



**TOWN OF  
CARRBORO**

NORTH CAROLINA

**TRANSMITTAL  
PUBLIC WORKS DEPARTMENT**

**To: David Andrews, Town Manager  
Board of Aldermen**

**From: Randy Dodd, Stormwater Utility Manager**

**Through: Joe Guckavan, Public Works Director  
Nick Herman, Town Attorney**

**Date: August 29, 2019**

**Subject: Stormwater Service Delivery**

**Summary**

The purpose of this memo is to provide a report regarding the Stormwater Utility's historical and current services and options going forward. The separate stormwater monthly report provides additional details and a snapshot of the Stormwater Utility's expanding services. Service delivery options and a recommendation for next steps are included.

**Information**

*Stormwater Services*

The Town's stormwater services have been incrementally increasing over the past 35-40 years, with a broad overview shown in Table 1, as supplemented in Appendices A-C and the separate monthly report. The Town is transitioning into its largest increase in services with the new Stormwater Utility, Enterprise Fund, and Advisory Commission.

Until 2018, the stormwater program was staffed through a distributed network of responsibility across departments and positions. With the formation of the Stormwater Utility and the establishment of a rate structure with dedicated funding, the program is currently supporting 2 full time staff positions. The program continues to be supported by other staff as well.

**Table 1: Carrboro Stormwater Program Evolution**

	<b>Stormwater 1.0</b>	<b>Stormwater 1.1</b>	<b>Stormwater 2.0</b>	<b>Stormwater 2.1</b>	<b>Stormwater 3.0</b>
<b>Focus</b>	Flood mitigation 1.0	Water quality 1.0 Bolin Creek listed, prepare for NPDES, Jordan Lake Rules	Water quality 2.0: Jordan Lake Rules, stream geomorphology, Bolin Creek watershed restoration	Flood mitigation 2.0: more frequent and intense storms	Water Quality and Flood Mitigation 3.0 Integrated/holistic program; robust regulatory compliance
<b>Time frame</b>	1980-2000	2000-2007	2007-2012	2013-2018	2018-
<b>Regulatory</b>	Land Use Ordinance adopted and amended; begin participation in National Flood Insurance Program	More LUO amendments. First approved floodplain map NPDES permits issued	More LUO, Town Code amendments. NPDES permits reissued	More LUO amendments NPDES permits reissued Floodplain map updated.	LUO amendments under review First NPDES audit scheduled (2020).
<b>Infrastructure maintenance/ equipment</b>	Legal basis defined; Public Works maintains system	System inventory MS4 defined/inventoried 1 <sup>st</sup> street sweeper		2 <sup>nd</sup> street sweeper	Projects initiated; Inventory update, condition assessment (planned); 3 <sup>rd</sup> street sweeper; other equipment?
<b>Program funding (annual)</b>	Not specifically measured, but estimated at <\$100k from General Funds.	Not specifically measured, but estimated at <\$150k. Some additional funds for program/regulatory compliance	Grant funds for Bolin Creek Watershed Restoration obtained.	~\$150k. Rate Structure, Enterprise Fund/ dedicated funding. FEMA HMGP funds sought.	\$820k funding (FY 20). Additional HMGP, Public Assistance funds being sought. Additional funding needed?
<b>Administration</b>	Staff assume new stormwater roles; contract engineer hired; Orange County Erosion Control	Minimal staff expansion. Environmental Advisory Board established. Decided not to establish Utility.	More partnering: Clean Water Education Partnership; Bolin Creek Watershed Restoration Team, etc.	Engineering studies; Utility established	2 FTEs hired (2018); Rate structure SWAC established

Beyond the transition from a formative to operational Stormwater Utility, the program is experiencing an inflection point for service delivery:

- 1) EPA and the State are now requiring a higher level of regulatory compliance, record keeping, and reporting for NPDES permits, which will require additional effort and capacity. One specific component of the permit for which immediate attention is especially needed and has been initiated is expanding the Stormwater Control Measure (SCM) maintenance and inspection program for private properties with SCMs permitted by the Town (see Appendices for additional information).
- 2) Recent experience with and concern for more intense storms is leading to a desire for the stormwater program to play an expanding role in improved resilience to storm/flood events, and floodplain management. Specific current examples include pursuit of FEMA Hazard Mitigation Grant Program (HMGP) and Public Assistance funds, Toms Creek flood mitigation, and support for potential Land Use Ordinance amendments to improve resiliency.
- 3) The Jordan Lake Rules will be reviewed in 2020, which could place additional requirements on the program and Enterprise Fund.
- 4) Especially in some older sections of town, there is infrastructure that could need repair/rehabilitation/replacement/retrofitting sooner than in newer parts of town.

#### Stormwater Enterprise Fund and Rate Structure

The Stormwater Enterprise Fund has been set up to fund both operational and capital stormwater program needs<sup>1</sup>. The rate structure established in 2018 assumes that the utility will be initiating projects with both water quantity/flood mitigation and water quality/environmental benefits, and there will be a transition time to build up reserves for larger projects that require more than a year of revenue. Establishing the rate structure created the initial foundation for a program with dedicated funding. Since the Stormwater Utility is in the first year of receiving dedicated revenue, there are constraints on currently available funding for capital/larger projects since capital reserves are just beginning to accumulate. In addition, the rate structure did not anticipate or try to reconcile:

- the new NPDES permit compliance requirements and record keeping that EPA and the State are in the process of implementing;
- uncertainties associated with requirements for the Jordan Lake Rules;
- uncertainties with comprehensive asset/infrastructure life cycle repair/rehabilitation/replacement nor larger equipment purchases, given limited information;
- the hydrologic/meteorological situation in Carrboro since last summer, and the resulting demands on the stormwater program;
- the staffing or fiscal impacts associated with seeking federal/state funding on a large scale, as is occurring with FEMA funds through the NC Department of Public Safety.

It is important to emphasize that the adopted rate structure also did not consider the Town's extension of stormwater infrastructure and services onto private property. The Town attorney has provided a separate memo on the legal and financial reasons for not having the Town assume this responsibility. In brief, these reasons include: 1) the constraints of the "public purpose" doctrine; (2) the level of stormwater service that the Town must provide to all similarly situated private property owners; and (3) the liability of the Town for assuming responsibility over stormwater infrastructure on private property.

<sup>1</sup> This approach is referred to as "pay as you go". According the UNC Environmental Finance Center, it is how most stormwater programs fund their programs, including capital improvements. The EFC discusses various funding and financing options at

[https://efc.sog.unc.edu/sites/default/files/2019/NC%20Stormwater%20Landscape\\_Final%20Draft\\_0.pdf](https://efc.sog.unc.edu/sites/default/files/2019/NC%20Stormwater%20Landscape_Final%20Draft_0.pdf)

### Service Level Options Going Forward

Three short term (1-2 year) service level/delivery expansion options are presented (Table 2), and then a recommendation provided. Note that this table and discussion do not attempt to comprehensively address the complete suite of services that have been/are being provided, only the expansion of selected services. In presenting these options, an attempt has been made to present clear, viable, and practical alternatives that consider and balance all aspects of the program.

In broad terms, the first option is to continue with implementation as currently in process, the second is to more moderately further expand and accelerate service delivery than currently being pursued, and the third is to more assertively expand and accelerate service delivery. The options presented in Table 2 are broken down by the category/type of service delivery. To some extent, the individual items presented can be considered independently if a finer detail of direction to the program than for each option is desired. The first option can be pursued without a need for a nearer term increase in revenue. The other two options will require revenue increases, and will also allow for expansion of staff capacity and an acceleration of capital project implementation over time. An increase would also recognize that there is an ongoing increase in service delivery costs associated with inflation and other increases in operating and project delivery costs. Staff have not attempted to present an the necessary increase in the service charge (fee) associated with these options, pending feedback from the Board.

An important consideration for planning for service delivery over the next 1-2 years is that Stormwater staff are/will continue to be supporting FEMA HMGP projects (2 grant cycles, four residential properties) and Public Assistance efforts (Florence disaster recovery and 2 projects). These are requiring a very significant amount of staff time since their success is contingent on cooperation across multiple agencies and navigation of many administrative requirements. The primary motivation is that, if successful, flood mitigation will be provided for 4 of the most vulnerable residences along Toms Creek, a vulnerable situation at Public Works will be addressed, and an important infrastructure project will be completed. The Town could, if successful, also access over \$1M of federal and state funds for these projects. (They are being pursued on a reimbursal basis that requires substantial documentation and adherence to federal requirements; funding is not guaranteed.) Stormwater staff's pursuit of these projects is a major reason why the two core/full time Stormwater staff are not currently able to devote more time to other important activities such as NPDES permit compliance or other service expansion.

Another important need in planning for future service delivery is for stability and predictability as the program grows, and also to allow for a "buffer" in staff capacity, for example, for storm event response, regulatory response, or other unexpected demands on staff workload.

**Table 2. Service Expansion Options Matrix (1-2 year time horizon)<sup>2</sup>**

<b>Services</b>	<b>Current/Planned</b>	<b>Option 1</b>	<b>Option 2</b>
<b>Public Stormwater Infrastructure</b> (repair, rehab, replace, retrofit, extend)	Pursue Public Works stream restoration and Broad Street Culvert Replacement. Develop capital project prioritization matrix and plan.	Update MS4 inventory Initiate system wide condition assessment	Finish condition assessment; Develop asset management system and green infrastructure plan.
<b>Private Stormwater Control Measures Inspections</b>	Inspect 25% of SCMs in next 18-24 months.	Inspect 50% of SCMs within 2 years.	Inspect 100% of SCMs within 2 years.
<b>Regulatory/Water Quality</b>	Prepare for NPDES audit in early 2020 as able with current capacity and workload. Continue to track Jordan Lake Rules.	Prioritize/expand NPDES permit compliance activities	Commit to 319 grant application for next grant cycle (2020).
<b>Flood Mitigation/Resilience</b>	Continue with FEMA HMGP grants and Public Assistance projects. Complete engineering assessment for Toms Creek catchment. Complete neighborhood pilot RainReady project. <sup>3</sup> Schedule LUO text amendment public hearing by December, 2020.	Launch residential assistance program within 2 years Schedule LUO text amendment public hearing by September, 2020.	Could include additional cost sharing. Schedule LUO text amendment public hearing by June, 2020.
<b>Stormwater Operations and Administration</b>	Continue with Stormwater Enterprise Fund administration and other current operations. Initiate workflow management system.	Consider new contractual services, e.g., on call Jet Vac and inspections of MS4	Invest in additional equipment. Consider tiered rate structure and/or credit manual Prepare first annual stormwater report.

The options provided in Table 2 do not include having the Town assume private stormwater control measure (SCM) maintenance responsibilities. SCMs are regulated structural devices that treat stormwater runoff to reduce both water quantity and quality impacts. The Town's NPDES permit requires that the Town insure that permitted SCMs are being properly maintained. The annualized maintenance cost for adequate maintenance for the ~170 SCMs currently permitted by the Town is estimated at about \$600k (see Appendix D for details), not including rehab/repair to bring any SCMs that have not been adequately maintained up to standards. Having the Town assume responsibility not only would be contrary to the constraints related to having the Town assume new services and responsibility on private property mentioned above, but would be cost prohibitive, and also very challenging to pursue while growing other program components.

<sup>2</sup> Options 1 or 2 will require a rate increase. All "Current/Planned" services are implicit in "Option 1".

"Option 1" services are implicit in "Option 2". Only services not included in others are shown for "Option 2".

<sup>3</sup> A proposal from the Center for Neighborhood Technology has been prepared.

All things considered and given staff's understanding of the desire to accelerate and expand service delivery, it is recommended that the Town plan to pursue Option 1 or 2 through an increase in the stormwater service charge. This will enable the Town to complete current projects and initiatives and continue to attend to fundamental program development needs, while also further building reserves and growing services.

**Recommendation**

Stormwater staff recommend that the Manager and Board of Aldermen receive the staff report and presentation, discuss the options presented, and direct staff to report back by early 2020 with a recommendation for changes to the service charge and rate structure and scheduling of a public hearing on these changes.

## Appendix A: Highlights and Overview of Stormwater Utility Activities January-August, 2019

(see separate monthly report and Appendices B and C for additional details)

Service	Activity
Administration	<ol style="list-style-type: none"> <li>1. Stormwater Utility rate structure implementation began in July 2018. Staff continued to coordinate with Orange County Property Tax office, received billing inquires, and updated data for the 2019 billing cycle.</li> <li>2. Prepared and followed up on Stormwater Advisory Commission and Board of Aldermen agenda materials</li> <li>3. Administered NPDES Phase II permits               <ul style="list-style-type: none"> <li>• 6 management measures for Townwide permit</li> <li>• Coordination with Public Works staff and contractor for Public Works facility permit</li> </ul> </li> <li>4. No new activity for Bolin Creek watershed restoration/TMDL or Jordan Lake Rules compliance</li> <li>5. Supported FEMA Public Assistance application.</li> </ol>
Infrastructure	<ol style="list-style-type: none"> <li>1. Pursued and coordinated public conveyance system maintenance and inspection activities with Streets Division and community members (uptick due to storm events)</li> <li>2. Pursuing FEMA Public Assistance funding to address high risk situation at Public Works associated with repetitive and significant flooding and a rapidly eroding streambank adjacent to the fleet's underground fuel tanks along with a culvert replacement project for Broad Street. The potential for Public Assistance funding to assist with relocating the Public Works facility is in the early stages of being reviewed by FEMA/NCDPS staff.</li> </ol>
Community	<ol style="list-style-type: none"> <li>1. Provided staff support for Hazard Mitigation Grant Program (HMGP) acquisition/elevation projects and applications</li> <li>2. UNC educational outreach internship that promoted trees and tree canopy</li> <li>3. UNC Institute for the Environment spring semester Capstone team</li> <li>4. Provided phone, email, and on site consultative services/technical assistance to community members.</li> <li>5. Prepared materials related to potential residential assistance policy update and program</li> <li>6. Continued to participate in Clean Water Education Partnership.</li> <li>7. Held an outreach for the upper Tom's Creek watershed. Worked with the Center for Neighborhood Technology to prepare proposal for pilot project for this neighborhood.`</li> </ol>

Planning	<ol style="list-style-type: none"><li>1. Provided technical review for projects seeking land use permits and rezoning.</li><li>2. Providing staff level review of potential LUO text amendments, and coordinating review with Stormwater Advisory Commission.</li></ol>
Field	<ol style="list-style-type: none"><li>1. Completed stream determinations to clarify inquiries regarding regulated surface waters and associated buffers.</li><li>2. Inspected Stormwater Control Measures.</li><li>3. Initiating update to MS4 system data, condition assessment</li><li>4. Continued to participate in a cooperative agreement with Chapel Hill and USGS to support a stream gage on Bolin Creek.</li><li>5. Continued to complete annual benthic monitoring to document Bolin Creek's biological integrity.</li></ol>



## **Appendix B: Selected Details of Stormwater Program Service Expansion**

This appendix provides additional information about the stormwater program's expanded service delivery as a part of launching of the Stormwater Utility.

### *Community Assistance and Engagement*

As a part of the stormwater program's daily workload, staff routinely and frequently respond to a variety of stormwater related inquiries and concerns through on site and office meetings and phone and email support. To date, assistance provided has been consultative and technical in nature and no financial assistance has been provided, nor is any included in the FY 20 budget. Topics have included but not been limited to:

- 1) investigating and supporting Public Works response to reports of the public stormwater conveyance system maintenance needs;
- 2) private property drainage issues and flood preparedness/response (including neighborhood scale-see additional discussion below);
- 3) stormwater billing inquiries;
- 4) advising regarding Town, State, and Federal regulatory compliance, including stream determinations;
- 5) referrals to other Town/agency staff for topics beyond stormwater;
- 6) responding to complaints regarding spills and potential illicit discharges;
- 7) development/construction site inspections, and review of buffer impacts;
- 8) Stormwater Control Measure (SCM) inspections in response to inquiries (more below on regularly scheduled inspections and future plans);

One specific early 2019 activity was working with a UNC intern on an educational outreach program that promoted trees and tree canopy for improving water quality, reducing runoff, and increasing rainfall interception, infiltration, evapotranspiration, and groundwater recharge. "Tree Value Tags" were placed throughout town with information on how trees are a valuable part of the town's green infrastructure. The tags provided information on the economic and ecological value of specific trees and also provided online links to information and the tools available from iTree. Thirty tree value tags were located throughout town. Another activity has been presence at the Farmers Market, Open Streets, and Carrboro Day. Stormwater staff also worked with a UNC Institute for the Environment spring semester Capstone team that: identified outreach methods to increase awareness about stormwater; surveyed municipalities across North Carolina to obtain information about stormwater programs; and completed technical analyses of stormwater runoff at selected sites. Staff will be referring to this study as the program continues to develop.

In the coming months, staff plan to update the website and create additional outreach materials. Staff have also offered time to assist with a neighborhood sponsored grant project, if funded, for a restoration/stabilization project in the Bolin Forest neighborhood. At the April 23<sup>rd</sup> meeting, the Board directed staff to initiate an assessment in consideration of a request regarding flooding/drainage concerns in a subwatershed of Toms Creek. Staff are working with Sungate and also recommend that the Town contract with the Center for Neighborhood Technology on a neighborhood engagement pilot project in the upper Toms Creek watershed.

As presented in January and in consideration of the requests and inquiries that staff regularly receive, Stormwater Utility staff have also: reviewed the Town's (1984) Drainage Policy; researched approaches taken in other municipalities; and informed the Stormwater Advisory Commission of the interest in revisiting the policy and considering a new program. Any cost sharing to potentially be offered will be based on future policy and management direction. Stormwater staff have placed this work temporarily on hold since the existing workload does not enable staff to focus on this currently.

While it has not been initiated by Stormwater staff or the Town, it is worth passing on that a new stream gage is being installed on Morgan Creek at the Smith Level Road bridge with federal/state monies. The gage should be of benefit to the Town for the Public Works facility operation, and to residents/landowners especially along Morgan Creek for accessing local flood risk information.

#### NPDES Permits, Jordan Lake Rules, Bolin Creek Impairment/Watershed Restoration

EPA, through the State, first issued the Town NPDES stormwater permits in 2005, one town wide (for the MS4, as a Phase II [population <100k]) community and one specifically for the Public Works facility. The permits have been reissued twice. Carrboro is one of 97 Phase I or II communities in NC. Many of these communities formed a Stormwater Utility to insure that the funding and capacity were in place for regulatory compliance when these permits were issued; Carrboro is relatively late in doing so. There were 56 municipal stormwater utilities with permits in 2010, 64 in 2017 and 81 municipal and five county stormwater utilities as of 2019. The Town has maintained compliance to date, however, as mentioned above and from meetings and materials provided by State staff in 2019, the Town has considerable work to do to address new regulatory and record keeping requirements. (An audit is scheduled for 2020; other municipalities face this same challenge.) Stormwater staff are aware of the likely deficiencies, but do not currently have the ability to pursue all the steps needed to address them due to many other responsibilities and priorities (as touched on in this memo and in the separate monthly report). Preparing for this audit and improving the Town's permit compliance and record keeping activities will be a major undertaking for staff in the months to come.

As mentioned above, staff anticipate movement with Jordan Lake Rules regulatory review in 2020 as a UNC Collaboratory study wraps up. It is preliminary at this point to speculate on the potential fiscal/staff/regulatory impacts that will result, beyond an understanding that some staff time will be required to stay informed and report back as the review is pursued.

The downstream extent of Bolin Creek in Carrboro, and continuing into Chapel Hill, is on the state/federal list of impaired waters. Local actions are needed to improve water quality. Carrboro staff worked with Chapel Hill and other local, state and federal agency staff in 2006 to create the Bolin Creek Watershed Restoration Team (BCWRT) because of the impaired waters listing. At the time, the Bolin Creek watershed was selected as one of only 7 watersheds in the state to receive focused state and federal assistance in preparing grant applications and leveraging other resources to remove Bolin Creek from the impaired waters list. The long term goal is to improve the health of Bolin Creek and its tributaries and remove it from the impaired waters list. This is an ambitious goal that will require a robust commitment for many years to come. Aside from continued benthic monitoring, the BCWRT has been inactive since 2012 due to insufficient capacity/resources and a focus for both Chapel Hill and Carrboro on flooding relative to watershed restoration.

Stormwater Control Measure (SCM) Maintenance and Inspections

An activity that staff are ramping up is providing oversight for SCM maintenance and inspections for SCMs regulated by the Town as part of land use permits. There are over 170 of these SCMs in Carrboro, with several dozen more anticipated as projects are built out. This is a regulatory requirement under the Town's NPDES permit. It is also seen as the single most immediate and cost effective action that the Town can currently take to mitigate flood risks since there are many existing SCMs for which the flood mitigation performance can be improved with proper maintenance, and risks of poorer future performance can also be avoided through preventative maintenance. This activity will take a significant amount of staff time since many owners of SCMs are not aware of either their maintenance responsibility or the technical details of performing the necessary maintenance and associated reporting requirements.

Stormwater Capital Needs

Table 1 provides a high level and preliminary overview of potential capital needs, noting that some needs are shown that were not included in the most recent Stormwater Capital Improvements update.

**Table 1: Broad Overview of Potential Stormwater Capital Projects**

<i>Project Type</i>	Notes	Approximate Funding Needs	Potential Federal/State Funding
Stormwater Infrastructure/Conveyance	Identified to date <sup>A</sup>	\$1.7M	Outside funding sources have not been identified/pursued. Cost sharing for private properties and benefitting neighborhoods has been presented in previous BoA agendas.
Stormwater Retrofits	Identified to date <sup>B</sup>	\$4M	<sup>C</sup>
FEMA Public Assistance <sup>E</sup>	Stream restoration, culvert replacement <sup>D</sup>	\$400k-\$500k	\$300k-\$500k
Total		\$6.2M-\$6.3M	\$0.3M-\$0.5M

A This is preliminary and not based on a comprehensive assessment, but rather compiled from specific needs identified and multiple Board agenda items from 2013-2017. Work is needed to more comprehensively assess needs and prioritize improvements. An example of how other communities approach this is to complete a system wide condition/asset assessment. After that, a certain percentage of the asset value can be identified for annual repair/rehab/replacement

B As identified in Capital Improvements Program. Update on Jordan Lake compliance anticipated in 2020.

C Competitive EPA/State grant funding exists, most applicable for Bolin Creek watershed

D Discussed below; not included in 1st row to avoid double counting.

E Does not include Public Works facility relocation.

The current total annual revenue from stormwater fees is ~\$820k. Using revenue from the fees and the current rate structure alone, it will take at least 12 years to meet these needs. With the potential for future regulatory requirements along with expectations for increased program service delivery and the results of planned condition assessments and need to look at life cycle costs and more comprehensive asset management, it is certain that capital needs will increase. The table does not account for additional infrastructure/green infrastructure projects that have not yet been identified (green infrastructure examples include, green streets/parking lots, stormwater retrofits, urban forestry, restoration, land conversion, etc.)

At current funding levels and with current staffing, the capacity exists to pursue 1-2 capital projects per year. Some of the projects that have been identified are larger projects, and therefore will require delay before implementing, multiple years, and/or supplemental/alternative funding/financing. With the exception of 2 of the HMGP projects (which are not being funded from stormwater fees), none of the projects are “shovel ready”. The studies that have been done to date to identify these projects are diverse in nature, ranging from State level ecological/environmental/regulatory efforts to site specific in response to flooding/drainage concerns. They have occurred over the past 15 years, and their collective undertaking has not resulted in a Town approved, prioritized implementation plan. Staff have initiated a review process towards creating this plan.

#### Cost of Services

The cost of stormwater services for several decades was embedded in the General Fund and not specifically tracked. Establishing the Stormwater Enterprise Fund and Stormwater Utility and adopting a rate structure has resulted not only in a significant increase in operating capacity, but also an ability to fund larger projects. The breakdown of the FY 19/20 budget is shown below. The FY 19/20 budget is structured to pursue operations (42%), as well as for projects and to save money for future needs (58%).

**Table 2: FY 19/20 Breakdown for Operating and Capital Budgets**

	<b>FY 19/20</b>
<b>Operating</b>	
Personnel <sup>1</sup>	\$245k
Contractual Services	\$69k
Other Operating	\$30k
<b>Total Operating</b>	<u>\$344k</u>
<b>Projects<sup>2</sup></b>	<u>\$310k</u>
<b>Reserves</b>	
Equipment Reserve <sup>3</sup>	\$25,000
Other Reserve <sup>4</sup>	\$138,500
<b>Total Reserves</b>	<u>\$163,500</u>
Total (=Annual Revenue)	\$817,500

<sup>1</sup> Full and part time staff from Public Works and Planning (salary and benefits)

<sup>2</sup> Pursuing federal funding for 2 projects. If successful, will increase revenue

<sup>3</sup> Annualized cost for replacement of street sweeper

<sup>4</sup> Unspecified reserves for future projects (does not include \$100k emergency reserve)

**Appendix C: Permitted Stormwater Control Measure Inventory and Estimate of Annualized Maintenance Costs**

	<u>Bioretention</u> <u>(71)</u>	<u>Dry Pond</u> <u>(57)</u>	<u>Wet pond</u> <u>(18)</u>	<u>Level</u> <u>spreader</u> <u>(7)</u>	<u>Sand filter</u> <u>(4)</u>	<u>Underground</u> <u>Detention (4)</u>	<u>Proprietary</u> <u>Device (3)</u>	<u>Stormwater</u> <u>Wetland (2)</u>	<u>Permeable</u> <u>Pavement</u> <u>(2)</u>	<u>Rainwater</u> <u>Harvesting</u> <u>(2)</u>	<u>Grassed</u> <u>swale (1)</u>	<u>Total</u>
<b>Town owned (5)</b>	\$12,934	\$0	\$5,355	\$0	\$0	\$0	\$0	\$0	\$5,389	\$0	\$0	<b>\$23,678</b>
<b>Schools (28)</b>	\$66,828	\$18,421	\$20,691	\$0	\$0	\$0	\$0		\$0	\$12,768	\$0	<b>\$118,707</b>
<b>Other Public (8)</b>	\$15,090	\$7,001	\$0	\$0	\$0	\$2,686	\$4,311	\$6,384	\$0	\$0	\$0	<b>\$35,472</b>
<b>HOA (78)</b>	\$142,278	\$39,961	\$46,580	\$6,036	\$0	\$0	\$0	\$2,859	\$0	\$0	\$500	<b>\$238,214</b>
<b>Commercial (53)</b>	\$74,373	\$40,325	\$0	\$0	\$25,869	\$11,201	\$4,311	\$0	\$5,389	\$0	\$0	<b>\$161,468</b>
<b>Total (172)</b>	<b>\$311,503</b>	<b>\$105,707</b>	<b>\$72,626</b>	<b>\$6,036</b>	<b>\$25,869</b>	<b>\$13,887</b>	<b>\$8,623</b>	<b>\$9,243</b>	<b>\$10,779</b>	<b>\$12,768</b>	<b>\$500</b>	<b>\$577,540</b>

Unit cost estimates obtained from Durham: <https://durhamnc.gov/695/BCE-As-Built-BMC-Maintenance-Programs>

<b><u>Under construction</u></b>	
Inara Court	These projects will add ~\$30k in annual SCM ownership costs
South Green	
IFC	
MLK Park	
<b><u>Approved, awaiting construction</u></b>	
Hilton	This project will add ~\$4k of annual SCM ownership costs
<b><u>In review</u></b>	These projects, if approved and built, could result in about ~\$40k of new annual ownership costs
Lloyd Farm	CUP review
Sanderway	CUP approved, awaiting construction plans
Beaumont	CUP review
Kentfield	CUP review
CASA	CUP approved, awaiting construction plans
Chan Live Work	CUP approved, awaiting construction plans
Club Nova	CUP review