

Wake County Stormwater and Green Stormwater Infrastructure Best Practice Summary

Introduction

The purpose of this document is to summarize best practices for stormwater management and Green Stormwater Infrastructure (GSI) based upon expertise of stormwater practitioners represented on the Wake County Water Partnership. The document is intended to be used as a resource for jurisdictions seeking to advance stormwater management programs, with a particular focus on integrating GSI. Information covers a range of topics including policies, modeling, maintenance as well as GSI incentive programs and project examples. This document is not intended to be all inclusive, but is a living document that will continue to evolve as science and stormwater policies evolve.

The GSI Subcommittee will reevaluate this document on an annual basis to update information based upon the current state of knowledge and local practice applications.

Policies

Existing

- Town of Holly Springs: [Drainage Policy](#) requires developers to update basin Hydrology and Hydraulic (H&H) model as new development projects are proposed upstream or downstream of known drainage concerns.
- Town of Cary: Peak attenuation rules moved to floodplain ordinance rather than water quality/stormwater ordinance so that peak attenuation will not be impacted by changing state regulations.
- City of Raleigh: Lead by Example Policy requires evaluation of GSI on City's development and improvement Projects.
- Asheville, NC policy: Permeable pavement whenever above minimum parking lot requirement.
- State Policy: [Low Impact Development \(LID\) Policy/Storm EZ](#) to meet stormwater requirements.

In Development

- Garner: Developing comprehensive design manual for streets and stormwater.
- Knightdale: Stormwater as focal features; SW features serve as amenity and bring to forefront.
- Cary: Evaluating future policies; adding GSI to 2040 Community Plan and will then incorporate into ordinance updates
- Wilmington, NC: Looking at removing wet ponds, incentivizing GSI

Incentives

- [Raleigh Rainwater Rewards](#) program provides cost-share funding for GSI projects. Applicants may receive up to 90% cost-share funding depending on location in watershed.
- Cary: Grant (Southeast Sustainable Communities Fund) provided cost share funding for GSI projects and paid up to \$5,000 for individual projects. Funded buffer restoration, rain gardens and cistern. Partnered with Partners for Environmental Justice (PEJ) in Walnut Creek watershed to mitigate downstream impacts of stormwater. Partnered with Step Up Ministries for GSI job training.

Modeling

- Town of Holly Springs: See Drainage Policy above. Developers update existing models and provide data to Town as new developments initiated.
- Town of Cary: Development of basin models support SCM maintenance and open space initiatives for flood mitigation. Completed Walnut Creek model and initiated work on Swift Creek. Leverage modeling data to fix known SCM issues as redevelopment occurs. Promotes cost-efficient solutions without slowing permitting process; fosters partnerships with developers.
- Town of Morrisville: [Stormwater Drainage System Inventory Map](#) used to help build town-wide model and develop capital project list.
- City of Durham uses watershed Stormwater Management Models (SWMM/PCSWMM) models as part of [Watershed Improvement Plans](#) to evaluate areas of pollutant loading and perform scenario analysis. Models developed for: Eno River, Little Lick Creek, New Hope Creek and Little Creek, Ellerbe Creek, Northeast and Crooked, Third Fork Creek watersheds.
- UNC Chapel Hill: Campus-wide SWMM model to support stormwater management for existing and future development.

Maintenance

- Town of Cary-Town shifted maintenance to stormwater group; greater flexibility by moving SCM maintenance in Stormwater group.
- Raleigh Maintenance strategy: Centralize stormwater maintenance for City projects under Stormwater Department.

- All Jurisdictions follow NCDEQ Stormwater Control (SCM) Design Manual: [NCDEQ Stormwater Control Measure \(SCM\) Design Manual](#) used for design and maintenance

Data Mapping

- Town of Morrisville: [Stormwater Drainage and System Inventory Map](#)
- Town of Holly Springs: Stormwater Complaint Map

Public-Private Partnerships

- Town of Cary: Early conversations with developers support opportunities to collaborate on GSI.

Example Projects

- Town of Morrisville: Large, constructed wetland SCM across from Town Hall to support future priorities. Stormwater wetland serves as amenity and aesthetic; incentive for developers coming into downtown so developers don't have to build SCM directly with development.
- Wake County: [Beech Bluff County Park](#) designed to meet Sustainable [SITES](#) certification; considers landscape in site plan and design; incorporates GSI at design phase; design includes integrated stormwater management-grass swales, bioretention, permeable pavers, rainwater harvesting and education.
- Downtown South Project: Establishment of Riparian Corridor Fund as part of Rezoning conditions. Fund used as matching grant funds for water quality improvement/flood mitigation projects in larger watershed. Local stakeholders key to establishment of fund.
- [Walnut Creek Community Partnership](#): Collaborative effort that supports community engagement and watershed improvement. The Conservation Fund is supporting through [Parks with Purpose](#) initiative. Online [Watershed Action Plan](#) identifies and tracks project opportunities.
- McAdams Engineering: Incorporate GSI into parks
 - Garner examples: Yeargan and Meadowbrook Parks

Funding

- Stormwater Utility fees fund projects in Raleigh, Holly Springs, Apex
- Debt financing
- City of Raleigh plans to issue revenue bonds for stormwater FY 25
- Budget allocation- Town of Cary has recurring appropriation from Utility Fund balance that is roughly equivalent to roughly 15 cents per 1000 gallons water consumed by Cary Customers that will be applied to Jordan Lake One Water
- Public-Private Partnerships
- [American Rescue Plan \(ARP\) Funding](#)

- Grants:
 - NCDEQ [Financial Resources for Watersheds Water Quality, Cost-Share, Grants and Loans](#)
 - [USEPA: Green Infrastructure Funding Opportunities](#)
 - Watershed Stewardship Network Funding Site: <https://wrrri.ncsu.edu/partnerships/watershed-stewardship-network/resources/watershed-resources/sustainable-funding-resources/>

Integrated Water Management

- Cross-communication between stormwater, planning, general services, parks and recreation departments will help facilitate coordinated stormwater management and support GSI projects that provide co-benefits
- Town of Cary coordinates across departments and is incorporating GSI into the 2040 Community Plan
- City of Raleigh: GSI Advocate to work across departments
- Wake County: Housing and Community Revitalization Dept. shares affordable housing proposals at early design phase with Water Quality Division to identify potential opportunities for GSI.
- Wake County: Quarterly interdepartmental flood coordination meeting to identify data sharing opportunities/needs, regulatory updates, pilot project opportunities with the following departments: Parks, Recreation and Open Space, Emergency Services, GIS, Planning, General Services Administration, Environmental Services, Soil and Water Conservation District.

Education

- Third party provides GSI presentation to local elected officials: League of Women Voters of NC, UNC Environmental Finance Center, Water Resource Research Institute (WRRI).
- Walnut Creek Partnership: Informed community helps promote GSI in rezoning, development efforts.
- Town of Cary using grant funding to produce videos on GSI. Partnering with NCSU Extension.

Resources

- City of Raleigh Menu of GSI-based conditions for rezoning
- [NCDEQ Stormwater Control Measure \(SCM\) Design Manual](#)
- [ACTION PLAN FOR NATURE-BASED STORMWATER STRATEGIES: Promoting Natural Designs that Reduce Flooding and Improve Water Quality In North Carolina](#)
- [NCDEQ Low Impact Development \(LID\) Guidance and Storm EZ Tool](#)

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