ANNUAL REPORT

STORMWATER MANAGEMENT ADVISORY COMMISSION

FY 2024

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ANNUAL REPORT

SUMMARY OF REPORT

The Fiscal Year (FY) 2024 Stormwater Management Advisory Commission (SMAC) Annual Report provides a synopsis of SMAC and Raleigh Stormwater's efforts from July 1, 2023, to June 30, 2024.

MISSION AND VISION STATEMENTS

SMAC Mission Statement

Manage stormwater to preserve and protect life, support healthy natural resources, and complement sustainable growth for the community.

Stormwater Vision Statement

Foster the "**Smartest**" Stormwater Program possible to economically and equitably achieve our Mission.

STORMWATER INFRASTRUCTURE PROJECTS

The <u>Stormwater Capital Improvement Plan</u> (CIP) includes a five-year projection of projects to address the highest priority project needs in the City. The CIP is developed by stormwater staff with input from SMAC, and presented to and approved by City Council as part of the annual budget. These projects protect public safety, mitigate flooding, improve water quality, restore aging infrastructure, and improve stormwater system performance. CIP projects typically include upgrades, repairs, and improvements to stormwater infrastructure including pipes, culverts, dams, bridges, streams, and stormwater control measures, such as green stormwater infrastructure. The following section highlights the Stormwater CIP projects developed or implemented during FY 2024.

Stormwater Infrastructure Highlights

Glenbrook Drive and Dacian Road Stormwater Improvements

The culverts located at the Glenbrook Drive and Dacian Road crossings of Walnut Creek Tributary 7 (WCT7) stream are undersized and contributing to street, yard and structural flooding to nearby homes and the project area. In addition, a small undersized drainage pipe is creating a sink hole in the vicinity of two homes on Glenbrook Drive. The City has recently acquired and demolished the two homes to eliminate repetitive flooding issues. Design and permitting for this project were completed in the winter of 2024. Construction is projected to start in Summer of 2024 with a low bid of **\$2.7 million.**



Stormwater pipes at Dacian Road



Staff observing pipe on Glenwood Avenue

Western North Ridge Stormwater Improvements

The Western North Ridge Stormwater Improvements project was developed to mitigate structural, roadway and yard flooding in a series of neighborhoods that are serviced by Tanbark Way, Pine Bark Court, Harps Mill Road, and Grist Mill Road. The project will also provide stream restoration improvements to an open channel that was previously unstable and in need of stabilization. As of July 2024, the project is 6 months into its anticipated 18-month construction timeline. Construction is expected to be completed in Summer 2025 with a total construction cost of **\$5.5 million.**

Glenwood Creston Drainage Project

A series of metal pipes are failing and deteriorating in both the City right-of-way and in the backyards located between Glenwood Avenue and Creston Road, which has resulted in several sink holes forming. The City acquired a home at 1909 Glenwood Avenue that has a large sink hole near the foundation and the home is anticipated to be demolished in Fall 2024. Design plans are near complete and will be submitted for permitting in Summer 2024. The City is reaching out to impacted property owners to secure easements which is projected to be completed Winter 2024. Construction is anticipated to begin late Winter 2025, with a total easement acquisition and construction cost of **\$4.5 million**.





Western North Ridge Stormwater Project Construction

Wetland Conversion of Upper Durant Lake

NCSU's Department of Biological and Agricultural Engineering and NC Sea Grant were contracted to assess the Upper Durant Lake to evaluate alternatives for the lake. NCSU developed, compared, and ranked alternatives and concluded that converting the Upper Lake to a wetland system provides the most sustainable, educational, recreational, and maintenance benefits. Staff are collaborating with Raleigh Parks throughout the project phases. The upfront Phase 1 study of this project will be completed in late Summer 2024 with design and permitting projected to be completed February 2026. The City anticipates construction starting Summer 2026 and lasting 12 months and with a construction and inspection cost of \$7 million.

Rose Lane Safe Access Flood Resilience Project

Rose Lane provides vehicular access to the Rosalynn Place and Maplewood Forest communities located on the southern side of Walnut Creek just inside the I-440 Beltline. This road overtops as floodwaters of Walnut Creek will get high enough to prevent cars from entering or leaving the subdivision. The project is further complicated by the more than 30 existing homes located in and near the upstream floodplain of Walnut Creek. The consultant provided six design alternatives and staff are collaborating with Raleigh Transportation and Wake County Public Schools to address property access and viability. A projected cost for construction and timeline will not be in hand until the recommended design alternative receives approval from the various stakeholders.

Staff held pop-up public meetings in the Rosalynn Place and adjacent neighborhoods to present the alternatives, gather feedback and observations, and share stormwater education and programs. Through the pop-up meetings, stormwater staff interacted with HOA members and longtime community members, received quality engagement from residents, and had a positive turn-out for attendance. The Rose Lane project served as a pilot for future pop-up meeting styles.



Wetland Conversion of Upper Durant Lake Public Meeting



Rose Lane Street Flooding



Rose Lane Pop-Up Meeting

Board and Commissions Annual Report

DRAINAGE ASSISTANCE PROGRAM

The <u>Drainage Assistance Program</u> is a voluntary program that assists private residents with flooding and erosion on their property. To qualify for the program, participants must own property in the city, receive runoff from public right-of-way or public property, and be willing to donate a drainage easement to the City. DA Program funding for FY 2024 was \$1 million.

Drainage Assistance Highlights

In FY 2024 three Drainage Assistance projects, Dresden Lane, Hunting Ridge Road and Northbrook Drive were put out to bid. As of July 2024, Dresden Lane is nearing completion, with Hunting Ridge Road and Northbrook Drive expected to be completed in Fall 2024. Two projects at Frank Street and Fairfax Drive were approved by SMAC in FY 2024. Fairfax Drive will utilize in-house construction services provided by Transportation Field Services, to save costs. In addition, revisions to the Drainage Assistance as well as the Stream Stabilization policies have begun and will be brought to SMAC in FY 2025.

Frank Street had repeated flooding and severe structural concerns. This project involves opening a drainage ditch and replacing an adjacent retaining wall that it's in critical condition.

Drainage Assistance Projects Under Design

Currently, there are **26** Drainage Assistance projects in various stages of design phase, from going out to bid in the next few months, to earlier stages that include the consultant engineer in the early stages of the design phase. Their total estimated cost is **\$3.7 million.**



Dresden Lane Completed Project



Frank Street Retention Wall

STREAM STABILIZATION PROGRAM

The <u>Stream Stabilization Program</u> assists private residents with stream erosion that is not an immediate threat to a structure and improves water quality throughout the city. The Stream Stabilization Program provides funding to projects that would not be covered by the Drainage Assistance Program.

Stream Stabilization Highlights

Stream Stabilization Projects

The Stream Stabilization Program has \$500,000 in annual funding for minor to moderate stream erosion projects. In FY 2024, SMAC approved a project on Quail Ridge Road, which includes 150 linear feet of erosion that is approximately 17 feet from the home and continues to get closer.

Buffer Builder Bag Program

The program also established the Buffer Builder Bag (B3) Program which provides property owners with free native shrub and tree seedlings to help improve or create a streamside buffer on their property. This year, approximately **2,208 live stakes** were installed throughout city properties. Residents received **405 plants** to install on their properties.





Quail Ridge Road Stream Erosion

Stream Bank Repair Workshops and Small-Scale Stream Repairs

Staff hosted **four stream bank repair workshops** and **15 small-scale stream bank repairs** on private and public properties. These workshops include partnering with the NC State University and teaches residents cost-effective stream protection practices, using natural materials and native plants. The small-scale stream repair projects focused mostly on private properties assisting homeowners with stabilizing minor to moderate erosion utilizing natural measures. This year the programs stabilized approximately **1,700 feet of stream** on public and private properties.

Small-Scale Stream Repair

WATER QUALITY INITIATIVES

Raleigh Stormwater established a variety of programs, policies, and initiatives to improve and sustain water quality across the city. By meeting and exceeding regulatory water quality requirements, incorporating <u>Green Stormwater Infrastructure (GSI)</u> in public and private properties, and investing in stream restoration and repair projects, the city can benefit from improved water quality and environmental health.

Water Quality Improvement Projects

Biltmore Hills Park GSI Retrofits

In partnership with Water Resources Research Institute (WRRI) of NC State University (NCSU), Raleigh Stormwater completed the construction of four bioretention cells, two cisterns, two conveyance swales, and three conveyance stabilizations at Biltmore Hills Park in FY 2024. These GSI components help reduce the amount of stormwater runoff and pollutants entering Rochester Heights Creek. Stormwater staff anticipate a reduction in streambank erosion and frequent nuisance flooding for residents living in the downstream Rochester Heights community.



Painted Cistern at Biltmore Hills Park



Pre-construction meeting with Raleigh Parks, Raleigh Stormwater, and the contractor



Bioretention Area at Biltmore Hills Park

Durant Nature Preserve and Spottswood Stormwater Control Measure Improvements

Detailed design has continued for restoration of an existing detention pond and the outfall channel that flows through Durant Nature Preserve. The detention pond will be retrofitted to a wet pond with continuous monitoring adaptive control (CMAC) smart technology, which will increase water quality treatment capacity. The downstream outfall restoration is designed to protect Lower Durant Lake from erosion. The overall goal is to reduce erosion, improve stream health, reduce sedimentation in the downstream lake, and provide a safe experience for residents using nearby trails.

Board and Commissions Annual Report

Millbrook Exchange Park Stream Repair Project

The Millbrook Exchange Park Stream Repair project was completed this fiscal year. Repairs include raising the elevation of the streambed, armoring the structures with stone, and constructing a new floodplain bench that was planted with native tree and shrub species to further stabilize the project, provide wildlife habitat, and replace trees that are removed during construction. After construction completed in May 2024, stormwater staff led a group of Millbrook High School Sustainable Agriculture Academy students on a field trip.



Repaired stream at Millbrook Exchange Park



Millbrook High School Student Field Trip

Worthdale Park Stream Restoration and Stormwater Improvement Project

A public meeting was held in October 2023, where positive feedback was received from attendees and online survey respondents on the proposed stream restoration design and amenities (boardwalks and seating area). In December 2023, several Stormwater staff also led stormwater-related activities for 3rd, 4th, and 5th graders at Bugg Magnet Elementary School, which is adjacent to the park, to help kick off STEM week and help connect the school community to the Worthdale Stream Restoration and Stormwater Improvement project. The final design of the approximately 2,000 linear feet of stream restoration and enhancement is complete, and the project team is securing final permits in preparation for construction, which will take place in FY 2025. The construction phase for this project is funded by American Rescue Plan Act (ARPA) Funding.

Lions Park GSI Retrofits Project (ARPA Funded)

The development of the feasibility study and detailed design for the Lions Park GSI retrofit project was completed through the 90% design milestone. Two GSI features are proposed for Lions Park, one constructed gravel wetland and one bioswale. Once constructed, the GSI retrofits will help treat stormwater runoff from impervious areas in the park (such as parking lots, sidewalks and roofs), increase wildlife habitat using native plant species, and reduce the amount of pollution that reaches Bridges Branch.

Green Stormwater Infrastructure (GSI) to Mitigate Stormwater & Heat Island Effects Project (ARPA Funded)

The development of a prioritization tool for site identification and ranking along with detailed design through the 90% milestone have been completed for two pilot project locations. Once constructed, these GSI features on Crest Road and Levister Court will enhance community resiliency by using natural features and processes to mitigate the impacts of climate change and the urban heat island (UHI) effect in heat-vulnerable communities. Proposed GSI will include plantings and street trees that improve shade, while also providing water quality benefit.

Raleigh Stormwater held two successful pop-up public meetings at the GSI installation sites. Staff were able to connect and share design information with local residents, students, kids, and a local congregation. Communication will continue with these communities as the project progresses.

NPDES MS4 Permit Compliance

Raleigh Stormwater continues to meet and exceed the City's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit requirements. This permit and corresponding Stormwater Management Plan (SWMP) aims to protect water quality by preventing polluted stormwater runoff from discharging to Raleigh waterways.



GSI Urban Heat Island Rendering at Crest Street



GSI Urban Heat Island Pop-Up Meeting

This past year, in addition to maintaining program activities required by the permit, staff completed a program self-audit, reviewed the Stormwater Management Plan (SWMP), and negotiated new permit language for the next 5-year permit cycle. Staff anticipates receiving the final permit from North Carolina Department of Environmental Quality (NCDEQ) in the coming months, after which the Commission will have an opportunity to review the new permit and updated SWMP.

Education, Outreach, and Public Engagement

Stormwater education, outreach, and public engagement are requirements of the City's NPDES MS4 permit. Raleigh Stormwater has dedicated staff to conduct educational programming and to manage Stormwater Volunteer programs to fulfill these requirements and engage community members in helping to protect and improve water quality. Education and outreach activities include classroom lessons and interactive demonstrations, tabling events, public meetings, career days, STEM events, and the annual Stormwater Capture it! Art Contest. Stormwater Volunteer programs and initiatives include Adopt a Stream, Pop-up Stream Clean-up events, Volunteer Stream Monitoring, Storm Drain Marking, and Green Stormwater Infrastructure (GSI) Visual Monitoring.



SMAC Chair presenting Capture It! Award

SMAC is involved in outreach and education strategies for various stormwater initiatives throughout the year to improve communication and outreach to communities across the city, specifically through the Stormwater Capture it! Art Contest. Acting in the capacity of a Grand Jury, they reviewed and made the final determination of winning entries for the Art and Video awards. The 2024 contest had an outstanding year with **64 entries.** Reverend Jemonde Taylor, SMAC Chair presented the Awards to the students at the Dix Park Earth Day event during the Environmental Awards Ceremony in April 2024.

Stormwater staff also participated in a variety of community, educational, and outreach events like Regional Creek Week, Arbor Day, Earth Day, and the Walnut Creek Watershed Learning Network sessions, among others.



Stream Cleanup at Southgate Park

Stormwater offers short- and long- term volunteer opportunities for individuals interested in marking storm drains with 'No Dumping' stickers, collecting baseline water quality data, and removing trash from creeks and streams during organized cleanups. In FY 2024, Stormwater continued the pilot GSI Visual Monitoring Program, which helps monitor projects using photos to visually track changes and project growth over time. Approximately **1,300 volunteers** contributed **2,243 hours** to help remove approximately **27,800 pounds of trash** from our streams, mark **355 storm drains**, and monitor **12 streams**.

Green Stormwater Infrastructure (GSI) in Raleigh

In July 2021, City Council endorsed the <u>GSI Action Plan</u> developed by SMAC and Stormwater staff, and in FY 2024, work on each action is described below.

1. Lead by Example

- Numerous GSI projects were led by Raleigh Stormwater staff, including those previously described under the Water Quality Improvement projects section.
- The GSI Policy was signed by the City Manager and became effective in November 2023. The Policy requires that all City-led development projects that disturb land evaluate for the use of GSI in the early stages of design.
- GSI Advocates met with project teams regarding implementation of GSI.
- City staff identified opportunities to utilize GSI as traffic calming measures and developed GSI conceptual designs and outreach materials for use by the Transportation Department.
- GSI technical specifications were developed and standardized for internal City use.
- Agreements were executed to fund select GSI elements designed for the East Civic Tower and Dix Park Gipson Play Plaza, which are currently under construction and include a green roof, silva cells, bioretention, permeable pavement, and more.
- Stormwater staff led GSI Tours for the American Water Resources Association and the Walnut Creek Watershed Learning Network.
- Staff had discussions with Wake County Public Schools staff to share opportunities for Raleigh Stormwater to help support the design, construction, and maintenance of above-and-beyond GSI on school grounds within Raleigh.

2. Support and Incentivize Private Developers

- New standard details for construction were developed for GSI elements; existing details were updated.
- GSI Fact Sheets were updated and posted on the website.
- Raleigh Stormwater collaborated with the City's Housing and Neighborhoods Department and Office of Sustainability on a 'Stormwater and Sustainable Solutions for Affordable Housing' Open House Event with more than **100 attendees**.
- The Stormwater Design Manual incorporated language to encourage and support GSI in private development.

3. Include GSI in Rezoning Decisions

• Stormwater staff drafted example rezoning conditions and presented them to SMAC in January 2024.



Affordable Housing Open House

4. Include GSI in City's Planning Reports

• Stormwater staff met with planning staff regarding incorporating GSI into the Comprehensive Plan.

5. Propose Regulation Changes to Support GSI

- Council supported staff action to develop a process for allowing private GSI in the ROW.
- Council supported staff action to develop reimbursement tables that will make use of the GSI Reimbursement option in the UDO.

6. Build a Program for Maintaining City-owned GSI

- Raleigh Stormwater proposed an internal GSI maintenance crew and this was approved by City Council as part of the FY25 budget.
- Staff organized a design charette with Raleigh Stormwater, Transportation, and Parks
 maintenance staff to develop resilient and attractive planting plans for bioretention in City parks
 and Rights of Way that require low to medium maintenance.

Raleigh Rainwater Rewards Highlights

SMAC authorized <u>Raleigh Rainwater Rewards</u> projects under the Stormwater Quality Cost Share Policy. The policy supports water quality projects that are a shared cost between program participants and the City. Over the last five years, 163 projects were approved (63 by SMAC, 2 by City Council, and 98 by Stormwater staff). In FY 2024, **37 projects were approved** totaling approximately \$488,616 and 38 projects were installed and began maintenance terms.

Rainwater Rewards Subsidy Pilot Program

In 2022, Raleigh City Council designated American Rescue Plan Act (ARPA) funding to expand outreach and implementation of Raleigh Rainwater Rewards projects in disproportionately impacted communities through a pilot program that offers 100% reimbursement of project costs for property owners, rental properties, and places of worship. With ARPA funding sunsetting, staff collaboration with the Office of Sustainability has resulted in the securing of Climate Action Funding that will continue this 100% funding program into the future. This will allow the Raleigh Rainwater Rewards program to support projects in potentially underserved communities within the City.





Rain Garden installed through the Raleigh Rainwater Rewards Program

EQUITY AND INCLUSION FRAMEWORK

Raleigh Stormwater and SMAC are continuing to follow the City of Raleigh's equity and inclusion goals and implement policies into stormwater services, operations, public engagement, CIP project prioritization, and budgeting. The objective is to economically and equitably achieve the mission and vision of stormwater management.

Equity and Inclusion Framework Highlights

Stormwater staff continued work for the Pigeon House Branch Watershed Study, which has further helped to provide a framework to help advance the City's equity goals for public engagement related to watershed studies and project outreach. The watershed studies received responses from diverse stakeholders and requested voluntary demographic information from survey respondents which helps ensure equitable representation from the community.

Raleigh Stormwater continued to work with partners and consultants to advance Stormwater's operational equity work. This project provided detailed analysis and review of stormwater's communications and outreach strategies, project prioritization, utility fee crediting, and human resources activities.



Pigeon House Watershed Study Public Meeting





Walnut Creek Wetland Learning Network

Stormwater has continued implementation of the **\$3 million** received from the City's allocation of American Rescue Plan Act (ARPA) funding to implement priority projects in areas of Raleigh that are disproportionately impacted communities. SMAC will remain actively involved with Stormwater's ARPA-funded projects as they move forward towards completion over the next several years.

SMAC and Stormwater staff partner with diverse organizations and City of Raleigh departments, such as the Department of Equity and Inclusion; the Office of Sustainability; Parks, Recreation and Cultural Resources; and Strategy and Innovation, to advance environmental equity, community resilience, and sustainability. Staff also provided a well-received update presentation to the City's Equity and Inclusion leadership team during FY 2024 which highlighted SMAC's ongoing advisory role.

FLOOD EARLY WARNING SYSTEM

The <u>Flood Early Warning System</u> (FEWS) allows stormwater staff to proactively monitor flooding citywide through stream and rain gauges, street cameras, and prediction models.

Flood Early Warning System Highlights

SMAC members continued to support staff in enhancing the City's storm and flood monitoring efforts which included:

- Working with a consultant to update watchpoints in our FEWS software to change color in the system as the warning and flood elevations are reached
- Expanding the Gauge Adjusted Radar Rainfall (GARR) coverage to include all of Wake County and some of Durham and Johnston Counties
- Adding 20 new rain gauges to the system from surrounding communities and the National Weather Service to help support the GARR expansion
- Adding more forecasting options to the system with one extending out to seven days
- Developing an In-Storm Event Report that can be run from the system during storm events to pull needed data with a push of a button
- Reviewing the potential to pull outside services such as our Flood Warning Sign system into the FEWS software
- Continued End of Monthly (EOM) Hydrometeorology Gage Adjusted Radar Rainfall (GARR) QC and Review.

In addition, staff continued to work closely with partners at the United States Geological Survey (USGS) and started discussions and review of sites for five new stream and rain gauges. Staff worked with City Transportation to purchase eight additional Flood Monitoring cameras to monitor flood-prone locations. Staff also enlarged the cellular cameras network to 21 cameras to be placed where the traffic network system is not available.

Stormwater staff presented and gave tours on the FEWS Program to SMAC, Partners for Environmental Justice (PEJ), USGS, the Smart Cities Conference, Raleigh and Wake Emergency Management, and others. Interviews were conducted with media outlets about the Flood Early Warning System and the Active Lake Level Management at Lake Johnson for Walnut Creek. The FEWS Program continues partnerships with USGS, Wake County, the National Weather Service, and the Army Corps of Engineers.



USGS Rain Gauge

STORMWATER UTILITY FEE

The <u>Stormwater Utility Fee</u> provides revenue to implement stormwater's mission and vision, which protects people, property, and local waterways by reducing hazardous flooding, preventing erosion, and preventing pollution from entering streams and rivers.

Stormwater Utility Fee Highlights

SMAC reviewed FY 2024 stormwater fee rate options for City Council approval. The fee was changed from an average residential monthly fee of \$7.36 to **\$7.65 for FY 2025** beginning July 2024. This rate adjustment helps maintain a high level of service to City of Raleigh stormwater utility customers and provides for increased green stormwater infrastructure maintenance capabilities.

Under the new utility fee rate, the stormwater budget for FY 2025 is approximately **\$38.9 million**, with more than \$13 million available for upcoming capital improvement projects. Stormwater continues to regularly benchmark its fee to other municipal programs and Raleigh continues to provide high service levels for a competitive rate compared to our peers. SMAC received information on the program budget and provided input to level of service and the proposed fee rate adjustment.

DEVELOPMENT MANAGEMENT

The Development Management team ensures that development projects meet the City's requirements to protect the environment and public safety through plan review, construction inspections, and post-construction stormwater control measures (SCM) inspections.

Plan Review

Task	FY 2024
Plan Reviews	15,206
Major Cases	832
Resident Inquiries and Case-Specific Correspondence	468

Construction Inspections



Staff Reviewing Development Plans

Task	FY 2024
Post-construction Stormwater Inspections	4,130
Erosion and Sediment Control Inspections	15,084
Floodplain Inspections	105
Riparian Buffer Inspections	111
Water Supply Watershed Inspections	65
Resident Inquiries Regarding Construction throughout the City	364

Stormwater Control Measures Inspections

In FY 2024, the Stormwater Control Measures (SCM) Inspections group saw above **90% compliance** with annual post-construction SCM inspection requirements across 1277 sites.







SCM Inspections by Stormwater Staff

Stormwater Design Manual Highlights

In FY 2024, the approval process for the draft <u>Stormwater Design Manual</u> advanced significantly, ending the year with a recommendation from the Planning Commission for approval. Additionally, input was obtained from both internal and external stakeholders. Specifically:

- SMAC received updates on the Manual in September 2023, December 2023, and January 2024.
- Informal public comment periods were held in September 2023 and December 2023. Plan review staff also met with many stakeholders, such as manufacturers and the Wake County Home Builders Association.
- In February 2024, City Council authorized work on the text changes and Manual.
- In March and April 2024, the items were posted for formal public comment.
- In April 2024 and June 2024, the Manual and text changes were considered by the Planning Commission's Text Change Committee.
- On June 25, 2024, the full Planning Commission voted to recommend approval of the Manual and associated UDO text changes to City Council.

FLOODPLAIN MANAGEMENT

The Floodplain Management Team seeks to protect and enhance the resilience of our communities by promoting smart floodplain management through sustainable and innovative practices. Through various activities, stormwater staff aim to reduce flood risks, preserve natural floodplain functions, and foster stakeholder collaboration.

Community Rating System

The Community Rating System (CRS) is a voluntary incentive program under the National Flood Insurance Program (NFIP) that encourages communities to implement floodplain management practices that exceed the minimum NFIP requirements. In return, property owners in these communities can benefit from reduced flood insurance premiums.

Key Elements of the CRS

- Communities that participate in CRS can earn points for various floodplain management activities in four categories: Public Information, Mapping and Regulations, Flood Damage Reduction, and Warning and Response.
- Based on the points accumulated, communities are assigned a CRS class rating ranging from Class 1 (the best rating with the highest discount) to Class 10 (no discount).
- For each class improvement, flood insurance policyholders can see a reduction in their premiums of up to 45%.

Elevation Certificate Review Team



Flooding on Residential Property

Elevation Certificates are submitted once construction on a building is finished, and all adjacent grading is finalized. The ECRT is responsible for reviewing floodplain-related construction certificates, including Elevation Certificates, Floodproofing Certificates, and certifications of engineered flood openings, and for managing the Elevation Certificate database.

Floodplain Education and Outreach

The there are ongoing education and outreach efforts aimed at improving public knowledge of flood hazards and the floodplain management resources. Stormwater staff developed a flyer that was included in Raleigh Water's June water bill mailing about flood zone determinations and flood insurance requirements. Digital newsletter outreach is also being conducted with the Raleigh Chamber of Commerce.



Staff showing floodplains at local event

Flood Mitigation Grants

Grants opportunities were pursued in FY 2024 to further implement mitigation projects. Staff applied for the FEMA's Building Resilient Infrastructure and Communities (BRIC) program for the Midtown Waterfront Park planning study, which plans to transform a flood-prone area along Crabtree Creek into a mixed-use space that will infiltrate stormwater and create functional park space. Staff also applied to the Flood Mitigation Assistance (FMA) program to elevate a residential structure located in the floodplain that has experienced repetitive flood losses. Funds from the Community Development Block Grant (CDBG) will be used to acquire and demolish a flood-prone structure and maintain the parcel as open space.

Floodplain Prioritization Tool

Stormwater staff contracted with a private consultant to create a prioritization tool for documented and potential flood prone properties within the city. The floodplain prioritization tool will create a ranking of property flood risk in the City that will assist staff to plan for future mitigation opportunities using a data-based approach. The tool will be available for use in FY2025.

Managing Development in the Floodplain Training

Four Stormwater staff members attended FEMA's Managing Development in the Floodplain training offered through North Carolina Emergency Management in March 2024. This training provided extensive guidance on federal, state, and local floodplain regulations and strengthened the Division's knowledge of floodplain management activities across teams within the Development and Mitigation group.

ASSET MANAGEMENT



Floodplain field tour at the 2023 Association of State Floodplain Managers Conference

The Asset Management Program makes the best use of resources to extend the life of stormwater assets and protect public safety. Stormwater staff continued to implement the Asset Management Program that has been supported by SMAC for Dams and Stormwater Control Measures (SCMs) and Municipal Separate Storm Sewer System (MS4) assets.

Dams and Stormwater Control Measures

Advancement of asset management fundamentals included inventorying all City-owned Stormwater Control Measure (SCM) assets and continued effort towards documenting condition. The City currently has 115 SCMs that include both regulatory controls and voluntary measures that were designed to improve water quality. Additional devices will be completed over the next year. In FY 2024, work has continued by stormwater staff to address maintenance concerns identified during annual inspections. Furthering those efforts, the City has agreed to the first maintenance contract for the long-term maintenance of City owned SCMs and some City owned dams. Devices in the inventory include:

- Bioretention (42)
- Proprietary devices (13 Filterra)
- Constructed wetland (11)
- Dry pond (10)
- Rainwater harvesting / cistern (10)
- Wet pond (8)

- Underground detention (7)
- Permeable pavement (4)
- Green roof (3)
- Level spreader/ filter strip (3)
- Sand Filter (3)
- Treatment Swale (1)

Staff continuously evaluates lessons learned from each SCM practice to improve and incorporate those lessons into new SCMs. Successful implementation of SCMs is a collaborative practice between Raleigh Stormwater and other city departments.

Raleigh Stormwater has an interest in 36 dams. Of these, 15 are in parks and seven are associated with previous capital improvement projects, and 14 are associated with City right-of-ways.

Many of the structures associated with City right-of-ways have complex consortium ownership with private residents and City interest through right-of-ways and/or easements. In FY 2025, Camp Pond Dam is expected to move to design to address deficiencies; Eastgate Park Dam will begin design of improvements recommended in the engineering study; and Upper Longview Dam will undergo rehabilitation to address concerns noted during a recent inspection of the dam; furthering the City's committment to maintaining safe and functional dams.







SCM Inspections by Stormwater Staff



Bioretention Area at Biltmore Hills Park

MS4 Asset Management Highlights

The Municipal Separate Storm Sewer System (MS4) assets include pipes, crossline conveyances, inlets, junctions, and manholes located throughout the city. In FY 2024, the MS4 Asset Management Program focused on the following:

- Proactive condition assessment in coordination with the watershed studies
- Implementing a process to inspect and evaluate the condition of cross line conveyances (CLCs), such as culverts
- Review of condition assessment data to prioritize assets for rehabilitation or replacement
- Developing a permit process to receive as-built drawings of newly installed stormwater infrastructure to update the asset inventory
- Continued improvements to the risk framework used to identify stormwater assets with the highest risk of failure. Improvements include integration of the risk model with the asset inventory and inspection data software.

Several MS4 asset rehabilitation and replacement projects were ongoing in FY2024 to address high risk assets in poor condition. These include the following:

Saratoga Drive Culvert Endwall Replacement

This project includes removal and replacement of a failing endwall for a 96" culvert crossing Saratoga Drive. Design was finished and bid in FY 2024. Construction will take place in FY 2025.

North Hills Drive Culvert Headwall Replacement

This project includes replacement of a partially collapsed brick headwall at the 60" culvert across North Hills Drive. Design was completed in FY 2024, with bid and construction in FY 2025.

City-Wide Lining and Pipe Rehabilitation



Collapsed Headwall at North Hills Drive

This project will renew stormwater pipes and structures at six sites where pipes are in poor condition, in some cases resulting in sinkholes. The stormwater pipes will be rehabilitated via cured-in-place-pipe (CIPP) lining, which is a trenchless method used to repair defects in existing pipes. Design was completed in FY 2024, with bid and construction in FY 2025.

Annual Stormwater Rehabilitation Project – Bundle 1

In FY 2024, staff began design of the first annual stormwater rehabilitation project, which includes 11 sites throughout using CIPP lining to rehabilitate failing stormwater infrastructure. The work will be proactive to address issues before larger surface presenting problems appear. The project is anticipated to bid in Fall 2024.

Stormwater Maintenance Unit

The Stormwater Maintenance Unit (SMU) provides maintenance to the portion of the MS4 in the City's Right-of-Way and other areas within public drainage easements. The SMU also supports other stormwater programs; including Asset Management, Watershed Planning, Drainage Assistance, Education and Outreach, Capital Improvements, and the Leaf Collection Program. In FY 2024, the SMU focused on the following:

- Stormwater staff conducted a ride-a-long on the flusher truck tour with an interested Councilmember to show the process and equipment used to clear blockages in stormwater pipes.
- Jet/Vac/flush Recycler began implementation first full year of implementation showed significant advantages in efficiency where we are working on quantifying to compare to with traditional jet/vac combination machine.
- Repair damage to stormwater pipes from third-party directional drilling contractors -- eight identifield locations of other utilities being bored through stormwater pipes were repaired/removed in preparation for the Citywide lining project.
- In effort to ArcGIS Quick Capture data collection application is being used to gather information on debris collection routes (street sweeping and leaf collection) to increase efficiency and effectiveness.
- Quicklock Three localized trenchless repairs were made using Quicklock internal mechanical sleeve. These repairs were able to be completed by in-house staff, saving time, money and resources compared to traditional external excavation repairs.
- New online submission form for Stormwater issues in the right-of-way allows residents to report stormwater concerns and problems directly to SMU (44 submissions since April 2024).



Ride-A-Long Flusher Truck Tour with Councilmember





The SMU continues to grow and advance the maintenance capabilities of the City with the support of SMAC. This past year the SMU had another active and successful year of maintenance and system repairs by expanding their capabilities, completing several larger projects and reorganizing to provide better internal and external customer service.

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Construction Projects Undertaken by SMU in FY 2024

The SMU does several larger system repair projects each year and plans to expand this component of their program in the future. Using in-house maintenance crews to construct larger system repair level projects reduces the project timeline, reduces cost and allows for the City to have a greater level of control over design-bid-build projects. These projects are typically designed in-house, but can also be consultant designed. Below are projects completed or started over the past fiscal year.

Pullen

This project replaced 130 feet of 36-inch corrugated metal pipe on the property boundary of Pullen Park and Pullen Memorial Baptist Church. This project addressed a sinkhole that had formed under the parking lot.



Steel Street Construction

Bailey Drive

This project was identified through Parks at the Walnut Creek Wetland Park. A stormwater pipe draining Bailey Drive outlet near a newly installed trail. Due to the depth of the pipe a deep hole had formed at the outlet. Stormwater Maintenance replaced 40 feet of 24-inch concrete pipe with 24inch HDPE with a new alignment to eliminate the deep hole.



Pullen Park Construction

Steel Street

This project replaced 160 feet of 24-inch mixed material pipe with a 30-inch high-density polyethylene (HPDE). This project addressed a sinkhole that had formed in the Right of Way.



Bailey Drive Construction

Stormwater Maintenance will also be assisting Drainage Assistance projects on upcoming small-scale projects (Summerton Drive, Columbia Drive, and Courtland Drive).

WATERSHED PLANNING

The watershed planning program seeks to strategically improve stormwater conditions for our customers. In FY 2023, SMAC provided input on the watershed planning process which includes a comprehensive look at stormwater conveyance needs, asset renewal, water quality, flooding, and stream conditions in a watershed. SMAC also provided input on the Public Engagement Plan developed to engage the community in watershed planning. In FY 2024, studies were ongoing in the following high priority watersheds:

Pigeon House Branch Watershed

This study was ongoing in FY 2024 and included modeling, evaluation of potential improvements, and continued public engagement. The study will wrap up in FY 2025 with the final improvement alternatives and public meeting.



Rocky Branch Public Meeting



Pigeon House Branch Public Meeting

Rocky Branch & Central Walnut Creek Watershed

This study was started in FY 2023. Work in FY 2024 included development of the Public Engagement Plan, water quality model, and hydraulic model. The study will continue through FY 2025. The next phase includes modeling, evaluation of potential improvements, and continued public engagement.



This watershed was identified as the next area for study. Data collection for this study began in FY 2024 with stream condition assessment.



Marsh Creek Watershed

INTERNSHIP PROGRAM

During FY 2024, Raleigh Stormwater participated in the award-winning <u>Partnership Raleigh</u> <u>Community Climate Internship Program</u> to offer internship opportunities for area college students. Several part-time/intern roles have been developed to support the stormwater program such as flood early warning, stormwater utility billing, GIS, and water quality. Stormwater and SMAC are continually helping to advance the City's Strategic Plan initiative (GNR 4.4) that focuses on youth engagement with stewardship and environmental education.



2024 Partnership Raleigh Community Climate Interns

STORMWATER MANAGEMENT ADVISORY COMMISSION MEMBERS



Reverend Jemonde Taylor Chairperson



Graham Smith Vice Chairperson



Josh Dalton



Nicola Hill



Barrett Jenkins



Samantha Krop



lan McMillan



Lou Ann Phillips



Melody Whitford

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YEAR AT A GLANCE FY 2024 Stormwater Projects



Our Raleigh Residents



Stormwater Maintenance Unit Summary Statistics

Task	Asset Quantity FY 2023	Asset Quantity FY 2024
Pipes Inspected	6,550 (481,101 LF)	7,058 (511,255 LF)
Pipes Flushed	12,822 LF	36,815 LF
Replaced or Repaired Pipes	669 LF	830 LF
Culverts Maintained	1,356	3,359
Catch Basins Repaired	215	196
Street Sweeping	7,007 miles	6,346 miles