

# MANAGING STORMWATER COSTS TO MEET NPDES REGULATIONS

## WPI Stormwater Costs IQP D21



# WPI



### BACKGROUND

The NPDES permit has been implemented by the EPA to guide communities that utilize an MS4 towards environmentally clean stormwater management. The permit's requirements can require a large stormwater budget for communities. WPI's Water Resource Outreach Center (WROC) works to help municipalities and watershed associations with their water resource needs through undergraduate Interactive Qualifying Projects (IQP). Our IQP team collaborated with the Central Massachusetts Regional Stormwater Coalition (CMRSWC) to help them overcome stormwater-related issues.

### GOAL AND OBJECTIVES

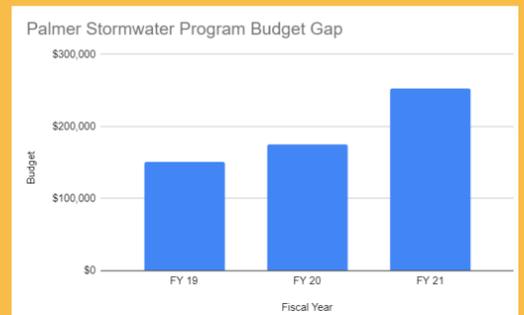
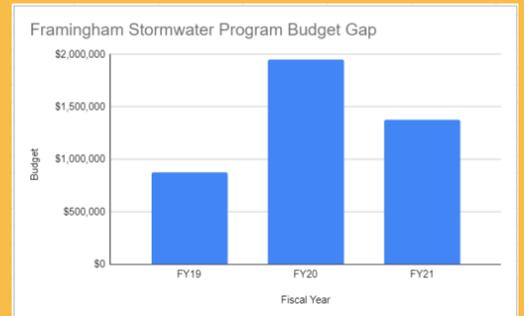
Our project goal was to help communities better prepare for future stormwater costs. This goal was accomplished by conducting case studies on three CMRSWC towns: Ashland, Framingham, and Palmer. Our team outlined three main objectives to achieve this goal:

- Interview stormwater department members from each case study town and the CMRSWC
- Research and draw conclusions based on the NPDES permit requirements and financial information on each town's stormwater programs
- Form recommendations to help the town involved in the CMRSWC stay in compliance with the NPDES permit

### STORMWATER BUDGET GAPS ARE INCREASING

Each case study town has experienced an increasing gap between their stormwater programs' requested and received stormwater program budgets. This has caused the towns to push back multiple projects. The table below contains information on the increased budget gap from 2019 to 2020 for our case study towns. The graphs on the right provide more insight on this topic. From this information, our team concluded other towns in the CMRSWC could be experiencing this increasing budget gap.

Fiscal Year	Framingham Budget Gap	Palmer Budget Gap	Ashland Budget Gap
FY19	\$874,142	\$150,796	\$34,765.90
FY20	\$1,951,602	\$175,360	\$55,160.42



### STORMWATER COSTS ARE NOT PROPORTIONAL TO TOWN/POPULATION SIZE

The information on each case study town led us to conclude that stormwater costs are not proportionate to town population/size. The chart on the right shows the key data findings for this topic. Though Ashland is the smallest town in size it still has higher stormwater costs per square mile. Palmer also charges their population a larger amount than Framingham does despite being a smaller town. From these findings our team determined that the requirements found in the NPDES permit create a wide range of necessary stormwater program costs among communities.

ESTIMATED STORMWATER COSTS PER PERSON & COST PER SQUARE MILE		
Framingham	Ashland	Palmer
Costs/Person: <b>\$6.00</b> Costs/ Sq Mi: <b>\$17,358</b>	Costs/Person: <b>\$8.00</b> Costs/ Sq Mi: <b>\$11,627</b>	Costs/Person: <b>\$14.00</b> Costs/ Sq Mi: <b>\$5,366</b>
Population: 74,416	Population: 17,807	Population: 12,232
Size: 26.5 mi <sup>2</sup>	Size: 12.9 mi <sup>2</sup>	Size: 32 mi <sup>2</sup>
Requested Capital Funding (FY 2019): <b>\$460,000</b>	Requested Funding (FY 2019): <b>\$150,000</b>	Requested Funding (FY 2019): <b>\$171,720</b>

#### From this finding, our team concluded:

- Each town experiences and manages stormwater in different ways Instead
- There are many factors that can influence a stormwater budget regardless of town size or population

#### Examples of these factors are:

- The number of impaired water bodies
- The condition of existing stormwater infrastructure
- A town's available funds and if they are tied to other municipality programs

### THE BENEFITS OF A STORMWATER ENTERPRISE

A stormwater enterprise program can be beneficial for stormwater management. The enterprise utility allows towns to have much better funding for stormwater management. For example, Ashland's stormwater program is funded by a stormwater enterprise utility. Citizens of Ashland pay a quarterly fee for their stormwater department. A stormwater enterprise allows the stormwater program officials to make executive project and financial decisions. Framingham and Palmer do not utilize a stormwater enterprise.

Representatives from these two towns' stormwater programs have expressed an interest in the idea of a stormwater enterprise utility program structure, although any efforts to date have been on hold due to the COVID-19 pandemic and other factors. Stormwater enterprise funds can allow stormwater programs to acquire sufficient funds and become more streamlined in program management. Towns that rely on budget and project approval from town administrators may have difficulty in acquiring funds and support to meeting their stormwater requirements.

Image Source: capitolregionalwd.org



# THE SEE PLAN

A plan to help the CMRSWC overcome stormwater-related issues and excel!

## SUSTAINABILITY

The first component of the SEE plan involves *sustainability*. This component of the plan focuses on two recommendations including the utilization of Low Impact Development (LID) Strategies as well as adjusting stormwater infrastructure for climate change.

## CLEANER STORMWATER MANAGEMENT

LID strategies are techniques used to:

- Reduce runoff and source pollutants
- Reduce water treatment costs for the given town.

Aging stormwater infrastructure was not designed to handle modern storms. Upgrading stormwater infrastructure will help towns:

- Efficiently manage the increasing precipitation from modern and future storms
- Decrease MS4 component maintenance projects
- Avoid impairment of their local bodies of water
- Avoid TMDL and IDDE NPDES permit issues

## EDUCATION

The second component of the SEE plan revolved around *education*. This component primarily focused on educating town executives responsible for approving stormwater budgets and projects on stormwater management. This can be done by increasing awareness of the NPDES permit, the nature of stormwater costs, and available stormwater grants.

## COMFORTABLE NPDES PERMIT COMPLIANCE

By understanding the strict requirements found in the NPDES permit and the legal issues that will arise from non-compliance:

- Town executives will treat stormwater programs as a higher priority
- These executives will be more eager to approve projects and meet requested program budgets
- Stormwater programs will be able to complete mandatory projects more time efficiently
- Towns will be able to stay in compliance with the NPDES permit comfortably.

## EFFICIENCY

The third category of the SEE Plan, efficiency, focused on developing a stormwater enterprise, streamlining stormwater management plans, and increasing collaboration within the Central Massachusetts Regional Stormwater Coalition (CMRSWC).

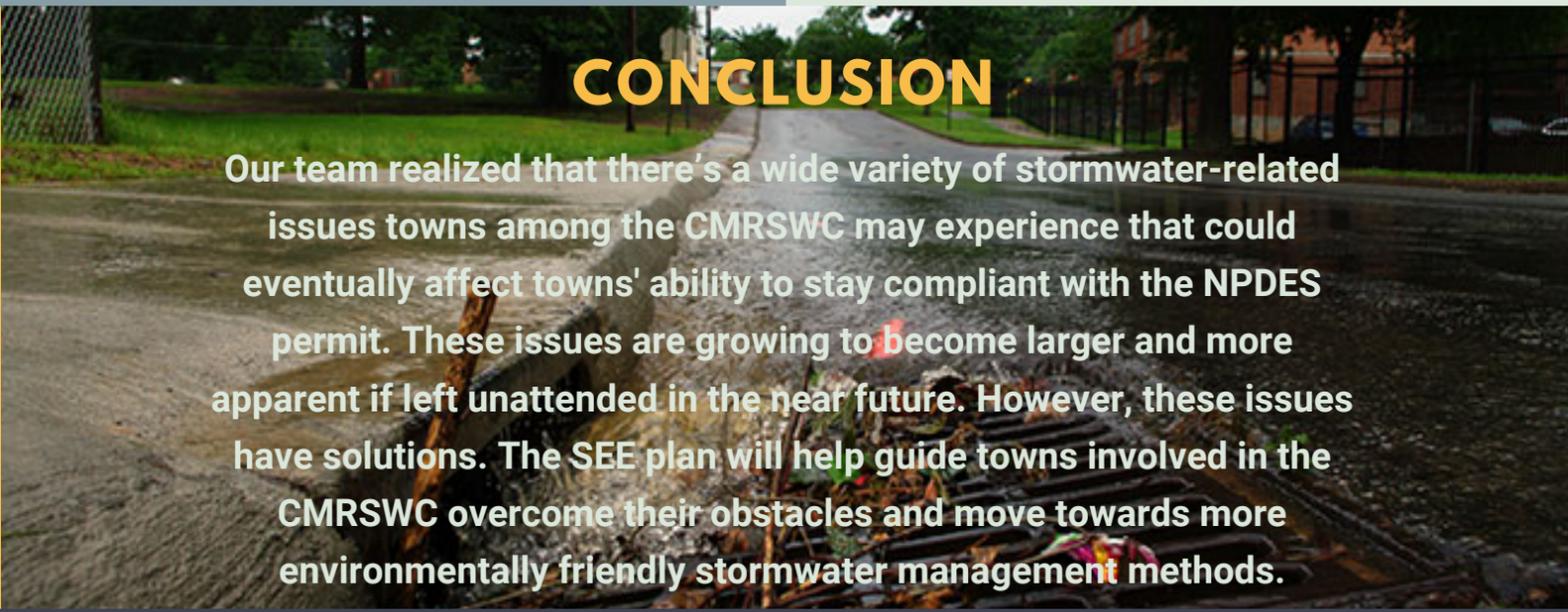
## INCREASED COLLABORATION AMONG THE CMRSWC

Programs that implement a stormwater enterprise will be:

- More streamlined due to large available funds and no budgetary ties to other town programs.
- Able to have executive freedom in regards to the project and some financial decisions

Increasing collaboration among the CMRSWC is beneficial. Towns could share:

- Methods to better stormwater management among the CMRSWC
- Stormwater infrastructure and BMPs to better manage their MS4 and local bodies of water



## CONCLUSION

Our team realized that there's a wide variety of stormwater-related issues towns among the CMRSWC may experience that could eventually affect towns' ability to stay compliant with the NPDES permit. These issues are growing to become larger and more apparent if left unattended in the near future. However, these issues have solutions. The SEE plan will help guide towns involved in the CMRSWC overcome their obstacles and move towards more environmentally friendly stormwater management methods.