Stormwater Management Implementation Advisory Group Recommendations

November 10, 2025

OVERVIEW

From May 2025 to September 2025, the Virginia Beach Stormwater Management Implementation Advisory Group ("SWAG", "Advisory Group", "we" or "us") convened to review stormwater management in the City of Virginia Beach. The Advisory Group was made up of thirteen (13) representatives from across the City and was comprised of members representing a wide range of community interests and needs, from residents to environmentalists to developers and engineers. Representatives from the Departments of Public Works and Planning, the offices of the City Manager and the City Attorney, as well as other key city staff participated in SWAG's activity as subject matter experts and advisors.

In June of 2024, the Virginia Beach City Council passed a resolution establishing the Stormwater Management Implementation Advisory Group and setting the following objectives:

- ✓ Further review the topic of stormwater management and its impact and consequences on land use and redevelopment issues
- ✓ Identify whether there are any opportunities, advantages, and disadvantages to strengthening regulation alignment and specificity based on the City's varied drainage basins, and a property's land use and zoning characteristics
- ✓ Formalize a cost-sharing program relative to stormwater infrastructure and policy to include developing criteria for cost-sharing eligibility
- ✓ Determine whether there are any opportunities to advance/incentivize Council-adopted policy and/or planning objectives, such as affordable housing, the preservation and enhancement of our City's tree canopy and open spaces, enhanced water quality, more sidewalks and paved paths, utilization of nature-based stormwater management practices in addition to grey infrastructure solutions, implementation of regional stormwater solutions, strategic and resilient approaches to redevelopment in our City's Strategic Growth Areas and in areas of our City that are less at-risk of flooding and that do not abut neighborhoods or environmentally sensitive areas, and other preferred land use approaches, through stormwater management

After extensive education and support from subject matter experts, and collaboration amongst the Advisory Group members, the Advisory Group reached unanimous consensus on every recommendation, a testament to the SWAG members' shared commitment to the future of our City. These recommendations reflect a broad and unified vision, and SWAG believes they provide a clear and actionable path forward.

This document outlines the Advisory Group's recommendations (the "Recommendations"), which have been organized by the four (4) objectives above. An Executive Summary of the Recommendations is presented first, with detailed recommendations on the subsequent pages.

EXECUTIVE SUMMARY OF RECOMMENDATIONS

Stormwater Advisory Group Guiding Principles

The City of Virginia Beach has stormwater challenges and needs unique from other Virginia localities and therefore requires regulations capable of meeting those unique challenges and needs. The Advisory Group supports predictable processes and simultaneously recognizes the City needs sufficiently strict regulations to reduce flooding, protect water quality, support economic vitality, protect against loss of life and property, and to create a resilient City.

Objective 1: Stormwater Management, Land Use, and Redevelopment

A. **REGIONAL BMPs**: The City should encourage regional stormwater solutions by investing more heavily into an approach or program for implementing regional Best Management Practices (BMPs) for stormwater that can be used by multiple properties in close proximity. These regional BMPs will allow various property owners to collaborate to meet stormwater requirements more holistically and maximize co-benefits in an area, while minimizing negative environmental impacts, optimizing nature-based strategies, and maximizing preservation of existing natural and open spaces.

B. **FACILITATE REDEVELOPMENT**: The City's draft Comprehensive Plan encourages redevelopment, and SWAG supports this emphasis, because redevelopment of properties typically neither adds additional impervious surface nor increases stormwater runoff and can offer opportunities to address existing stormwater problems in the surrounding area. The City should ensure similar alignment of redevelopment goals with applicable City plans, regulations, and ordinances for the purpose of maximizing stormwater management.

C. **HOLISTIC STORMWATER APPROACH:** The City should sustain and strengthen its holistic approach to stormwater management, which addresses factors that contribute to and exacerbate flooding and stormwater pollution. This approach includes incentivizing redevelopment and employing regional solutions and nature-based stormwater management practices[1] where appropriate.

Objective 2: Drainage Basins, Land Use, and Zoning Characteristics

A. **NO REGIONAL DRAINAGE BASIN CHANGES**: The Council charged SWAG with reviewing whether there should be different regulations for the City's different drainage basins. We do not recommend making changes to existing ordinances based on different drainage basins. Consistency and predictability across the City is important and differing ordinances or regulations cause confusion.

B. **PUBLIC AND DEVELOPER EDUCATION**: The City should increase public education and access to information regarding the City's drainage basins and the impact of stormwater throughout the City. This increase in awareness and education will serve to heighten understanding of the importance and benefits of ongoing projects throughout the City.

[1] Green Infrastructure is defined as "the range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspirate stormwater and reduce flows to sewer systems or to surface waters" (Water Infrastructure Improvement Act 2019).

C. **ALIGN LAND USE AND ZONING ORDINANCES**: Land use and zoning requirements should be updated to align with the City's redevelopment and preservation priorities.

Objective 3: Stormwater Cost-Share Program

A. **DEVELOP A COST-SHARE PROGRAM**: The City should create stormwater cost-share program criteria, which prioritize the needs of the City and participants, and which improves stormwater management.
B. **ENSURE THE COST-SHARE PROGRAM IS ACCESSIBLE AND SUFFICIENTLY FUNDED:** The City should ensure the stormwater cost-share program process is clear, is well known by potential users, and sufficiently funded.

Objective 4: Incentivizing Council Policy and Planning Priorities

A. **INCENTIVES**: Incentivize Council priorities that align with the City's stormwater needs, like redevelopment, attainable housing, and tree canopy, especially when there are multiple and compounding benefits.

DETAILED RECOMMENDATIONS

Objective 1: Stormwater Management, Land Use, and Redevelopment

A. The City should encourage and increase investment in regional stormwater solutions.

1. The City should invest more heavily into an approach or a program for implementing regional Best Management Practices (BMPs)[2] where they can be utilized by multiple properties.
    - The City or private property owner(s) should establish a mechanism for other property owners to contribute equitably to the cost of construction and maintenance of the regional BMP.
    - The City's regional BMP approach or program should take into consideration issues of ownership, maintenance, public and private modeling, and different future standards.
    - The City should gather lessons learned from regional BMPs and continue implementation in locations where regional BMPs make sense.
    - Regional BMPs should not be limited to regional ponds.
        - Opportunities for nature-based stormwater management practices and multiple use/benefits approaches (e.g. a park with flood storage) should be prioritized in design.
    - Under-utilized areas should be examined as opportunities for innovative nature-based stormwater management practices and subsurface water storage.

2. The following issues should be taken into consideration for regional BMP site selection:

[2] Stormwater BMPs are devices, practices, or methods that are used to manage stormwater runoff by controlling peak runoff rate, improving water quality, and managing runoff volume.

- Virginia Beach's Strategic Growth Areas (SGA) have been chosen and vetted to target (re)development and would be prime locations to implement regional BMPs.
- City-owned regional BMPs should be considered in places where the City is making investments and/or has identified a City need.
- Regional BMPs should be constructed proximate to areas where there are existing stormwater/flooding issues.
- Regional BMPs should not be installed in a manner that displaces residents nor removes well-used community amenities.
- Prioritize site selection to minimize adverse environmental impact and maximize preservation of tree canopy, forests, and wetlands.
- Prioritize the City's landholdings for areas that could be used for potential regional BMP sites.

3. There are different viable financial management and ownership options for regional BMPs. The following issues should be taken into consideration for developing and maintaining regional BMPs:
   - Regional BMPs should be paid for by those who will benefit from them (i.e., structures/people served by the BMP).
   - When appropriate, implement private-public cost-share of regional level stormwater control.
     - This can act as a means of disincentivizing development in known areas of stormwater/flooding concerns while incentivizing responsible stormwater practices.
     - The City of Chesapeake's Public Facilities Manual provides a potential example in the Public Facilities Manual Chapter 5.8 Master Drainage and Drainage Pro-Rata.
   - The City could construct a BMP for a defined region
     - This should include a mechanism for developers who use the regional BMP to pay into it.
     - This will require an initial mechanism to fund construction of the BMP (e.g., bond, zero/low interest loan).
   - Dedicated funding programs that draw from select revenue streams (i.e., the Tourism Investment Program (TIP) and the Open Space Program), and the potential use of Tax Increment Financing (TIF) and Special Service Districts (SSD's) are viable **models** to consider while designing a financial management approach to Regional BMP's.
   - As regional BMPs need to be constructed prior to or concurrent with development, the associated costs can follow a pro rata scheme, similar to the Public Utilities model.
   - Stormwater fees may be reasonably offset for those utilizing regional BMPs dependent on ownership and maintenance models.
   - The City can share the cost of creating a regional BMP by identifying and incentivizing strategic parcel locations.
   - City ownership and maintenance of regional BMPs appears ideal; however, other means of ownership and/or maintenance could be considered.
   - All legally permissible ownership structures should be considered (e.g., homeowners associations, non-profits, the City of Virginia Beach, condo associations, etc.).
   - Owners must be aware of their responsibilities, especially future maintenance needs.

4. Explore and investigate quantity trading and stormwater cooperative system programs, keeping in mind best practices for these systems to meet regional and local needs.
   - This exploration should include reviewing programs in cities like Washington D.C. and Grand Rapids, Michigan, where stormwater volume cooperative systems are utilized for quantity in geographic areas proximate to flooding areas are utilized for quantity in geographic areas proximate to flooding areas.
   - If cooperative banking systems are pursued, this will need State legislation to give municipalities the authority to create these systems.

B. Ensure alignment between the City's redevelopment goals and City plans, regulations, and ordinances.

1. Review existing plans, codes, regulations, and applicable guidance to ensure alignment with principles promoting responsible redevelopment that meets City goals.
    - This review should include the following codes, regulations, and policy documents:
        - Comprehensive Plan
        - Public Works Design Standards Manual
        - Zoning Ordinance
        - Subdivision Regulations
        - Site Plan Ordinance
        - Erosion and Stormwater Management
        - Tree Planting Preservation and Replacement
        - Chesapeake Bay Preservation Area Ordinance
        - Southern Rivers Watershed Management Ordinance
        - Storm Sewer System Discharge Ordinance
        - Floodplain Ordinance
        - Strategic Growth Area Design Guidelines

2. Explore incorporating a redevelopment ordinance into the Zoning Ordinance update.
    - A redevelopment ordinance can strengthen regulation alignment and create incentives.
    - This redevelopment ordinance should focus on land use and zoning characteristics and guide redevelopment.
    - Encourage developers to reduce impervious footprints for redevelopment to reduce the impact on the environment.
    - Explore implementing ordinance changes specifically in the SGAs.

3. This Advisory Group recognizes that predictability of project viability is important to the development community and facilitates the development community's efforts to address stormwater.
    - Some of the examples of how City processes could be improved to increase predictability are included in Process Improvement Steering Committee (PISC) white papers and the 2020 Kimley Horn report on design standards changes.
    - Enchanced predictibility will address and responsd to the difficulty developers face in estimating costs when using Personal Computer Stormwater Management Model (PCSWMM) for larger projects.

4. Continued dialogue and coordination are needed between the development community and City staff to help address some of the challenges that the City's current supplemental stormwater standards (which exceed state regulations) present, as we strive to meet the demands for City Council priorities, such as attainable housing, economic development, and redevelopment.

C. Promote sustainable practices and approaches that target the factors contributing to and exacerbating flooding.

1. Continue and intensify City efforts to incorporate a holistic and sustainable approach to stormwater management by emphasizing and utilizing nature-based stormwater management practices.
    - Our region's increased flooding is exacerbated by the effects of climate change, sea level rise, increased precipitation, land subsidence, major storm events, and insufficient drainage

infrastructure. Upgrading pipes, pumps, and other infrastructure is just part of the solution; addressing the causes of flooding at their source and educating and assisting private property owners on adaptive measures is also vital.

- The City of Virginia Beach should increase efforts to reduce actions and factors contributing to climate change: use of fossil fuels, greenhouse gas emissions, vehicle-miles driven, increased impervious surfaces, and ecosystem loss (including wetlands and tree canopy).
- The City of Virginia Beach should increase adaptive actions to boost resilience: promote use of renewable energy and battery storage, retain tree canopy, preserve wetlands and other natural filters, future-sizing stormwater practices, reduce impervious surfaces, and otherwise protect spaces that offer ecosystem services.
- The Department of Public Works Sea Level Wise program is an example of the positive and pragmatic steps the City has taken to adapt to changing environmental conditions.
- Tell the story of the positive efforts Virginia Beach has taken and continues to make for resiliency and sustainability. Strengthen partnerships with outside entities to better tell the story, for example with a Stormwater Extension program.[3]
- Encourage the state to increase the design benefits provided by nature-based practices for stormwater management.

2. At the very beginning of the urban planning and site design processes, encourage the integration of stormwater practices, including nature-based stormwater management practices. The City should prioritize site design and analysis that incorporates rainwater management, porosity, permeability, and tree preservation.

Objective 2: Drainage Basins, Land Use, and Zoning Characteristics

A. Do not create additional regional stormwater ordinances for different parts of the city.

1. The Advisory Group does not recommend creating different stormwater regulations in different parts of the City, as this would overcomplicate enforcement of applicable ordinances and the process of development. Additionally, if restrictions are lowered in one geographical area, that could create negative repercussions for surrounding areas.

2. Review existing regional stormwater ordinances, like the Southern Rivers Watershed Management Ordinance and Chesapeake Bay Preservation Area Ordinance, to ensure they align with current City goals and practices.

B. Increase public education and access to information on the City's drainage basins and the impact of stormwater and the consequences of inaction throughout the City.

1. Increase education and awareness about the existing regional-based drainage areas.

[3] The Stormwater Extension Program gives residents and business owners resources to mitigate flooding on their property. (https://pw.virginiabeach.gov/stormwater/stormwater-extension)

2. Update the Virginia Beach Recurrent Flooding Indicator Map with additional information to better educate the public.
    - Add a GIS layer that includes an SGA overlay option to the Virginia Beach recurrent flooding indicator map.
    - Create a public education campaign to raise awareness of this map and how to use it.

C. Align land use and zoning ordinances to encourage redevelopment of existing underutilized developed properties and preservation of undeveloped land where appropriate.

1. Land use and zoning requirements should specifically highlight the parts of the City where increased density and redevelopment is appropriate and encouraged.

2. SWAG recognizes there is a tradeoff in encouraging preservation of agricultural and undeveloped land, particularly in the Southern part of the City, when addressing its flooding limitations.

3. The northern part of the City, in particular, may require more density and redevelopment of underutilized developed properties. This will require some creativity with development and redevelopment in the northern part of the City.

Objective 3: Stormwater Cost-Share Program

A. Create cost-share program criteria that meet stormwater requirements and prioritize the needs of the City

1. The City has established a stormwater cost-share program in the Capital Improvement Plan (CIP) and provided funding of $2 million per year to the fund. The fund should have clear criteria for its use. Developers, City staff, Councilmembers, and the public should be made aware of the criteria. City staff should establish criteria for eligible projects. However, the following table describes the general criteria SWAG has identified, including a suggestion of which criteria should be mandatory or weighted heavily. The cost-share program should only fund projects proportional to a project's benefit to the public.

Project Criteria	Mandatory	Weight
Project has a public component and enhances/upgrades existing public stormwater infrastructure. Funding should be proportional to the benefit to the public.	Yes	
The project must surpass the minimum stormwater requirements for the site.	Yes	
Project includes green stormwater infrastructure that offers defined co-benefits to the community (e.g., tree canopy/open space requirements, offsite flood management, public amenities, bioswales, pervious pavement, wetland benches, etc.).		High
Project is in an area of high flooding.		High
Project is in an area with higher development/density.		High
Project addresses identified City need and/or priority (e.g., watershed priority areas, project creates attainable housing).		High
Project is in a targeted area (e.g., an SGA or other area targeted for redevelopment).		High
Project is a regional BMP.		High
Project is more cost-effective for the City		High
Project is more time-effective for the City		High

Project Criteria	Mandatory	Weight
Project is redevelopment.		
Project preserves and/or enhances the landscape, greenspace, tree canopy, and/or open space above what is already required by the minimum code.		
Project reduces runoff, addresses existing stormwater problem, or mitigates or prevents a future stormwater problem.		
Project complies with all City permits and other requirements.		
Project can be completed within a reasonable time frame and with limited disruption to the neighborhood or district.		
Project handles a specified minimum stormwater volume criterion.		

B. Ensure the cost-share program is accessible, well known, and sufficiently funded.

1. The cost-share program's **process** should have the following qualities:
    - The program criteria and application process should be simple, easy to understand, and accessible.
    - The program should be operational, remain a budget line-item, and be sufficiently funded.
        - Explore supplemental revenue streams to fund this program.
    - The program should be introduced in a project's first pre-submittal meeting.
    - The cost-share should be pro-rated based on the quantity of contributed development and design. The City's contribution should be proportionate to how much the city contributes to the stormwater problem being addressed and not subsidize the developer's portion of the problem.
    - If the project is commercial, the property owners must agree to maintain the BMP over time.
    - Allocate funds based on drainage basin, council district, stormwater sensitivity, or volume of stormwater events.
        - Include consideration of how much funding has already been allocated to certain areas.
    - If a project meets the minimum criteria threshold for consideration into the cost-share program, staff should make a recommendation to City Council whether the project should receive cost-share program funds. City Council should make the ultimate determination.

2. Create awareness of the cost-share program, particularly with the development community, elected officials, and advocates for City funding.

Objective 4: Incentivizing Council Policy and Planning Priorities

A. Incentivize Council priorities that align with the City's stormwater needs, especially when there are multiple and compounding benefits.

1. **Potential incentives** include:
    - Incentive-based credits, such as Parking reduction credits
    - Financial incentives, such as:
        - Stormwater utility fee structures that incentivize targeted actions
        - Grants
        - Rebates
        - Direct funding

- Allow flexibility in site design as it relates to design standards in flood volume storage
    - For example, a variance that allows utilizing and creating low-lying areas without requiring them to meet BMP requirements
    - For example, when nature-based stormwater management practices are used
- The Advisory Group identified potential incentives related to several of the City Council's policy priorities (redevelopment, attainable housing, preserving tree canopy and open space, sidewalks, enhanced water quality, nature-based solutions). These potential incentives are identified on the following pages.

2. **Potential scenarios** eligible for these incentives include projects that:
    - Construct or utilize regional BMPs
    - Implement adaptive onsite stormwater management, such as encouraging the enhancement of existing wetlands
    - Creating multi-use spaces that can serve as flood storage during large storms and recreational spaces at other times (ex. Bow Creek).
    - Implement stormwater management methods beyond the minimum requirements.
    - Provide for stormwater treatment offsite, where such provision goes beyond the new development's responsibility
    - Preserve and/or enhance tree canopy and open space beyond the minimum requirements (ex., tree planting provision, as referred to in Virginia Trees for Clean Water Grant Program; or other nature-based stormwater management practices).
    - Install site-level or neighborhood-level nature-based solutions that offer multiple benefits

3. Housing density credits should be offered to incentivize creating attainable housing and responsible stormwater management practices.
    - Housing density credits should be offered for the following actions:
        - Providing a specified amount of tree canopy/natural space that exceeds existing requirements
        - Reducing a specified amount of existing impervious areas (ex. utilizing existing offsite parking within a specified distance from the project site)
        - Preserving natural areas and installing landscaping and vegetated areas in excess of minimum requirements
        - Making stormwater improvements that exceed minimum requirements to existing properties, including small and residential lots
        - Creating on-site stormwater management that reduces runoff
        - Implementing stormwater practices that lead to pollution reduction exceeding minimum requirements
        - Implementing green stormwater infrastructure
        - Reducing the amount of stormwater because of the implementation of green solutions
    - Housing density credits should require a specified percentage of the new density to include attainable housing.
    - Housing density credits should allow a project to build up, build smaller units, build less parking, and/or other specified deviations from the City ordinance that create space for density.

4. Expand the existing Water Quality Education, Outreach, and Stormwater Management program for installation of stormwater best management practices on developed sites to both commercial and residential. (This is currently funded in the Capital Improvement Program: "100472 Water Quality Cost Participation Projects")
    - All City watersheds should be eligible for the program.

- Practices include installation of rainwater catchment devices, rain gardens, infiltration trenches, bio-swales, buffer gardens, tree planting, and other conservation landscaping practices that reduce stormwater run-off.
- The City should continue to fund the Virginia Beach Conservation Assistance Program (VBCAP) and work with the Soil and Water Conservation District to ensure adequate staffing of the program.

5. Explore regulations regarding quantity-only stormwater management facilities.
    - Allow flexibility in site design as it relates to design standards in flood volume storage
    - For example, a variance that allows utilizing and creating low-lying areas without requiring them to meet BMP requirements

Potential Incentives for Specific Council Priorities

Redevelopment

Educate City staff and elected or appointed officials with decision making authority on the impacts of stormwater on redevelopment projects. (Add this information to the planning team toolkit)

Encourage redevelopment by strategically using incentives where appropriate.

Advocate for and collaborate on the benefits of redevelopment projects to the environment and residents. The City and subject matter experts should engage in proactive outreach about the environmental benefits of redevelopment.

In redevelopment or new development, consider new parking lot standards.

Attainable housing

Consider zoning ordinance amendments that would allow, in certain targeted areas of the City, developers to opt into by-right zoning if they dedicate a specified percentage of the project to attainable housing.

Create zoning ordinances allowing density and update related land use and zoning ordinances to support density.

- Parking requirements in SGAs and other areas targeted for redevelopment should be reduced to truly allow for density and reduce impervious surfaces and runoff. Consider allowing shared parking and making parking minimums the new maximums.
- Require a specified percentage of density be dedicated to attainable housing.
- Consider providing expedited plan review and approval for projects with attainable housing that include both green and grey stormwater solutions.

Attainable housing efforts should be focused on redevelopment where stormwater infrastructure already exists and can be enhanced through the development process.

Preserve and enhance City's tree canopy and open space

Create a public education campaign on the benefits of preserving and enhancing the City's tree canopy and open space. Create public tools such as the Trees and Stormwater Calculator Tool.

- Provide access to a City GIS layer that shows tree canopy gain or loss.

Collaborate with and lobby the Commonwealth of Virginia to further incorporate preservation of trees and urban forestry into stormwater management regulation.
Support reforestation and mass tree planting efforts in areas that would experience the most stormwater-related benefits from doing so. (ex. by increasing the credit given to the evapotranspiration impact of new and existing trees.

Prioritize designing neighborhood-level regional BMPs such that they can operate as both water retention areas and provide open space and passive recreational opportunities.

Use the City's existing Agriculture Reserve Program as a model to encourage preserving tree canopy and open space in flood prone areas.

Enhanced water quality

Update related zoning ordinances that can impact water quality in ways that implement preferred stormwater management principles.

- It should be mandatory that parking that exceeds lot/project maximums be made with permeable materials.
- Allow for shared parking between lots/developments/projects in residential zones to meet parking requirements.
- Allow for a percentage of required parking to be smaller spaces for compact cars and motorcycles for all uses.

More sidewalks and paved paths.

In SGAs, update sidewalk design to encourage permeable materials and nature-based stormwater management practices where appropriate and if accessibility and maintenance issues are mitigated.

- Permeable sidewalks and paths should be incentivized only if ADA requirements can be met.
- Incentivize permeable sidewalks with financial incentives and streamlined permitting.
- Integrate nature-based stormwater management practices into sidewalk design, including options such as right-of-way rain and infiltration gardens, stormwater planters and tree filter boxes, and curb cut and grates.

Many Virginia Beach residents want sidewalks constructed. Permeable pavements are expensive such that constructing these sidewalks with permeable pavements would be cost-prohibitive. However, constructing new sidewalks with permeable pavements is more feasible in yet-to-be-developed or redeveloped areas of Virginia Beach, such as SGAs, that can incorporate maintenance needs into early site-design.

Incentivize developers for creating walkable areas, especially if they use green design.

Incentivize nature-based stormwater solutions.

Collaborate with the State and the Department of Environmental Quality (DEQ) to create credits and specific incentives to utilize vegetation for stormwater storage and treatment.

Prioritize nature-based stormwater solutions when possible.

APPENDIX

Quantity Trading and Stormwater Cooperative System Programs in Other Big Cities

- Washington D.C.'s Stormwater Retention Credit Trading Program Website
- City of Grand Rapids, Michigan, Stormwater Credit Trading Program Website
- Establishing a Stormwater Volume Credit Trading Program. Published by Stormwater Currency in September 2019

Southern Rivers Watershed Management Ordinance and Chesapeake Bay Preservation Area Ordinance

- Chesapeake Bay Preservation Area Ordinance – Virginia Beach Code of Ordinances Appendix F
- Southern Rivers Watershed Management Ordinance – Virginia Beach Code of Ordinances Appendix G

Attached Reports

- Development Review Process White Paper. Published by City of Virginia Beach Process Improvement Steering Committee (PISC).
- Stormwater Solutions. Published by the City of Virginia Beach PISC in January 2023.

March 2020 Kimley-Horn PWDSM Analysis

- Review of Draft Public Works Design Standards Manual. Published by Kimley Horn in March 2020.

Green Infrastructure Evapotranspiration

- Flood Reduction Potential of Urban Forests in Virginia Beach Phase II: Stormwater Modeling to Quantify Runoff Reduction. Written by David Sample, Daniel McLaughlin, and Yang Shao. Published November 8, 2023.