeping, spot repair, concrete joint repair, or pothole filling); (2) excessively disproportionate cost; (3) the project is not feasible or cost effective “because of significant or adverse environmental impacts to waterways, flood plains, remnants or native vegetation, wetlands or other critical areas;” and (4) constrained budgetary resources or when project timing permits more efficient construction at a future date. City staff are instructed to document any proposed exceptions.<sup>244</sup>

### Coordination

The City’s Policy and Plan promote advocating for Living Streets principles when a local transportation or land use decision is under the jurisdiction of another agency.<sup>245</sup>

### Incorporation.

The Policy and Plan anticipate the City will incorporate the Plan’s design guidelines into other City plans, manuals, rules, regulations, and programs, and the Plan itself will be updated as practices continue to evolve. The Policy also advises updating City ordinances, engineering standards, policies and guidelines, and inventory building and zoning codes.<sup>246</sup> City staff is currently in the process of updating Edina’s Comprehensive Plan.<sup>247</sup>

### Maintenance

The policy does not directly address maintenance.

### Accountability

The Policy and Plan include several benchmarks for demonstrating success. Two pertain specifically to stormwater. The first is the outcome-based goal of preventing any unfiltered street water from draining into local waterways and reducing storm water volume. The second is the output-based goal of selecting cost-effective stormwater BMPs and strategically siting them to provide for flood protection, water quality, and stormwater volume reduction. The Policy

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<sup>241</sup> CITY OF EDINA, MINN., LIVING STREETS POLICY 2 (2013) [hereinafter EDINA POLICY]; EDINA PLAN, *supra* note 226 at 10.

<sup>242</sup> EDINA PLAN, *supra* note 226 at 17, 22 (noting that many of Edina’s collector and minor arterial streets are Minnesota State Aid (MSA) or Hennepin County streets and reconstruction projects must meet the standards of both entities).

<sup>243</sup> *See Id.* at 40.

<sup>244</sup> EDINA POLICY, *supra* note 241 at 2–3; EDINA PLAN, *supra* note 226 at 12–13.

<sup>245</sup> EDINA POLICY, *supra* note 241 at 2; EDINA PLAN, *supra* note 226 at 10.

<sup>246</sup> EDINA POLICY, *supra* note 241 at 3, 5; EDINA PLAN, *supra* note 226 at 13.

<sup>247</sup> E-mail from Chad Millner, Dir. of Eng’g, City of Edina, Minn., to Cynthia R. Harris, Staff Att’y, Env’tl. Law Inst. (May 23, 2019 10:41 EST) (on file with author).



and Plan indicate the City will rely on ENVISION ratings from the Institute for Sustainable Infrastructure to evaluate its performance.<sup>248</sup>

### Outcomes

*Reaction and outreach:* The City engaged in public outreach while developing the Living Streets Plan. Efforts included hiring a consultant to provide branding expertise, obtaining feedback from focus groups on messaging, holding open houses, and disseminating publicity materials such as posters.<sup>249</sup>

The Plan includes a section on Project Stakeholder Engagement, and anticipates folding Living Streets into the existing communication and outreach program for annual street reconstruction. The Plan lays out an outreach timeline, with strategies such as informational letters, open houses, resident questionnaires, neighborhood meetings, and final assessment hearings, in addition to general access to elected officials at City Council meetings and public hearings. Affected residents may also bring their inquiries to City engineering technicians available on site.<sup>250</sup>

*Successes:* City staff reports 28 projects incorporated Living Streets elements from 2015 to 2018 (25.39 miles and \$55.043 million estimated total). Three of the completed projects incorporated green elements (4.81 miles and \$1.483 million total). Six projects are under construction (3.62 miles and \$9.216 million total) and 30 are planned (22.94 miles and \$55.049 million total). Five of the planned projects have anticipated green elements (7.32 miles and \$5.3 million total). Four projects have been exempted from the Policy.<sup>251</sup> Outcomes include an improved multi-modal transportation network and more storm water management features. City staff also note general positive public support.

*Challenges:* Recently, specific projects have generated pushback, due to proposals for narrowing streets in order to create the space necessary to incorporate Living Streets features. City staff work individually with property owners to find a balance between their values and the Policy. Edina also struggled to implement green infrastructure facilities into projects, due to a lack of eligible funding sources. The City is continuing to identify suitable funding sources, and hired a Minnesota GreenCorps member to assist with articulating hard-to-measure aspects of Green Streets—green infrastructure, in particular—in order to demonstrate the benefits to City officials.<sup>252</sup> City staff note the City Council currently is selecting the “status quo” stormwater option over installing green infrastructure, when presented with options (status quo, mid-, and high-level green infrastructure), based on resident and staff feedback.<sup>253</sup>

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<sup>248</sup> EDINA POLICY, *supra* note 241 at 4; EDINA PLAN, *supra* note 226 at 15.

<sup>249</sup> Nolan, *supra* note 237.

<sup>250</sup> EDINA PLAN, *supra* note 226 at 37–39.

<sup>251</sup> CITY OF EDINA, MINN., LIVING STREETS PROJECTS (2019) (on file with author).

<sup>252</sup> See *GreenCorps Alumnus: Mehjabeen Rahman*, MINN. POLLUTION CONTROL AGENCY, <https://www.pca.state.mn.us/waste/greencorps-alumnus-mehjabeen-rahman> (last visited June 10, 2019) (“As a MN GreenCorps member in 2017-2018, Mehjabeen served with the city of Edina, working on green transportation issues. She created a plan to make the city's vehicle fleet more sustainable and designed a matrix to quantify the benefits of the different aspects of Living Streets”); see also, *supra* Nolan note 237; Millner, *supra* note 227.

Case Study: Fairbanks

**Chesapeake Watershed Jurisdiction: NO**

**Green Streets Policy adopted: 2016**

**Policy Type: Non-binding policy statement, with resolutions of support from co-jurisdictions, including Fairbanks<sup>254</sup>**

**Applicability: New and existing PROW projects**



Municipal Characteristics
<b>Jurisdiction type:</b> City/Regional transportation agency
<b>Population:</b> 31,516
<b>Total area:</b> 32.53 mi <sup>2</sup>
<b>Water area:</b> 0.83 mi <sup>2</sup>
<b>Land area:</b> 31.69 mi <sup>2</sup> <sup>255</sup>
<b>PROW:</b> 355 mi. roadways, 97 mi. storm drain piping <sup>256</sup>
<b>Average annual precipitation:</b> 11.27 in. <sup>257</sup>
<b>FY 2019 budget:</b> <sup>258</sup>
\$39,141,079 total expenditures
\$34,739,899 general fund
\$4,401,180 CIP
N/A stormwater sewer system

- Lessons Learned**
- **Incentivize Green Streets implementation in calculating which projects to award funding**, a tactic available to regional planning and transportation agencies, and an alternative to imposing a mandate.
  - **Identify reliable sources of funding for maintenance** to ensure green infrastructure is sustainable over the long-term.
  - **Accommodate infiltration capacity of local soils** when selecting and siting green elements, and install overflow devices to retain runoff during periods when the soil cannot percolate stormwater.

**STORMWATER MANAGEMENT**

Fairbanks is a Phase II MS4 currently under an Individual Permit issued by the Alaska Department of Environmental Conservation. The Permit requires the City’s SWMP to implement a strategy providing incentives for increasing use of green infrastructure/Low-Impact Design (LID) techniques and practices in both private and public sector development projects. The Permit also requires the City to evaluate the performance of LID techniques in the previous Permit cycle's pilot project, and to use recommendations from that pilot project to revise the City's Green

<sup>254</sup> CITY OF FAIRBANKS, ALASKA, RESOLUTION NO. 4762 (2016). FAIRBANKS N. STAR BOROUGH, ALASKA, RESOLUTION NO. 2016-53 (2016).  
<sup>255</sup> U.S. Census Bureau, AMERICAN FACTFINDER (last visited June 12, 2019) (search “Fairbanks city”); U.S. Census Bureau, *Population, Housing Units, Area, and Density: 2010—United States, Places by State*, AMERICAN FACTFINDER (downloaded June 7, 2019) (search “Fairbanks”).  
<sup>256</sup> *Street Division*, CITY OF FAIRBANKS, ALASKA, <https://www.fairbanksalaska.us/publicworks/page/street-division> (last visited June 10, 2019).  
<sup>257</sup> Data Tools: 1981-2010 Normals, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/cdo-web/datatools/normals> (select “Alaska” and average annual precipitation of “Fairbanks Airport Number 2, AK US,” “Fairbanks International Airport, AK US,” and “Fairbanks Midtown, AK US” (last visited June 10, 2019).  
<sup>258</sup> CITY OF FAIRBANKS, ALASKA, ANNUAL BUDGET: CITY OF FAIRBANKS FOR THE YEAR 2019 45–47.

Infrastructure Resource Guide.<sup>259</sup> Three local water bodies—Chena River, Noyes Slough, and Chena Slough—are included on the State’s List of Impaired Water Bodies for sediment.<sup>260</sup> Noyes Slough is also listed for petroleum products and debris; specifically, litter.

The City’s Public Works Department oversees stormwater and PROW projects. Fairbanks has enacted a stormwater ordinance. While the ordinance requires owners and operators of commercial and industrial establishments to prevent discharges to the storm drainage system through structural and non-structural BMPs, green infrastructure is not specifically addressed.<sup>261</sup>

## GREEN STREETS POLICY

The Fairbanks Metropolitan Area Transportation System (FMATS) is a Metropolitan Planning Organization (MPO) that funds approximately \$8 million in road projects annually. The MPO’s Policy Board comprises three local Mayors, representing two cities—including Fairbanks—and one borough, as well as the regional director of the State Department of Transportation and Public Facilities (AK DOT&PF).

FMATS in 2016 adopted a non-binding policy statement promoting Green Streets.<sup>262</sup> The local jurisdictions, including Fairbanks, followed with resolutions of support.<sup>263</sup>

The policy strongly encourages the concept of Green Streets for all projects within the Metropolitan Planning Area.<sup>264</sup> FMATs incentivizes implementation of policy by favoring PROW projects incorporating green elements when allocating funding. When road project nominations are submitted to the MPO and scored, inclusion of Green Street elements results in projects obtaining higher project scores.

### Historical context/impetus

FMATs adopted the Green Streets policy as complimentary to its Complete Streets Policy. Motivations included improving local water quality to protect salmon habitat and promoting downtown beautification. The adoption process involved significant agency participation and opportunity for public comment and other feedback.

The City of Fairbanks recently developed a draft Green Streets Plan, which provides design recommendations for green infrastructure facilities suited to the Fairbanks environment.<sup>265</sup>

### Funding

FMATS leverages Community Transportation Program (CTP) funding from the Federal Highway Administration (FHWA). This is flexible funding, primarily funded by the Moving Ahead for Progress in the 21st Century Act’s (MAP-21) Surface Transportation Program (STP), and is used by state and localities for projects on any Federal-aid highway. Alaska is permitted to apply these funds to any public road in the State, regardless of classification. Alaska’s Department of Transportation and Public Facilities administers the funds. Green Streets projects constitute eligible

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<sup>259</sup> Alaska Pollutant Discharge Elimination System: Permit for Storm Water Discharges from Small MS4s, Permit No. AKS053406 § 3.5.6 (Alaska Dep’t Env’tl. Conservation May, 11 2018).

<sup>260</sup> *Id.* at § 1.4.4.1.

<sup>261</sup> CITY OF FAIRBANKS, ALASKA, 2017 WASTEWATER TREATMENT REGULATIONS, Div. 11, § 82-340 (2017).

<sup>262</sup> CITY OF FAIRBANKS, ALASKA, RESOLUTION NO. 4762 (2016).

<sup>263</sup> FAIRBANKS N. STAR BOROUGH, ALASKA, RESOLUTION NO. 2016-53 (2016).

<sup>264</sup> FMATS, ALASKA, GREEN STREETS POLICY 1 (2016).

<sup>265</sup> FAIRBANKS DRAFT PLAN, *supra* note 100 at 1.

environmental measures under the program, with the caveat that green infrastructure elements do not exceed 20 percent of the total project cost.<sup>266</sup>

No federal funding is available for road maintenance. Maintenance remains the responsibility of local jurisdictions, which may rely on their General Fund. Fairbanks funds stormwater management out of the City's general fund; there is no utility fee or designated fund for those activities.<sup>267</sup>

### Applicability

FMATS's Green Streets policy recommends implementing Green Streets as an integrated aspect of roads right-of-way infrastructure and, where feasible, maintenance-level or rehabilitation projects.

**Exceptions** are inapplicable because the policy is non-binding. FMATS focuses on incentivizing localities to incorporate green elements into PROW projects, rather than requiring green infrastructure in all projects as the default. Road project nominations submitted to the MPO are scored, with Green Streets elements awarded additional points. This increases the likelihood of Green Streets projects receiving funding.

### Coordination

Coordination is at the discretion of individual cities.

### Maintenance

The policy does not directly address maintenance.

### Accountability

The Green Streets policy recommends conducting ongoing monitoring of Green Streets facilities to evaluate effectiveness, as well as performance. However, the policy provides no direction on specific indicators, or what types of outputs and outcomes to record, measure, and evaluate.

### Outcomes

*Reaction and outreach:* Fairbanks officials report the community welcomed the policy as a measure to protect fish habitat and beautify the downtown. Key stakeholders supporting the policy included the Downtown Association, Festival Fairbanks, and Explore Fairbanks, a local tourism agency.<sup>268</sup> The Cushman Street project—underway prior to adoption of the policy—was acknowledged with multiple state and national awards; it also was named one of the 15 Great Places (2018 Great Streets) in America by the American Planning Association in 2018.

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<sup>266</sup> See Memorandum from Walter C. Waidelich, Jr., Associate Admin. Infrastructure, Fed. Highway Admin., U.S. Dep't. Transp, to Div. Admins. & Dirs. Of Field Servs.(attaching Surface Transportation Block Grant Program (STBG) Implementation Guidance at § D.1.b(3) (2016) ; see also 23 U.S.C. § 328(a) (2005) ("environmental restoration and pollution abatement to minimize or mitigate the impacts of any transportation project funded under this title (including retrofitting and construction of stormwater treatment systems to meet Federal and State requirements under sections 401 and 402 of the Federal Water Pollution Control Act (33 U.S.C. 1341; 1342)) may be carried out to address water pollution or environmental degradation caused wholly or partially by a transportation facility.").

<sup>267</sup> Ackerman, *supra* note 75.

<sup>268</sup> See Letter from Anna Plager, Chair, Chena Riverfront Commission to Mayor Bryce Ward, Chair, FMATS Policy Committee (Apr. 13, 2016); see also Letter from David van den Berg, Executive Dir., Fairbanks Downtown Ass'n to Mayor Bryce Ward, Chair, FMATS Policy Committee (Apr. 13, 2016).

*Successes:* Progress is estimated at approximately 0.8 miles per year. Two projects were underway prior to implementing the Green Streets Policy: Cushman Street at \$10 million and Noble Street at \$12 million in downtown Fairbanks. The cost of the green infrastructure elements is estimated at 10 percent of total project cost. Moving forward, FMATs intends to apply its Green Streets Policy and Green Streets Plan on the design starts for 5th Avenue, Barnette Street, and Lacey Street in downtown Fairbanks.

*Challenges:* The impact of the sub-Arctic climate on infiltration and plant selection is an identified logistical challenge, while reliable maintenance funding presents a significant financial obstacle.<sup>269</sup> The cold climate and associated springtime freeze-thaw cycles affects capacity for infiltration. Project planners must select plant and trees species capable of thriving over the long, cold winters, and take care to site green elements only where local soils can percolate runoff. This means either selecting sites where infiltration is feasible year-round, or installing overflow devices to accommodate periods when infiltration is not feasible. Engineers cannot install green infrastructure over permafrost, because water cannot percolate into the ground. Soils generally are frozen from September to May.<sup>270</sup>

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<sup>269</sup> See FAIRBANKS DRAFT PLAN, *supra* note 100 at 3.

<sup>270</sup> E-mail from Jackson Fox, Executive Dir., Fairbanks Metropolitan Area Transportation System, to Cynthia R. Harris, Staff Att’y, Env’tl. Law Inst. (Mar. 12, 2019 13:50 EST).

Case Study: Kansas City

**Chesapeake Watershed Jurisdiction: NO**

**Green Streets Policy adopted: 2017**

**Policy Type: Ordinance/Combined Complete & Green Streets**

**Applicability: New and existing PROW**



Municipal Characteristics
<b>Jurisdiction type:</b> City
<b>Population:</b> 491,918
<b>Total area:</b> 319.03 mi <sup>2</sup>
<b>Water area:</b> 4.08 mi <sup>2</sup>
<b>Land area:</b> 314.95 mi <sup>2</sup> <sup>271</sup>
<b>PROW:</b> 6,500 mi. <sup>272</sup>
<b>Average annual precipitation:</b> 40.28 in. <sup>273</sup>
<b>FY 2019 budget:</b> <sup>274</sup>
\$1,730,252,151 total expenditures
\$528,700,000 general fund
\$75,010,982 CIP
\$15,920,802 stormwater

Lessons Learned
➤ <b>Prioritize integration of green infrastructure</b> when incorporating Green Streets into Complete Streets policies, in order to avoid missing opportunities for improving water quality and meeting goals mandated by CSO Plans, MS4 Permits, and/or consent decrees.
➤ <b>Strategize coordination across agencies</b> when responsibility for PROW capital projects and operations/maintenance falls under the jurisdiction of multiple City agencies.

**STORMWATER MANAGEMENT**

Stormwater runoff in Kansas City is collected via both an MS4 and a CSS. The Missouri Department of National Resources (DNR), Missouri Clean Water Commission issued the City’s Phase I MS4 in 2018.<sup>275</sup> Kansas City is subject to a consent decree, which discusses the City’s intention to use green infrastructure both in lieu of and in addition to structural controls.<sup>276</sup>

<sup>271</sup> U.S. Census Bureau, AMERICAN FACTFINDER (last visited June 12, 2019) (search “Kansas City Missouri city”); U.S. Census Bureau, *Population, Housing Units, Area, and Density: 2010—United States, Places by State*, AMERICAN FACTFINDER (downloaded June 7, 2019) (search “R14147”).

<sup>272</sup> *Public Works Receives National Accreditation*, City of Kansas City, Mo., <http://kcmo.gov/publicworks/nationally-accredited-agency/> (last visited June 10, 2019).

<sup>273</sup> Data Tools: 1981-2010 Normals, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/cdo-web/datatools/normals> (select “Missouri” and averaged annual precipitation of “Kansas City Downtown Airport Number, MO US,” “Kansas City International Airport, MO US,” and “Kansas City Pleasant Hill, MO US” (last visited June 10, 2019).

<sup>274</sup> CITY OF KANSAS CITY, MO., ADOPTED BUDGET FISCAL YEAR 2019-2020 48, 57, 83, 89 (2019).

<sup>275</sup> See Mo. State Operating Permit No. MO-0130516 (Mo. Dep’t of Nat. Res. Sept. 1, 2018).

<sup>276</sup> *United States v. City of Kansas City, Mo.*, No. 4:10-cv-0497-GAF 17–22 (W.D. Mo. Sept. 27, 2010) (ordering a consent decree to issue a final report on the Middle Blue River 100-acre green infrastructure pilot project and to develop a plan for implementing green infrastructure across the 744-acre Marlborough neighborhood).

The City's Public Works Department oversees approximately 70 percent of projects in the PROW. Parks and Recreation oversees work conducted in the City's boulevards and other portions of the PROW where specific construction and maintenance standards apply.

## GREEN STREETS POLICY

Kansas City in 2017 approved its Complete Streets Ordinance, amending the City's municipal code.<sup>277</sup>

### Historical context/impetus

The City Council adopted the ordinance as part of an ongoing effort to promote accessibility by providing multi-modal transportation options to users of the PROW.

### Funding

Funding sources for capital projects under the policy include general obligation bonds. The City funds stormwater management through its Stormwater Utility Impervious Surface Fee, which is based on the amount of runoff surface on a property (ERU), plus fixed costs.<sup>278</sup> Citizens have expressed opposition to recent increases in utility rates.<sup>279</sup>

### Applicability

Green Streets is arguably required by the ordinance's language, but in practice has not been meaningfully implemented. The ordinance addresses green infrastructure in its statement describing the intent of Complete Streets. The stated intent initially focuses on multimodal forms of transportation, and then declares: "[a]dditionally, the City shall incorporate green infrastructure, innovative stormwater management, street trees, and appropriate lighting in transportation projects."<sup>280</sup> The ordinance makes the statement of intent enforceable under the section laying out the policy's scope. This section states that all transportation facilities owned by the City in the PROW "shall be designed, constructed, and operated to adhere to the intent of *Complete Streets*" (the title of the chapter).<sup>281</sup> However, *Complete Streets* itself is defined narrowly as providing for multimodal streets and street networks.<sup>282</sup>

The ordinance directs incorporation of Complete Streets elements "within the general scope of roadway maintenance projects, which are not considered as major maintenance, and at no significant additional costs."<sup>283</sup> The ordinance defines "major maintenance" as "construction or repair activity removing more than 50% of the pavement structure for a given street segment,"<sup>284</sup> but does not elucidate the term "significant additional cost."

**Exceptions** to incorporation of Complete and, contestably, Green Streets, may be justified by: (1) presentation of a viable alternative; (2) "excessively disproportionate costs," which is not defined; (3) conflict with public safety

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<sup>277</sup> See CITY OF KANSAS CITY, MO., CODE OF ORDINANCES ch. 64, art. II).

<sup>278</sup> See CITY OF KANSAS CITY, MO., CODE OF ORDINANCES, ch. 61, art. I, § 61-4(2014) (stating the fee is \$0.50 per month for every 500 square feet, or portion of 500 square feet, of runoff surface on a property and that the City offers stormwater fee credits).

<sup>279</sup> See, e.g., Lynn Horsley, *KC Water, Sewer Rates Continue to Rise*, THE KANSAS CITY STAR (Apr. 7, 2016, 5:47 PM) <https://www.kansascity.com/news/politics-government/article70598727.html> ("With these new rates, the average household residential water/sewer/stormwater bill is expected to rise from about \$102 per month to \$110 per month. That's up from an average of \$65 per month in 2011-12.").

<sup>280</sup> CITY OF KANSAS CITY, MO., CODE OF ORDINANCES, ch. 64, art. II, § 64-42 (2017).

<sup>281</sup> *Id.* at § 64-43(a) (emphasis added).

<sup>282</sup> *Id.* at § 64-42.

<sup>283</sup> *Id.* at § 64-43(b).

<sup>284</sup> *Id.* at § 64-42.



considerations; and (4) the absence of a current or future need to serve a category of users.<sup>285</sup> Exceptions are reviewed by the Bicycle and Pedestrian Advisory Committee, which issues a recommendation to the City's Transportation Committee and City Plan Commission. The latter must approve any exception, with appeals made to the Board of Zoning Adjustment. Supporting data are documented and made publicly available.

#### Coordination

The policy does not directly address coordination.

#### Maintenance

The policy does not directly address maintenance.

#### Accountability

The Ordinance requires the City review the policy every three years and adopt changes as technologies and design standards evolve.<sup>286</sup> The policy also requires City staff to develop and track specific indicators, although these apply only to walking, biking, and public transit, and not to water quality.<sup>287</sup> City staff make annual reports to the City Council showing implementation progress, with the report providing a comprehensive summary of City-controlled projects and detailing major capital projects.<sup>288</sup>

#### Outcomes

*Challenges:* Kansas City generally has not implemented the Green Streets element of its Complete Streets policy. The Mid-America Regional Council (MARC)—of which Kansas City is a member—is currently developing a Green Infrastructure Framework. Phase I focused on identifying priority areas for implementing green infrastructure.<sup>289</sup> The next phase of the Framework will determine how to implement green infrastructure and improved stormwater design—including determining where existing policies, procedures, and ordinances could be updated. This may provide impetus for Kansas City to take steps to proactively implement Green Streets.

However, the City may face opposition to implementation if it relies on its utility fee to either directly fund Green Streets or to repay general obligation bonds. The public has expressed opposition to recent hikes made to the wastewater utility rate, in order to complete projects under the City's consent decree. Other challenges may include coordinating projects across different areas of the PROW and across different departments, due to the different categories of the PROW falling under the jurisdiction of various City department (e.g., boulevards).

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<sup>285</sup> *Id.* at § 64-44(a)(1)–(4).

<sup>286</sup> *Id.* at § 64-47(a).

<sup>287</sup> *Id.* at § 64-48(a).

<sup>288</sup> *Id.* at § 64-48(b).

<sup>289</sup> MID-AMERICA REGIONAL COUNCIL, PHASE I GREEN INFRASTRUCTURE FRAMEWORK: CONNECTING PEOPLE TO NATURE, 78 (recommending implementing green infrastructure and complete streetscape solutions to reduce runoff).

Case Study: Maplewood



**Chesapeake Watershed Jurisdiction: NO**

**Green Streets Policy adopted: 2013**

**Policy Type: Non-legally binding guidelines/Combined Complete & Green Streets (“Living” Streets)**

**Applicability: New and Reconstruction**

Municipal Characteristics
<b>Jurisdiction type:</b> City
<b>Population:</b> 41,004
<b>Total area:</b> 17.98 mi <sup>2</sup>
<b>Water area:</b> 1.01 mi <sup>2</sup>
<b>Land area:</b> 16.98 mi <sup>2</sup> <sup>290</sup>
<b>PROW:</b> 135.05 mi. City streets, 31.79 mi. County roads, 13.15 mi. State highways <sup>291</sup>
<b>Average annual precipitation:</b> 32.04 in. <sup>292</sup>
<b>FY 2018, 2019 budget:</b> <sup>293</sup>
\$49,814,332 total expenditures
\$20,357,490 general fund
\$16,780,971 CIP
N/A stormwater sewer system

Lessons Learned
➤ <b>Take a context-sensitive approach</b> in designing projects, looking at site conditions and neighborhood characteristics.
➤ <b>Consider alternative approaches</b> to meeting stormwater runoff requirements when on-site conditions do not allow for installing green infrastructure. Examples include off-site mitigation or contributing funding to regional efforts aimed at improving water quality.
➤ <b>Align goals and strategies with the governing watershed district</b> , finding ways to meet multiple goals by partnering on projects.
➤ <b>Start with an internal working group</b> at the staff level to identify and address potential technical challenges before making a proposal to local officials and stakeholder organizations. Examples include concerns over design and maintaining Green Streets facilities.
➤ <b>Create design guidelines providing visuals of Green/Complete Streets</b> to members of the public.

**STORMWATER MANAGEMENT:**

Maplewood is a Phase II MS4 under a General Permit.<sup>294</sup> The Minnesota Pollution Control Agency (MPCA) plans to reissue the permit in autumn 2019. The current General Permit makes a single specific reference to green

<sup>290</sup> U.S. Census Bureau, AMERICAN FACTFINDER (last visited June 12, 2019) (search “Maplewood city”); U.S. Census Bureau, *Population, Housing Units, Area, and Density: 2010—United States, Places by State*, AMERICAN FACTFINDER (downloaded June 7, 2019) (search “R12908”).

<sup>291</sup> *Streets*, CITY OF MAPLEWOOD, MINN., <https://maplewoodmn.gov/421/Streets> (last visited June 10, 2019).

<sup>292</sup> Data Tools: 1981-2010 Normals, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/cdo-web/datatools/normals> (select “Minnesota” and “Vadnais Lake, MN US”) (last visited June 7, 2019).

<sup>293</sup> CITY OF MAPLEWOOD, MINN., 2018 BUDGET AND CAPITAL IMPROVEMENT PLAN FOR THE YEARS 2018-2022 117-18 (2017); CITY OF MAPLEWOOD, MINN., DRAFT 2019-2023 CAPITAL IMPROVEMENT PLAN 19 (2018).

<sup>294</sup> General Permit Authorization to Discharge Stormwater Associated with Small MS4s under the NPDES/State Disposal System Permit Program, Permit No. MNR04032 (Minn. Pollution Control Agency (2013)).

infrastructure in MCM 5, governing post-construction stormwater management; this section instructs that permittees' post-construction stormwater management programs give the highest preference to BMPs constituting green infrastructure techniques and practices.<sup>295</sup>

Maplewood lies within the boundaries of three different watershed districts: Ramsey-Washington Metro Watershed District, Valley Branch, and Capitol Region.<sup>296</sup> The Ramsey-Washington Metro Watershed District (RWMWD), which overlaps the majority of the City, exercises jurisdiction over another Green Streets jurisdiction, North St. Paul. RWMWD's rules require 1.1 inch on-site infiltration of runoff over impervious surfaces.<sup>297</sup> RWMWD is subject to TMDLs for Kohlman Lake, which is located in Maplewood. The Kohlman Lake TMDL addresses excess nutrients; specifically, phosphorus. Maplewood's wasteload allocation is 0.72 lbs./day, a 10 percent reduction of the existing Total Phosphorus load.<sup>298</sup> MPCA has also designated Wakefield Lake, which drains from Maplewood, as an impaired water body.<sup>299</sup>

Maplewood's Public Works Department is responsible for designing, operating, and maintaining most of the City's stormwater system.<sup>300</sup> The City has enacted a stormwater ordinance,<sup>301</sup> and promulgated the Maplewood Stormwater Management Standards (MSMS), which serve as the guiding document for stormwater design.<sup>302</sup> The MSMS establishes a 1.1 inch infiltration standard for impervious surfaces, following the RWMWD standard, and encourages green infrastructure elements via credits.<sup>303</sup>

## GREEN STREETS POLICY

Maplewood's City Council in 2013 passed a resolution approving a Living Streets Policy.<sup>304</sup> "Living Streets" combines Complete and Green Streets Principles. The Policy heavily relies on the North St. Paul Living Streets Plan. It sets construction guidelines for rebuilding streets, suggests amendments to the City Code and other planning and

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<sup>295</sup> General Permit Authorization to Discharge Stormwater Associated with Small MS4s under the NPDES/State Disposal System Permit Program, Permit No. MNR040000 15 (Minn. Pollution Control Agency, Aug. 1, 2013).

<sup>296</sup> MICHAEL THOMPSON, CITY OF MAPLEWOOD, MINNESOTA: LIVING STREETS POLICY 21 (2013) [hereinafter CITY OF MAPLEWOOD, MINN., LIVING STREETS POLICY].

<sup>297</sup> Compare Ramsey-Washington Metro Watershed District, § (C)(3)(c) (2015) ("Stormwater runoff shall be retained onsite in the amount equivalent to 1.1 inches of runoff over the impervious surfaces of the development."); with Ramsey-Washington Metro Watershed District, Draft Rules (C)(3)(c) (2019) ("Stormwater runoff shall be retained onsite in the amount equivalent to 1.1 inches of runoff over the *new and reconstructed* impervious surfaces of the development.") (emphasis added).

<sup>298</sup> BARR ENG'G CO., KOHLMAN LAKE TOTAL MAXIMUM DAILY LOAD REPORT: FINAL., 44 (2010).

<sup>299</sup> MINN. POLLUTION CONTROL AGENCY, 2018 IMPAIRED WATERS LIST (2018), available at <https://www.pca.state.mn.us/water/minnesotas-impaired-waters-list>; See Minn. Pollution Control Agency, Approved WLAs for MS4s-Edina Maplewood North St. Paul (2019) (on file with author) (listing TMDL projects in the watershed as the Kohlman Lake TMDL, the Lake St. Croix Excess Nutrient TMDL, Ramsey-Washington WD WRAPS TMDL, South Metro Mississippi TSS TMDL, and the Twin Cities Metro Area Chloride TMDL and Management Plan).

<sup>300</sup> *Public Works*, CITY OF MAPLEWOOD MINN., <https://maplewoodmn.gov/522/Public-Works> (last visited June 10, 2019).

<sup>301</sup> CITY OF MAPLEWOOD, MINN., CODE OF ORDINANCES, ch. 18, art. V, div. 4 (2015).

<sup>302</sup> *Id.* at § 18-271.

<sup>303</sup> CITY OF MAPLEWOOD, MINN., STORMWATER MGMT. STANDARDS §§ 1–2 (2015). (applying to all "[p]rojects conducting mill and overlay, full depth mill, or other surface pavement treatments (where aggregate base is not excavated), on existing impervious areas are exempt from the City's water quality treatment and rate control requirements. However, requirements must be met if the project requires excavation and/or removal of the base and/or sub-base materials for 21,780 square feet (one-half acre) or more of disturbed area." at § 1(c), "[f]or all new impervious portions of a project or all impervious portions of a redevelopment project, a runoff volume of 1.1 inches must be treated through infiltration practices." at § 2(a)(1), and "[f]iltration practices that are designed for partial recharge (e.g., bioretention basin with under drains) shall receive fifty five percent (55%) credit for infiltration/volume control. Trees and shrubs are encouraged to be incorporated into filtration practice designs." at § 2(a)(2)).

<sup>304</sup> Agenda Report from Michael Thompson, Public Works Dir./City Eng'r, City of Maplewood, Minn., to James Antonen, City Manager, City of Maplewood, Minn. (Jan. 23, 2013) (attaching resolution to adopt the Living Streets Policy).

standard-setting documents to bring them into conformance with Living Streets goals,<sup>305</sup> issues recommendations for creating a Citywide Tree Plan, and advises new incentives for participating in the raingarden program.

#### Historical context/impetus

Maplewood administered a robust rainwater garden program prior to adopting a comprehensive Living Streets Policy. The first rainwater garden was installed in 1996 and the program grew to encompass an inventory of over 700 rainwater gardens and over 60 rainwater gardens on City land.<sup>306</sup> The program provides for planning rainwater gardens as part of public street reconstruction projects, and encourages homeowners and businesses to install raingardens. The City has drafted ten standard rainwater garden designs. As an added incentive, rainwater gardens constitute an approved BMP allowing property owners a 30 percent credit toward their Environmental Utility Fee (discussed below) for establishing and maintaining a rainwater garden.<sup>307</sup>

The City Council directed City staff in 2009-2010 to explore methods of delivering municipal services in a more sustainable manner. A Living Streets Sustainability Workgroup, comprised of eight City staff, met three times in 2010. Workgroup discussions encompassed improving stormwater quality through expansion of the rainwater garden program, reducing the impervious footprint of streets, and meeting or exceeding the one-inch infiltration standard. On May 23, 2011, the City Council authorized a ten-person Task Force, comprising City staff and representatives from various City bodies. The Planning Commission, Community Design Review Board, and Environmental and Natural Resources Commission each reviewed the Living Streets concept in 2011 and 2012.<sup>308</sup> The City also conducted outreach to hundreds of residents in two neighborhoods, at open houses, and during reconstruction activities.

Following significant opposition to a proposed Living Street project in the neighboring City of North St. Paul, RWMWD withdrew a grant intended for that project. RWMWD instead directed the funding to Maplewood, which had initiated the design phase for street replacement in the City's Bartelmy-Meyer neighborhood. Construction on the project completed in October 2012. The \$4.289 million project incorporated 32 rainwater gardens, a regional infiltration rainwater garden, and 200 drought resistant trees in street boulevards. RWMWD estimated the project removed 11.6 lbs. of phosphorus annually and filtered/infiltrated 50 percent of stormwater runoff.<sup>309</sup>

#### Funding

The City's Environmental Utility Fee (EUF), established in 2003, is a flat rate for residential properties, and is based on the amount of impervious surface for commercial and industrial properties. The quarterly EUF rate for a single-family home is \$22.44 (or \$7.48 monthly).<sup>310</sup> Maplewood's EUF finances storm water treatment improvements, in

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<sup>305</sup> Telephone Interview with Steve Love, Public Works Dir. & City Eng'r, Public Works, City of Maplewood, Minn. (May 20, 2019) (reporting many of the suggested amendments have been implemented and the Engineering Department is currently updating the Standard Plates).

<sup>306</sup> *Rain Gardens*, CITY OF MAPLEWOOD, MINN., <https://maplewoodmn.gov/1032/Rain-Gardens> (last visited June 10, 2019).

<sup>307</sup> CITY OF MAPLEWOOD, MINN. LIVING STREETS POLICY, *supra* note 296 at 21–22 (2013) (stating that the location, design, and installation must meet Maplewood requirements, be approved, and is subject to annual inspection).

<sup>308</sup> *Id.* at 9–10.

<sup>309</sup> Cliff Aichinger, *Living Streets*, THE RIPPLE EFFECT (July 18, 2013) <http://therippleeffectmn.blogspot.com/2013/06/living-streets.html>.

<sup>310</sup> *Environmental Utility Fee*, CITY OF MAPLEWOOD, MINN., <https://maplewoodmn.gov/454/Environmental-Utility-Fee> (last visited June 10, 2019); CITY OF MAPLEWOOD, MINN. LIVING STREETS POLICY, *supra* note 296 at 22.

addition to paying for operating expenses. When there is insufficient funding for stormwater improvements, the City may issue bonds for the EUF component of a project.<sup>311</sup>

The Policy instructs City staff to perform cost comparisons for inclusion in the feasibility reports prepared for street improvement projects. The intention is to ensure living street costs do not exceed those of traditional streets. The Policy also anticipates achieving cost effectiveness by selecting appropriate street sections, siting rainwater gardens appropriately, and narrowing streets. The Policy estimates the City will realize cost savings in maintenance and repair costs for activities such as seal coating, crack filling, mill and overlays, and reclamation.<sup>312</sup> City staff reports realizing cost savings related to narrowing streets, such as reduced costs for maintaining roads, the need to install fewer stormwater management facilities, and time and effort dedicated to snow removal.<sup>313</sup>

### Applicability

The Policy applies to three categories of streets—Local Streets, Collectors, and Minor Arterials (not Principal Arterials).<sup>314</sup> City staff recommended the City Council resolution clearly identify the Living Streets Policy as the new standard for all street projects, both new and reconstruction, within the City of Maplewood.<sup>315</sup> However, the resolution does not include such explicit instruction.

In practice, a street reconstruction project area may not be conducive for installing green infrastructure; for example, local soil may not allow for proper infiltration. Maplewood's stormwater ordinance and the Maplewood Stormwater Management Standards (MSMS) provide options for off-site mitigation.<sup>316</sup> One option Maplewood has successfully undertaken is to contribute funding to regional projects implemented in collaboration with RWMWD.<sup>317</sup> Maplewood is contributing approximately \$1 million to a joint project underway in 2019, the Gladstone Phase 3 Corridor Improvements project.<sup>318</sup>

### Coordination

The Policy recognizes that Municipal State Aid (MSA) routes and County Roads must be designed and constructed to meet MSA and Ramsey County standards and rules.<sup>319</sup> All Minor Arterials and the majority of the Collectors are designated routes on the Municipal State Aid System, and Ramsey County has jurisdiction over many Minor Arterials. In order to maintain State Aid funding for those roads and use it in their reconstruction, plans must be approved by

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<sup>311</sup> CITY OF MAPLEWOOD, MINN., DRAFT 2019-2023 CAPITAL IMPROVEMENT PLAN 28 (2018) (anticipating EUF revenues of \$2.918 million in 2019, \$3.029 million in 2020, \$3.149 million in 2021, \$3.244 million in 2022, and \$2.25 million in 2013; CIP expenditures are estimated at \$1.483 million, \$1.532 million, \$1.327 million, \$1.246 million, and \$888,000, respectively).

<sup>312</sup> CITY OF MAPLEWOOD, MINN. LIVING STREETS POLICY, *supra* note 296 at 16–17.

<sup>313</sup> Love, *supra* note 305.

<sup>314</sup> CITY OF MAPLEWOOD, MINN. LIVING STREETS POLICY, *supra* note 296 at 24.

<sup>315</sup> *Id.* at 51.

<sup>316</sup> See CITY OF MAPLEWOOD, MINN., CODE OF ORDINANCES, ch. 18, art. V, div. 4, § 18-271(2)(b) (2015) (“For projects where infiltration or filtration is not feasible, or is prohibited as described in the MSMS, the project must meet the mitigation provision of the MSMS.”); see also CITY OF MAPLEWOOD, MINN., STORMWATER MGMT. STANDARDS §§ 2(c)(9) (2015) (“As a last alternative, on projects that are required to meet the post construction management for water quality treatment with a proposed disturbed area of 1 acre or greater, the applicant shall coordinate with the City and the appropriate watershed district to pay into a stormwater impact fund managed by the watershed district.”) (applying technically to private development and redevelopment projects; however, the City generally adheres to these same standards when implementing public projects, including street reconstruction under these provisions).

<sup>317</sup> Love, *supra* note 305.

<sup>318</sup> City Council Staff Report from Steve Love, Public Works Dir./City Eng'r & Jon Jarosch, Assistant City Eng'r, to Melinda Coleman, City Manager (Mar. 11, 2019).

<sup>319</sup> CITY OF MAPLEWOOD, MINN. LIVING STREETS POLICY, *supra* note 296 at 20.

the Minnesota Department of Transportation (MnDOT). This means following State Aid design rules, such as for lane widths and clear zones, when designing Living Streets projects. However, localities may apply for a variance.<sup>320</sup>

The Policy also notes the importance of ensuring Living Streets designs are compatible with private utilities. One solution is requiring, whenever possible, the installation of private utilities in a joint trench. This reduces the area of the right-of-way impacted, and allows for more space in which to install Living Streets elements.<sup>321</sup>

#### Maintenance

The policy does not directly address maintenance.

#### Accountability

The policy does not directly address accountability.

#### Outcomes

*Reaction and outreach:* Maplewood conducted a communication program for street reconstruction prior to adopting Living Streets. However, the Policy does address public education and outreach, and lists tools of communication, elements of messaging, target groups, and methods and aspects of communication.<sup>322</sup>

*Successes:* Maplewood has completed five Living Streets projects so far. Two more will be constructed in 2019, and eight are identified as having potential.<sup>323</sup> This includes the Gladstone Phase 3 Corridor Improvements project, discussed above.

*Challenges:* None reported.

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<sup>320</sup> *Id.* at 24–25.

<sup>321</sup> *Id.* at 23.

<sup>322</sup> *Id.* at 51–52.

<sup>323</sup> CITY OF MAPLEWOOD, MINN., DRAFT 2019-2023 CAPITAL IMPROVEMENT PLAN 107, 109, 112 (2018) (listing Living Streets Projects including: the Cope/McMenemy Street Improvements (\$7.150 million project; \$982,000 EUF; includes expansion of stormwater facilities); the Prosperity Road Street improvements (\$3.770 million project; \$788,000 EUF); and the Gladstone Area Phase 3 Street Improvements (\$5.292 million project; \$921,000 EUF); CITY OF MAPLEWOOD, MINN., 2018 BUDGET AND CAPITAL IMPROVEMENT PLAN FOR THE YEARS 2018-2022 290 (2017) (noting that the Farrell/Ferndale Area Street Improvements were proposed to be reconstructed in 2018, including exploring infiltration basins and rainwater garden; \$1.453 million EUF)..

Case Study: Nashville

**Chesapeake Watershed Jurisdiction: NO**

**Green Streets Policy adopted: 2016**

**Policy Type: Executive Order/Combined Complete & Green Streets**

**Applicability: New construction and incorporation into private development along PROW only**



Municipal Characteristics
<b>Jurisdiction type:</b> City
<b>Population:</b> 669,053
<b>Total area:</b> 525.94 mi <sup>2</sup>
<b>Water area:</b> 21.91 mi <sup>2</sup>
<b>Land area:</b> 504.03 mi <sup>2</sup> <sup>324</sup>
<b>PROW:</b> 2,200 mi. <sup>325</sup>
<b>Average annual precipitation:</b> 47.55 in. <sup>326</sup>
<b>FY 2019 budget:</b> <sup>327</sup>
\$2,230,100,600 total expenditures
\$123,013,900 general fund
\$3,287,445,000 CIP
\$24,170,600 stormwater

Lessons Learned
<ul style="list-style-type: none"> <li>➤ <b>Provide sufficient oversight by City leadership over the long-term</b> to ensure City agencies implement the policy systematically and according to its intent. City Council action may be preferred over Mayoral direction to guarantee faithful execution of the policy across multiple administrations and to promote greater accountability.</li> <li>➤ <b>Develop and faithfully track progress toward clear and quantifiable goals and performance measures specific to green infrastructure</b>, especially when Green Streets are part of a combined policy with Complete Streets.</li> </ul>

**STORMWATER MANAGEMENT:**

Nashville’s storm sewer system is a combination CSS and MS4, subject to both a CSO Control Plan and an MS4 Permit. The CSS comprises the oldest part, or approximately ten percent of the system. The Tennessee Department of Environment and Conservation, Division of Water Pollution Control, issued the City’s NPDES permit in 2012. The MS4 Permit enables Nashville to require management measures to treat stormwater runoff on-site, as part of site design standards for new development and significant redevelopment. The MS4 Permit also empowers Nashville to establish incentive standards for implementing green infrastructure BMPs.<sup>328</sup> Nashville submitted its Long Term

<sup>324</sup> U.S. Census Bureau, AMERICAN FACTFINDER (last visited June 12, 2019) (search “Nashville-Davidson”); U.S. Census Bureau, *Population, Housing Units, Area, and Density: 2010—United States, Places by State*, AMERICAN FACTFINDER (downloaded June 7, 2019) (search “Nashville-Davidson metropolitan government”).

<sup>325</sup> *About the Public Works Department*, NASHVILLE.GOV, <https://www.nashville.gov/Public-Works/About-Us.aspx> (last visited June 11, 2019).

<sup>326</sup> *Data Tools: 1981-2010, NORMALS, NAT’L OCEANIC & ATMOSPHERIC ADMIN.*, <https://www.ncdc.noaa.gov/cdo-web/datatools/normal> (select “Tennessee” and averaged annual/season normal for precipitation for “Nashville Berry Field, TN US” and “Nashville International Airport, TN US”) (last visited June 11, 2019).

<sup>327</sup> THE METRO. GOV’T OF NASHVILLE & DAVIDSON CNTY., OPERATING BUDGET FOR FISCAL YEAR 2018-2019 A-12, A-29, 27 (2018).

<sup>328</sup> Authorization to Discharge under the NPDES Permit No. TNS068047 § 3.2.5.2.1 (Tenn. Dep’t of Env’tl. & Conservation, Jan. 1, 2012).



Control Plan (LTCP) to the EPA in 2011, but has not yet obtained approval.<sup>329</sup> The LTCP states that benefits from implementing the improvements recommended in the document include incorporation of Green Streets and LID techniques to reduce storm water loading. The LTCP also notes Metro Water Services was, at the time, developing a green infrastructure master plan, and intended to implement green projects to address localized flooding and other stormwater-related problems.<sup>330</sup> The City is under a consent decree and subject to TMDLs, but neither Green Streets nor green infrastructure play a significant role in either.<sup>331</sup>

Nashville's Metro Water Services, Stormwater Division manages the City's stormwater system infrastructure, while Public Works is responsible for Green Streets assets. The City has enacted a stormwater ordinance; although it defines green infrastructure, it does not directly reference it.<sup>332</sup>

Approximately 17.7 percent of the City comprises impervious surface area, with roadways accounting for approximated 5.6 percent of total impervious area.<sup>333</sup>

## GREEN STREETS POLICY

Nashville's Green Streets policy is authorized by Mayoral Executive Order. Mayor Karl F. Dean's original Complete Streets policy, issued in 2010, evolved into a Green and Complete Streets program in 2016 under Mayor Megan Barry's executive order. The current Mayor, David Briley, reaffirmed the policy in 2018.<sup>334</sup>

### Historical context/impetus

Mayors Dean and Barry developed the Executive Orders in consultation with various Metro departments, including Planning, Public Works, WeGo Public Transit, Stormwater, and Health. The 2016 order was tied to a recently completed General Plan, NashvilleNext, and involved significant community participation by several organizations, including the American Heart Association, Walk Bike Nashville, and the Mayor's Bicycle Pedestrian Advisory Committee.

### Funding

Nashville funds Green Streets projects within the regular budgets of identified capital projects. Maintenance expenditures fall under Metro Water Service's budget. The Executive Order directs City staff to identify sources of funding for street improvements and maintenance programs. Nashville implemented a Storm Water Utility and User Fee, which is a monthly fee based on the property's classification as residential or nonresidential, and on the amount of impervious surface area, in square feet.

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<sup>329</sup> See AECOM ET AL., TERM CONTROL PLAN FOR METRO NASHVILLE COMBINED SEWER OVERFLOWS (2011).

<sup>330</sup> *Id.* at ES-4, 12-17.

<sup>331</sup> Env'tl. Law Inst. Green Streets Survey response by Rebecca Dohn, Low Impact Dev. & Sustainability Coordinator, Metro. Gov't of Nashville & Davidson Cnty. (2019) (reporting the TMDLs address E.coli, low dissolved oxygen, nutrients, metals, siltation, and habitat alteration).

<sup>332</sup> METRO. GOV'T OF NASHVILLE & DAVIDSON CNTY., CODE OF ORDINANCES, TIT. 15, DIV. I, ch.15.64.

<sup>333</sup> See David J. Nowak & Eric J. Greenfield, *Tree and Impervious Cover Change in U.S. Cities*, 11 *URBAN FORESTRY & URBAN GREENING* 21, 23, 25 (2012).

<sup>334</sup> See Exec. Order No. 040 (2010); Exec. Order No. 031, (2016) (amending Executive Order No. 040 adding Green Streets component); Exec. Order Number 004 (2018) ("All Executive Orders in effect on June 5, 2018, are reaffirmed and continued in effect unless superseded by new or revised Executive Orders").

### Applicability

While the language of the Executive Order indicates all transportation improvement projects should incorporate Green Streets elements, in practice only a handful of Green Streets projects are developed.

The Executive Order establishes both a clear intent to promote green infrastructure and specifies what green elements entail. The Order states that a system of Green and Complete streets "improves environmental quality through the inclusion of green-street elements such as street trees, swales, native plants and grasses, that reduce storm-water runoff, optimize storm-water quality, and enhance natural environments." The order mandates all Metro-owned transportation facilities in the PROW be "designed, constructed, operated, and maintained to enhance environmental quality," and instructs City agencies to "[a]pproach every transportation improvement project phase with the purpose to create greener, safer, and more accessible streets for all users." Project phases include construction, reconstruction, CIPs, re-channelization projects, and major maintenance projects.<sup>335</sup> The Order specifically requires, "[w]henever applicable," incorporation of "street trees and sustainable water-quality management principles . . . to reduce pollutant, temperature, and runoff impacts to local waterbodies," although the policy does not elucidate the term "applicable."<sup>336</sup>

City staff clarifies that, as a practical matter, the policy applies only to: (1) new streets built by Metro, which occurs rarely; and (2) private development along existing streets. In the latter case, developers typically address stormwater requirements on the private property side although, in a few instances, green components are integrated in the PROW. Usually, this occurs within large-scale, high-density projects, or where Metro funds a portion of a private developer's infrastructure.<sup>337</sup>

**Exceptions** deemed appropriate by the policy include, but are not limited to: (1) ordinary maintenance activities; and (2) "severe topographic, historical, natural resource, right-of-way constraints" precluding *Complete Street* facility construction without incurring extreme cost. The Executive Order does not establish a threshold for "extreme cost." Exceptions, including for eligible private projects, must receive interdepartmental staff review and approval and be documented, with the supporting record made publicly available.<sup>338</sup> City staff note that exceptions generally involve situations where a new street may not serve all users; this refers to the Complete, and not Green Streets component. City agencies review private projects to determine the need for an in-lieu contribution or variance.

### Coordination

The Executive Order directs City staff to collaborate among themselves on engineering, educational, enforcement, and evaluation activities that support implementation, although the focus is specifically on reducing traffic-related deaths.<sup>339</sup> In practice, responsibility for implementation rests with each City department.<sup>340</sup> Bi-weekly Department of Transportation (DOT) coordination meetings with Planning, Public Works, WeGo Public Transit, and the Mayor's Office aim to promote communication of new issues and concerns.

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<sup>335</sup> Exec. Order. No. 031 §§ I, 1, 1(a) (2016).

<sup>336</sup> *Id.* at § 3(e).

See E-mail from Michael Briggs, AICP, Manager of Multimodal Transp. Planning, Metro Nashville Planning Dep't, City of Nashville, Tenn., to Cynthia R. Harris, Staff Att'y, Env'tl. Law Inst. (Mar. 29, 2019 09:45 EST); see also E-mail from Michael Briggs, AICP, Manager of Multimodal Transp. Planning, Metro Nashville Planning Dep't, City of Nashville, Tenn., to Cynthia R. Harris, Staff Att'y, Env'tl. Law Inst. (Apr. 8, 2019 16:28 EST) (on file with author).

<sup>338</sup> Exec. Order No. 031, § 2 (2016).

<sup>339</sup> *Id.* at § 3(d).

<sup>340</sup> See E-mail from Michael Briggs, AICP, Manager of Multimodal Transp. Planning, Metro Nashville Planning Dep't, to Cynthia R. Harris, Staff Att'y, Env'tl. Law Inst. (Apr. 8, 2019 16:28 EST).

### Maintenance

The policy does not directly address maintenance.

### Accountability

The Executive Order states Nashville's government will measure success based on performance measures the Planning Commission selects, and which derive from NashvilleNext, the City's planning document. The City is to report performance measures annually and make them publicly available, though the policy gives no guidance on reporting progress toward meeting those measures.<sup>341</sup> In practice, City departments have significant discretion on how they follow the policy, with staff noting more streamlined administrative action may be required to move projects forward.

### Outcomes

*Reaction and outreach:* No information provided.

*Successes:* Green Streets projects thus far are limited to a handful of larger-scale Metro projects. These include the Division Street Extension, a \$25 million Complete Street project incorporating bioswales and pervious pavement,<sup>342</sup> the 11th Avenue Complete Street Project, incorporating roadside bioretention zones, street trees, native ornamental landscaping, and green space,<sup>343</sup> and the Harding Place Sidewalk Project (stormwater improvements, though not necessarily green infrastructure).<sup>344</sup>

*Challenges:* The City has not successfully integrated green infrastructure into opportunities beyond a few new streets and some private development projects occurring along existing streets.<sup>345</sup> Tracking progress beyond a few well-documented and publicized projects is difficult. For example, Capital Improvement Budgets do not identify Green Streets, green infrastructure, or other stormwater infiltration projects. The only references to "green" tend toward greenways (involving public parks and trails) and golf courses.<sup>346</sup>

The largest reported hurdle to policy implementation relates to tasking Metro departments with additional work and, in some cases higher capital costs, when budgets are tight. City staff report challenges to garnering public support for specific follow-up legislation related to the policy's Complete Street's components—like the expansion of sidewalk requirements with redevelopment—although commercial builders were more accepting than residential and infill homebuilders.

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<sup>341</sup> Exec. Order No. 031, § 3(e) (2016).

<sup>342</sup> *Division Street Extension and Bridge Complete Street Project*, NASHVILLE.GOV, <https://www.nashville.gov/Public-Works/Capital-Projects/Division-Street-Extension.aspx> (last visited June 11, 2019).

<sup>343</sup> *11th Avenue Complete Street Project*, NASHVILLE.GOV, <https://www.nashville.gov/Public-Works/Capital-Projects/11th-Avenue-Complete-Street-Project.aspx> (last visited June 11, 2019).

<sup>344</sup> *Harding Place Sidewalk and Pedestrian Enhancement Project*, NASHVILLE.GOV, <https://www.nashville.gov/Public-Works/Capital-Projects/Harding-Place-Sidewalk-and-Pedestrian-Enhancement.aspx> (last visited June 11, 2019); Briggs, *supra* note 340.

<sup>345</sup> *Id.*

<sup>346</sup> See THE METRO. GOV'T OF NASHVILLE & DAVIDSON CNTY., CAPITAL IMPROVEMENTS BUDGET: FY 2018-2019 THROUGH FY 2023-2024, III-33, III-71, III-82–83 (2018) (describing stormwater projects are in the aggregate, as "Stormwater capital construction" with no detail other than references to drainage improvements, engineering, and mitigation).

Case Study: North St. Paul



**Chesapeake Watershed Jurisdiction: NO**

**Green Streets Policy adopted: 2011**

**Policy Type: Non-legally binding guidelines/Combined Complete & Green Streets (“Living” Streets)**

**Applicability: Reconstruction**

Municipal Characteristics
<b>Jurisdiction type:</b> City
<b>Population:</b> 12,477
<b>Total area:</b> 3.01 mi <sup>2</sup>
<b>Water area:</b> 0.16 mi <sup>2</sup>
<b>Land area:</b> 2.85 mi <sup>2</sup> <sup>347</sup>
<b>PROW:</b> 43 mi. streets <sup>348</sup>
<b>Average annual precipitation:</b> 30.19 in. <sup>349</sup>
<b>FY 2019 budget:</b> <sup>350</sup>
N/A total expenditures
\$7,154,826 general fund
N/A CIP
N/A stormwater sewer system

Lessons Learned
➤ <b>Be flexible and willing to adjust projects in order to obtain community buy-in.</b> While the resulting project may not include all desired Living Streets elements, every component included in the final project provides a benefit.
➤ <b>Non-binding policies may be preferable to mandates</b> depending on the community context.
➤ <b>Invest time, effort, and resources into community education</b> in order to win community support for the Living Streets policy and for proposed projects. <sup>351</sup>

**STORMWATER MANAGEMENT:**

North St. Paul is a Phase II MS4 under a General Permit. <sup>352</sup> The Minnesota Pollution Control Agency (MPCA) plans to reissue the permit in autumn 2019. The current General Permit makes a single specific reference to green infrastructure in Minimum Control Measure (MCM) 5, governing post-construction stormwater management; this section instructs that permittees' post-construction stormwater management programs give the highest preference to BMPs constituting green infrastructure techniques and practices. <sup>353</sup>

<sup>347</sup> U.S. Census Bureau, AMERICAN FACTFINDER (last visited June 12, 2019) (search “North St. Paul city”); U.S. Census Bureau, *Population, Housing Units, Area, and Density: 2010—United States, Places by State*, AMERICAN FACTFINDER (downloaded June 7, 2019) (search North St. Paul).

<sup>348</sup> *Public Works Department*, NORTHSTPAUL.ORG, <https://www.northstpaul.org/234/Public-Works> (last visited June 11, 2019).

<sup>349</sup> Data Tools: 1981-2010 Normals, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/cdo-web/datatools/normals> (select “Minnesota” and averaged annual precipitation totals of “St. Paul 3 SW, MN US,” and “St. Paul Downtown Airport, MN US”) (last visited June 7, 2019).

<sup>350</sup> CITY OF N. ST. PAUL, MINN., GENERAL FUND BUDGET: FISCAL YEAR 2019 40 (2018).

<sup>351</sup> See Dawley, *supra* note 111.

<sup>352</sup> General Permit Authorization to Discharge Stormwater Associated With Small MS4s under the NPDES/State Disposal System Permit Program, Permit No. MNR040000 (Minn. Pollution Control Agency, Aug. 1, 2013).

<sup>353</sup> *Id.* at 15.

The Ramsey-Washington Metro Watershed District (RWMWD) exercises jurisdiction over the watershed drainage area that includes North St. Paul and another Green Streets jurisdiction, Maplewood. RWMWD's rules require 1.1 inch on-site infiltration of runoff over impervious surfaces.<sup>354</sup> RWMWD is subject to TMDLs for Kohlman Lake and Silver Lake; most of North St. Paul drains to Kohlman Lake. The Kohlman Lake TMDL addresses excess nutrients; specifically, phosphorus. The City of North St. Paul's wasteload allocation is 2.51 lbs./day.<sup>355</sup> Other water bodies subject to TMDLs include Lake St. Croix, Wakefield Lake, and the Mississippi River.<sup>356</sup>

North St. Paul's Public Works Department oversees both stormwater capital projects and maintenance activities.<sup>357</sup> The City has enacted a stormwater ordinance, which does not specifically reference green infrastructure.<sup>358</sup> However, the municipal code explicitly permits rain gardens in the right-of-way, subject to following certain provisions.<sup>359</sup>

## GREEN STREETS POLICY

North St. Paul's City Council in 2011 passed a resolution approving a Living Streets Plan and authorizing City staff to use the plan in designing street reconstruction projects. "Living Streets" combines Complete and Green Streets Principles. The Plan is intended to be flexible, and incorporation of Living Streets elements is not mandatory.<sup>360</sup>

### Historical context/impetus

Eighty-nine percent of North St. Paul drains to Kohlman Lake via Kohlman Creek (located in Maplewood); the remainder drains to Silver Lake. Kohlman Lake is on the Impaired Waters List for the State, and TMDLs were developed for each.<sup>361</sup> Kohlman Lake is listed due to chloride and excess nutrients, such as phosphorus.

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<sup>354</sup> Compare Ramsey-Washington Metro Watershed District Rules, § (C)(3)(c) (2015) ("Stormwater runoff shall be retained onsite in the amount equivalent to 1.1 inches of runoff over the impervious surfaces of the development."); with Ramsey-Washington Metro Watershed District Draft Rules (C)(3)(c) (2019) ("Stormwater runoff shall be retained onsite in the amount equivalent to 1.1 inches of runoff over the *new and reconstructed* impervious surfaces of the development.") (emphasis added).

<sup>355</sup> BARR ENG'G CO., *supra* note 298.

<sup>356</sup> Minn. Pollution Control Agency, Approved WLAs for MS4s-Edina Maplewood North St. Paul (2019) (on file with author).

<sup>357</sup> See CITY OF N. ST. PAUL, MINN., CODE OF ORDINANCES tit. V, ch. 56, § 56.02 (2005) ("The Superintendent of the Public Works Department shall have control of the drainage and sanitary and storm sewer system and all drains and sewers now or hereafter built or authorized by the city and the building, repair and maintenance thereof and connections therewith.").

<sup>358</sup> See CITY OF N. ST. PAUL, MINN., CODE OF ORDINANCES tit. V, ch. 56 ("Sanitary and Storm Sewer System Utilities"); but see CITY OF N. ST. PAUL, MINN., CODE OF ORDINANCES tit. XV, ch. 154, § 154.008(D)(10)(b) (2015) (including zoning regulations specific to the Shoreland Overlay District that prioritize natural features and green infrastructure in stormwater management.) ("When development density, topographic features, and soil and vegetation conditions are not sufficient to adequately handle stormwater runoff using natural features and vegetation, various types of constructed facilities such as diversions, settling basins, skimming devices, dikes, waterways, and ponds may be used. Preference must be given to designs using surface drainage, vegetation, and infiltration rather than buried pipes and manmade materials and facilities.").

<sup>359</sup> CITY OF N. ST. PAUL, MINN., CODE OF ORDINANCES tit. IX, ch. 94, § 94.60(D) (2016) ("Rain gardens shall be allowed in the right-of-way to the extent that they are allowed by and comply with the provisions of § 154.010."); *Rainwater Gardens*, NORTHSTPAUL.ORG, <https://www.northstpaul.org/247/Rainwater-Gardens> (last visited June 11, 2019) (providing Rainwater Guidelines for placing rainwater gardens within the City Right-of-Way).

<sup>360</sup> See CITY OF NORTH ST. PAUL, MINN. RESOLUTION NO. 2011-014 (2011) (directing the incorporation LID principles into street reconstruction projects with the goal of infiltrating on-site at least the first inch of rainfall, or the volume required under RWMWD's current rules).

<sup>361</sup> MINN. POLLUTION CONTROL AGENCY, 2018 IMPAIRED WATERS LIST (2018), available at <https://www.pca.state.mn.us/water/minnesotas-impaired-waters-list> (Kohlman Lake is located in neighboring Maplewood and is part of the Phalen Chain of Lakes, which eventually flows into the Mississippi River).

In the early 2000s, RWMWD explored options for preventing polluted runoff from entering Kohlman Lake.<sup>362</sup> A report issued in 2005 found 34 percent average impervious coverage in the watershed.<sup>363</sup> North St. Paul at the time initiated a 20-year program to reconstruct neighborhood streets, in order to replace aging drinking water and sanitary sewer pipes.<sup>364</sup> This program provided an opportunity for RWMWD to collaborate with a fully developed community to reduce stormwater volume—specifically, through green infrastructure and incorporating multi-modal accessibility.<sup>365</sup>

The City Council appointed a Community Task Force to develop the Living Streets Plan. The 15-member Task Force, comprising residents, businesses, City staff, and a Council representative, met six times from June to October 2009. Design objectives included, but were not limited to, improving stormwater runoff quality by infiltrating at least the first inch of rainfall from City streets near the street edge, reducing impervious surfaces by converting some parking lanes for water treatment and bike/pedestrian circulation, and minimizing long-term maintenance costs, by reducing the amount of pavement to maintain and to replace in the future.<sup>366</sup> RWMWD received a \$500,000 grant for this effort and provided \$600,000 in matching funds.<sup>367</sup>

RWMWD secured a \$500,000 Clean Water Fund grant and planned to contribute \$700,000 for a \$1.9 million Living Street projects on 15th Avenue from McKnight Road to Margaret Street. Reconstruction of the avenue – a high-traffic residential road – proposed adding new trees, rainwater gardens, curbs, and a sidewalk on one side of the road.<sup>368</sup> Neighborhood residents expressed significant resistance to the project; however, this was due predominantly to concerns over narrowing the street, rather than to the proposed stormwater management elements. The City Council declined to order completion of the project.<sup>369</sup> RWMWD ultimately withdrew, using the grant instead to implement a pilot project in the neighboring City of Maplewood.<sup>370</sup>

North St. Paul continued pursuing the idea of incorporating Living Streets elements into reconstruction projects, though in a manner drawing on lessons learned from the ill-fated 15th Avenue project.

### Funding

The Surface Water fund, a utility fee based on impervious surface area, is the primary source of stormwater funding. Other revenue sources include special assessment taxes and grants.<sup>371</sup> North St. Paul generally leverages bond

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<sup>362</sup> Miles Trump, *North St. Paul's 'Living Streets' Program Aims to Make Roads Safer, More Environmentally Friendly*, TWINCITIES.COM/PIONEER PRESS (Nov. 11, 2015 9:10AM).

<sup>363</sup> RAMSEY-WASHINGTON METRO WATERSHED DIST., WATERSHED RESTORATION AND PROTECTION STRATEGIES REPORT 11–13 (2017) (“Analysis of impervious surfaces within the District as part of the Detailed Assessment of Phosphorus Sources to Ramsey-Washington Metro Watershed District [citing BARR ENG’G CO., DETAILED ASSESSMENT OF PHOSPHORUS SOURCES TO RAMSEY-WASHINGTON METRO WATERSHED DISTRICT (2005)] found that impervious coverage in the various subwatersheds ranged from 21% to 43% impervious, with the average being 34% impervious. Figure 1-2 shows the breakdown of each land use in terms of percent coverage throughout the District.”).

<sup>364</sup> BARR ENG’G CO., *supra* note 110 at 3–4.

<sup>365</sup> See Telephone Interview with Cliff Aichinger, Vice President, Ramsey-Washington Metro Watershed Dist. (May 14, 2019).

<sup>366</sup> BARR ENG’G CO., *supra* note 110 at 16–17.

<sup>367</sup> Aichinger, *supra* note 309.

<sup>368</sup> Trump, *supra* note 362 (anticipating the remaining costs would come from North St. Paul utility funds); See BARR ENG’G CO., *supra* note 298 at 16 (noting that RWMWD was working with North St. Paul at the time—2010—in selecting a residential street to demonstrate “green street features,” and also to create a comprehensive Green Infrastructure Plan to incorporate green street features into future redevelopment projects).

<sup>369</sup> See Aichinger, *supra* note 309.

<sup>370</sup> Aichinger, *supra* note 365.

<sup>371</sup> CITY OF N. ST. PAUL, MINN., CODE OF ORDINANCES, tit. V, ch. 56, §56.04 (establishing a surface water utility to be operated as a public utility); CITY OF N. ST. PAUL, MINN., SURFACE WATER FUND BUDGET: FISCAL YEAR 2019 1 (2018) (including revenue sources of special

revenues for Living Streets projects, with utility funds paying back the debt service. Funding sources for street improvements comprise a combination of street capital improvement funds (via a general tax levy), State gas tax revenues, and special assessments.<sup>372</sup> Special assessments are charges imposed on individual properties and used to pay for local improvements benefiting the property.<sup>373</sup>

The Living Streets Plan estimated the expense of constructing new elements—including rainwater gardens—would be compensated by reducing the amount of impervious surface. For example, the Plan calculated that reducing the width of a residential street from 30 to 22 ft. could result in a savings of 15 percent or more on pavement, and a 25 percent reduction in maintenance costs—or up to \$1,000 per mile per year. Based on that assumption, the Plan estimated the City could realize \$50,000 in life-cycle maintenance costs per mile of roadway over the life of the road.<sup>374</sup>

### Applicability

The Plan is intended to be flexible, and does not specify where the design guidelines do and do not apply. The City indicates opportunities for incorporating Living Streets elements are greatest in full reconstruction projects. Such projects extend outside the curb line, and involve full removal and replacement of existing pavement as well as reconstruction of the storm sewer. Ultimately, moving forward with a Living Streets project is the City Council's decision.<sup>375</sup>

The Plan offers guidance in identifying appropriate projects, describing the various categories of streets and the opportunities for converting them, over time, into Living Streets.<sup>376</sup> For example, the Plan explains that residential streets offer the best opportunities for living streets design, due to considerations such as fewer conflicts with underground utilities and under-used parking zones. Two of the recommended stormwater management approaches for all categories are street trees and rainwater gardens.<sup>377</sup>

### Coordination

The Design Guidelines set out a four-step design sequence. Step 2, Site Analysis, recommends beginning project discussions early in the process, when a road under consideration for conversion into a Living Street is under another entity's jurisdiction. Step 2 also directs City staff to identify utility conflicts, practicing avoidance as a first step, and to coordinate any necessary relocations or utility upgrades with utility entities. Step 3, Design Development, recommends conducting a design meeting with RWMWD. During this meeting, the parties should consider opportunities to add supplemental stormwater BMPs to the design.<sup>378</sup> The Plan also recognizes the need to cooperate with the State and County. Two categories of roadways—Collectors and Arterials—are State Highways or State Aid roads, meaning that reconstruction plans must meet State and County design standards. However, localities may apply for a waiver.<sup>379</sup>

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assessment taxes (zero in current budget), grants, Surface Utility Charge (\$775,000 in current budget), and other charges (\$27,581 in current budget)); City of North St. Paul, Minn., 2019 Municipal Fee Schedule and Utility Rates 25 (2019).

<sup>372</sup> Dawley, *supra* note 111.

<sup>373</sup> BARR ENG'G CO., *supra* note 110 at 37 (citing MINN. STAT. § 429.021 (2018) (authorizing local governments to use special assessments to pay for comprehensive list of improvements, including streets and roads and storm sewers))

<sup>374</sup> *Id.* at 30.

<sup>375</sup> Dawley, *supra* note 111.

<sup>376</sup> BARR ENG'G CO., *supra* note 110 at 20–29 (categorizing streets as Residential, North-South Arterials/Collectors, East-West Arterials/Collectors, and Parkway).

<sup>377</sup> *Id.* at 22.

<sup>378</sup> *Id.* at 33–34.

<sup>379</sup> *Id.* at 24, 26.

### Maintenance

The Plan's Design Guidelines, under Step 3, advise determining the acceptable level of maintenance, how it will be funded, and who will conduct the maintenance work, and to incorporate these considerations into budget plans. Step 5, Proceed with Final Design and Construction, recommends developing a management plan pertaining to a project's green features.<sup>380</sup> Notably, the long-term responsibility for maintaining rainwater gardens—a major component of the Plan's green infrastructure elements—falls to the adjacent property owners after a one-year establishment period.<sup>381</sup>

### Accountability

The Living Streets Plan makes two significant recommendations pertaining to monitoring and oversight. First, the Plan recommends developing an Asset Management Plan. This includes maintaining an inventory of the infrastructure and evaluating these assets in terms of needed repair and replacement, along with anticipated timelines. The Plan also advises creating a citizen advisory board or other citizen group that meets regularly and provides oversight.<sup>382</sup>

The City initiated the Asset Management Plan recommendation shortly after the adoption of the Living Streets Plan. The current Capital Improvement Plan, adopted in 2013, incorporated much of the street pavement, sidewalks and trails, water main, and sanitary sewer inventory, condition evaluation, and prioritization of improvements included in the initial comprehensive Asset Management effort. The City makes regular updates to these systems, which assist with coordinating, prioritizing, and budgeting public improvement efforts. The City Council provides oversight; no separate entity or commission was created.<sup>383</sup>

### Outcomes

*Reaction and outreach:* The Living Streets Plan emphasizes implementing a City-Wide Communications Program, and appends a recommended strategy encompassing key messages, target audiences, coalition-building, community events, and outreach materials.<sup>384</sup> North St. Paul has implemented some components of the communications plan, such as holding open houses and taking residents' comments.<sup>385</sup>

*Successes:* North St. Paul implemented three Living Streets projects under the Plan, which incorporate green elements. The 2014 Street and Utility Improvement Project, including 1.3 miles of roadway, sewer, water main, and storm sewer reconstruction and rehabilitation, incorporated rainwater gardens and water quality improvements for street runoff, narrowed streets for reduced impervious surface area, and tree replacement/reforestation. The 2016 Street and Utility Improvement Project, including 1.6 miles of roadway, sanitary sewer, water main and storm sewer reconstruction and rehabilitation, incorporated rainwater gardens and water quality improvements for street runoff, sidewalks, narrowed streets, and tree replacement/reforestation. The 2018 Street and Utility Improvement Project, including 1.7 miles of roadway, sanitary sewer, water main and storm sewer reconstruction and rehabilitation,

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<sup>380</sup> *Id.* at 34–35.

<sup>381</sup> Dawley, *supra* note 110.

<sup>382</sup> BARR ENG'G Co., *supra* note 110 at 39, 41.

<sup>383</sup> E-mail from Morgan Dawley, Municipal Senior Project Manager, WSB & Assocs., to Cynthia R. Harris, Staff Att'y, Env'tl. Law Inst. (May 16, 2019 18:16 EST) (on file with author).

<sup>384</sup> BARR ENG'G Co., *supra* note 110 at B-1–3.

<sup>385</sup> Dawley, *supra* note 111.



incorporated rainwater gardens and water quality improvements for street runoff, sidewalks and trails, narrowed streets, and tree replacement/reforestation.<sup>386</sup>

*Challenges:* The City experienced significant community pushback during consideration of the 15th Street project proposal. Much of the opposition pertained to narrowing streets for sidewalks. Future challenges include the impacts of climate change on stormwater runoff volume.<sup>387</sup>

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<sup>386</sup> Dawley, *supra* note 383.

<sup>387</sup> Aichinger, *supra* note 365.

Case Study: Portland

**Chesapeake Watershed Jurisdiction: NO**

**Green Streets Policy adopted: 2017**

**Policy Type: Legally binding resolution/Policy**

**Applicability: New, reconstruction (disturbing 500+ sq. ft. impervious area), other improvement projects (discretionary)**



Municipal Characteristics
<b>Jurisdiction type:</b> City
<b>Population:</b> 653,115
<b>Total area:</b> 145.09 mi <sup>2</sup>
<b>Water area:</b> 11.66 mi <sup>2</sup>
<b>Land area:</b> 133.43 mi <sup>2</sup> <sup>388</sup>
<b>PROW:</b> 4,852 total centerline mi., 1,869 mi. arterial and collector streets, 2,983 mi. local streets, 452 mi. storm sewer. <sup>389</sup>
<b>Impervious road:</b> 12.5% <sup>390</sup>
<b>Average annual precipitation:</b> 36.03 in. <sup>391</sup>
<b>FY 2019 budget:</b> <sup>392</sup>
\$4,900,407,478 total expenditures
\$681,621,221 general fund
\$677,644,161 CIP
\$1,186,784,734 combined water, stormwater and sewer system

Lessons Learned
➤ <b>Select Green Streets when it is the best "tool"</b> to accomplish stormwater and watershed goals.
➤ <b>Develop a maintenance policy with strong oversight and quantifiable outcomes and outputs</b> that justify expenditures on Green Streets to taxpayers.
➤ <b>Implement pilot projects to garner support both from City staff and the public.</b> An EPA Innovative Wet Weather Grant funded a demonstration and test project, providing an opportunity for educating City engineers, politicians, and the public about the benefits of Green Streets.

<sup>388</sup> U.S. Census Bureau, AMERICAN FACTFINDER (last visited June 12, 2019) (search "Portland city, Oregon"); U.S. Census Bureau, *Population, Housing Units, Area, and Density: 2010—United States, Places by State*, AMERICAN FACTFINDER (downloaded June 7, 2019) (search "R21389"). U.S. Census Bureau, *Population, Housing Units, Area, and Density: 2010—United States, Places by State*, AMERICAN FACTFINDER (downloaded June 7, 2019) (search "R21389").

<sup>389</sup> Acock, *supra* note 109.

<sup>390</sup> Nowak & Greenfield, *supra* note 333 at 26; Natural Resources Defense Council, *Portland, Oregon: A Case Study of how Green Infrastructure is Helping Manage Urban Stormwater Challenges 2* (stating that more than half of Portland’s land area is impervious, with streets comprising 25 percent of impervious surfaces and rooftops representing 40 percent).

<sup>391</sup> Data Tools: 1981-2010 Normals, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/cdo-web/datatools/normals> (select "Oregon" and averaged annual precipitation totals of "Portland Hillsboro Airport, OR US," "Portland International Airport, OR US," "Portland KGW TV, OR US," "Portland Troutdale Airport, OR US," and "Portland Weather Forecast Office, OR US") (last visited June 12, 2019).

<sup>392</sup> CITY OF PORTLAND, OR., ADOPTED BUDGET: FISCAL YEAR 2018-19 VOLUME ONE CITYWIDE SUMMARIES AND BUREAU BUDGETS 78, 81, 98, 103 (2018) [hereinafter PORTLAND 2018-2019 BUDGET SUMMARIES].

## STORMWATER MANAGEMENT

Portland's storm sewer system is a combination CSS and MS4, subject to both a CSO Control Plan and an MS4 Permit. The Oregon Department of Environmental Quality (DEQ) issued the City's current Phase I Permit in 2011.<sup>393</sup> Green infrastructure and Low-Impact Design techniques are included in the MS4-required Storm Water Management Plan (SWMP) and in the Stormwater Management Manual (SWMM) for new development and re-development.

Portland is a listed Designated Management Agency (DMA) for four TMDLs. The City's TMDL Implementation Plan (TIP) discusses Green Streets in reference to conducting public education and stewardship activities, promoting and incorporating the use of Green Streets facilities in public and private development, and implementing the Percent for Green and payment-in-lieu activities to fund Green Streets assets (discussed below).<sup>394</sup>

The City's Bureau of Environmental Services (BES) oversees stormwater planning and Green Streets assets. Green Streets projects are also built by other bureaus/agencies overseeing transportation projects, and by developers in accordance with ROW permit requirements.

Portland has enacted a stormwater ordinance,<sup>395</sup> which references Green Streets only tangentially.<sup>396</sup> The City Stormwater Management Manual explicitly prioritizes on-site infiltration through vegetated facilities, or green infrastructure.<sup>397</sup>

## GREEN STREETS POLICY

Portland's City Council in 2007 adopted its Green Streets Policy.<sup>398</sup> The City is distinguished as the first identified locality to adopt a comprehensive Green Streets Policy.

**The City anticipates revising the policy within the next couple of years, based on a decade of practical experience implementing the current version.** Early on, neither City staff nor the public had fully embraced Green Streets, and the City sought to establish it as a legitimate tool for addressing stormwater runoff. It did so by making incorporation of green infrastructure commonplace. The City's practice has evolved from one of implementing Green Streets regularly, per strict interpretation of the policy, toward one of considering Green Streets as one tool among many. The key change will be reprioritizing Green Streets, recognizing that green infrastructure is one of a number of good tools, and providing greater discretion to project designers in selecting the best tool to address the runoff concerns specific to each PROW project site.

### Historical context/impetus

Portland's initial impetus was identifying a cost-effective method to alleviate pressure on the City's CSS, in order to reduce the number of basement sewer backups and CSOs. The City sought ancillary benefits, such as neighborhood aesthetics, mitigating the urban heat island, and other positive environmental outcomes.

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<sup>393</sup> NPDES MS4 Discharge Permit, Permit No. 101314 (Or. Dep't of Env'tl. Quality, Jan. 31, 2011) (receiving an administrative extension since 2015).

<sup>394</sup> CITY OF PORTLAND, OR., TMDL IMPLEMENTATION PLAN FOR THE WILLAMETTE RIVER & TRIBUTARIES 21–23 (2019).

<sup>395</sup> See CITY OF PORTLAND, OR., CITY CODE, tit. 17 §§ 17.32 (2014), 17.38 (1999), 17.39 (2011) (referencing "Public Sewer and Drainage System Permits, Connections and Maintenance," "Drainage and Water Quality," and "Storm System Discharges" respectively).

<sup>396</sup> CITY OF PORTLAND, OR., CITY CODE, tit. 17, § 17.28 (2011) ("Green street or other public stormwater management facilities in the [right-of-way] shall be modified or repaired only by the City or under an appropriate permit from the [BES]).

<sup>397</sup> CITY OF PORTLAND, OR., STORMWATER MANAGEMENT MANUAL 1-23 (2016) [hereinafter PORTLAND STORMWATER MANAGEMENT MANUAL].

<sup>398</sup> CITY OF PORTLAND, OR., RESOLUTION No. 36500 (2007) (accepting and endorsing the Portland Green Streets Policy and Green Streets Cross-Bureau Phase 2 Report).

In the fall of 2005, an interdisciplinary Green Streets Team, comprised of City staff across multiple agencies and bureaus, engaged in a two-year effort to promote integration of Green Streets into City plans and projects. Phase I of the effort identified opportunities for addressing multi-bureau and site-specific challenges. Phase II, initiated in July 2006, focused on developing a broader programmatic approach. An early deliverable was the Cross-Bureau Team Report, issued in March 2007.<sup>399</sup> The report listed several recommendations, including that the City draft a binding Green Streets policy.<sup>400</sup>

### Funding

**Capital costs** are paid for by general obligation bonds, repaid by stormwater and sewer rates and fees.<sup>401</sup> Stormwater utility rates for residential properties with four or fewer units consist of a flat on-site and off-site charge per user or per dwelling. Nonresidential properties and properties with five or more units are charged per 1,000 sq. ft. of impervious area.

A separate source of capital funding is the “% for Green” Street fund. All City-funded development, redevelopment, or enhancement projects, requiring a street opening permit or occurring in the PROW but not triggering the SWMM, are assessed one percent of the construction costs directed into the fund. A *General Accounting Record for the 1% for Green/Offsite Stormwater Management Fees* from FY 2008 to April 2019 indicates a total of \$7.18 million in revenues and \$3.947 million pledged to Green Streets projects over this period of time. The City projects \$9.19 million in revenue and \$5.29 million pledged as of FY 2022. The City also anticipates expenditures of \$255,400 and \$276,670 in FY 2019 and 2020 respectively, and \$700,000 annually from FY 2021-2022. Three City agencies are the major contributors to the Percent for Green fund: the Bureau of Environmental Services (BES), Bureau of Transportation (PBOT), and Water. Another source is off-site stormwater contributions. As of April 2019, offsite stormwater management fees accounted for \$2.12 million of the \$7.18 million in revenue contributed to the fund, or 30 percent; BES contributed \$2.675 million, or 37 percent.<sup>402</sup>

“% for Green” is now listed as a separate project in the City CIP budget, under Surface Water Management. These projects are funded entirely from both Offsite Stormwater Management Fees and the Percent for Green Charges. \$1.8 million is the total cost projected for the current five-year period.<sup>403</sup>

**Maintenance** is similarly funded by stormwater and sewer rates and fees. The Green Streets maintenance budget currently equates to approximately \$700,000 annually.<sup>404</sup>

### Applicability

Portland’s policy applies to all City-funded development, redevelopment, or enhancement projects in the PROW, as required by the current version of the SWMM.<sup>405</sup> In other words, the policy operates *via* the SWMM, whose stormwater management requirements are triggered by capital projects in the public right-of-way creating more

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<sup>399</sup> CITY OF PORTLAND, OR., GREEN STREETS CROSS-BUREAU TEAM REPORT PHASE 2 3 (2007) [hereinafter Green Streets Report].

<sup>400</sup> *Id.* at 3–4.

<sup>401</sup> CITY OF PORTLAND, OR., ADOPTED BUDGET FISCAL YEAR 2018-2019 VOLUME 2 CITY FUNDS AND CAPITAL PROJECTS 163–169 (2018) [hereinafter PORTLAND 2018-2019 CAPITAL BUDGET].

<sup>402</sup> City of Portland, Or., response to Public Records Request #C095481-040519 (Apr. 05, 2019) (on file with author).

<sup>403</sup> PORTLAND 2018-2019 CAPITAL BUDGET, *supra* note 401 at 177.

<sup>404</sup> Telephone Interview with Michele Juon, Watershed Revegetation Program Manager, Bureau of Env'tl. Servs., City of Portland, Or. (Apr. 8, 2019).

<sup>405</sup> CITY OF PORTLAND, OR., GREEN STREETS POLICY 1 (2007) [hereinafter PORTLAND GREEN STREETS POLICY].

than 500 square feet of new or redeveloped impervious surface.<sup>406</sup> The SWMM requires stormwater be infiltrated onsite to the maximum extent feasible; under the infiltration and discharge hierarchy, vegetated facilities should be implemented first, and to the maximum extent feasible.<sup>407</sup> The SWMM does not define "redeveloped." According to conversations with City staff, redevelopment would likely encompass projects involving street regrading. "Maintenance," here referring to projects that simply overlay new asphalt or involve trench work for replacing utility lines, is unlikely to trigger the SWMM.

In addition to the 500 sq. ft. trigger under the SWMM, the policy may be triggered by stormwater retrofit scenarios (not strictly required under the SWMM), which aim to remove stormwater from the CSS (and thus avoid CSOs) by constructing Green Streets to infiltrate runoff on-site.

In practice, and aside from projects meeting the 500 sq. ft. threshold required by the SWMM, the types of projects triggering the policy have changed over time. The City's focus has evolved from taking advantage of every opportunity to incorporate green infrastructure to a more goal-oriented approach. This means determining where Green Streets offer the best tool for addressing stormwater runoff infiltration. Strong examples include projects whose goals include diverting runoff from the combined sewer system by infiltrating stormwater onsite.<sup>408</sup>

**Exceptions** are provided for in the policy, which requires an off-site project or off-site management fee be collected when green elements are not triggered by the SWMM, or when only partial on-site stormwater management is achieved.<sup>409</sup> As discussed above, any City-funded development, redevelopment, or enhancement project that does not trigger the SWMM, but requires a street opening permit or occurs in the PROW, pays one percent of the construction costs into a "% for Green" Street fund for the project. Minor repairs are excepted. The off-site management fee is charged to both public projects (including projects in the PROW) and private development projects.

The policy does not list specific categories of projects that may be exempted—beyond projects not triggered by the SWMM—but exceptions are made in practice. One example is low-traffic streets when the drainage discharges to a sump. City staff may also determine that larger off-street (parcel or regional) facilities provide greater benefits.

### Coordination

The City Council resolution explicitly directs City bureaus and agencies to cooperatively plan and implement the policy. The resolution also ensures consideration of green elements from the earliest phases of capital projects by requiring integration of the policy into the City's Comprehensive Plan, Transportation System Plan, and the Citywide System Plan.

### Maintenance

Currently, Portland relies on a contractor model to provide maintenance services, although the City is moving to in-house maintenance crews and contractors.<sup>410</sup> The Green Streets policy directs City staff to establish standard

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<sup>406</sup> PORTLAND STORMWATER MANAGEMENT MANUAL, *supra* note 397 at 1–13 ("Projects that develop or redevelop over 500 square feet of impervious surface are required to comply with stormwater management requirements for the new or redeveloped impervious area at the site, unless specifically exempt").

<sup>407</sup> *Id.* at 1-23–1-24.

<sup>408</sup> *See* Juon, *supra* note 404.

<sup>409</sup> PORTLAND GREEN STREETS POLICY, *supra* note 405.

<sup>410</sup> Juon, *supra* note 404.

maintenance techniques and monitoring protocols. The BES Watershed Revegetation Program (WRP) is responsible for providing maintenance services.<sup>411</sup>

Maintenance crews follow the City's Green Streets Maintenance Policy, contained in the City's Stormwater Operations & Maintenance Manual.<sup>412</sup> The Green Streets guidelines aim to maintain all Green Streets assets in a functional condition. Maintenance crews are instructed to conduct a minimum of two inspections annually, in spring and in the fall—prior to the wet season, and afterwards. Crews inspect for overall condition and function, structural deficits, sediment level, and vegetation health, coverage, and function, and record information about inlets and curb cuts, check dams, structural walls, side slopes, outlets and overflow structures, and vegetation. The maintenance policy describes special issues affecting Green Streets facilities, noting they are particularly vulnerable to vandalism and to disturbance, due to immediate adjacency to streets, commercial and industrial buildings, sidewalks, and front yards.<sup>413</sup>

Appendix A of the Manual contains the Green Streets Maintenance Protocol,<sup>414</sup> recognizing that the City's rapidly increasing Green Street inventory counseled establishing a standard maintenance approach. This includes laying out a hierarchy of treatments in order to optimize limited staff and contractor resources. Emergency Response and Non-Emergency Response Protocols contain specific timelines for responding to each type of situation.<sup>415</sup>

#### Accountability

The Green Streets Policy directs ongoing monitoring of Green Streets facilities to evaluate facility effectiveness. Specific indicators include gallons measured, and the distribution of projects geographically by watershed and by neighborhood.<sup>416</sup> The Green Streets Cross-Bureau Team discussed, during Phase II, specific performance measures and targets, and recommended issuing annual progress reports recognizing program leaders and innovators in order to track and encourage progress.<sup>417</sup> These recommendations have not been implemented.

#### Outcomes

*Reaction and outreach:* The Cross-Bureau Team Report for Phase 2 noted that the City at the time was developing a Green Street tour schedule and a doorhanger to provide a means of regularly communicating with private property owners living in the vicinity of Green Street facilities. The Report also identified Green Street facility site markers as another outreach tool for educating the public. Currently, when the City proposes Green Street projects, public involvement staff conduct outreach, send letters, and hold open houses. The City initially produced a Green Street newsletter issued to neighbors adjacent to projects, but discontinued the practice. Maintenance staff continue to leave behind doorhangers, and BES places a metal medallion on every Green Street facility. Additional outreach

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<sup>411</sup> PORTLAND O&M MANUAL, *supra* note 58 at 71 (stating WRP is responsible for vegetation management at all public Green Street facilities no longer in a warranty period).

<sup>412</sup> *Id.* at 39–41 (providing information and guidelines for managing each type of stormwater facility and laying out criteria and standards for inspection, maintenance, and repair to maintenance crews working for both the Bureau of Environmental Services (BES) and the Portland Bureau of Transportation/Maintenance Operations (PBOT/MO)).

<sup>413</sup> *See id.* (recognizing vegetation as an integral component of Green Streets' water quality treatment function, directing maintenance crews to encourage desired plants, minimize weeds, avoid obstructing sight lines, and to follow horticultural best practices and applicable wildlife protection guidelines and laying out a maintenance process, and provide instructions for disposing residuals, such as sediment, vegetative debris, and large trash).

<sup>414</sup> *Id.* at 71–78.

<sup>415</sup> *Id.* at 73–74 (containing also a Stormwater Management Facility Inspection and Work Log, and a BES Revegetation Public Communication Form).

<sup>416</sup> PORTLAND GREEN STREETS POLICY, *supra* note 405 at 5.

<sup>417</sup> GREEN STREETS REPORT, *supra* note 399 at 37.

includes an “Art of Stormwater” rotating photo exhibit, developing publicity materials, tabling at community events, conducting tours, and providing lectures. Portland also manages a Green Street Steward Program, through which community members assist in maintaining the City’s Green Streets assets.<sup>418</sup>

The City reports the Portland Bureau of Transportation (PBOT) and Planning Bureau (BPS) are more aware of green infrastructure as a result of policy implementation. Green Streets have also increased public visibility of stormwater issues and have helped the City avoid costly pipe upsizing by preserving pipe capacity. Initial concerns about safety and contaminant accumulation have been addressed, including through sediment and soil monitoring.

*Successes:* Portland’s database indicates the City oversees approximately 2,400 Green Streets assets. City staff alternatively measures progress at 151 acres of impervious surface. However, due to cessation of detailed accounting, City agencies can account for only 2,099 assets.

Not all of these assets were developed under the policy. Other agencies in charge of transportation projects develop Green Streets assets on their own initiative. Private developers also build Green Streets in accordance with their ROW permit requirements. Green Streets assets are attributed to the following entities: (1) BES-initiated Green Street assets: 582, or 28 percent (502 funded by CIP, 21 by “% for Green,” 47 Sustainable Stormwater program, and 12 via other grants); (2) Interagency (Transportation, TriMet, Parks, and other agencies): 943, or 45 percent; and (3) Public Works Permitting: 574, or 27 percent. 572 Green Streets assets were funded by private development, and two via a combination of public/private development.<sup>419</sup>

The adopted FY2018-19 Budget lists one \$36,758 million project (Alder Street) (over five years) encompassing replacing and upsizing sewer pipes and installing street, roof, and parking lot stormwater controls. This project incorporates Green Streets.<sup>420</sup> Green Streets is also listed under two Small Urgent Capacity Projects,<sup>421</sup> and under “% for Green” as a separate project in the City CIP budget, under Surface Water Management, with \$1.8 million anticipated to be expended over five years.<sup>422</sup>

*Challenges:* In December 2018, the City Auditor released a report focused on BES’s wetland restoration and Green Streets projects. The report found insufficient monitoring of the City’s Green Streets assets. Specifically, BES lacked a formal method to track and report its progress in meeting specific outcome-based goals.<sup>423</sup>

The City Auditor recognized that BES’s Operations and Maintenance Manual directed staff to maintain Green Street facilities in a functional condition. However, the Manual did not require reporting on whether the facilities were, in fact, in a functional condition, and focused instead on reporting inspection counts and maintenance activities. The investigation found that 53 percent of Green Streets were not inspected in the spring of 2018. The report added that in 2017, 40 percent of assets were not maintained sufficiently often, and 70 assets were not maintained at all. The City Auditor found quality assurance to be deficient: there was no oversight to ensure individual assets met the operations and maintenance criteria. Barriers to effectively reporting the condition of Green Streets assets included

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<sup>418</sup> *Green Street Steward Program*, CITY OF PORTLAND, OR., <https://www.portlandoregon.gov/bes/52501> (last visited June 12, 2019).

<sup>419</sup> E-mail from Ivy Dunlap, Landscape Architect, Bureau of Env’tl. Servs., City of Portland, Or., to Steve Hansen, CIP Manager, Bureau of Env’tl. Servs., City of Portland, Or. (Apr. 9, 2019 17:45 PST).

<sup>420</sup> PORTLAND 2018-2019 CAPITAL BUDGET, *supra* note 401 at 163–64.

<sup>421</sup> *Id.* at 169 (referencing Stark HSS-17 \$13,242 million and TGD: Richmond Neighborhood \$4.75 million, both sewer pipe projects incorporating green streets).

<sup>422</sup> *Id.* at 177.

<sup>423</sup> PORTLAND CITY, OR., AUDITOR, RESTORATION PROJECTS AND GREEN STREETS: PLANNING AND EVALUATION NEEDED TO CONFIRM SUCCESS 14 (2018); Gordon R. Friedman, *Portland Falls Short on Tracking ‘Green Streets,’ Watershed Work, Auditor Says*, THE OREGONIAN/OREGONLIVE (Dec. 4, 2018), <https://www.oregonlive.com/news/2018/12/portland-falls-short-on-tracking-green-streets-watershed-work-auditor-says.html>.

inconsistent data collection and no method quantifying the overall condition of its Green Streets assets. Significantly, while BES tracked specific *outputs*, the agency failed to develop indicators connecting those outputs to *outcomes* such as improved water quality.<sup>424</sup> The bulk of this last criticism was directed at wetland restoration projects, but it also applies to Green Streets.

Recommendations included: Providing reliable reports on Green Street asset condition to ratepayers and regulators; defining quantifiable standards for defining the functioning condition of assets; updating the Operations and Maintenance Guidelines; and creating oversight procedures to ensure maintenance crews followed the Guidelines. The BES responded affirmatively to each of these recommendations, estimating it would implement every recommendation by summer of 2019.<sup>425</sup>

Loss of parking presents an ongoing issue for neighborhoods. Strategic placement of facilities to minimize parking loss has helped, but not eliminated the issue. The City reports that utility conflicts can be costly and might make a Green Street impractical to build.

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<sup>424</sup> Acock, *supra* note 109.

<sup>425</sup> *Id.*



Case Study: Prince George’s County

**Chesapeake Watershed Jurisdiction: YES**

**Green Streets Policy adopted: 2012**

**Policy Type: Council Bill/Combined Complete & Green Streets**

**Applicability: All new PROW and transportation improvement projects**



Municipal Characteristics
<b>Jurisdiction type:</b> County
<b>Population:</b> 909,308 <sup>426</sup>
<b>Total area:</b> 498.84 mi <sup>2</sup>
<b>Water area:</b> 16.15 mi <sup>2</sup>
<b>Land area:</b> 482.69 mi <sup>2</sup> <sup>427</sup>
<b>PROW:</b> 2,000 mi. roads <sup>428</sup>
<b>Average annual precipitation:</b> 43.24 in. <sup>429</sup>
<b>FY 2019 budget:</b> <sup>430</sup>
\$4,102,520,100 total expenditures
\$3,431,966,100 general fund
\$959,280,000 CIP
\$112,265,000 stormwater capital

Lessons Learned
➤ <b>Make information on Green Streets projects publicly available.</b> Prince George’s County makes available a GIS map where members of the public can locate active Green Streets projects and obtain basic details on project scope, cost, and status. However, there are little specific details on green infrastructure elements and costs.
➤ <b>Establish measurable performance goals</b> tracking progress in implementing the policy and in meeting water quality objectives.
➤ <b>Develop a clear, transparent process for determining when to exempt PROW projects from the policy.</b> The County’s policy leaves DPW&T substantial discretion in determining when to exempt projects, and does not provide for oversight.

**STORMWATER MANAGEMENT:**

Prince George’s County is a Phase I MS4. Maryland’s Department of the Environment (MDE) in 2018 approved a modification to the County’s Permit, authorizing nutrient trading. Parties anticipate MDE issuing a new Permit in 2019.

<sup>426</sup> U.S. Census Bureau, AMERICAN FACTFINDER (last visited June 12, 2019) (search “Prince George’s County, Maryland”); U.S. Census Bureau, *Population, Housing Units, Area, and Density: 2010—United States, Places by State*, AMERICAN FACTFINDER (downloaded June 7, 2019) (search “Prince George’s County”).

<sup>427</sup> U.S. Census Bureau, AMERICAN FACTFINDER, Population, Housing Units, Area, and Density: 2010 - County -- County Subdivision and Place more information

2010 Census Summary File 1, <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF> (last visited June 16, 2019).

<sup>428</sup> *About DPW&T*, PRINCE GEORGE’S COUNTY, MD., <https://www.princegeorgescountymd.gov/2287/About-Us> (last visited June 12, 2019).

<sup>429</sup> Data Tools: 1981-2010 Normals, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/cdo-web/datatools/normals> (select annual precipitation for “Maryland” and “Upper Marlboro 3 NNW, MD US”) (last visited June 12, 2019).

<sup>430</sup> PRINCE GEORGE’S CNTY., MD., BUDGET IN BRIEF: FISCAL YEAR 2019 APPROVED BUDGET 2, 19 [hereinafter BUDGET IN BRIEF].

Prince George's County is subject to 13 EPA-approved TMDLs, including nutrients (phosphorus and nitrogen) and total suspended solids (TSS) in the Chesapeake Bay watershed. Phase II reduction goals include 22.56 percent for nitrogen, and 38.58 percent for total phosphorus.<sup>431</sup> MS4 Permit requirements pertinent to Chesapeake Bay TMDLs include commencing and implementing restoration efforts for 20 percent of the County's impervious surface area, and developing a strategy calling for restoration of 20 percent of previously developed impervious land with little or no controls within the five-year permit term, as described by Maryland's WIP.<sup>432</sup> Notably, the TMDL 2012-2013 Milestones included reducing existing untreated impervious surfaces through the County's Green Streets Program Initiative.<sup>433</sup>

The Department of Public Works and Transportation (DPW&T), Office of Engineering & Project Management is responsible for PROW projects, including Green & Complete Streets. The Stormwater Management Division of the Department of the Environment oversees construction and maintenance of the County's stormwater management system. The County has enacted a stormwater ordinance,<sup>434</sup> which, in accordance with State law, requires developers to implement Environmental Site Design (ESD) to the maximum extent practicable (MEP).<sup>435</sup> The County Code also instated a Stormwater Management Retrofit Program incentivizing property owners to install green stormwater retrofits.<sup>436</sup>

### GREEN STREETS POLICY

Prince George's County Council in 2012 approved a bill,<sup>437</sup> amending Prince George's County Code, by adding a new section on Complete and Green Streets under the subtitle addressing "Roads and Sidewalks."<sup>438</sup>

#### Historical context/impetus

The Policy originated with a focus on Complete Streets, with both grassroots and Council support. In April 2012, the Coalition for Smarter Growth, the Envision Prince George's Community Action Team for Transit-Oriented Development, and the Maryland-National Capital Park and Planning Commission sponsored a forum on road safety and multimodal access.<sup>439</sup> Concerns primarily related to the number of pedestrian and cyclist injuries and fatalities. The County Council leveraged the opportunity to address, at the same time, the environmental impact of road construction.<sup>440</sup> The policy is consistent with and expands upon the Washington Metropolitan Council of Government's regional Complete Streets Policy (the regional transportation agency later adopted a model Green Streets Policy, referencing Prince George's County).

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<sup>431</sup> PRINCE GEORGE'S COUNTY, MD., CHESAPEAKE BAY WATERSHED NUTRIENT AND SEDIMENT TMDL, tbl. 2 (2010).

<sup>432</sup> See NPDES MS4 Discharge Permit, Permit No. 11-DP-3314 MD0068284 17 (Md. Dep't of the Env't, Jan. 2, 2014).

<sup>433</sup> PRINCE GEORGE'S CNTY., MD., PHASE II WATERSHED IMPLEMENTATION PLAN: REVISED DRAFT 14 (2012).

<sup>434</sup> PRINCE GEORGE'S CNTY., MD., CODE OF ORDINANCES, subtit. 32, div. 3, §§ 32-170–32-201.07.

<sup>435</sup> *Id.* at § 32-179 (2015).

<sup>436</sup> *Id.* at § 32-201.01 (2014).

<sup>437</sup> PRINCE GEORGE'S CNTY., MD., CNTY. COUNCIL BILL CB-83-2012 (2012).

<sup>438</sup> PRINCE GEORGE'S CNTY., MD., CODE OF ORDINANCES, subtit. 23, div. 7, § 23-615 (2012); PRINCE GEORGE'S CNTY., MD., CODE OF ORDINANCES, subtit. 23, div. 1 § 23-102(8.1) (2012) (adding relevant definitions, including "Green Street").

<sup>439</sup> Christine Green, *Prince George's Moves Toward Complete and Walkable Streets*, GREATER WASHINGTON (Apr. 16, 2012), <https://ggwash.org/view/12868/prince-georges-moves-toward-complete-and-walkable-streets>.

<sup>440</sup> Press Release, Prince George's Cnty. Council, Cnty. Council Adopts Legislation Establishing Complete & Green Streets Policy in Prince George's Cnty. (Nov. 26, 2012) *available at* <https://pgccouncil.us/ArchiveCenter/ViewFile/Item/1609>.

### Funding

**Capital projects** are funded by General Obligation Bonds, with \$5.4 million—for debt service payments—allocated to Green Streets through 2018.<sup>441</sup> The FY 2020 Proposed CIP Budget anticipates \$57.9 million in total expenditures for Green Streets Improvements, with \$5.467 million estimated in FY 2019 and \$10.999 million in FY 2020.<sup>442</sup>

**Maintenance** falls under the Stormwater Management operations budget. Major funding sources for the Department of the Environment, which includes the Stormwater Management Division, are the General Fund, the Stormwater Management Fund, and the Local Watershed Protection & Restoration Fund, with the FY 2019 Budget allocating \$4.318 million, \$56.931 million, and \$44.158 million, respectively, to each. Stormwater funding derives from stormwater property taxes and water quality impact fees.<sup>443</sup> The Local Watershed Protection and Restoration Fund charges a fee based on impervious area, or Equivalent Service Units (ESUs), according to three tiers.<sup>444</sup>

### Applicability

Prince George's County's policy applies to all new and existing PROW projects financed by the County.<sup>445</sup>

**Exceptions** provided for under the policy include when: (1) project cost is disproportionate to the projected need; and (2) facilities are deemed inappropriate "due to the nature of the project, including the context and character of the surrounding built and natural environment of the neighborhood or area."<sup>446</sup>

### Coordination

The policy directs DPW&T to revise the capital program as necessary in order to foster implementation of Complete and Green Streets.

### Maintenance

The policy does not directly address maintenance.

### Accountability

The policy does not provide accountability measures.

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<sup>441</sup> E-mail from Caleb Hii, Highway & Bridge Design Div., Office of Eng'g & Project Mgmt.t, Dep't of Public Works & Transp., Prince George's Cnty., Md., to Cynthia R. Harris, Staff Att'y, Envtl. Law Inst. (Apr. 4, 2019, 11:04 EST).

<sup>442</sup> PRINCE GEORGE'S CNTY., MD., FY 2020-2025 PROPOSED CAPITAL IMPROVEMENT PROGRAM: DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION III-5, 113; PRINCE GEORGE'S CNTY., MD., FY 2019-2024 APPROVED CAPITAL IMPROVEMENT PROGRAM: DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION III-5, 122 (estimating \$60.593 million in expenditures for Green Streets Improvements over five years, with \$12.096 million in expenditures for FY 2019).

<sup>443</sup> Prince George's Cnty., Md., 2019 Fiscal Year Approved Budget: Department of the Environment 328 (2018).

<sup>444</sup> *Fee Structure*, PRINCE GEORGE'S CNTY. MD., <https://www.princegeorgescountymd.gov/276/Fee-Structure> (last visited June 12, 2019); PRINCE GEORGE'S CNTY., MD., RESIDENTIAL, SINGLE-FAMILY CALCULATION (basing fee on parcel zoning and current land use).

<sup>445</sup> Prince George's Cnty., Md., Code of Ordinances, subtit. 23, div. 7, § 23-615(b) (2012) ("All planned County financed and approved road, sidewalk, trail and transit related construction and reconstruction projects shall include environmental site design . . .").

<sup>446</sup> *Id.*

### Outcomes

*Reaction and outreach:* No reported efforts.

*Successes:* Several projects are underway in the County. Active Green & Complete Street projects include: Swann Road (\$2.95 million total project cost; under construction), Edmonston Road (\$1.534 million total project cost; under construction), Harry S. Truman Drive (\$9 million total project cost; in planning), Montpelier Drive (\$3 million total project cost; in final design), Ager Road (\$10.487 million total project cost; in contract and award process), and Campus Drive (\$2 million total project cost; in semi-final design).<sup>447</sup> The Department of Public Works & Transportation makes information on active projects publicly available, at a GIS website.<sup>448</sup>

*Challenges:* No reported challenges.

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<sup>447</sup> LIST OF GREEN COMPLETE STREETS PROJECTS, PRINCE GEORGE'S COUNTY, MD. (2019) (on file with author) (pending response to an ELI request for further information on costs of the specific green infrastructure elements of each project).

<sup>448</sup> See *Department of Public Works and Transportation Capital Improvement Program (CIP) Active Projects*, PRINCEGEORGES.MAPS.ARCGIS.COM (indicating Green Streets projects with an icon in the shape of a green sun) <https://princegeorges.maps.arcgis.com/apps/webappviewer/index.html?id=c13928ea8a2946acba51feb034088ce3&extent=-8578036.5975%2C4715854.5108%2C-8559691.7107%2C4725695.7782%2C102100>, (last visited June 12, 2019); See also *Capital Roadway and Bridge Projects*, Prince George's Cnty., Md., <https://www.princegeorgescountymd.gov/1012/Capital-Roadway-Project> (last visited June 12, 2019).

Case Study: Tucson

**Chesapeake Watershed Jurisdiction:** NO  
**Green Streets Policy adopted:** 2013  
**Policy Type:** Council resolution/Guidelines  
**Applicability:** New and reconstruction widening roadways only



Municipal Characteristics
<b>Jurisdiction type:</b> City
<b>Population:</b> 545,975
<b>Total area:</b> 227.03 mi <sup>2</sup>
<b>Water area:</b> 0.33 mi <sup>2</sup>
<b>Land area:</b> 226.71 mi <sup>2</sup> <sup>449</sup>
<b>PROW:</b> 400 lane mi., 1,744 centerline mi.
<b>Average annual precipitation:</b> 12.39 in. <sup>450</sup>
<b>FY 2019 budget:</b> <sup>451</sup>
\$1,502,819,240 total expenditures
\$497,634,490 general fund
\$353,712,700 CIP
N/A stormwater sewer system

Lessons Learned
➤ <b>Develop, measurable performance standards</b> setting clearly-defined goals for Green Streets facilities.
➤ <b>Outline a clear project design, planning, construction, and post-construction process</b> to ensure incorporation of green infrastructure at every step of capital development and subsequent operation & maintenance period.
➤ <b>Design work should be a combined effort</b> of project engineers, hydrologists, and landscape architects. <sup>452</sup>

**STORMWATER MANAGEMENT:**

Tucson, Arizona is a Phase I MS4 operating under a Permit issued by the Arizona Department of Environmental Quality. <sup>453</sup> The Stormwater Section of Tucson’s Department of Transportation (DOT) manages the City’s storm drainage system.

<sup>449</sup> U.S. Census Bureau, AMERICAN FACTFINDER (last visited June 12, 2019) (search “Tucson City”); U.S. Census Bureau, *Population, Housing Units, Area, and Density: 2010—United States, Places by State*, AMERICAN FACTFINDER (downloaded June 7, 2019) (search “Tucson city”).

<sup>450</sup> Data Tools: 1981-2010 Normals, NAT’L OCEANIC & ATMOSPHERIC ADMIN., <https://www.ncdc.noaa.gov/cdo-web/datatools/normals> (select “Arizona” and averaged annual precipitation totals of “Tucson 11 W, AZ US,” “Tucson International Airport, AZ US,” “Tucson U of A Number 1, AZ US,” “Tucson 17 NW, AZ US,” and “Tucson CP Ave Experimental FM, AZ US”) (last visited June 12, 2019).

<sup>451</sup> CITY OF TUCSON, ARIZ., ADOPTED BUDGET FISCAL YEAR 2019 B-17, E-7 (2018).

<sup>452</sup> E-mail from Gary Wittwer, Landscape Architect, Dep’t of Transp., City of Tucson, Ariz., to Cynthia R. Harris, Staff Att’y, Envtl. Law Inst. (Mar. 18, 2019 12:40 EST).

<sup>453</sup> See City of Tucson, Ariz., AZPDES Municipal Stormwater Permit AZS000001-2010: Sixth Annual Report (2017); City of Tucson, Ariz., General Ordinances, pt. II, ch. 26, art. II (2005) (enacting a stormwater Ordinance).

## GREEN STREETS POLICY

Tucson's City Council in 2013 adopted a resolution approving the Department of Transportation's Active Practices Guidelines (APG), which set out a detailed Green Streets policy.<sup>454</sup>

### Historical context/impetus

Tucson's APG originated in a grassroots movement, with the combined goals of promoting beautification, saving water, reducing runoff, and providing water to trees. The City Council and Mayor directed DOT to develop the policy.

### Funding

Tucson's Gas Tax and the Regional Transportation Authority (RTA) are two sources of funding for Green Streets capital costs, while the Gas Tax also funds maintenance activities.

### Applicability

The APG applies only to completely new roads or projects that widen the roadway.<sup>455</sup>

**Exceptions** to the policy include roadway maintenance projects such as pavement preservation, resurfacing, or landscape and irrigation maintenance. In practice, DOT exempts projects marked by a lack of sufficient right-of-way, utility conflicts, poor soils, the presence of flood hazard areas, and adjacent neighbors' concerns about grade.

### Coordination

The APG includes detailed, step-by-step procedural guidelines for incorporating green infrastructure into PROW projects throughout the project planning, design, construction, and post-construction phases.<sup>456</sup>

Permanent project review teams comprise Planning, Engineering, and Landscape staff, and the design/construction project manager. During the planning stage, civil and landscape designers give input to the project manager in selecting locations for potential green infrastructure opportunities. These designers also assist in determining the feasibility of the proposed project and in making modifications to green infrastructure features in order to meet the project budget. The project manager, landscape architect, and project inspector meet to review the green infrastructure elements prior to the pre-bid meeting.<sup>457</sup>

The APG directs City staff and consultants to collaborate with utility companies on the compatibility of utilities with proposed green infrastructure sites and facilities. This includes determining utility locations during early design stages, developing a utility plan that includes a map of preferred utility locations in order to minimize conflicts with green infrastructure facilities, and considering the compatibility of existing utilities with potential green infrastructure facility sites. At the 100 percent submittal/design stage, the project team notifies utility companies about the upcoming construction; utility companies at this point are responsible for addressing utility conflicts via utilizing the planned utility corridor.<sup>458</sup>

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<sup>454</sup> See APG, *supra* note 57.

<sup>455</sup> Wittwer, *supra* note 452; *Id.* at § C (limiting scope to new construction and reconstruction, with widening and realignment given as specific examples, and to drainage projects that include a landscaping element).

<sup>456</sup> See *id.* at § G.

<sup>457</sup> *Id.*

<sup>458</sup> *Id.*

### Maintenance

The APG requires, during the early stages of project planning, development of an irrigation plan and, during later stages, an estimated water and maintenance budget. The Landscape Architect reviews the project plan's green infrastructure elements with DOT's Streets Maintenance Section during the planning phase, and monitors maintenance during the two-year Landscape Establishment period.<sup>459</sup>

### Accountability

The APG establishes several performance goals for City roadways "wherever possible." These include, but are not limited to: (1) PROW landscaped areas are designed to retain at least the first half-inch of rainfall falling in the PROW and, where this goal cannot be met, green infrastructure features are incorporated into as much of the landscaped area as possible; (2) all green infrastructure basins drain within 24 hours of a rainfall event; (3) meeting green infrastructure basin design criteria; and (4) meeting land planting criteria.<sup>460</sup> Project review teams agree on a set of performance goals appropriate to each project. The Director of Transportation must justify, in writing, any goals less stringent than those laid out by the APG.<sup>461</sup>

The Project Manager prepares, for the Engineering Administrator, a report describing each project's green infrastructure, the cost, and ability to achieve compliance. The APG's multi-step, detailed process for Green Infrastructure Planning ensures, at each step, that green infrastructure methods are incorporated, the APG intent is met, and that reviewers provide input into possible alternatives meeting the original standards whenever modifications are proposed.<sup>462</sup>

Tucson is beginning to keep records, but these are limited to curb cuts for water harvesting in the PROW, which require a permit. Staff is recording and quantifying those locations. DOT is not yet collecting data on cost savings, though City staff noted an increase in construction costs.<sup>463</sup>

### Outcomes

*Reaction and outreach:* DOT has witnessed a greater public appreciation for stormwater management in general, evidenced by increasing requests for permits to conduct water harvesting, and media stories promoting the practice.<sup>464</sup>

*Successes:* DOT completed two major projects thus far, including the Grant Road Improvement Project.<sup>465</sup> Although Tucson has only recently started collecting records, and lacks significant data, a recent study and report prepared by the Watershed Management Group for the City's Ward 1,<sup>466</sup> identified a Green Streets benefit/cost ratio of 2.1. The study also found a 10 percent peak discharge rate resulting from green infrastructure implementation.<sup>467</sup> The report

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<sup>459</sup> *Id.*

<sup>460</sup> *Id.* at § D.

<sup>461</sup> *Id.* at § E.

<sup>462</sup> *Id.*

<sup>463</sup> E Wittwer, *supra* note 452; E-mail from Gary Wittwer, Landscape Architect, Dep't of Transp., City of Tucson, Ariz., to Cynthia R. Harris, Staff Att'y, Envtl. Law Inst. (Mar. 19, 2019, 10:21 EST).

<sup>464</sup> Wittwer, *supra* note 452; E-mail from Gary Wittwer, Landscape Architect, Dep't of Transp., City of Tucson, Ariz., to Cynthia R. Harris, Staff Att'y, Envtl. Law Inst. (Mar. 19, 2019, 10:21 EST).

<sup>465</sup> See Natalie Tarangioli, *City of Tucson Collecting Rainwater at Construction Projects*, KGUN 9 (Aug. 18, 2018, 4:09 PM), <https://www.kgun9.com/news/local-news/city-of-tucson-collecting-rainwater-at-construction-projects> (also referencing a project on First Avenue).

<sup>466</sup> WATERSHED MANAGEMENT GROUP & PIMA COUNTY REGIONAL FLOOD CONTROL DISTRICT, *supra* note 87 at 2 (discussing Financing and Financial Benefits of Green Streets).

<sup>467</sup> *Id.* at 16.

recommended, in the short term, Tucson maintain the APG and develop Green Streets best practice guidelines and a maintenance plan to ensure achievement of performance goals.<sup>468</sup> In the medium term, the report advised developing a dedicated green infrastructure fund to provide a sustained funding mechanism for implementing and maintaining Green Streets.<sup>469</sup>

*Challenges:* Engineering Staff expressed concerns that water harvesting in the PROW would undermine the roadway base and curb. DOT and a Soils Engineers and Hydrologist developed details to reassure the Civil Engineers no damage would occur. The City is currently engaged in efforts to adjust depths of water harvested.<sup>470</sup>

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<sup>468</sup> *Id.* at 42.

<sup>469</sup> *Id.* at 43–44.

<sup>470</sup> Wittwer, *supra* at note 452.



## Policy Resolution: National Capital Region Transportation Planning Board

### Green Streets Policy for the National Capital Region

The Metropolitan Washington Council of Governments (COG) is an independent, nonprofit association with a membership of 24 local governments in the metropolitan Washington D.C. region, which includes 14 in Maryland, nine in Virginia, and the District of Columbia.<sup>471</sup> In February 2014, COG's Transportation Planning Board (TPB) passed a resolution approving the *Green Streets Policy for the National Capital Region*.<sup>472</sup> The policy is a non-binding advisory document endorsing the concept of Green Streets,<sup>473</sup> and strongly encourages member jurisdictions and agencies to adopt a Green Streets policy.<sup>474</sup> The TPB recommends that member jurisdictions follow best practices in adopting such a policy, and provides guidance. Key recommendations include application to all transportation facilities and to both new and retrofit projects; explicit categorization of exceptions and a clear approval process; establishment of performance standards with measurable outcomes; and specific steps for implementation. The policy does not address funding mechanisms.

### Background

TPB developed the Green Streets policy in response to a December 2012 request from the Anacostia Watershed Restoration Partnership to draft a policy for the region.<sup>475</sup> COG staff modeled the policy language on several examples across the nation, including Prince George's County, Maryland, Cleveland, Ohio, and Portland, Oregon.<sup>476</sup> TPB hosted public workshops for interested stakeholders both prior to the passage of the resolution adopting the policy and afterward.

### Implementation of Policy

The policy requires TPB conduct a survey of COG member governments every two years, assessing adoption and implementation of Green Streets policies. As of the 2016 survey,<sup>477</sup> only three jurisdictions had implemented a Green Streets policy:<sup>478</sup> the District of Columbia, Prince George's County, Maryland, and Manassas, Virginia.<sup>479</sup> Of these

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<sup>471</sup> *Local Governments*, METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS, <https://www.mwcog.org/about-us/cog-and-our-region/local-governments/> (last visited June 13, 2019) (including member governments in Maryland (Town of Bladensburg, City of Bowie, City of College Park, Charles County, City of Frederick, Frederick County, City of Gaithersburg, City of Greenbelt, City of Hyattsville, City of Laurel, Montgomery County, Prince George's County, City of Rockville, and City of Takoma Park); in Virginia (City of Alexandria, Arlington County, City of Fairfax, Fairfax County, City of Falls Church, Loudoun County, City of Manassas, City of Manassas Park, and Prince William County); and the District of Columbia).

<sup>472</sup> NAT'L CAPITAL REGION TRANSP. PLANNING BD., RES. TPB R10-2014 (2014).

<sup>473</sup> *Id.* (defining "Green Streets" as "an alternative to conventional street drainage systems designed to more closely mimic the natural hydrology of a particular site by infiltrating all or a portion of local rainfall events. A green street uses trees, landscaping, and related environmental site design features to capture and filter stormwater runoff within the right-of-way, while cooling and enhancing the appearance of the street.").

<sup>474</sup> *Id.* at 1 (defining a "green streets policy" as "[a] directive at the local, state, regional, or federal level that requires the use of green streets techniques to manage stormwater runoff from transportation facilities in a manner appropriate to the function and context of the relevant facility.").

<sup>475</sup> Telephone interview with Michael Farrell, Senior Transportation Planner, Metro Washington Council of Governments Transportation Planning Board (April 15, 2019).

<sup>476</sup> *Id.*

<sup>477</sup> METRO WASHINGTON COUNCIL OF GOVERNMENTS, LOCAL GOVERNMENT SURVEY ANALYSIS\_TRANSPORTATION (on file with author).

<sup>478</sup> ELI does not regard these jurisdictions as having a policy that meets this report's definition of a Green Streets Policy.

<sup>479</sup> City of Manassas MS-4 Stormwater Home Page, Manassascity.org, <http://www.manassascity.org/812/Stormwater> (last visited June 13, 2019) (noting Manassas, Virginia does not have a Green Streets Policy, but the Manassas Public Works Department does administer a Stormwater Program, through which staff disseminate information about stormwater mitigation and plan, design, and construct stormwater projects that will reduce runoff volumes and mitigate pollution to local waterways).

localities, Prince George's County, Maryland most fulfills the ideal elements recommended by the policy, including covering all transportation facilities and applying to both new and retrofit projects.<sup>480</sup> Five jurisdictions indicated being in the process of developing a Green Streets policy.<sup>481</sup>

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<sup>480</sup> PRINCE GEORGE'S CNTY., MD., CODE OF ORDINANCES subtit. 23, §§ 23-102, 23-615.

<sup>481</sup> METRO WASHINGTON COUNCIL OF GOVERNMENTS, *supra* note 477 (including Rockville, Greenbelt, and Bladensburg in Maryland, and Alexandria and Fairfax County in Virginia).

## Under Development: City of Los Angeles

While the City of Los Angeles has not adopted a formal Green Streets policy, it is currently in the process of developing such a policy, building on more than a decade of concerted work to better manage stormwater.

In May of 2007, the Los Angeles Board of Public Works (now the Department of Public Works) adopted a Green Streets Initiative with the purpose to “promote, advance, and evaluate the implementation and design of streets and parking lots to maximize the capture and infiltration of urban runoff and to create community beautification benefits.” The practical objectives of the Initiative included “preparation of design guidelines, standard plan development and adoption, development of policies, identifying priority projects, and applying for funds from various funding sources.” Though the Board of Public Works was actively pursuing funding for the implementation of green infrastructure elements and of BMPs into the design of Capital Improvement Projects, there was at that time no official policy adopted regarding Green Streets.<sup>482</sup>

In 2011, the Department of Public Works recommended, to its Bureaus of Engineering (BOE), Sanitation (BOS), and Street Services (BSS), the adoption of a departmental Green Streets Policy that would encourage the BOE, BOS, and BSS to pursue funding for Green Street BMPs and Green Street Elements for Public Works CIPs whenever appropriate, and to incorporate Green Street BMPs and Elements into CIPs wherever funding was available. The proposed policy also directed the BOE, in coordination with other relevant offices, to continue to develop and adopt Green Street Standard Plans and guidelines for use in both City street designs and in private development. In July 2011, Los Angeles Public Works adopted the policy.<sup>483</sup>

Not until 2014 did Los Angeles’ policy makers begin concertedly pursuing a more systematic approach to stormwater management. On June 6, 2014, Los Angeles City Councilmembers Felipe Fuentes and Mike Bonin made a motion that the City Council instruct the BOS, in conjunction with the BOE, Department of Water and Power, City Administrative Officer, and Chief Legislative Analyst, to work with the City Attorney to develop “a draft ordinance that requires all public street construction and reconstruction projects, irrespective of funding source, to incorporate *Stormwater Management Guidelines for Public Street Construction and Reconstruction*... consisting of the following components:

- Drainage capacity/flood mitigation;
- Stormwater infiltration feasibility;
- Water quality improvement and regulatory standards.”<sup>484</sup>

The Councilmembers also directed the BSS and BOS to report to the Council in 45 days regarding progress on the development of a draft ordinance as characterized by the motion.

In January 2015, the BOE, BOS, and BSS reported to the Council that a working group had been established. They also recommended that the Energy and Environment and Public Works and Gang Reduction Committees consider developing a draft ordinance incorporating stormwater management checklist requirements for PROW projects as follows:

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<sup>482</sup> Memorandum from Los Angeles Dept. of Public Works, to Board Public Works of the City (July 11, 2011).

<sup>483</sup> See memorandum from Enrique C. Zaldivar, Dir., Bureau of Sanitation, City of Los Angeles, Cal., et al., to Honorable Felipe Fuentes, Chair of the Energy & Env’t Committee, City of L.A., et al. (Jan. 14, 2015).

<sup>484</sup> L.A. City Council, Motion for the Bureau of Street Services and Bureau of Sanitation to report to the Council in 45 days on the status of the working group and draft ordinance development (2014)(File No. 14-748) (as moved by Fuentes).

“a. Checklist requirements consisting of the following:

- Water quality improvement and regulatory standards;
- Stormwater infiltration/filtration feasibility; and
- Drainage capacity/flood mitigation.

b. Checklist requirements to be applied to the following public ROW activities:

- Department of Public Works Projects by private contractors and Capital Projects by City departments such as streets, sewers, storm drains, bridges, street lights, traffic signals, bike lanes and landscaping;
- B-Permit Projects (City/Non-City) - large projects in the public ROW often as part of development projects or projects by City Departments other than the Department of Public Works; and
- Assessment Projects (new sewers, streets, street lights, etc. paid by property owners).

c. Checklist requirements to be applied to the following public ROW projects contingent on requirement feasibility/applicability to projects (i.e. - an impervious surface, no drainage capacity):

- U-Permits — excavations in the streets by utilities;
- E-Permits — excavations in the street by other entities;
- A-Permits — curbs/sidewalks/driveways;
- S-Permits — sewer connections; and
- R-Permits — revocable permits for conditional encroachment<sup>485</sup>

The BOE, BOS, and BSS also recommended the development of a stormwater management handbook for PROW projects as well as to begin identifying potential funding strategies.

In February 2015, the Committees submitted a report recommending approval of the recommendations contained in the January 2015 joint BOS/BOE/BSS report. The recommendations were then submitted to the Council for consideration.<sup>486</sup> In March 2015, the Council adopted the Committees' report approving the joint BOS/BOE/BSS recommendations.<sup>487</sup>

Beginning in late 2015, the BOS solicited the assistance of Geosyntec Consultants to support the Bureau in developing a *Stormwater Management for Public Right-of-Way Projects Handbook*<sup>488</sup> and a Stormwater Low Impact Development (LID) Ordinance, as well as to develop more practical processes around implementation of Green Streets.<sup>489</sup> To date, the City of Los Angeles has not adopted an ordinance systematically integrating stormwater management elements into the PROW when triggered by construction or reconstruction, nor has it adopted an accompanying Handbook.

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<sup>485</sup> Memorandum from Los Angeles Dept. of Public Works, to Board Public Works of the City (July 11, 2011).

<sup>486</sup> ENERGY & ENV'T COMM. & PUBLIC WORKS & GANG REDUCTION COMM., CITY OF L.A., CAL., REPORT RELATIVE TO STORMWATER MANAGEMENT GUIDELINES FOR PUBLIC STREET CONSTRUCTION AND RECONSTRUCTION, File No. 14-0748 (Feb. 18, 2015).

<sup>487</sup> CITY OF L.A., CAL., OFFICIAL ACTION OF THE L.A. CITY COUNCIL (Mar. 4, 2015).

<sup>488</sup> E-mail from Ali Poosti, Division Manager, Wastewater Engineering Services Division, LA Sanitation, to Ken Susilo, Senior Principal Water Res. Eng'r, Geosyntec Consultants (Nov. 8, 2016) (on file with ELI).

<sup>489</sup> *Id.*

## Impervious Surface and Watershed Impacts: Why Green Streets Matter

Impervious cover in the conterminous United States is estimated at 2.4 percent, or 18.4 million hectares of impervious cover (45.5 million acres).<sup>490</sup> States with more densely populated areas, typically in the Northeast, tend to have a higher percentage of impervious surface. Two jurisdictions in the Chesapeake Bay watershed exceed 6 percent impervious surface cover: Delaware at 6.2 percent and Maryland at 6.1 percent.<sup>491</sup>

The percentage of impervious cover is significantly higher in urban areas. David J. Nowak and Eric J. Greenfield's 2012 study of tree and impervious cover in the United States estimated average urban impervious cover at 25 percent, and noted this can be higher in densely populated areas.<sup>492</sup> In a separate study, Nowak and Greenfield analyzed impervious cover change in 20 U.S. cities. The analysis demonstrated a general loss in tree cover and an increase in impervious cover in the mid to late 2000s.<sup>493</sup>

The United States features a high proportion of urban land use allocated to roads and surface car parks, as paved surfaces, compared to cities in other nations.<sup>494</sup> Indeed, the Federal Highway Administration (FHWA) estimates that more than 20 percent of U.S. roads are in urban areas.<sup>495</sup>

The EPA in 2008 estimated that urban roads—along with sidewalks and parking lots—constituted almost two-thirds of the total impervious cover and contributed a similar ratio of runoff.<sup>496</sup> As the amount of urban land is converted to impervious surface, air temperature, energy use, water quality, and human health and well-being are all negatively impacted.<sup>497</sup> However, certain practices—specifically, green infrastructure—can mitigate and minimize these environmental impacts while meeting the transportation needs of the urban public.<sup>498</sup>

Impervious surface area in Chesapeake Watershed jurisdictions <sup>499</sup>		
	Statewide	Urban
Delaware	6.2 %	19 %
District of Columbia	26 % <sup>500</sup>	
Maryland	6.1 %	21.6 %
New York	4.5 %	27.4 %
Pennsylvania	4.6 %	24.6 %
Virginia	4.3 %	21.9 %
West Virginia	2.0 %	20.0 %

<sup>490</sup> Nowak & Greenfield, *supra* note 7 at 25.

<sup>491</sup> *Id.* at 26.

<sup>492</sup> *Id.* at 28.

<sup>493</sup> Nowak & Greenfield, *supra* note 7 at 23, 27 (finding the amount of road and other impervious cover ranged from 36.2 percent in Miami to 12.3 percent in Nashville; total impervious cover varied from 61.1 percent in New York City to 17.7 percent in Nashville).

<sup>494</sup> Black, *supra* note 8 at 1, 3 (representing 23% PROW of Chicago's land area and 25% of San Francisco's land area).

<sup>495</sup> EPA, MANAGING WET WEATHER WITH GREEN INFRASTRUCTURE MUNICIPAL HANDBOOK: GREEN STREETS, 1 (2008)

<sup>496</sup> *Id.*

<sup>497</sup> Nowak & Greenfield, *supra* note 7 at 29.

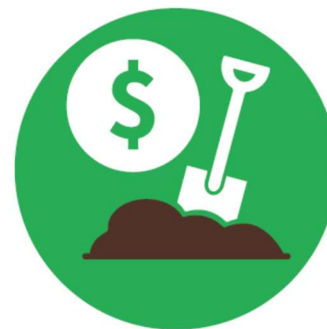
<sup>498</sup> *Id.*

<sup>499</sup> Nowak & Greenfield, *supra* note 7 at 26.

<sup>500</sup> John Metcalfe, *D.C. is Packing on Huge Amounts of Impervious Surfaces*, CITYLAB (Mar. 30, 2016), <https://www.citylab.com/environment/2016/03/washington-dc-development-stormwater-runoff-impervious-surfaces/475950/> (summarizing results from NASA maps of impervious surfaces from 1984 and 2016, and citing University of Maryland scientist Xiao-Peng Song in noting the percentage of impervious cover increased from 22 percent in 1984 to 26 percent in 2010. The author noted the pace of development is 9-11 square kilometers per year);

## Financing and Financial Benefits of Green Streets

Implementing Green Streets requires identifying one or more sustainable funding sources that can pay both capital and maintenance costs. At the same time, integrating green infrastructure into planned capital projects yields cost savings, and green infrastructure practices create quantifiable community benefits. This section first looks at the costs, benefits, and cost-savings associated with green streets, and then discusses options for funding green streets projects.



### Costs, Benefits and Cost-Savings

Green Streets provide localities with substantial benefits, many with quantifiable economic value. A 2015 study of green infrastructure practices in Tucson utilized cost benefit analysis to understand the potential for green infrastructure to cost effectively address flooding and water quality challenges.<sup>501</sup> The authors determined the benefit/cost ratio for Green Streets was \$2.10, with a 10-year payback period for capital expenditures.<sup>502</sup> In comparison, each dollar invested in *gray* infrastructure created only \$0.01 of flood risk reduction value.<sup>503</sup> Overall, each dollar invested in green infrastructure created 2 to 4 dollars of community benefits in return.<sup>504</sup>

The study identified both direct and indirect economic values associated with green infrastructure practices.<sup>505</sup> *Direct* economic values, which have a market value, include: water conservation, air quality improvement, energy savings, reduced street maintenance from shaded pavement, stormwater runoff reduction, property value increases, and avoided gray infrastructure. *Indirect* values include: the social value of water conservation, reductions in greenhouse gas emissions, flood risk, and energy, stormwater pollution prevention, lowering the urban heat island effect, traffic calming, and habitat creation.

Programmatically incorporating green infrastructure—that is, integrating green infrastructure with other planned infrastructure improvements, such as road reconstruction —results in cost savings.<sup>506</sup> A 2015 report analyzed the real cost of green stormwater infrastructure from hundreds of built projects across the country, using different cost efficiency metrics,<sup>507</sup> and determined integrating green infrastructure into other public improvements has the potential to reduce costs by 30 to 60 percent.<sup>508</sup> The authors also reviewed available data on typical green infrastructure maintenance costs, finding a relatively high level of cost variability.<sup>509</sup> They noted that vegetated systems tend to have higher annual maintenance costs per square foot than non-vegetated areas and subsurface systems. However, many maintenance activities for green infrastructure build off operations that already are being performed in most municipalities.

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<sup>501</sup> See WATERSHED MANAGEMENT GROUP & PIMA COUNTY REGIONAL FLOOD CONTROL DISTRICT, *supra* note 87 at 2.

<sup>502</sup> *Id.* at 31 (basing the ratio on a 25% GSI area (sq. ft.)).

<sup>503</sup> *Id.*

<sup>504</sup> *Id.* at 2.

<sup>505</sup> *Id.* at 27.

<sup>506</sup> Andrew Potts et al., *The Real Cost of Green Stormwater Infrastructure*, WATER ENVTL. FED’N 4366, 4366 (2015).

<sup>507</sup> *Id.*

<sup>508</sup> *Id.*

<sup>509</sup> *Id.* at 4373.

## Financing Green Streets

Several revenue options are available for funding Green Streets, with stormwater utility fees considered the most reliable as a general matter. Some funding sources may be more applicable to capital projects, while others are intended for sustaining program development, including operations and maintenance.<sup>510</sup> Green infrastructure transitions a high capital cost, low maintenance gray drainage system into a low capital cost, higher maintenance green system.<sup>511</sup> A dedicated funding source is essential for long-term targeted implementation and maintenance of new green infrastructure systems.<sup>512</sup>

A locality's **General Fund** revenues derive from property, income, and sales taxes. A general fund tends to provide a consistent source of revenue from one year to the next. However, funding is subject to competing demands and has limited growth potential. Furthermore, the system is not equitable in that taxes do not fully reflect each individual property's contribution to stormwater runoff.<sup>513</sup>

**Stormwater utility, or user fees** charge users—generally property owners—a fee for “using,” or impacting, the storm drain network.<sup>514</sup> Utility fees are generally considered a sustainable, stable revenue source, dedicated to funding stormwater management.<sup>515</sup>

First and foremost, localities must have the legal authority to create stormwater utility systems. This may require the State to enact enabling legislation. Other cities may already have the authority to enact fees as a Home Rule jurisdiction, a concept discussed in the section on Regulatory Framework. Black & Veatch's *2018 Stormwater Utility Survey* found 96 percent of the 75 participants surveyed were located in states with such enabling legislation.<sup>516</sup>

There are three main types of stormwater utility rate structures. The uniform flat rate/flat per-parcel fee is the most administratively simple. Tiered rates apply different fee amounts to different categories of properties, based on considerations such as property size.<sup>517</sup>

Other jurisdictions individually calculate each property owner's contribution to stormwater runoff based on the property's amount of impervious surface area. This directly correlates runoff volume to each property's amount of impervious cover.<sup>518</sup> Ideally, localities would determine the amount of stormwater runoff from each property and assess a fee based on the amount of stormwater flowing off the property.<sup>519</sup> However, it is impractical to measure stormwater runoff so precisely; calculating the impervious surface on every property would be extremely time-consuming and burdensome,<sup>520</sup> although some jurisdictions take advantage of satellite technology to measure impervious surface area. Instead, most localities using this system estimate a property's level of imperviousness by

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<sup>510</sup> EPA, *GETTING TO GREEN: PAYING FOR GREEN INFRASTRUCTURE 1* (2014) [hereinafter *GETTING TO GREEN*].

<sup>511</sup> ENVIRONMENTAL CONSULTING & TECHNOLOGY, INC., ET AL., *PUBLIC PRIVATE PARTNERSHIPS AND FINANCE OF LARGE-SCALE GREEN INFRASTRUCTURE IN THE GREAT LAKES BASIN 11* (2017).

<sup>512</sup> WATERSHED MANAGEMENT GROUP & PIMA COUNTY REGIONAL FLOOD CONTROL DISTRICT, *supra* note 87 at 2.

<sup>513</sup> *GETTING TO GREEN*, *supra* note 510 at 3.

<sup>514</sup> Avi Brisman, *Considerations in Establishing a Stormwater Utility*, 26 S. ILL. U. L. J. 505, 507 (2002).

<sup>515</sup> *GETTING TO GREEN*, *supra* note 510 at 2.

<sup>516</sup> BLACK & VEATCH MANAGEMENT CONSULTING, LLC, *2018 STORMWATER UTILITY SURVEY 10*, 27-28 (2018) [hereinafter *BLACK & VEATCH*] (finding 59 percent of respondents stated their state legislatures authorized independent public utilities such as authorities, boards, and commissions, to charge a stormwater user fee; the 75 participants originated from 21 states).

<sup>517</sup> See PENNFUTURE, *FUNDING STORMWATER MANAGEMENT IN PENNSYLVANIA MUNICIPALITIES: CREATING AUTHORITIES AND IMPLEMENTING ORDINANCES* 9.

<sup>518</sup> Brisman, *supra* note 514 at 509.

<sup>519</sup> PENNFUTURE, *supra* note 517.

<sup>520</sup> *Id.*

calculating the average impervious area on a parcel as an equivalent residential unit (ERU). Some communities define ERUs as the average of all residential parcels.<sup>521</sup>

A common method is sampling. Localities take a random sample of developed, residential properties and calculate the area of the impervious surface on each lot in the sample. The average area of impervious surface across the sample lots is the ERU for the municipality, which is measured in square feet per parcel. The locality determines the amount charged for each ERU by evaluating the total financial needs of the municipality for stormwater management and dividing that number by the estimated total number of ERUs in the community. The result is a fee rate in dollars per ERU. For each property, the stormwater management fee is assessed by multiplying the number of ERUs by the calculated fee rate.<sup>522</sup> Some property classes may be exempt from stormwater user fees; for example, public streets. Yet adjacent property owners contribute to runoff on the right-of-way.<sup>523</sup>

Adopting a stormwater utility fee is not without risk or controversy. A commonly contested legal issue is whether the exaction is actually a fee or whether it functions as a tax. Whereas taxes are intended to raise general revenue, fees should meet the following test: (1) the fee is a charge for a particular service; (2) the fee is based on the user's contribution to the problem; and (3) users charged should receive some benefit from the service for which they are paying, although the benefits may be indirect or immeasurable. In other words, there must be a clear nexus between the fee and the service. The distinction between fee and tax is significant, because while most municipalities have the legal authority to assess fees for public services, few have the ability to assess taxes—at least not without a public vote. Notably, the federal government, schools, and religious and charitable institutions often are exempt from paying taxes, but are not exempt from paying fees. In most such cases, the utility charge has been upheld as a valid fee.<sup>524</sup>

Fostering community support presents another issue. For example, opponents of the Maryland legislature requiring the State's ten most populous jurisdictions to charge a stormwater fee decried the measure as a "rain tax."<sup>525</sup> This characterization is misleading; fees based on impervious area seek to charge users for their property's contribution to stormwater runoff.

Arguments in favor of implementing stormwater utility fees to pay for stormwater management—and Green Streets in particular—include: revenue stability, a dedicated funding stream, and a stronger nexus between stormwater management costs and user fees. Utility revenue may fund both capital and maintenance, and may be leveraged to pay off revenue bonds used to finance capital costs.<sup>526</sup>

Arguments in favor of basing utility fees on impervious area, in particular, include equitability: the level of imperviousness more reasonably correlates to the demand a property places on the stormwater system. This also simplifies establishing the requisite nexus to defend the charge is a legitimate fee and not a tax. This type of fee also can incorporate credits, whereby individuals pay a reduced rate for helping to diminish the amount of runoff from their properties.<sup>527</sup>

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<sup>521</sup> WARREN CAMPBELL, WESTERN KENTUCKY UNIVERSITY STORMWATER UTILITY SURVEY 2018 2 (2018).

<sup>522</sup> PennFuture, *supra* note 517 at 9–10.

<sup>523</sup> BLACK & VEATCH, *supra* note 516 at 30, 38 (reporting 64 percent of respondents stated that Public Streets/Roads/Median/Public Right-of-Way were exempt).

<sup>524</sup> Brisman, *supra* note 514 at 520–22.

<sup>525</sup> Travis H. Brown, *When It Rains, It Pours Tax Dollars in Maryland*, FORBES (Jan. 3, 2014 8:00 AM), <https://www.forbes.com/sites/travisbrown/2014/01/03/when-it-rains-it-pours-tax-dollars-in-maryland/#7ea2f2e77c69>; see *infra* Regulatory Framework (discussing this legislation and the later law making establishment of a user fee optional).

<sup>526</sup> PENNFUTURE, *supra* note 517 at 7.

<sup>527</sup> Brisman, *supra* note 514 at 515.



The current trend favors utility fees based on impervious surface area. A decade ago, the U.S. EPA found that user fees, based on ERUs, or the average impervious surface on a parcel, was used by more than 80 percent of all stormwater utilities (USEPA 2009b).<sup>528</sup> Black & Veatch's 2018 study stated 92 percent of respondents reported using impervious area as the basis for fees.<sup>529</sup> The Western Kentucky University 2018 Stormwater Utility Survey also confirmed the ERU as the most widely used method of funding.<sup>530</sup>

According to the Western Kentucky University 2018 Stormwater Utility Survey, nationwide the average monthly single-family residential fee was \$5.34, and the median fee was \$4.00. Notably, as of July 2013, fewer than 30 of the 18,000 localities in the bay watershed had or were expected soon to have stormwater utility fees.<sup>531</sup> However, a number of localities have since established such a charge.

Congress established the **Clean Water State Revolving Fund (SRF)**, in the 1987 amendments to the CWA, as a financial assistance program for a wide range of water infrastructure projects, under 33 U.S.C. § 1383.<sup>532</sup> States distribute funding as subsidized loans at very low interest rates. Loans are a one-time source of revenue and generally are used for planning and capital projects; not maintenance. According to the US EPA Finance Advisory Board: each dollar of recycled SRF program equity can generate \$3-14 of SRF guarantee capacity for GI projects.<sup>533</sup> **The Green Project Reserve** is a requirement Congress placed on states to set aside green investments in order to receive stimulus funds. Specifically, the American Recovery and Reinvestment Act of 2009 (ARRA) required all CWSRF programs to set aside 20 percent for investments in green infrastructure, water and efficiency, or other environmentally innovative activities.<sup>534</sup> The Fiscal Year 2012 Appropriation Act (P.L. 112-74) modified this to 10 percent.<sup>535</sup> The EPA issued guidance for determining project eligibility, under each of those four categories, including green infrastructure.<sup>536</sup> Categorical projects explicitly include implementation of green streets, defined as "combinations of green infrastructure practices in transportation rights-of-ways," including for redevelopment and retrofits.<sup>537</sup> Each state administers the program, and may rate applications to fund projects under additional criteria.

Localities may also issue **bonds**, borrowing money at low or no interest to fund stormwater capital projects. Bonds can provide a steady funding stream.<sup>538</sup> Municipal bonds can be *revenue bonds*, secured by a utility's future rate revenues and traditionally issued by utilities to finance large capital expenditures. *General obligation bonds* are backed by a government's full faith and credit and its future tax revenue, and are often repaid by the general fund.

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<sup>528</sup> GETTING TO GREEN, *supra* note 510 at 6.

<sup>529</sup> BLACK & VEATCH, *supra* note 516 at 32.

<sup>530</sup> CAMPBELL, *supra* note 521 at 1 (comprising data on 1681 stormwater utilities located in 40 states and the District of Columbia).

<sup>531</sup> Jeff Day, *Urban, Suburban Stormwater Control Necessary, but Funding Poses Major Problem*, ENV'T & ENERGY REPORT (July 10, 2013).

<sup>532</sup> See 33 U.S.C. § 1383(c)(5) (2018) (projects eligible for financial assistance include "measures to manage, reduce, treat, or recapture stormwater or subsurface drainage water").

<sup>533</sup> EPA ENVIRONMENTAL FINANCIAL ADVISORY BOARD, UTILIZING SRF FUNDING FOR GREEN INFRASTRUCTURE PROJECTS 4 (2014).

<sup>534</sup> American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 169 ("That, to the extent there are sufficient eligible project applications, not less than 20 percent of the funds appropriated herein for the Revolving Funds shall be for projects to address green infrastructure, water or energy efficiency improvements or other environmentally innovative activities.").

<sup>535</sup> Consolidated Appropriations Act of 2012, Pub. L. No. 112-74, 125 Stat. 786; Ariel Wittenberg, *Bill Would Dedicate Revolving Funds to 'Green Projects,'* E&E Daily (May 3, 2019), <https://www.eenews.net/eedaily/2019/05/03/stories/1060260927> (reporting on the proposed Water Infrastructure Sustainability and Efficiency (WISE) Act, H.R. 2458, requiring at least 20 percent of CWSRF funding be invested in green infrastructure and other "environmentally innovative" water projects); H.R. 2458, 116th Cong. (2019).

<sup>536</sup> EPA, 2012 Clean Water State Revolving Fund 10% Green Project Reserve: Guidance for Determining Project Eligibility 5-7 (2012).

<sup>537</sup> *Id.* at 5.

<sup>538</sup> PENNFUTURE, *supra* note 517 at 7.

Bonds generally constitute a one-time source, often require voter approval, involve administrative preparation, and must be fully repaid with interest charges—requiring a dedicated repayment revenue stream.

**State and federal grants** are competitive, typically one-time or time-constrained, and likely require a local funding match.<sup>539</sup>

**Public-private partnerships** have gained recognition for reducing costs and leveraging public funding and government resources while sharing risk. Drawbacks include the loss of public control.

Jurisdiction	Stormwater Utility	Fee	GS Funding Source
Ann Arbor, MI <sup>540</sup>	Impervious area (assigned into four billing tiers)	\$25.16 (Tier 1)–\$132.07 (Tier 4) quarterly	Utility fee <sup>541</sup>
Central Falls, RI	N/A	N/A	Anticipated via bonds, partnerships, and/or grants
Cleveland, OH <sup>542</sup>	Impervious surface	\$3.09–\$9.27 monthly (residential) \$5.15/ERU monthly (non-residential)	No dedicated funding source
Cleveland Heights, OH <sup>543</sup>	Impervious surface (ERU)	\$3.09–\$9.27 monthly (residential) \$5.15/ERU monthly (non-residential)	Motor vehicle registration proceeds, State gas tax, matching grants from the Northeast Ohio Areawide Coordinating Agency (NOACA)
Dallas, TX <sup>544</sup>	Fee per sq. ft. impervious area	\$3.57–\$13.91 monthly (residential) \$1.92/1000 sq. ft. monthly (non-residential and vacant)	General fund
Edina, MN <sup>545</sup>	Flat rate (residential) Impervious area (commercial)	\$34.81 quarterly	Storm water utility funds Special assessments
Fairbanks, AK			MTO
Kansas City, MO <sup>546</sup>	Impervious area (ERU)	\$0.50/500 sq. ft. monthly	General N/A; general obligation bonds fund Complete Streets
Maplewood, MN <sup>547</sup>	Flat rate (residential) Impervious area (commercial/industrial)	\$22.44/quarter (or \$7.48 monthly) (single-family residential)	Environmental Utility Fee
Nashville, TN <sup>548</sup>	Impervious area (sq. ft.)	\$1.50–11.00 (residential) monthly \$3.00 (condo unit) monthly	Within the regular budgets of identified capital projects

<sup>539</sup> *Id.* at 6.

<sup>540</sup> *Stormwater Rates and Credits*, CITY OF ANN ARBOR, MICH., <https://www.a2gov.org/departments/systems-planning/planning-areas/water-resources/Pages/Stormwater-Rates-and-Credits.aspx> (last visited June 14, 2019).

<sup>541</sup> City of Ann Arbor, Mich., Code of Ordinances tit. 2 ch. 33 § 2:214 (2007).

<sup>542</sup> *Wastewater Rates and Stormwater Fees*, N. E. OHIO REG’L SEWER DIST., <https://www.neorsd.org/customers-service-page/sewer-rates-and-stormwater-fees/#rate> (last visited June 14, 2019).

<sup>543</sup> *Id.*

<sup>544</sup> *Stormwater Billing Information*, CITY OF DALL., TEX., <https://dallascityhall.com/departments/waterutilities/stormwater-operations/Pages/billing.aspx%20> (last visited June 14, 2019).

<sup>545</sup> CITY OF EDINA, MINN., CODE OF ORDINANCES ch. 2, art. VIII, div. 2, § 2-724 (2019).

<sup>546</sup> CITY OF KANSAS CITY, MO., SCHEDULE OF: WATER & SANITARY SEWER SERVICE RATES 16 (2017).

<sup>547</sup> *Environmental Utility Fee*, CITY OF MAPLEWOOD, MINN., <https://maplewoodmn.gov/454/Environmental-Utility-Fee> (last visited June 14, 2019).

<sup>548</sup> CITY OF NASHVILLE, TENN., STORMWATER PROGRAM FAQ 1.

IMPROVING WATER QUALITY THROUGH CAPITAL IMPROVEMENT POLICIES

		\$10.00-\$1,300.00 (non-residential) monthly	
<b>North St. Paul, MN<sup>549</sup></b>	Residential Equivalency Factor (REF) Impervious area (percentage) 35% rainwater incentive discount	10.56/REF (residential) \$10.56/REF x percent impervious (commercial, multi-family, public)	Bonds repaid by Surface Water Fund (utility fee) Special assessments
<b>Portland, OR<sup>550</sup></b>	Per user/dwelling unit (1-4 units, residential) Impervious area (5+ units, non-residential)	\$19.29 off-site; \$10.39 on-site (single/duplex)(per user) monthly  \$8.04 off-site; \$4.32 on-site (3/4-Plex)(per dwelling) monthly  \$8.04 off-site; \$4.32 on-site (5+ units) (per 1,000 sq. ft. imperv.) monthly  \$8.46 off-site; \$4.56 on-site (per 1,000 sq. ft. imperv.) monthly	General obligation bonds repaid by stormwater/sewer utility fees
<b>Prince George’s County MD<sup>551</sup></b>	Impervious area (Equivalent Service Unit, or ESU) 3 tiers	\$33.12—\$62.38 (single-family) yearly \$20.90/ESU \$20.58 administrative fee	Local Watershed Protection and Restoration Fund
<b>Tucson, AZ</b>	Flat rate	\$2.90 (single-family)monthly \$2.90/5,000 sq. ft. ERU (commercial) monthly <sup>552</sup>	Gas Tax, Regional Transportation Authority (RTA) funded by countywide transaction ½-cent sales tax  Fee for green infrastructure program under consideration. <sup>553</sup>

<sup>549</sup> CITY OF NORTH ST. PAUL, MINN., 2019 MUNICIPAL FEE SCHEDULE AND UTILITY RATES 25 (2019).

<sup>550</sup> CITY OF PORTLAND, OR., BES 2018-2019 RATE ORDINANCE EXHIBIT A 1.

<sup>551</sup> *Fee Structure*, PRINCE GEORGE’S CNTY., MD., <https://www.princegeorgescountymd.gov/276/Fee-Structure> (last visited June 14, 2019); Prince George’s Cnty., Md., Residential, Single-Family Calculation.

<sup>552</sup> TOWN OF ORO VALLEY, ARIZ., STORMWATER UTILITY RATE ANALYSIS, 13 (2016).

<sup>553</sup> Bud Foster, *Tucson Considering New Fee for Green Infrastructure Program*, KOLD NEWS 13 (Mar. 12, 2019 5:17PM), <http://www.kold.com/2019/03/13/tucson-stepping-up-wastewater-program-with-new-infrastructure-plan/>.

## ADA: A Model for Green Streets

The Americans with Disabilities Act's (ADA) regulatory framework governing alterations to public transportation facilities serves as a viable model for applying Green Streets policies to the existing public right-of-way. This section summarizes relevant ADA requirements, including associated regulations and guidance documents promulgated by the Department of Justice, and discusses key principles and processes applicable to a model Green Streets policy.



Title II of the ADA requires both newly designed and constructed and “altered” state and local government facilities to be readily accessible to and usable by individuals with disabilities.<sup>554</sup> This means state and local governments must supply accessibility features when making alterations to existing public facilities.

As a general matter, Title II ensures disabled persons can access public facilities.<sup>555</sup> The statute states: “[N]o qualified individual with a disability shall, by reason of such disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of a public entity, or be subjected to discrimination by any such entity.”<sup>556</sup>

This prohibition on discriminating against persons with disabilities translates into a positive mandate on agencies to make public facilities accessible. “Public facilities” are broadly defined under the ADA regulations to include the public right-of-way—specifically, roads, walks, and passageways.<sup>557</sup>

This means public entities must provide persons with disabilities with pedestrian access to the agency’s streets and sidewalks, whenever a pedestrian facility exists.<sup>558</sup> Public streets, curbs, and sidewalks are often necessary to access programs or services, and many public entities have responsibility for streets and sidewalks as a program or activity.<sup>559</sup> ADA regulations implement this requirement by imposing standards for accessible features such as curb cuts, ramps, continuous sidewalks, and detectible warnings (e.g., truncated domes).

<sup>554</sup> Nondiscrimination on the Basis of Disability in State and Local Government Services, 28 C.F.R. § 35 (2016); 28 C.F.R. §35.104 (2019) (“Public entity means—(1) Any State or local government.”).

<sup>555</sup> See Americans with Disabilities Act (ADA) of 1990, 42 U.S.C. §§ 12131–12165 [hereinafter ADA](representing an evolution of 29 U.S.C. § 794(a)–(b) of the Rehabilitation Act of 1973, Nondiscrimination under Federal grants and programs, which focuses on ensuring access to programs and activities receiving Federal financial assistance stating “No otherwise qualified individual with a disability in the United States . . . shall, solely by reason of her or his disability, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance . . . ‘program or activity’ means all the operations of—(1)(A) a department, agency, special purpose district, or other instrumentality of a State or of a local government.”); See also 28 C.F.R. § 35 (2016) (“Title II extends the prohibition on discrimination established by section 504 of the Rehabilitation Act of 1973, as amended . . . to all activities of State and local governments regardless of whether these entities receive Federal financial assistance.”).

<sup>556</sup> ADA § 12132; 28 C.F.R. § 35.149 (“Except as otherwise provided in § 35.150, no qualified individual with a disability shall, because a public entity’s facilities are inaccessible to or unusable by individuals with disabilities, be excluded from participation in, or be denied the benefits of the services, programs, or activities of a public entity, or be subjected to discrimination by any public entity.”).

<sup>557</sup> 28 C.F.R. §35.104 (“Facility means all or any portion of buildings, structures, sites, complexes, equipment, rolling stock or other conveyances, roads, walks, passageways, parking lots, or other real or personal property, including the site where the building, property, structure, or equipment is located) (emphasis added).

<sup>558</sup> *Questions and Answers about ADA/Section 504*, supra note 60 at (requiring public agencies to provide accessible facilities to persons with disabilities to the extent feasible when pedestrian facilities are provided).

<sup>559</sup> Elizabeth Pendo, *Taking It to the Streets: A Public Right-of-Way Project for Disability Law*, 54 St. Louis U. L. J. 901, 904, 908 (2010) (“[L]ocal and state governments are required to provide curb cuts on public streets. The employment, transportation, and public accommodation sections of this Act would be meaningless if people who use wheelchairs were not afforded the

In addition to constructing *new* facilities to be accessible to disabled persons, state and local governments must incorporate accessibility features when making “alterations” to *existing* facilities “used in the provision of designated public transportation services that affect or could affect the usability of the facility or part thereof[.]”<sup>560</sup> Courts have specifically interpreted this to mean that, when a public entity alters a street or road, it must install these accessibility features at intersections. The oft-cited case on this is *Kinney v. Yerusalim*.<sup>561</sup> The Third Circuit held that ADA regulations require local governments to install curb ramps at intersections where they resurface City streets, and not just when work on City streets otherwise affects the curb or sidewalk, or when engaging in a complete reconstruction of the street. The basis of the Court’s decision was that resurfacing constitutes an “alteration” within the scope of the regulation.<sup>562</sup>



The term “alteration” encompasses any change to public right-of-way facilities “that affects or could affect access, circulation, or use.” The Federal Highway Administration Office of Civil Rights clarifies that alterations include reconstruction, rehabilitation, widening, resurfacing, signal installation and upgrades, and projects of similar scale and effect.<sup>563</sup> In other words, such improvements to the public right-of-way—even a utility project that includes repaving—trigger the requirement to bring those facilities into compliance with the ADA, such as by installing curb cuts and truncated domes.<sup>564</sup> Maintenance activities—actions “intended to preserve the system, retard future deterioration, and maintain the functional condition of the roadway without increasing the structural capacity” are excluded. Examples of maintenance include joint repair, pavement patching (filling potholes), shoulder repair, signing, striping, minor signal upgrades, and repairs to draining systems.<sup>565</sup> Non-maintenance alterations trigger the mandate to install pedestrian access improvements, although this is limited to only that portion of the public right-of-way changed or affected by the alteration.<sup>566</sup>

The ADA imposes a “maximum extent feasible” standard on public entities to ensure the altered portions of the facility are accessible to and usable by disabled individuals. Additionally, the “path of travel” to the altered area—

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opportunity to travel on and between streets.”) (citing H.R. REP. NO. 101-485(1), pt. 2, at 84 (1990), *reprinted in* 1990 U.S.C.C.A.N. 303, 367).

<sup>560</sup> ADA § 12147 (“Alterations of existing facilities”).

<sup>561</sup> *Kinney*, 9 F.3d at 1067 (upholding lower court’s decision that 28 C.F.R. § 35.151(e)(1) requires a municipality to install curb ramps at intersections where it resurfaces city streets—not just when work on city streets otherwise affects the curb or sidewalk, or when engaging in a complete reconstruction of the street—on the basis that resurfacing constitutes an “alteration” within the scope of the regulation).

<sup>562</sup> *See* *Frame v. City of Arlington*, 575 F.3d 432 (5th Cir. 2009) (holding the municipality’s curbs, sidewalks, and parking lots constituted a service, program or activity within the meaning of Title II); *see also* 28 C.F.R. § 35.151(i) (addressing specifically the installation of curb ramps and providing that when a public entity undertakes to construct new streets or to alter existing ones, it shall take that opportunity to install curb ramps at intersections).

<sup>563</sup> *Questions and Answers about ADA/Section 504*, *supra* note 60 at 17.

<sup>564</sup> *Questions & Answers*, U.S. DEPT. OF TRANSPORTATION. FEDERAL HIGHWAY ADMINISTRATION OFFICE OF CIVIL RIGHTS, 11 [https://www.fhwa.dot.gov/civilrights/programs/ada/ada\\_resurfacing\\_qa.cfm](https://www.fhwa.dot.gov/civilrights/programs/ada/ada_resurfacing_qa.cfm) (last visited June 14, 2019) (requiring compliance with ADA curb ramp requirements for utility trench work “depends on the scope and location of the utility trend work being done. If the utility trench work is limited to a portion of the pavement, even including a portion of the crosswalk, repaving necessary to cover the trench would typically be considered maintenance and would not require simultaneous installation or upgrading of curb ramps. . . [and] If the utility work impacts the curb at a pedestrian street crossing where no curb ramp exists, the work affecting the curb falls within the definition of ‘alteration.’”).

<sup>565</sup> *Questions and Answers about ADA/Section 504*, *supra* note 60 at 18.

<sup>566</sup> *Id.* at 20.

and to certain features serving that altered area—must be readily accessible.<sup>567</sup> Failure to meet this standard constitutes discrimination under the ADA.

As a general matter, “feasibility” refers to physical possibility. The Federal Highway Administration Office of Civil Rights issued guidance clarifying that *infeasibility* refers to when physical terrain or site conditions restrict constructing or altering the facility to the standard.<sup>568</sup> The guidance notes there is no required decision-making process to determine that an accessibility improvement is not technically feasible, but the best practice is to document the decision to enable the public agency to explain the decision in any later compliance review.<sup>569</sup> Cost does not constitute a justification for a public entity to fail to complete an ADA-required improvement.<sup>570</sup> Analogous examples are found in the Green Streets policies of Ann Arbor (to apply the highest infiltration standard feasible), Cleveland (severe topographic or natural resource constraints) and Nashville (severe topographic, historical, natural resource, or right-of-way constrains preclude construction without incurring extreme cost).

However, the ADA permits one exception to the “maximum extent feasible” standard to ensuring the *path of travel* to an *altered area* is readily accessible, which has analogues in several Green Streets policies. This exception is triggered when the alterations are “disproportionate to the overall alterations in terms of cost and scope (as determined under criteria established by the Attorney General).”<sup>571</sup>

This “disproportionality” standard is given definition by the Department of Justice regulations, under Title 35, as occurring when the cost exceeds 20 percent of the cost of the alteration to the primary function area.<sup>572</sup> Nevertheless, public entities remain obligated to make the path of travel accessible to the extent they can do so without incurring disproportionate costs.<sup>573</sup> The regulations also establish a prioritized list of accessible elements. The City of Cleveland’s Green Street’s policy is analogous in including a financial hardship exemption, triggered when compliance constitutes a minimum of 20 percent of the total project cost. Central Falls’ policy also permits the City Council to consider a recommendation by the Director of Public Works that application of the policy would be unduly cost prohibitive. Kansas City’s policy considers “excessively disproportionate costs” when accommodating a mode of transportation or category of users (a complete street rather than a green street element). Prince George’s County policy considers cost that is “disproportionate to the projected need.”

The regulations also establish an exception to the requirement that *newly* constructed public facilities be readily accessible and usable. The exception is one of “structural impracticability,”<sup>574</sup> and applies “only in those rare circumstances when the unique characteristics of terrain prevent the incorporation of accessibility features.”<sup>575</sup> Again, this mirrors the Green Streets policies of Ann Arbor (allowing examination of the required infiltration standard when the project area contains groundwater within five feet of the surface, contaminated soil, or other limiting conditions), Cleveland (permitting exceptions when there are severe topographic or natural resource constraints, and when existing structures preclude implementation), and Nashville (where severe topographic, historical, natural resource, right-of-way constraints preclude construction of facilities without incurring extreme cost).

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<sup>567</sup> ADA § 12147.

<sup>568</sup> *Questions and Answers about ADA/Section 504*, *supra* note 60 at 26.

<sup>569</sup> *Id.*

<sup>570</sup> *Id.* at 14–25.

<sup>571</sup> ADA § 12147(a); 28 C.F.R. §35.151(b)(4).

<sup>572</sup> 28 C.F.R. §35.151(b)(4)(iii).

<sup>573</sup> *Id.* at §35.151(b)(4)(iv).

<sup>574</sup> *Id.* at § 35.151(a)(1)-(2).

<sup>575</sup> *Id.* at § 35.151(a)(2)(i).

Additionally—and separate from requirements on alterations to existing facilities—public entities must *operate* existing facilities to be accessible and usable to persons with disabilities. But a public entity may be excepted from this standard if it establishes that taking action to make a service, program, or facility readily accessible to and usable by disabled individuals would either: (1) “threaten or destroy the historic significance of an historical property;” (2) fundamentally alter the nature of a service, program, or activity; or (3) result in “undue financial and administrative burdens.”<sup>576</sup>

The head of a public entity or her designee is responsible for determining whether one of the latter two exceptions applies, but only after: (1) “considering all resources available for use in the funding and operation of the service, program, or activity;” and (2) supplying a written justification of her decision.<sup>577</sup> The public entity remains obligated to find a way to ensure disabled persons still receive the benefits or services, without resulting in such a fundamental alteration or undue administrative burden.<sup>578</sup>

Each of these three exceptions find analogies in Green Streets policies, particularly those obligating localities to explore alternative solutions to mitigate stormwater runoff if incorporating green infrastructure would significantly affect use of a street as a public right-of-way—such as by vehicles, cyclists, and pedestrians. The City of Cleveland obligates the Director of Capital Projects to provide City Councilmembers with notice of all exemption requests. Nashville’s mayor requires any exceptions to that City’s Green and Complete Streets Policy to receive interdepartmental review and be documented and made publicly available. Cleveland Heights adopted a similar procedure, requiring exceptions be documented and posted for public review.

This white paper leverages a number of the principles of application and exemption, as well as procedural safeguards present in this ADA regulatory framework, in proffering a suggested model Green Streets policy.

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<sup>576</sup> *Id.* at § 35.150(a); *Id.* at § 35.151(b)(3) (including a similar exception for historically significant properties when altering).

<sup>577</sup> *Id.* at § 35.150(a)(3).

<sup>578</sup> *Id.*

## Regulatory Framework: Chesapeake Bay Watershed Jurisdictions



State and local laws and regulations will affect whether and how Chesapeake Bay watershed jurisdictions can adopt and implement Green Streets policies.

Two key areas of law are particularly important: first, the extent to which state law gives local governments regulatory and land use authority to make and carry out decisions; and second, the regulation of stormwater within the framework of state laws, which themselves operate within the context of the federal Clean Water Act (discussed in Appendix E).

Jurisdiction	Local authority	Overseeing agency	SW system	Empowers SW fee
Delaware	Municipalities may adopt Home Rule powers	Department of Natural Resources and Environmental Control, Division of Watershed Stewardship's Drainage and Stormwater Section, Sediment and Stormwater Management	1 Phase I MS4s 4 Phase II MS4s	✓
District of Columbia	Home Rule, subject to Congress's plenary authority	EPA (NPDES); DC Water and Sewer Authority (CSS); District Department of Energy and Environment, Stormwater Management Division (MS4 SWMP)	1/3 CSS 2/3 MS4	✓
Maryland	Home Rule (Charter and Home Rule Counties; all incorporated cities)	Department of the Environment, Water Management Administration, Sediment, Stormwater, and Dam Safety Program	11 Phase I MS4s (5 large, 4 medium, SHA) 35 Phase II MS4s 9 waived MS4s 2 CSS	✓
New York	Empowers municipal home rule.	Department of Environmental Conservation	26 Phase II MS4s 3 CSS (in Chesapeake Bay watershed)	No prohibition but no enabling law
Pennsylvania	Dillon's and Home Rule	Department of Environmental Protection, Bureau of Clean Water	2 large MS4s 953 small MS4s 126 CSS	✓
Virginia	Dillon's Rule	Department of Environmental Quality, Soil and Water Conservation Board	10 Phase I MS4s 103 Phase II MS4s 3 CSS	✓
West Virginia	Home Rule Pilot Program made permanent	Department of Environmental Protection, Division of Water and Waste Management	53 Phase II MS4s	✓

### Dillon's Rule/Home Rule

Municipalities are political sub-divisions of their respective state. States tend to apply either *Dillon's Rule* or the *Home Rule* form of government to municipalities, which determines the extent of local authority.

Examination of whether local government action is permitted under Dillon's Rule requires a two-step analysis. The first step asks: Did the statute grant the locality authority to act? Local governments may exercise only those powers: a) the state *expressly* grants to it; b) necessarily and fairly *implied* from that grant; or c) *indispensable* to the existence of the unit of local government.<sup>579</sup> The second step queries: Did the locality properly *exercise* the authority? Granted

<sup>579</sup> 1 JOHN F. DILLON, COMMENTARIES ON THE LAW OF MUNICIPAL CORPORATIONS 448–49 (5th. ed. 1911) (“It is a general and undisputed proposition of law that a municipal corporation possesses and can exercise the following powers, and no others: First, those granted in express words; second, those necessarily or fairly implied in or incident to the powers expressly granted; third, those essential to the declared objects and purposes of the corporation, —not simply convenient, but indispensable” (emphasis in original)); see also 13B MICHIE’S JURISPRUDENCE OF MUNICIPAL CORPORATIONS § 25 (2016) (“A municipal corporation possesses and can exercise the following powers, and no others. First, those granted in express words by general statutes or charters; second, those



authority is properly executed when either: a) the enabling authority provides *specific direction* for how to execute the power and the locality follows that direction, or b) if the enabling authority does not provide specific direction and the localities' actions are considered *within reason*.<sup>580</sup>

In contrast, Home Rule generally means the state's political subdivisions are authorized to legislate on almost all local matters, without seeking permission from the state; the usual exception involves preemption by or conflict with state law.

### Clean Water Act and Cooperative Federalism

The Clean Water Act (CWA) defines the basic structure regulating the discharge of pollutants into the waters of the United States.<sup>581</sup> The two primary components of CWA's statutory scheme for regulating pollution are *water quality standards* (WQS) and the *National Pollutant Discharge Elimination System* (NPDES), a permitting program for regulating point source pollution. This statutory regime is administered by the Environmental Protection Agency (EPA) in coordination with state governments, territories, and tribes. The Water Quality Act of 1987 amended the CWA by adding a comprehensive national program for addressing the problem of stormwater discharges through stormwater permitting, nonpoint source pollution control, and the Great Lakes and Chesapeake Bay protection programs.<sup>582</sup> Appendix E provides detailed discussion of federal Clean Water Act requirements and history.

Municipal storm sewer systems are subject to regulatory control under NPDES. A discussion of this regulatory framework requires a basic understanding of the two types of urban wet weather flows: combined sewer overflows (CSOs) and municipal separate storm sewers (MS4s). Both systems often include a large number of outfalls, or discharge points, and urban discharges are weather-dependent. NPDES permits for MS4s take a unique approach under CWA § 402(p). The EPA generally applies permits on a system-wide basis rather than outfall-by-outfall. There usually are no end-of-pipe pollutant discharge limits; instead, permits require the application of best management practices (BMPs), or construction of storage and treatment facilities. Permits require strategic plans for addressing problems. The most significant distinction between MS4 and other NPDES permits is the requirement that municipal storm sewer systems reduce the discharge of pollutants to the *maximum extent practicable* (MEP) standard. State stormwater management and pollution control laws define the roles of local governments, including, frequently, their MS4 obligations and authorities. These affect the decisions of these governments in management and reconstruction of the PROW.

Within the Chesapeake Bay watershed, the requirements derived from the Total Maximum Daily Load (TMDL) for the Bay and its contributing watersheds also profoundly affect choices being made by state and local governments concerning their management of MS4 systems and other activities affecting pollutants.<sup>583</sup>

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necessarily or fairly implied in or incident to the powers expressly so granted; third, those essential to the declared objects and purposes of the corporation, not simply convenient, but indispensable.”).

<sup>580</sup> DILLON, *supra* note 579 at 453 (“The rule of strict construction does not apply to the *mode adopted* by the municipality to carry into effect powers expressly or plainly granted, where the mode is not limited or prescribed by the legislature, and it is left to the discretion of the municipal authorities. In such a case the usual test of validity of the act of a municipal body is, [w]hether it is reasonable? and there is no presumption against the municipal action in such cases.” (emphasis in original)); see also MICHIE’S JURISPRUDENCE OF MUNICIPAL CORPORATIONS, *supra* note 579 at § 25 (“Virginia courts recognize the ‘reasonable selection of method’ rule, which permits local governing bodies to exercise discretionary authority when a statutory grant of power has been expressly made but is silent upon the mode or manner of its execution.”).

<sup>581</sup> Clean Water Act of 1977, Pub. L. 95-217, 91 Stat. 1566 (codified as amended at 33 U.S.C. § 1251–1387 (2018) [hereinafter CWA].

<sup>582</sup> Water Quality Act of 1987, Pub. L. 100-4, 101 Stat. 7; CWA § 1342(p) (2018).

<sup>583</sup> See *Chesapeake Bay TMDL Fact Sheet: Driving Actions to Clean Local Waters and the Chesapeake Bay*, EPA, <https://www.epa.gov/chesapeake-bay-tmdl/chesapeake-bay-tmdl-fact-sheet> (last visited June 14, 2019) [hereinafter *Chesapeake Bay TMDL Fact Sheet*].

## Delaware

### Local authority

Title 22, Chapter 8 of the Delaware State code empowers municipalities—meaning cities, towns, and villages with a population of at least 1,000—to adopt Home Rule powers.<sup>584</sup>



### Stormwater

The Division of Watershed Stewardship's Drainage and Stormwater Section, Sediment and Stormwater Management program, administers stormwater management in Delaware, within the Department of Natural Resources and Environmental Control (DNREC).

State law directs DNREC to develop a State stormwater management program.<sup>585</sup> Local conservation districts, counties, municipalities, and State agencies are authorized to develop and manage their own sediment and stormwater program, subject to DNREC approval and renewal every five years.<sup>586</sup> DNREC is authorized to develop model sediment and stormwater ordinances.<sup>587</sup> State law also empowers DNREC and local jurisdictions to establish a stormwater utility fee to fund the program.<sup>588</sup> The fee system must be “reasonable and equitable,” defined as ensuring contributors to runoff “pay to the extent to which runoff is contributed.”<sup>589</sup> State regulations setting forth criteria for implementing a stormwater utility similarly require stormwater financing be “reasonable and equitable so that each user within the stormwater utility jurisdiction, including State agencies, contributes to the financing according to the users’ pro rata share of runoff.”<sup>590</sup> State regulations set forth the program components a stormwater utility may fund. This includes maintenance operations and capital construction.<sup>591</sup>

Delaware’s NPDES program currently regulates one Phase I MS4, covering co-permittees New Castle County and the Delaware Department of Transportation as principal permittees, and the towns of Bellefonte, Newport, and Elsmere, as well as the cities of Delaware City, New Castle, and Wilmington. There are four Phase II MS4 permittees: the City of Newark/University of Delaware, the Town of Middletown, the City of Dover, and Kent County/Delaware Department of Transportation. These four Small MS4s each are regulated under individual permits.

DNREC is developing a General Permit Program in response to the 2010 Census expanding the “urbanized area” within Delaware and thus the number of municipalities requiring NPDES Phase II MS4 permit coverage. DNREC released a draft permit in 2015, and substantially revised the proposal based on public comment. The Tier I Phase II

<sup>584</sup> DEL. CODE. ANN. tit. 22, § 802 (2019).

<sup>585</sup> DEL. CODE. ANN. tit. 7, § 4006(a) (2018).

<sup>586</sup> *Id.* at § 4007(a); *id.* At § 4011(a) (requiring taking a watershed approach to nonpoint pollution control in DNREC-designated watersheds, mandating development of a specific plan).

<sup>587</sup> *Id.* at § 4006(b)(2).

<sup>588</sup> *Id.* at § 4005(c); *id.* at § 4002(12) (defining a stormwater utility as “an administrative organization that has been created for the purposes of funding sediment control, stormwater management or flood control planning, design, construction, maintenance, and overall resource needs by authorized and imposed charges.”).

<sup>589</sup> *Id.* at § 4005(c).

<sup>590</sup> 5101 DEL. ADMIN. CODE § 10.2 (2013).

<sup>591</sup> *Id.* at § 10.3.

MS4 General Permit will apply to the four current small MS4 permittees.<sup>592</sup> The Tier II General Permit is designed for those MS4s that do not currently hold a NPDES MS4 permit.<sup>593</sup>

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<sup>592</sup> See *Municipal Separate Storm Sewer Systems*, DELEWARE.GOV <https://dnrec.alpha.delaware.gov/water/surface-water/npdes/municipal-storm-sewers/> (last visited June 14, 2019).

<sup>593</sup> See *id.*

## District of Columbia

### Local authority

The District of Columbia was established in 1791 and has served as capital of the United States since 1800. The District is a unique governmental entity combining state, county, and municipal characteristics. The City is governed by an elected Mayor and an elected Council in accordance with powers delegated to them by Congress in the Home Rule Act of 1973.<sup>594</sup> The powers and duties of the City Council under Home Rule are comparable to those held by state, county, and city legislatures; this includes the authority to adopt laws and to approve an annual budget. However, Congress’s plenary authority over the District under the Constitution—which gives Congress the power to “exercise exclusive Legislation in all Cases whatsoever, over [the] District”<sup>595</sup>—is a key limitation on local power. For example, Congress retains the right to review and overturn laws created by the Council and intervene in local affairs, and the City may not obligate or expend funds absent annual Congressional appropriation.<sup>596</sup> Consequently, there is an ongoing effort by District residents to achieve further control of their own local affairs.



### Stormwater

The District of Columbia encompasses 61.4 square miles, with approximately 39 percent comprising impervious surfaces, as of 2008.<sup>597</sup> Over the past 30 years, DC has experienced a 34 percent increase in stormwater runoff.

One-third of the District is served by a CSS dating to the beginning of the 1900s and earlier. The DC Water and Sewer Authority, established in 1996, operates 1,800 miles of sanitary and combined sewers.<sup>598</sup> As of 2018, an estimated 1.3 billion gallons of CSOs discharged to the Anacostia River, 640 million gallons into the Potomac, and 49 million gallons into Rock Creek.<sup>599</sup> The District entered into a Consent Decree with the EPA in 2005 to build four tunnels over 15 years to hold combined stormwater and sewage during storm events. The Clean Rivers Project is expected to cost the City \$2.7 billion. The Consent Decree was subsequently modified to include green infrastructure, with parties anticipating the project will green nearly 500 acres.<sup>600</sup>

The EPA maintains its authority over the NPDES stormwater program in the District, as the District is not a political subdivision of any state. The District Department of Energy and Environment (DOEE) is the agency responsible for managing the MS4 Stormwater Management Program (SWMP), under the Department of the Environment Establishment Act of 2005, effective February 15, 2006.<sup>601</sup> DOEE assumed responsibility as Permit Administrator in

<sup>594</sup> 87 Stat. 774 (1973).

<sup>595</sup> U.S. CONST. art. I, § 8, cl. 17.

<sup>596</sup> See, e.g., 87 Stat. 813 (1973) (“Notwithstanding any other provision of this chapter, the Congress of the United States reserves the right, at any time, to exercise its constitutional authority as legislature for the District, by enacting legislation for the District on any subject, whether within or without the scope of legislative power granted to the Council by this chapter, including legislation to amend or repeal any law in force in the District prior to or after enactment of this chapter and any act passed by the Council.”).

<sup>597</sup> Natural Resources Defense Council, Washington, D.C.: A Case Study of How Green Infrastructure is Helping Manage Urban Stormwater Challenges 1 (2008).

<sup>598</sup> DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY, 2011 ANNUAL REPORT 4 (2011).

<sup>599</sup> DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY, BIENNIAL REPORT: COMBINED SEWER OVERFLOW (CSO) CONTROL ACTIVITIES, 3 (2018).

<sup>600</sup> DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY, 2017 ANNUAL REPORT 5 (2017).

<sup>601</sup> D.C. CODE §§ 8-151.01 *et seq.* (2019).

February 2007.<sup>602</sup> DOEE's Stormwater Management Division (SWMD) administers the MS4 Permit and coordinates compliance activities among District agencies. DOEE partners with sister agencies to implement Permit activities under a Memorandum of Understanding executed December 14, 2000, and subsequently updated in 2008.<sup>603</sup>

The two key statutes governing stormwater management in the District are the Comprehensive Stormwater Management Enhancement Amendment Act of 2008, effective July 1, 2009,<sup>604</sup> and the Water Pollution Control Act of 1984, effective March 16, 1985.<sup>605</sup> In 2013, DC finalized the Stormwater Management Soil Erosion and Sediment Control regulations (Stormwater Rule).<sup>606</sup> The Stormwater Rule requires the design, construction, and maintenance of stormwater controls to achieve on-site retention of 1.2 inches of stormwater from a 24-hour storm with a 72-hour antecedent dry period for all public and private development and redevelopment projects that disturb greater than or equal to 5,000 square feet of land area, in concert with the provision for an off-mitigation program.<sup>607</sup> Substantial improvement projects must meet the on-site retention standard of 0.8 inches of stormwater.<sup>608</sup> A regulated site may meet part of this stormwater retention volume requirement through Stormwater Retention Credits (SRCs) that are purchased in a private market or through payment of In-Lieu Fees (ILFs).<sup>609</sup>

The Stormwater Rule provides three options for projects in the existing PROW to comply with stormwater retention volume requirements—generally, the 1.2 inch requirement for the 24-hour storm: (1) retain 50 percent of the required stormwater retention volume on-site and meet the remaining volume via off-site retention; (2) achieve 100 percent of the required stormwater retention volume requirement on-site; or (3) achieve on-site the required stormwater retention volume to the MEP, subject to demonstrating the technical infeasibility, limitations, and environmental harm associated with installing additional or alternative BMPs.<sup>610</sup>

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<sup>602</sup> DEPARTMENT OF ENERGY & ENVIRONMENT, 2017 MS4 ANNUAL REPORT 8 (2018) [hereinafter 2017 MS4 ANNUAL REPORT].

<sup>603</sup> *Id.* at 9.

<sup>604</sup> D.C. CODE § 8-153.01 *et seq.* (2013).

<sup>605</sup> *Id.* at §§ 8-103.01 *et seq.* (2019).

<sup>606</sup> D.C. MUN. REG. tit. 21, §§ 500, *et. seq.* (2013).

<sup>607</sup> *Id.* at § 520.

<sup>608</sup> *Id.* at § 522.4.

<sup>609</sup> 2017 MS4 ANNUAL REPORT, *supra* note 602 at 17 (leveraging private investment in green infrastructure through the Stormwater Retention Credit (SRC) Trading Program. Additionally, SRCs are generated by green infrastructure, or by removing impervious surfaces and may be sold on the market to development projects regulated under DOEE's stormwater management regulations).

<sup>610</sup> D.C. MUN. REG. tit. 21, § 521.2.

An exception to meeting this standard exists for minor projects in the existing Public Right-of-Way.<sup>611</sup> DOEE published its Revised Stormwater Management Plan January 21, 2016.<sup>612</sup>

On February 15, 2019, DOEE proposed amendments to the Stormwater Rule and revisions to the Stormwater Management Guidebook. A key goal of the amendments is to reduce the burden complying with the Rule—specifically, the cost of designing and installing green infrastructure—places on certain, socially desirable projects. Examples include affordable housing projects, playing fields, trails, and landscape maintenance. DOEE also aims to encourage generating more Stormwater Retention Credits (SRC) in the MS4 area.<sup>613</sup>

The current MS4 permit requires DOEE conduct an assessment of the District’s stormwater management regulations, and submit to the EPA, with its 2020 Annual Report, an analysis of potential changes to existing stormwater management regulations, exploring options identified in the *Consolidated TMDL Implementation Plan*.<sup>614</sup>

As noted, stormwater pollution flows into the Anacostia and Potomac Rivers, and Rock Creek. That pollution makes its way, from those water bodies, into the Chesapeake Bay. The 2018 Final Permit is the first permit to begin implementing the TMDL IP.<sup>615</sup> The current MS4 Permit requires DOEE, by 15 months prior to the Permit’s expiration date, to make the fully updated *Consolidated TMDL Implementation Plan* available for public notice and comment.<sup>616</sup>

The District is not currently discharging wastewater at its full capacity, and therefore is below its planning targets as of 2017. Once the District meets full capacity, DOEE estimates that meeting its planning targets will require a two percent reduction in nitrogen from urban runoff on federal and nonfederal land. In contrast, phosphorus loads can

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<sup>611</sup> D.C. MUN. REG. tit. 21, § 520.2; *see also* D.C. MUN. REG. tit. 21 § 517.3 (“A land-disturbing activity that consists solely of cutting a trench for utility work and related replacement of sidewalks and ramps is exempt from the stormwater management requirements of this chapter if it does not involve the reconstruction of a roadway from curb to curb or curb to centerline of roadway”); *see also* D.C. MUN. REG. tit. 21 § 517.6 (“A land-disturbing activity in the existing Public Right of Way is exempt from the requirements in Section 520 (Stormwater Management: Performance Requirements for Major Land-Disturbing Activity) for maintaining post-development peak discharge rates”); *see also* CENTER FOR WATERSHED PROTECTION, STORMWATER MANAGEMENT GUIDEBOOK B-5 (2013) [hereinafter STORMWATER MANAGEMENT GUIDEBOOK] (“If a PROW project includes major land-disturbing activity required for the operation and maintenance of existing commercial and residential streets, existing alleyways, and other existing transportation infrastructure designed and maintained for the safe conveyance of people and commerce, it is captured by the stormwater regulatory obligations of Chapter 5 of Title 21, of the District of Columbia Municipal Regulations, Water Quality and Pollution (2012). Routine maintenance such as surface asphalt milling of roadways, where the roadway base is not disturbed, is not considered a level of disturbance that will require compliance with the regulation.”); *See also* D.C. MUN. REG. tit. 21, § 517.2 (“A land-disturbing activity shall be exempt from the requirements of Section 520 (Stormwater Management: Performance Requirements for Major Land-Disturbing Activity), Section 522 (Stormwater Management: Performance Requirements For Major Substantial Improvement Activity) and Section 529 (Stormwater Management: Covenants and Easements) if the Department determines that it is conducted solely to install a best management practice or land cover that retains stormwater for one or more of the following purposes . . . (d) To comply with a Watershed Implementation Plan established under a Total Maximum Daily Load for the Chesapeake Bay; or (e) To reduce Combined Sewer Overflows (CSOs) in compliance with a court-ordered consent decree, including court-approved modifications, for reducing CSOs in the District of Columbia, or in compliance with a National Pollutant Discharge Elimination System permit.”).

<sup>612</sup> 2017 MS4 ANNUAL REPORT, *supra* note 602 at 11.

<sup>613</sup> DEP’T OF ENERGY & ENV’T, NOTICE OF PROPOSED RULEMAKING: STORMWATER MANAGEMENT AND SOIL EROSION AND SEDIMENT CONTROL AMENDMENTS 1 (2019).

<sup>614</sup> Authorization to Discharge under the NPDES MS4 Permit, NPDES Permit No. DC0000221 § 2.2.4.1 (EPA, May 23, 2018) [hereinafter D.C. NPDES PERMIT].

<sup>615</sup> *See* GOV’T OF D.C., FACT SHEET: NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) PERMIT No. DC0000221 [hereinafter DC NPDES FACTSHEET].

<sup>616</sup> D.C. NPDES PERMIT, *supra* note 614 at § 2.2.5.5.

increase from federal and nonfederal lands. In total, nonfederal sources must reduce nitrogen and phosphorus loads from urban runoff by one percent to meet the District's planning targets. There is no planning target for sediment.<sup>617</sup>

The District lacks counties or municipalities, so instead DOEE partners with Federal agencies with facilities located in the District to meet water quality standards.<sup>618</sup> Federal agencies make up nearly one-third of DC's footprint or land surface area. The Energy Independence and Security Act of 2007, Section 438—and EPA Guidance—calls for Federal facilities to comply with a 1.7 inch on-site retention standard.<sup>619</sup> Executive Order 13,508 (section 501) directs Federal agencies to implement controls on their own properties.<sup>620</sup> Executive Order 13,514, reiterates this policy.<sup>621</sup> Generally, these Executive Orders direct Federal agencies to “lead by example” when it comes to stormwater management.

However, federal agencies are not regulatorily bound to abide by the local target DOEE assigns them,<sup>622</sup> although they did commit to 2-year milestones. DDOE issued proposed target load assignments to Federal agencies, located physically within the District, on July 21, 2011.<sup>623</sup> Target loadings were finalized with all agencies in October 2011.

DOE is currently addressing stakeholder comments on the preliminary draft Phase III WIP and anticipates submitting the draft by EPA's deadline of April 12.<sup>624</sup>

The District's MS4 Permit requires a dedicated funding source for stormwater management.<sup>625</sup> District customers receive two charges on their utility bills. The first is the Stormwater Fee, paid to DOEE, which addresses the costs of the SWMP required by current MS4 Permit.<sup>626</sup> The Comprehensive Stormwater Management Enhancement Amendment Act of 2008, enacted in 2009,<sup>627</sup> authorized DOEE to revise the stormwater fee rate structure to be based on an impervious area assessment of each property. DOEE established a new rate structure based on the equivalent residential unit (ERU); one ERU is equivalent to 1,000 square feet of impervious area. Residential properties are charged one ERU per month, while the rate for other properties is based on the actual amount of

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<sup>617</sup> E-mail from Katherine Antos, Chief, Partnering & Env't. Conservation Branch, Dep't of Energy & Env't., Gov't. of D.C., to Cynthia R. Harris, Staff Att'y, Env'tl. Law Inst. (Feb. 18, 2019, 17:09 EST) (on file with author).

<sup>618</sup> D.C. DEP'T OF THE ENV'T, CHESAPEAKE BAY TMDL: PHASE II WATERSHED IMPLEMENTATION PLAN 1 (2012) [hereinafter CHESAPEAKE PHASE II WIP] (as of the publication of this report, the EPA had not yet formally approved the Phase III Watershed Implementation Plan); Antos, *supra* note 617 (noting EPA incorporated the most critical components of the plan as performance requirements in the District's current MS4 Permit).

<sup>619</sup> 42 U.S.C. § 17094 (“The sponsor of any development or redevelopment project involving a Federal facility with a footprint that exceeds 5,000 square feet shall use site planning, design, construction, and maintenance strategies for the property to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.”); STORMWATER MANAGEMENT GUIDEBOOK, *supra* note 611 at 309.

<sup>620</sup> Exec. Order No. 13,508, 3 C.F.R. § 13508 (2009) (“Agencies with land, facilities, or installation management responsibilities affecting ten or more acres within the watershed of the Chesapeake Bay shall, as expeditiously as practicable and to the extent permitted by law, implement land management practices to protect the Chesapeake Bay and its tributary waters consistent with the report required by section 202 of this order and as described in guidance published by the EPA under section 502.”).

<sup>621</sup> Exec. Order No. 13,514 § 1, 3 C.F.R. 13514 (2009). This Executive Order was revoked by Exec. Order No. 13,693 (2015), which itself was subsequently revoked by Exec. Order No. 13,843 (2018) (section 2, stating goals for agencies, includes complying with stormwater management requirements).

<sup>622</sup> Antos, *supra* note 617 (addressing stormwater, the District of Columbia is not a signatory to the Memorandum of Understanding between EPA and other federal agencies, although DOEE engages federal agencies as part of the WIP development process, including assigning local planning goals, setting interim deadlines for submitting information for the WIP, and providing educational sessions).

<sup>623</sup> CHESAPEAKE PHASE II WIP, *supra* note 618 at 2 (loading CSO is not included in EPA's analysis because SW loading from the CSO is largely handled by D.C. Water).

<sup>624</sup> Antos, *supra* note 617.

<sup>625</sup> 2017 MS4 ANNUAL REPORT, *supra* note 602 at 5.

<sup>626</sup> See D.C. CODE § 8-103.09d (2017).

<sup>627</sup> *Id.* at § 34-2202.16(d-1) (2018).

impervious area, converted to ERUs. DOEE, in 2010, subsequently created a multi-tier rate fee structure for residential properties,<sup>628</sup> and increased the fee from \$2.57 to \$2.67 per ERU.<sup>629</sup> On July 19, 2013, DOEE finalized the Stormwater Fee Discount Program.<sup>630</sup>

The second charge, the Clean Rivers Impervious Area Charge, was implemented in 2009 and is paid to DC Water to recover costs related to the CSO Clean Rivers Project. This fee follows the same, flat rate structure for residential customers, and is based on water usage for all other customers.<sup>631</sup>

The Stormwater Permit Compliance Amendment Act of 2000 established the Stormwater Permit Compliance Enterprise Fund to provide revenue to implement and administer activities directly required by the MS4 Permit. The Enterprise Fund generates approximately \$13 million annually.<sup>632</sup> Monies generated by the Enterprise Fund are used solely for activities specific to MS4 Permit compliance, and to pay for capital construction, operation and maintenance, and programmatic activities.<sup>633</sup> The fiscal year 2018 budget allocated \$18,441,000 from the Enterprise Fund.<sup>634</sup> The law also requires District agencies to maintain budget allocations that support baseline levels of effort for activities that control pollution from stormwater discharges from the MS4. These allocations derive from each agency's general obligation budget.<sup>635</sup>

Other sources of funding include general obligation funds and The Anacostia River Clean Up and Protection Act (Bag Law), which generates approximately \$2 million annually.<sup>636</sup> DOEE's Water Quality Division applies to EPA's Clean Water State Revolving Fund (CWSRF) Program to finance the District's Clean Water Construction (CWC) Program. The Program finances projects likely to make a strong contribution to attaining the District's water quality standards.<sup>637</sup>

The current MS4 Permit gives DOEE the option to conduct a stormwater fee option evaluation and propose an increase if the evaluation supports one, and determine how the fee can complement and leverage other funding sources in order to meet the permit's water quality goals.<sup>638</sup> DOEE is obligated under the Permit to submit to the EPA, with the 2020 Annual Report, an evaluation of the adequacy of the District's Stormwater Fee for achieving the Permit's water quality goals.<sup>639</sup>

The District is categorized as a Phase I MS4, regulated under an individual permit. The current permit took effect June 22, 2018, replacing the 2012 Final Revised Permit, and mandates the District maintain its 1.2 inch stormwater retention standards as the MEP, in concert with the off-site mitigation program.<sup>640</sup>

A key metric for the District SWMP under the current permit is *Acres Managed*, defined as one acre of land treated by stormwater control measures to the applicable standard expressed in the Permittee's stormwater regulations or

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<sup>628</sup> D.C. MUN. REG. tit. 21, § 556.2 (2010).

<sup>629</sup> *Id.* at § 556.5.

<sup>630</sup> *Id.* at §§ 557–563.

<sup>631</sup> See *Impervious Area Charge*, D.C. Water, <https://www.dewater.com/impervious-area-charge> (last visited June 15, 2019).

<sup>632</sup> 2017 MS4 ANNUAL REPORT, *supra* note 602 at 5.

<sup>633</sup> *Id.* at 6.

<sup>634</sup> *Id.* at 7.

<sup>635</sup> DEP'T OF ENERGY & ENV'T, REVISED STORMWATER MANAGEMENT PLAN 2 (2016) [hereinafter REVISED STORMWATER MANAGEMENT PLAN].

<sup>636</sup> 2017 MS4 ANNUAL REPORT, *supra* note 602 at 5.

<sup>637</sup> *Id.* at 5, 8 (noting the Public Space Green Infrastructure Program and Trees Enterprise Fund budgeted \$2,191,049 for fiscal year 2017).

<sup>638</sup> D.C. NPDES PERMIT, *supra* note 614 at § 2.2.3.

<sup>639</sup> *Id.*

<sup>640</sup> *Id.* at § 8.



consistent with the relevant voluntary program.<sup>641</sup> The MEP for the current permit term is 1,038 Acres Managed, with 307, 116, and 96 Acres Managed assigned to the Anacostia River, Potomac River, and Rock Creek watersheds respectively; 519 Acres Managed may be achieved anywhere in the MS4 Permit Area.<sup>642</sup>

The current MS4 Permit defines the *Public Right-of-Way (PROW)* as “the surface, the air space above the surface (including air space immediately adjacent to a private structure located on public space or in a PROW), and the area below the surface of any public street, bridge, tunnel, highway, railroad track, lane, path, alley, sidewalk, or boulevard, where a property line is the line delineating the boundaries of public space and private property.”<sup>643</sup> The PROW occupies approximately 25 percent of the impervious area of DC.<sup>644</sup> The District Department of Transportation (DDOT) implements stormwater projects in the PROW. DDOT’s responsibilities include planning and constructing Low Impact Development (LID) practices in the PROW, under a 2016 Memorandum of Understanding between DDOT and DOEE.<sup>645</sup>

The 2018 MS4 Permit requires DDOE to attain 62 Acres Managed in the PROW—meaning achieving retention capacity to the MEP—as part of the total 1,038 Acres Managed. These projects may include non-PROW areas that are disturbed as part of the reconstruction of existing PROW or to allow pedestrian access alongside existing PROW.<sup>646</sup>

The Final Permit—and District stormwater regulations—requires that a site-specific determination be made of the maximum amount of stormwater retention, rather than imposing a straight numeric on-site retention requirement. The EPA decided against requiring the District to provide off-site mitigation for all PROW projects that cannot achieve on-site retention of 1.2 inches of stormwater.<sup>647</sup> Rationales include concerns such as: the requirement would disincentive full utilization of on-site retention at sites that could achieve significantly more than that 1.2 inch standard; that it could divert the District’s resources from implementing projects with greater pollutant reduction potential; and that on-site retention totals would not necessarily be enhanced, since the District already has fixed annual numeric limits. Instead, DOEE’s design considerations and decision process continue to be the mechanism for implementing stormwater retention measures in the PROW, as described in the *Stormwater Management Guidebook*.<sup>648</sup> The 2013 Stormwater Management Guidebook includes a “General Retention Compliance Calculator” tool, a series of worksheets for the application and review of the proposed MEP for the reconstruction of the existing PROW.<sup>649</sup> The Guidebook, in Appendix B, Maximum Extent Practicable Process for Existing Public Right-of-Way, contains the decision process for planners, designers, and reviewers to evaluate whether or not a PROW project has

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<sup>641</sup> *Id.*

<sup>642</sup> *Id.* at § 1.5.3.1.

<sup>643</sup> *Id.* at § 8.

<sup>644</sup> REVISED STORMWATER MANAGEMENT PLAN, *supra* note 635 at 44.

<sup>645</sup> 2017 MS4 ANNUAL REPORT, *supra* note 602 at 10, Attachment A: Memorandum of Understanding between the District Department of Transportation (DDOT) and the Department of Energy and the Environment (DOEE) 3-4 (“DDOT shall... 1. Plan, design, construct, maintain, and monitor LID projects in the MS4 area public right-of-way, including permeable pavement, bioretention, tree plantings, and other practices as allowed by the Stormwater Guidebook. The projects shall be projects that are not required by regulation, but that are essential to the District meeting its MS4 permit retrofit requirements.”).

<sup>646</sup> D.C. NPDES PERMIT, *supra* note 614 at §§ 1.5.3.1, 3.2.4.

<sup>647</sup> *Id.* at § 3.2.4; D.C. NPDES PERMIT FACTSHEET, *supra* note 615 at 19 (stating the 2012 Final Revised Permit provided a five-year exemption from achieving the full 1.2 inch on-site retention requirement and conducting off-site mitigation for District-owned projects in the PROW that were greater than or equal to 5,000 square feet. DOEE undertook site plan reviews for 13 Type 1 projects (solely reconstruction in the PROW) and 116 Type 2 (parcel-based development that reconstructs adjacent PROW) and found feasibility to vary widely from 0 to 600 percent retention of the 1.2” SW retention volume).

<sup>648</sup> D.C. NPDES PERMIT, *supra* note 614 at § 3.2.4 (“Each process shall follow the six design steps described in the District’s 2013 *Stormwater Management Guidebook*.”).

<sup>649</sup> 2017 MS4 ANNUAL REPORT, *supra* note 602 at 48.

exhausted every opportunity to achieve the full retention of the regulated stormwater volume.<sup>650</sup> The Guidebook notes meeting the stormwater retention standard may be technically infeasible on many occasions. Site assessment considerations that may limit the allowable placement of BMPs include: available space—which means coordinating with transportation, access, safety, and other applicable requirements, such as the ADA and emergency vehicle needs—ownership of adjacent land, the location of existing utilities—taking a ranked approach of avoidance, mitigation, relocation, and acceptance—the grade differential between road surface and storm drain system, longitudinal slopes, the ability to safely access BMPs for maintenance, infiltration, street profile, and harmonizing with pedestrian circulation. The MEP process assumes transportation design criteria govern when conflicting demands exist.<sup>651</sup> The Final Permit requires that the Permittee develop a set of PROW-optimal designs by 2020. The EPA anticipates these standardized designs will optimize factors including costs, performance, and community palatability.<sup>652</sup>

DDOT issued Green Infrastructure Standards in April 2014 to use for all public and private projects.<sup>653</sup> DDOT GI Standards include standard designs for bioretention, permeable pavements, and tree space design in the PROW. DOEE has noted several challenges related to design and construction remain in making green infrastructure a standard practice in the streetscape.<sup>654</sup> For example, DOEE noted DDOT established pedestrian safety guidelines around depressed stormwater capture areas; DDOT also created designs for curb wall designs to allow depressed planters for stormwater ponding and to ensure the street and sidewalk remain stable. DDOT continues to experience concerns over proper drainage despite establishing soil testing protocols, recognizes the sewer authority limits options to connect underdrains to the sewer system, and has experienced difficulty in finding soil suppliers that will provide the bioretention soil mix and testing results.

Notably, Sustainable DC Plan's Action includes the goal of "[i]ncreas[ing] the use of green infrastructure along public rights of way" and building 25 miles of green alleys, to reduce damage caused by polluted storm runoff.<sup>655</sup> The Plan's Water Goal 2 is to "[r]elieve pressure on stormwater infrastructure and reduce long-term flood risk," with a target of using 75 percent of the landscape to capture rainwater for filtration or reuse by 2032.<sup>656</sup>

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<sup>650</sup> STORMWATER MANAGEMENT GUIDEBOOK, *supra* note 611 at B-5–B-10.

<sup>651</sup> *Id.* at B-4.

<sup>652</sup> D.C. NPDES PERMIT, *supra* note 614 at § 2.4.

<sup>653</sup> *See* D.C. DEP'T OF TRANSP., GREEN INFRASTRUCTURE STANDARDS (2014).

<sup>654</sup> REVISED STORMWATER MANAGEMENT PLAN, *supra* note 635 at 45.

<sup>655</sup> D.C., SUSTAINABLE DC PLAN 95 (2017).

<sup>656</sup> *Id.* at 116.

## Maryland

### Local authority

Of Maryland's 23 counties, six are Commissioner Counties, 11 are Charter Counties, with the power to legislate on almost all local matters,<sup>657</sup> and six are Code Home Rule Counties, possessing home-rule powers and authorized to enact legislation in the areas of the "express powers" of the charter counties.<sup>658</sup>

Maryland applies Home Rule to all of its 157 incorporated cities.<sup>659</sup> Maryland's Local Government code expressly grants municipalities and most counties substantial powers over stormwater system management. The Express Powers Act, encoded in the state Local Government Code, specifically grants Charter and Code counties substantial authority over building, maintaining, and repairing the Public Right-of-Way and storm drainage.<sup>660</sup>



### Stormwater

Maryland's Stormwater Management Act of 2007—encoded in the Environmental Article, Title 4, Subtitle 2, of the Annotated Code of Maryland and in Chapters 26.17.01 and 26.17.02 of the Stormwater Code of Maryland Regulations (COMAR)—requires each county and municipality to develop and implement an MDE-approved local stormwater management program to ensure appropriate stormwater management for any proposed new development and redevelopment project disturbing 5,000 or more square feet of land.<sup>661</sup> State law requires developers implement environmental site design (ESD) to the maximum extent practicable (MEP).<sup>662</sup> "Environmental site design" is another term for green infrastructure, referring to "small-scale stormwater management practices, nonstructural techniques, and better site planning to mimic natural hydrologic runoff characteristics and minimize the impact of land development on water resources."<sup>663</sup>

Maryland's Department of the Environment (MDE) administers the State's MS4 program, under the Water Management Administration's Sediment, Stormwater, and Dam Safety Program. Eleven large or medium MS4s—five large MS4s and five medium MS4s, as well as the State Highway Administration—are regulated under individual

<sup>657</sup> See MD. CONST. art. XI-A, § 3 ("From and after the adoption of a charter by the City of Baltimore, or any County of this State, as hereinbefore provided, the Mayor of Baltimore and City Council of the City of Baltimore or the County Council of said County, subject to the Constitution and Public General Laws of this State, shall have full power to enact local laws of said City or County including the power to repeal or amend local laws of said City or County enacted by the General Assembly, upon all matters covered by the express powers granted as above provided").

<sup>658</sup> See *Id.* at art. XI-F (defining "code county"); see also MD. ASS'N OF CNTYS., COUNTY GOVERNMENT STRUCTURE (2018).

<sup>659</sup> See *Home Rule in Maryland*, MD. MUN. LEAGUE, <http://www.md-municipal.org/index.aspx?NID=414> (last visited June 15, 2019).

<sup>660</sup> MD. CODE ANN., Local Government §§ 10-319, 10-321 (LexisNexis 2013).

<sup>661</sup> See MD. CODE ANN., Environment § 4-201 *et seq.* (passing Maryland's Stormwater Management Law in 1982 and revising it in 2007, requiring developers implement appropriate best management practices (BMPs) in order to maintain, as nearly as possible, pre-development runoff conditions).

<sup>662</sup> *Id.*; MD. CODE REGS. § 26.17.02.01 *et seq.* (requiring developers produce approved stormwater management plans for developments disturbing over 5,000 square feet of land area).

<sup>663</sup> MD. CODE ANN., Environment § 4-201.1(b) (2012); MD. CODE ANN., Environment § 4-203(b)(5)(ii) (including duties for MDE's as adopting regulations and a model local ordinance that require the implementation of ESD to the maximum extent practicable); MD. CODE REGS. § 26.17.02.04(B)(1)(d) ("Local ordinances shall provide for a comprehensive stormwater management plan review and approval process that...requires implementation of ESD to the MEP.").

NPDES (Phase I) municipal stormwater permits.<sup>664</sup> Thirty-five jurisdictions are designated for Phase II MS4 coverage.<sup>665</sup> Nine MS4 jurisdictions are waived from permit requirements.<sup>666</sup> Two municipalities, Cumberland and Frostburg, operate combined sewage systems.<sup>667</sup>

The Chesapeake Bay TMDL limits loading in Maryland to discharges of 39.09 million pounds per year of nitrogen, 2.72 million pounds per year of phosphorus, and 1,218.10 million pounds per year of sediment.<sup>668</sup> The Phase II WIP is the second part of a three-phased planning process that extends to 2017, with a final implementation target date of 2025.<sup>669</sup> The WIP describes implementation strategies for the five major basins: the Potomac River basin, Eastern Shore, Western Shore, the Patuxent River basin, and Maryland's portion of the Susquehanna River basin.<sup>670</sup> The final targets are: total nitrogen reduction of 22 percent (20.3 percent allocated to the stormwater sector); total phosphorus total reduction of 14.9 percent (30.2 percent allocated to the stormwater sector); and total suspended solids reduction of 1.9 percent, from the 2010 baseline.<sup>671</sup> MDE anticipates completing the Phase III WIP later in 2019.

MDE issued the current NPDES General Permit in 2018.<sup>672</sup> The General Permit aims to make progress in meeting the Chesapeake TMDL 2025 Final Targets for nutrient and sediment loads by establishing new requirements for impervious area restoration. Permittees must restore 20 percent of existing developed lands that have little or no stormwater management.<sup>673</sup> This is the first Phase II MS4 general permit to incorporate restoration requirements; the current fourth generation Phase I MS4 permits require commencing and completing restoration of 20 percent of each jurisdiction's untreated impervious area within the 5-year permit term.<sup>674</sup>

The objective for restoration design is based on treating the water quality volume (WQ<sub>v</sub>), or one inch of rainfall. When less than one inch of rainfall is treated, impervious area treatment credits are based on the proportion of the full WQ<sub>v</sub> treated.<sup>675</sup> Specific requirements include: (1) performing a baseline impervious area assessment, identifying water quality improvement opportunities; (2) drafting an impervious area restoration workplan that includes sufficient budget, staffing, and resources; (3) developing an implementation schedule to show the 20 percent

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<sup>664</sup> See Paul Smail, *Work in Progress: The Regulation of Stormwater Discharges from Municipal Separate Storm Sewer Systems in Maryland*, 48 Md. B.J. 12, 18 (2015) (Phase I MS4 permits in Maryland counties are Anne Arundel, Baltimore, Carroll, Charles, Frederick, Harford, Howard, Montgomery, and Prince George's counties, and Baltimore City).

<sup>665</sup> NPDES General Permit for Discharges from Small MS4s, General Discharge Permit No. 13-IM-5500, General NPDES No. MDR055500 A-3-A-4 (Md. Dep't of the Env't, Apr. 27, 2018) [hereinafter MD. PERMIT] (listing all municipalities designated for Phase II coverage and noting approximately 40 small municipalities are currently regulated through the MS4 NPDES program as co-permittees within Carroll, Montgomery, and Prince George's Counties).

<sup>666</sup> MD. DEP'T OF THE ENV'T, FACT SHEET 2 (2017) [hereinafter MD. FACTSHEET] (including Chesapeake City, Burkittsville, New Market, Rosemont, Funkstown, and Woodboro as MS4s serving populations of fewer than 1,000, not contributing substantially to the pollutant loadings of a physically interconnected regulated MS4 jurisdiction, and not needing stormwater controls based on WLAs in an EPA approved TMDL, and as Charlestown, Delmar, and Fruitland as MS4s serving populations of fewer than 10,000 and not requiring additional stormwater controls based on WLAs associated with an EPA approved TMDL).

<sup>667</sup> *Id.* at 3.

<sup>668</sup> EPA, CHESAPEAKE BAY TMDL EXECUTIVE SUMMARY ES-7 (2010); Smail, *supra* note 664 at 17.

<sup>669</sup> UNIV. OF MD. ET AL., MARYLAND'S PHASE II WATERSHED IMPLEMENTATION PLAN FOR THE CHESAPEAKE BAY TMDL iii (2012).

<sup>670</sup> *Id.* at 2 n.4.

<sup>671</sup> *Id.* at iv.

<sup>672</sup> See MD. PERMIT, *supra* note 665 (requiring MS4 owners and operators designated under this general permit must submit a NOI to MDE by October 31, 2018).

<sup>673</sup> *Id.* at 11.

<sup>674</sup> MD. FACTSHEET, *supra* note 666 at 3.

<sup>675</sup> MD. DEP'T OF THE ENV'T, ACCOUNTING FOR STORMWATER WASTELOAD ALLOCATIONS AND IMPERVIOUS ACRES TREATED 3 (2014) (providing a list of practices considered acceptable water quality treatment BMPs for addressing restoration requirements in MS4 permits).

impervious area restoration requirement will be achieved by 2025; and (4) managing a BMP database to track implementation. Restoration efforts may include the use of ESD practices.<sup>676</sup>

State law gives localities the option of assessing stormwater utility fees. In 2012, the State legislature passed H.B. 987. The bill required jurisdictions subject to an NPDES MS4 Phase I permit—the ten largest jurisdictions, including the City of Baltimore and the nine largest counties—to implement a stormwater remediation fee, and to deposit the fee into a local watershed protection and restoration fund dedicated to addressing polluted runoff.<sup>677</sup> In 2015, the legislature eliminated the mandate following significant opposition. But, at the same time, the legislature increased accountability for cleaning up stormwater pollution by requiring these jurisdictions demonstrate adequate funding and plans to reduce their polluted runoff.<sup>678</sup> While counties are required to have adequate funding set aside in a dedicated fund for addressing polluted runoff, how they raise this revenue is left to local discretion.<sup>679</sup>

The current language permits—but does not mandate—localities to adopt a “system of charges” to fund stormwater management program implementation.<sup>680</sup> The provision applies to Phase I MS4s, with an exception for Montgomery County, and for localities that enacted a system of charges under another provision,<sup>681</sup> for the purpose of funding a watershed protection and restoration or similar program. The statute further allows localities, which established a fee under the earlier mandate, to repeal or reduce the fee before July 1, 2016, if it identified other revenue sources to meet its Phase MS4 permit requirements. While localities are required to establish a watershed protection and restoration program, adopting a stormwater remediation fee to fund that program is optional.

If a locality establishes a fee, it must be based on the share of stormwater management services related to the property and provided by the locality. The fee may be charged as a flat rate, a graduated amount, an amount based on the amount of impervious surface on each property, or another method of calculation. The localities must recognize property owners, who have taken steps to address polluted runoff, through a fee reduction. Fees may be used only for certain, enumerated purposes, including, but not limited to, capital improvements for stormwater management, and operation and maintenance of stormwater management systems and facilities.<sup>682</sup>

Recently, Maryland’s appellate court upheld a stormwater utility, but as an excise tax rather than as a fee. In the 2018 case, *Shaarei Tfiloh Congregation v. Mayor and City Council of Baltimore*,<sup>683</sup> the court held Baltimore’s stormwater fee constituted an excise tax rather than property tax, user fee, or service charge. The court determined first that the stormwater fee constituted a tax, because its primary purpose was to raise revenue and the property owners’ only obligation was to pay the charge. The court then classified the stormwater fee as an *excise* rather than property tax, because the exaction was based on the particular use of the property, rather than on the value of the

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<sup>676</sup> See *Id.* (establishing the baseline year for the impervious area assessment may be 2002, the year the 2000 Maryland Stormwater Design Manual was fully implemented. Permittees may take credit for retrofit and redevelopment implemented between 2006 and the beginning of the permit term. Impervious acre credits are based on the level of water quality treatment provided. When water quality BMPs treat one inch of rainfall, the impervious acres draining to the BMP will be considered restored).

<sup>677</sup> Stormwater Fees, CHESAPEAKE BAY FOUNDATION, <https://www.cbf.org/about-cbf/locations/maryland/issues/stormwater-fees.html> (last visited June 15, 2019); H.B. 987 (2012) (amending MD. CODE ANN., Environment § 4-201 *et seq.*).

<sup>678</sup> Stormwater Fees, CHESAPEAKE BAY FOUNDATION, <https://www.cbf.org/about-cbf/locations/maryland/issues/stormwater-fees.html> (last visited June 15, 2019)

<sup>679</sup> *Id.*

<sup>680</sup> MD. CODE ANN., Environment § 4-202.1(a)(2).

<sup>681</sup> *Id.* at § 4-204.

<sup>682</sup> *Id.* at § 4-202.1(h)(4).

<sup>683</sup> *Shaarei Tfiloh Congregation v. Mayor and City Council of Baltimore*, 237 Md. App. 102 (2018) (seeking judicial review of Baltimore City, Maryland Board of Municipal and Zoning Appeal’s rejection of its challenge to stormwater fees assessed on the congregation’s property, based on religious freedom and the city’s powers under state law).

property or property ownership.<sup>684</sup> For an exaction to be a fee, the court pointed out, there must be a relationship between the fee and the benefit to the property owner, and the fee must be reasonable and have some defined relationship to the purpose of the enactment.<sup>685</sup> The court noted that the revenues were “indisputably utilized for the benefit of the general public,” and the ordinance imposed no additional obligation on owners of non-exempt properties apart from the requirement to pay the stormwater fee.<sup>686</sup>

An additional source of funding is the Chesapeake and Atlantic Coastal Bays Nonpoint Source Fund, which provides financial assistance for the implementation of urban and suburban stormwater management practices and stream and wetland restoration.<sup>687</sup> However, capital funds have not been available to finance projects in recent years.<sup>688</sup>

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<sup>684</sup> *Id.* at 110.

<sup>685</sup> *Id.* at 137–138.

<sup>686</sup> *Id.* at 139–143 (basing its decision on the seminal case *Weaver v. Prince George’s County*, 281 Md. 249 (1977), which devised a test separating an excise tax from a property tax. In *Weaver*, the state supreme court devised a test based on the designation placed upon the tax by the Legislature, the subject matter of the tax, and the incidents of the tax, or the measure of the tax and the manner in which it is assessed. The appellate court found the charge was based on an aspect of the property’s use; specifically, the amount of impervious surface, rather than on the value of the property or ownership of the property. The court also noted that most property owners can undertake various efforts to reduce their assessment via the credit system).

<sup>687</sup> See *Chesapeake and Atlantic Coastal Bays Trust Fund*, DNR.Maryland.Gov, <https://dnr.maryland.gov/ccs/Pages/funding/trust-fund.aspx> (last visited June 15, 2019).

<sup>688</sup> E-mail from Megan E. Granato, Senior Program Dir., Chesapeake & Coastal Serv., Md. Dep’t of Nat. Res., to Cynthia R. Harris, Staff Att’y, Env’tl. Law Inst. (Feb. 13, 2019, 13:37 EST) (on file with author) (noting capital funds in prior fiscal years were utilized for green street projects).

## New York

**Local authority**

New York recognizes both Dillon’s Rule and Home Rule law. Article IX of the State Constitution, adopted in 1963, lays out the framework for Home Rule in the State,<sup>689</sup> granting municipalities the power to enact local laws in Section 2(c). In addition to authorizing localities to adopt and amend local laws relating to property, affairs, or government not inconsistent with State law, the State constitution enumerates ten subject areas beyond those areas, subject to the legislature’s prerogative to restrict such local laws. This includes the “acquisition, care, management and use of its highways, roads, streets, avenues and property” and the power to levy assessments for local improvements.<sup>690</sup>

The Municipal Home Rule Law contains the constitutional grants of power to local government, including the authority to care, manage, and use highways, streets, avenues, roads, and property, and to lay assessments for local improvements.<sup>691</sup> Article IX of the State constitution further sets out a Bill of Rights for Local Governments, and provides for a Statute of Local Governments.<sup>692</sup> The grant of powers to local governments under this Statute similarly includes that of levying and administering rates and fees on local property.<sup>693</sup>

The State’s General City law also lays out the powers of cities, which includes a specific grant of power to spend funds for public or municipal purposes, to “lay out, establish, construct, maintain, operate, alter and discontinue streets, sewers and drainage systems,” and to construct and maintain public works and public improvements.<sup>694</sup>

**Stormwater**

Approximately 640,000 people live in New York’s portion of the Chesapeake Bay watershed, which covers 6,250 square miles across 19 counties. The Susquehanna and Chemung Rivers in New York form the northern headwaters of the Bay, with the Susquehanna comprising the Bay’s largest tributary.<sup>695</sup> The State contributes approximately six

<sup>689</sup> See N.Y. DEP’T OF STATE, DIV. OF LOCAL GOV’T SERVS, ADOPTING LOCAL LAWS IN NEW YORK STATE 1, 4 (2015) [hereinafter ADOPTING LOCAL LAWS IN NY] (granting Constitutional home rule power to all counties outside of New York City, and to all cities, towns, and villages).

<sup>690</sup> N.Y. CONST. art. IX, § 2(c). “In addition to powers granted in the statute of local governments or any other law, (i) every local government shall have power to adopt and amend local laws not inconsistent with the provisions of this constitution or any general law relating to its property, affairs or government and, (ii) every local government shall have power to adopt and amend local laws not inconsistent with the provisions of this constitution or any general law relating to the following subjects . . . (6) The acquisition, care, management and use of its highways, roads, streets, avenues and property . . . (8) The levy, collection and administration of local taxes authorized by the legislature and of assessments for local improvements, consistent with laws enacted by the legislature.”)

<sup>691</sup> ADOPTING LOCAL LAWS IN NY, *supra* note 689 at 1, 4 (giving the legislature ability to enact *general* laws affecting the property, affairs, or government of any local government, but a *special* law that does so may not be enacted without a “home rule message”—a request of two-thirds of the total membership of the local legislative body or a request of its chief executive officer concurred in by the majority of such membership—from the locality or localities affected by such law. A recognized exception factors in when a special law serves—that is, bears a direct and reasonable relationship to—a substantial State concern. A separate process exists for New York City); N. Y. MUN. HOME RULE LAW § 10(ii)(a)(6), (8) (2018).

<sup>692</sup> N.Y. CONST. art. IX, § 2(b)(1).

<sup>693</sup> N. Y. MUN. HOME RULE LAW § (ii)(2)(9-a) (2018).

<sup>694</sup> N. Y. GEN. CITY LAW § 20(5), (7), (11) (2018).

<sup>695</sup> *Chesapeake Bay: Chesapeake Bay Watershed Program*, N.Y. DEP’T OF ENVTL. CONSERVATION, <https://www.dec.ny.gov/lands/33279.html> (last visited June 15, 2019) (listing the 19 New York counties either partially or completely in the Chesapeake Bay

percent of the total pollutant load to the watershed.<sup>696</sup> Of this six percent, stormwater contributes 12 percent of the nitrogen load, 13 percent of the phosphorus load, and 30 percent of the sediment load.<sup>697</sup> New York's Final Phase II WIP was issued in 2012, and the New York State Department of Environmental Conservation (NYSDEC) anticipates completing the Final Phase III WIP in late summer of 2019.<sup>698</sup>

There are 26 municipalities in New York's portion of the Chesapeake Bay watershed, all of which are small Phase II MS4s.<sup>699</sup> New York's share of the Chesapeake Bay Watershed overlaps primarily two counties, Chemung County and Broome-Tioga counties. There are 14 and 15 MS4s in Chemung and Broome-Tioga Counties, respectively.<sup>700</sup> There are three municipalities within the Chesapeake Bay watershed with combined sewer systems.<sup>701</sup>

Notably, EPA Region 2, in its 2013 assessment of NYSDEC's MS4 Permit Program for the Chesapeake Bay Watershed, recommended the State consider including more controls on State and county roads to reduce loads from impervious surfaces.<sup>702</sup> EPA Region 2 also advised the State to actively require incorporation of green infrastructure and low impact design in both its MS4 permit and Design Manual rather than simply direct permittees "consider" those techniques.<sup>703</sup>

NYSDEC administers the State Pollutant Discharge Elimination Permit Program (SPDES) under New York's Environmental Code.<sup>704</sup> The SPDES is broader in scope than the requirements under the CWA, in that it controls point source discharges to groundwaters as well as to surface waters.<sup>705</sup> No laws or regulations are specific to the Chesapeake Bay watershed.<sup>706</sup>

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watershed as: Allegany, Broome, Chemung, Chenango, Cortland, Delaware, Herkimer, Livingston, Madison, Oneida, Onondaga, Ontario, Otsego, Schoharie, Schuyler, Steuben, Tioga, Tompkins, and Yates).

<sup>696</sup> EPA REGION 2, ASSESSMENT OF NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION'S MS4 PERMIT PROGRAM FOR THE CHESAPEAKE BAY WATERSHED 1 (2013) [hereinafter ASSESSMENT OF NY'S MS4 PROGRAM].

<sup>697</sup> *Id.*

<sup>698</sup> *Id.* at 2; Phase III Watershed Implementation Plan: Development of New York's Phase III Plan, N.Y. Dep't of Env'tl. Conservation, <https://www.dec.ny.gov/lands/112126.html> (last visited June 15, 2019).

<sup>699</sup> ASSESSMENT OF NY'S MS4 PROGRAM, *supra* note 696 at 2 (including an additional two relatively small urbanized areas: Binghamton and Elmira).

<sup>700</sup> The regulated entities in Chemung County include regulated communities in Chemung: Town of Ashland, Town of Big Flats, City of Elmira, Town of Elmira, Village of Elmira Heights, Town of Horseheads, Village of Horseheads, Village of Millport, Town of Southport, Town of Veteran, Village of Wellsburg, Chemung County Highway Department, Elmira Corning Regional Airport, and Chemung County Solid Waste Transfer Station. The regulated entities in Broome-Tioga Counties include: Broome County, City of Binghamton, Town of Binghamton, Town of Chenango, Town of Conklin, Town of Dickinson, Village of Endicott, Town of Fenton, Village of Johnson City, Town of Kirkwood, Village of Port Dickinson, Town of Union, Town of Vestal, Tioga County and Town of Owego.

<sup>701</sup> E-mail from Lauren Townley, Research Scientist, Div. of Water, N.Y. State Dep't of Env'tl. Conservation, to Cynthia R. Harris, Staff Att'y, Env'tl. Law Inst. (Aug. 28, 2018, 09:22 EST) (on file with author) (including the Johnson City, Binghamton, and Elmira-Chemung County sewer districts).

<sup>702</sup> ASSESSMENT OF NY'S MS4 PROGRAM, *supra* note 696 at 3.

<sup>703</sup> *Id.* at 4.

<sup>704</sup> See N.Y. ENVTL. CONSERV. LAW §§ 17-0801–17-0831 (2018); see also N.Y. COMP. CODES R. & REGS. tit. 6, § 750 (2018).

<sup>705</sup> N.Y. COMP. CODES R. & REGS. tit. 6, § 750-1.1, 750-1.15 (stating SPDES permits for stormwater discharges to waters of the State are valid up to five years but permits for discharges to groundwaters are valid up to ten years).

<sup>706</sup> *But see* N.Y. COMP. CODES R. & REGS. tit. 6, § 750-1.11 ("The provisions of each issued SPDES permit shall ensure compliance with . . . (5) any more stringent limitations, including those: . . . (ii) necessary to implement a total maximum daily load/waste load allocation/load allocation established pursuant to section 303(d) of the act and 40 CFR part 130.7").



NYSDEC issued its first MS4 permit in 2003.<sup>707</sup> The current General Permit was originally issued May 2015, with the second modification effective January 13, 2016.<sup>708</sup> Germane to this report, Minimum Control Measures 6, or Pollution Prevention/Good Housekeeping, directs permittees to “[c]onsider and incorporate cost effective runoff reduction techniques and green infrastructure in the routine upgrade of the existing stormwater conveyance systems and municipal properties to the MEP.”<sup>709</sup> This may be compared with the Phase I SPDES Permit issued to New York City, effective August 2015, which similarly requires the City to develop a Stormwater Management Program (SWMP) incorporating the same measure. However, the requirement for the City to incorporate green infrastructure is more stringent, with the permit directing the MS4 to “[c]onsider and if feasible and cost-effective incorporate, runoff reduction techniques and green infrastructure during planned municipal upgrades *including municipal rights of way.*” *Green streets* is included in the list of examples.<sup>710</sup>

Few stormwater utilities in New York have implemented a stormwater user fee.<sup>711</sup> The State funds green infrastructure projects through multiple grants, although there is no specific guidance for green streets.<sup>712</sup> State law establishes a 75 percent matching grant program for nonpoint source abatement and control.<sup>713</sup> The program treats storm water discharges of a permitted municipality as a non-agricultural nonpoint source for the purpose of qualifying.<sup>714</sup>

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<sup>707</sup> ASSESSMENT OF NY’S MS4 PROGRAM, *supra* note 696 at 1.

<sup>708</sup> SPDES General Permit for Stormwater Discharges from MS4s, Permit No. GP-0-15-003 (N.Y. State Dep’t of Env’tl. Conservation, May 1, 2015).

<sup>709</sup> *Id.* at 48 (“Some examples include replacement of closed drainage with grass swales, replacement of existing islands in parking lots with rain gardens, or curb cuts to route the flow through below grade infiltration areas or other low cost improvements that provide runoff treatment or reduction.”).

<sup>710</sup> *Id.* at 25; *see also* N.Y. STATE DEP’T OF ENVTL. CONSERVATION, FACT SHEET FOR SPDES PERMIT FOR STORMWATER DISCHARGES FROM MS4S OF N.Y.C. (2015) (administering both an MS4 and a CSS, subject to a Combined Sewer Overflow Long Term Control Plan (CSO LTCP)).

<sup>711</sup> *See, e.g.*, Thomas Pudney, *Explained: Ithaca’s Stormwater Utility Fee Changes*, ITHACA J. (Oct. 19, 2018, 2:10 PM).

<sup>712</sup> *See Green Infrastructure Funding Sources*, DEP’T OF ENVTL. CONSERVATION, <https://www.dec.ny.gov/chemical/108961.html> (last visited June 15, 2019).

<sup>713</sup> N.Y. ENVTL. CONSERV. LAW § 17-1409 (noting eligible projects must be located with a water body identified by the commissioner pursuant to § 17-1407; N.Y. ENVTL. CONSERV. LAW § 17-1405(a) (directing the commissioner to, every five years, prepare a report identifying water bodies requiring additional action to control nonpoint sources of pollutions in order to maintain water quality standards).

<sup>714</sup> N.Y. ENVTL. CONSERV. LAW § 17-1409(6).

## Pennsylvania

### Local authority



Pennsylvania municipalities are classified by population into nine classes of counties, four classes of cities, and two classes of townships. As of 2016, there were 2,560 municipal corporations comprising 67 counties, 56 cities, 956 boroughs, one incorporated town, 93 first class townships and 1,453 second class townships.<sup>715</sup>

Both Dillon’s Rule and Home Rule apply in Pennsylvania. The State adopted Dillon’s Rule in *Philadelphia v. Fox*, an 1870 case.<sup>716</sup> Pursuant to a 1968 constitutional authorization, the Legislature in 1972 enacted a law granting municipalities the option of home rule.<sup>717</sup> Home rule is subject to restrictions found in both federal and state constitutions, in state laws applicable to home rule municipalities, and in a municipality’s home rule charter.

Chapter 11 of Title 53 of the Pennsylvania Statutes explicitly authorizes municipalities to lay out and improve streets, including the construction of sewers and drains.<sup>718</sup> The Municipal Authorities Act, as amended in Chapter 56 of Title 53, empowers municipalities to create stormwater authorities, which are separate local entities that have defined responsibilities such as stormwater planning, management, and implementation.<sup>719</sup> Stormwater authorities may impose “reasonable and uniform” rates for the purpose of carrying out its functions.<sup>720</sup> In June 2013, Act 68 passed

<sup>715</sup> See *PA Municipalities List*, PA. DEP’T OF CMTY. & ECON. DEV., <https://dced.pa.gov/local-government/municipal-statistics/municipalities/> (last visited June 15, 2019); PA. LOCAL GOV’T COMMISSION, PA. LEGISLATOR’S MUN. HANDBOOK 7 n.3 (5th ed. 2017) [hereinafter LEGISLATOR’S HANDBOOK] (noting Pennsylvania is home to one first class city, one second class city, one second class-A city, and 53 third class cities); 53 PA. CONS. STAT. § 55201 (2019) (defining townships of the first class as those with a population density of at least 300 people per square mile that have elected to choose first class township status. All other townships are of the second class); 53 PA. CONS. STAT. § 101 (noting cities of the first class are populated by 1 million or more people (Philadelphia); second class by between 250,000 and 1 million (Pittsburgh); cities of the third class by 80,000 to under 250,000 and which elect the classification (Scranton); second class A by between 80,000 and 250,000 and elect the classification; boroughs not classified based on population).

<sup>716</sup> LEGISLATOR’S HANDBOOK, *supra* note 716 at 9 (citing *Philadelphia v. Fox*, 64 Pa. 169 (1870)).

<sup>717</sup> PA. CONST. art. IX, §§ 2, 3; 22 Summ. Pa. Jur. 2d Municipal and Local Law § 3:1 (2d ed.) (“A municipality that has adopted a home rule charter may exercise any powers and perform any function not denied by the Constitution of Pennsylvania, by statute or by its home rule charter. All grants of municipal power to municipalities governed by a home rule charter under this subchapter, whether in the form of specific enumeration or general terms, shall be liberally construed in favor of the municipality.”); 53 PA. CONS. STAT. §§ 2901–3171 (encoding the idea that existed prior to adoption of the Home Rule Charter and Optional Plans Law, the General Assembly first authorized home rule only for Philadelphia in 1949, and then enacted the Optional Third Class City Charter Law in 1957. The Home Rule Charter and Optional Plans Law gives municipalities the right to enact either home rule charters or one of six optional plans, and, thereafter, to operate within the parameters of the selected plans).

<sup>718</sup> 53 PA. CONS. STAT. § 1721 (“Every municipal corporation shall have power to lay out, establish, or re-establish grades of streets and alleys, or parts thereof, and to construct bridges, piers, and abutments therefor, and sewers and drains in any street or alley, or through, or on, or over private property.”).

<sup>719</sup> *Id.* at § 5607(a) (“Every authority incorporated under this chapter shall be a body corporate and politic and shall be for the purposes of financing working capital; acquiring, holding, constructing, financing, improving, maintain and operating, owning or leasing, either in the capacity of a lessor or lessee, projects of the following kind and character and providing financing for insurance reserves: . . . (18) Storm water planning, management and implementation as defined in the articles of incorporation by the governing body. Authorities, existing as of the effective date of this paragraph, already operating storm water controls as part of a combined sewer system, sanitary sewer system or flood control project may continue to operate those projects.”).

<sup>720</sup> *Id.* at § 5607(d) (“Every authority may exercise all powers necessary or convenient for the carrying out of the purposes set forth in this section, including, but without limiting the generality of the foregoing, the following rights and powers: . . . (9) To fix, alter, charge and collect rates and other charges in the area served by its facilities at *reasonable and uniform rates* to be determined exclusively by it for the purpose of providing for the payment of the expenses of the authority, the construction, improvement, repair, maintenance and operation of its facilities and properties”) (emphasis added); *West v. Hampton Tp.*

the General Assembly, adding stormwater responsibilities as an authorized project permitted under the Municipal Authorities Act for existing and newly created authorities. The BMPs for Stormwater Act 123, enacted in July 2014, further defined implementation of stormwater charges.<sup>721</sup> These provisions give explicit authority to municipalities not designated as “Home Rule.” While only two jurisdictions imposed stormwater fees as of 2013, currently a growing number of jurisdictions either have or will establish such fees due to these changes in state law.<sup>722</sup>

## Stormwater

Pennsylvania comprises 67 counties and 2,566 municipalities distributed across 376 designated stormwater management watersheds. The Bureau of Clean Water, within the Department of Environmental Protection (DEP), administers Stormwater management in the Commonwealth. The Bureau oversees NPDES permitting and compliance under the State’s Stormwater Management Planning Act.

### Stormwater Management Act of 1978

The Stormwater Management Planning Act of 1978, Act 167, governs stormwater in the Commonwealth. This statute requires counties adopt and implement a stormwater management plan (SWMP) for each watershed located in the County.<sup>723</sup> Counties adopt SWMPs in consultation with the municipalities located within each watershed. At least one municipality must be represented on watershed plan advisory committees.<sup>724</sup> Act 167 enumerates several items for inclusion in each SWMP. Relevant to this white paper is an assessment of alternative runoff control techniques and their efficiency in the particular watershed.<sup>725</sup> Counties submit their SWMPs to DEP for review and approval.<sup>726</sup> SWMPs are reviewed and revised at least every five years.

Act 167 mandates municipalities conduct certain activities consistent with the applicable SWMP. This includes major developments, obstructions, flood control projects, public utilities services and facilities, and, notably, highways and transportation facilities.<sup>727</sup> Municipalities must also adopt or update ordinances and regulations—covering zoning, subdivision and development, building codes, and erosion and sedimentation—necessary for regulating development consistently with the SWMP.<sup>728</sup>

The statute also lays out DEP’s powers and duties regarding stormwater oversight.<sup>729</sup> This includes publishing guidelines for storm water management and model storm water ordinances for use by counties and

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Sanitary Authority, 661 A.2d 459 (Pa. Super. Ct. 1995) (finding municipalities can collect fees); LEGISLATOR’S HANDBOOK, *supra* note 716 at 25.

<sup>721</sup> See 53 PA. CONS. STAT. § 5607(d)(34) (“In the case of an authority that performs storm water planning, management and implementation, reasonable and uniform rates may be based in whole or in part on property characteristics, which may include installation and maintenance of best management practices approved and inspected by the authority.”).

<sup>722</sup> See, e.g., Day, *supra* note 531; Bill Wellock, *Stormwater 101: Answering Your Questions about the New Fee*, THE CITIZENS’ VOICE, <https://www.citizensvoice.com/news/stormwater-101-answering-your-questions-about-the-new-fee-1.2432686> (Jan. 13, 2019); Andy Mehalsnick, *State lawmakers Address the Stormwater Runoff Fee*, PA EYEWITNESS NEWS, <https://www.pahomepage.com/news/state-lawmakers-address-the-stormwater-runoff-fee/1706474855> (Jan. 16, 2019, 6:21 PM).

<sup>723</sup> Stormwater Management Act (1978), Pub. L. 864, No. 167 § 5(a).

<sup>724</sup> *Id.* at § 6(a).

<sup>725</sup> *Id.* at § 5(b)(7).

<sup>726</sup> *Id.* at §9.

<sup>727</sup> *Id.* at § 11(a).

<sup>728</sup> *Id.* at § 11(b).

<sup>729</sup> *Id.* at § 14.

municipalities.<sup>730</sup> The guidelines for storm water management and model storm water ordinances are submitted to the General Assembly for approval.<sup>731</sup>

### NPDES Permitting

Municipalities regulated as MS4s and CSS's have legal obligations, under the NPDES program and independent of Act 167, related to stormwater management. There are two Large MS4s, no Medium MS4s, and 1059 Small MS4s in Pennsylvania.<sup>732</sup> Of the 748 permitted MS4 facilities, 237 were issued individual permits and 511 under a general permit.<sup>733</sup> There are 126 CSSs.<sup>734</sup>

Small MS4s may apply for coverage under the 2018 NPDES General Permit for Stormwater Discharges from Small MS4s (PAG-13). These MS4s must, by September 2022, adopt an ordinance compliant with DEP's 2022 Model Stormwater Management Ordinance. The ordinance focuses on regulating stormwater runoff from developments and construction. However, it does recognize the benefit of using green infrastructure and low impact development (LID) to improve water quality.<sup>735</sup>

There are roughly 334 MS4s discharging to the Chesapeake Bay. Municipalities discharging to impaired waters or waters within the Chesapeake Bay watershed are required to undertake additional stormwater control practices. Each MS4 under permit coverage—not just in the Chesapeake Bay—is required to reduce its current pollutant load by 10 percent.<sup>736</sup> PAG-13 maintains the requirement of Chesapeake Bay Pollutant Reduction Plans (PRPs) for the Chesapeake Bay watershed. MS4s discharging to the watershed must identify BMPs to reduce loads for sediment, total phosphorus, and total nitrogen by 10, 5, and 3 percent, respectively, within five years of approval of permit coverage.<sup>737</sup>

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<sup>730</sup> *Id.* at § 14(a)(3).

<sup>731</sup> *Id.* at § 14(b).

<sup>732</sup> *Municipal Stormwater*, PA. DEP'T OF ENVTL. PROT., <https://www.dep.pa.gov/Business/Water/CleanWater/StormwaterMgmt/Stormwater/pages/default.aspx> (last visited June 15, 2019).

<sup>733</sup> *Pennsylvania Municipal Separate Storm Sewer Systems (MS4)*, PA. DEP'T OF ENVTL. PROT. [http://www.depreportingservices.state.pa.us/ReportServer/Pages/ReportViewer.aspx?/WMS/WMS\\_Permitted\\_Facilities\\_MS4](http://www.depreportingservices.state.pa.us/ReportServer/Pages/ReportViewer.aspx?/WMS/WMS_Permitted_Facilities_MS4) (last visited June 15, 2019).

<sup>734</sup> Data from Maria Schumack, P.E., Environmental Engineer, Pa. Dep't of Env'tl. Prot., Bureau of Clean Water (Aug. 2, 2018) (noting these numbers do not account for combined systems); *Separate Sewer System*, PHILA. WATER DEP'T, [http://www.phillywatersheds.org/watershed\\_issues/stormwater\\_management/separate\\_sewer\\_system](http://www.phillywatersheds.org/watershed_issues/stormwater_management/separate_sewer_system) (last visited June 15, 2019) (noting, for example, the City of Philadelphia manages both a MS4 and CSS. The separate sewer system covers more than one-third of the sewer service area in Philadelphia with approximately 455 stormwater outfalls throughout the city).

<sup>735</sup> PA. DEP'T OF ENVTL. PROT, 2022 MODEL STORMWATER MANAGEMENT ORDINANCE (3800-PM-BCW0100j) art. III, § 301(G)(3) ("If methods other than green infrastructure and LID methods are proposed to achieve the volume and rate controls required under this Ordinance, the SWM Site Plan must include a detailed justification demonstrating that the use of LID and green infrastructure is not practicable."); *id.* at Art. IV. § 403(C) ("For any SWM Site Plan that proposes to use any BMPs other than green infrastructure and LID practices to achieve the volume and rate controls required under this Ordinance, the Municipality will not approve the SWM Site Plan unless it determines that green infrastructure and LID practices are not practicable.")

<sup>736</sup> E-mail from Maria Schumack, P.E., Env'tl. Eng'r, Pa. Dep't of Env'tl. Prot., Bureau of Clean Water, to Cynthia R. Harris, Staff Att'y, Env'tl. Law Inst. (Aug. 2, 2018, 14:50 EST) (noting the type and number of BMPs would therefore vary for each MS4).

<sup>737</sup> PA. DEP'T OF ENVTL. PROT, PAG-13 Authorization to Discharge Under the General Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges From All Municipal Separate Storm Sewer Systems (MS4s) Approval of Coverage. NPDES Permit No. 3800-PM-BCW0100d app. D at 29 (May 2016). Under PAG-13, MS4 TMDL Plans are required only for MS4s with sediment and/or nutrient WLAs in a TMDL, and MS4s with TMDL Plan obligations must apply for an individual permit.

## Virginia

### Local authority

Virginia is a Dillon Rule state, meaning that local governments have the authority to act only in instances where they have been expressly granted such authority from the Commonwealth, or where such authority is necessarily implied by an express grant.<sup>738</sup> Courts must narrowly interpret delegations of power to local governments.<sup>739</sup>



### Stormwater

Virginia's Department of Environmental Quality (DEQ) administers the State's NPDES stormwater program under the Virginia Pollutant Discharge Elimination System (VPDES) Permit Program. The Virginia Soil and Water Conservation Board is the body charged with oversight in terms of permitting, regulating, and controlling stormwater runoff in the Commonwealth.<sup>740</sup> Currently, there are 113 MS4 Permittees, including 11 Phase I and 102 Phase II MS4s, and 3 CSSs in the Commonwealth.<sup>741</sup>

MS4 permits focus primarily on improving water quality and require operators to implement an MS4 Program Plan in compliance with the Virginia Stormwater Management Act (VSMA) and the Virginia Stormwater Management Program (VSMP) Permit regulations.<sup>742</sup> The current General Permit went into effect on November 1, 2018, and expires October 31, 2023.<sup>743</sup>

The Potomac, Rappahannock, York, and James River Basins flow into the Chesapeake Bay Watershed. The Chesapeake Bay Preservation Act, enacted in 1988 as a key element of the Commonwealth's non-point source management program, leverages local authority over land use decisions to improve water quality, under Board oversight. The Chesapeake Bay Preservation Area Designation and Management Regulations supplement the statute.

The statute requires each Tidewater locality to adopt a program based on the Act and Regulations.<sup>744</sup> Specifically, localities must delineate Chesapeake Bay Preservation Areas, using the criteria promulgated by the Board,<sup>745</sup> and

<sup>738</sup> See *Winchester v. Redmond*, 25 S.E. 1001 (1896) (adopting the Dillon Rule in Virginia).

<sup>739</sup> See MICHIE'S JURISPRUDENCE OF MUNICIPAL CORPORATIONS, *supra* note 579 at n.366.

<sup>740</sup> See VA. CODE ANN. § 62.1-44.15 (2019) ("It shall be the duty of the Board and it shall have the authority: . . . (18) to be the lead agency for the Commonwealth's nonpoint source pollution management program, including coordination of the nonpoint control elements of programs developed pursuant to certain state and federal laws, including § 319 of the federal Clean Water Act").

<sup>741</sup> VIRGINIA MS4 PERMITTEES 2018-2023, VA. DEP'T OF ENVTL. QUALITY, *available at* [https://www.deq.virginia.gov/Portals/0/DEQ/Water/PollutionDischargeElimination/MS4/20190116\\_UpdatedMS4\\_Permittee\\_Listfinalrmhedit%20Compliant%20\(4\).pdf?ver=2019-03-08-163108-703](https://www.deq.virginia.gov/Portals/0/DEQ/Water/PollutionDischargeElimination/MS4/20190116_UpdatedMS4_Permittee_Listfinalrmhedit%20Compliant%20(4).pdf?ver=2019-03-08-163108-703) (last visited June 15, 2019).

<sup>742</sup> VA. CODE ANN. §§ 62.1-44.15:24–62.1-44.15:50; 9 VA. ADMIN. CODE § 25-31-10 *et seq.* (2019); *Municipal Separate Storm Sewer System (MS4) Permits*, VA. DEP'T OF ENVTL. QUALITY, <http://www.deq.virginia.gov/Programs/Water/StormwaterManagement/VSMPPermits/MS4Permits.aspx> (last visited June 15, 2019); 9 VA. ADMIN. CODE § 25-31-120 (governing storm water discharges and paralleling CWA §402(p)); 9 VA. ADMIN. CODE § 25-31-100 (setting out requirements for permit applications).

<sup>743</sup> 9 VA. ADMIN. CODE § 25-890-40, part 1(B) (codifying General Permit No. VAR04 into the stormwater regulations); ("Implementation of MCMs in Part I E and the Chesapeake Bay and local TMDL requirements in Part II (as applicable) consistent with the provisions of an iterative MS4 program required pursuant to this general permit constitutes compliance with the standard of reducing pollutants to the 'maximum extent practicable'").

<sup>744</sup> VA. CODE ANN. § 62.1-44.15:67 *et seq.*

<sup>745</sup> *Id.* at § 62.1-44.15:74.

incorporate general water quality protection measures into their comprehensive plans, zoning ordinances, and subdivision ordinances.<sup>746</sup> The Board promulgates criteria for these localities to use in determining the ecological and geographic scope of Chesapeake Bay Preservation Areas, provides technical assistance, develops procedures local governments use in designating the Chesapeake Bay Preservation Areas, and ensures local government comprehensive plans, zoning ordinances, and subdivision ordinances are in compliance.<sup>747</sup>

The Commonwealth's MS4 operators are afforded up to three full five-year permit cycles to implement the necessary reductions to meet the Level 2 (L2) scoping run reductions, with a deadline of 2025.<sup>748</sup> Level 2 implementation equates to an average reduction of 9 percent of nitrogen loads, 16 percent of phosphorus loads and 20 percent of sediment loads from impervious regulated acres, and 6 percent of nitrogen loads, 7.25 percent of phosphorus loads and 8.75 percent sediment loads beyond 2009 progress loads—which serves as the baseline level—and beyond urban nutrient management reductions for pervious regulated acreage.<sup>749</sup> This translates into a requirement MS4 operators develop TMDL Action Plans each permit term, incorporating the means and methods to reach five percent, 40 percent, and finally 100 percent, of the required L2 reductions by the end of each permit term.<sup>750</sup> MS4 operators may adjust the levels of reduction between pervious and impervious land uses within their service area, provided the total pollutant load is met, and they may leverage the Chesapeake Bay Watershed Nutrient Credit Exchange Program.<sup>751</sup> The current General Permit includes a section on TMDL Special Conditions and states the goal of a total reduction of 40 percent of L2 by the end of the permit term.<sup>752</sup>

Notably, the Commonwealth's Phase II WIP list of local implementation strategies for the Urban/Suburban Source Sector includes "investigat[ing] developing programs that will utilize green roofs, *green streets*, and other similar practices on publicly owned lands to demonstrate the efficiency of these practices to [sic] public and increase awareness." Suggested resources to implement this strategy include a dedicated funding source.<sup>753</sup>

State law currently provides for a Stormwater Local Assistance Fund, collecting monies from sources including penalties and charges. The Fund provides matching grants to local governments for implementing stormwater BMPs, including to meet Chesapeake Bay TMDL requirements.<sup>754</sup> The WIP Phase III, with DEQ anticipating submission to the EPA in 2019.

Virginia's stormwater management regime has undergone significant revision over the past decade, including the integration of prior and separate regimes over stormwater, erosion and sediment control, and provisions of the Virginia Chesapeake Bay Preservation Act. Currently, all localities operating an MS4 system—both Phase I and II MS4s—or that previously administered a *VSMP*, must adopt and administer a consolidated Virginia Erosion and

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<sup>746</sup> *Id.* at § 62.1-44.15:74.

<sup>747</sup> *Id.* at § 62.1-44.15:70; *Id.* at § 62.1-44.15:72.

<sup>748</sup> VA. SOIL & WATER CONSERVATION BD., FACT SHEET VSMP GENERAL PERMIT VAR040 23 (2013) [hereinafter VSMP FACTSHEET].

<sup>749</sup> COMMONWEALTH OF VA., CHESAPEAKE BAY TMDL PHASE I WATERSHED IMPLEMENTATION PLAN 91, 93 (2010) [hereinafter Chesapeake TMDL Phase I WIP].

<sup>750</sup> VSMP FACTSHEET, *supra* note 748 at 23.

<sup>751</sup> *Id.* at 26; 9 VA. CODE ANN. § 10.1-603.15:1 *et seq.*; 9 VA. ADMIN. CODE § 25-40.

<sup>752</sup> 9 Va. Code Ann. § 25.890-40 (II)(A)(9) ("Reductions required in Part II A 3, A 4, and A 5 shall be achieved through one or more of the following: (a) BMPs approved by the Chesapeake Bay Program; (b) BMPs approved by the department; or (c) a trading program described in Part II A 10.").

<sup>753</sup> COMMONWEALTH OF VA., CHESAPEAKE BAY TMDL PHASE II WATERSHED IMPLEMENTATION PLAN 52 (2012) (*emphasis added*).

<sup>754</sup> See VA. CODE ANN. § 62.1-44.15:29.1 ("Moneys in the Fund shall be used to meet (i) obligations related to the Chesapeake Bay total maximum daily load (TMDL) requirements...(iv) water quality requirements related to the permitting of small municipal separate storm sewer systems. The grants shall be used solely for stormwater capital projects, including (a) new stormwater best management practices...(d) low-impact development projects.").

Stormwater Management Program (VESMP).<sup>755</sup> The State Water Control Board approves VESMPs, which are thereafter subject to a five-year review.<sup>756</sup> Each locality that does not operate an MS4, and which previously opted to have DEQ administer a VSMP for it pursuant to earlier legislation, may select one of three options: (1) adopt its own VESMP; (2) adopt its own VESMP, with DEQ technical support; or (3) continue to administer its current Virginia Erosion and Sediment Control Program (VESCP), while the State Water Control Board administers a VSMP on its behalf.<sup>757</sup>

Title 15.2 of the Code of Virginia states provides that “[a]ny locality, by ordinance, may establish a utility or enact a system of service charges to support a local stormwater management program” consistent with the Commonwealth’s stormwater management legal framework.<sup>758</sup> As of 2014, 17 municipalities had enacted stormwater fees, most located in coastal areas subject to flooding. Eleven of these were established prior to the Chesapeake Bay TMDL.<sup>759</sup>

Both the Virginia Supreme Court and the United States District Court for the Western District of Virginia have upheld the validity of local stormwater fees. In the 1998 *Twietmeyer v. City of Hampton* case, the State Supreme Court held the City’s stormwater management fee bore a “rational correlation” to the amount of stormwater runoff. The court explained this was due to the fee imposed being higher for non-residential than for residential properties, and the fact the fee was directly tied to stormwater management, rather than intended to raise general revenue. Thus, the fee was indeed a fee and not a tax.<sup>760</sup> In the 2017 federal case, *Norfolk S. Ry. Co. v. City of Roanoke*, the court upheld a local stormwater utility ordinance, passed pursuant to State law, as a regulatory fee rather than a tax.<sup>761</sup> The court similarly applied a test to determine a “rational relationship” existed between the utility charge and the stormwater management services provided.<sup>762</sup> The court recognized all residents benefited from the services, but added the parcels, to which the fee applied, received a special benefit from the funded stormwater management services.<sup>763</sup>

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<sup>755</sup> See Virginia Erosion and Stormwater Management Act, 2016 Va. SB 673 (requiring any locality operating a MS4 permit or VSMP to adopt a VESMP regulating any land-disturbing activity disturbing 10,000 or more square feet generally, or 2,500 or more square feet if located in a Chesapeake Bay Preservation Area).

<sup>756</sup> VA. CODE ANN. § 62.1-44.15(19); VA. DEP’T OF ENVTL. QUALITY, LOCAL VSMP AUTHORITIES (2017) (mapping of current VSMP authorities).

<sup>757</sup> See VA. CODE ANN. § 62.1-44.15:27 (administering the retained category of “VSMP” authority—not “VESMP”—for these localities, and will manage only the quality and quantity of stormwater runoff resulting from development that disturbs one acre or more of land).

<sup>758</sup> *Id.* at § 15.2-2114.

<sup>759</sup> Day *supra* note 531.

<sup>760</sup> *Twietmeyer v. City of Hampton*, 255 Va. 387, 391–92 (1998).

<sup>761</sup> See *Norfolk S. Ry. Co. v. City of Roanoke*, 2017 WL 6599008 \*7 (W.D. Va. 2017) (complaining the ordinance constituted a tax discriminating against a rail carrier, in violation of the Railroad Revitalization and Regulatory Reform Act of 1976. The court drew upon the Supreme Court’s Head Money Cases, in which the Court determined that a government levy constitutes a tax if it raises revenue to spend for the general public welfare, whereas if *regulation* is the levy’s primary purpose, it constitutes instead a fee).

<sup>762</sup> *Id.* at 8–9.

<sup>763</sup> *Id.* at 11.

## West Virginia

### Local authority



The 1936 Home Rule Amendment to West Virginia’s State constitution provides that municipalities may adopt their own charters, consistent with State law.<sup>764</sup> However, local government authority remains restricted to a degree; for example, taxing powers are quite limited. In 2007, the State legislature created the Municipal Home Rule Pilot Program and the Municipal Home Rule Board to oversee the program.<sup>765</sup> The pilot program was set to expire July 1, 2013, but the legislature amended the Home Rule statute in 2013, opening the Pilot Program to 20 more municipalities and giving the four participating municipalities until June 1, 2014, to withdraw.<sup>766</sup> The legislature rewrote the Home Rule statute again in 2015, opening the Pilot Program to an additional 14 municipalities, four of which had to be Class IV, or with a population of 2,000 or fewer.<sup>767</sup> In March 2019, Governor Justice signed into law S.B. 4, which made the Home Rule Pilot Project permanent. Thirty-four of the State’s 231 cities currently operate under Home Rule.<sup>768</sup> Notably, and relevant to Green Streets, the Pilot Program explicitly forbids participating municipalities from passing laws and regulations contrary to environmental law and laws governing taxation, bidding on government construction and other contracts, and wages for construction of public improvements.<sup>769</sup>

Chapter 8 of the State code lays out the powers and limitations of municipal corporations, including those pertaining to storm water systems and the public right-of-way. General powers granted to West Virginia municipalities include

<sup>764</sup> W. VA. CONST., art. VI, § 39(a) (“The Legislature shall provide by general laws for the incorporation and government of cities, towns and villages[.] Under such general laws, the electors of each municipal corporation, wherein the population exceeds two thousand, shall have power and authority to frame, adopt and amend the charter of such corporation, or to amend an existing charter thereof, and through its legally constituted authority, may pass all laws and ordinances relating to its municipal affairs: Provided, That any such charter or amendment thereto, and any such law or ordinance so adopted, shall be invalid and void if inconsistent or in conflict with this constitution or the general laws of the state then in effect, or thereafter from time to time enacted.”).

<sup>765</sup> W. VA. MUN. HOME RULE BD., WEST VIRGINIA MUNICIPAL HOME RULE PILOT PROGRAM: SUMMARY REPORT 2017 1 (2017) [hereinafter MUNICIPAL HOME RULE PILOT PROGRAM]; See W. VA. CODE § 8-1-5a.

<sup>766</sup> MUNICIPAL HOME RULE PILOT PROGRAM, *supra* note 765 at 1–2 (amending the statute again in 2014, prohibiting participating municipalities from passing ordinances that conflict with any state statutes regarding firearms); W. VA. CODE § 8-1-5a(c)(1) (authorizing, beginning July 1, 2015, thirty Class I, Class II and Class II municipalities and four Class IV municipalities to participate in the Municipal Home Rule Pilot Program).

<sup>767</sup> W. VA. CODE § 8-1-5a(b) (continuing the Municipal Home Rule Pilot Program until July 1, 2019); W. VA. CODE § 8-1-3 (defining a Class I city as home to a population of 50,000 or more, a Class II city with a population between 10,000–50,000, a Class III city with a population of between 2,000–10,000, and a Class IV town or village home to a population of 2,000 or fewer residents).

<sup>768</sup> Shauna Johnson, *Home rule is Becoming a Permanent Option for West Virginia’s Cities*, METRO NEWS (Mar. 27, 2019 12:54 PM), <http://wvmetronews.com/2019/03/27/home-rule-is-becoming-a-permanent-option-for-west-virginias-cities/>; W. VA. S.B. 4 (2019), (“The Municipal Home Rule Pilot Program is established as a permanent program and shall be identified as the Municipal Home Rule Program. Any plan or amendment to a plan approved by the board during the period of the Municipal Home Rule Pilot Program is continued. Any ordinance, act, resolution, rule, or regulation enacted by a participating municipality under the provisions of this section during the period of the Municipal Home Rule Pilot Program shall continue in full force and effect unless and until repealed[.]”); MUNICIPAL HOME RULE PILOT PROGRAM, *supra* note 765 at 2 (limiting home rule additions for Class IV cities to four annually).<sup>771</sup>: See *Id.* at § 8-20-1a(a) (“Any municipality may acquire, construct, establish and equip and thereafter repair, maintain and operate a combined waterworks, sewerage and stormwater system . . . and such municipality may provide by ordinance that when such stormwater system shall have been acquired, constructed, established and equipped, the same shall thereafter by owned, repaired, maintained and operated as a combined undertaking under the provisions of this article.”); *Id.* at § 8-20-1a(b) (“Any municipality which has combined its waterworks, sewerage and stormwater systems . . . may hereafter construct extensions, additions, betterments and improvements . . . and may finance . . . by the issuance of bonds”).

<sup>769</sup> See W. VA. CODE § 8-1-5a(i)(1)–(2), (5), (14).



the authority to establish, maintain, and improve both the public right-of-way, and drainage systems.<sup>770</sup> This includes specific authority to acquire, operate, maintain, and improve combined sewer systems.<sup>771</sup> The State code further grants all municipalities the plenary power and authority over municipal affairs consistent with other State law and local charter. Such municipal affairs include the acquisition, care, management and use of the City's streets, avenues, roads, alleys, ways, and property.<sup>772</sup>

Chapter 8 also lays out provisions permitting localities to assess abutting property owners for making improvements to the public right-of-way and constructing storm sewer systems in the public right-of-way, and to assess the associated costs on abutting property.<sup>773</sup> Localities have expansive authority over the repair, maintenance, operation, and management of combined storm water systems, and may charge users of a combined system for the use and service of the system. Such revenues may be used solely for repairing, maintaining, and operating the system.<sup>774</sup> Localities may also issue revenue bonds to pay the costs of constructing, extending, or improving such public works.<sup>775</sup>

Chapter 16 of the State code, which governs Public Health laws, separately grants municipalities and sanitary districts explicit authority to “own, acquire, construct, equip, operate, and maintain” a stormwater collection system and control system, and associated facilities.<sup>776</sup> The chapter also grants governing bodies the power to establish “just and equitable rates, fees” for operation and maintenance of a stormwater system. These fees are assessed to individual properties served by the stormwater system, or whose property is protected by the system.<sup>777</sup>

## Stormwater

The U.S. EPA authorized West Virginia to administer the CWA's NPDES program and related general permits program in 1982.<sup>778</sup> The State legislature empowered the West Virginia Department of Environmental Protection (WVDEP) to regulate NPDES permitting program under Chapter 22, Article 11 of the West Virginia Code (the Water Pollution

<sup>770</sup> See *Id.* at § 8-12-5 (“[E]very municipality and the governing body thereof shall have plenary power and authority therein by ordinance or resolution, as the case may require, and by appropriate action based thereon . . . (1) To lay off, establish, construct, open, alter, curb, recurb, pave or repave and keep in good repair, or vacate, discontinue and close, streets, avenues, roads, alleys, ways, sidewalks, drains and gutters, for the use of the public . . . (7) To provide for the construction and maintenance of water drains, the drainage of swamps or marchlands and drainage systems . . . (28) . . . and for the drainage of lots by proper drains and ditches”) (emphasis added).

<sup>771</sup> See *Id.* at § 8-20-1a(a) (“Any municipality may acquire, construct, establish and equip and thereafter repair, maintain and operate a combined waterworks, sewerage and stormwater system . . . and such municipality may provide by ordinance that when such stormwater system shall have been acquired, constructed, established and equipped, the same shall thereafter by owned, repaired, maintained and operated as a combined undertaking under the provisions of this article”); *Id.* at § 8-20-1a(b) (“Any municipality which has combined its waterworks, sewerage and stormwater systems...may hereafter construct extensions, additions, betterments and improvements . . . and may finance . . . by the issuance of bonds”).

<sup>772</sup> *Id.* at § 8-12-2(a)(5).

<sup>773</sup> See *Id.* at § 8-18-1; See also *Id.* at §8-18-6 (empowering local governments to construct storm and sanitary sewers and charge abutting properties all or part of the associated costs); *Id.* at §8-18-8 (requiring costs of public improvement projects to be assessed to abutting parcels, and establishing process for equitably apportioning those costs); *Id.* at ch. 8, art. 18, pts. V–VI (discussing other methods of financing such public improvements, including, e.g., § 8-18-13 (assessment certificates)); and See *Id.* at §§ 8-18-14–8-18-16 (issuing of bonds).

<sup>774</sup> *Id.* at § 8-20-10(a)(1)–(2); *Id.* at § 8-20-12 (collecting revenues may also be used for providing adequate reserve fund and depreciation funds, and paying the principal of and interest upon revenue bonds used to pay for the system).

<sup>775</sup> *Id.* at § 16-13-11.

<sup>776</sup> *Id.* at §16-13-1(a)(2).

<sup>777</sup> *Id.* at § 16-13-16(b).

<sup>778</sup> U.S. ENV'T'L PROT. AGENCY, WEST VIRGINIA STORMWATER PROGRAM REVIEW: FINAL REPORT 6 (2015); W. VA. DEP'T OF ENVTL. PROT., WEST VIRGINIA/NPDES GENERAL WATER POLLUTION CONTROL PERMIT STORMWATER DISCHARGES FROM SMALL MUNICIPAL SEPARATE STORM SEWER SYSTEMS: FACT SHEET AND RATIONALE (2014) [hereinafter PERMIT FACT SHEET AND RATIONALE].

Control Act),<sup>779</sup> and Title 47, Series 10 of the West Virginia Code of State Regulations (CSR), which focuses on the designation of separate storm sewers for regulation under the permit program.<sup>780</sup> WVDEP's Division of Water and Waste Management (DWWM) oversees the State MS4 permitting program. DWWM also oversees the State's Nonpoint Source Program. Combined Sewer Systems, of which there are 60 in the State,<sup>781</sup> are required to develop Combined Sewer System Long-Term Control Plans.

DWWM authorizes coverage to all Phase II MS4s under a single general permit. As of 2018, there were no Phase I MS4s and 53 Phase II MS4s.<sup>782</sup> Designated MS4 communities in West Virginia are *all* considered "small," as each has a population numbering less than 100,000.<sup>783</sup> Forty-seven Phase MS4s are categorized under the following entities: One county, 35 municipalities (cities or towns), two state transportation agencies, four schools, universities, or hospitals, and five federal facilities.<sup>784</sup> Due to 2010 Federal Census showing increases in population, more jurisdictions became eligible for designation as Phase II MS4s.<sup>785</sup>

The first MS4 permit was issued in 2003.<sup>786</sup> The latest General Permit was issued in 2014.<sup>787</sup> Notably, the revised permit is more stringent, reflecting lessons learned from a January 9, 2014, chemical spill into drinking water source that affected approximately 300,000 West Virginians.<sup>788</sup>

The Chesapeake Bay TMDLs and the Watershed Implementation Plan (WIP) apply to the portion of the state draining to the Potomac or James Rivers, and subsequently the Chesapeake Bay. Specifically, the counties of Jefferson, Berkeley, Morgan, Hampshire, Mineral, Grant, Hardy, and Pendleton drain to the Chesapeake Bay; three MS4s and

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<sup>779</sup> See W. VA. CODE. § 22-11-8(a) ("The secretary may, after public notice and opportunity for public hearing, issue a permit for the discharge or disposition of any pollutant or combination of pollutants into waters of this state upon condition that the discharge or disposition meets or will meet all applicable state and federal water quality standards and effluent limitations and all other requirements of this article and article three, chapter twenty-two-b of this code."); W. VA. CODE. § 22-11-8(b) ("It is unlawful for any person, unless the person holds a permit therefor from the department, which is in full force and effect, to: (1) Allow sewage, industrial wastes or other wastes, or the effluent therefrom, produced by or emanating from any point source, to flow into the waters of this state.")

<sup>780</sup> See W. VA. CODE R. § 47-10-2(2.29)(f) (determining whether an MS4 requires NPDES permit coverage under the criteria established pursuant to 40 C.F.R. §122.32); W. VA. CODE R. § 47-10-3(3.1), (3.5)(a) (forbidding the discharge of pollutants from a point source into State waters except as authorized by a State NPDES permit, under § 22-11-4, and limiting the effectiveness of permits to five years); W. VA. CODE R. § 47-10-13(13.4.a) (noting separate storm sewers are defined as point sources subject to the permit program); W. VA. CODE R. § 47-10-13(13.6.a.2) (authorizing the WVDEP to issue general permits to regulate separate storm sewers).

<sup>781</sup> E-mail from John Morgan, W. Va. Dep't of Env'tl. Prot., to Cynthia R. Harris, Staff Att'y, Env'tl. Law Inst. (Jan. 28, 2019, 12:20 EST) (on file with author).

<sup>782</sup> See W. VA. DEP'T OF ENVTL. PROT., WEST VIRGINIA MS4 COMMUNITIES; See also EPA, WEST VIRGINIA STORMWATER PROGRAM REVIEW: FINAL REPORT 31 (2015) (reporting the WVDEP oversaw 47 Phase II MS4s).

<sup>783</sup> PERMIT FACT SHEET AND RATIONALE, *supra* note 778 at 4.

<sup>784</sup> EPA, WEST VIRGINIA STORMWATER PROGRAM REVIEW: FINAL REPORT 31–32 (2015) (issuing 10 Phase II MS4s permit waivers. Most waivers were approved because the MS4s operate combined sewer systems and the jurisdiction's population numbers was under 2,000. One is a municipality with fewer than 1,000 residents and no resources to implement permit requirements). 40 C.F.R. §122.32(c)–(e) (permitting coverage may be waived if the MS4 serves a population of less than 1,000 or 10,000 and meets other enumerated criteria in each circumstance).

<sup>785</sup> PERMIT FACT SHEET AND RATIONALE, *supra* note 778.

<sup>786</sup> EPA, WEST VIRGINIA STORMWATER PROGRAM REVIEW: FINAL REPORT 35 (2015).

<sup>787</sup> General National Pollution Discharge Elimination System Water Pollution Control Permit No. WV0116025 1 (W. Va. Dep't of Env'tl. Prot., July 22, 2014).

<sup>788</sup> PERMIT FACT SHEET AND RATIONALE, *supra* note 778 at 3–4 (recognizing the limited resources a small population has to apply to a regulatory program. Permittees may not have the ability to recognize all contaminated discharges, that they may not own the water treatment/delivery services, and the source water protections areas and treatment plans may not be located within the geographical jurisdiction of permittees. The permit now: (1) authorizes non-stormwater discharges provided they have been determined not to be substantial contributors to a particular small MS4; (2) allows uncontaminated water line flushing unless documented health or safety emergencies occur; and (3) places more emphasis placed on MEP).

four combined sewer systems are located in the Chesapeake Bay watershed.<sup>789</sup> These jurisdictions must address the Chesapeake Bay TMDL, via the West Virginia WIP, although WVDEP does not impose specific pollution reduction requirements to individual local jurisdictions. Other TMDLs apply across the state based on Hydrologic Groups.<sup>790</sup> The current General Permit features a revised TMDL Implementation section, along with the MCMs to describe how permittees may demonstrate compliance with TMDL requirements.<sup>791</sup> Required load reductions for the Chesapeake Bay watershed, as of publication of the Phase II WIP, are: 33 percent for nitrogen, 35 percent for phosphorus, and 6 percent for sediment.<sup>792</sup>

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<sup>789</sup> E-mail from Dr. Sebastian Donner, Stormwater Specialist, W. Va. Dep't of Env'tl. Prot. Div. of Water & Waste Mgmt, to Cynthia R. Harris, Staff Att'y, Env'tl. Law Inst. (Jan. 24, 2019, 11:09 EST) (on file with author) (noting the MS4s include the City of Martinsburg, Berkeley County, and West Virginia Department of Transportation).

<sup>790</sup> W. VA. DEP'T OF ENV'TL PROT., WEST VIRGINIA STORMWATER MANAGEMENT AND DESIGN GUIDANCE MANUAL 13 (2012); PERMIT FACT SHEET AND RATIONALE, *supra* note 778 at 8–9. General National Pollution Discharge Elimination System Water Pollution Control Permit No. WV0116025 42 (W. Va. Dep't of Env'tl. Prot., 2014) (requiring permittees to modify the SWMP to include BMPs targeting the pollutant of concern, within six months of approval of a new TMDL. Within two years of approval of the SWMP, permittees must develop BMPs targeting the pollutant(s) of concern and report the implementation of those BMPs in the third and all subsequent annual reports).

<sup>791</sup> See PERMIT FACT SHEET AND RATIONALE, *supra* note 778 at 8–9 (2014) (noting that existing permittees not expected to have a reduction in loadings affecting the TMDL, nor is significant municipal growth anticipated. However, new stormwater loadings associated with municipal stormwater discharges will be included in the State's 2015 stormwater assessment, which will evaluate the success or failure of the WIP strategy to not increase delivered loading from Potomac watershed urban stormwater sources beyond 2010NA levels).

<sup>792</sup> See W. VA. WIP DEVELOPMENT TEAM, WEST VIRGINIA'S CHESAPEAKE BAY TMDL FINAL PHASE II WATERSHED IMPLEMENTATION PLAN (2012).

## Conclusions

If Chesapeake Bay jurisdictions are to make effective use of Green Streets policies in meeting their stormwater obligations and effectively managing public funds, they should take into account five lessons learned:

### 1. Determine the best method for promoting the policy

Green Streets advocates must gain the support of three key stakeholder groups: Public officials, agency staff, and the community, or ratepayers. This requires articulating and quantifying the benefits of green infrastructure. The stated goal may be to meet regulatory mandates under a TMDL, MS4 Permit, Combined Sewer Overflow (CSO) Control Plan, or a consent decree. If there is no such mandate, promoters can illustrate the need by effectively leveraging data on how stormwater runoff, contributed by the public right-of-way, impacts local water quality. The more environmentally conscious the community, the more straightforward this effort will be. Some localities credited successful pilot projects with garnering support, by providing a visual example. One local official advised starting with an internal working group at the staff level to identify and address potential technical challenges before making a proposal to local officials and stakeholder organizations.

### 2. Ensure sufficient flexibility in implementing and updating the policy based on experience

A locality needs to decide whether the best strategy is to make its policy legally binding, such as by incorporating it into the municipal code. Some Green Streets jurisdictions found it simpler to gain political and public support by structuring their policy as a set of nonbinding guidelines. A valuable tactic available to regional planning and transportation agencies that award grants to local jurisdictions is to incentivize integration of green infrastructure into public right-of-way projects when awarding funding.

A number of localities stressed the importance of taking into account the local physical context of each jurisdiction. The policy should accommodate the infiltration capacity of local soils and provide for exemptions when integrating green infrastructure is impracticable for technical or financial reasons. However, the policy should require exemptions be justified, documented, and reported, so that they do not swallow the rule. The process should be clear and transparent and require agency staff to develop alternative approaches for meeting stormwater runoff requirements when on-site conditions do not allow for installing green infrastructure. For example, the policy could require stormwater runoff mitigation off-site or contributing funding to regional efforts aimed at improving water quality.

Localities benefiting from several years implementing their policies advised reevaluating Green Streets policies and plans as living documents. This permits course-corrections. For example, a locality may shift from an early strategy of incorporating green infrastructure whenever possible, to a more holistic, regional approach or evaluating individual projects to determine when Green Streets is the best "tool" to accomplish stormwater and watershed goals.

### 3. Designate a reliable funding source

Localities reported greater adherence to the spirit and letter of their Green Streets policies when they could rely on a sustainable source of funding. The most reliable option is an established stormwater utility, often to repay general obligation bonds. Nearly as critical is ensuring a reliable source of funding for maintenance to ensure green infrastructure facilities are sustainable over the long-term. When implementing a combined Complete and Green Streets policy, it is vital to allocate funding specific to the green infrastructure elements.

### 4. Coordinate across all agencies with an interest in the PROW

Responsibility for public right-of-way capital projects and operations/maintenance may fall under the jurisdiction of multiple City agencies. Localities should outline a clear project design, planning, construction, and post-construction process to ensure incorporation of green infrastructure at every step of capital development and during the subsequent operation & maintenance period. Design work should be a combined effort of project

engineers, hydrologists, and landscape architects. Localities should also align their goals and strategies with the governing watershed district, and find opportunities to meet multiple goals by partnering on projects.

**5. Recognize the importance of public engagement**

Several Green Streets jurisdictions stressed the importance of investing sufficient time, effort, and resources into community education in order to win public support for the policy and for proposed projects. Localities should engage with the public as early as possible on projects and take a context-sensitive approach in designing projects, looking at site conditions, neighborhood characteristics, and community values. For example, residents may react negatively to projects that narrow streets and eliminate parking. This means being flexible and willing to adjust projects in order to obtain community buy-in. While the resulting project may not include all desired Green Streets elements, every component included in the final project provides a benefit.

## APPENDIX A: Model Ordinance

### ORDINANCE NO. [####]

WHEREAS [...]

[Provide contextual information for the locality implementing the Green Streets policy. Include past action, reasons for adopting the policy, and specific goals. This is separate from the INTENT section, which is part of the operative text and succinctly states the purpose of the policy itself in clear terms.]

NOW, THEREFORE be it ordained by the [GOVERNING BODY] of the [JURISDICTION] that [APPLICABLE SECTION OF MUNICIPAL CODE ADDRESSING THE PUBLIC RIGHT-OF-WAY] is hereby amended by adding [SECTION], "Green Streets," as follows:

### Section [####] GREEN STREETS

#### Section 1. INTENT

The goal of this Section is to systematically transform [JURISDICTION] roadways into Green Streets in order to infiltrate stormwater runoff and improve [JURISDICTION] and regional water quality, while furthering [JURISDICTION's] ability to meet its requirements under the [MUNICIPAL SEPARATE STORM SEWER PERMIT/CSO LONG TERM CONTROL PLAN/TMDL WIP/CONSENT DECREE]. Additional goals are to minimize flooding, reduce air pollution, increase resiliency, green space, and recreational opportunities, and to enhance property values while promoting economic development, neighborhood aesthetics, and community quality-of-life. Green Streets will aid [JURISDICTION] in meeting these goals by systematically integrating Green Infrastructure facilities into all capital improvement projects in the public right-of-way, whenever practicable.

#### Section 2. DEFINITIONS

The following words and phrases are hereby defined with respect to their use in this Ordinance:

[If the local code already defines any of these terms, reference them and consider updating them. Alternately, specify that the definitions below pertain to those terms only as used in this Ordinance.]

- (a) **[AGENCY NAME]** means the [AGENCY RESPONSIBLE FOR IMPLEMENTING GREEN STREETS POLICY]. Where this Ordinance applies to a capital improvement project undertaken by a [JURISDICTION] agency not the [AGENCY NAME], public company, utility, or private developer, [AGENCY's] duties under this Ordinance apply instead to the [JURISDICTION] agency, public agency, public company, utility, or private developer, except for where this Ordinance makes explicitly distinct requirements.
- (b) **Capital improvement projects** include new roadway construction, reconstruction of existing facilities, rehabilitation and resurfacing projects, streetscape enhancements, utility installation and replacement projects (including water, sewer, communication, gas, and other utility lines, and undergrounding of overhead utilities), and road repair (except for maintenance activities).
- (c) **Disproportionate cost** exists when compliance with Section 3 constitutes a minimum of [NUMBER] percent of the total capital improvement project cost.
- (d) **Green Infrastructure** comprises products, technologies, and practices that use natural systems, or engineered systems that mimic natural processes, to treat and infiltrate stormwater on-site where it is generated, in order to improve water quality and reduce the volume and rate at which stormwater leaves the site. Specific examples include: preservation of natural features, resources, and drainageways,

permeable paving materials, bioretention areas and vegetated swales, rain gardens, infiltration trenches, landscaped medians and parkways, underground detention, planter boxes, and street trees.

- (e) **Green Streets** are public rights-of-way that incorporate Green Infrastructure in order to improve water quality by providing for reduction and on-site pretreatment of stormwater prior to eventual release into local waterways. Green Streets reduce and mitigate the stormwater and other environmental impacts of surface transportation, and provide ancillary environmental, economic, and social benefits.
- (f) **Maintenance activities**, in regard to the public right-of-way, include actions that are intended to preserve the system, retard future deterioration, and maintain the functional condition of the roadway without increasing the structural capacity. These activities include, but are not limited to, joint repair, pavement patching (filling potholes), shoulder repair, signing, striping, minor signal upgrades, and repairs to drainage systems.<sup>793</sup> In regard to Green Street facilities, maintenance activities include actions intended to keep the assets in serviceable condition. These activities include moving, replanting, cleaning, sweeping, and repairing.
- (g) **Maximum Extent Practicable** is the extent to which [AGENCY NAME] is required to implement Green Infrastructure as the primary method for managing stormwater in the public right-of-way. This standard is met once [AGENCY NAME] takes all practicable, technically feasible measures, which do not result in a disproportionate cost, to incorporate Green Infrastructure into a capital improvement project subject to this Ordinance. This is an iterative standard that evolves over time, as knowledge and techniques for managing urban stormwater runoff improve.
- (h) **Public Right-of-Way (PROW)** comprise public streets, roads, alleys, sidewalks, bridges, pedestrian paths, greenways, and similar surface transportation infrastructure.

### Section 3. SCOPE OF APPLICABILITY

- (a) [AGENCY] shall incorporate, to the maximum extent practicable, Green Infrastructure into all [CITY/TOWN/COUNTY/BOROUGH]-funded capital improvement projects in the public right-of-way, which:
  1. Construct, reconstruct, or otherwise disturb [NUMBER] or more square feet of impervious surface; and  
*[the number of square feet may be customized to be consistent with the locality's available and projected resources].*
  2. Do not constitute maintenance activities.

[Option for requirement to meet/calculate infiltration rate/standard for project area, and provide site condition factors]<sup>794</sup>

- (b) Notwithstanding (a), [AGENCY] may consider and implement alternative methods and facilities for managing stormwater, if [AGENCY] determines that:
  1. The alternative approach more effectively, and cost-effectively, manages stormwater; and
  2. The alternative approach provides environmental and social benefits, in addition to stormwater management, that are equivalent to, or greater than would be attained by utilizing Green Infrastructure.

[AGENCY] shall record its rationale for selecting the alternative approach and make that information publicly available and easily accessible, including placing that information on [AGENCY's] website.

- (c) When a capital improvement project falls outside the scope of (a), [AGENCY] does not take an alternative approach under (b), or only partial stormwater management is achieved, then [AGENCY] shall provide for off-site mitigation or pay a fee into the Green Streets Project Fund.
  1. Projects disturbing [NUMBER] or fewer square feet are excepted from this provision.

<sup>793</sup> *Questions and Answers about ADA/Section 504, supra* note 60 at 18 (using the U.S. Dept. of Transportation's definition regarding ADA requirements applicable to alternations to existing public facilities).

<sup>794</sup> *See, e.g.,* CITY OF ANN ARBOR, MICH., POLICY STATEMENT: STORMWATER MANAGEMENT GUIDELINES FOR PUBLIC STREET CONSTRUCTION AND RECONSTRUCTION (2014) (naming site conditions used in determining the infiltration standard include whether the site is located within a floodplain, slope is greater or less than 20 percent, and soil infiltration rate).

2. [List of specific types of projects] are excepted from this provision.<sup>795</sup>
  3. If [AGENCY] pays a fee into the Green Streets Project Fund, [AGENCY] shall contribute an amount that is [NUMBER] percent of the total construction costs for the project.
- (d) This Ordinance, including the requirements under (a-c) of this Section, applies to privately constructed streets and parking lots.
- (e) This Ordinance applies to all capital improvement projects, including those implemented by a [JURISDICTION] agency not the [AGENCY], public agencies, public companies, utilities, and private developers.

#### Section 4. EXEMPTIONS

- (a) [AGENCY], a [JURISDICTION] agency not the [AGENCY], public agency, public company, utility, or developer may propose a capital improvement project be exempted from the requirements of Section 3 when incorporation of Green Infrastructure into the public right-of-way:
1. Is likely to result in threats to public safety, health, or welfare;
  2. Is prohibited by law;
  3. Imposes a disproportionate cost;
  4. Faces severe constraints due to concerns about topography, historical and cultural sites, natural resources, insufficient right-of-way, unresolvable utility conflicts, flood hazard areas, groundwater contamination, or slope or grade of the project site, or is otherwise technically infeasible; or
  5. Is not needed and will have no beneficial impact on water quality.
- (b) Every proposed exemption must undergo the following process:
1. The Director of [AGENCY] may issue a recommendation that a capital improvement project be exempted under (a).
    - i. If a capital improvement project is implemented by a [JURISDICTION] agency not the [AGENCY], then the director of that agency may issue the recommendation after consulting with the Director of [AGENCY].
    - ii. If a capital improvement project is implemented by a public agency, public company, utility, or developer, then the public agency, public company, utility, or developer may submit an application for a waiver that the capital improvement project be exempted for any of the reasons listed in (a).
  2. The [PUBLIC BODY: CITY/COUNTY COUNCIL, PLANNING/TRANSPORTATION COMMISSION] shall review every recommendation or application for a waiver and shall either approve or disapprove each recommendation or application.
  3. A public agency, public company, utility, or developer, whose waiver is denied, may appeal the decision to [PUBLIC BODY].
  4. Notwithstanding (1) and (2), the Director of [PUBLIC SAFETY AGENCY] may issue an exemption if the Director of [PUBLIC SAFETY AGENCY] determines (a)(1) applies, with notice given to the [PUBLIC BODY] within [NUMBER] days [*if business days, reference definition elsewhere in Municipal Code*].
  5. [AGENCY], the [JURISDICTION] agency not the [AGENCY], public agency, public company, utility, or developer shall, when the [PUBLIC BODY] exempts a capital improvement project under this Section:
    - i. Provide for off-site mitigation or pay a fee into the Green Streets Project Fund;
    - ii. Provide notice of the exemption to the [CITY COUNCIL MEMBER/ALDERMAN/SUPERVISOR] whose [WARD/DISTRICT] includes the project; and
    - iii. Maintain a record of the exemption, including the rationale for exempting the project and supporting documentation.

<sup>795</sup> See CITY OF PORTLAND, OR., GREEN STREETS POLICY 1(b) (2007) (listing emergency maintenance and repair projects, repair and replacement of sidewalks and driveways, pedestrian and trail replacement, tree planting, utility pole installation, street poles, traffic signal poles, traffic control signs, fire hydrants, where this use of funds would violate contracted or legal restrictions).



1. In the case of a capital improvement project implemented by [AGENCY], the agency shall make the record of the exemption publicly available and easily accessible, including placing that information on [AGENCY's] website.
2. In the case of a capital improvement project implemented by a [JURISDICTION] agency not the [AGENCY], that agency shall provide this record to [AGENCY]. Both that agency and [AGENCY] shall make this record publicly available and easily accessible, including placing that information on both agencies' websites.
3. In the case of a capital improvement project implemented by a public agency, public company, utility, or developer, the public agency, public company, utility, or developer shall provide this record to [AGENCY]. [AGENCY] shall make this record publicly available and easily accessible, including placing that information on [AGENCY's] website.

## Section 5. SOURCE OF FUNDS

- (a) Funding available to implement the capital costs of implementing this Ordinance [MAY/MUST] be allocated from the [STORMWATER UTILITY FUND], [ENTERPRISE FUND], [REVOLVING STATE FUND AND OTHER FEDERAL AND STATE REVOLVING LOANS], [REGIONAL TRANSPORTATION FUNDING], [GAS TAX REVENUE], the Green Streets Projects Fund, grants, and other public and private funds. Funding derived from general obligation and other bonds [MUST/MAY] be repaid by monies from the [STORMWATER UTILITY FUND].
- (b) Funding available to operate and maintain Green Infrastructure facilities designed and constructed under this Ordinance [MAY/MUST] be allocated from the [STORMWATER UTILITY FUND/GENERAL FUND], and may be supplemented by grants and donations.
- (c) There is established within the [AGENCY/CAPITAL IMPROVEMENT PROGRAM BUDGET] a Green Streets Project Fund. The Director shall allocate monies from the Green Streets Project Fund to carry out activities that fulfill the intent of this policy.
- (d) [JURISDICTION] will actively seek additional sources of appropriate funding to implement this Ordinance.

## Section 6. INTER-DEPARTMENTAL AND INTER-AGENCY COORDINATION

- (a) [AGENCY] shall, in conjunction with other [JURISDICTION] agencies and bureaus with interest occurring in the public right-of-way, develop a protocol for coordinating Green Streets projects.
  1. [AGENCY] shall complete this protocol before [DATE] and review it for potential revisions every [NUMBER] years; and
  2. The protocol must, at minimum:
    - i. Ensure the intent of this Ordinance is carried out throughout the design, planning, construction, and post-construction phases of capital improvement projects that are subject to the requirement to incorporate Green Infrastructure;
    - ii. Clarify specific roles and responsibilities in carrying out the intent of this Section, including designating [AGENCY] staff in charge of coordinating Green Street activities;
    - iii. Require Green Street and Green Infrastructure performance measures specific to each project;
    - iv. Address potential conflicts with utilities; and
    - v. Consider the long-term costs and activities associated with maintaining Green Streets facilities.
- (b) [AGENCY] shall coordinate and foster partnerships with [THE STATE], [COUNTIES/CITIES], [REGIONAL WATERSHED DISTRICT], public transportation providers, regional transportation agencies, and neighboring jurisdictions to ensure that streets, roads, sidewalks, and all other transportation corridors connecting to other jurisdictions comply with the intent of this Ordinance. School districts, [IMPROVEMENT DISTRICTS BIDS/NIDS], [REDEVELOPMENT DISTRICTS], and other special taxing districts shall ensure that streets, roads, sidewalks, and all other transportation corridors not owned by the [CITY/TOWN/COUNTY/BOROUGH], but which are within its jurisdictional limits, comply with the intent of this Ordinance.

## Section 7. MAINTENANCE

- (a) [AGENCY] shall determine the maintenance requirements and estimated costs for each Green Streets project and facility during the design and planning phase of capital improvement projects.
- (b) [AGENCY] shall develop, before [DATE], a plan for maintaining Green Streets facilities in a functional condition that achieves the performance goal for each facility and that furthers the intent of this Ordinance. [AGENCY] will review and revise this plan, as appropriate, every [NUMBER] years. At a minimum, the maintenance plan must include:
  1. A protocol for regularly inspecting Green Streets facilities, at a minimum of [NUMBER/YEAR in TIMES OF YEAR] and maintaining Green Streets facilities, at a minimum of [NUMBER/YEAR in TIMES OF YEAR];
  2. A system for grading the condition of Green Streets facilities; and
  3. Guidelines for ensuring quality control and assurance.
- (c) [AGENCY] shall ensure all maintenance [CREWS/PERSONNEL/CONTRACTORS] responsible for Green Streets facilities are trained on implementation of the maintenance plan, and on best practices particular to inspecting and maintaining Green Infrastructure facilities.

## Section 8. GREEN STREETS TRAINING AND EDUCATION

- (a) Every [NUMBER] years, [AGENCY] shall provide staff [*optional*: NUMBER hours of] professional development and training on the latest and best practices in Green Street infrastructure through participation in conferences, classes, seminars, or workshops, or combination thereof.
- (b) Every [NUMBER] years, [AGENCY] shall provide [*optional*: NUMBER hours of] training to [maintenance CREWS/PERSONNEL/CONTRACTORS] on best practices in maintaining Green Streets facilities.
- (c) [AGENCY] shall seek all current and potential future sources of funding for staff professional development and training on Green Streets planning, design, engineering, construction, and maintenance.

## Section 9. PUBLIC EDUCATION, ENGAGEMENT, AND OUTREACH

- (a) [AGENCY] shall propose a Green Streets public education, engagement, and outreach plan, including a proposed budget, to [GOVERNING BODY] before [DATE].
- (b) [AGENCY] shall consider, but not limit itself to, the following outreach activities in developing the Green Streets public education, engagement, and outreach plan:
  - a. Media relations goals and strategies;
  - b. Online, telephone, and in-person surveys;
  - c. Open houses;
  - d. Door-hangers;
  - e. Tours;
  - f. Community events;
  - g. Green Streets facility site markers;
  - h. Town hall meetings;
  - i. Exhibits;
  - j. Lectures;
  - k. School visits and field trips;
  - l. Newsletters;
  - m. Publicity materials;
  - n. Art and other competitions;
  - o. Recognition of community, education, business, and youth leaders;
  - p. Postal mail; and
  - q. Social media.
- (c) The public education, engagement, and outreach plan must contain a protocol for measuring significant changes in public opinion pertaining to Green Streets and to implementation of this Ordinance.

- (d) The public education, engagement, and outreach plan must include a strategy to identify and engage underrepresented communities.
- (e) [AGENCY] shall implement the Green Streets public education, engagement, and outreach plan developed under this Section.

## Section 10. MONITORING AND REPORTING

- (a) [AGENCY] shall, before [DATE], establish and present to [GOVERNING BODY/COMMISSION] benchmarks and performance-measures that track [JURISDICTION's] progress in meeting the intent of this Ordinance. At a minimum, these benchmarks and performance-measures must quantify and measure:
  1. Progress integrating Green Infrastructure into new and existing public-right-of-way, including: *[List suggests options for quantifiable outputs]*
    - i. Number of Green Streets assets and facilities;
    - ii. Amount of impervious area restored;
    - iii. Total acreage drained;
    - iv. Miles of public right-of-way incorporating Green Infrastructure facilities;
    - v. Percent of impervious area, in total, and percent of impervious area constituting the public right-of-way;
    - vi. Number of street trees;
    - vii. Volume of stormwater runoff managed; *[E.g., indicating the first ½" of rainfall falling on the public right-of-way is retained. May include for each Green Street asset.]*
    - viii. Number of Green Streets capital projects completed and in progress;
    - ix. The costs associated with each Green Streets project implemented under this Ordinance;
    - x. The costs of the maintenance and operations activities carried out in association with Green Streets facilities;
    - xi. The cost savings associated with implementing this policy; and
    - xii. Exemptions made under Section 4, including the total number of exemptions, the number of exemptions by exemption category, the rationale for recommending and approving each exemption, and associated off-site mitigation projects and contributions into the Green Streets Project Fund.
  2. Progress toward improving water quality, including: *[List suggests options for quantifiable outcomes]*
    - i. Contaminants, as measured at selected [MS4/CSO] outfalls;
    - ii. Progress to meeting wasteload allocations [e.g., removal of sediment measured in tons and phosphorus measured in pounds];
    - iii. Number of days per year water advisories are posted, by water body;
    - iv. Flood events; and
    - v. *[For CSS: Number of sanitary sewer overflows].*
  3. Green Streets training and education activities, including:
    - i. Number of [JURISDICTION] staff who participated in training and education activities on the subject of Green Streets;
    - ii. Number of [JURISDICTION] staff who participated in activities in each of the following categories: Green Streets planning, design, engineering, construction, and best practices in maintaining Green Streets facilities; and
    - iii. Number of total hours [JURISDICTION] staff participated in training and education activities, and the average number of hours per person.
  4. Public outreach and education activities, including: *[List suggests options for quantifiable outputs and outcomes]*
    - i. Progress in implementing the Green Streets public outreach and education plan developed under Section 9;
    - ii. Number, by category, of public outreach and education activities;
    - iii. Number, by category, of attendees and participants at, and recipients of, public outreach and education activities;

- iv. Efforts to engage underrepresented communities, consideration of their suggestions, and documentation of improvements that resulted from their input; and
  - v. Any measurable and significant changes in public opinion pertaining to Green Streets and implementation of this Ordinance.
- (b) [AGENCY] shall review the benchmarks and performance-measures developed in (a) every [NUMBER] years, and make any revisions that promote the intent of this Ordinance. [AGENCY] shall submit any revisions to [GOVERNING BODY/COMMISSION].
  - (c) [AGENCY] shall develop and present to [GOVERNMENT BODY/COMMISSION], before [DATE], a protocol for monitoring, measuring, and documenting each of the performance measures developed under (a).
  - (d) [AGENCY] shall track [JURISDICTION's] progress in meeting the intent of this Ordinance, against the benchmarks developed in (a), as modified under (b), and using the protocol developed under (c), on at least an annual basis.
  - (e) [AGENCY] shall, before [DATE] of each year, submit to the [GOVERNING BODY] an annual report summarizing [JURISDICTION's] progress in meeting the intent of this Ordinance. The annual report must document each of the performance measures and compare them against the benchmarks developed in this Section. [AGENCY] shall make the report publicly available, including placing the report on [the CITY/COUNTY/TOWN/BOROUGHS or AGENCY's] website.

## Section 11. DESIGN STANDARDS

[OPTION 1] Rely on the jurisdiction's own design standards: In designing and constructing Green Streets facilities under this Ordinance [CITY/COUNTY/TOWN/BOROUGH] shall follow the practices, guidelines and requirements under the [JURISDICTION's stormwater and Green Infrastructure standards and guidelines], as it may be from time to time amended.

[OPTION 2] Develop the jurisdiction's own design standards: [AGENCY] shall develop a Green Streets Manual ["Manual"] before [DATE], and shall follow the practices, guidelines and requirements contained in the Manual, as it may be from time to time amended, in designing and constructing Green Streets facilities under this Ordinance. [AGENCY] shall review and revise the Manual every [NUMBER] years.

[OPTION 3] Rely on other/more than one design standard(s): In designing and constructing Green Streets facilities under this Ordinance, [CITY/COUNTY/TOWN/BOROUGH] shall follow accepted or adopted design standards and use the best and latest design standards available. These standards include, but are not limited to: [STATE/FEDERAL/INDUSTRY stormwater and Green Infrastructure standards and guidelines], [JURISDICTION's design standards, if available], as they may be from time to time amended, and other standards and guidelines that may be developed.

## Section 12. INCORPORATION OF GREEN STREETS INTO RELEVANT INSTRUMENTS, PLANS, AND GUIDELINES, AND PROCESSES

- (a) [AGENCY] and other relevant departments, agencies, bureaus, commissions, boards, and committees shall incorporate Green Streets principles into all applicable and existing plans, manuals, guidebooks, design standards, guidelines, checklists, decision trees, internal policies, and programs, including, but not limited to, the Capital Improvement Program and land use plans, before [DATE]. [AGENCY] shall revise these plans, manuals, guidebooks, design standards, guidelines, checklists, decision trees, internal policies, and programs in order to align with the requirements and intent of this Ordinance.
- (b) [AGENCY] shall review the [MUNICIPAL/CITY/COUNTY CODE] and [MUNICIPAL/CITY/COUNTY REGULATIONS], to identify specific amendments necessary to provide references to and ensure consistency with the requirements and intent of this Ordinance. [AGENCY] shall propose revisions to [GOVERNING BODY] [MUNICIPAL/COUNTY CODE] before [DATE].

**Section 13. POLICY REVIEW**

[AGENCY] shall review this Ordinance every [NUMBER] years, and propose to [GOVERNING BODY] any amendments that promote the intent of this Ordinance or that reflect evolving technologies and design standards.

**Section 14. SEVERABILITY**

[Insert severability clause language used by the locality]

**Section 15. BE IT FURTHER ORDAINED**

that this Ordinance shall take effect on [DATE].

## APPENDIX B: Survey

The Environmental Law Institute is gathering information from localities across the United States regarding their experiences developing and implementing **Green Streets policies**. Under a Green Streets policy, construction in the Public Right of Way triggers the incorporation of Green Infrastructure elements.

The goal of this project, which is funded by the Chesapeake Bay Trust, is to develop a summary of best practices for local governments interested in developing and implementing a Green Streets policy of their own.

Please provide your responses below in as much detail as you are able. Thank you in advance for your time! (Please feel free to provide links or references to laws, ordinances, regulations, or policies, if you prefer).

### Background Information

1. Please provide the following information:
  - a. Name, title, agency, jurisdiction (city/county name), contact information (address, phone, e-mail).
2. How many miles of Public Right of Way (PROW) (streets, roads, etc.) is your city/county responsible for?
3. Which agency/agencies are responsible for stormwater system infrastructure (capital projects) and for maintenance?

### Regulatory

1. Is your stormwater system a Municipal Separate Storm Sewer System (MS4), a Combined Sewer System (CSS), or a combination?
  - a. If an MS4:
    - i. Phase I or Phase II?
    - ii. Covered by an individual or general permit? (If possible, please attach a copy, or include a link to a copy of the permit)
  - b. If a CSS, is there a CSO control plan covering your jurisdiction? (If possible, please attach a copy, or include a link to a copy of the plan)
  - c. Is Green Infrastructure required (or otherwise mentioned) in your MS4 permit, CSO control plan, or other similar plan/document? Are Green Streets?
2. Is your jurisdiction under a consent decree?
  - a. If yes, please attach a copy, or provide a link to it (current version).
  - b. If yes, does the consent decree include a requirement for Green Infrastructure? For Green Streets? Or is your city/county otherwise implementing Green Infrastructure and/or Green Streets to comply with the consent decree?
3. Is your jurisdiction subject to any Total Maximum Daily Loads (TMDL)?
  - a. If yes, please attach a copy of the (Watershed) Implementation Plan (WIP) (current version), or provide a link to it.
  - b. If yes, does the WIP/IP call for Green Infrastructure practices as a measure to control stormwater pollutant discharges? Green Streets?
4. Has your jurisdiction enacted a stormwater ordinance?
  - a. Does it call for Green Infrastructure practices?
  - b. Does it reference/call for Green Streets?
5. Does your stormwater system discharge to the Chesapeake Bay watershed?
  - a. If yes, by how much are you required to reduce your current pollutant load?

## Green Streets Policy

*We would like to know more about your locality's Green Streets Policy—background context, how it works, the results you have seen. Please feel free to provide any additional information or documents.*

1. Please provide a copy of, or link to the Green Streets policy.
  - a. What type of instrument is the policy? For example, is it an ordinance, resolution, executive order, non-binding policy, guidance document, etc.?
2. When was the policy adopted (date)?
3. What is the historical context for adopting the policy?
  - a. What was impetus? *For example, is your policy a subset of larger complete streets policy, part of an economic development strategy, a beautification effort, inspired by a pilot project, or an effort to improve stormwater management generally?*
  - b. Did you look at any other locality for examples? If so, which ones?
4. Historical context:
  - a. Please briefly describe the process of adopting this policy, including e.g., key city officials and stakeholders (city government, community, business) involved.
  - b. How did different public/private stakeholders react to the introduction/ development of the Green Streets policy? If applicable, please tell us about any resistance and/or enthusiasm toward elements of the policy, and how you were able to address those concerns or leverage that support.
5. Legal background:
  - a. Can you tell us about the legal authority that allows you to adopt a Green Streets policy? *A city attorney/county counsel may be helpful in providing this information.*
  - b. Is the policy legally binding on your locality? *For example, are the agencies or departments mandated to implement the policy, or is the policy considered guidance, best practices, etc.?*
6. Are there any exceptions/exemptions to implementing the policy?
  - a. If yes, what are they, and why were they included?
7. Coordinating Green Streets
  - a. How do you coordinate the Green Streets policy with public construction projects?
  - b. Does your city/county follow a capital improvement program (CIP) or similar program for implementing upcoming public construction projects?
    - i. If yes, please provide a copy or a link to the document.
    - ii. If yes, was the plan modified to account for the Green Streets policy? If so, could you briefly summarize how?
8. Funding mechanism(s)
  - a. How do you fund Green Streets projects (specifically, the Green Infrastructure components of projects in the PROW)? What is the source of revenue paying for these projects (e.g. fund name, is it from a tax, fee, other source, a combination thereof)?
    - i. Funding for capital.
    - ii. Funding for maintenance.
    - iii. Do you distinguish between funding for stormwater in general, and for Green Streets specifically?

## Results

1. Can you tell us about, list, and/or provide link(s) to specific PROW projects implemented/planned under your Green Streets policy, and the associated costs? *Ideally, we are looking for a brief summary, Green*

*Infrastructure elements installed, co-implemented capital project, cost breakdown, and cost efficiencies realized.*

2. Can you provide an estimate of the area affected by Green Streets implementation under the policy (e.g., total miles or miles per year)?
3. Results
  - a. What were/are positive outcomes of implementing the policy?
  - b. What were/are obstacles encountered, and how have these been/are these being addressed?
  - c. Are there any other “lessons learned” you would want to bring to the attention of other localities considering a Green Streets policy?
4. Aside from, or in addition to the Green Streets policy, does your city have a Green Streets program, or otherwise proactively construct Green Streets/transform existing streets into Green Streets. If so, please provide additional information.

Are there any additional contacts you recommend we contact to provide further information or perspective on these issues?

Please feel free to provide any additional comments:

*Thank you!*





## APPENDIX C: Green Streets Policies

### Ann Arbor

Resolution and Guidelines:

<https://www.a2gov.org/departments/engineering/Documents/Green%20Streets%20Policy%20Approved%202-18-2014.pdf>

### Central Falls

Ordinance:

[https://library.municode.com/ri/central\\_falls/codes/code\\_of\\_ordinances?nodeId=PTIICOOR\\_CH32STSIOTPUPL\\_AR\\_TIXGRCOST](https://library.municode.com/ri/central_falls/codes/code_of_ordinances?nodeId=PTIICOOR_CH32STSIOTPUPL_AR_TIXGRCOST)

### Cleveland

Ordinance:

<https://www.noaca.org/home/showdocument?id=17498>

### Cleveland Heights

Resolution:

<https://www.clevelandheights.com/DocumentCenter/View/3529/037-2018-2nd?bidId=>

### Dallas

Resolution and Manual: (*Chapter 7: Green Streets*)

<http://citysecretary2.dallascityhall.com/resolutions/2016/01-27-16/16-0173.pdf>

### Edina

City Council Approval and Policy:

[http://edina.granicus.com/MetaViewer.php?view\\_id=7&clip\\_id=1792&meta\\_id=45453](http://edina.granicus.com/MetaViewer.php?view_id=7&clip_id=1792&meta_id=45453)

Plan: (*revised Policy in Chapter 2*)

<https://www.edinamn.gov/DocumentCenter/View/1199/Living-Streets-Plan-PDF?bidId=>

### Fairbanks

Resolution:

[https://www.fairbanksalaska.us/sites/default/files/fileattachments/ordinance/19291/reso\\_4762\\_supporting\\_fmat\\_s\\_green\\_streets\\_policy.pdf](https://www.fairbanksalaska.us/sites/default/files/fileattachments/ordinance/19291/reso_4762_supporting_fmat_s_green_streets_policy.pdf)

Policy:

<http://www.fairbanksgig.com/green-streets>

### Kansas City

Ordinance:

<http://cityclerk.kcmo.org/LiveWeb/Documents/Document.aspx?q=8o49w2zA0CSTnmeH9aHKkOg64CS%2bkNfm9pNSr3I7caKAubnyrUeDhTRcSROTTz%2fn>

### Maplewood

Policy:

<https://maplewoodmn.gov/DocumentCenter/View/8955/Living-Streets-Policy-Final-Version?bidId=>

**Nashville**

Executive Order No. 040:

<https://www.nashville.gov/Metro-Clerk/Legal-Resources/Executive-Orders/Mayor-Karl-Dean/kd040.aspx>

Executive Order No. 031:

[https://www.nashville.gov/Portals/0/SiteContent/pw/docs/news/2016/031\\_ExecutiveOrder\\_CompleteStreetsPolicy.pdf](https://www.nashville.gov/Portals/0/SiteContent/pw/docs/news/2016/031_ExecutiveOrder_CompleteStreetsPolicy.pdf)

**North St. Paul**

Plan:

<https://www.northstpaul.org/DocumentCenter/View/197/Living-Streets-Plan-PDF?bidId=>

**Portland**

Resolution, Policy, and Report:

[https://efiles.portlandoregon.gov/Record/2850080/?\\_ga=2.130650445.397948918.1560447506-784163380.1560346855](https://efiles.portlandoregon.gov/Record/2850080/?_ga=2.130650445.397948918.1560447506-784163380.1560346855)

**Prince George's County**

Policy:

<https://princegeorgescountymd.legistar.com/LegislationDetail.aspx?ID=2466718&GUID=F15AA125-7F1F-4C65-B537-A84C33F811A3&Options=ID|Text|&Search=CB-83-2012>

**Tucson**

Guidelines:

[https://www.tucsonaz.gov/files/transportation/Green\\_Streets\\_APG\\_Signed\\_by\\_Director.pdf](https://www.tucsonaz.gov/files/transportation/Green_Streets_APG_Signed_by_Director.pdf)

## APPENDIX D: Tribal Regulatory Framework

Tribes, like states, can pursue eligibility to develop their own WQS and manage their own NPDES permitting programs. Any of the seven federally recognized Indian tribes in the Chesapeake Bay watershed contemplating whether to obtain the authority to implement CWA programs may also consider the benefits of adopting a Green Streets policy as a water quality measure.

“Treatment as a state” (TAS) provisions in a number of federal environmental statutes enable the EPA to delegate authority to eligible tribes to manage selected environmental programs, similar to state governments. The 1987 CWA amendments added Section 518, a TAS provision. This authority encompasses several programs under the CWA, including WQS, certain grants, and programs including NPDES permits, nonpoint source management, and dredge and fill permits.<sup>796</sup>

EPA must first determine the tribe is eligible to administer WQS and water quality certification programs. Tribes must meet three criteria, including capability of carrying out substantial lawmaking responsibilities, ability to implement the CWA program, and authority over reservation land and the reservation’s water quality. A 1991 EPA rule took a cautious approach to the third criterion and required tribes to demonstrate the second prong of the *Montana* test for regulating non-Indians on non-trust land. *Montana* refers to a landmark Supreme Court decision that held that, in the absence of a federal grant of authority, a tribe presumptively lacks inherent jurisdiction over the activities of nonmembers on nonmember fee land. There are two exceptions: (1) where nonmembers enter into a consensual relationship with the tribe or its individual members, such as through a lease, contract, or commercial deal; and (2) where nonmember activity has a direct effect on or threatens the political stability, economic security, or the general welfare or health of the tribe.<sup>797</sup> The EPA’s approach placed the burden on tribes to meet the second prong of the *Montana* test. In 2016, EPA promulgated a new rule on TAS that reinterpreted the CWA section as a delegation of authority from Congress to the tribes.<sup>798</sup> This eliminated the need for a tribe to demonstrate inherent authority to regulate sources of water pollution on non-trust land within reservation boundaries under principles of federal Indian common law.<sup>799</sup>

Out of 573 federally recognized tribes and 326 Indian land areas administered as federal Indian reservations, the EPA has found 61 tribes eligible to administer a WQS program. Forty-five tribes have adopted EPA-approved WQS; EPA has promulgated federal WQS for one tribe.<sup>800</sup> Thus far, no tribe has implemented a NPDES program.

EPA can act on any submitted tribal water quality programs once TAS eligibility is determined. For example, the EPA may issue NPDES permits in compliance with a tribe’s water quality standards. Tribal standards may also be enforced

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<sup>796</sup> See 33 U.S.C. § 1377(e) (“The Administrator is authorized to treat an Indian tribe as a State for purposes of subchapter II of this chapter and sections 1254, 1256, 1313, 1315, 1318, 1319, 1324, 1329, 1341, 1342, 1344, and 1346 of this title to the degree necessary to carry out the objectives of this section”).

<sup>797</sup> *Montana v. United States*, 450 U.S. 544, 565–66 (1981).

<sup>798</sup> See Revised Interpretation of Clean Water Act Tribal Provision, 81 Fed. Reg. 30,183 (May 16, 2016).

<sup>799</sup> See *id.* at 30,184 (“EPA today revises its interpretation of CWA section 518 and concludes definitively that Congress expressly delegated authority to Indian tribes to administer CWA regulatory programs over their entire reservations, including over nonmember activities on fee lands within the reservation of the applicant tribe, subject to the eligibility requirements in section 518.”); See also Revised Interpretation of Clean Water Act Tribal Provision, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/wqs-tech/revised-interpretation-clean-water-act-tribal-provision> (last updated Oct. 2, 2018) (bringing also EPA’s treatment of tribes under the CWA in line with EPA’s treatment of tribes under the Clean Air Act (CAA), which has similar statutory language).

<sup>800</sup> *EPA Actions on Tribal Water Quality Standards*, EPA, <https://www.epa.gov/wqs-tech/epa-actions-tribal-water-quality-standards-and-contacts> (last visited June 15, 2019).

by the EPA off the reservation against non-tribal parties discharging from a point source. The downstream point source must comply if the upstream tribe has more stringent standards.<sup>801</sup>

Currently, there is a gap in water quality protection where tribes do not have EPA-approved WQS, where the EPA has not promulgated federal WQS on a tribe-by-tribe, reservation-by-reservation basis, and where a particular state is not granted authority to administer WQS on reservations. The EPA in 2016 proposed establishing federal baseline WQS for Indian reservation waters, for which WQS have not yet been adopted.<sup>802</sup> In 2016, EPA promulgated a rule establishing the process through which tribes could become authorized to be treated like states for the TMDL program.<sup>803</sup>

The Chesapeake Bay watershed overlaps EPA Region 3, and is currently home to only seven federally-recognized tribes. All are based in Virginia. The Pamunkey Indian Tribe is one of only two Virginia tribes that own reservation lands; the tribe obtained federal recognition via a U.S. Department of the Interior administrative process in 2016.<sup>804</sup> The six other tribes received federal recognition in 2018, under the Thomasina E. Jordan Indian Tribes of Virginia Federal Recognition Act of 2017.<sup>805</sup> None of these tribes have yet established TAS eligibility, although the Pamunkey tribe may pursue TAS status in the near future.<sup>806</sup> A key issue to be addressed is taking tribal land into trust in order for the tribes to be eligible for TAS status, as the tribal land involved is currently fee-based.

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<sup>801</sup> See, e.g., *City of Albuquerque v. Browner* 97 F.3d 415, 423–24 (10th Cir. 1996) (EPA sought to revise city’s NPDES permit to meet the higher WQS of the upstream Isleta Pueblo Indians. Court held EPA’s construction of the 1987 amendment to the CWA, as recognizing tribes’ ability to set WQS more stringent than those required by federal law, as in accord with their inherent sovereign powers, was permissible, and that those standards could be enforced on upstream point dischargers beyond reservation boundaries).

<sup>802</sup> Federal Baseline Water Quality Standards for Indian Reservations, 81 Fed. Reg. 66,900 (Sept. 29, 2016) (Advance notice of proposed rulemaking (ANPRM) to invite comments on the matter. No further efforts have been made on federal baseline WQS for Indian reservations since the 2016 ANPRM, although the National Tribal Water Council remains involved in this issue); E-mail from Mary Lou Soscia, Columbia River Coordinator, U.S. Env’tl. Prot. Agency, Region 10, to Cynthia R. Harris, Staff Att’y, Env’tl. Law Inst (May 28, 2019 12:35PM EST) (on file with author).

<sup>803</sup> In April 2019, the EPA issued a notice the agency planned to submit an information collection request (ICR) on the matter and solicited public comments on the proposed ICR. This proposed an extension to the ICR, which was approved through December 31, 2019. Proposed Information Collection Request; Comment Request; Treatment of Indian Tribes in a Similar Manner as States for Purposes of Section 303(d) of the Clean Water Act (Renewal), 84 Fed. Reg. 15,216 (Apr. 15, 2019).

<sup>804</sup> Indian Entities Recognized and Eligible To Receive Services From the United States Bureau of Indian Affairs, 81 Fed. Reg. 26,826, 26,827, 26,829 (May 4, 2016).

<sup>805</sup> See Thomasina E. Jordan Indian Tribes of Virginia Federal Recognition Act of 2017 Pub.L. 115–121 (2018) (including the Chickahominy Indian Tribe; Chickahominy Indian Tribe-Eastern Division; Upper Mattaponi Tribe; Rappahannock Tribe, Inc.; Monacan Indian Nation; and the Nansemond Indian Tribe. The Commonwealth of Virginia recognizes 11 tribes).

<sup>806</sup> Telephone Interview with Brian Hamilton, EPA, State & Cong. Liaison, Region 3 (May 22, 2019).

## APPENDIX E: Federal Regulatory Framework

### History of the Clean Water Act

The Federal Water Pollution Control Act of 1948 was the first major U.S. law to address water pollution.<sup>807</sup> The Congress subsequently enacted amendments in 1956, 1961, 1965, 1966, 1970, 1972, 1977, 1981, 1987, and 2014.<sup>808</sup>

Sweeping amendments in 1972 created the basic structure currently used for regulating the discharge of pollutants into the Waters of the United States (WOTUS) and introduced the NPDES permitting system.<sup>809</sup> This statutory regime, colloquially known as the Clean Water Act (CWA), is the primary federal law governing water pollution in the United States and is administered by the Environmental Protection Agency (EPA) in coordination with state governments, territories, and tribes in what is termed “cooperative federalism” or “state primacy.” Critical to this white paper is the subsequent Water Quality Act of 1987, which amended the CWA by adding a comprehensive national program for addressing the problem of stormwater discharges through stormwater permitting, nonpoint source pollution control, and the Great Lakes and Chesapeake Bay protection programs.<sup>810</sup>

The CWA specifically addresses *surface water quality* protection but does not directly address ground water or water quantity. The question of whether the CWA applies to the release of pollutants into groundwater that eventually migrate into WOTUS is the subject of recent litigation.<sup>811</sup> Furthermore, federal law prohibits EPA from regulating water *quantity*, but a number of states have enacted quantity requirements; particularly the western states.<sup>812</sup>

### State Primacy and Cooperative Federalism Under the CWA

The CWA is an example of cooperative federalism, in which the states—and several tribes under the statute’s “treatment as a state” or “TAS” provision—generally assume primary regulatory responsibility, or primacy, in administering provisions of the CWA, subject to EPA oversight, review, and approval.<sup>813</sup> The two primary components of CWA’s statutory scheme for regulating pollution are *water quality standards* (WQS) and the *National Pollutant Discharge Elimination System* (NPDES), a permitting program for regulating point source pollution.

WQS comprise two parts: designated uses and water quality criteria.<sup>814</sup> First, a designated use (DU) means the designation or classification of the use of a water body or segment. Examples of DUs include drinking, fishing,

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<sup>807</sup> Federal Water Pollution Control Act, Pub. L. No. 80-845, 62 Stat. 1155 (1948) (codified as amended at 33 U.S.C. § 1251 (2012 & Supp. V 2017)) (addressing first matters pertaining to water pollution with the Rivers and Harbors Act of 1899, giving the Corps the authority to regulate most forms of obstruction to navigation, including hazards resulting from effluent. Rivers and Harbors Appropriation Act of 1899, 30 Stat. 1151 (codified as amended at 33 U.S.C. § 401 (2012)).

<sup>808</sup> Claudia Copeland, CONG. RESEARCH SERV. *Clean Water Act: A Summary of the Law*, RL30030 1 (2016).

<sup>809</sup> Federal Water Pollution Control Act Amendments of 1972, Pub. L. 92-500, 86 Stat. 816 (codified as amended at 33 U.S.C. § 1251 (2017)).

<sup>810</sup> Water Quality Act of 1987, Pub. L. 100-4, 101 Stat. 7; *see also* 33 U.S.C. § 1342(p) (2012).

<sup>811</sup> *See* Rachel Jacobson et al., *The Groundwater Conduit Theory: Expanding the Scope of the CWA?*, AM. BAR ASS’N (Oct. 24, 2018), [https://www.americanbar.org/groups/environment\\_energy\\_resources/publications/wr/20181024-wr-the-groundwater-conduit-theory/](https://www.americanbar.org/groups/environment_energy_resources/publications/wr/20181024-wr-the-groundwater-conduit-theory/) (discussing the federal circuit court split on the issue.).

<sup>812</sup> NAT’L ASS’N OF CLEAN WATER AGENCIES, *MS4 STORMWATER PERMITTING GUIDE 62* (2018) (noting although state stormwater regulations typically include water quality and quantity components in technical criteria, these standards are not imposed on discharges from municipal separate storm sewer systems (MS4s)).

<sup>813</sup> 33 U.S.C. § 1377(e) (2012); 40 C.F.R. § 123.31 (1999). *EPA Actions on Tribal Water Quality Standards and Contacts*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/wqs-tech/epa-actions-tribal-water-quality-standards-and-contacts> (last visited June 17, 2019).

<sup>814</sup> 33 U.S.C. § 1313(c)(2)(A) (2017) (“Such revised or new water quality standard shall consist of the designated uses of the navigable waters involved and the water quality criteria for such waters based upon such uses.”); *see also* 40 C.F.R. §130.3(i)

swimming, and recreation. Use reclassification refers to the process of changing a use designation. However, the CWA's antidegradation policy protects existing uses and establishes a floor or an absolute minimum level of protection on water quality applicable to all WOTUS.<sup>815</sup> Second, water quality criteria (WQC) are numeric and narrative descriptions of the conditions in a water body necessary to support the DUs. Put another way, WQC means the level of individual pollutants or water quality characteristics, or other descriptions of conditions of a water body that, if met, will protect the DUs.<sup>816</sup>

WQS are not directly enforceable by the EPA on the states if the states fail to meet the standards. However, each state is obligated to place impaired water bodies on that state's CWA §303(d) list and develop Total Maximum Daily Loads (TMDLs) for each pollutant exceeding the applicable WQC. Then states must reduce effluent limits in NPDES permits for regulated facilities and activities to the degree necessary to prevent any cause of or contribution to or violations of WQS and to achieve wasteload allocations (WLAs) in any relevant TMDLs. NPDES permittees—including MS4s and CSSs—are required to meet effluent limits detailed in their permits.

The NPDES regulatory and permitting program prohibits the discharge of any pollutant from a *point source*—a manmade conveyance—into navigable waters, except under the terms of a *permit* authorized under the CWA.<sup>817</sup> NPDES permits place limits on the amount of various pollutants that a source may discharge in a given time. The creation of a “permit shield” occurs when a discharger receives a permit and becomes a permittee, with the effect that a discharger's compliance with its NPDES permit insulates it from enforcement actions based on alleged violations of the CWA.<sup>818</sup> Permit terms may not exceed five years.

The EPA authorizes a state to run its own NPDES program if the state can demonstrate that it administers a program at least as stringent as the regime established by EPA's regulations.<sup>819</sup> Forty-six states and one territory administer NPDES programs.<sup>820</sup> Alternately, the EPA is the permitting authority through its regional offices; the EPA currently manages the NPDES stormwater program in four states, in addition to the District of Columbia.<sup>821</sup> The public is entitled to review and comment on draft permits, and the EPA may also schedule a public hearing. Stakeholders may pursue administrative or judicial appeal processes; for example, to challenge the issuance of a permit.

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(2017) (defining water quality standards). For more in-depth guidance on water quality standards, see EPA, EPA-823-B-17-001 WATER QUALITY STANDARDS HANDBOOK (2017) available at <https://www.epa.gov/wqs-tech/water-quality-standards-handbook>.

<sup>815</sup> 40 C.F.R. § 131.12 (2017).

<sup>816</sup> See 40 C.F.R. §131.3(b) (2011) (defining water quality criteria as “elements of State water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use. When criteria are met, water quality will generally protect the designated use.”); see also 40 C.F.R. §131.11 (2015).

<sup>817</sup> 33 U.S.C. § 1342 (2012); 33 U.S.C. § 1311(a) (2012) (“Except as in compliance with this section and sections 1312, 1316, 1317, 1328, 1342, and 1344 of this title, the discharge of any pollutant by any person shall be unlawful.”); 40 C.F.R. § 122.2 (2018) (“Point source means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.”) (including examples of discharges from wastewater treatment plants and operational wastes from industries. Point sources also include outfalls from combined sewer and municipal separate storm sewer systems).

<sup>818</sup> 33 U.S.C. § 1342(k) (2012) (“Compliance with a permit issued pursuant to this section shall be deemed compliance, for purposes of sections 1319 and 1365 of this title, with sections 1311, 1312, 1316, 1317, and 1343 of this title, except any standard imposed under section 1317 of this title for a toxic pollutant injurious to human health.”).

<sup>819</sup> See 33 U.S.C. § 1342(b) (2012) (describing the process for a state to administer its own permit program).

<sup>820</sup> *National Pollutant Discharge Elimination System (NPDES): About NPDES*, EPA, <https://www.epa.gov/npdes/about-npdes> (last visited Dec. 20, 2018).

<sup>821</sup> *District of Columbia NPDES Permits*, EPA, <https://www.epa.gov/npdes-permits/district-columbia-npdes-permits> (last visited Dec. 20, 2018).

The two basic types of NPDES permits are *individual* permits, tailored to an individual facility,<sup>822</sup> and *general* permits, covering a group of dischargers with similar qualities within a given geographical location.<sup>823</sup> The main elements of an individual permit include effluent limitations, which may be technology-based or water quality-based,<sup>824</sup> monitoring and reporting requirements, and standard and special conditions.

General permits, which tend to apply to numerous small sources, may be used to cover any discharger that meets criteria established by the permitting authority. Dischargers submit a Notice of Intent (NOI) to the permitting authority requesting coverage and promising to comply with permit conditions. Sources covered can include stormwater.<sup>825</sup>

## Impaired waters and TMDLs

“Impaired waters” are those failing to meet WQS. The two most common causes of impairment are nutrients, such as nitrogen and phosphorus, and sediment.<sup>826</sup> The CWA addresses impaired waters through monitoring, reporting, and developing and meeting “pollution budgets” for impacted water bodies.

The first step is collecting and tracking information in an Integrated § 305(b)/303(d) Report. CWA § 303(d) requires states to identify those water bodies and segments for which technology-based effluent limitations are not adequate to achieve the state’s WQS.<sup>827</sup> The state then places these “water quality limited” water bodies on a “303(d) list,” which also includes water bodies likely to become impaired for specific uses by the time the next 303(d) list is due. States update and resubmit this list of impaired waters every two years. CWA § 305 similarly requires states to submit a report every two years. Among the five items addressed in this report is “a description of the nature and extent of nonpoint sources of pollutants, and recommendations as to the programs which must be undertaken to control each category of such sources, including an estimate of the costs of implementing such programs.”<sup>828</sup> Water Quality Reports may be found online at the EPA’s Assessment Total Maximum Daily Load (TMDL) Tracking and Implementation System (ATTAINS). ATTAINS provides information reported by the states to the EPA about the conditions in their surface water.<sup>829</sup>

Total Maximum Daily Loads (TMDLs) constitute “pollution budgets” for impaired water bodies that, if not exceeded, would result in attaining WQS. When a water body or segment fails to meet one or more WQS and is placed on a 303(d) list, the authority implementing the CWA in that state must assess and allocate pollutant loads in a manner

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<sup>822</sup> See EPA EPA-833-K-10-001, NPDES PERMIT WRITERS’ MANUAL 3-2 (2010).

<sup>823</sup> 40 C.F.R. § 122.28 (2018).

<sup>824</sup> See 40 C.F.R. § 125.3(a) (2018) (defining technology-based effluent limitations (TBELs) as “performance standards,” and based on what is attainable or the capabilities of the technologies available to control those discharges); 40 C.F.R. § 122.44(d) (2018) (noting water quality-based effluent limitations are established when TBELs are demonstrated insufficient to achieve WQS).

<sup>825</sup> “Permits for discharges from municipal storm sewers (i) may be issued on a system or jurisdiction-wide basis; (ii) shall include a requirement to effectively prohibit non-storm water discharges into the storm sewers; and (iii) shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.” 33 U.S.C. § 1342(p)(3)(B)(i)-(iii) (2012); 40 C.F.R. § 122.28(a)(2)(i) (2018).

<sup>826</sup> *State Progress toward Developing Numeric Nutrient Water Quality Criteria for Nitrogen and Phosphorus*, U.S. ENVTL. PROT. AGENCY, <https://www.epa.gov/nutrient-policy-data/state-progress-toward-developing-numeric-nutrient-water-quality-criteria> (last visited June 17, 2019) (showing that the EPA and most states do not currently maintain numeric WQC parameters for these causes of impairment).

<sup>827</sup> 33 U.S.C. § 1313(d)(1)(A) (2017) (“Each State shall identify those waters within its boundaries for which the effluent limitations required by section 301(b)(1)(A) and section 301(b)(1)(B) are not stringent enough to implement any water quality standard applicable to such waters. The State shall establish a priority ranking for such waters, taking into account the severity of the pollution and the uses to be made of such waters.”).

<sup>828</sup> 33 U.S.C. § 1315(b)(1)(E) (2017). See also 40 C.F.R. § 130.8 (2018).

<sup>829</sup> ATTAINS, EPA, <https://www.epa.gov/waterdata/attains> (last visited Dec. 21, 2018).

that would lead to WQS attainment. Implicit is the acknowledgment that merely implementing the technology-based controls imposed upon point sources by the CWA and EPA regulations is insufficient to achieve WQS.<sup>830</sup>

TMDLs are established on a pollutant-by-pollutant basis, specifying the amount of a specific pollutant that a waterbody can receive and still meet WQS. States and tribes are required to develop TMDLs for waters on their 303(d) lists. If the EPA disapproves of a TMDL, it will develop and impose its own TMDL.<sup>831</sup> TMDLs often take decades to implement fully. The EPA currently encourages states, tribes, and territories to develop TMDLs on a “watershed basis.”<sup>832</sup>

Developing a TMDL requires the state, tribe, or EPA first determine the level of pollution load consistent with meeting WQS. This typically means determining the “assimilative capacity,” “total load,” or pollutant “cap”—the *total* amount of the target pollutant that can enter the §303(d) listed water so as to be consistent with meeting the WQS for that pollutant. The state quantifies existing pollutants loads and calculates the load reductions needed to meet WQS.<sup>833</sup> The state then allocates acceptable loads among sources of the relevant pollutants: wasteload allocations (WLAs) among point source dischargers and load allocations (LAs) among nonpoint sources. This allocation similarly includes a margin of safety, reserving some of the load for future dischargers. WLAs include stormwater discharges from MS4s and other permitted dischargers.<sup>834</sup> No EPA regulations specify how the pollutant cap in a TMDL should be allocated among sources, meaning states are free to allocate among sources in any way they seem fit, so long as the sum of all the allocations is no greater than the overall loading cap. Different authorities and programs must be used to implement the pollutant reductions.

The CWA does not explicitly require TMDL (watershed) implementation plans (IPs or WIPs), but states are utilizing WIPs in the Chesapeake Bay watershed. WIPs detail how TMDL allocations will be attained, including how the nonpoint source LA will be met, and incorporate a monitoring plan to assess implementation. States may maintain individual legal requirements or preferences for implementation plans.

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<sup>830</sup> 33 U.S.C. § 1313(1)(C) (2017) (“Each State shall establish for the waters identified in paragraph (1)(A) of this subsection, and in accordance with the priority ranking, the total maximum daily load, for those pollutants which the Administrator identifies under Section 304/1314(a)(2) as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.”); *See also* 40 C.F.R. §130.7(b) (2018) (promulgating regulations for identifying and setting priorities for water quality-limited segments requiring TMDLs: “Each State shall identify those water quality-limited segments still requiring TMDLs within its boundaries for which...[t]echnology-based effluent limitations [,] more stringent effluent limitations [and] other pollution control requirements...are not stringent enough to implement any water quality standards (WQS) applicable to such waters.”).

<sup>831</sup> 40 C.F.R. § 130.7(d) (2018) (“If the Regional Administrator disapproves such listing and loadings, he shall, not later than 30 days after the date of such disapproval, identify such waters in such State and establish such loads for such waters as determined necessary to implement applicable WQS.”).

<sup>832</sup> *See, e.g.* U.S. ENVTL. PROT. AGENCY, HANDBOOK FOR DEVELOPING WATERSHED TMDLS 4–6 (Draft 2008) (noting that the EPA has issued several guidance documents containing recommendations for developing TMDLs on a watershed basis, due to providing environmental and programmatic benefits).

<sup>833</sup> *See* 40 C.F.R. § 130.2(i) (2018) (defining TMDL); *See also* 40 C.F.R. §130.7(c) (2018) (describing the development of TMDLs and individual water quality based effluent limitations: “TMDLs shall be established at levels necessary to attain and maintain the applicable narrative and numerical WQS with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality...TMDLs shall be established for all pollutants preventing or expected to prevent attainment of water quality standards as identified pursuant to paragraph (b)(1) of this section.”).

<sup>834</sup> A group of sources covered under a “general” NPDES permit may be assigned one collective WLA. While LAs *should* be assigned to individual nonpoint sources, this is often not practical or feasible. Loads may be assigned to categories of nonpoint sources or to geographic groupings of nonpoint sources.



## Regulating nonpoint source pollution under the CWA

### Background

The CWA initially focused on regulating discharges from traditional *point* source facilities, with little attention paid to “nonpoint” source pollution, which is conveyed by runoff or precipitation. Examples include runoff from agriculture, silviculture, and City streets and other impervious surfaces in urban areas. Urban stormwater runoff is associated with industrial activity, construction, and discharges from municipal storm sewer systems.

Nonpoint source pollution today is cited in state water quality assessments as the leading cause of water quality impairment.<sup>835</sup> In fact, nonpoint source pollution is responsible for the pollution of eighty-five percent of rivers and streams and eighty percent of lakes and reservoirs.<sup>836</sup> Pollutants commonly associated with NPS include nutrients, such as phosphorus and nitrogen.

No specific federal requirements apply to nonpoint sources. The CWA provides no detailed definition of nonpoint sources, which by default are defined by exclusion as everything not considered a “point source.”<sup>837</sup> Critics note that the CWA’s “usual tools for regulating discrete discharges from industrial and municipal wastewater treatment facilities, such as end-of-pipe numeric effluent limits on various pollutants, are poorly suited for episodic precipitation events and largely uncontrolled MS4 discharges.”<sup>838</sup> Indeed, the CWA explicitly prohibits subjecting to permits certain nonpoint discharges—such as those from agricultural return flows and runoff from extractive and silvicultural activities.<sup>839</sup>

Yet the CWA’s permitting scheme today does regulate urban storm sewer systems. These systems are treated as “wet weather point sources,” due to channelization. In contrast, diffuse stormwater runoff, which is not channelized, is considered a nonpoint source and is not regulated.

The modern regulatory scheme governing municipal stormwater originated in the 1980s when efforts to address polluted runoff increased significantly. Key efforts then focused on education and voluntary programs, such as cost-sharing with landowners. The EPA initially exempted stormwater discharges, including urban runoff and industrial stormwater discharges, from NPDES permitting requirements. The U.S. Court of Appeals for the District of Columbia Circuit held the exemption unlawful in 1977 in *Natural Resources Defense Council v. Train*.<sup>840</sup> The EPA subsequently issued proposed and final rules covering stormwater discharges in 1980, 1982, 1984, 1985, and 1988, which were challenged at the administrative level and in the courts.

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<sup>835</sup> U.S. ENVTL. PROT. AGENCY, A NATIONAL EVALUATION OF THE CLEAN WATER ACT SECTION 319 PROGRAM, 6 (2011).

<sup>836</sup> See U.S. ENVTL. PROT. AGENCY, EPA 841-R-16-009, NATIONAL NONPOINT SOURCE PROGRAM: A REPORT ON HIGHLIGHTS OF THE § 319 PROGRAM 4 (2016) [hereinafter § 319 HIGHLIGHTS] (“[o]f all the Waterbodies across the nation that have been assessed and a possible source of impairment identified, 85% of rivers and streams and 80% of lakes and reservoirs are polluted by nonpoint sources.”).

<sup>837</sup> 33 U.S.C. § 1362(14) (2012) (“The term ‘point source’ means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.”).

<sup>838</sup> *MS4 Stormwater Permitting Guide supra* note 812 at 8.

<sup>839</sup> 33 U.S.C. § 1342(l) (2018) (prohibiting the EPA administrator, or the state administering a NPDES program, from requiring a NPDES permit for discharges composed of agricultural return flows, stormwater runoff from oil, gas, and mining operations, or silvicultural activities).

<sup>840</sup> *Natural Resources Defense Council v. Train*, 396 F. Supp. 1393 (D.D.C. 1975), *aff’d*, *NRDC v. Costle*, 568 F.2d 1369 (D.C. Cir. 1977). The EPA’s 1973 regulations at 40 C.F.R. §125.4(f), (j) exempted certain sources from NPDES permit requirements, including storm sewers discharging only storm runoff. The court held that the plain language of the CWA—supported by its legislative history—did not permit EPA discretion to exempt entire classes of point sources from the NPDES permit requirements. *Id.* at 1396. The court noted that the EPA had at its disposal several devices to mitigate administrative burden, such as general permits.

Congress ultimately amended the CWA via the Water Quality Act of 1987, incorporating the CWA § 402 stormwater program, which subjected stormwater discharges from MS4s—where stormwater is collected or channelized, and discharged from a discrete source—to regulation under NPDES permitting.<sup>841</sup> The statutory section directed the EPA to implement a specific permit program covering stormwater discharges from industrial sources and municipalities.<sup>842</sup>

Municipal storm sewer systems thus today are subject to regulatory control under NPDES. A discussion of this regulatory framework requires a basic understanding of the two types of urban wet weather flows: combined sewer overflows (CSOs) and municipal separate storm sewers (MS4s). Both systems often include a large number of outfalls, or discharge points, and urban discharges are weather-dependent. CWA §402(p) directly addresses MS4s, while §402(q) addresses CSOs.

NPDES permits for MS4s take a unique approach under CWA § 402(p). For example, the EPA generally applies permits on a system-wide basis rather than outfall-by-outfall. There usually are no end-of-pipe pollutant discharge limits; instead, permits require the application of best management practices (BMPs), or construction of storage and treatment facilities. Permits require strategic plans for addressing problems.

The most significant distinction between MS4 and other NPDES permits is the standard applied: the *maximum extent practicable* (MEP) standard. The requirement that municipal storm sewer systems reduce the discharge of pollutants to the MEP completely replaces the CWA § 302 standard that most NPDES permits include any water quality-based effluent limits that are as stringent as necessary to ensure that permittees' discharges comply with all applicable WQS.<sup>843</sup> The Ninth Circuit Court of Appeals in the seminal 1999 *Defenders of Wildlife v. Browner* case upheld the EPA's decision to issue NPDES permits to MS4s requiring best management practices rather than numeric limits under the statutory language.<sup>844</sup> Yet the scope of what MEP entails remains unclear, as the EPA has rebuffed requests to develop a regulatory definition of MEP.

Permit compliance primarily focuses on developing and implementing a suite of “best management practices” (BMPs) designed to reduce the discharge of pollutants to the MEP. BMPs mean schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of

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<sup>841</sup> See 33 U.S.C. § 1251(a)(7) (2012) (“[I]t is the national policy that programs for this control of nonpoint sources of pollution be developed and implemented in an expeditious manner so as to enable the goals of this Act to be met through the control of both point and nonpoint sources of pollution.”); See Water Quality Act of 1987, Pub. L. No. 100-4, 101 Stat. 60 (adding subsection (a)(7)); *id.* at 101 Stat. 69 (adding subsection (p) to CWA Section 402).

<sup>842</sup> See Water Quality Act of 1987, Pub. L. No. 100-4, 101 Stat. 70 (*amending* CWA 404/33 U.S.C. § 1342 by adding subsection (p)(3)(B), (4)).

<sup>843</sup> 33 U.S.C. § 1312(a) (2018); 33 U.S.C. § 1342(p)(3)(B) (2017) (“Permits for discharges from municipal storm sewers...shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.”).

<sup>844</sup> *Defenders of Wildlife v. Browner*, 191 F. 3d 1159 (9th Cir. 1999) (challenging EPA decision to issue NPDES permits to five municipalities for their separate storm sewers without requiring numeric limitations to ensure compliance with state water-quality standards), amended on denial of rehearing by *Defenders of Wildlife v. Browner*, 197 F.3d 1035 (9th Cir. 1999). The EPA determined that inclusion of best management practices in the permit ensured compliance with state water-quality standards. The Court noted the Water Quality Act set a different standard for municipal discharges of storm water by MS4s (and for industrial discharges, too), and emphasized the text at 33 U.S.C. § 1342(p)(3)(B)(iii). The Court, applying *Chevron* step one, determined the WQA text is unambiguous: Congress did not require municipal storm-sewer discharges to comply strictly with 33 U.S.C. § 1311(b)(1)(C), because the amended text replaces those requirements with the lesser MEP standard and examples of methods for meeting that standard. However, the text leaves the EPA with the discretion to determine what pollution controls are appropriate, meaning that EPA has the authority to determine that ensuring strict compliance—or less than strict compliance—with state water quality standards is necessary to control pollutants).

WOTUS.<sup>845</sup> *Structural* BMPs refer to physical structures or features intended to collect, treat, infiltrate, and convey stormwater, whereas *nonstructural* BMPs constitute “various practices or actions that are intended to directly reduce stormwater pollution or encourage the public to take steps to reduce stormwater pollution.”<sup>846</sup>

NPDES permits for urban wet weather discharges require cities to develop an overall strategic plan for addressing runoff of pollutants from various types of land use currently employed and expected. These Stormwater Management Plans (SWMPs) are a crucial tool for reducing the discharge of pollutants to the MEP “using management practices, control technologies and systems, design and engineering methods.”<sup>847</sup> SWMPs address what specific measures permittees will implement to meet the permit’s requirements, and the EPA could incorporate SWMPs into the permit as an enforceable document.<sup>848</sup>

The CWA gives states latitude to impose requirements more stringent than the CWA, and the EPA recommends that MS4 permits include numeric requirements and conditions. The National Association of Clean Water Agencies recently noted an increasing trend of permitting authorities including numeric effluent limits and other permit conditions that are intended to bring MS4 discharges into compliance with WQS.<sup>849</sup> NPDES permits designed to achieve WLAs for stormwater sources included in a TMDL may incorporate a range of options, including BMPs and numeric effluent limits, if necessary.

### Combined Sewer Overflows

A Combined Sewer System (CSS) is a wastewater collection system owned by a state or municipality that conveys municipal sewage and stormwater through a single-pipe system to a Publicly Owned Treatment Works (POTW) Treatment Plant.<sup>850</sup> CSSs must obtain NPDES permits.<sup>851</sup> Whereas MS4s convey stormwater separately from wastewater, often directly to a receiving waterbody and bypassing treatment, CSSs incorporate both flows into the same system destined ultimately to a treatment plant. This same-system incorporation means that a wet weather event can cause system back-ups and overflows which will release both stormwater and wastewater into the environment. Such an event is termed a “combined sewer overflow” (CSO), or a discharge from a CSS before reaching the POTW.<sup>852</sup>

The EPA’s 1994 CSO Control Policy requires CSS system owners to implement nine minimum control measures (MCMs) to address impacts from overflows.<sup>853</sup> The MCMs do not include a statement of required or expected end-of-pipe concentrations of individual pollutants. Instead, the measures aim to reduce the volume of wastewater routed around the wastewater treatment plant and to lower the amount of pollutant loads associated with CSO events. Most CSO permits do not contain end-of-pipe limits.

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<sup>845</sup> 40 C.F.R. § 122.2 (2018).

<sup>846</sup> *MS4 Stormwater Permitting Guide*, *supra* note 812 at 22.

<sup>847</sup> *Id.* at 23.

<sup>848</sup> *Id.* at 14, 78. Tactics for addressing *existing* stormwater discharges typically require installing certain types of structural devices or employment of various management strategies, such as retrofitting stormwater basins, disconnecting impervious surfaces, promoting infiltration of rainfall and snowmelt wherever possible via “rain” gardens, pervious pavement, and other features. *New* development runoff often can be controlled through low-impact development (LID).

<sup>849</sup> *Id.* at 42.

<sup>850</sup> 40 C.F.R. § 122.2 (2018).

<sup>851</sup> *Id.* at § 122.26 (a)(7) (“Conveyances that discharge storm water runoff combined with municipal sewage are point sources that must obtain NPDES permits in accordance with the procedures of §122.21 and are not subject to the provisions of this section.”).

<sup>852</sup> 40 C.F.R. § 122.2 (2018).

<sup>853</sup> Combined Sewer Overflow (CSO) Control Policy, 59 Fed. Reg. 18,688 (Apr. 19, 1994).

Congress added to CWA §402 subsection (q), requiring CSS permits issued post-2000 to conform to the CSO control policy.<sup>854</sup> In 2012, the EPA issued a memorandum on integrated municipal stormwater and wastewater planning. The primary objective was to aid in identifying efficiencies in the implementation of wastewater and stormwater programs, including prioritization of capital investments.<sup>855</sup>

CSSs in the Chesapeake Bay watershed jurisdictions include the District of Columbia. In 2015, DC Water sought an amendment to its consent decree to include requirements of green infrastructure in the system's CSO control plan.<sup>856</sup> Philadelphia (albeit not situated in the Chesapeake watershed itself) celebrates the use of GI as a primary CSO control technology in the City's Long Term Control Plan (LTCP).<sup>857</sup>

### Municipal Separate Storm Sewer Systems

Municipal separate storm sewer (MS4) permits authorize cities, counties, or other governmental entities to discharge stormwater collected by their storm sewer systems to WOTUS.<sup>858</sup> MS4 operators must obtain an NPDES permit and develop an SWMP to reduce the contamination of stormwater runoff and prohibit illicit discharges.

CWA § 402(p) takes a phased approach to regulating MS4s under the NPDES program.<sup>859</sup> The statutory language authorizes the EPA to require permits of "large" and "medium" MS4s—those serving populations of 250,000 or more, and between 100,000 and 250,000, respectively—and of MS4s where the regulatory body determines "the stormwater discharge contributes to a violation of a water quality standard or is a significant contributor of pollutants in waters of the United States." The latter statement underpins EPA regulation of "small" MS4s.<sup>860</sup>

The EPA developed stormwater regulations under §402(p) in two phases, adopting, in Phase I, a procedure that would enable the EPA to address the major contributors of stormwater pollutants—large and medium MS4s—first, and all remaining stormwater discharges in later phases, including small MS4s in Phase II.

The Phase I rule, published November 16, 1990,<sup>861</sup> established application and other NPDES permit requirements for stormwater discharges from medium and large MS4s.<sup>862</sup> Large and medium MS4s are usually covered by *individual* permits, which involve a detailed list of application requirements.<sup>863</sup> This includes a new or updated Stormwater Pollution Plan or Stormwater Management Program Plan listing specific program components and structural and

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<sup>854</sup> Pub. L. 106–554, § 1(a)(4) [div. B, title I, § 112(a)], 114 Stat. 2763, 2763A–224 (2000) (codified as 33 U.S.C. § 1342(q) (2008)).

<sup>855</sup> Memorandum from the Environmental Protection Agency on Achieving Water Quality through Integrated Municipal Stormwater and Wastewater Plans (Oct. 27, 2011), <https://www3.epa.gov/npdes/pubs/memointegratedmunicipalplans.pdf>; see also Memorandum from Environmental Protection Agency on Integrated Municipal Stormwater and Wastewater Planning Approach Framework (June 5, 2012), <https://semspub.epa.gov/work/02/205159.pdf>.

<sup>856</sup> See EPA, *Green Infrastructure in the Mix to Reduce District of Columbia Sewer Overflows: Stories of Progress in Achieving Healthy Waters* (2015) available at <https://www.epa.gov/dc/green-infrastructure-mix-reduce-district-columbia-sewer-overflows>.

<sup>857</sup> See PHILA. WATER DEP'T, *GREEN CITY CLEAN WATERS: THE CITY OF PHILADELPHIA'S PROGRAM FOR COMBINED SEWER OVERFLOW CONTROL, A LONG TERM CONTROL PLAN UPDATE* (2009).

<sup>858</sup> *MS4 Stormwater Permitting Guide*, *supra* note 812 at 9 (defining MS4 to include roads with drainage systems and municipal streets). 40 C.F.R. §122.26(b)(8) (2018). Several states operate under definitions and impose requirements on MS4s under state law that vary from, or are more stringent than, the federal CWA requirements. Some states expand the regulatory scope of MS4 permits to cover sources of stormwater that are otherwise not subject to regulation under the federal CWA).

<sup>859</sup> See 33 U.S.C. § 1342(p) (2017).

<sup>860</sup> See 33 U.S.C. § 1342(p)(2) (2017).

<sup>861</sup> National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges, 55 Fed. Reg. 47,990 (Nov. 16, 1990).

<sup>862</sup> See 40 C.F.R. §122.26(a)(3)(i) (2011) ("Permits must be obtained for all discharges from large and medium municipal separate storm sewer systems.").

<sup>863</sup> *Id.* at §122.26(c)(1), (d).

source control BMPs; an illicit discharge detection and elimination (IDDE) program; an industrial and construction site runoff program; an updated map of the MS4 system, major outfalls, regulated MS4 service area; identification of water bodies receiving discharges and their condition; and WLAs used to develop NPDES permit limits. Phase I MS4s must implement a program to reduce loadings of pollutants in stormwater runoff from existing sources in all major urban land use categories to the MEP. Notably for this paper, Phase I MS4 permits require management practices to reduce the impact of stormwater runoff from local streets. In the proposed management program, a permittee must describe “practices” for operating and maintaining “public streets, roads and highways” and “procedures” for reducing impacts on receiving water from discharges from the MS4, including “pollutants discharged as a result of deicing activities.”<sup>864</sup>

The Phase II MS4 rule, published December 8, 1999, covers “regulated” small MS4s in urbanized areas, and small MS4s outside urbanized areas that are designated by the permitting authority—for example, where the EPA or state determines discharges may have significant water quality impacts.<sup>865</sup> A regulated small MS4 is generally defined as any MS4 not already covered by Phase I program and located within the urbanized area boundary as determined by the latest U.S. Decennial Census.<sup>866</sup> A permit need not cover MS4 dischargers in three circumstances: when they constitute small MS4s located outside of Census-designated urban areas;<sup>867</sup> they are small MS4s granted a waiver;<sup>868</sup> or they are discharges from separate storm sewers in “very discrete areas,” such as individual buildings.<sup>869</sup>

EPA regulations impose six MCMs that apply specifically to medium and small MS4s.<sup>870</sup> The sixth MCM, Pollution prevention/good housekeeping for municipal operations, has the goal of preventing or reducing pollutant runoff from municipal operations and addresses stormwater runoff from municipality-owned facilities and activities. Among the items EPA recommends permittees address are “controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards...”<sup>871</sup> Regulated

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<sup>864</sup> *Id.* at §122.26 (d)(2)(iv)(A)(3).

<sup>865</sup> National Pollutant Discharge Elimination System—Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges, 64 Fed. Reg. 68,723 (Dec. 8, 1999); *see also* 33 U.S.C. § 1342(p)(4) (2017).

<sup>866</sup> *See* U.S. ENVTL. PROT. AGENCY, EPA-833-F-00-003 STORMWATER PHASE II FINAL RULE: WHO’S COVERED? DESIGNATION AND WAIVERS OF REGULATED SMALL MS4S 2 (2012) (defining an “urbanized area” to cover a central area and urban fringe with a residential population of 50,000 or more, and an overall population density of at least 1,000 people per square mile. Notably, other small MS4s located outside of an urbanized area may be designated as a regulated small MS4 if the NPDES permitting authority determines that its discharges cause, or have the potential to cause, an adverse impact on water quality); 40 C.F.R. §§ 122.32(a)(2), 123.35(b)(3) (2018); *See also* 40 C.F.R. §122.26(a)(9)(i) (2018) (“[o]n and after October 1, 1994, for discharges composed entirely of storm water, that are not required by paragraph (a)(1) of this section to obtain a permit, operators shall be required to obtain a NPDES permit only if: (A) The discharge is from a small MS4 required to be regulated pursuant to § 122.32 . . . (C) The Director, or in States...determines that storm water controls are needed for the discharge based on wasteload allocations that are part of the “total maximum daily loads” (TMDLs) that address the pollutant(s) of concern, or (D) The Director...determines that the discharge, or category of discharges within a geographic area, contributes to a violation of a water quality standard or is a significant contributor of pollutants to the Waters of the United States.”).

<sup>867</sup> 40 C.F.R. § 122.32(a)(1) (2018).

<sup>868</sup> *See* § 40 C.F.R. §122.32(c-e) (2018) (permitting coverage may be waived if the MS4 serves a population of less than 1,000 or 10,000 and meets other enumerated criteria in each circumstance and including information on waivers with regard to population requirements.); U.S. ENVTL. PROT. AGENCY, EPA 833-F-00-004, STORMWATER PHASE II FINAL RULE: URBANIZED AREAS: DEFINITION AND DESCRIPTION (2012).

<sup>869</sup> 40 C.F.R. § 122.26(b)(16)(iii) (2018) (excluding such separate storm sewers from the definition of small MS4s).

<sup>870</sup> *See* EPA, EPA-810-U-16-001, COMPENDIUM OF MS4 PERMITTING APPROACHES: PART 1: SIX MINIMUM CONTROL MEASURES (2016) *available at* [https://www.epa.gov/sites/production/files/2017-01/documents/part1-epa\\_compendium\\_of\\_ms4\\_general\\_permit\\_requirements](https://www.epa.gov/sites/production/files/2017-01/documents/part1-epa_compendium_of_ms4_general_permit_requirements)

*\_508.pdf* (specific real-world examples of permit provisions). Permittees may rely on other entities to satisfy their NPDES permit obligations to implement a MCM under certain conditions. 40 C.F.R. § 122.35(a) (2018).

<sup>871</sup> *See* 40 C.F.R. §122.34(b)(1)–(6).

small MS4s must also develop and implement SWMPs, which explain how the permittee will comply with the permit's terms. Generally, the permittee is allowed to select the appropriate BMPs.<sup>872</sup>

All MS4s must include in their permit applications a description of the management program to control pollutants from the municipal separate storm sewer system, as well as a description of structural and source control measures to reduce pollutants from runoff from commercial and residential areas that are discharged from the municipal storm sewer system.<sup>873</sup> This description must include a description of practices for operating and maintaining *public streets, roads, and highways*.<sup>874</sup>

A *general* permit usually covers small MS4s; CWA §402(p) and its accompanying regulations explicitly authorize permitting authorities to issue permits on a system- or jurisdiction-wide basis.<sup>875</sup> 40 C.F.R. § 122.28 lays out the requirements for general permits. Permitting authorities can choose either the Comprehensive General Permit or the Two-Step General Permit approach to apply to small MS4s seeking to be regulated under a general permit.<sup>876</sup> Under the Comprehensive General Permit approach, a general permit includes the full set of requirements necessary to meet the MS4 permit standard—that is, to reduce the discharge of pollutants from its MS4 to the MEP to protect water quality. The permitting authority does not establish additional requirements after permit issuance. Under the Two-Step General Permit approach, the permitting authority issues a *base* general permit containing the terms and conditions applicable to all small MS4s covered by the permit and then establishes through a second permitting step additional permit terms and conditions for each MS4. The permittee's Notice of Intent (NOI) must contain whatever information is necessary for the permitting authority to develop the additional requirements for each permittee. The permittee reviews the NOI for adequacy, determines needed additional requirements, and provides public notice and opportunity for the public to submit comments and request a hearing. This approach was formulated under the MS4 General Permit Remand Rule,<sup>877</sup> following partial remand of the Phase II stormwater regulations by U.S. Ninth Court of Appeals in the 2003 case, *Environmental Defense Center v. U.S. Environmental Protection Agency*.<sup>878</sup>

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<sup>872</sup> *Id.* at § 122.34(b).

<sup>873</sup> *Id.* at § 122.26(d)(2)(iv)(A).

<sup>874</sup> *Id.* at § 122.26(d)(2)(iv)(A)(3).

<sup>875</sup> 33 U.S.C. § 1342(p)(3)(B) (2017); *see also, e.g., id.* § 122.26(a)(3)(iii) (2018) (authorizing the permitting authority to issue either one system-wide permit covering all discharges from MS4s within a *large or medium* municipal storm sewer system or issue distinct permits for appropriate categories of discharges *within* a large or medium MS4) (emphasis added).

<sup>876</sup> 40 C.F.R. § 122.28(d) (2018) ("For general permits issued under paragraph (b) of this section for small MS4s, the Director must establish the terms and conditions necessary to meet the requirements of §122.34 using one of the two permitting approaches in paragraph (d)(1) or (2) of this section . . .").

<sup>877</sup> U.S. ENVTL. PROT. AGENCY, FACT SHEET: FINAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) GENERAL PERMIT REMAND RULE 5 (2016).

<sup>878</sup> *Environmental Defense Center v. U.S. Environmental Protection Agency*, 344 F.3d. 832 (9th Cir. 2003) (holding the Phase II rule provisions for small MS4 general permits lacked procedures for permitting authority review and public notice, and the opportunity to request a hearing on Notices of Intent (NOIs) for authorization to discharge under a general permit. The court found that NOIs under the existing rule did not operate similarly as in other NPDES general permit: other general permits contain specific effluent limitations and conditions applicable to the class of discharges, and authorization to discharge is obtained by filing an NOI agreeing to comply with general permit's terms, and providing some basic information to determine eligibility. However, under the Phase II rule, the NOI contains information describing what MS4 will do to reduce pollutants to the MEP, making the NOI the functional equivalent of an individual permit application. The CWA therefore requires public notice and opportunity to request a public hearing for all permit applications. Key to the court's determination was the fact that the Phase II rule allowed an MS4 to identify the BMPs it would undertake in its stormwater management program without any permitting authority review. This lack of review to ensure the measures a small MS4 operator decided to undertake would *in fact* reduce discharges of pollutants to the MEP did not comport with CWA's requirements. The EPA changed its regulations governing how small MS4s obtain NPDES general permits, and the Phase II Remand Rule was effective Jan 9, 2017).

State procedures vary widely regarding whether an MS4 has the option to pursue an individual permit if the MS4 is not satisfied with the general permit.<sup>879</sup> For example, in West Virginia, state procedure requires an MS4 authorized by a general permit, but seeking to apply for an individual permit, to “request to be excluded from the coverage...” by submitting an application no later than 90 days after the general permit notice.<sup>880</sup>

## Grant Programs

Non-point source (NPS) programs address nonpoint sources of pollution mainly through education and cost-share grants. Although Clean Water State Revolving Funds (SRF) loans may be used to fund such programs, CWA §319 grants constitute the only EPA funding program dedicated to addressing NPS pollution.

CWA §319 created a federal grant program that provides funding to states and localities for developing and implementing NPS management programs.<sup>881</sup> These cost-sharing grants require a 40 percent state match.<sup>882</sup> In Fiscal Year 2017, Congress appropriated \$167 million, a decrease from a peak of \$238.5 million in 2003.<sup>883</sup> Grantees must complete and update an NPS management plan every five years as a condition of receiving Section 319 funds.<sup>884</sup>

Grantees may, at their discretion, use Section 319 funds to develop their own NPS regulatory programs, although few have done so.

The 107th Congress in 2002 enacted legislation allowing states to use Section 319 grant funds for projects or activities related to developing and implementing a Phase II stormwater program,<sup>885</sup> although this authority applied only to Section 319 funds in FY 2003. Legislation to extend this authority beyond FY2003 was introduced in the 108th Congress but was not enacted.<sup>886</sup>

A 2016 EPA report on the National Nonpoint Source Program summarized funding sources supporting the restoration of 538 NPS-impaired waters across the nation. Approximately \$238 million, or 13 percent of the \$1.78 billion total,

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<sup>879</sup> *MS4 Stormwater Permitting Guide*, *supra* note 812 at 75.

<sup>880</sup> W.VA. CODE R. § 33-9-11.2.b.3.

<sup>881</sup> 33 U.S.C. § 1329(h) (2017); Water Quality Act of 1987, Pub. L. 100–4§ 316(a), 101 Stat. 56.

<sup>882</sup> 33 U.S.C. § 1329(h)(3) (2017) (“The Federal share of the cost of each management program implemented with Federal assistance under this subsection in any fiscal year shall not exceed 60 percent of the cost incurred by the State in implementing such management program and shall be made on condition that the non-Federal share is provided from non-Federal sources.”).

<sup>883</sup> See EPA, *319 Grant Program for States and Territories: 319 Overview*, <https://www.epa.gov/nps/319-grant-program-states-and-territories> (last visited Dec. 24, 2018). President Trump’s FY 2018 budget request eliminated funding for nonpoint source grants. See Jonathan L. Ramseur & Mary Tiemann, CONG. RESEARCH SERV., RL96647, WATER INFRASTRUCTURE FINANCING: HISTORY OF EPA APPROPRIATIONS 36 (2019); EPA, EPA-833-F-08-009, MANAGING WET WEATHER WITH GREEN INFRASTRUCTURE 1 (2008).

<sup>884</sup> See 33 U.S.C. §1329(a, b) (2017). Section §319(a)(1) describes the required contents of state assessment reports identifying navigable waters within each state requiring additional action to control nonpoint sources of pollution necessary to achieve WQS and other CWA goals, as well as categorizing sources of nonpoint pollution, the process for reducing the level of pollution from those sources to the MEP, and state and local programs for controlling such pollution. Section §319(b) lays out the requirement for state management plans and specific contents, including identification of BMPs.

<sup>885</sup> Great Lakes and Lake Champlain Act of 2002, Pub. L. 107–303§ 301, 116 Stat. 2361.

<sup>886</sup> See S. 1716, 108th Cong. (2003); H.R. 3528, 108th Cong. (2003). However, “for fiscal year 2003, funds made available to a State to carry out nonpoint source management programs under section 319 of the Federal Water Pollution Control Act (33 U.S.C. § 1329 (2011) may, at the option of the State, be used to carry out projects and activities in the State relating to the development or implementation of phase II of the storm water program of the Environmental Protection Agency established by the rule entitled ‘National Pollutant Discharge Elimination System—Regulations for Revision of the Water Pollution Control Program Addressing Storm Water Discharges,’ promulgated by the Administrator of the Environmental Protection Agency on December 8, 1999 (64 Fed. Reg. 68,722 (1999)).”

was Section 319 funding.<sup>887</sup> The report also outlined the source categories NPS projects focused on from 2008 to 2015, with the second largest category at 1,507 projects addressing urban stormwater runoff, including from roads and parking lots.<sup>888</sup>

## Chesapeake Bay TMDL

Several agreements, orders, and settlements have helped establish the Chesapeake Bay TMDL: the Chesapeake Bay Agreement, the settlement of a lawsuit between the Chesapeake Bay Foundation and the EPA, and the 2009 Executive Order by President Barack Obama.

Originally, the Chesapeake Bay Agreement “was a simple, one-page pledge signed in 1983,” recognizing “that a cooperative approach was necessary to address the Bay’s pollution problems.”<sup>889</sup> However, in 1987, the signees began to set “the first numeric goals to reduce pollution and restore the Bay system.”<sup>890</sup> The 1987 Chesapeake Bay Agreement—signed by the governors of Virginia, Pennsylvania, Maryland, and the District of Columbia, along with the EPA—established the Chesapeake Bay Program, which required that, by 2000, the amount of nutrients in the Bay would be reduced by 40 percent.<sup>891</sup> The Agreement was later amended in 1992, with the parties agreeing to address the nutrient pollution at its source—upstream in the Chesapeake Bay’s rivers—and “develop ‘tributary-specific strategies’ on how to meet the nutrient reduction goal.”<sup>892</sup> Additionally, after the 1992 Amendments, the Chesapeake Bay Program “began reevaluating its Basinwide Toxics Reduction Strategy to better understand the effects of chemical contaminants on the Bay’s aquatic life.”<sup>893</sup>

The parties ultimately failed to meet the deadline set by the 1987 Chesapeake Bay Agreement and its subsequent amendments, so, as a result, the Chesapeake Bay Program partnership signed a new agreement—The Chesapeake 2000: A Watershed Partnership.<sup>894</sup> As part of this partnership, the federal government authorized the EPA to continue working on the Chesapeake Bay Program by providing “support to the Chesapeake Executive Council” through scientific development and provision of information “pertaining to the environmental quality and living resources of the Chesapeake Bay ecosystem,” cooperation and coordination with “appropriate Federal, State, and local authorities,” and the implementation of outreach programs.<sup>895</sup>

Another key origin of the Chesapeake Bay TMDL was the May 2010 settlement of a lawsuit between Chesapeake Bay Foundation and the EPA, *Fowler v. EPA*.<sup>896</sup> The settlement came out of a lawsuit—filed in 2009—which alleged that the EPA failed to comply with the CWA, the Administrative Procedure Act, and the Chesapeake Bay Agreements

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<sup>887</sup> See § 319 HIGHLIGHTS *supra* note 836 at 5.

<sup>888</sup> See *id.* at 8.

<sup>889</sup> *Bay Program History*, CHESAPEAKE BAY PROGRAM, [https://www.chesapeakebay.net/who/bay\\_program\\_history](https://www.chesapeakebay.net/who/bay_program_history) (last visited June 17, 2019).

<sup>890</sup> *Id.*

<sup>891</sup> Chesapeake Bay Agreement (1987).

<sup>892</sup> *Bay Program History*, *supra* note 889; Statement of Mr. William C. Baker, *Chesapeake Bay Foundation*, [http://www.cbf.org/document-library/federal-affairs/CBF-Testimony\\_113th-Congress\\_Status-of-the-Bay-Cleanup0e1e.pdf](http://www.cbf.org/document-library/federal-affairs/CBF-Testimony_113th-Congress_Status-of-the-Bay-Cleanup0e1e.pdf) (last visited Feb. 1, 2019).

<sup>893</sup> *Bay Program History*, *supra* note 889.

<sup>894</sup> Baker, *supra* note 892.

<sup>895</sup> 33 U.S.C. § 1267 (2017) (defined as “the program directed by the Chesapeake Bay Executive Council [the signatories to the Chesapeake Bay Agreement] in accordance with the Chesapeake Bay Agreement”).

<sup>896</sup> CHESAPEAKE BAY FOUNDATION, *EPA Signs Binding Commitment to Reduce Pollution* (2010), <http://www.cbf.org/news-media/newsroom/2010/epa-signs-binding-commitment-to-reduce-pollution.html>.



concerning restoring and preserving the Chesapeake Bay water quality and living resources.<sup>897</sup> As part of the settlement, the EPA was required to set specific targets for Bay restoration and specific limits on all sources of nitrogen, phosphorus, and sediment—or the Bay TMDLs—by December 31, 2010.<sup>898</sup> The TMDLs were to include LAs for nonpoint sources for each impaired segment of the Bay.<sup>899</sup>

The TMDLs are implemented via WIPs: plans developed by the seven Bay Jurisdictions to achieve and maintain the Bay TMDL's nitrogen, phosphorus and sediment allocations by 2015.<sup>900</sup> Phase I WIPs were to be submitted by November 29, 2010, and the final Phase II WIPs by November 1, 2011.<sup>901</sup> Under the agreement, the EPA reviews progress made toward the WIP commitments every two years, with regard to addressing program gaps and achieving the pollution loading reductions, and each WIP's two-year milestone commitments.<sup>902</sup> The EPA also provides NPDES permit oversight, and implements a Tracking and Accounting System, which includes "information about load and wasteload allocations and how the TMDL is being implemented."<sup>903</sup> Additionally, in July 2010, the EPA published the *Urban Stormwater Approach for the Mid-Atlantic and the Chesapeake Bay Watershed*, which "describes an approach for the National Pollutant Discharge Elimination System (NPDES) permitting authorities to follow and develop and issue permits and implementing regulations for discharges from municipal separate storm sewer systems (MS4) in the Mid-Atlantic Region and Chesapeake Bay Watershed."<sup>904</sup>

The settlement agreement also obligated the EPA to propose a regulation under CWA § 402(p) by September 30, 2011, to expand the universe of regulated stormwater discharges and control, at a minimum, stormwater discharges from newly developed and redeveloped sites.<sup>905</sup> The EPA was required to take final action on this rule by November 19, 2012.<sup>906</sup> However, the deadline was renegotiated several times and, in 2014, the EPA discontinued development of a national stormwater rule.<sup>907</sup> The EPA instead pursued other approaches and, notably, stated it would continue to promote green infrastructure as an integral part of stormwater management.<sup>908</sup>

The Chesapeake Bay TMDL sets watershed limits at 185.9 million pounds nitrogen, 12.5 million pounds phosphorus, and 6.45 million pounds of sediment per year.<sup>909</sup> This is a drastic reduction standard, requiring a 25 percent reduction in nitrogen, a 24 percent decrease in phosphorus, and a 20 percent decrease in sediment.<sup>910</sup> As mentioned above, TMDLs are implemented through WIPs, and the EPA expected that the states would submit their Phase III WIPs by

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<sup>897</sup> Jon A. Mueller & Angeline Purdy, *Settlement Agreement between the Chesapeake Bay Foundation, Inc. and the U.S. Department of Justice Environmental and Natural Resources Division 1* (2010) (alleging EPA has nondiscretionary duties under 33 U.S.C. § 1267(g) to achieve and maintain the goals of the Chesapeake Bay Agreement).

<sup>898</sup> *Id.* at 12.

<sup>899</sup> *Id.* at 13.

<sup>900</sup> *Id.* at 14.

<sup>901</sup> *Id.*

<sup>902</sup> *Id.* at 14-15.

<sup>903</sup> *Id.* at 15-16, 18.

<sup>904</sup> EPA, *Urban Stormwater Approach for the Mid-Atlantic Region and the Chesapeake Bay Watershed* (2010) available at [https://www.epa.gov/sites/production/files/2015-07/documents/ms4guider3final07\\_29\\_10.pdf](https://www.epa.gov/sites/production/files/2015-07/documents/ms4guider3final07_29_10.pdf).

<sup>905</sup> Mueller & Purdy, *supra* note 897.

<sup>906</sup> *Id.*

<sup>907</sup> EVERYCRSREPORT.COM, *Stormwater Permits: Status of EPA's Regulatory Program*, <https://www.everycrsreport.com/reports/97-290.html> (last visited Apr. 11, 2019).

<sup>908</sup> Claudia Copeland, CONG. RESEARCH SERV. R97290, *STORMWATER PERMITS: STATUS OF EPA'S REGULATORY PROGRAM 11* (2016).

<sup>909</sup> See *Chesapeake Bay TMDL Fact Sheet supra* note 583.

<sup>910</sup> *Id.*

2017.<sup>911</sup> The District of Columbia and Virginia published draft Phase III WIPs in 2019,<sup>912</sup> Maryland published its Phase III WIP in 2019,<sup>913</sup> and Pennsylvania is still developing its Phase III WIP.<sup>914</sup>

In February 2013, the Chesapeake Bay Program Office within EPA Region 3 established the pollution loading reductions from urban and suburban stormwater needed by 2025.<sup>915</sup> Estimates for the Chesapeake Bay watershed jurisdictions between 2009 and 2017 are as follows: Delaware cut its nitrogen loads 8 percent, phosphorus loads 21 percent, and sediment loads 18 percent; the District of Columbia cut its nitrogen loads by 45 percent, slightly increased its phosphorus loads, and cut sediment loads by 6 percent; Maryland cut its nitrogen loads by 10 percent, phosphorus loads by 18 percent, and sediment loads by 15 percent; New York cut its nitrogen loads by 2 percent, phosphorus loads by 22 percent, and sediment loads 3 percent; Pennsylvania cut its nitrogen loads by 5 percent, phosphorus loads by 16 percent, and sediment loads by 10 percent; Virginia cut its nitrogen loads by 18 percent, phosphorus loads by 26 percent, and sediment loads by 7 percent; and West Virginia cut its nitrogen loads by 7 percent, phosphorus loads by 9 percent, and sediment loads by 27 percent.<sup>916</sup>

Unfortunately, guaranteed future funding for the Chesapeake Bay Restoration is uncertain. The federal government had between \$460 and \$570 million in budgetary authority for restoration activities between FY 2014 and 2017. The FY 2018 EPA budget request proposed eliminating the Chesapeake Bay Program, but Congress provided the program with \$73 million in FY 2018. Congress supported other Chesapeake Bay restoration activities in the FY 2018 appropriations omnibus at prior or increased levels. The President's FY 2019 agency budget request proposes reductions for many of these programs.<sup>917</sup>

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<sup>911</sup> *Id.*

<sup>912</sup> D.C. DEP'T OF ENERGY & ENV'T, *District of Columbia's Phase III Watershed Implementation Plan for the Chesapeake Bay* (Draft 2019) available at [https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service\\_content/attachments/Phase%20III%20WIP%20Draft-Appendix.pdf](https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/Phase%20III%20WIP%20Draft-Appendix.pdf); VA. DEP'T OF ENVTL. QUALITY, *Virginia's Draft Phase III Watershed Implementation Plan* (2019) available at <https://www.deq.virginia.gov/Programs/Water/ChesapeakeBay/ChesapeakeBayTMDL/PhaseIIIWatershedImplementationPlanning.aspx>.

<sup>913</sup> MARYLAND.GOV, *Maryland's Phase III Watershed Implementation Plan to Restore Chesapeake Bay by 2025* (2019) available at [https://mde.maryland.gov/programs/Water/TMDL/TMDLImplementation/Documents/Phase%20III%20WIP%20Report/Draft%20Phase%20III%20WIP%20Document/Full%20Report\\_Phase%20III%20WIP-Draft\\_Maryland\\_4.11.2019.pdf](https://mde.maryland.gov/programs/Water/TMDL/TMDLImplementation/Documents/Phase%20III%20WIP%20Report/Draft%20Phase%20III%20WIP%20Document/Full%20Report_Phase%20III%20WIP-Draft_Maryland_4.11.2019.pdf).

<sup>914</sup> PA. DEP'T OF ENVTL. PROT., *Phase 3 of Pennsylvania's Chesapeake Bay Watershed Implementation Plan (WIP3)* (2019), [https://www.dep.pa.gov/Business/Water/Pennsylvania%E2%80%99s%20Chesapeake%20Bay%20Program%20Office/WIP3/Pages/Phase-III-WIP-\(Watershed-Implementation-Plans\).aspx](https://www.dep.pa.gov/Business/Water/Pennsylvania%E2%80%99s%20Chesapeake%20Bay%20Program%20Office/WIP3/Pages/Phase-III-WIP-(Watershed-Implementation-Plans).aspx).

<sup>915</sup> EPA & CHESAPEAKE BAY PROGRAM, *EPA's Expectations for Phase III Watershed Implementation Plans*, [https://www.chesapeakebay.net/documents/Updated\\_Phase\\_III\\_WIP\\_Expectations\\_Fact\\_Sheet.pdf](https://www.chesapeakebay.net/documents/Updated_Phase_III_WIP_Expectations_Fact_Sheet.pdf) (last visited Apr. 11, 2019).

<sup>916</sup> Catherine Krikstan, Chesapeake Bay Program partnership exceeds 2017 pollution reducing targets for phosphorus, sediment, CHESAPEAKE BAY PROGRAM, [https://www.chesapeakebay.net/news/blog/partnership\\_exceeds\\_2017\\_pollution\\_reducing\\_targets\\_for\\_phosphorus\\_sediment](https://www.chesapeakebay.net/news/blog/partnership_exceeds_2017_pollution_reducing_targets_for_phosphorus_sediment) (July 17, 2018).

<sup>917</sup> Eva Lipiec, CONG. RESEARCH SERV. RL45278, Chesapeake Bay Restoration: Background and Issues for Congress 18–10 (2018).