

**Appendix V**  
**Preliminary Stormwater Funding Evaluation**

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**PRELIMINARY STORMWATER FUNDING  
EVALUATION**

**EASTHAMPTON DEPARTMENT OF PUBLIC WORKS**

**Easthampton, Massachusetts**

**December 2018**



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## **1 INTRODUCTION**

Operating and maintaining stormwater infrastructure in Easthampton is a recurring cost that is expected to increase significantly due to the requirements outlined in the 2016 Municipal Separate Storm Sewer System (MS4) General Permit. Stormwater expenditures in the City currently only cover operational and maintenance (O&M) activities including street sweeping, catch basin cleaning, and minor stormwater collection system repairs. The 2016 MS4 General Permit requires Easthampton to invest in stormwater-related public education, system evaluation, maintenance activities, sampling and testing, reporting, and upgrades to stormwater infrastructure above and beyond current levels of spending. Beyond that, there are also several stormwater infrastructure improvement projects required to address stormwater-related problems such as structural issues, increases in capacity, and erosion prevention. In summary, there are three main categories of stormwater related costs:

- Operations and Maintenance (O&M) – Current expenditures for activities that include street sweeping, catch basin cleaning and minor stormwater collection system repairs;
- 2016 MS4 General Permit – Future, planned costs to address permit requirements.
- Capital Costs – Future planned costs for the design and construction of larger infrastructure improvement projects; and the purchase of larger O&M vehicles and equipment.

In the following sections the current and future expected costs of owning and maintaining stormwater infrastructure will be described. We also discuss options for funding stormwater infrastructure operations, maintenance, permit compliance and capital projects.

## **2 STORMWATER EXPENDITURES**

Easthampton has stormwater catch basins, storm drains, pipes, culverts, and detention basins, all of which require maintenance, as well as periodic repair and replacement. Currently aging stormwater infrastructure is upgraded concurrently along with roadway improvements as part of state funded roadway projects (through Chapter 90 project funding), or on an as-needed basis by the collection system and highway repair crews. These city-funded projects include staff time, overhead, and construction costs and are typically paid through the Sewer Enterprise Fund.

Expenses related to construction, maintenance and repair of stormwater infrastructure are not currently identified and tracked as stormwater costs, nor does the City levy any fees or taxes to specifically cover the costs of maintaining stormwater infrastructure.

A list of some of the typical expenditures associated with stormwater management related to operations and capital improvements is provided in **Table 1**.

**Table 1**  
**Typical Stormwater Management Expenditures**

	<b>Operations</b>	<b>Capital Improvements</b>
Personnel	Engineering Laborers Administrative	Consultant Fees <ul style="list-style-type: none"> <li>• Planning/Studies</li> <li>• Design, Permitting &amp; Construction</li> </ul>
Environmental Protection	Pollution Prevention Water Quality Sampling Corrective Actions <ul style="list-style-type: none"> <li>• IDDE</li> <li>• Flood Control</li> </ul>	River Restoration <ul style="list-style-type: none"> <li>• Sediment Removal</li> </ul> Pump Station Rehab Pipe Repair and Replacement Drainage Improvements
General	Maintenance <ul style="list-style-type: none"> <li>• Street Sweeping</li> <li>• Catch Basin Cleaning</li> <li>• Materials and Supplies</li> </ul>	GIS Mapping Drainage Improvements Culvert Replacement
Other	Public Education and Outreach Personnel Training	

## 2.1 CURRENT OPERATIONS AND MAINTENANCE COSTS

Stormwater infrastructure operations and maintenance (O&M) work is typically performed by the City's collection system maintenance staff. As such, the work is typically funded by the Water & Sewer Enterprise Fund. The costs attributed to stormwater, though, are not tracked separately. Department of Public Works (DPW) staff estimate that up to 50% of the staff time and certain materials and other expenses paid for through the Enterprise Fund budget are spent on

stormwater infrastructure O&M. Current stormwater O&M expenditures were estimated using data from the FY 2013 through FY 2017 annual budgets.

The main categories and estimated expenditures are listed in **Table 2**. The estimated annual expenditures on stormwater O&M is approximately \$700,000 per year.

**Table 2  
Estimated Average Annual Stormwater O&M Expenditures (2013-2017)**

<b>Categories</b>	<b>Estimated Expenditures</b>	<b>Notes</b>
Labor	\$430,000	DPW staff, portion of Mayor, assessor, etc.
Materials	\$52,000	Stones, gravel, loam, precast concrete, bituminous concrete, etc.
Supplies	\$8,000	Small tools, office supplies, protective clothing, uniforms, etc.
Vehicle repair & Maintenance	\$20,000	Gas, oil, repairs, etc.
Miscellaneous	\$8,000	Education & training, computers, building services, telephone, etc.
Technical & Professional Services	\$12,500	Assistance from consultants and technical service providers.
Capital Expenses	\$24,000	50% of costs for flushing machine, equipment trailer, vehicle
<b>Subtotal (Enterprise Fund)</b>	<b>\$554,500</b>	
Chapter 90 Projects	\$138,000	Stormwater portion of state roadway projects.
<b>Total</b>	<b>\$692,500</b>	

The labor costs include salaries and overhead expenses for DPW staff prorated from the Sewer Enterprise Fund based on the estimated amount of time spent on stormwater-related tasks. A percentage of the salary of supplemental City staff including the Mayor, the Assessor, and the Treasurer is also included.

Note that the costs in **Table 2** are for current expenditures, and do not include delayed maintenance or repair costs, MS4 General Permit costs, nor future, planned capital improvement projects. Recommended, future, planned projects identified through the IWRMP evaluation are included in **Section 2.3**.

## 2.2 2016 MS4 GENERAL PERMIT COMPLIANCE COSTS

Provisions of the 2016 MS4 General Permit include items that will require Easthampton to invest additional funding in, among others, maintenance, record keeping, sampling, reporting, public education and outreach, and evaluating the stormwater system for connections with the sewer system (Illicit Discharge Detection and Elimination); which will also likely lead to additional improvements to stormwater infrastructure.

A model was created to estimate the cost of compliance with the permit. It lists each of the requirements, the estimated level of effort (labor hours), and associated non-labor costs. For the purposes of estimating labor costs a blended rate was developed, assuming all labor would be from City employees in the first year of the permit and an 80% / 20% split between City employees and consultants in the following four years of the permit.

Estimated costs for compliance with the 2016 MS4 General Permit were reduced in the model to account for tasks that were completed as part of the IWRMP project, such as GIS mapping and prioritizing outfalls for illicit connection investigations. Total five-year costs for compliance with major provisions of the permit are presented in **Table 3**. The estimated five-year cost of MS4 permit compliance is over \$750,000. The IWRMP included over \$200,000 of work towards MS4 permit compliance, leaving an estimated \$550,000 in remaining costs that will be incurred by Easthampton.

**Table 3  
2016 MS4 Permit Compliance Costs**

<b>Permit Category</b>	<b>Total</b>	<b>IWRMP</b>	<b>Remaining</b>
MS4 Permit Administration <sup>1</sup>	\$106,000	\$60,000	\$46,000
TMDL Compliance	\$81,000	\$0	\$81,000
Public Education / Outreach (MCM 1) <sup>2</sup>	\$37,000	\$7,000	\$30,000
Public Participation / Involvement (MCM 2) <sup>2</sup>	\$12,000	\$12,000	\$0
Illicit Discharge Detection & Elimination (MCM 3) <sup>2</sup>	\$208,000	\$93,000	\$115,000
Construction Site Run-off Control (MCM 4) <sup>2</sup>	\$7,000	\$3,000	\$4,000
Post-Construction Management in New Development (MCM 5) <sup>2</sup>	\$28,000	\$8,000	\$20,000
Pollution Prevention & Good Housekeeping (MCM 6) <sup>2</sup>	\$282,000	\$28,000	\$254,000
<b>Total</b>	<b>\$760,000</b>	<b>\$211,000</b>	<b>\$550,000</b>

<sup>1</sup>File Notice of Intent (NOI), reporting, record keeping, etc.

<sup>2</sup>MCM = Minimum Control Measure

All costs provided in November 2017 dollars (ENR CCI =10870)

Easthampton is not alone in seeing new costs associated with stormwater permits. The City is partnering with other communities through the Pioneer Valley Stormwater Committee to meet some of the educational requirements of the new permit. The cost of that membership is \$2,500 per year and is included in the cost estimates.

Construction costs are anticipated in Year-6 of the MS4 General Permit in the form of stormwater pollution control infrastructure. The planning, design, and yearly progress reports on installing pollution control infrastructure (also called best management practices (BMPs)) for stormwater systems as required by the permit are included in the model, but the cost of constructing them is not.

## 2.3 CAPITAL COSTS

Other stormwater infrastructure need and projects include capital projects that have been deferred due to lack of funds, the purchase of a street sweeper, and a stormwater utility feasibility study to evaluate the costs and benefits of raising funds to cover stormwater costs through a fee-based Enterprise Fund. These projects, listed in **Table 4**, total \$2.3 M. As these are based on recommendations from a five-year plan, the estimated annual cost is \$460,000, assuming an equal distribution of expenditures over the five years and not accounting for expected price escalations.

**Table 4**  
**Stormwater Infrastructure Capital Needs**

<b>Project or Expense Category</b>	<b>Estimated Cost</b>
Hendricks Street culvert improvements	\$200,000
Ferry Street culvert improvements	\$150,000
Emerald Place outlet structure replacement and slope stabilization	\$250,000
Industrial Drive headwall replacement	\$250,000
Cherry Street headwall replacement	\$50,000
Union Street - TIP /SW system improvements	\$250,000
CCTV Inspections	\$100,000
Repair/replace aging pipes and structures	\$750,000
Inspect and maintain structural BMPs	\$50,000
Street Sweeper	\$250,000
<b>Total Costs</b>	<b>\$2,300,000</b>
Estimated Annual Costs	\$460,000

Note: All costs in November 2017 dollars (ENR CCI = 10870). Price escalations not included.

## 2.4 TOTAL ESTIMATED STORMWATER COSTS

A summary of the estimated stormwater projects and costs are listed in **Table 5** and total over \$1.3M per year. New expenditures are estimated at \$620,000, which is approximately equal to what Easthampton currently pays for stormwater.

**Table 5  
Estimated Annual Stormwater Infrastructure Costs**

	<b>Estimated Cost</b>
MS4 Compliance	\$160,000
Capital Costs	\$460,000
<b>Subtotal</b>	<b>\$620,000</b>
Current O&M Expenditures	\$692,500
<b>Total Estimated Annual Stormwater Costs</b>	<b>\$1,312,500</b>

Note: All costs in November 2017 dollars (ENR CCI = 10870). Price escalations not included.

### 3 FUNDING MECHANISMS

There are several types of funding mechanisms that Easthampton could use to fund increases in expenses to maintain and repair stormwater infrastructure, and to achieve compliance with the 2016 MS4 General Permit. The City currently funds stormwater maintenance and repairs through the Sewer Enterprise Fund and Chapter 90 funds. When roads are repaved or upgraded, the stormwater infrastructure is typically upgraded as needed. Culverts, catch basins and pipes in the greatest need of replacement throughout the City are not always aligned with Chapter 90 projects. The following methods for funding stormwater operations, maintenance, permit compliance and capital projects are described in this section, and are not all mutually exclusive:

- Existing Water and Sewer Fees through Water & Sewer Enterprise Fund
- Create a new Stormwater Utility
- Property taxes and budgeting through the General Fund
- Special Assessment Districts
- System Development Charges
- Grants and Low Interest Loans
- Capital Bonds

A list of advantages and disadvantages to each method is provided after each description.

### 3.1 USE EXISTING WATER AND SEWER ENTERPRISE FUND

An Enterprise Fund gives a community the ability to separately account for all financial and accounting activities associated with a municipal service such as water, sewer, stormwater or a combination thereof. An Enterprise Fund is a way to separate accounting and financial reporting for specific municipal services for which fees are charged. The revenues and expenditures are separated from other governmental activities and collections can only be used to fund delivery of the specific service for which the fund is established. Enterprise Funds can be fully funded through user fees or they can be partially subsidized from the General Fund.

Currently stormwater infrastructure repair costs in Easthampton are being funded through the Water & Sewer Enterprise Fund, which is entirely funded through the collection of water and sewer fees from property owners. The main advantage of using the existing Enterprise Fund for stormwater costs is that there is already an administrative system in place for funding the work. The main disadvantage of this method is that it is difficult to separate and track stormwater costs from water and wastewater costs. Also, as the costs of managing stormwater increases, the fairness of using water and sewer fees for stormwater expenses could be called into question, as those paying the fees may not be contributing as much to stormwater generation as others, which is not accounted for in the user fee structure. Advantages and disadvantages to using the existing Enterprise funding fee structure to pay for stormwater costs are listed below.

#### *Advantages:*

- Administrative and funding systems are already in place.
- The work-crews that perform sewer repairs also perform the stormwater repairs; and with the current system, there isn't a need to separately track time and materials based on the type of repair.

#### *Disadvantages:*

- It is difficult to separate and track stormwater costs from water and/or wastewater costs.
- The user-fee structure is not aligned with stormwater runoff generation by property.
- Water, sewer and stormwater projects would compete for funds.
- It would be difficult to hold larger non-point contributors accountable for their water quantity/quality impacts on the community.

Due to the high costs associated with stormwater management, we recommend that the City further evaluate the current practice of funding stormwater expenses through the existing Water & Sewer Enterprise Fund fee structure.

### 3.2 CREATE NEW, SEPARATE STORMWATER UTILITY (ENTERPRISE FUND)

The establishment and use of Enterprise Funds is authorized and regulated under Massachusetts General Law, Chapter 44. §53F1/2. The law limits establishment of Enterprise Funds to public utilities (i.e. water, sewer, trash disposal), health care, or recreational or transportation facilities<sup>1</sup>. To collect revenue specifically for stormwater expenses, the City would have to create a public stormwater utility and establish a fee structure and billing system specifically for stormwater.

The USEPA favors this approach to funding stormwater infrastructure maintenance, assessments, and capital costs. There are over 1,600 stormwater utilities in 40 states throughout the United States.<sup>2</sup> Advantages and disadvantages to creating a stormwater utility to fund the Enterprise Fund are listed below.

#### *Advantages:*

- Most fair way to distribute costs of managing stormwater compared to using property taxes or water & sewer fees.
- Stormwater projects could be prioritized and funds raised to pay for them.
- Funds collected for stormwater projects could not be re-appropriated and spent on other needs.

#### *Disadvantages:*

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<sup>1</sup> <https://www.mass.gov/files/documents/2017/09/08/enterprisefundmanual.pdf>

<sup>2</sup> *Western Kentucky University Stormwater Utility Survey.*  
<https://www.wku.edu/seas/documents/swusurvey2017b.pdf>.

- Public is not generally in favor of additional fees.
- Establishing a stormwater utility takes concentrated effort and attention to public relations.
- Funds collected for stormwater projects could not be re-appropriated and spent on other needs.

Specific fee structures for funding a stormwater utility are discussed in **Section 4**.

Due to the high costs associated with stormwater management, we recommend that the City further evaluate the creation of a stormwater utility in a Stormwater Utility Feasibility Study.

### 3.3 GENERAL FUND

Another method for funding stormwater expenses is through general fund appropriations from property tax collections. There are multiple risks associated with this method because stormwater expenses compete against other municipal services from year to year. They must be re-evaluated each year, which can interfere with providing a stable fund for long-term planning. Also, there is no clear path between fund source and uses, which makes progress and fund allocation difficult to track. Finally, tax-exempt properties do not contribute to the general fund, though they impose costs on the stormwater system (i.e. churches, community buildings, hospitals, schools and public housing).

#### *Advantages:*

- This method could fund capital projects and be used in conjunction with existing funding structure for small repairs and maintenance projects.
- Funds for stormwater capital projects could be set aside into a stabilization account.

#### *Disadvantages:*

- Stormwater projects would compete with other City priorities each year, risking being not funded or under-funded.

- Proposition 2 ½ limits tax increases.

Due to the budget constraints, it is likely that stormwater needs would not be fully funded through General Fund appropriations. Relying on property taxes to fund stormwater infrastructure costs is, therefore, not recommended.

### 3.4 BETTERMENTS

Another way municipalities facilitate a property tax-based funding stream is through property betterments. Betterments are a discrete charge on properties on the basis that a property directly benefits from the infrastructure improvements. The cost may be paid in full or apportioned over a long-term period (typically 20 years). The funds can be used to populate a special fund for payment of the improvements. In Massachusetts, municipalities may assess a betterments tax through legislative action such as City Council vote. Betterments do not have to cover the entire cost of the improved or expanded infrastructure, but if it is less, an alternate funding source must be identified. The fee is applied to a small area with discrete improvements as opposed to a generalized area or the whole community.<sup>3</sup>

#### *Advantages:*

- This method could fund capital projects and be used in conjunction with the existing funding structure for small repairs and maintenance projects.
- Stormwater projects could be prioritized and funds raised to pay for them.
- Funds collected for stormwater projects could not be re-appropriated and spent on other needs.

#### *Disadvantages:*

- The public is not generally in favor of additional fees.

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<sup>3</sup> *Metropolitan Area Planning Commission. (2014). Stormwater Financing/Utility Starter Kit. Greater Boston: MAPC.*

- Funds would only cover capital expenses of specific projects.
- Increased administration would be required to fund multiple projects.

Due to the number and diversity of identified stormwater related expenses, and the politics and administrative complexity of deciding which properties would be subject to betterment fees, this method of funding projects is not recommended as the sole method for funding stormwater related needs, though it could be considered for individual appropriate stormwater capital projects.

### 3.5 SPECIAL ASSESSMENT DISTRICTS

Special Assessment Districts can be created using the Planning and Zoning Land Use descriptions to target areas with larger impervious areas. Districts can be delineated through several methods such as proximity to water source, assessments of existing drainage water quality and frequency of surface flooding. While these districts generally contribute the most to impervious area, they also tend to be near business districts, and can be perceived as business-restrictive for development. However, they can be an effective way to target critical areas susceptible to water quality impacts. Another inequity in this method is that upstream non-point polluters may not be held accountable for their contributions to decentralized runoff pollution. Considering community needs and geographic water quality concern areas during the assessment is imperative to determining the boundaries of a Special Assessment District.<sup>4</sup>

#### *Advantages:*

- Stormwater projects could be prioritized and funds raised to pay for them.
- Funds collected for stormwater projects could not be re-appropriated and spent on other needs.

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<sup>4</sup> *Metropolitan Area Planning Commission. (2014). Stormwater Financing/Utility Starter Kit. Greater Boston: MAPC*

*Disadvantages:*

- Can be viewed as unfriendly to businesses.
- Increased administration would be required to fund multiple projects.
- Causes of impairments have not been identified, therefore difficult to target specific landowners.

Due to the number and diversity of identified stormwater related expenses, and the politics and administrative complexity of deciding which properties would be subject to special assessments, this method of funding projects is not recommended as the sole method for funding stormwater-related needs.

### 3.6 SYSTEM DEVELOPMENT CHARGES

Development review fees, permit fees and construction fees are all popular examples of System Development Charges as a way of generating revenue for stormwater infrastructure programs. While success of the revenue stream depends on consistent volume of new permittees and developments, the fees are not burdened on community members and can be politically advantageous. Practical consideration of growth and development should be assessed when considering this method, as System Development Charges are typically used in addition to other funding sources.

Another System Development Charge is through MassDevelopment District Improvement Financing (DIF) or Local Infrastructure Development Program (23-L) financing. The DIF is a tax that is collected on a pre-defined geographic area (neighborhood) for local improvements. Through the 23-L program special assessments are collected from current and future owners to repay investments in infrastructure. Structuring of this program would require diligent administration, as a capital bond would pay upfront for capital improvements, with assessments levied on property owners. While a City Council form of government is better suited to support this structure, property turn-over and public support should be considered before pursuing this option.

*Advantages:*

- This method could fund some specific capital projects and be used in conjunction with existing funding structure for small repairs and maintenance projects.

*Disadvantages:*

- Increases cost of development; can be viewed as unfriendly to development.
- Would only cover capital expenses on certain specific projects.
- Increased administration to bond and recover fees for capital project.

Easthampton is mostly fully built out and is actively pursuing in-fill development in specific locations, but many of the identified needs for stormwater investment are not directly related to specific projects. This method is therefore not recommended for Easthampton's general stormwater needs, but could be considered for individual projects as appropriate.

### 3.7 GRANTS AND LOW INTEREST LOANS

#### 3.7.1 Grants

Several grant avenues exist to fund stormwater infrastructure projects through Federal Clean Water Act funds. The grants are typically competitive and dependent on funding availability, and require utilization of minority and women owned businesses for a portion of the project costs. In addition, since grants are designed by awarding agencies to meet specific goals, they may carry additional mandates and require matching funds. The following grants are available through MassDEP from Federal, non-point source programs.

- *Clean Water Act Section 319 Nonpoint Source Competitive Grants Program:* This grant program is authorized under Section 319 of the federal Clean Water Act for implementation projects that address the prevention, control, and abatement of nonpoint source (NPS) pollution. In general, eligible projects must:
  - implement measures that address the prevention, control, and abatement of NPS pollution;
  - target the major source(s) of nonpoint source pollution within a watershed/subwatershed;
  - contain an appropriate method for evaluating the project results;

- and must address activities that are identified in the Massachusetts NPS Management Plan.

Proposals may be submitted by any interested Massachusetts public or private organization. To be eligible to receive funding, a 40% non-federal match is required from the grantee. Easthampton has utilized this grant program in the past for the Nashawannuck Pond Restoration projects (Phase 1 and 2). For up-to-date information on how to apply to this grant program, go to <https://www.mass.gov/service-details/grants-financial-assistance-watersheds-water-quality>.

- *Clean Water Act Section 604b Water Quality Planning Grants Program:* This grant program is for water quality assessment and management planning. It would not fund stormwater system operations and maintenance costs or capital project, but it could possibly be used to fund stormwater quality-related assessments. It does not require a local match, but the amount of available funds is limited - \$180,000 total was available in 2018. The Pioneer Valley Planning Commission has utilized this grant program to produce technical assistance documents for communities in the Westfield, Connecticut and Chicopee River Basins. For up-to-date information on how to apply to this grant program, go to <https://www.mass.gov/service-details/grants-financial-assistance-watersheds-water-quality>.

### 3.7.2 Low-Interest Loans

Low-interest loans, such as those offered through the Clean Water State Revolving Fund (CWSRF) program can be used for capital project needs, but are not eligible for repair or operational costs. Low-interest loans through CWSRF are also competitive, and funding for stormwater projects varies from year-to-year based on statewide project applicants. The projects must demonstrate a water quality benefit and eliminate or mitigate a risk to public health. The stormwater needs for Easthampton do not readily meet these criteria, but we recommend this funding option be considered on a case by case basis for each capital project.

#### *Advantages:*

- Funding source is from outside of the community.
- Grant funds do not have to be paid back.

*Disadvantages:*

- Significant investment required in preparing applications, administering loans.
- Increased administration required for low interest loans; loans have to be paid back with interest.
- Funds are not guaranteed as they are offered on a competitive basis.

Many of the identified stormwater needs are not directly related to specific projects. This method is therefore not recommended for Easthampton's general stormwater needs, but should be considered for individual projects as appropriate.

### 3.8 CAPITAL BONDS

Capital bonds are a well-known municipal funding source, appropriate for large capital investments. There are two types of capital improvement bonds for municipalities:

- *General Obligation Bonds (GO Bonds):* Backed by the "full faith and credit" of a municipality, these are not secured by a particular source of revenue. Municipalities pledge to use legally available resources, including tax revenues, to repay bond holders.
- *Revenue Bonds:* Typically, a municipal bond supported by the revenue from a specific project, such as a toll bridge, highway or local stadium. A benefit to using this type of bond is avoiding reaching legislated debt limits. However, if a municipality used a revenue bond to pay for stormwater infrastructure capital expenses, it would need to designate a revenue source.

Similar to grants and low-Interest loans, these bond options are not considered acceptable for operational or administrative use, as they carry large risk for the municipality as they approach debt ceilings and risk bond rating degradation. However, they can be considered for capital stormwater projects.

## 4 STORMWATER UTILITY AND DRAINAGE FEES

As discussed in **Section 3.2** the establishment of a stormwater utility would be required to fund stormwater costs through an Enterprise Fund. While a stormwater utility can be a stand-alone department, in Easthampton it would likely be administered by the Department of Public Works. Although the funds of an independent stormwater utility are directly controlled by the utility, a stand-alone utility is usually more expensive. Either way, increased staffing for administration of the utility would be required.

The establishment of a stormwater utility and new fee structure would require a more detailed feasibility study to evaluate the costs and benefits of a stormwater utility and possible impacts of fee structures on the community. Throughout the process of evaluating, and if recommended, implementing a stormwater utility and fee structure, it is important to garner community support through outreach and education.

Drainage fees (also known as a drainage service or drainage user fee) are charges for the generation of stormwater runoff for the management of that stormwater. Drainage fees are assessed based on property ownership and land use such that all properties that contribute to stormwater runoff generation are subject to the fee.

Setting drainage fees requires an assessment process to understand the composition of property types within the community. All properties in the Massachusetts Land Parcel Database (MLPD) can be categorized by their “Real Estate Type,” described in **Table 6**.

**Table 6  
Easthampton Land Use Descriptions**

<b>Real Estate Type</b>	<b>Description of Land Use</b>
1	Single Family Properties (SFR)
2	Duplex/ Triplex
3	Small Apartments (8 units or less)
4	Large Apartments (more than 8 units)
5	Multi-Use Residential: More than half residential use
6	Mixed Use: More than half commercial use
7	Agriculture and Outdoor Recreation
8	Commercial, retail, entertainment and medium sized offices with floor area ratio (FAR) < 0.75
9	Commercial, retail, entertainment and medium sized offices with FAR > 0.75
10	Educational uses such as universities
11	Industrial properties, warehouses, utilities
12	Tax-exempt properties such as public properties, charities and local properties

Parcels with a land use description of educational are also tax-exempt properties, and thus are categorized as Real Estate Type 12 in the MLPD. The advantage of setting and collecting drainage fees is that they can be assessed on tax-exempt properties.

There are a number of industry-established methodologies that are used by stormwater utilities to calculate drainage fees. Impervious area is the most important factor influencing stormwater runoff and is therefore a major element in the calculation for three of the methods. Each of these

standard methods is described below; and three were used to estimate the potential stormwater fees for landowners in Easthampton. Any of them could be modified to suit the specific needs of Easthampton by, for example, incorporating drainage fee reductions for low-income and elderly citizens, or offering credits for volume reduction. These types of detailed analyses would be examined in a Stormwater Utility feasibility study.

#### 4.1 FLAT FEES

One method of collecting revenue to fund stormwater expenses is to charge a flat fee to the owner of each parcel in the community. There are approximately 5,900 parcels of land in Easthampton. Dividing the estimated annual stormwater costs by the number of parcels results in a flat fee of \$240 per parcel per year. Annual and quarterly flat fees are shown in **Table 7**.

**Table 7**  
**Example Flat Fee per Parcel Rate**

Annual Stormwater Cost	Number of Parcels	Fee per Parcel	
		Annual	Per Quarter
\$1,312,500	5,900	\$222	\$56

#### 4.2 EQUIVALENT RESIDENTIAL UNIT (ERU)

The Equivalent Residential Unit (ERU) Method is the predominant method used by most stormwater utilities. The unit represents the average impervious area footprint of a single-family residential home up to a specific threshold. Usually, the impervious area of a parcel is comprised primarily of a home's roof and driveway. The ERU is determined by calculating the average impervious area footprint (in square feet) for a subsample of single family residential parcels. A flat fee is assigned to the ERU (\$/ ft<sup>2</sup>) on a monthly, quarterly or annual basis. For non-residential properties, the fee charged is based on a multiplier of the ERU that is determined based on impervious area relative to the square footage assigned to each ERU. Non-residential properties with larger areas such as commercial, industrial and institutional parcels are often evaluated individually to determine their impervious area footprint.

The major advantage of the ERU Method is that it is simple and does not require detailed calculations. However, it is not as equitable as the other standard methods because it is more

generalized, involves assumptions, and every single family residential parcel is charged the same fee regardless of size of impervious area. This method can save money in implementation costs since it is an easy cost-effective way to define a fee structure to generate system revenue.

*Advantages:*

- Quickest and easiest way to determine number of total building units.
- Calculation of impervious area is relatively easy to explain to public.

*Disadvantages:*

- Stormwater-related expenses come from a smaller area base.
- Considered to be less equitable than other methods because runoff from pervious areas is not included in the calculation.

A preliminary analysis of average drainage fees using the ERU Method was performed. Total parcel area and land use data for Easthampton was sourced from the MLPD. Based on this data set the average impervious area for single family residential homes in Easthampton is 3,989 ft<sup>2</sup>, which is approximately 21% of the total single family residential parcel area. Thus, 3,989 ft<sup>2</sup> is the ERU for Easthampton based on this preliminary analysis.

The total square footage of impervious area in commercial, industrial and tax-exempt parcels was divided by the ERU to determine the total number of ERUs. This was used to calculate that a charge of \$144 per ERU would be required to raise the funds of the current (FY19) estimated annual stormwater expenses. Assuming all costs escalate by 3% per year, and to cover all stormwater-related costs including those recommended in the Capital Improvement Plan, the estimated projected cost per ERU in FY20 would be \$148.

For each parcel type the impervious area was divided by the ERU to determine the associated ERU equivalent. The estimated annual and quarterly stormwater rates for each parcel type are shown in **Table 8**.

**Table 8**  
**Preliminary Annual and Quarterly Cost per Property Type for ERU Method**

<b>Parcel Type</b>	<b># Parcels</b>	<b>Total Impervious Area (ft<sup>2</sup>)</b>	<b>Average Impervious Area per Parcel (ft<sup>2</sup>)</b>	<b>ERU</b>	<b>Annual Rate</b>	<b>Quarterly Rate</b>
Residential Single Family	4,079	16,271,984	3,989	1	\$148	\$37
Other Residential	1,202	7,188,390	5,980	1.5	\$222	\$56
Commercial	175	3,356,674	19,181	4.8	\$713	\$178
Industrial	94	4,010,841	42,669	10.7	\$1,587	\$397
Tax-exempt	282	5,516,305	19,561	4.9	\$728	\$182
<b>Total</b>	<b>5,832</b>	<b>36,344,196</b>				

The range of rates within the tax-exempt, commercial and industrial parcel types can vary drastically from the average rates presented in **Table 8**. Some example preliminary rates estimated using this ERU method for specific property owners are provided in **Table 9**.

**Table 9  
Preliminary Annual and Quarterly Cost for Specific Properties with ERU Method**

Owner	# Parcels	Total Impervious Area (ft <sup>2</sup> )	ERU Equivalent	Annual Rate	Quarterly Rate
Williston	45	829,160	208	\$30,843	\$7,711
WEMCO	20	169,211	42	\$6,294	\$1,574
Wells Fargo Bank	2	9,806	2	\$365	\$91
Eastworks LLP	1	307,176	77	\$11,426	\$2,857
Ferry Street Partners Investment Trust	1	252,853	63	\$9,406	\$2,351
USPS	1	146,064	37	\$5,433	\$1,358
Church 1	1	12,742	3	\$474	\$118
Church 2	1	15,535	4	\$578	\$144

Ultimately the billing unit can be based on either total property size or amount of impervious surface. This determination should be made by evaluating characteristics of the typical residential parcel in Easthampton (land use type, density of housing, etc.). For non-residential parcels with commercial or industrial use, the ERU method could be used or a separate fee recovery method could be implemented if it makes more sense to establish a separate fee structure.

#### 4.3 INTENSITY OF DEVELOPMENT (ID)

The Intensity of Development (ID) method is based on the percentage of impervious area relative to an entire parcel's size. The proportion of impervious area relative to the total area of a parcel is defined as the *intensity of development*. Typically, all parcels, including those that are vacant and undeveloped are charged a fee using the ID Method. For developed parcels, rates are based on their ID, while vacant or undeveloped parcels are assigned a lower rate. In the ID method,

several categories, each representing a range of % impervious surface area (intensity of development), are established and assigned different rates, progressing from a low rate for vacant and undeveloped land with progressively higher rates for categories with higher percentages of impervious area. Vacant or undeveloped parcels are usually classified with an ID less than 1% while very heavy developed parcels would have an ID range from 76% to 100%. The rates for each range should be developed on a sliding scale, reflective of the community’s input, and the building characteristics of Easthampton.

A preliminary ID rate structure based on the property data from the MLPD was developed. The estimated preliminary quarterly and yearly rates are shown in **Table 10**.

**Table 10**  
**Example of Intensity Development Rates for Easthampton**

<b>Category (Impervious Area %)</b>	<b># Parcels in Range</b>	<b>Average Impervious Area (ft<sup>2</sup>/1000ft)</b>	<b>Quarterly Rate per 1,000 ft<sup>2</sup> of Impervious Area</b>	<b>Average Quarterly User Bill</b>	<b>Average Yearly User Bill</b>
Vacant/Undeveloped (< 1%)	458	0.35	\$3.00	\$1	\$4
Light development (1% to 26%)	3443	4.95	\$8.25	\$41	\$163
Moderate development (26% to 51%)	1365	6.95	\$10.65	\$74	\$296
Heavy development (51% to 76%)	372	15.95	\$13.50	\$215	\$861
Very heavy development (76% to 100%)	265	18.01	\$16.50	\$297	\$1,189

The advantage to using this method is that it is more equitable than the ERU. However, it is often more difficult to implement than the ERU method because it is more complicated to explain to the public. It also has the possibility of discouraging urban development and encouraging sprawl.

*Advantages:*

- Accounts for stormwater from the pervious portion of parcels, therefore it can be more equitable than the ERU Method.
- A slight increase in a parcel's impervious area usually does not change its ID category.

*Disadvantages:*

- ID categories are broad, and parcels are not billed in direct proportion to their relative stormwater discharges.
- This method can be more difficult to implement than the ERU Method because parcel pervious and impervious areas need to be reviewed.
- Can be more complicated to explain to customers than the ERU Method.
- Potential to discourage urban development and promote suburban sprawl.
- More likely to put single family residential property owners with smaller lot sizes into a higher ID category.

#### 4.4 EQUIVALENT HYDRAULIC AREA (EHA)

The Equivalent Hydraulic Area (EHA) method is the most equitable but also the most complicated and has the potential to be more time consuming. Parcels are billed based on the amount of stormwater runoff generated by individually accounting for the amount of pervious and impervious area of each parcel. Measuring the amount of pervious and impervious area for each parcel in a community is time-consuming and adds to the overall cost of implementing the program; however, the information is available for Easthampton in the MLPD. Due to the time required and the considerable number of data points, a detailed analysis was not performed for this method. An analysis of the suitability and estimated costs for landowners using the EHA method could be included in a Stormwater Feasibility Study.

*Advantages:*

- Accounts for flow from the pervious portions of parcels only.

- Allows billing of undeveloped/vacant parcels.
- Billing based on per parcel measurements of pervious and impervious areas.

*Disadvantages:*

- Takes significantly longer time to calculate property bills.
- More complicated to explain to customers.

## 5 RECOMMENDATIONS

Funds can be raised through general taxation, increasing sewer rates, drainage fees (through the development of a stormwater utility) or some combination of these methods. Certain specific projects and some permit compliance components could be funded through Betterments, Special Assessment Districts, or System Development Charges, but those methods are not expected to collect the full scope of funds required, and each require investments in administration. Low-interest SRF loans for construction projects are also an option, but those also require an administrative investment, must be paid back, and the success of the application is not guaranteed. Increases in administrative costs should be expected in any of these scenarios.

**We recommend using Drainage Fees through a Stormwater Utility to provide long-term, sustainable revenue for stormwater management.** Several of the funding sources can supplement a drainage fee program, but it is unreasonable to expect any of the sources alone to provide sufficient funding.

### 5.1 CREATING A STORMWATER UTILITY

For communities such as Easthampton that are exploring the concept of creating a Stormwater Utility, the EPA has recommended the following steps:

1. *Develop a Feasibility Study:* Develop a methodology with rigorous quality assurance. For example, GIS mapping of the system should be used or created and be integral to the method selected, especially if impervious area is the main factor in setting rates. Ensure that the established rate schedule for fees is adequate to achieve Easthampton's goals.

The feasibility study would further define costs to be covered by the new utility, and the rate impact to all property owners, including residences, commercial, industrial and tax-exempt properties.

2. *Create a Billing System:* Stormwater utility fees are collected either on a separate bill, added to water/sewer bills, or added to the property tax bill.
3. *Roll Out a Public Information Program:* Start with a thoughtful public outreach campaign with a goal to generate enthusiasm for the City's vision. If property owners understand the benefits they will receive, they are more likely to support the fee.
4. *Adopt an Ordinance:* Make sure cost sharing is fair and equitable. The greatest costs should be directed towards users that create the most runoff, particularly commercial and industrial facilities with large impervious areas.
5. *Provide Credits/Exemptions:* Considerations for low-income and elderly residents, as well as property owners proactively addressing their water quantity/quality should be encouraged through this program, and credits provided accordingly.
6. *Implement the Utility:* Public outreach and education should be ongoing throughout the entire planning process.

Based on this preliminary evaluation of the stormwater needs in Easthampton, we recommend that the City conduct a more detailed stormwater utility feasibility assessment. This assessment is included as a project in the 5-year CIP for Easthampton.

## 5.2 ADDITIONAL SOURCES OF INFORMATION ON CREATING AND FUNDING STORMWATER UTILITIES

Further information on paying for stormwater related costs, creating stormwater utilities, and different methods for assessing drainage fees can be found online. The websites listed below are not an exhaustive list, but a good place to start.

- EPA

Paying for Stormwater – the Benefits of a Utility Webcast Slides and Transcripts

<https://www.epa.gov/green-infrastructure/paying-stormwater-benefits-utility>

Funding Stormwater Programs (EPA 901-F-09-004) April 2009

<https://www3.epa.gov/region1/npdes/stormwater/assets/pdfs/FundingStormwater.pdf>

- Metropolitan Area Planning Council

“Stormwater Management Municipal Separate Storm Sewer System (MS4) 2104 Permit / Financing”. Conroy, Julie.

[www.mapc.org/wp-content/uploads/2017/10/NSPC\\_sw\\_financing\\_pres\\_040815\\_rev.pdf](http://www.mapc.org/wp-content/uploads/2017/10/NSPC_sw_financing_pres_040815_rev.pdf).

Stormwater Financing/Utility Starter Kit

<https://www.mapc.org/resource-library/stormwater-financing-utility-starter-kit/>

- National Association of Flood and Stormwater Management Agencies

Guidance for Municipal Stormwater Funding January 2006

<https://www.epa.gov/sites/production/files/2015-10/documents/guidance-manual-version-2x-2.pdf>

- Northampton City Website

The City of Northampton has a number of stormwater related informational links:

<https://www.northamptonma.gov/768/Stormwater-Resources-Links>

- Pioneer Valley Planning Commission

Understanding Stormwater Management: The Challenge of Stormwater

<http://www.pvpc.org/sites/default/files/files/PVPC-Stormwater%20Management.pdf>

How to Create a Stormwater Utility

[http://www.pvpc.org/sites/default/files/storm\\_util.pdf](http://www.pvpc.org/sites/default/files/storm_util.pdf)