Neponset Stormwater Collaborative:
DRAFT Stormwater Financing Pilot Report

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By:
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TABLE OF CONTENTS

1. ACKNOWLEDGEMENTS

We'd like to acknowledge the leadership of a number of municipal officials within each community who were willing to take the risk in exploring the sometimes controversial notion of a stormwater drainage fee or new utility, as follows:

Town of Dedham
Nancy Baker, Town Manager
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Joseph Flanagan, DPW Superintendent
Cindy O'Connell, Conservation Agent
Richard McCarthy, Town Planner
Virginia LeClair, Director of Environmental Services

Town of Milton
Joseph Lynch, Director of Public Works
John Thompson, Town Engineer
Dale Horsman, Civil Engineer
Allan Bishop, GIS Specialist

The concept of stormwater management as a service or utility within Massachusetts municipalities is a relatively new concept in our "Home Ruled" state. Although drainage fees or stormwater utilities are widely accepted and utilized in numerous cities, towns and counties across the U.S., the concept has been slow to take movement in the Northeast for numerous reasons. Although these reasons may vary from municipality to municipality, the combination of our parochial local system of government under the state's Home Rule Act, the relatively higher property tax rates across the state, in combination of the non-visible nature of this significant water quality issue within the state makes it difficult for this type of system to be put into place. This combination leads to a wide-spread reluctance to pay a fee that is more visible than if the money came out of the general tax fund or through property taxes, which has led to legal challenges sidelining the concept. We greatly commend the Towns of Milton and Dedham for being proactive and taking a leadership role within the MAPC region, and the state, to explore this concept fully in order to best be prepared for the increasing costs and urgent manner associated with stormwater management under climate change conditions.

2. INTRODUCTION

Task Eight (8) of the Neponset Valley Stormwater Collaborative was to conduct a pilot stormwater financing program for the municipalities of Dedham and Milton. The intent of this task was to "walk-through" the Stormwater Financing Starter Kit developed by MAPC in 2013 for establishing a stormwater drainage fee. We solicited two municipalities within the Neponset River Watershed that had previously discussed the concept of a drainage fee and were willing to go through the initial evaluation and process establishment of a fee.

TASK BACKGROUND

We felt that work on this Task was critical, particularly due to the draft National Pollutant Discharge Elimination System Municipal Sanitary Storm Sewer System (MS4) permit for Massachusetts Watersheds that is currently undergoing its second round of comments and is expected to be finalized in 2016. Stormwater remains the state's (and nation's) largest water quality issue to date. Massachusetts communities still struggle with finding resources necessary to manage stormwater, let alone meet the existing MS4 (2003) permit. The 2015 draft permit includes additional costly management requirements such as monitoring, mapping, and education.

There are very few communities in Massachusetts that have established a long-term, dedicated funding stream for this work. Most municipalities rely on their general funds or grant funding, which is extremely limited. MAPC's Stormwater Financing/Utilities Starter Kit provides municipalities with the information needed to consider the establishment of a dedicated funding source, particularly the development of a drainage fee. The premise is based on the fact that all property owners are responsible for the generation of stormwater from impervious surfaces created by development. Therefore, a drainage fee system would allow a municipality to receive revenue from property owners, based on their impervious surface area, and finally take control of their local water quality issues. In the Kit, we also encourage municipalities to work collaboratively on stormwater management, since it is a watershed issue that crosses municipal boundaries. We have found that there are cost efficiencies to sharing stormwater management services across communities, as well as a potential cost-savings in establishing a stormwater collaborative or multi-municipal utility.

TASK GOAL

The primary goal of the stormwater financing task was to work within two varying community types to determine how a drainage fee can be explored, as well as the issues municipal officials face in doing so and how to overcome these challenges. Milton is an affluent suburban community located between the Neponset River and the Blue Hills Reservation made up primarily of residential and institutional properties. Dedham is a Dedham is a suburban industrial town on the principal southern corridor of metropolitan Boston with numerous commercial uses along the US Route 1 corridor. Working with both of these community types allowed us to understand the varying issues and concerns regarding stormwater management and how to address associated funding needs.

TASK OVERVIEW

The analysis included using the steps outlined in the Stormwater Financing/Utility Kit and tools made available in the kit for the analysis. General steps for exploring and implementing a long-term, sustainable funding source in the Kit include:

1. **Define** water quality problems & management needs;
2. **Determine** the fee structure (and incentives for certain practices, opportunities for reduction in fee);
3. **Deliver** the internal and external outreach programs;
4. **Develop** a management program;
5. **Draft** the required bylaw or ordinance authorizing the financing, as well as the associated rules and regulations outlining the management and implementation of the fee system.

Due to the time constraints of the project, the project team only included the implementation of steps one (1) and two (2), and portions of item three (3). These are primarily the data-driven portions of implementing a long term, sustainable funding source; the more theoretical and time-consuming portion of the fee exploration. Both communities were interested in receiving this information from the project team in order for them to even discuss the concept openly with the general public.

As noted, working within each of these community types allowed the project team to learn about different challenges and opportunities for the use of a stormwater drainage fee and different ways of implementing a fee. In addition, each community varied in terms of the data available to conduct an analysis, their political make-up and will for change, and their current level of stormwater management. The process and methodologies, issues faced, and solutions presented for each community are outlines separately below.

3. DEDHAM PILOT

The project team worked directly with a number of departments across the municipality, under the leadership of the Town Engineer. The approach Dedham took was to discuss the early concepts with the Town Manager and some members of the Board of Selectmen and Finance Commission in order to begin to receive buy-in from the Town leaders. There were then a number of meetings the project team presented at where each department representatives were present: Conservation, Engineering/Public Works, Planning, and Environment, in order to further the concept of the fee as a shared responsibility. Each department contributed a wealth of knowledge and understanding of the issue, as well as a sense of comradery in addressing stormwater pollution. The project team conducted an impervious surface and subsequent rate options analysis as described in the methodology section below. These drainage fee options were presented to the Town in February 2015 for their feedback and comments. A refined analysis for the Town became the final product for this Task.

METHODOLOGY

The following sections explain the methodology for the impervious analysis and the rate calculations for the Town of Dedham.

Impervious Calculation

The Town of Dedham, like most Massachusetts municipalities, relies on the Massachusetts Geographic Information Systems office for most of their data needs. Specifically, the Town uses the MA GIS impervious data layer to ascertain what areas of their community include impervious surfaces. We are of the understanding from conversations with both representatives from the Massachusetts Department of Environmental Protection and the Environmental Protection Agency Region 1 that using MA GIS impervious data is acceptable in calculating stormwater fees. Therefore, MAPC utilized both the MA GIS impervious data layer and the 2015 parcel data to complete a parcel-by-parcel impervious analysis, as described in further detail below.

Prior to this project, MAPC data analysts performed a statewide analysis of impervious surfaces by parcel to create a specific parcel database, essentially a union of parcel data and impervious into a single GIS layer. The impervious surface coverage was calculated in ArcGIS using the MA GIS building roofprint dataset from 2012, and the state's Impervious Surface dataset from 2005. The Impervious Surface dataset was converted from a raster to a vector file in order to overlay or "union" this data with the roofprint dataset. This new datalayer or "feature class" allowed MAPC to not only calculate the total area of impervious surface coverage, but also to break that coverage down into rooftop and pavement impervious surfaces in any case where a municipality asks for these separate coverages. For the purposes of our impervious surface calculation in determining potential rates, impervious surface values for each surface type were totaled for each parcel and then joined back to the MAPC Massachusetts Land Parcel Database for accuracy. Percent impervious coverage was then calculated for each parcel, as well as a total impervious figure for each property classification. These classes are included within the parcel database, as delineated by the

Massachusetts Department of Revenue's Property Type Classification Codes[1]; a guideline for municipal Assessors in determining property types according to use:

Table 3.1: Property Types within Analysis

Code	Property Type	In Impervious Analysis
0XX	Multiple Use	Yes
1XX	Residential	Yes
2XX	Open Space	Yes
3XX	Commercial	Yes
4XX	Industrial	Yes
5XX	Personal Property	No – Not Found
6XX	Forest – Chapter 61 Protected	No – Pervious
7XX	Agricultural – Ch. - 61A Protected	Yes – Some Impervious
8XX	Recreational – Ch. 61B Protected	Yes – Some Impervious
9XX	Tax Exempt Property	Yes

The total impervious calculation for each property type was used in the rate options analysis in generating an Equivalent Residential Unit, as described in the following section.

Financing Considerations

The first item that the Town was tasked with was to determine both current stormwater management expenditures and new expenditures, as driven by new requirements of the draft MS4 Massachusetts permit. What we learned was that the Town of Dedham has been rather proactive in the operations and maintenance of their highly urbanized stormwater system using funds generated under the General Tax fund. Even with these current expenditures, it was determined that the Town still has a funding gap of approximately $1 million to meet requirements of the draft MS4 permit, as shown in the abbreviated table below.

Table 3.2: Expenditures for Fee to Cover

Category/Item	Total (Permit Year 1)
Administration	$83,553
Regulation/Enforcement	$13,500
Engineering and Master Planning	$366,795
Operations and Implementation	$575,113
Monitoring	$17,650
TOTAL:	**$1,056,611**

After first determining existing and future expenditures and deciding upon the costs to be covered under a fee, there are key variables for the municipality to consider up front regarding how to distribute a fee. Each

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[1] Property Type Classification Codes, Non-arm's Length Codes and Sales Report Specifications; Massachusetts Department of Revenue Division of Local Services; Revised March 2014.

of the rate options described below attempt to provide data for the Town to answer the following three key questions regarding fee distribution:

1. ***How do you want to distribute the fee burden across property types?*** For example, if the Town's commercial properties include more impervious surfaces, in total, than all other property types; perhaps this is where the fee burden is more heavily weighed.
2. ***How do you want to distribute the fee within each property type?*** For example, does the Town want to use the same fee for each property within one property classification?
3. ***Is there an interest in "leveling-out" the fee distribution within a property type?*** For example, are there political sensitivities of imposing a fee based on actual imperviousness in cases where some properties bear a very high burden for one reason or another?

Rate Options

The project team used the total stormwater costs listed in Table 1 as the annual revenue required to be generated under a drainage fee. This information was then used to determine four different options for a rate structure, as follows:

1. Flat fee based only on the number of parcels in Town against costs;
2. Graduated fee per land use classification using an Equivalent Residential Unit (ERU);
3. Proportional fee based on impervious surface data for each parcel; and
4. Distributed fee using a square root of the proportional calculations.

Each of these rate options are described below.

Flat Fee

MAPC generated this basic fee structure to show what a specific surcharge would be if it was spread across all properties with impervious surfaces. The annual rate, per parcel, is calculated simply by dividing the annual expenditures needed by the total number of parcels within the Town (See Table 3 below). It should be noted that MAPC would not necessarily advise the Town to consider this fee structure as it is rarely used due to inequalities in billing based on the variations of impervious surfaces for different land uses. For example, an average commercial property typically includes a higher level of impervious surfaces than an average residential property, as well as a larger residential lot versus a multiple unit residential dwelling in a more dense area. This analysis is done to first get a sense of the average fee required to cover the costs of the stormwater management program or utility.

Table 3.3: Flat Fee Calculation

Expenditures (Year 1)	Total Impervious Parcels (#)	Annual Rate (per parcel)	Quarterly Rate (per parcel)
$1,056,611	8,997	$117.44	$29.36

Graduated Fee

In this fee structure, the fact that certain properties among different land use classifications are likely to send greater quantities of stormwater to a municipal storm sewer system is recognized. Therefore, the project team encouraged the Town to consider this as a basic rate option.

An Equivalent Residential Unit (ERU) calculation was required to determine a Graduated Fee system for the Town. The ERU is based on determining the average impervious surface for residential properties, and using this as the basis by which increased percentages of impervious per property type is calculated, as shown in the table below. For example, commercial properties have an average of approximately 20 times more impervious on site than residential properties, and using this number as the multiplying factor; we can see that reflected in the rate for commercial properties.

Table 3.4: Graduated Fees

Property Type	# of Parcels	Total Impervious (sq ft)	Average Impervious per parcel (sq ft)	ERU Equivalent	Annual Rate (per parcel type)	Quarterly Fee
Res - Single Family	**6,578**	**16,733,888**	**2,544**	**1**	**$160.63**	**$40.15**
Res – Accessory	378	616,628	1,631	0.6	$103.00	$25.75
Res – Multi-Unit	1,521	7,914,075	5,203	2.0	$210.68	$52.67
Commercial	295	15,009,539	50,880	20.0	$3,212.65	$803.16
Industrial	39	2,361,727	60,557	23.8	$3,823.70	$955.92
Exempt	186	5,303,104	28,406	11.2	$1,150.14	$287.54
Totals:	8,997	47,919,303				

Proportionate Fee (Parcel-by –Parcel)

In order to provide the Town with a better understanding of how a fee could be imposed based on actual imperviousness for every property; we calculated fees on a proportionate basis. Essentially, this analysis shows the fee in proportion to each parcel's impervious surfaces, as described in the impervious calculation section above. It should be noted that this was a relatively new, pilot analysis that went above and beyond what was included in the Stormwater Financing Kit. MAPC is grateful to have had the opportunity to conduct this parcel-by-parcel analysis to determine its usefulness in evaluating rates. Generally, the method for determining the fee per parcel is as follows:
1. Calculate the percentage of impervious surface each parcel contributes: total impervious (square feet) divided by the total impervious surface (square feet) for ALL properties = 47,919,303;
2. Calculate the fee for each parcel based on their percentage of impervious contribution: percent of impervious multiplied by the estimated expenditures (i.e. X% impervious per parcel x $1,056,611).

The following exclusions to this calculation should be noted:
- Exempt properties owned by the Town of Dedham were excluded. The reason for doing so is that the operations and maintenance for these properties are covered under the Town's overall capital expenses. In addition, it would be potentially inefficient for the future Stormwater Department of Utility to bill another Town entity. However, this structure could certainly be examined to determine its usefulness as an accounting mechanism.
- Properties under any property class with zero (0) impervious surfaces were excluded. For obvious reasons, properties that are not contributing to the stormwater management need, as their lack of impervious surfaces do not generate stormwater, are excluded from paying a fee.

Table 3.5: Proportional Fee Ranges

Property Type	Land Use Code	Total Impervious (sq ft)	Percent of Town's Impervious	Approximate Low Fee (Annual)	Approximate High Fee (Annual)
Res - Single Family	**101**	**16,733,888**	**39%**	**$5**	**$2,000**
Res - Other/Accessory	130-142	616,628	19%	$30	$9,000
Res – Multi-Unit	102-125	7,914,075	1%	$1	$600
Commercial	300-393	15,009,539	35%	$1	$30,000*
Industrial	400-452	2,361,727	6%	$20	$5,000
Exempt	900	5,283,445	11%	$1	$9,000
Totals:		47,919,303	100%		
* Note: Sizeable variation is due to approximately 10 properties with over 200,000 sq ft impervious. See explanation below.					

Generally, the range of fees for a single-family property ranged anywhere from $5 to $2,000 per year due to the wide variation of imperviousness on residential properties. However, a sizeable range of properties fall within the $10 to $100 per year fee for the proportionate fee, as shown in the graph below. In addition, almost all residential properties include impervious surfaces totaling under 8,700 square feet; therefore, all of these properties would pay less than the calculated residential flat fee of $160 annually.

The range of fees for multi-unit residential or mixed with residential included an even wider range as there is a lot of variation of the number of residential units the property includes. This range includes approximately $30 to $9,000 annually. However, it is important to note that if fees were distributed amongst every unit on these properties, the fee range decreases significantly from $10 to $1,000. The highest range within this property type includes a very large complex with only 9 units to split the fee. Removing this, and a few other "outlier properties with few units, decreased the potential proportionate fee range for multi-unit properties to $10 to $100 annually.

A unique land use category includes uses within a residential zone that are accessory to residential uses such as registered "in-law" or rental dwellings, child care facilities, or studios. These land uses have been separated out in the analysis since they are often listed as having one unit, yet are not a single-family use. Therefore, impervious surfaces are either much smaller or larger than single-family (or even multi-unit), depending upon the unique use. For example, a child-care facility may have either a much smaller area of impervious surface if the site is designed well to include natural areas and green spaces, or on the other hand, it could have a much larger area of impervious if there is significant parking or even a paved play yard. The proportionate calculation for these property types ranged from a fee of approximately $1 to $600, depending upon its imperviousness.

Collectively, the calculations show a wide-range of fees across commercial properties due to the variety of land uses and impervious surfaces. For example, there are some dense portions of the Town in which commercial uses are found within buildings in a "village center" style along the roadway with street parking, and there are other uses with large parking lots and "big box" building formats. The full range of fees for this property type is approximately $1 to $30,000 annually. However, this range is generally due to a smaller few of the "big box" shopping areas that include very high areas of impervious surfaces; approximately 10 properties with over 200,000 square feet of impervious with fees ranging from approximately $5,000 to $30,000. If these properties were addressed separately, the general range for commercial fees would be approximately $10 to $2,000, with an average fee of approximately $600 annually.
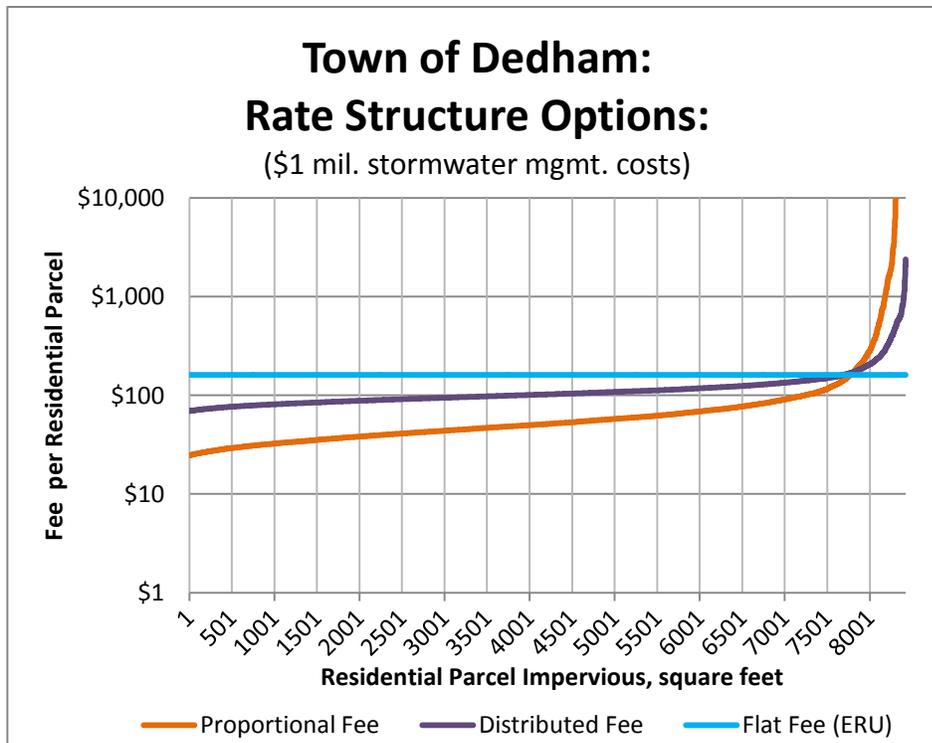
Industrial uses in Dedham typically include less of a variety in terms of impervious surfaces (averaging approximately 60,000 square feet). Therefore, the fee range is also thinner than the previous property types ranging from $20 to $5,000 annually. There is an "outlier" property that includes a very high proportion of impervious surface (approximately 900,000 square feet), which would result in a $20,000 annual fee. This property is coded as a warehouse use, located on Meadow Road in Dedham.

Properties exempt from taxes such as institutions (academic and health), and local, state or federal facilities were included in this analysis as most all were found to include impervious surfaces. As noted above, properties that did not have impervious surfaces were excluded, as well as those owned by the Town of Dedham. It should be noted that some Town entities such as the Housing Authority and other potentially revenue-generating entities were included. Impervious surfaces for these properties also varied, similar to commercial properties, with a potential proportionate fee ranging from $1 to $9,000. There was a property excluded from this range as it had a significantly higher area of impervious surface than any others (approximately 950,000 square feet). The proportional fee for this property would reach $20,000 annually.

Distributed Fee

A fourth and final calculation was completed to provide the Town with an understanding of how the stormwater management costs could be more widely distributed across parcels. It is a way to apply a transformation to the proportionate fee structure that narrows the extreme values of the analysis. As noted above, when calculating the fee on a parcel-by-parcel basis, there are some properties where an annual fee totaling thousands of dollars would be imposed. Detailed analysis would have to be completed to determine whether this is due to merely its imperviousness or other factors. If the political will for imposing a proportionate fee is not present, a fee distributed across a category of properties is another

Town of Dedham:
Rate Structure Options:
($1 mil. stormwater mgmt. costs)

option. Another method for reducing the highest fees is by basing the fee on the square root of the percent of Town's impervious surface on each parcel. As shown in the graphic below, this distribution somewhat "evens-out" the fee across parcels. On important factor to note is that this transformation reduces the fee required of those with the largest impervious surfaces and also slightly increases the fee required of those with less impervious.

Table 3.6: Distributed Fee Ranges

Property Type	Land Use Code	Total Impervious (sq ft)	Percent of Town's Impervious	Approximate Low Fee (Annual)	Approximate High Fee (Annual)
Res - Single Family	**101**	**16,733,888**	**39%**	**$30**	**$600**
Res - Other/Accessory	130-142	616,628	19%	$30	$300
Res – Multi-Unit	102-125	7,914,075	1%	$30	$800
Commercial	300-393	15,009,539	35%	$6	$2,000*
Industrial	400-452	2,361,727	6%	$40	$2,000
Exempt	900	5,283,445	11%	$1	$2,000
Totals:		47,919,303	100%		
* Note: Sizeable variation is due to approximately 10 properties with over 200,000 sq ft impervious. See explanation below.					

SUMMARY

As evidenced above, there are a number of ways in which Dedham could impose a drainage fee. These various rate schemes are compared side-by side in the table below.

Table 3.7: Fee Range Summary

Property Type	Total Imperv. (sq ft)	% Town's Imperv.	*Flat Fee (Annual)*	Graduated Fee (Annual)	Proportionate Fee - Highest (Annual)	Distributed Fee - Highest (Annual)
Res - Single Family	**16,733,888**	**39%**	***$118***	**$161**	**$2,000**	**$600**
Res - Other/Accessory	616,628	19%	*$118*	$103	$9,000	$300
Res – Multi-Unit	7,914,075	1%	*$118*	$211	$600	$800
Commercial	15,009,539	35%	*$118*	$3,213	$30,000	$2,000
Industrial	2,361,727	6%	*$118*	$3,824	$5,000	$2,000
Exempt	5,283,445	11%	*$118*	$1,150	$9,000	$2,000
Totals:	47,919,303	100%				

As shown in the table above, there are obvious differences between what a fee based on average impervious surface area for each property type (graduated) and what a fee would be based on actual imperviousness (proportionate). However, the analysis seems to indicate that the distributed fee could balance these options by providing a fee that is based on actual imperviousness, yet adds a factor of realism to what is charged.

4. MILTON PILOT

The project team worked directly staff from the Town of Milton Engineering and Public Works Department. The approach Milton took was to discuss the early concepts internally, to then bring the critical information to the Town Manager, Board of Selectmen and Finance Commission in order to begin to receive approval to proceed forward. Approval was given to look deeper into a rate structure, as well as to take the next steps toward designing and implementing an internal and external outreach campaign. MAPC staff met several times with the Director of Public Works, Town Engineer, and staff engineers to discuss the task methodology, existing expenditures and needed revenue, and the development of rate options. The project team conducted an impervious surface and subsequent rate options analysis as described in the methodology section below. These drainage fee options were presented to the Town in February 2015 for their feedback and comments. A refined analysis for the Town became the final product for this Task.

METHODOLOGY

The following sections explain the methodology for the impervious analysis and the rate calculations for the Town of Milton.

Impervious Calculation

The Town of Milton is unique in that they have collected their own impervious data, more recently generated than the MassGIS data. In the spring of 2012 the Town of Milton Engineering Department contracted to have an aerial flyover and development of GIS based Planimetric data layers. The flyover took place on April 3, 2012 which produced the following new datasets:
- New Town-wide 4-band color and CIR orthophotography, and
- New Town-wide detailed 40-scale planimetrics and 1-foot contours:
  - Hydrology: Streams, Ponds, Stream Name Annotation, Pond Name Annotation
  - Transportation: Road Centerlines, Road ROW, Road Patched Pavement, Bridges,
  - Infrastructure: Parking Lots and Markings, Sidewalks, Sports Fields, Driveways
  - Natural Resources: Trees, Vegetation (Canopy)
  - Building Structures: Building footprints, Other Impervious Structures: Decks, Pools, Steps, Patios, Walls, and Curbs.

Using Arc GIS 10.1, these impervious data layers provided by the Town were then matched to the MassGIS' Level 3 Assessors' Parcel Mapping data. Percent impervious coverage was then calculated for each parcel, as well as a total impervious figure for each property classification, as was done for Dedham.

The total impervious calculation for each property type was used in the rate options analysis in generating an Equivalent Residential Unit, as described in the following section.

Financing Considerations

The first item that the Town was tasked with was to determine both current stormwater management expenditures and new expenditures, as driven by new requirements of the draft MS4 Massachusetts permit.

Although the Town of Milton has been proactive in the operations and maintenance of stormwater management, they thought it prudent to calculate rate options under two scenarios:

1. Revenue costs only for new MS4 permit requirements (i.e. the gap in funding between current capital spending and costs associated with year one (1) of the new MS4, totaling approximately $600,000; and
2. Full revenue needed for meeting the new MS4 permit at year one (1), not including current capital spending, totaling approximately $1,200,000.

Each of these scenarios are shown below in Table 1, as well as used throughout the rate analysis.

Table 4.1: Expenditures for Fee to Cover

Category/Item	Funding Gap (approximate)	Total Expenses (Permit Year 1)
Administration	$35,000	$70,000
SW Management Operations	$375,000	$750,000
Monitoring/Planning	$190,000	$380,000
TOTAL:	$600,000	$1,200,000

After first determining existing and future expenditures and deciding upon the costs to be covered under a fee, there are key variables for the municipality to consider up front regarding how to distribute a fee. Each of the rate options described below attempt to provide data for the Town to answer the following three key questions regarding fee distribution:

1. ***How do you want to distribute the fee burden across property types?*** For example, if the Town's commercial properties include more impervious surfaces, in total, than all other property types; perhaps this is where the fee burden is more heavily weighed.
2. ***How do you want to distribute the fee within each property type?*** For example, does the Town want to use the same fee for each property within one property classification?
3. ***Is there an interest in "leveling-out" the fee distribution within a property type?*** For example, are there political sensitivities of imposing a fee based on actual imperviousness in cases where some properties bear a very high burden for one reason or another?

Rate Options

The project team used the total stormwater costs under each scenario as the annual revenue required to be generated under a drainage fee. This information was then used to determine four different options for a rate structure, as follows:

1. Flat fee based on merely the number of parcels in Town against costs;
2. Graduated fee per land use classification using an Equivalent Residential Unit (ERU);
3. Proportional fee based on impervious surface data for each parcel; and
4. Distributed fee using a square root of the proportional fees.

Each of these rate options are described below under each of the financing scenarios.

Flat Fee

MAPC generated this basic fee structure to show what a specific surcharge would be if it was spread across all properties with impervious surfaces. The annual rate calculation, per parcel, is calculated simply by

DRAFT
Neponset Stormwater Collaborative: Financing Pilot Report   March 15, 2015
Town of Milton Pilot   4- 2   *100% Post Consumer Recyclable Paper*

dividing the annual revenue needed, for both scenarios, by the total number of parcels within the Town: Scenario 1: $600,000 / 8,129 and Scenario 2: $1,200,000 / 8,129. It should be noted that the project team did not advise the Town to consider this fee structure as it is rarely used due to inequalities in billing based on the variations of impervious surfaces for different land uses. For example, an average commercial property typically includes a higher level of impervious surfaces than an average residential property, as well as a larger residential lot versus a multiple unit residential dwelling in a more dense area. This analysis is done to first get a sense of the average fee required to cover the costs of the stormwater management program or utility.

Table 4.2: Flat Fee Calculation

	Total Number of Parcels (Muni-Wide)	Total Expenditure	Annual Fee	Quarterly Fee
Scenario 1	8,129	1,200,000	$147.62	$36.90
Scenario 2	8,129	$600,000	$73.81	$18.45

Graduated Fee

An ERU calculation was required to determine a Graduated Fee system for the Town of Milton. The ERU is based on determining the average impervious surface for residential properties, and using this as the basis by which increased percentages of impervious per property type is calculated, as shown in the table below. For example, average commercial properties include approximately three (3) times as much impervious surfaces on site than residential properties, and using this number as the multiplying factor; we can see that reflected in the rate for commercial properties.

Table 4.3: Graduated Fee Calculation – Scenario 1 - $1,200,000 Costs

Property Classification	# of Parcels	ERU Equivalent	Total Imperv. (sq ft)	Average Imperv. (sq ft)	Annual Fee	Quarterly Fee
Single Family - ERU	***7,126***	***1.0***	**25,543,139**	**3,584**	***$168.40***	***$42.10***
Res - Accessory	72	3.4	870,844	12,095	$568.22	$142.05
Res - Multi-Unit	736	0.96	2,535,245	3,445	$161.83	$40.46
Commercial	4	3.5	15,009,539	12,420	$583.47	$145.87
Industrial	39	6.5	2,361,727	23,212	$1,090.50	$272.63
Recreational	2	1.4	10,386	5,193	$243.97	$60.99
Exempt	186	28.84	7,804,930	103,377	$4,856.56	$1,214.14
Totals:	8,129		37,863,391			

Table 4.4: Graduated Fee Calculation – Scenario 2 -$600,000 Costs

Property Classification	# of Parcels	ERU Equivalent	Total Imperv. (sq ft)	Average Imperv. (sq ft)	Annual Fee	Quarterly Fee
Single Family - ERU	*7,126*	*1.0*	*25,543,139*	*3,584*	$84.20	$21.05
Res - Accessory	72	3.4	870,844	12,095	$284.11	$71.03
Res - Multi-Unit	736	0.96	2,535,245	3,445	$80.91	$20.23
Commercial	4	3.5	15,009,539	12,420	$291.74	$72.93
Industrial	39	6.5	2,361,727	23,212	$545.25	$136.31
Recreational	2	1.4	10,386	5,193	$121.98	$30.50
Exempt	186	28.84	7,804,930	103,377	$2,428.28	$607.07
Totals:	8,129		37,863,391			

Its important to note that the Graduated Fee analysis showed the size and scale of the exempt properties in Milton, in terms of their impact to the stormwater management system. As shown in the tables above, the average exempt property has approximately 20 times greater impervious surfaces than an average residential property. Therefore, these properties, collectively create a sizeable burden on the Town's stormwater management burden.

Proportionate Fee

In order to provide the Town of Milton with a better understanding of how a fee could be imposed based on actual imperviousness for properties; we calculated fees for residential properties on a proportionate basis. Essentially, this analysis shows the fee in proportion to the parcel's impervious surfaces, as described in the impervious calculation section above. Since the Town of Milton's residential properties make up the vast majority of the Town's property-base, we decided to use these properties to explore the proportionate rate. Generally, the method for determining the fee per parcel is as follows:

1. Calculate the percentage of impervious surface each residential parcel contributes: total impervious (square feet) divided by the total impervious surface (square feet) for ALL residential properties = 37,863,391;
2. Calculate the fee for each residential parcel based on their percentage of impervious contribution: percent of impervious multiplied by the estimated expenditures (i.e. X% impervious per parcel x $1,200,000 AND $600,000).

Table 4.5: Proportionate Calculation – Residential – Scenario 1 ($1.2 mil. costs)

Property Classification	Land Use Code	Total Impervious (sq ft)	Percent of Town's Impervious	Approximate Low Fee (Annual)	Approximate High Fee (Annual)
Single Family - ERU	101	*25,543,139*	67%	$15	$3,000
Res - Accessory	130-140	870,844	2%	$1	$1,000
Res - Multi-Unit	102-124	2,535,245	7%	$10	$13,000
Totals:		28,949,228	76%		

Table 4.6: Proportionate Calculation – Residential – Scenario2 ($600k costs)

| Property Classification	Land Use Code	Total Impervious (sq ft)	Percent of Town's Impervious	Approximate Low Fee (Annual)	Approximate High Fee (Annual)
Single Family - ERU	**101**	**25,543,139**	**67%**	**$6**	**$1,500**
Res - Accessory	130-140	870,844	2%	$1	$500
Res - Multi-Unit	102-124	2,535,245	7%	$5	$6,500
Totals:		28,949,228	76%		

Scenario 1

The proportionate analysis under Scenario 1 ($1.2 million in costs) shows variability across all residential properties. The range of fees for a single-family property are anywhere from $15 to $3,000 per year to raise costs of $1.2 million, as show above. However, as shown in Figure 2 below, the majority of single-family residential properties include less than 5,500 sq ft impervious creating a potential rate between $50 and $150 is less than the calculated flat fee. Also shown are the properties that fall above this range, consisting all of single-family residences with impervious surfaces greater than 6,000 square feet. The few extreme "outlier" properties within the single family residential property type have fees ranging from $8,000 to the highest $13,000; each containing impervious surfaces over 200,000 square feet.

The range of fees for multi-unit residential or mixed with residential included a wider range as there is a lot of variation of the number of residential units the property includes. This range includes approximately $10 to $13,000 annually. However, it is important to note that if fees were distributed amongst every unit on these properties, the fee range decreases significantly from approximately $6 to $600. The highest range within this property type includes a very large complex with 158 units at an estimated rate of approximately $80 per unit.

A unique land use category includes uses within a residential zone that are accessory to residential uses such as registered "in-law" or rental dwellings, child care facilities, or studios. These land uses have been separated out in the analysis since they are often listed as having one unit, yet are not a single-family use. Therefore, impervious surfaces are either much smaller or larger than single-family, depending upon the unique use. The proportionate calculation for these property types ranged from a fee of approximately $1 to $1,000, depending upon its imperviousness.

Scenario 2

The analysis conducted for Scenario 2 ($600,000 in costs) shows the same variability across all residential properties, as the rate is merely split in half.
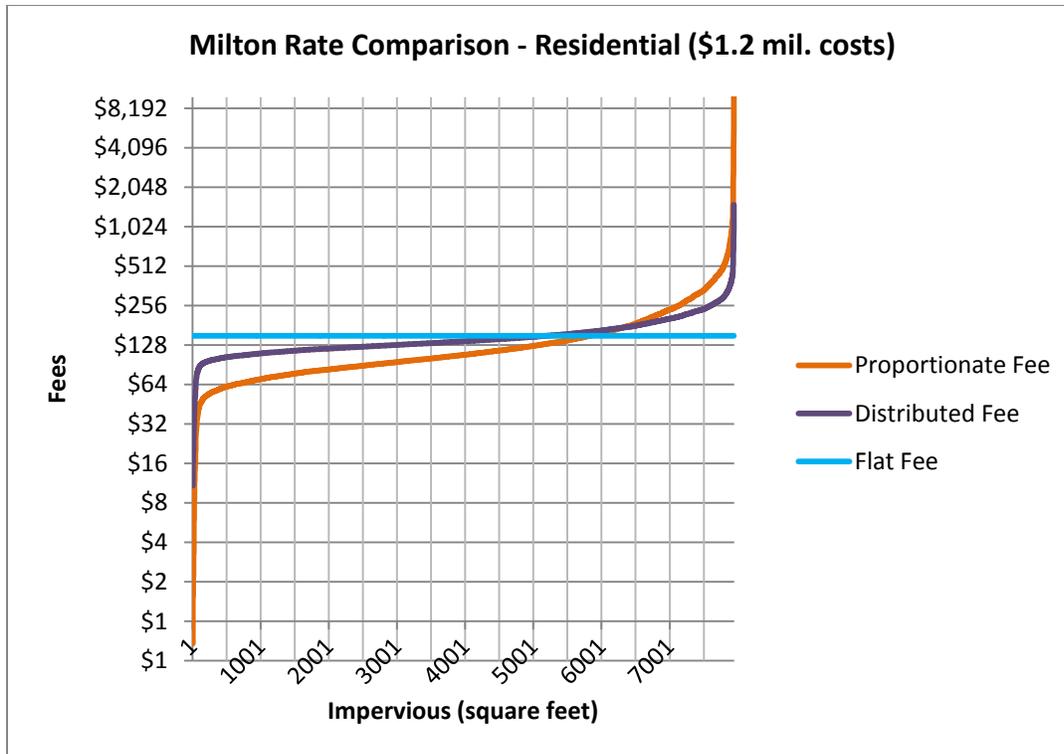
Milton Rate Comparison - Residential ($1.2 mil. costs)

Distributed Fee

A fourth and final calculation was completed to provide the Town with an understanding of how the stormwater management costs could be more widely distributed across parcels. It is a way to narrow the extremes of the proportionate analysis. As noted above, when calculating on a parcel-by-parcel basis, there are some properties where an annual fee totaling thousands of dollars would be imposed. Detailed analysis would have to be completed to determine whether this is due to merely its imperviousness or other factors. If the political will for imposing a proportionate fee is not present, a fee distributed across a category of properties is another option. One method for distributing the fee across parcels is by calculating the square root of the total impervious surface for each parcel. As shown in the graph, this distribution somewhat "evens-out" the fee across parcels so that the extremes are not explicit. On important factor to note is that the results of this calculation reduces the fee required of those with the largest impervious surfaces and also slightly increases the fee required of those with potentially less impervious; again to even-out the fee extremities.

Table 4.7: Distributed Fee Ranges – Scenario 1 ($1.2 million costs)

Property Type	Land Use Code	Total Impervious (sq ft)	Percent of Town's Impervious	Approximate Low Fee (Annual)	Approximate High Fee (Annual)
Res - Single Family	**101**	**25,543,139**	**67%**	**$50**	**$700**
Res - Other/Accessory	130-142	870,844	2%	$2	$350
Res – Multi-Unit	102-125	2,535,245	7%	$50	$1,500
Totals		28,949,228	76%		

Table 4.8: Distributed Fee Ranges – Scenario 1 ($600,000 costs)

Property Type	Land Use Code	Total Impervious (sq ft)	Percent of Town's Impervious	Approximate Low Fee (Annual)	Approximate High Fee (Annual)
Res - Single Family	**101**	**25,543,139**	**67%**	**$25**	**$400**
Res - Other/Accessory	130-142	870,844	2%	$1	$200
Res – Multi-Unit	102-125	2,535,245	7%	$25	$750
Totals		28,949,228	76%		

SUMMARY

As evidenced above, there are a number of ways in which Milton could impose a drainage fee. These various rate schemes are compared side-by side in the table below.

Table 4.9: Fee Range Summary – Scenario 1 (1.2 million cost)

Property Type	Total Imperv. (sq ft)	% Town's Imperv.	*Flat Fee (Annual)*	Graduated Fee (Annual)	Proportionate Fee - Highest (Annual)	Distributed Fee - Highest (Annual)
Res - Single Family	**25,543,139**	**67%**	*$148*	$84	$3,000	$700
Res - Other/Accessory	870,844	2%	*$148*	$284	$1,000	$350
Res – Multi-Unit	2,535,245	7%	*$148*	$81	$13,000	$1,500
Exempt	7,804,930	21%	*$148*	$2,428		
Totals:	37,863,391	100%				

We have found the Town of Milton to be a rather unique case study, primarily due to its significantly high residential property base (close to 90%). This is why the proportionate and distributed analysis was conducted using the various residential property types. However, what we found is that there are sometimes extreme variability within each residential property type, making the case for using a rate structure based on an average (graduated) could prove difficult. Therefore, the proportionate rate structure provides a far more equitable measure of impact and associated rate. As noted, however; the variability within property types create extremely high rates for properties with vast impervious surfaces, including exempt properties. Therefore, it may be prudent for Milton to further explore a distributed rate system. The example provided within this analysis provides a limited view into what a statistically distributed fee could look like within the three residential property types. However, we recommend that the Town consider expanding upon this analysis to further break-down the residential property types and explore alternative distribution methods.

5. FINDINGS

It is difficult for an outside entity such as MAPC to recommend a particular fee for each pilot municipality at this juncture, as we are not directly involved in local politics and do not have the understanding that Town staff do regarding what may or may not be palatable to its community members. Having said that, there are a few recommendations that we could offer based on past discussions with municipal staff within both municipalities, and the calculations completed, as listed.

1. The results of the Flat Fee are not equitable and are not based on impacts from practices of property owners; therefore, we would not recommend the use of this fee. Further, this fee does not provide the impetus for property owners to make positive change to reduce the generation of stormwater that must be conveyed and treated by the Municipality.

2. There is some merit in using a Graduated Fee that is based upon an average impervious surface area for each property class. First, this method has been executed by a number of municipalities across Massachusetts and proven defensible in court. It is a relatively easy calculation to implement, and is simple to explain to property owners. Last, it provides equity across property types since an average for each land use type is used to determine the fee for that property class. The primary drawback to using this fee is that, similar to the Flat Fee, there are some inequities to the way this fee is calculated. Using an average impervious figure creates a situation in which there are properties that should be paying more as they have greater areas of impervious, as well as others that should be paying less since they have smaller areas of impervious surface. Having said this, we would recommend the use of this fee if the Town wishes to use the calculations to determine the political will of the people, and employ a simpler system.

3. The proportionate fee is the most equitable and transparent method for establishing a rate structure. The fee each property owner is subject to is based directly on the amount of impervious surface that property has; and therefore, contributes stormwater to the municipal system. The primary difficulty associated with the use of this rate structure is the fact that there are large properties with significant impervious surfaces where the fee will be quite high, possibly too high for the Town to politically be able to promote. We would certainly recommend the use of this rate due to its fairness. However, we would recommend that the Town possibly consider determining ways to work with large property owners to lessen their impact; thereby lessening their fee, or finding ways to cap the high fees.

4. The distributed fee is the lesser-known method for distributing rates. Since it is based on a statistical method for dispersing the fee that is not easy to explain, it is more difficult to establish transparency. However, it is a solid method for leveling-out the rates, which stem from equitable, impact-based data. We would recommend the use of this rate structure with further analysis regarding the implications of disseminating the fee across properties, and whether that would effect the lure of credits.