

Results of the 2021 North Carolina Local Government Stormwater Management Survey

SEPTEMBER 2021



SCHOOL OF GOVERNMENT
Environmental Finance Center

Introduction

The Environmental Finance Center (EFC) conducted a survey between May and July 2021 of North Carolina stormwater utilities on stormwater management practices. All local government utilities with stormwater management responsibilities were invited to participate in the survey. However, the EFC put a special focus on encouraging the participation of local governments with stormwater utilities and/or NPDES MS4 permits. There were 62 total responses to the survey, both complete and partial. For the total responses to each question, please see the sample sizes provided in the analysis.

The survey included questions related to fee setting and capital planning, how utilities anticipate using debt, strategies for inventorying stormwater assets and infrastructure, local stormwater ordinances and codes, and methods of public outreach.

Acknowledgements

This survey was funded by the North Carolina Department of Environmental Quality, Division of Water Infrastructure. We also received support for the North Carolina League of Municipalities and the Stormwater Association of North Carolina. Thank you to all the local government representatives that took the time to fill out the survey.



Summary FAQ

1. Why charge a stormwater fee?

Local governments charge stormwater fees for regulatory compliance, financing of capital needs, addressing flooding and water quality challenges, and ensuring public safety.

2. Do utilities offer credit programs and are the credit programs utilized?

A stormwater credit program allows property owners to receive a rebate on their stormwater bill by installing a stormwater control measure (SCM) on their property. Less than one third of responding stormwater utilities offer credit programs. Credit programs are mostly offered to commercial customers only and very few customers utilize the credit programs.

3. Does the method for billing influence a utility's bill collection rate?

We were unable to prove a relationship between billing method and collection rate. Further research into this may be necessary. The 2016 Georgia Stormwater Utilities Report written by the Environmental Finance Center found that property tax bills have a higher collection rate than utility bills and stand-alone bills had the lowest collection rate.

4. Are stormwater utilities able to meet total stormwater needs with current stormwater fee revenue?

Mostly not. 80 percent of responding stormwater utilities (30 responses) have some level of unmet stormwater needs, whether it be capital needs or O&M and regulatory compliance. Based on responses, stormwater utilities with larger service populations seem better able to meet stormwater needs than those with small service populations.

5. Are stormwater fees affordable?

Utilities overwhelmingly reported their fees to be affordable or mostly affordable. 'Affordability' was not defined in the question, so responses were based on the perception of the respondent.

6. Why might local governments not charge a stormwater utility fee?

Most local government respondents that do not charge a fee have simply never considered charging one. Common barriers to establishing a stormwater fee

are perceived political infeasibility and inadequate staffing to operating a stormwater utility.

7. What are barriers to compliance with MS4 permits?

MS4 permit holders cited lack of funding and inadequate staffing as barriers to MS4 compliance. The local governments that are experiencing funding barriers to compliance with their MS4 permit have either just recently begun charging a stormwater utility fee or do not charge a stormwater utility fee at all.

8. What is the initial cost of mapping a local government's MS4?

While the figures vary widely, the initial cost of mapping a local government's MS4 among respondents correlates strongly with population and service area. The median cost of mapping per square mile was \$10,037 and the median cost per person in the municipality's census area was \$5.69.

9. How common is capital improvement planning and asset management for stormwater?

Only about half of respondents do some level of capital planning. About a quarter of respondents have an asset management plan.

10. Are local governments currently using debt to finance stormwater capital improvement needs?

While most local government respondents have not used, and do not plan to use debt to finance stormwater capital improvements, some plan to use debt financing in the future. There is also a notable level of unfamiliarity with certain stormwater debt instruments which may be a barrier to using debt to finance stormwater projects.

11. How do local governments partner with other entities?

More than half of stormwater programs contract with private entities and about one-third have interlocal agreements with local governments. Partnerships with private entities are mostly attributed to lack of in-house expertise or the construction of stormwater control measures (SCMs). Interlocal partnership is most often related to shared billing services, joint MS4 compliance, and sharing consultant costs.

12. How do local governments engage with the public on stormwater topics?

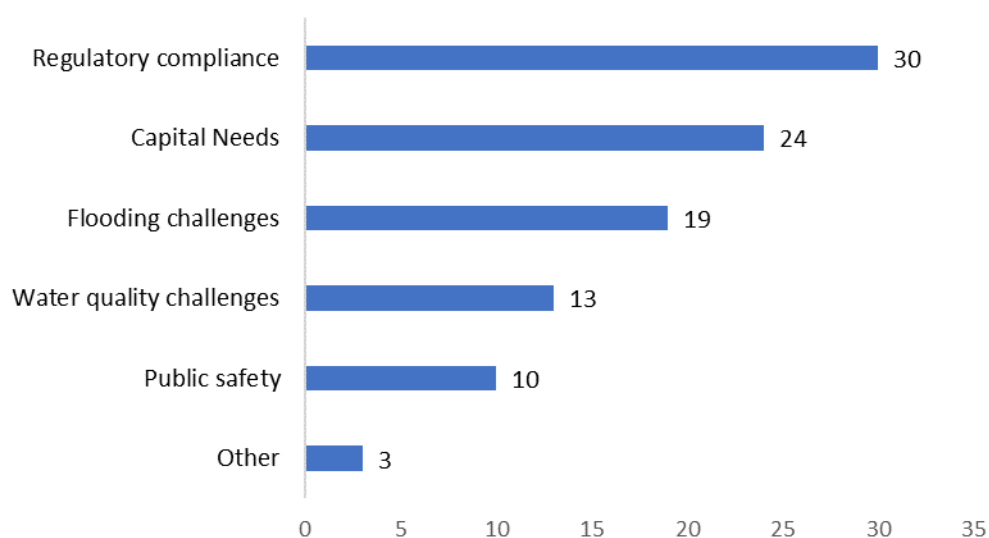
About half of respondents conduct some type of stakeholder engagement. Stakeholder engagement methods are diverse and include social media, educational programs, volunteering opportunities, public hearings, bill inserts, citizen stormwater advisory boards, and newsletters.

Survey Analysis

Rationale for charging a stormwater fee

Of the 62 respondents to the survey, 39 (62 percent) charge a stormwater fee. The most common reason for charging a fee was regulatory compliance, followed by funding capital needs, mitigating flooding challenges, dealing with water quality challenges, and ensuring public safety (Figure 1). Respondents could select more than one reason.

Figure 1: What is the reason(s) for which your municipality set a stormwater fee? (n=39)



We found several interesting, if unsurprising, facts about municipalities that charged a stormwater fee versus those who did not. First, fee-charging municipalities and counties tended to have larger populations than those that do not charge a stormwater fee. The median population of those without a fee was 4,659, whereas it was 17,751 for those that charged a fee. Furthermore, municipalities charging a stormwater fee commonly also have a stormwater ordinance, stormwater asset management plan (SWMP), and/or capital improvement plan (CIP).

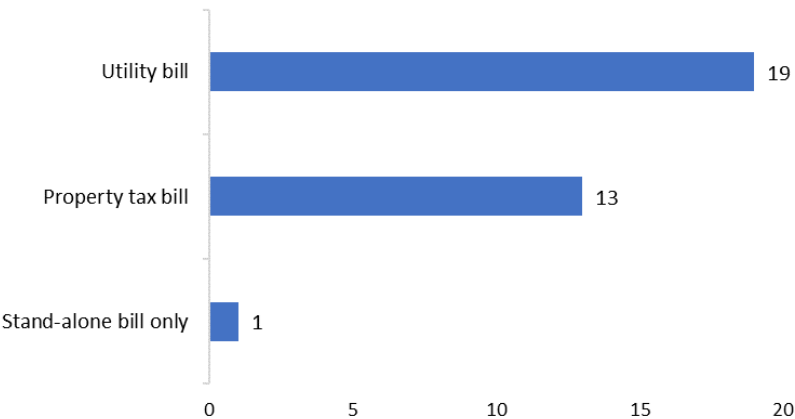
Credit Programs

A stormwater credit program allows property owners to receive a rebate on their stormwater bill by installing a stormwater control measure (SCM) on their property. About 30 percent of stormwater fee-charging respondents (n=33) offered some sort of stormwater credit program, mostly to commercial customers. The maximum credit for commercial customers for respondents ranged between 25 and 85 percent of the customer’s bill. Utilities with credit programs universally reported very little program usage (mostly less than one percent of customers).

Billing Method

The most common billing methods are utility bills and property tax bills. Just one municipality reported charging stormwater as a stand-alone bill (Figure 2). We tested for correlation between the billing method and the bill payment rate, but we found no statistically significant result. Respondents reported an average stormwater bill payment rate of 95 percent. A larger sample size would be needed to further examine if a relationship exists.

Figure 2: How do you bill for stormwater? (n=33)



Meeting current stormwater needs

Figure 3 shows the survey respondents’ self-assessments of their local government’s ability to meet current stormwater needs through the stormwater fee revenue. Just 20 percent of respondents report that the stormwater fee revenue is sufficient to meet all needs. Most respondents reported that they can meet operation and maintenance (O&M) and regulatory needs, but only some of their future capital

needs. We did not survey municipalities without stormwater fees on their ability to meet stormwater needs. However, that would be a valuable addition to a future survey.

Table 1: In your opinion, is your current stormwater fee revenue sufficient to meet current needs? (n=30)

Needs Met	Responses	Median Population
All	4	25,323
O&M, regulatory, and some capital needs	17	20,867
O&M and regulatory needs but no capital needs	3	12,005
Does not fully meet current needs O&M and regulatory needs	6	4,720

We found that the median population of local governments was larger for stormwater utilities that are better able to meet stormwater needs with current fee revenue (Table 1).

Affordability of fees

We also asked respondents about their perception of how affordable their customers perceived the stormwater fee to be. All but one respondent (who reported that it was “mostly unaffordable”) reported that their fee was “mostly” or “extremely” affordable (n=28 total responses). Looking at the affordability of stormwater fees alone may not give a complete picture of the burden to the rate payer. A wholistic affordability analysis would include other utility fees including water and wastewater, as well as the cost of necessities including housing, food, transportation, and health care.

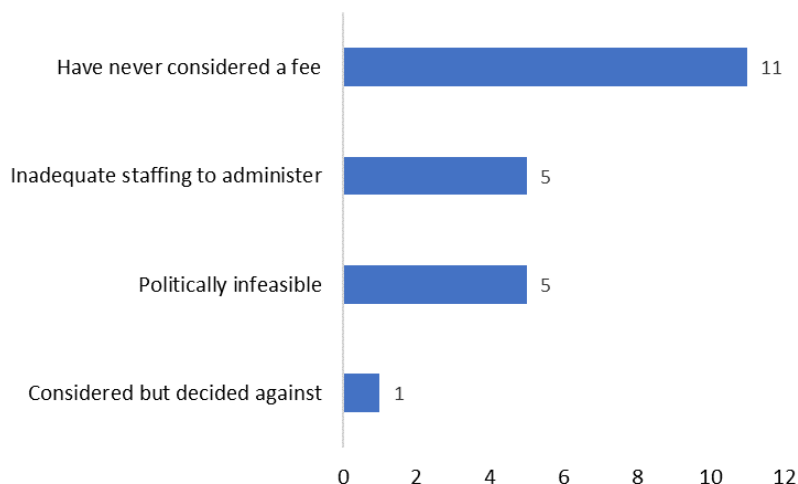
Reason for not charging a stormwater fee

We also explored the reasons local governments do not charge a stormwater fee (Figure 4). The most common response was simply that it was never considered. Respondents that have considered charging a fee cited inadequate staffing and political infeasibility as barriers to charging a fee and running a stormwater utility. One municipality that has experience political barriers cited that they are making headway in overcoming that barrier.

Three local governments are currently considering a fee. One local government reported that they are having difficulty substantiating the need for a fee.

Finally, one local government reported that they would consider a fee if they were designated a Phase II MS4 community.¹

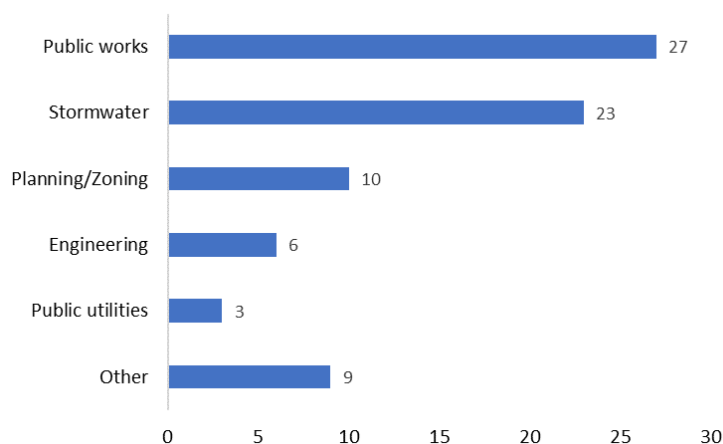
Figure 4: Why, in your experience, do you not charge a stormwater fee? (n=30)



Departmental structure of stormwater responsibilities

Public works is the most common department responsible for managing stormwater followed by a stand-alone stormwater department (Figure 5). Local government respondents commonly reported multiple departments handling stormwater responsibilities.

Figure 5: What department handles your stormwater responsibilities?

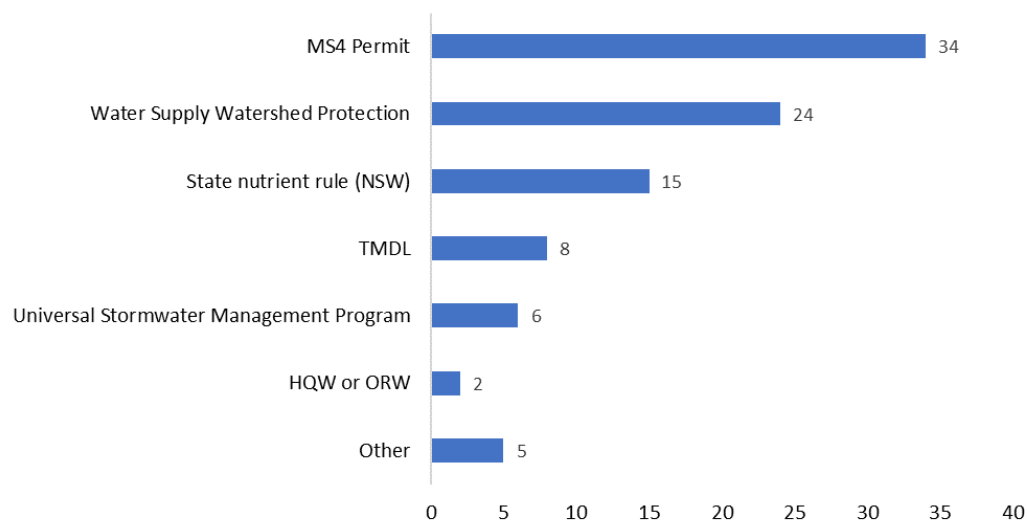


¹ For more information on the North Carolina NPDES MS4 Program visit: <https://deq.nc.gov/about/divisions/energy-mineral-land-resources/energy-mineral-land-permits/stormwater-permits/npdes-ms4>

Stormwater regulatory requirements

Stormwater systems are potentially subject to many different regulatory requirements (Figure 6). The most common regulation was an MS4 permit, followed by water supply watershed protection, state nutrient rule (Nutrient Sensitive Waters), Total Maximum Daily Loads (TMDL), universal stormwater management program, high quality water (HQW) or outstanding resource waters (ORW). Other responses include Goose Creek watershed, and coastal stormwater regulations.

Figure 6: What regulatory requirement(s) does your jurisdiction have? (n=51)

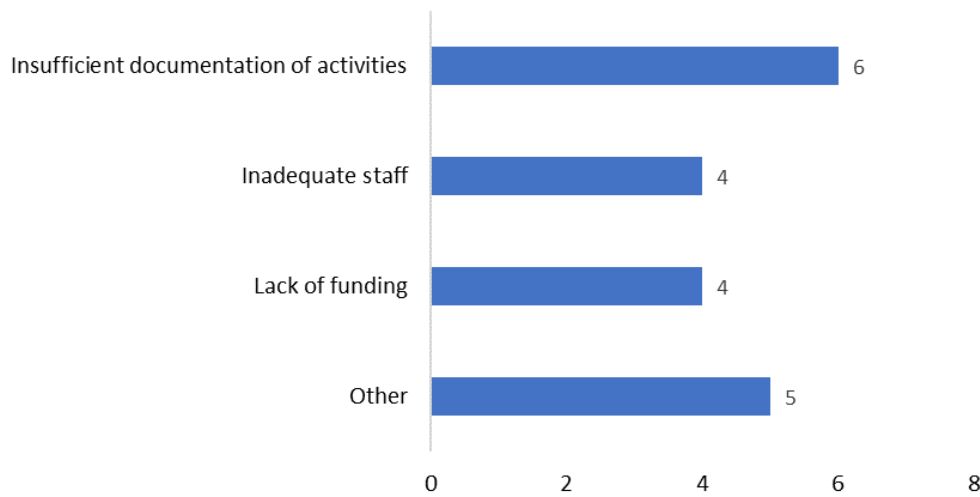


MS4 audits and barriers to MS4 compliance

Of those stormwater systems that reported having an MS4 permit (n=34), 65 percent have not been audited or are in the process of being audited. Of those that have been audited, two programs have received a notice of compliance because of the audit and ten have received a notice of violation (NOV) or notice of deficiency (NOD). North Carolina Department of Environmental Quality is auditing MS4 programs on a 5-year schedule.²

The most common barriers to compliance for those issued an NOV or NOD were a lack of funding, inadequate staffing, and insufficient documentation of activities (Figure 7). Other barriers to compliance include concerns about communication with the regulator and issues related to erosion control.

Figure 7: In your opinion, what is the reason(s) you are out compliance with your MS4 permit? (n=11)



MS4 system mapping costs

The reported initial cost estimate of mapping a local government’s MS4 varied greatly (Table 1). The median cost was \$90,000 dollars and ranged from \$20,000 to \$6,000,000. Since the cost of mapping an MS4 correlated strongly with population for the 12 respondents ($R^2=0.98$), we normalized the dollar amounts by the population of the census area.³ The median cost of mapping per person was \$5.69

² For more information, visit: <https://deq.nc.gov/about/divisions/energy-mineral-and-land-resources/stormwater/stormwater-npdes-ms4-program>.

³ Based on 2019 American Community Survey (ACS) estimates. 2020 ACS data was not available at the time of this analysis

and the values ranged from \$0.96 per person to \$22.29. Costs may be higher for local governments who need to contract with private companies. A future survey should consider this variable.

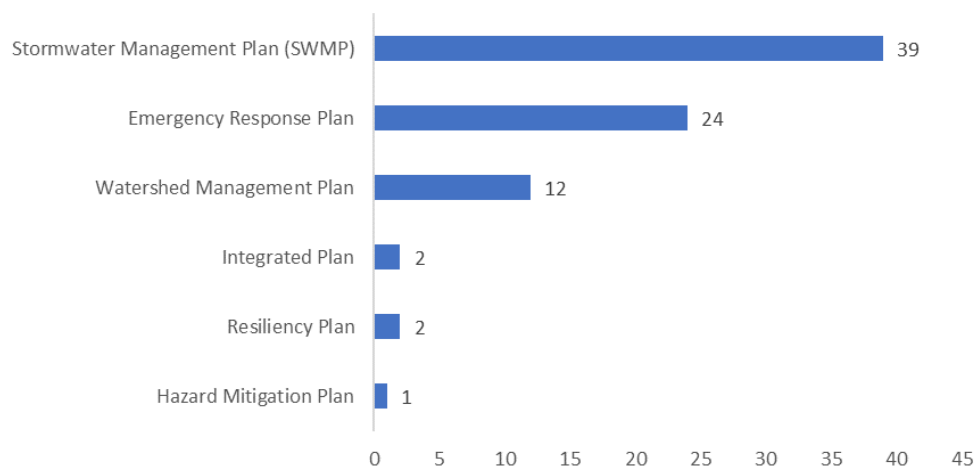
Table 1: Please estimate the initial cost of mapping your MS4. (n=12)

Population	Cost	Cost per Person
474,069	\$6,000,000	\$12.66
53,922	\$1,000,000	\$18.55
45,629	\$50,000	\$1.10
40,252	\$80,000	\$1.99
39,132	\$100,000	\$2.56
20,867	\$20,000	\$0.96
15,849	\$125,000	\$7.89
14,157	\$250,000	\$17.66
10,982	\$22,059	\$2.01
7,161	\$25,000	\$3.49
4,487	\$100,000	\$22.29
4,458	\$60,000	\$13.46

Stormwater ordinances and planning

Most respondents (87 percent) reported that their municipality had a stormwater ordinance (n=55). Respondents were also asked to report their jurisdiction's plans. The most common plan was a stormwater management plan (SWMP), followed by an emergency response plan. and watershed management plan. (Figure 7).

Figure 8: What plans does your jurisdiction have? (n=47)



Asset management planning

We found that 14 local government respondents have an asset management plan for their stormwater system (n=53). Just one local government reported having an asset management plan but no stormwater utility fee.

Capital improvement planning

A major cost of the management of a stormwater system is the installation and maintenance of stormwater capital assets. We found that 16 respondents had a capital improvement plan (CIP), 15 had an inventory of capital improvement projects but no formal plan, and 20 had no CIP or inventory (n=51).

What is the relationship between asset management and capital planning for stormwater? Local governments with asset management plans are extremely likely to practice capital planning. Only one of the local governments with an asset management plan had no CIP or capital project inventory.

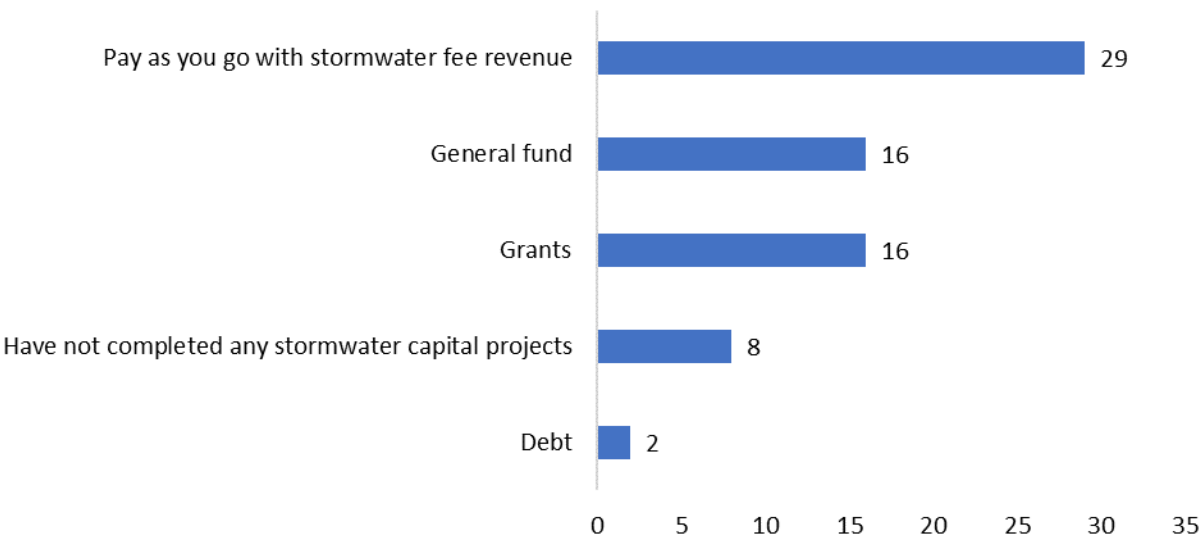
Stormwater needs

Estimates for total stormwater capital needs over the next five years ranged widely, from \$150,000 to \$80,000,000 (n=23). For a more detailed analysis of stormwater needs in North Carolina, please refer to the [pilot stormwater needs assessment for 2020-2034](#).

Financing capital improvement projects

The most common method of paying for stormwater capital improvements was pay-as-you-go through a stormwater fee, general fund, and grants. Just two local governments reported using debt to finance stormwater needs. Eight respondents reported that they had not completed any capital projects.

Figure 9: How do you currently fund stormwater capital needs? (Select all that apply) (n=49)



When asked about future use of debt, most respondents reported that they do not plan to use any debt in the future. However, since several respondents were

unfamiliar with the specific debt instruments, there may be opportunity to educate decision makers on debt financing options (Table 2). Two local governments explicitly mentioned that they plan to use American Rescue Plan funds to finance stormwater capital improvements.

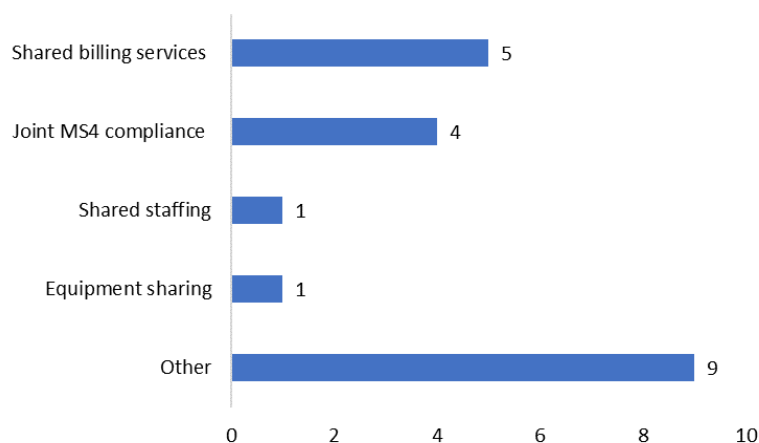
Table 2: What types of debt instruments have you used, or do you plan to use, to pay for stormwater capital improvements? (n=37)

	General obligation bond	Limited obligation bond	Revenue bond	Subsidized loan	Unsubsidized loan
Unfamiliar	6	7	6	5	5
Have used	2	0	2	2	2
Plan to use	0	1	3	5	5
Do not plan to use	29	28	26	24	24

Interlocal partnerships

Municipalities that provide stormwater services may partner with other municipalities through interlocal agreements, which may include shared equipment, staff, billing services, or joint MS4 compliance. The most common interlocal agreement type reported was shared billing services, followed by joint MS4 compliance. Other reported partnerships included equipment sharing, staff sharing, and shared finance of consultant services (n=19).

Figure 10: Do you have an interlocal agreement, written or verbal, for stormwater? (Select all that apply) (n=19)

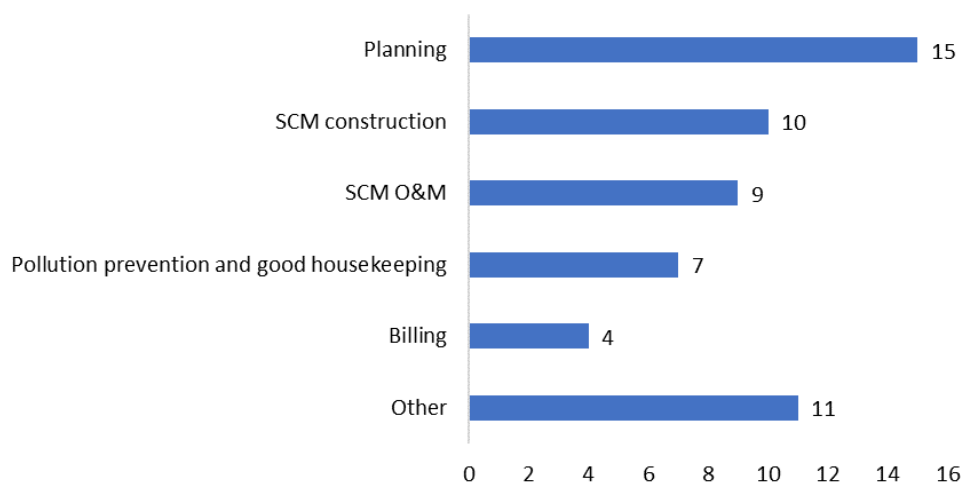


Contracting with private entities

In addition to interlocal partnerships, municipalities may contract out services related to stormwater. Reasons for contracting with private entities include planning, SCM construction, SCM operation and maintenance, pollution prevention

and good housekeeping, and billing. Other responses included engineering and plan review, MS4 mapping, and public education (Figure 11).

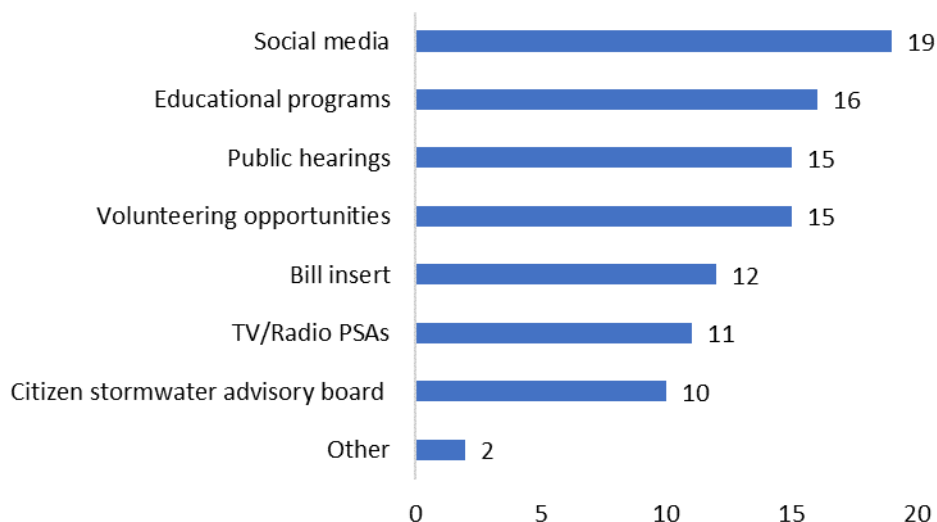
Figure 11: With which of the following aspects of your program does the contractor assist? (n=27)



Stakeholder Engagement

Many municipalities also conduct stakeholder engagement for stormwater. This may include public hearings, volunteer opportunities, public service announcements, educational programs, and social media campaigns. About half of respondents report conducting stakeholder engagement for their stormwater program (n=50). The frequencies with which different types of public outreach were conducted can be seen in Figure 12.

Figure 12: What types of outreach do you conduct? (n=22)





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© 2017 Environmental Finance Center
at the University of North Carolina, Chapel Hill
School of Government
Knapp-Sanders Building, CB# 3330
University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-3330
<http://efc.sog.unc.edu>