PORTLAND MAINE

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MEMORANDUM

To: Sustainable Storm Water Funding Task Force

From: Ian Houseal, Sustainability Coordinator

Date: May 17, 2011

Storm Water Funding – Cost of Service and Implications

Please see the attached material in preparation for the May Sustainable Storm Water Funding Task Force Meeting:

1. Presentation of Costs;

2. Copy of the Sewer Use Charges Ordinance;

3. Backlog Study
    a. DIMS Study;
    b. DIMS Study Appendix;

4. Case Studies
    a. Black and Veatch Storm Water Funding Survey, 2010
    b. Master Candidate Student's Municipal Financing Survey

The above mentioned material is available on the Sustainable Storm Water Funding Task Force web page at www.portlandmaine.gov/sustainablestormwaterfunding.htm. Copies of the presentation will be provided at the meeting.

Attachment 1:

Presentation of Costs

STORM WATER FUNDING:

CURRENT ORGANIZATIONAL STRUCTURE
COST OF SERVICE
IMPLICATIONS

SUSTAINABLE STORM WATER FUNDING TASK FORCE

Presentation Outline

- Review of Sewer Use Charges Ordinance
- Sewer Volumes and Sewer Rate
- Sewer Fund Total Actual Expenses (Historical FY 2001- FY 2010)
- Annualized Capital Renewal Costs
- Backlog Costs
- Sewer and Storm Water Operating Costs
- Sewer Fund Expense Implications
- Sewer Rate Implications
- Case Studies

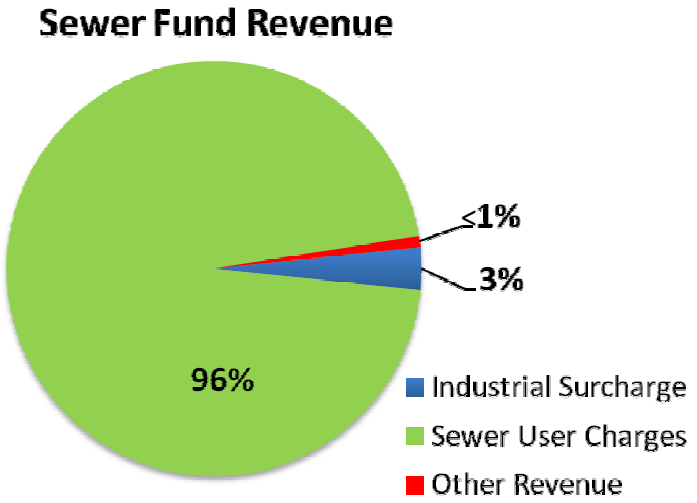
Review of Current Organizational Structure

Article IV: Sewer Use Charges

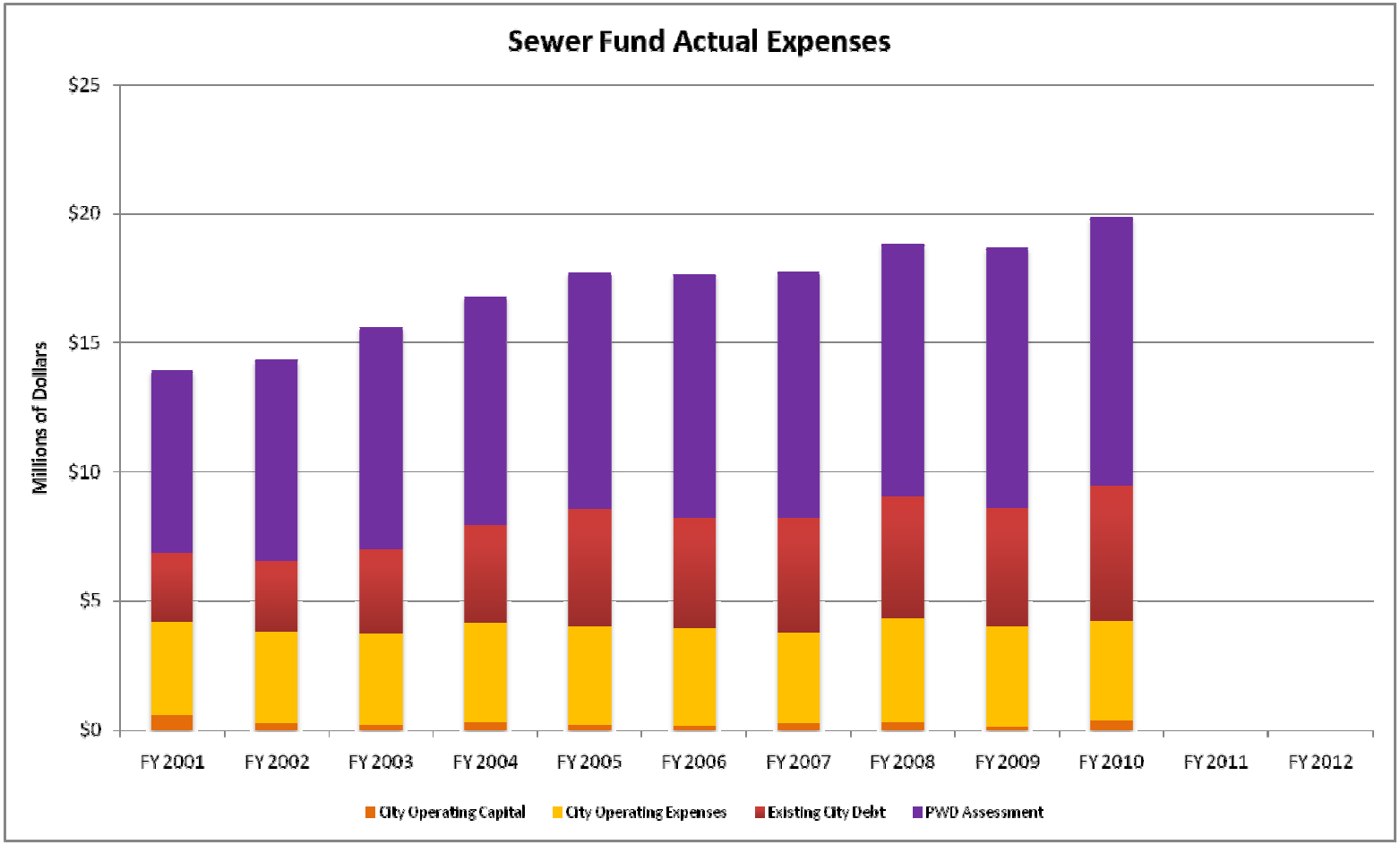
- To defray the current expenses of operating and maintaining the wastewater system, including any assessment made by the Portland Water District;
- To pay the interest and repay the principal on any outstanding or future indebtedness of the city for construction of sewers heretofore or hereafter constructed within the city;
- To reimburse the city for the cost of computation, billing and enforcement of such charges.

Sewer Fund Revenue

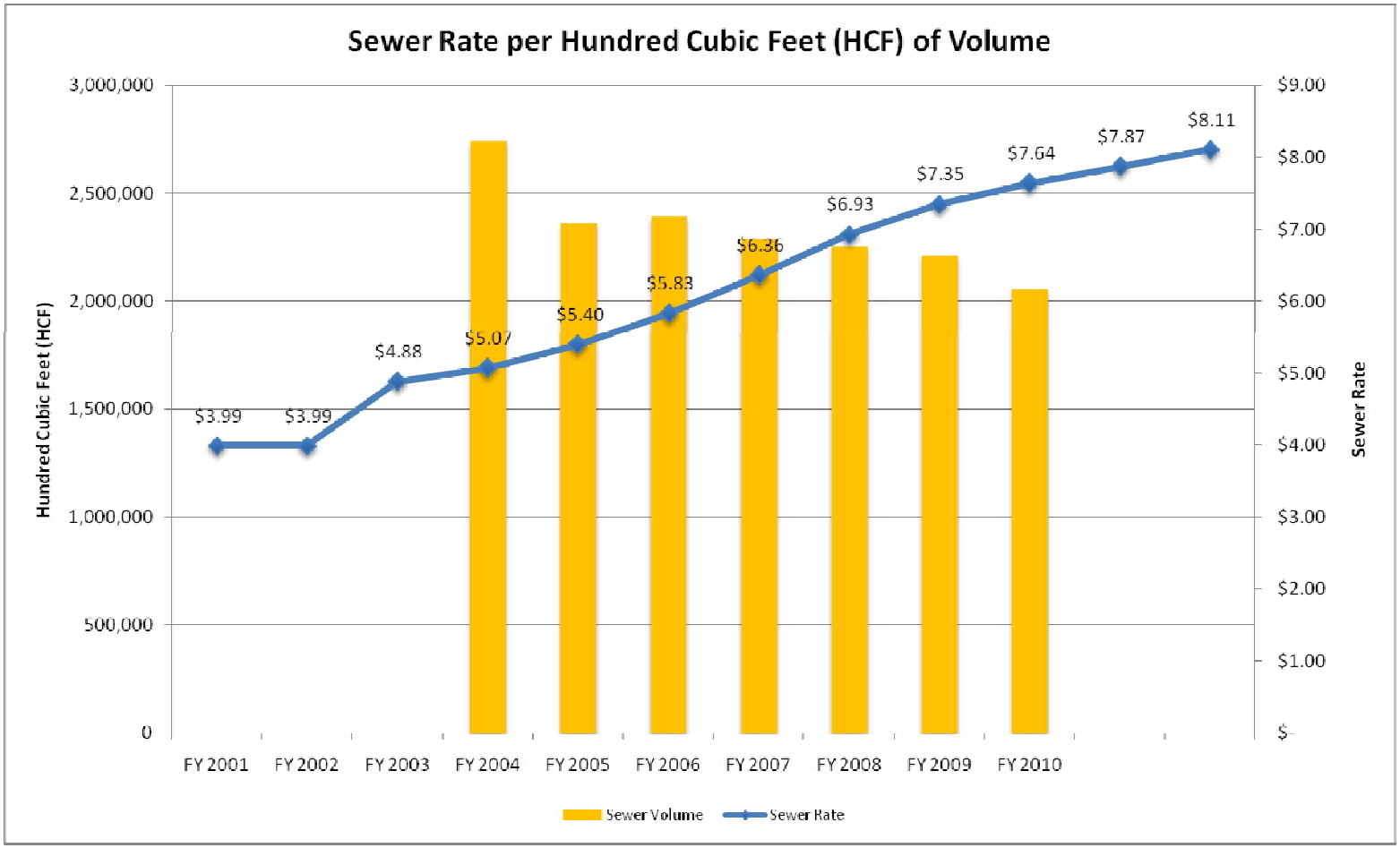
- Sewer Use Charges
- Industrial Surcharge
- Fees for Service (e.g. permits)



Sewer Fund Expenses

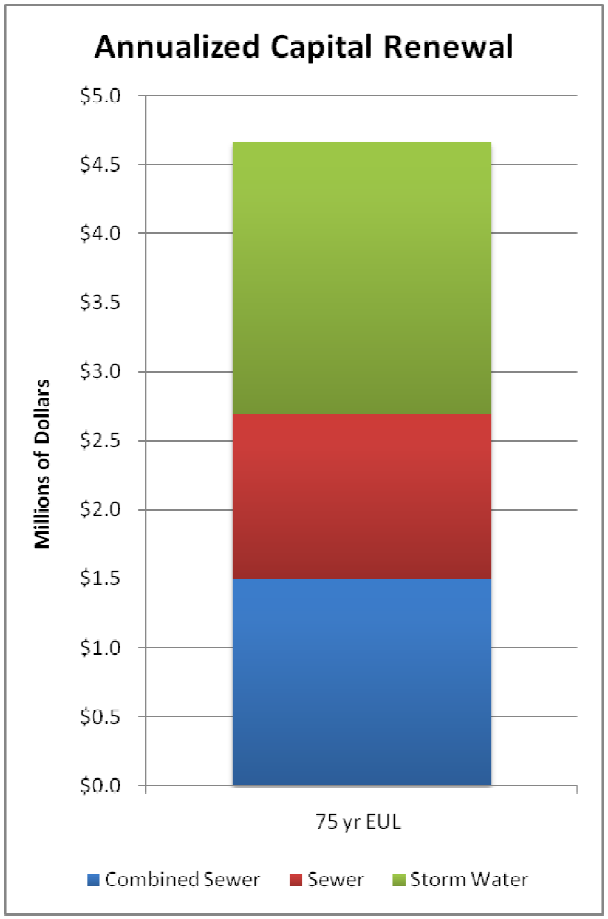


Sewer Rate per Sewer Volume



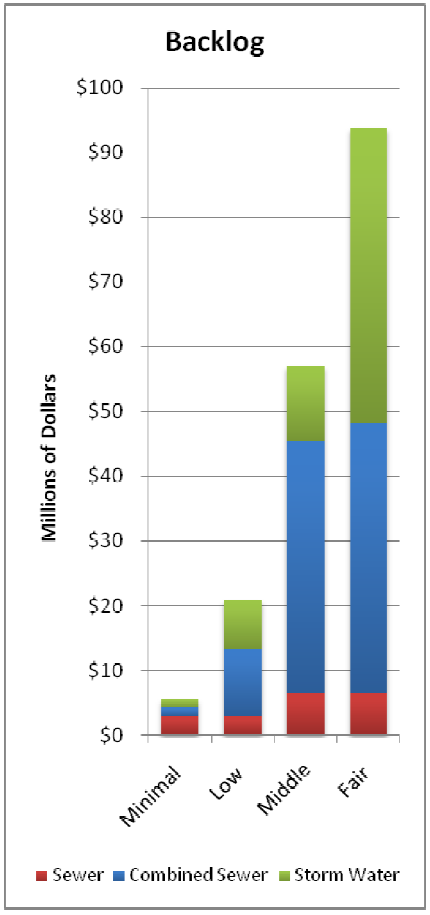
Estimated Annualized Capital Renewal

CAPITAL RENEWAL	75 YR ESTIMATED USEFUL LIFE (EUL)
Combined Sewer	
Combined Sewer Line	$1,500,000
Total Combined Sewer	**$1,500,000**
Sewer	
Separated Sewer Line	$720,000
Sewer Manholes	$325,000
Pump Stations (30 YRS)	$150,000
Total Sewer	**$1,195,000**
Storm Water	
Storm Drain Line	$1,500,000
Catch Basins	$310,000
Outfalls	$23,000
Storm Manholes	$140,000
Detention Ponds	Unknown
Total Storm Water	**$1,973,000**
GRAND TOTAL	**$4,668,000**



Backlog

BACKLOG	Minimal	Low	Middle	Fair
Combined Sewer	21% of Total	49% of Total	68%% of Total	44% of Total
Combined Sewer	$1,203,000	$10,300,000	$39,000,000	$41,715,000
Total Combined Sewer	**$1,203,000**	**$10,300,000**	**$39,000,000**	**$41,715,000**
Sewer	53% of Total	14% of Total	11% of Total	7% of Total
Separated Sewer	$2,900,000	$2,900,000	$6,300,000	$6,300,000
Sewer Manholes	Unknown	Unknown	Unknown	Unknown
Pump Stations	$75,000	$75,000	$130,000	$130,000
Total Sewer	**$2,975,000**	**$2,975,000**	**$6,430,000**	**$6,430,000**
Storm Water	25% of Total	36% of Total	20% of Total	49% of Total
Storm Drain Line	$1,196,000	$5,500,000	$9,500,000	$40,657,000
Catch Basins	$80,000	$1,639,000	$1,639,000	$3,716,000
Outfalls	$18,000	$190,000	$190,000	$577,000
Storm Manholes	$132,000	$264,000	$264,000	$779,000
Detention Ponds	Unknown	Unknown	Unknown	Unknown
Total Storm Water	**$1,426,000**	**$7,593,000**	**$11,593,000**	**$45,729,000**
GRAND TOTAL	**$5,604,000**	**$20,868,000**	**$57,023,000**	**$93,874,000**



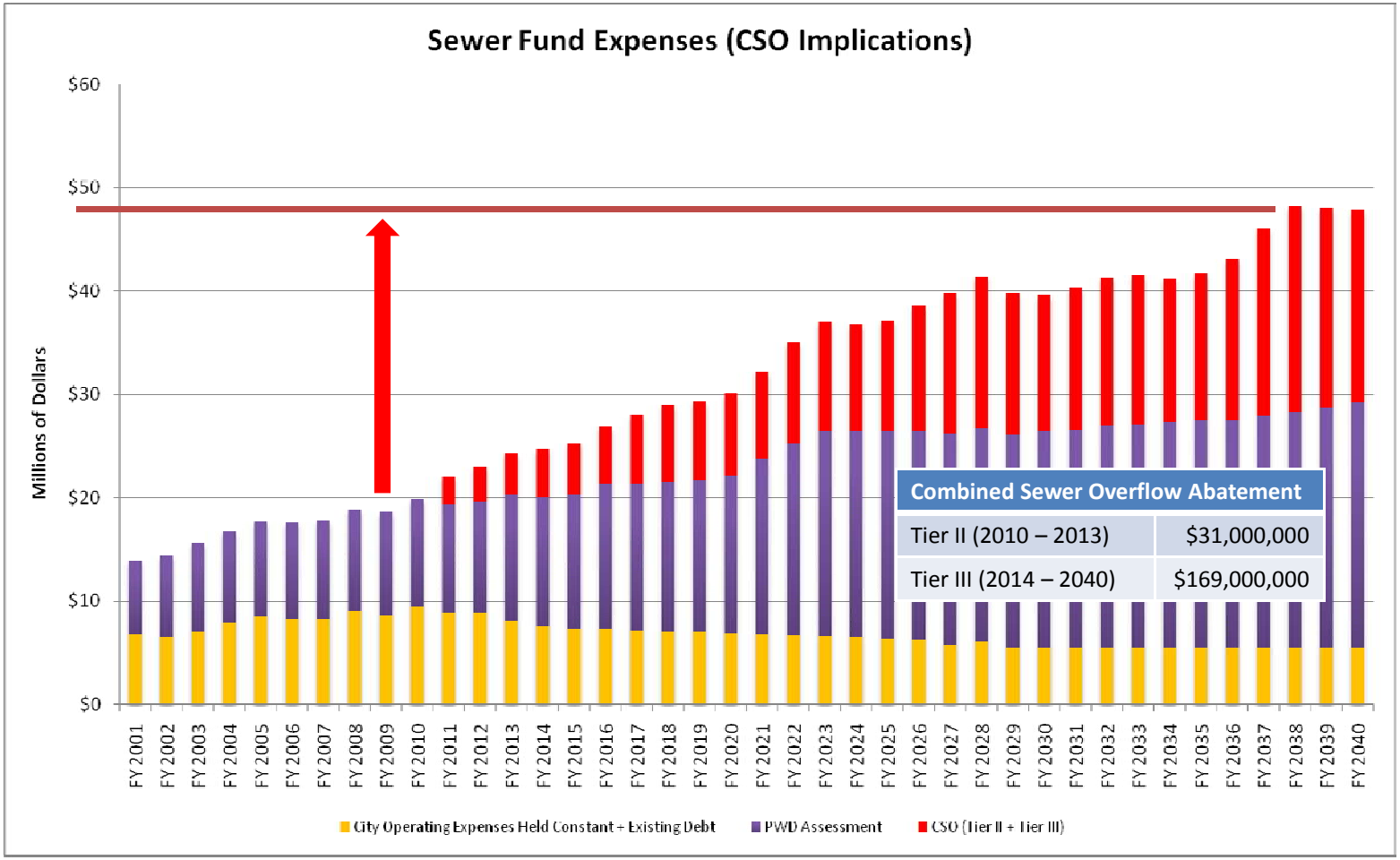
- **Minimal** –*Very Poor* DIMS categories, supplemented by *> 100 year* Needs Assessment categories.
- **Low** – *> 100 year* Needs Assessment categories supplemented by *Very Poor and Poor* DIMS categories.
- **Middle** – *> 75 year* Needs Assessment categories supplemented by *Very Poor and Poor* DIMS categories.
- **Fair** –*Very Poor, Poor and Fair* DIMS categories supplemented by *> 75 year* Needs Assessment categories.

Storm Water Operation Expenses

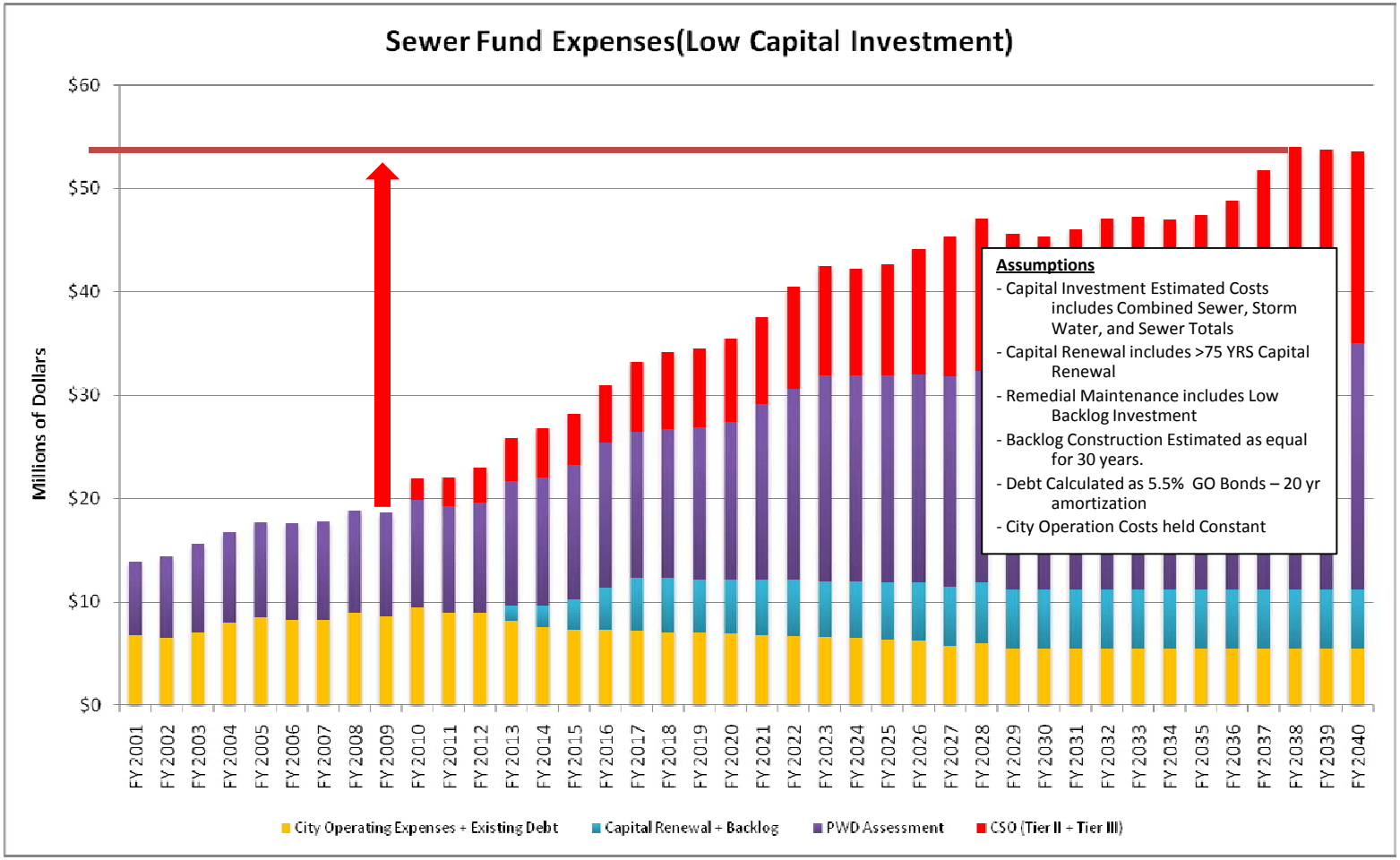
Sewer Fund Operation Expenses	
APPROXIMATE TOTAL FUTURE SEWER FUND OPERATION EXPENSES	**$5,000,000**

Storm Water Operating Expenses	Estimated Storm Water Operating Expenses in the Sewer Fund	Estimated Additional Storm Water Expenses Needed for a Segregated Storm Water Fund
Street Sweeping	$525,000	$95,000
Catch Basins (Every Other Year)	$260,000	
Public Education and Outreach	$50,000	
Inspection and Enforcement		$120,000
Long Creek General Permit	$60,000	
Engineering	$240,000	$180,000
GIS Mapping and Application		$125,000
Administration and Finance		$100,000
TOTAL STORM WATER OPERATIONS	**$1,135,000**	**$620,000**

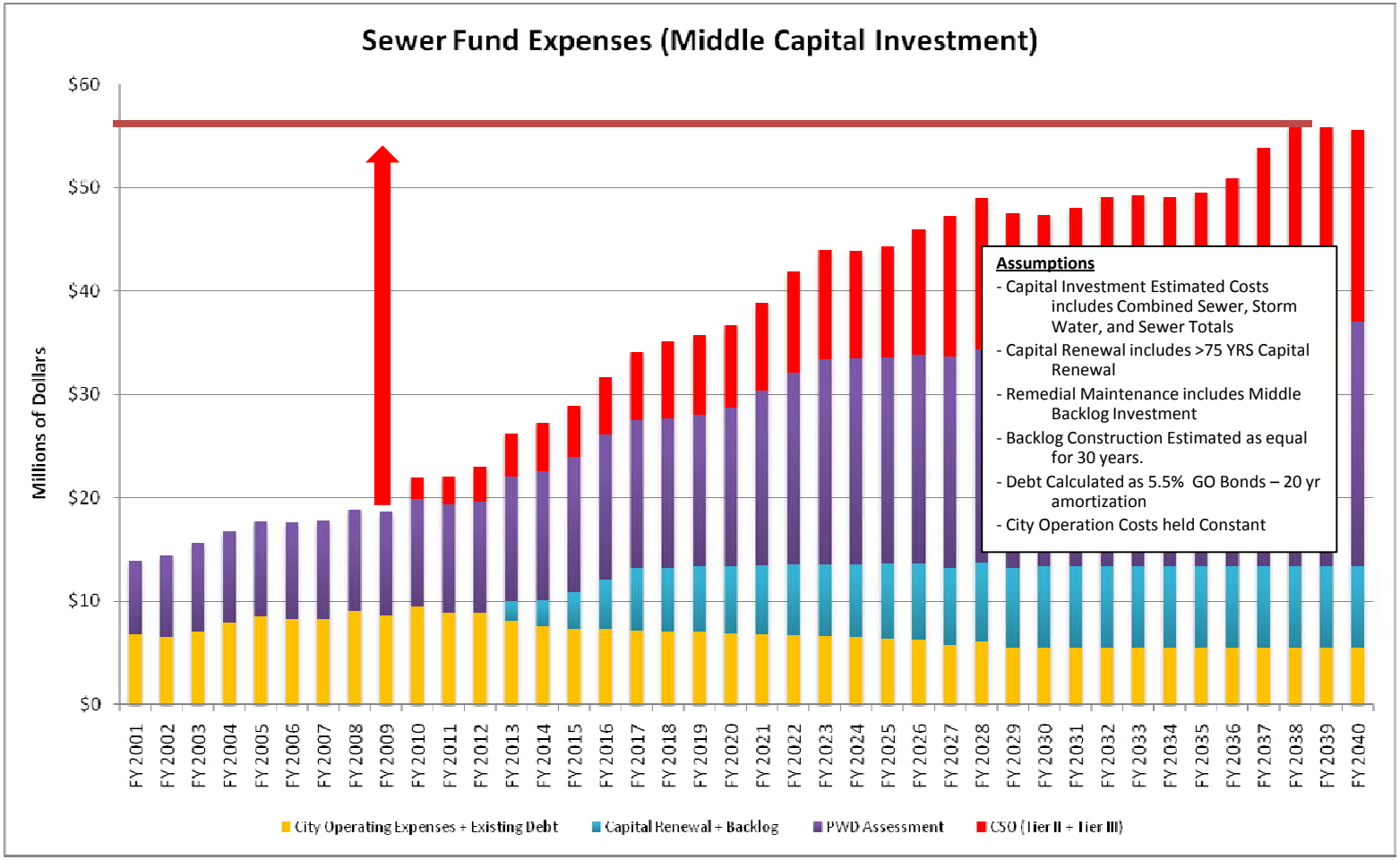
Implications of the CSO Tier II and Tier III



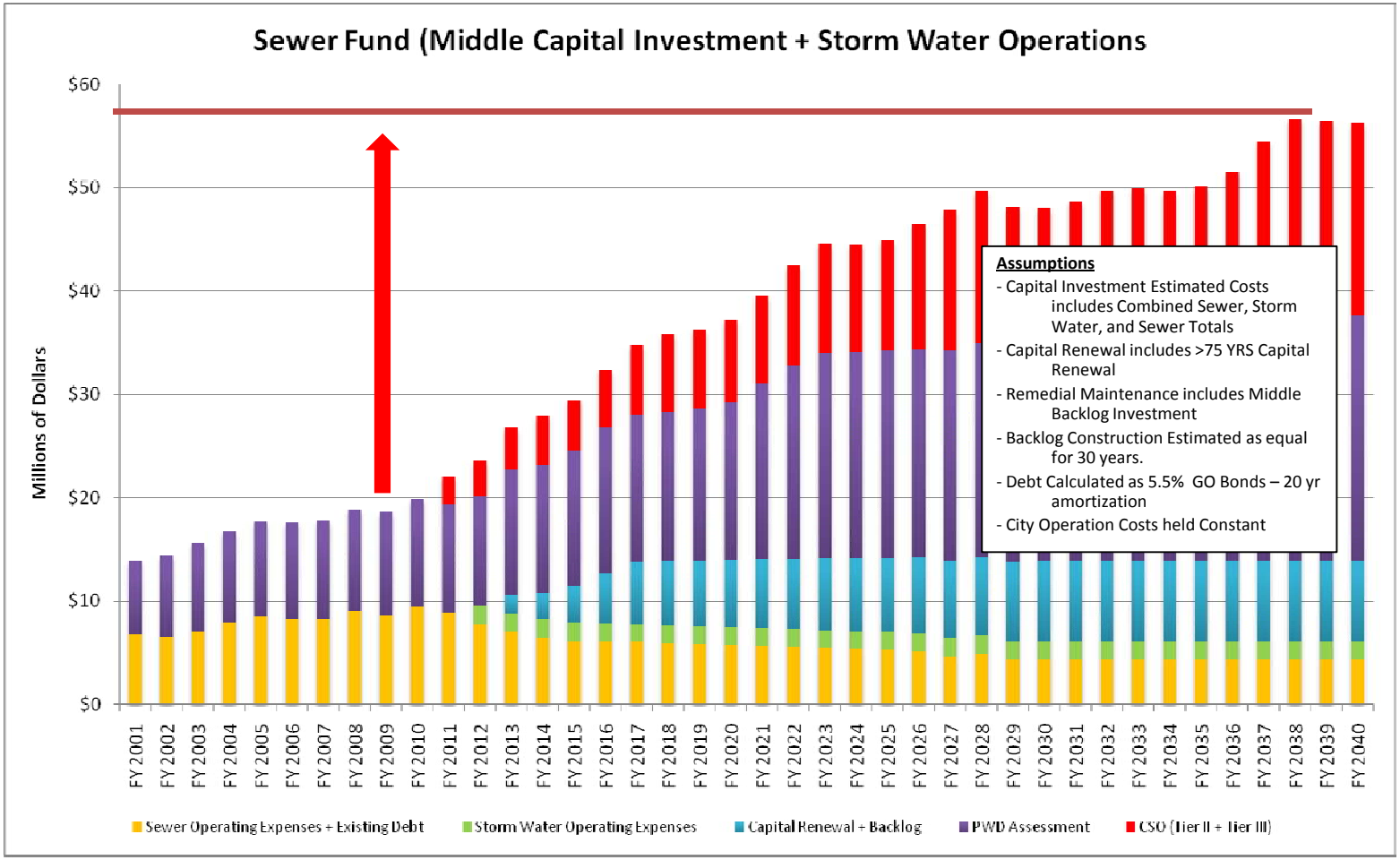
Implications of Low Capital Renewal and Backlog



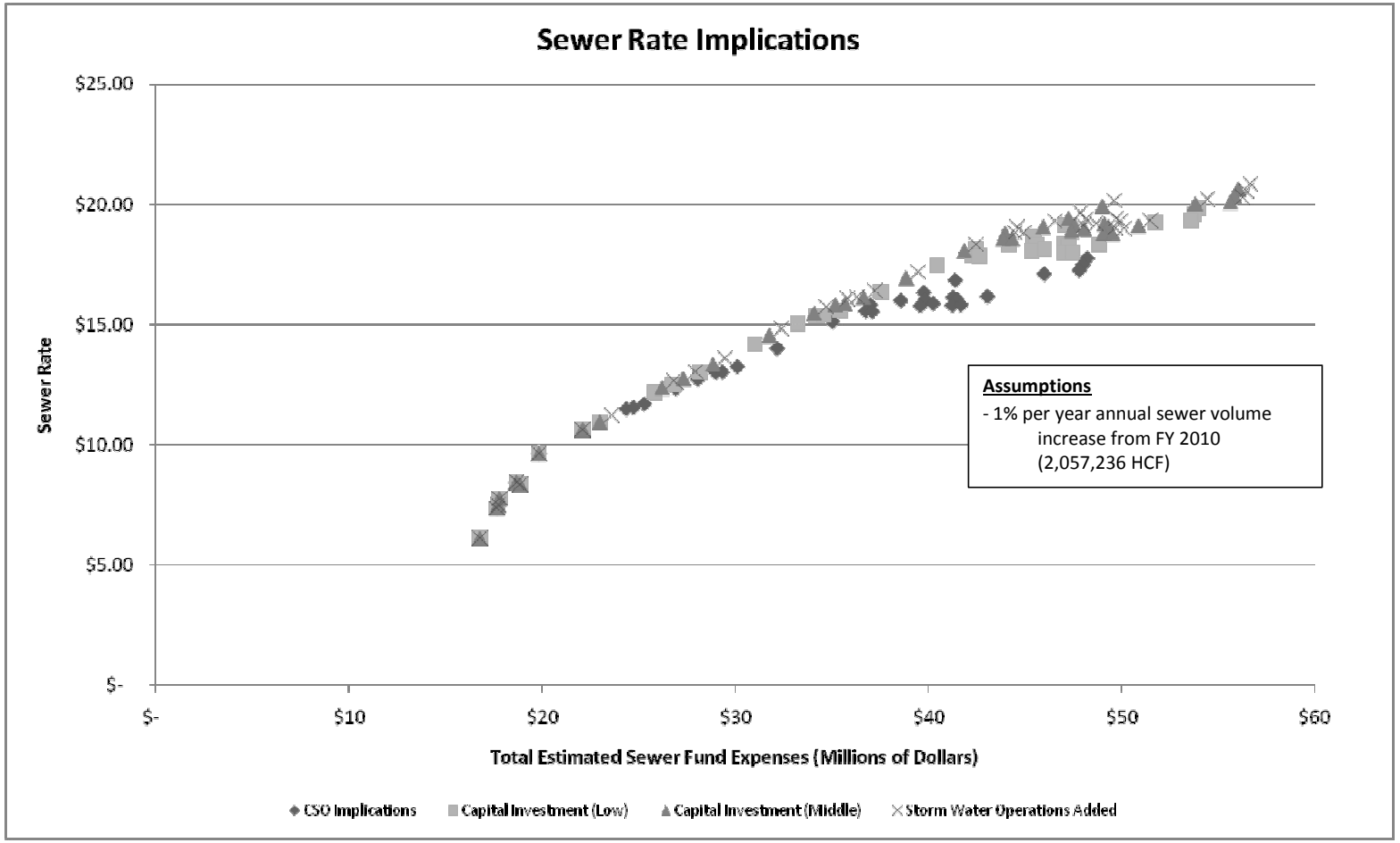
Implications of Middle Capital Renewal and Backlog



Implications of Estimated Storm Water Operations



Implications of Capital Renewal and Backlog



Storm Water Funding Case Studies

Case Studies

- Black & Veatch Storm Water Utility Survey, 2010
- Master Candidate Student's Municipal Financing Survey

Attachment 2:

Sewer Use Charges Ordinance

ARTICLE IV. SEWER USE CHARGES

Sec. 24-71. Definitions.

Unless the context specifically provides otherwise, the meanings of terms used in this article shall be as follows:

Commercial unit shall mean any structure or portion of a structure from which wastewater or industrial waste is discharged, excepting only dwelling units as defined hereinafter and shall include industrial users. Commercial units owned by different entities within the same structure and sharing the same water meter shall be treated as one (1) commercial unit.

Dwelling unit shall mean one (1) or more rooms occupied or designed to be occupied by one (1) or more natural persons as a single housekeeping unit with sanitary facilities, other than a place of public accommodation as defined hereinafter, discharging only domestic wastewater and shall include each unit of ownership in any condominium. If the occupant or occupants of rooms fit the definition of a dwelling unit except for the fact that the occupants share sanitary facilities with an occupant or occupants of other rooms located within the same structure, the number of units in the structure shall be deemed to be the total number of toilets or urinals located within such structure.

Parcel of land shall mean any area of land shown on the assessor's maps on the April first last preceding the operative date, located within the city, which is either connected in fact to a sewer within the city, or developed-but-unconnected to a sewer within the city, which sewer is nevertheless accessible to the area within the meaning of section 24-36. [Connection to public sewer required]

Place of public accommodation shall mean any establishment having sanitary facilities located therein which gives or offers shelter or lodging to members of the general public, whether transient or long term and shall include but is not limited to hotels, motels, guest houses, hospitals, rest homes, nursing homes, inns, fraternity houses and dormitories.

Treatment facilities shall mean all wastewater treatment plants owned and operated by the Portland Water District or by the city.

Total organic carbon or TOC shall mean the determination of organic matter present by the measurement of carbon dioxide produced by pyrolysis measured in accordance with 40 CFR Part 136.

Volume of water shall mean the amount of water, estimated or measured, whichever is less, provided to the property by the Portland Water District during the previous period of the calendar year. This term shall include any amounts of water obtained from other sources whether or not water is also provided by the district.

Sec. 24-72. Sewer user charges.

(a) *Applicability.* There are levied upon all parcels of land charges for cost of treatment of wastewater and for the operation and maintenance of the wastewater system.

(b) *Billing.* Bills for all charges under this article may be sent to the record owner, or to the person requesting water service. Bills shall be sent to each such owner or person every month, except that persons billed quarterly or seasonally by the Portland Water District for water service may be billed quarterly or seasonally for all charges under this article. All payments shall be credited against the oldest outstanding bill sent to such owner or person. Any payments made to the Portland Water District or its agents, which do not indicate to which account they are to be applied, shall be applied as provided by contract between the city and the Portland Water District. Bills shall contain an amount for sewer user charges, and if delinquent as provided in section 1-16 of this Code, shall include charges for interest to be computed in the same manner as provided for real estate taxes.

(c) *Computation.* The user charges shall be computed in accordance with the following schedule, as from time to time amended, which shall be sufficient to meet costs of the eligible purposes for which such charges may be used. User charges under this section for both dwelling units and commercial units billed for water used after July 1, 2010, the foregoing rate shall be seven dollars and eighty-seven cents ($7.87) per hundred cubic feet of volume for connected parcels of land. The user charge for developed but unconnected parcels of land shall be one dollar and seventy-one cents ($1.71) per hundred cubic feet of volume. Each metered billing unit shall have a minimum charge of at least one hundred (100) cubic feet per month.

(d) *Purposes for which charges may be used.* Charges and assessments made under this article shall be used consistently with 33 U.S.C.A. § 1281 et seq., and applicable federal regulations for the following purposes:

(1) To defray the current expenses of operating and maintaining the wastewater system, including any assessment made by the Portland Water District;

(2) To pay the interest and repay the principal on any outstanding or future indebtedness of the city for construction of sewers heretofore or hereafter constructed within the city;

(3) To reimburse the city for the cost of computation, billing and enforcement of such charges.

(e) *Collection.* Charges assessed pursuant to this section shall be enforceable pursuant to section 1-16 of this Code.

(f) *Disconnection for nonpayment of charges.* The Portland Water District shall disconnect sewer users with unpaid sewer use charges according to the same terms and procedures used to disconnect water users with unpaid water use charges.

Sec. 24-73. Industrial surcharges.

(a) *Applicability.* Each industrial user except those included in the Westbrook Inter-Municipal Sewer Service Agreement Area, shall be subject to surcharges in addition to any other treatment charge if the wastewater discharged by such user is determined by the public works authority, in accordance with 40 CFR Part 136, to exceed any of the following concentrations:

(1) BOD of two hundred fifty (250) mg/l; or COD, where indicated for specific wastewater and a correlation between BOD and COD is established in such wastewater; or TOC, where indicated for specific wastewater and a correlation is established between TOC and BOD in such wastewater;

(2) TSS content of three hundred (300) mg/l.

(b) *Computation of surcharge for BOD.* The surcharge for BOD shall reflect the cost of removing the excess BOD and shall be computed in accordance with the following formula:

$$\text{Surcharge for BOD} = (C_1 - 250 \text{ mg.l}) \times Q \times 8.34 \times S_1$$

Where C_1 = The concentration of BOD in mg/l

Q = The total volume of wastewater contributed during the billing period, in millions of gallons

8.34 = Conversion factor of gallons to pounds

S_1 = $0.1633 for each pound of BOD in dollars

(c) *Computation of surcharge for TSS.* The surcharge for TSS shall reflect the cost of removing the excess TSS and shall be computed in accordance with the following formula:

Surcharge for TSS = (C_2 – 300 mg/l) x Q x 8.34 x S_2

Where C_2 = The concentration of TSS in mg/l

Q = Total volume of wastewater contributed during the billing period, in millions of gallons

8.34 = Conversion factor of gallons to pounds

S_2 = $0.0817 for each pound of TSS in dollars

(d) Westbrook Inter-Municipal Sewer Service Agreement area may be surcharged for BOD and TSS, based on the cost of treatment at the Westbrook Gorham Regional Treatment Plant.

(e) *Industrial surcharge fee.* An industrial surcharge fee is hereby established for all permitted discharges from all permitted users at a rate of $0.0857 per hundred cubic feet of volume, provided that the city council may, from time to time, by order, readjust the surcharge fee according to the then prevailing cost of administering the industrial pretreatment program and the anticipated number of permitted users and anticipated volume to be surcharged.

(f) *Appeals.* Any person aggrieved by a determination of the public works authority made pursuant to this section may appeal such determination to the city manager, within thirty (30) days of notification of such determination. Such person may submit additional evidence and shall be heard orally by the manager or his deputy. The manager may modify the public works authority's determination if satisfied that the determination was erroneous, inconsistent with this chapter, or with applicable rules, regulations or grant requirements made pursuant to 33 U.S.C.A. c. 26. All determinations of the manager shall be rendered

within a reasonable period of time, not to exceed ninety (90) days from the date of such hearing and shall be final.

Sec. 24-74. Reserved.

Sec. 24-75. Volume measurements.

(a) *Water volume measurements.* Whenever in this article there is reference to volume of water, and the charges of such person are computed in whole or in part upon such volume of water, the use of such standard shall give the public works authority the right to require any person obtaining water from sources other than the Portland Water District to install and maintain at such person's own expense water meters of a type approved by the public works authority for the purpose of determining the volume of water obtained from their other sources and to report the volume of such water recorded by such meter to the public works authority. Following installation, such meter shall not be removed without the written permission of the public works authority.

(b) *Wastewater volume.* Devices for measuring the volume of wastewater discharged by a commercial or industrial user may be required by the public works authority if these volumes cannot be determined from the water volume records. Any person who is a commercial or industrial user may, at his option, install devices approved by the public works authority for the metering of wastewater and may have the charges based upon the volume of wastewater rather than upon water volume. All metering devices for determining the volume of wastewater shall be installed, owned and maintained by the person to be charged. Following approval and installation, such meters may not be removed without the consent of the public works authority and may be read by the public works authority at all reasonable times.

(c) *Submetering of water volume.* Any person who feels that recorded water records are not a reliable index of his discharge volume may install an additional water meter of a type approved by the public works authority to measure the volume of water which can be shown not to enter the sewerage system. The person installing such a meter shall immediately notify the public works authority of such installation and shall be responsible to the public works authority for reporting meter readings once every month. Such person shall be credited with the volume charges for the volume shown by such meter, which meter shall be accessible for reading by the city or its agents at all reasonable times.

(d) *Review.* Any person subject to charges under this article may make a written request for review of such charges by the city manager as provided in section 1-16 of this Code. The city manager may review and modify such charges, to the extent that justice requires, upon affirmative proof by such person that:

(1) The volume of metered water consumed exceeds the volume of wastewater generated by the unit;

(2) The difference between the volume of water and of wastewater exceeds ten (10) percent of the metered water measurement;

(3) The amount of the difference can be established to a substantial certainty by reliable tests or is documented by reliable sources prepared for purposes unconnected with wastewater disposal; and

(4) Measurement by the measuring devices provided for in the preceding subsections is impossible or impractical.

Sec. 24-76. Assessments.

(a) *Lien.* All assessments upon a parcel of land made under this article shall create a lien for the benefit of the city.

(b) *Reserved.*

Sec. 24-77. Violations.

Any person violating the provisions of this article, other than the requirement of payment of charges or assessments, shall be guilty of an offense.

Attachment 3:

Backlog Study

CITY OF PORTLAND, MAINE

Does It Make Sense Study
"DIMS"

February 2011

FINAL REPORT

AMEC Earth & Environmental, Inc.
offices nationwide

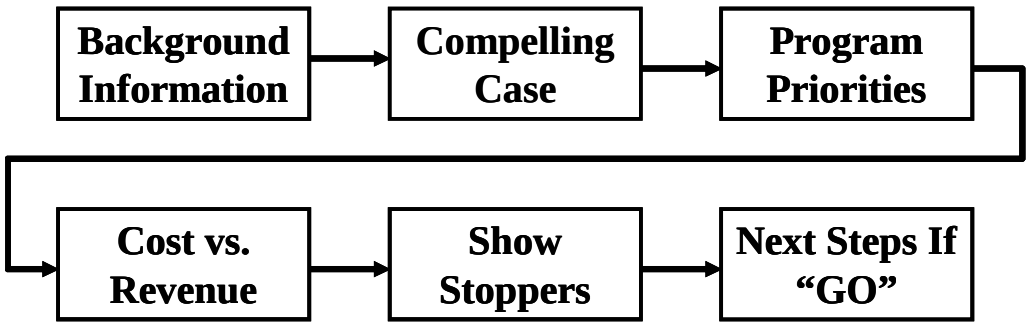
Overview

AMEC Earth & Environmental, Inc. (AMEC) representatives met with the City of Portland, Maine (City) staff to investigate the basic advisability of using a stormwater user fee mechanism to fund a program to enhance the local stormwater program to meet local program needs. Meetings were conducted via phone conferences and onsite in City Hall. A *Does It Make Sense* (DIMS) workshop was held on October 30, 2008, to familiarize City staff and regional stakeholders with the needs of a successful stormwater management program and potential funding options.

After the introductory portion of the workshop was complete, the local and regional stakeholders left the meeting, and the key City staff participated in a session to discuss the logistics and strategies of implementing a stormwater utility. Our goal was to come to essential agreement on the answer to the questions:

1. ***What are the key stormwater related problems, needs and issues that Portland faces?***
2. ***Does it make sense to initiate a user fee system to fund the stormwater program?***

The structure of the extended meeting followed the roadmap depicted below.



The remainder of the report follows this roadmap.

The invited full day meeting attendees included:

David Kane, PWD Treasurer
David Ladd, MeDEP MS4 Program Coordinator
John Anton, At-Large City Councilor
David Marshall, District 2 City Councilor
Joe Gray, City Manager
Pat Finnegan, Assistant City Manager
Mike Murray, Island/Neighborhood Administrator
Bob Leeman, Public Buildings Director
Ellen Sanborn, Director of Finance
Mary Costigan, Associate Corporation Counsel

Nicole Clegg, City Communications Director
Nelle Hanig, Business Development Representative
Penny Littell, Director of Planning & Development
Rick Blackburn, Assessor
Mike Bobinsky, Director of Public Services
Kathi Earley, DPS, Engineering Services Manager
Doug Roncarati, DPS, Associate Engineer
John Emerson, DPS, Wastewater Systems Coordinator
Betsy Beety, DPS, Principal Financial Officer
Andy Reese – AMEC
Charlene Johnston – AMEC

Background

What is stormwater?

Stormwater, also known as runoff or drainage, occurs when precipitation from rainfall or snow-melt flows over ground surfaces. Development creates impervious surfaces like roadways, sidewalks, parking lots, and building roof tops that impede the natural percolation of water into the ground. That runoff must go somewhere, so the City of Portland established a system of structures and pipes to collect and transport the runoff.

How is local stormwater management funded?

Municipalities and their subsidiary organizations employ a variety of "funding" methods, including service charges, several types of taxes, franchises and other fees, fines, and penalties. It is important to understand the three main ways of providing support to stormwater programs: resources, money and revenue:

- Resources include all the non-cash ways that a local stormwater program can be supported including: free resources available from the internet, shared costs with neighbors, transformation of current programs to better support stormwater needs, volunteer programs, etc. Resources are ***not*** free in that they often require significant staff time to find, coordinate, and manage.
- Money includes all one-time infusions of funds. This includes Federal and state grants, loans, penalties, bonds, special sales taxes, one-time development related fees and payments, penalties, etc. Money is often targeted to a specific need or program activity. It may, or may not, be sufficient to cover that program but its key characteristic is that it is ***one-time***.
- Revenue includes all ongoing flows of funds. For local governments this includes property and other ad valorem taxes, sales or gasoline taxes, franchise fees, user fees, etc. The key characteristic of this type of support is that it is ***ongoing***.

Each of these basic types of support has advantages and disadvantages and can be targeted toward different aspects of the stormwater program. The Stormwater Management Functions Table later in this report depicts the key elements of a typical stormwater program. As these elements are considered it is clear that the bulk of the cost of stormwater programs must be borne by revenue producing support sources not "resources" or "money". Since stormwater cannot compete effectively for general fund tax dollars, most local governments find that only legally dedicated revenue will last the test of time and competing priorities.

The various funding methods also have distinctive characteristics which separate them legally, technically, and in terms of public perceptions. Four major categories of municipal revenue generation methods are taxes, service charges, exactions, and assessments.

- Taxes are intended primarily as revenue generators, and with some exceptions (such as special local option sales or earmarked taxes), without any particular association with the activities or improvements that they fund. They can be used for the general purposes of local government. These include property tax, income tax, sales tax, etc.

- Service charges are not established simply to generate revenue, but must be tied to the objectives of a specific program to which they are associated. For example, water and sewer service charges are structured to cover the cost of those programs, not to simply generate revenue which is used for other purposes as well. Thus the total revenue generated must be tied to the cost of providing services and facilities and the amount each rate payer is charged must be related to the impact or "use" of the system (rational nexus).

- Exactions are related to the extension of an approval or privilege to use. Franchise fees for the privilege of using the right-of-way for cable and phone companies limited to a certain percentage of revenue by Federal or state laws are an exaction. Licenses, tap fees, impact fees, fees in lieu of detention, capital recovery charges of all kinds and the mandatory dedication of infrastructure during development are also exactions.

- Assessments are geographically or otherwise limited fees levied for improvements or activities of direct and special benefit to those who are being charged. The benefit must be direct – tied to a specific and measurable or estimable property improvement. And it must be special - a benefit which is not realized generally in the community or area.

A major source of funding for stormwater management is in the form of a user fee system under the auspices of a stormwater utility. This form of funding has several advantages over other competing forms of finance including its equitability, stability and adequacy. The user fee concept of a stormwater utility based funding method is fast growing. In the early 1970's there were only one or two true stormwater utilities in existence. By 2008 the number had grown to over 1,200. This number is expected to more than triple in the next decade as the financial impacts of stormwater quality legislation reach the many small municipalities.

A stormwater utility falls primarily under the second of these funding categories: a service charge. It is based on the premise that the urban drainage system is a public system, similar to a wastewater or water supply system. When a demand is placed on either of these two later systems the user pays. In the same way when a forested or grassy area is paved a greater flow of water is placed on the drainage system. This is the demand. The greater the demand (i.e. the more the parcel of land is paved), the greater the user fee should be.

The distinctions of the four revenue categories are very important. One of the critical issues which typically must be resolved if a utility service charge of any type is legally challenged is whether the service charge is clearly related to and incidental to the activities and improvements of the utility, or is in fact merely a means of creating revenue for all governmental purposes generally (a tax), or is a special assessment (which is supposed to reflect a direct and special benefit). Thus a stormwater utility must be based on a stormwater program and not simply a perceived financial need or willingness to pay.

A stormwater utility is seen as an umbrella under which individual communities address their own specific needs in a manner consistent with local problems, priorities and practices. It is understood in three ways: a means of generating revenue, a program concept, and potentially an organizational entity. A storm water utility may provide a vehicle for:

- consolidating or coordinating responsibilities that were previously dispersed among several departments and divisions

- generating funding that is adequate, stable, equitable and dedicated solely to the storm water function
- developing programs that are comprehensive, cohesive and consistent year-to-year

A stormwater utility is equitable because the cost is borne by the user on the basis of demand placed on the drainage system. It is stable because it is not as dependent on the vagaries of the annual budgetary process as are taxes. It is adequate because a typical storm water program can be financed with payments normally below the normal customer willingness to pay.

How do stormwater fees work?

The basic rate methodology defines the basis for the rate that users will be paying. The three main impacts on surface water of urban development are increases in peak flow, volume of discharge, and amount of pollution. All impacts can fit into these three basic categories. The variable most positively associated with each of these three major impacts is the conversion of pervious areas (forests and fields) to impervious areas (pavement, roof tops, and other hard surfaces).

Accommodating the runoff that occurs when pervious area that typically absorbs rainwater, is converted to impervious area requires Portland to invest in the public drainage system. Therefore, it is appropriate to use some measurement of impervious area or surrogate of impervious area in the rate methodologies. Most stormwater programs in the United States have taken this approach and a 2007 survey found that 74 percent of all stormwater programs responding used impervious area as a factor for rate calculation[1]. While impervious area does not directly account for all of the stormwater program costs, urbanization of land as reflected in intensity of development is, by far, the best measure of cost causation and provides a court-tested rational nexus for the fee amount on any property.

Impervious area is typically billed in units of an equivalent residential unit (ERU). We determine what a typical (median) residential property's impervious area is and bill all properties in numbers of ERUs. There is then a monthly (or quarterly) charge per ERU. Residences tend to be billed on a flat rate or several tiers.

The figure shows an example of the impervious coverage on a non-residential fast-food parcel in Portland. Impervious area includes such things as roof tops, sidewalks, parking areas, patios, tennis courts and gravel traveled ways – any man made surface that water cannot penetrate effectively and thus, must run off.

Example of Non-Residential Parcel Impervious Area.

There are, however, additional ways to configure the rate methodology to

[1] "Stormwater Utility Survey", Black and Veatch, Kansas City, 2007.

emphasize certain other impacts or recognize the benefits of certain kinds of development practices. Many of these considerations are handled with a stormwater crediting or secondary funding system, but some factors can also be handled in the makeup of the basic rate methodology itself. Two factors commonly considered are:

- Some communities charge for gross parcel area in addition to impervious area, reasoning that stormwater runs off all parcels and thus, all should pay.
- Some communities want to encourage green space and set up charges based on an intensity of development factor – so that the same amount of imperviousness would be charged less if it were located on a larger lot with more green space.

These latter two approaches are almost opposites of each other in how they treat open space. The 2007 Black & Veatch survey, which found that a majority (65%) of stormwater programs base charges on impervious area only, found that of the remaining stormwater programs:

- 9% charge based on gross area plus impervious area.
- 12% recognize the benefits of green space through an intensity of development factor.
- 14% use another basis for fees.

Compelling Case

What local government "sells" is service—services that local citizens feel they need. In most communities there are compelling reasons to improve stormwater programs (i.e. localized flooding issues, water quality violations, large backlog of capital needs). Improving stormwater services costs money, so the compelling reasons for each community to enhance services need to be determined and clearly communicated to convince stakeholders and citizens to spend more on the stormwater program.

Unlike other public works problems, such as wastewater or solid waste management, stormwater issues are rarely visible to the majority of the community. So it is incumbent on the organizations that manage stormwater to make these problems, issues, and opportunities known in an effective way. Experience has shown that in many cases, when the public is educated effectively, most citizens will acquiesce in allowing the organization to solve the problems, address the issues, and take advantage of the opportunities.

At the workshop, there was recognition of the reality that there are many "publics" in the community, and the messages will need to be tailor made to various groups and even to particular individuals. Key public sectors include: the Board, local political leaders, flooded individuals, business leaders, non-profits, schools, small business, environmental advocates, and the development community.

In discussions with the staff, a series of key problems, needs, and issues emerged that are either facing the City today or will face them in the near future. The group developed a top list of issues and messages that resonated with them. These messages were then voted on by the group; each participant was given 7 votes to select what they thought would be important to citizens and other stakeholders in the community. The outcome is summarized below in order of ranking done by the multi-voting (the number of votes cast for each compelling issue is in parenthesis).

1. Protect Water Quality and the Environment (24 votes) – There was an expressed desire to protect the valuable water resources on which the City relies. Many expressed that the physical setting and the desire to protect its natural beauty were primary reasons to institute a user fee, and the green design and a proactive stance were key to success.
2. Steward the System (22 votes) – There was a desire to catch up with long neglected maintenance and to provide adequate stewardship of the miles of channels, stream, pipes and thousands of appurtenant structures. There was a sense that the City was falling behind due to lack of proper investment in maintenance and that waiting would only increase costs.
3. Educate Citizens and Leaders (20 votes) – While many citizens and political leaders are generally aware of the key role clean water plays, there was a perceived need to provide much stronger education of citizens and to target the political leadership to bring them up to speed on the clean water issues and the need for a stable, adequate and equitable way to fund it.
4. Build the System (17 votes) – Paired with number 2 is the need to rebuild the parts of the system that are inadequate or failing and to do so in an environmentally sustainable manner taking full advantage of green designs and advances in understanding.

5. Equity and Efficiency (16 votes) – The group desired to shift costs in such a way that equity and fairness were maximized and that there was an efficient focus on stormwater needs. The idea of a user fee with crediting system to reward sound clean water behavior was compelling.
6. Meet Regulatory Mandates (11 votes) – Unfunded regulatory mandates are a growing concern. There is a desire to both meet the mandates, attempt to interpret them in a manner that best fits the Portland situation, and to do so in an effective and adequately funded manner.
7. Guide New Development (8 votes) – The group expressed a strong desire to do a better job in guiding new development and redevelopment to be less impacting than old development and to provide more field staff to support such efforts and to ferret out the problems caused by existing poor practices.
8. Enhance Economic Development (6 votes) – In recognition of the close ties between the environment and economic development, the group felt that all the 1-7 activities would contribute to enhanced economic development. However, there was also an expressed desire to recognize that activities could be targeted and decisions made which would more directly enhance and protect property values and demonstrate that Portland is an environmentally proactive place to live.

Program Priorities and Messages

Based on the compelling case discussion, the group discussed key program priorities and messages for the stormwater program.

- Priorities are the answer to the question: "the improved stormwater program will seek to accomplish, as a priority, the following things:"
- Messages would need to be developed to "sell" the idea of improving these priority services.

One underlying concern was that not many citizens have an understanding of the problems with the stormwater program and, thus, would need clear and convincing information effectively presented before they would willingly spend money to address them. The key additional priorities identified by the group were:

- Improve and repair our drainage system maintenance, for aesthetics and capacity
- Improve detection and elimination of illicit connection problems
- Develop watershed plans and models, to allow an ability to plan effectively
- Work to instill a sense of ownership/stewardship in the water resources of the community
- Provide opportunities for the development community to more efficiently use their land in new development and redevelopment
- Better coordinate the stormwater and CSO program to provide an efficient interface both programmatically and with the physical system
- Address overboard discharges on the peninsula

The key messages were framed in one or two words – these would provide the "flavor" of any stormwater program improvement campaign. They are:

- Water Quality
- Quality of Life
- Sustainability
- Fairness
- Stewardship
- The Bay
- Meet Mandates

These messages were thought to resonate with the staff, leaders and citizens and frame the foundations for why we are taking steps to improve the surface water program and to provide fair, adequate, and stable funding.

Cost vs. Revenue

Portland drainage systems

The City has a sewer system that predates the belief that storm sewers should be kept separate from sanitary wastewater; therefore, the City has an extensive system of pipes that carries a combination of wastewater and stormwater, commonly referred to as a combined sewer system. The downside of such a system is that stormwater runoff from development may eventually exceed the carrying capacity of the combined sewers, resulting in combined sewer overflows, which can impair water quality. The City is under a Consent Agreement to reduce combined sewer overflows. The City has a significant Combined Sewer Overflow (CSO) Abatement Program, but approximately 55% of the sewer system is still combined. The rest of the City system conveys stormwater separate from its wastewater; this system is known as a Municipal Separate Storm Sewer System (MS4).

The City is authorized to discharge stormwater from the MS4 to waters of the State under the General Permit for Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems. The City has an updated Stormwater Program Management Plan (dated October 28, 2008), which describes how the City will reduce or eliminate polluted stormwater runoff to the maximum extent practicable from its MS4. The Plan must be substantially implemented by June 30, 2013.

The City has 17 distinct watersheds: eight receiving waters with four freshwater and four saltwater. At the time of the DIMS study there were four impaired urban streams, the Capisic Brook, Fall Brook, Long Creek and Nason's Brook. Although it was not included in the DIMS study or the initial draft report, it should be noted that a fifth "unnamed brook" on the 303d impaired waters list has since been identified as Dole Brook. The City has prioritized the Capisic Brook Watershed within their Stormwater Program Management Plan. A majority of the City's CSO abatement work is within the Capisic Brook Watershed.

Stormwater is not a stand alone service within the City; therefore, it is difficult to attribute how many employee hours are spent specifically on stormwater management issues. Most of the stormwater management is provided by the Public Works Department. The Public Works Department is divided into five service groups. Most of the stormwater services are delivered through two groups—Engineering Services and Operations.

Portland's existing stormwater program

An adequately funded stormwater management program is the foundation of a successfully operated and maintained stormwater system. There is a clear understanding by the staff that the City currently does not have the budget to fund an enhanced stormwater management program. Discussion was held with the City staff to explore current stormwater activities to estimate typical stormwater program expenditures. Obtaining accurate information on all of the city's stormwater activities was challenging, because many of the activities are not accounted for nor tracked in a manner that allows for financial or even functional segregation from other programs or activities. Since City stormwater services are currently performed through many different departments and funded through different budgets, the staff reviewed the *Stormwater Management Program Functions* table on the following page and made educated estimates of resources expended on applicable functions.

STORMWATER MANAGEMENT PROGRAM FUNCTIONS TABLE

1. Administration & Finance
- General Administration
- General Program Development
- Interlocal Coordination
- Billing Operations
- Customer Service
- Financial Management
- Capital Outlay
- Overhead Costs
- Cost Control
- Support Services
- Contracting Services

2. Public Involvement & Education
- Public Awareness & Education
- Public Involvement
- Citizen's Group Facilitation
- PI&E Support to Other Programs
- Specific Technical Training/Certification

3. GIS and Technology Support
- Geographic Information Systems
- Mapping
- Database Management
- Data Support Services
- Graphical Support
- General Technology Support
- Internet and Web Support
- Technology Transfer

4. Engineering & Planning
- Design Criteria and Standards
- Structural and Non-Structural BMPs
- Field Data Collection
- Quantity Master Planning
- Multi-objective Holistic Planning
- Stream Restoration
- Habitat Conservation Plans
- Quality Master Planning
- Design, Field and Ops Engineering
- Hazard Mitigation
- Zoning Support
- Retrofitting Program Planning Support
- Green Site Design and Low Impact Approaches

5. Operations & Maintenance
- General Maintenance Management
- General Routine Maintenance
- General Remedial Maintenance
- Emergency Response Maintenance
- Infrastructure Management
- Public Assistance
- Complaints Response
- Street Maintenance Program
- Spill Response and Clean Up

6. Capital Construction
- Major Capital Improvements
- Minor Capital Improvements
- Land, Easement, and Right-of-Way
- Retrofitting and Redevelopment
- Construction Management
- Public-Private Partnerships

7. Development Support Services
- Code Development and Enforcement
- General Permit Administration
- Plans Review
- System Inspection & Regulation
- Zoning and Land Use Support
- Erosion Control Program
- Flood Insurance Program

8. Regulatory Compliance & Enforcement
- Flood Insurance Program
- Multi-Objective Floodplain Management
- Monitoring and Sampling Program
- Stormwater NPDES:
  - Pest, Herb and Fertilizer
  - Used Oil & Toxic Materials
  - Program for Public Ed & Involvement
  - Municipal Housekeeping
  - Industrial Program for Stormwater
  - Litter and Floatables Programs
  - Commercial & Residential Program
  - Erosion Control
  - Illicit Connection & Illegal Dumping
- Groundwater Protection
- Endangered Species Compliance
- Drinking Water Protection
- Watershed TMDL Support
- Septic Program

The majority of the City's current stormwater program is administered by the Public Works Department. The Public Works Department provided reports and data to help identify the biggest costs facing the City's stormwater program. At this time, the biggest known stormwater costs pertain to the following:

- A significant CSO separation program receives most of the attention and funding.

- There has been little capital investment in the deteriorating pipe system. They know there are significant problems but the system has not been fully inventoried and quantified. Problems get magnified when timely maintenance is not performed.
    - Example: 100 feet of collapsed combined sewer repair cost was $50,000
- There are many clogged, trashed and polluted inlets and outlets
    - Understaffed for education & enforcement
- The City knows of 77 larger detention ponds/basins – 12 are city-owned – with few of them maintained.
- There are 231 culverts inventoried. Some culverts are known to be in poor condition but currently repaired only in a crisis mode.
- The City does not have a formal ditch/swale maintenance program.
- Regulatory mandates are growing including requirements of the National Pollutant Discharge Elimination System (NPDES) Phase II stormwater permit and the Total Maximum Daily Load (TMDL) program
- The City regularly cleans catch basin sumps but remedial maintenance is falling behind, including:
    - 500 ± Casco traps missing or damaged
    - 100 ± Hydrobrakes need repair or replacement
- The City has an aging and inadequate equipment fleet.

Portland's future stormwater program

Detailed discussions were held concerning the types of improvements needed and estimates of staffing and cost increases. These are ballpark estimates but represent a consensus of the staff present. The *Stormwater Management Program Costs* Table below presents a summary of the major costs. In every category presented, current expenditures fall short of projected future needs.

Stormwater Management Program Costs Table

Function	Estimated Costs	
	Existing	Future
Operations & Maintenance	$ 350,000	$ 750,000
Capital Construction	$ 90,000	$ 1,000,000
Regulatory Compliance	$ 30,000	$ 120,000
Development Support	$ 60,000	$ 120,000
Engineering & Planning	$ 120,000	$ 180,000
Misc. Services	$ 10,000	$ 225,000
TOTALS	**$ 660,000**	**$ 2,395,000**

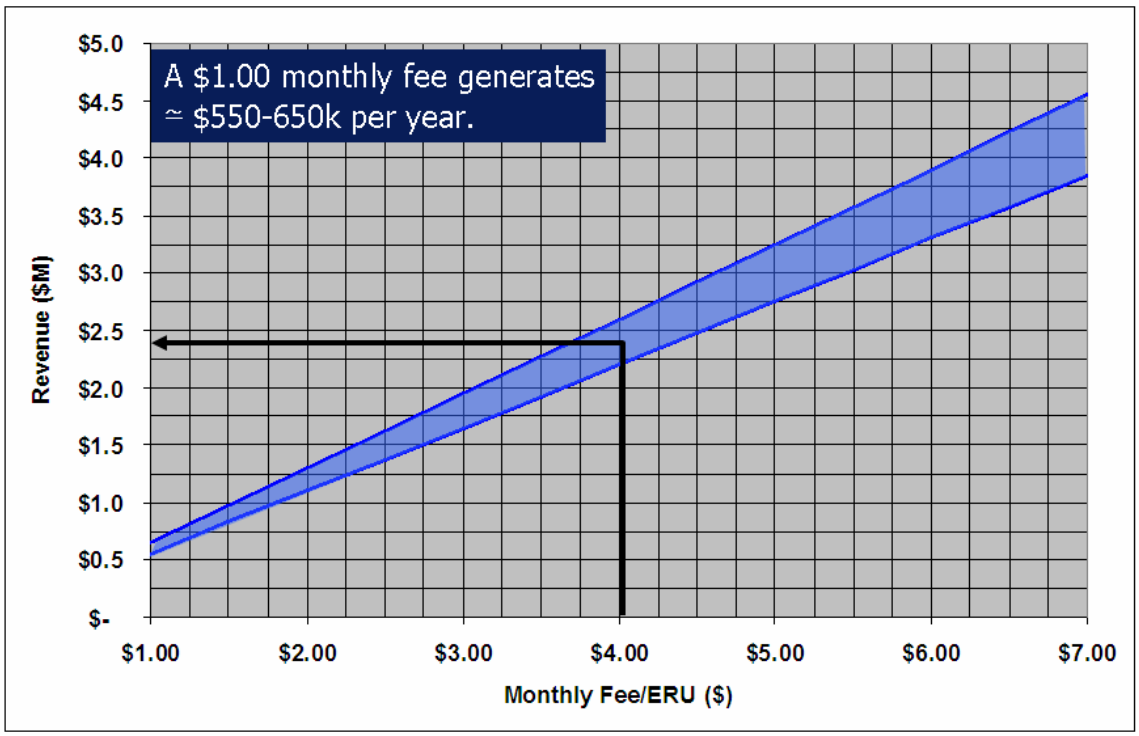
Recognizing the City cannot invest immediately in everything that is needed to operate an enhanced stormwater program, priorities need to be set. In order to determine priorities, there will be a need for master planning, mapping, and modeling in the first year. The $1,000,000 annually for future capital construction will not be sufficient to tackle the entire capital backlog in a timely way, but it could help the City to accelerate construction through bonding and/or to

leverage access to grants. The City has not been able to keep up with routine maintenance and the future operations and maintenance costs projected at $750,000 will provide a moderate ability to address the existing backlog of maintenance items. An important point to note is the advent of a successful stormwater management program raises expectations. People who in the past gave up on complaining about their stormwater problems will resurface when they see the program successes and they will then begin to call again. Other increases reflect staff additions to beef up and enhance current services in each area. The miscellaneous services category includes the future cost estimate of $125,000/year for stormwater user fee billing of approximately 22,000 accounts.

While national comparisons are difficult given the large CSO program, we believe this level of investment will place the City in the upper tier of a "moderate" program level.

Portland's revenue estimates

The following figure provides an estimate of the amount of revenue that could be generated with an impervious-based user fee. These numbers are based on using an Equivalent Residential Units (ERUs) rate structure. The ERU size was estimated at 3,200 square feet. We estimate that for every one dollar per ERU per month the City can generate between $550,000 and $650,000. These numbers are very preliminary. To generate the projected $2,400,000 required annually to fund all projected future stormwater needs, a charge in the range of $4.00 per month would be needed.



Show Stoppers/Hurdles

The group then identified the local issues and entities that, if not handled appropriately and proactively, can become "show stoppers" or "hurdles" that can slow or derail the transition to a more comprehensive stormwater management program with user fee funding. The hurdles were identified by asking the group "who will not like a stormwater user fee and why?" The hurdles identified by the group that will likely need to be cleared are:

- Economic times are getting harder. With recent sewer hike, we could look insensitive and expensive.
- Need to be sensitive to timing of election (November).
- Educate the business community. With proper education the Chamber of Commerce will be supportive. The local business motive is availability to necessary resources (land, labor, economic base).
- Sewer rate is very expensive. People will expect a shift in costs from the sewer rate if they are paying a stormwater user fee.
- Water bill may not be an easy alternative. Intensive negotiations will be necessary with PWD.
- Tax exempt properties: will have to pay a fee so they likely won't be happy.
- We need better statistics to communicate our story.
- Media issue: Watch out for Lewiston/Auburn and the "rain tax" story line.
- Beware of the regulatory community's feeling that this is a continued study situation rather than proactive movement, *What have you been doing all this time?*

A lot of discussion revolved around the fact that not enough is known about the extent and condition of the stormwater system. Several members of the group felt that a watershed plan needed to be completed to extrapolate the total cost needed for the City's stormwater management program.

Next Steps

A vote was taken at the end of the workshop to determine how the staff felt about a stormwater user fee being developed for the City of Portland. Each participant was asked to vote for one of the following (the number of votes cast for each expression is in parenthesis):

1. It won't work. (0)
2. I still need convincing that this is the right approach. (1)
3. Let's move to the next step. (2)
4. Let's move cautiously toward implementation. (4)
5. I strongly support implementing a stormwater user fee right now. (0)

There was one person who felt they were between a 2 and 3. The member felt that if the City had more data, they would be more supportive of moving to the next step. The group was reminded that this is an evolutionary process. Until the funding is provided, it will be difficult to have all the information they want to have to make master planning decisions. The first step is to identify the needs and gaps in the existing program, so it is clear what still needs to be done.

Two other members voted between 3 and 4. They wanted the next steps to be a cautious move toward a stormwater user fee implementation project. The average for the group was a 3, *Let's move to the next step.* The group consensus was that a stormwater utility was a practical solution to the City's funding problems. They agreed that it was a concept worth further investigation.

An alternative option is to explore a wet weather rate adjustment. The City has a sewer fee that currently supports the combined sewer system. There could be a justification to develop a wet weather fee that would support the combined sewer system as well as the separate storm sewer system and to shift program funds to be supported on that fee basis. Similar to a stormwater user fee, this is a more equitable approach to billing property owners for their contribution to the system.

The staff then debated key components and key next steps. It was agreed that a briefing of the Board was necessary to gain permission to explore public support for a District stormwater initiative. The overall roadmap for the City to move forward was given as:

1. Gather more data on the stormwater system
2. Hire a Consultant to present to City Council in a workshop, regarding the City's stormwater needs and the next step to develop a Stormwater Management Business Plan (SMBP) for the City
3. Consultant prepares presentation for the City Council and City reviews and rehearses with Consultant
4. City organizes a workshop with City Council to request permission to develop a SMBP
5. At the workshop, the Consultant presents to the Council requesting an appointed Stormwater Advisory Committee to work with Consultant to develop a SMBP
6. If the Council gives permission, develop the scope and process for a Stormwater Management Business Plan
7. Six months later, the Stormwater Advisory Committee reports back to City Council
8. With positive results, the Council passes resolution authorizing implementation of a stormwater utility.

Conclusions

The group agreed that there is a compelling need to enhance City stormwater services. Avoiding the problem will defer maintenance, increase backlogs, and escalate costs.

A stormwater user fee could generate sufficient revenue to support an enhanced program. While hurdles have been identified, they appear manageable with appropriate education and outreach. The next step is to inform City Council of these preliminary findings and request their support in moving forward with a Stormwater Management Business Plan.

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April 1, 2011

Mike Bobinsky
Department of Public Services
City of Portland
55 Portland Street
Portland, ME 04101

Dear Mike:

Woodard & Curran and AMEC are pleased to submit an Appendix to the original "Stormwater Does It Make Sense" Study prepared by AMEC Earth & Environmental Inc., in November 2008. As outlined in our contract accepted on October 21, 2010, the objective of the project was as follows:

- to improve the City's understanding of the condition of its stormwater infrastructure through a strategic stormwater system inventory, and
- to provide an update to the Stormwater Program Costs based on the sampling of the City's stormwater drainage infrastructure and current stormwater compliance efforts.

The DIMS Appendix includes the following attachments:

- Attachment A - The "Infrastructure Report" providing an overview of the field sample results and extrapolations used in the *Stormwater Program Cost Summary* spreadsheet.
- Attachment B - Cost estimate spreadsheets used as a basis for remedial repair and replacement, non-structural compliance and City maintenance activity costs.
- Attachment C - Catchbasin, manhole and outfall data collection forms used in the field study.

Additionally, we have included a CD containing the final *Stormwater Program Cost Summary* spreadsheet, the collected field data spreadsheet and field photos from the stormwater system inventory.

We look forward to discussing the results of this work with you and appreciate the opportunity to have supported your efforts to advance consideration for sustainable stormwater financing.

Sincerely,

WOODARD & CURRAN INC.

Barry Sheff P.E.
Senior Vice President

Zach Henderson
Project Scientist

222804.25
Attachments

cc: Ian Houseal
Kathi Earley
Doug Roncarati

DIMS Addendum 2011

Objectives

AMEC had four objectives within this limited scope of services:

- Advise Woodard & Curran (W&C) in execution of an infrastructure inventory;
- Update, as appropriate, program costs from the original DIMS study based on extrapolated findings from the infrastructure inventory;
- Re-examine and update, as appropriate, the program cost assumptions presented in the 2008 DIMS, including a validation of the larger estimated program costs; and
- Review the estimate of revenue potential based on more recent impervious area data.

Findings from these activities are to be contained in a brief addendum to the original Does it Make Sense? Study (DIMS) completed in November 2008.

AMEC provided advice on the execution of an infrastructure inventory, and upon receipt of the infrastructure inventory conducted by W&C, extrapolated the information to provide a meaningful estimate of long-term infrastructure remedial needs.

Inventory Extrapolation

The tabular data was combined with the City's GIS to examine the geographic distribution of structures. The GIS coverage was defined as the universe of data that would be considered. For example, the largest pipe exiting from a manhole was assumed to be the drain pipe and pipe system length calculated accordingly.

Data not in the GIS layer is unknown and was not considered. In addition, size information was available on 67.4 out of 139.8 miles of storm sewer pipe and 113.9 out of 136.6 miles of CSO pipe. Size and condition distributions were extrapolated to the rest of the system in the same proportions.

We evaluated the available data to determine if there was any significant correlation with specific variables:

- The field data could not be correlated to land use so as to develop a land use based extrapolation
- No condition information is available for combined sewer lines, storm sewer lines and only three outfalls were collected.
- There was a slight correlation with condition and percent impervious (>PI<condition)
- There was a slight correlation with condition and elevation (<elevation <condition)
- There was a slight correlation with condition and slope-break (condition worse just below steep to flat slope break)

None of these correlations could be extrapolated in a meaningful way.

Since these relationships were not strong enough to warrant geographic analysis, statistical distributions of the conditions of the structures that do have sufficient data were used to extrapolate costs across the populations of each type of infrastructure. This assumption needs to be ground-truthed with Portland staff.

Details of the inventory and its extrapolation and a spreadsheet have been provided to the City and will not be repeated here. The *Infrastructure Report* was delivered on Monday January 24, 2011 and the Stormwater Program Cost Summary spreadsheet, dated March 01, 2011, are attached.

Program Revenue and Cost Estimates

The primary focus of the inventory and analysis was to develop a better estimate for the "Remedial maintenance" line item within the DIMS cost of service spreadsheet. The 2008 DIMS line item contains a $900,000 item tied specifically to the Preble Street culvert. The idea was to develop a more accurate estimate tied to the needs of the system.

Revenue Capacity

Using currently available data AMEC performed an updated revenue capacity estimate. The data sets used in the update included: building footprints, satellite data converted to impervious features, parcel boundaries, land use data parcel attributes. We developed a median value estimate of an "Equivalent Residential Unit" (ERU) of 2,500 s.f. based on review of a sampling of residential properties. Using this and a blending of the data sets several estimates were made of the total revenue capacity in Portland. We assumed one ERU per residential property and a rounded value for the rest of the parcels. We performed this estimate on 20,501 parcels.

The process for developing the estimate and the descriptions for the data sources and the acronyms are as follows: AMEC received from the City a Parcels GIS polygon layer and a CAMA tax dataset, both of which are indexed on the parcel ID field called "Lead CBL." We also received a building footprint polygon layer from the City, and had previously received a satellite-derived impervious feature polygon layer from Woodard & Curran.

The impervious features were edited to combine the building footprints with the satellite-derived impervious features to create two alternative impervious polygon layers (to choose from), both of which are more accurate than either source taken alone. Ultimately the impervious features we used for the estimates were developed by "unioning" the building polygons with the satellite-derived polygons, then eliminating single pixel impervious polygons from the satellite-derived impervious features where these single pixels were not overlain by building polygons. Because the building polygons are more accurate than satellite-derived features, and because single pixel impervious areas are often false positives, this was viewed as the most accurate approach for the given budget and time constraint.

The GIS parcel polygons were intersected with this modified impervious area polygon layer to compute the impervious area for each parcel polygon citywide. Next, the computed impervious areas were tallied by unique "Lead CBL" parcel ID, by grouping the dataset on Lead CBL. This resulted in two types of Lead CBL: "real" parcels with a Lead CBL that matched a CAMA database record, and GIS polygons that appeared to not represent typical fee-simple owned land. For this second type of polygon, the tallies were carried forward but the decision was made not to include these in the revenue estimate because they would likely be unbillable in a utility. These polygons had Lead CBL ID's of Interstate, MDOT, Railroad, ROW, and Water. The "count" shown in the summary table for these is deceiving because the grouping process described above (to achieve unique Lead CBL ID's) results in the grouped count being 1 for these situations in most cases. For example, there are 69 polygons in the parcel layer that have "MDOT" as the Lead CBL ID, but since records were grouped by Lead CBL, the count is shown as 1.

For all resulting unique Lead CBL ID parcel polygons, the CAMA table was used to assess the field called “LCI”, which is an indicator of residential or non-residential land use. For parcels with an LCI of “R” and a measured impervious area (from the intersect) over 400 square feet, the parcel was assumed a flat-rate one ERU billable single family residential (SFR) parcel. Statistics were run on these 15,463 parcels to determine the median impervious area of these and it was approximately 2,500 square feet. This was then used as the ERU.

For parcels with less than 400 square feet of impervious area, we classified these as VACANT.

For parcels with an LCI that indicated non-residential use, we mapped these to be non-single family residential (NSFR) in the estimate. There are 2,995 of these parcels and for each, the number of ERUs was reported as the impervious area on the parcel divided by the ERU of 2,500 square feet.

In the estimate, decisions had to be made on whether to include certain types of properties in the revenue estimate. Table 1 shows the decisions that were made in the revenue estimate, and are discussed in the next paragraph. The anticipated annual revenue ($602,687) represents one dollar per month charge, for each of the roughly 50,300 ERU on the stormwater bill. For example, increasing from $1/ERU per month to $3.50 would generate about $2.1M on annual stormwater revenue. All fees for non-single family residential properties can be calculated by dividing the total impervious area of the parcel by 2,500 and rounding up to the next higher even ERU. A larger ERU size will reduce the annual revenue. For example an increase to 3,000 square feet will reduce the overall revenue an estimated 8.6%.

Note that Maine Turnpike, MDOT ROW properties, railroad tracks, street right-of-way and local streets, and waterbodies were not included in the estimate. However if the City chooses to include any of these entities, the increase in ERUs and annual revenue (12 times the ERU number) per monthly dollar charge can be calculated from the table. In summary, prior to any credits being applied or accounting for bad debt it is estimated that a one-dollar charge per ERU with the ERU being set at the median home amount of impervious area is estimated to generate $600,000 revenue annually.

Table 1. Revenue Estimate

TYPE	Count	ERUs	INCLUDE?	Parcel ID?
Airport	N/A	854	Y	N
Non-Single Family Residential	2995	33907	Y	Y
Single Family Residential	15463	15463	Y	Y
Parcels w/o Impervous Area	2035	0	Y	Y
	SUM	**50224**		
		$ 602,687		

Remedial Maintenance Cost Development

During the Stormwater System Inventory Task, five categories of infrastructure were included (stormwater manholes, stormwater pipes, catch basins, combined sewer pipes, and outfalls) and each was given an assigned remedial maintenance cost based on site specific dimensions and on one of three conditions observed in the field: fair, poor, very poor. These costs were extrapolated city-wide. Table 2 shows the raw data.

Table 2. Overall Results of Inventory Extrapolation

Condition	Stormwater Manholes	Stormwater Pipes	Catch Basins	Combined Sewer Pipes	Outfalls	TOTALS
Very Poor	$ 132,000	$ 1,196,000	$ 80,000	$ 1,203,000	$ 18,000	$ 2,629,000
Poor	$ 132,000	$ 11,956,000	$ 1,559,000	$ 12,033,000	$ 172,000	$ 25,852,000
Fair	$ 515,000	$ 27,505,000	$ 2,077,000	$ 28,479,000	$ 387,000	$ 58,963,000
TOTALS	$ 779,000	$ 40,657,000	$ 3,717,000	$ 41,714,000	$ 577,000	$ 87,444,000

From this table it can be seen that the maximum backlog for all conditions and for all kinds of infrastructure is estimated to be $87.4M dollars (including combined sewer pipe system). This total may be beyond the City's financial capability with respect to a tax-based or user-fee based funding mechanism. For example, if the user fee were set at $5.00 per ERU per month, it would take almost 30 years for the current backlog to be removed.

However, choices must be made as to which conditions warrant city action, and what categories would be funded by a stormwater user fee. Several combinations of decision would change the total. For example:

- Excluding all infrastructures in "fair" condition would eliminate almost $59M dollars bringing the total to $28.5M (Poor and Very Poor infrastructure).
- Excluding the Combined Sewer Pipes expenses with the reasoning that they are wastewater expenses would bring the total to $45.7M.
- Excluding both fair condition and Combined Sewer Pipes expenses will bring the total to $15.2M.

A subsequent recommendation was made that that all combined sewer pipes remedial repair be eliminated from consideration at this time, and that costs for stormwater pipes be adjusted downward by 25% as a conservative accounting for uncertainties regarding actual pipe condition. This adjustment factor could be reconsidered during stormwater utility feasibility analysis if additional televising data is made available by the City or through additional data collection acquired through the feasibility study. Table 3 reflects these recommendations.

Table 3. Modified Overall Results of Inventory Extrapolation

Condition	Stormwater Manholes	Stormwater Pipes	Catch Basins	Combined Sewer Pipes	Outfalls	TOTALS
Very Poor	$ 132,000	$ 897,000	$ 80,000	$ -	$ 18,000	$ 1,127,000
Poor	$ 132,000	$ 8,967,000	$ 1,559,000	$ -	$ 172,000	$ 10,830,000
Fair	$ 515,000	$ 20,629,000	$ 2,077,000	$ -	$ 387,000	$ 23,608,000
TOTALS	$ 779,000	$ 30,493,000	$ 3,717,000	$ -	$ 577,000	$ 35,565,000

Program Cost Development

W&C and Portland staff have evaluated original DIMS program costs and supplemented the worksheet with updated cost estimates for various stormwater program needs. The program cost updates have been based on requirements under the City's Municipal Separate Storm Sewer System (MS4) permit and recent restoration recommendations in the impaired Capisic Brook watershed. These updated costs have been integrated into the overall program cost of service. Changes to the cost of service estimate (COS) made by W&C and Portland staff is reflected in this report. There will be a need to refine estimated stormwater program costs during future stormwater utility feasibility analysis.

Based on these estimates the total stormwater program cost is estimated at $1.78M annually. These costs include General Routine Maintenance (street sweeping and catchbasin cleaning), Regulatory Compliance & Enforcement, Engineering and Planning, Technical Support, Public Education, and Miscellaneous Administration.

Summary of Costs and Rates

Referring to Table 2 and the *Program Cost* worksheet in the *Stormwater Program Cost Summary* spreadsheet, the total program cost then includes both an annual stormwater program cost of $1.78M plus a remedial maintenance cost. Based on Table 3 the existing remedial maintenance backlog that will be addressed by the user fee is $35.56M. This backlog will be addressed over a period of years.

During that time others specific parts of the system or structures will deteriorate and will need to be added to the backlog. A reasonable assumption is that the backlog might grow at about 2% per year. Taking this into account Table 4 provides annual remedial maintenance costs to work off the current and incremental backlog within the planning horizon.

For example, if a 20 year planning horizon is chosen the annual remedial maintenance cost is estimated to be $2.1M.

The right hand column is the estimated monthly fee per ERU for that combination of basic stormwater program plus annual remedial maintenance cost from the second column.

Table 4. Annual Remedial Maintenance Costs and Total Fee

Planning Horizon (years)	Projected Annual Cost ($$)	Monthly Total User Fee Per ERU ($$)
10	$ 3,882,000	$ 9.39
20	$ 2,132,000	$ 6.49
30	$ 1,557,000	$ 5.54
40	$ 1,275,000	$ 5.07

In closing this addendum to the DIMS study, several things should be pointed out. First of all, it should be noted that the updated cost items outside the inventory extrapolation were not the product of a rigorous analysis of the implications either of future compliance requirements or of a comprehensive discussion of which costs should be recognized as “stormwater” costs and which properly reside in other budgetary areas. The decision was made to make a preliminary best estimate of changes from the original DIMS analysis and reserve a more detailed analysis for a future time should the decision be made to move forward with additional feasibility analysis and decision making.

Secondly, the decision of which inventory-based remedial maintenance costs to include in stormwater was made independent of a more comprehensive look at the allocation of infrastructure costs generally and levels of service offered by the City. The inventory extrapolation results are the best data available, but are admittedly estimates. When more experience is gained in remedial maintenance of the system and a broader inventory is completed these numbers can be tightened. However, a wider staff group should review decisions and their implications.

Lastly, the monthly rates per ERU reflected in Table 4 may or may not be above a perceived willingness to pay for stormwater management in the City. Stormwater must, even as a separate user fee, compete with other demands. Such balancing of priorities should be made by a larger and more widely constituted group.

It is clear that hard decisions must be made on the establishment of priorities for stormwater expenditure, an acceptable level of user fee, and other decisions about the rate basis, credits, etc. We recommend that these decisions be made during a feasibility study wherein a larger stakeholder group systematically moves through a decision process culminating in answers in these key areas.

ATTACHMENT A: INFRASTRUCTURE REPORT

Portland Stormwater Infrastructure Analysis

Quick Summary

AMEC was tasked with estimating remedial costs for stormwater infrastructure in Portland focusing on catch basins, manholes, outfalls and sewer lines. AMEC was provided:

GIS data layers from the City of Portland GIS;

Tabular information regarding field sampling of condition data for 193 catch basins (191 referenced in the GIS), 79 manholes and 3 outfalls (2 in the GIS);
Unit cost data for structure rehabilitation or replacement was provided based on specific infrastructure types, depth or size, and physical condition.

The objective was to take this data and attempt to extrapolate it to city-wide costs for system rehabilitation.

Extrapolation

The tabular data was combined with the GIS to examine the geographic distribution of structures. The GIS coverage was defined as the universe of data that would be considered. For example, the largest pipe exiting from a manhole was assumed to be the drain pipe and pipe system length calculated accordingly.

Data not in the GIS layer is unknown and was not considered. In addition, size information was available on 67.4 out of 139.8 miles of storm sewer pipe and 113.9 out of 136.6 miles of CSO pipe. Size and condition distributions were extrapolated to the rest of the system in the same proportions.

We evaluated the available data to determine if there was any significant correlation with specific variables:

- The field data could not be correlated to land use so as to develop a land use based extrapolation
- No condition information is available combined sewer lines, storm sewer lines and only three outfalls were collected.
- There was a slight correlation with condition and percent impervious (>PI<condition)
- There was a slight correlation with condition and elevation (<elevation <condition)
- There was a slight correlation with condition and slope-break (condition worse just below steep to flat slope break)

None of these correlations could be extrapolated in a meaningful way.

Since these relationships were not strong enough to warrant geographic analysis, statistical distributions of the conditions of the structures that do have sufficient data were used to extrapolate costs across the populations of each type of infrastructure. This assumption needs to be ground-truthed with Portland staff.

Worksheet Description

Note the annotations within the spreadsheet as to assumptions or ancillary information.

Samples

- Green Shaded – field inventory information
- Unshaded – GIS database interpretation

GIS Populations

The overall populations are given for each type of infrastructure examined.

- For catch basins, the number was taken from the count in the Portland GIS layer "sde_PORTGIS_CatchBasin."
- The manhole count was taken from "sde_PORTGIS_ManholeD," and
- outfalls from "sde_PORTGIS_DischargePointD."
- Sewer line quantities were determined in length of pipe (given in feet) in the layers "sde_PORTGIS_StormMain" and "sde_PORTGIS_SewerMain."

These population numbers were used for extrapolation in the third worksheet, "Extrapolations," and if changed, all extrapolated numbers should change as well.

Extrapolations

Worksheet contains attributes that can be used to derive more specific distribution data on what structures need to be repaired or replaced: depth, size, material, condition (as appropriate). These attributes were only present for a subset of the total population, for example only 58 manholes had depth information out of the population of 1846. Exit pipe diameters in all cases were derived using GIS analysis to find the largest diameter pipe touching each structure. Outfalls had too few structures sample to create a condition distribution and no condition information was part of the sampling protocol for pipes. This would require camera equipment not part of the original scope of services.

Where condition data did not exist, AMEC worked under the assumption that the distributions from other structures could be averaged to estimate condition. As the condition distributions were similar for catch basins and manholes, this assumption may be safely applied to outfalls.

The assumption was also applied to sewer lines though this may be a weaker assumption. If the distributions are updated in the "Extrapolations" worksheet then the pricing information will update accordingly. Therefore a CSO and Storm Sewer pipe adjustment factor was supplied as shown on the right of the spreadsheet. These factors are NOT changed on this sheet but on the Cost Summary sheet at the end of the workbook. Only the values are shown here. Changing these values will reapportion the condition information applying only that fraction of the factor to the three conditions: "Very Poor", "Poor" and "Fair". For example using a 0.75 factor reduces each of these three conditions by 25% of their original value and reapportions that number of structures and percentage to the "Good" and "Very Good" categories where no cost is attributed.

Pricing

The distribution information is applied equally among each set of attributes to further partition structure information. For example, 554 of the 1846 manholes had a depth of 0-6 feet. Of those 1846, 1216 manholes had an exit pipe (i.e. largest pipe touching) diameter greater than 8 inches and less than or equal to 18 inches. Of those 1846 manholes, 23 should be considered in poor condition. Conditions of Good and Very Good were not included as AMEC assumed that no repair or replacement would need to occur for those conditions.

Cost information was developed by Woodard & Curran and entered in the red boxes associated with that type of structure. For example, the replacement cost of $4,000 for a manhole 0-6 feet deep with an exit pipe diameter of less than or equal to 8 inches with a condition of "Poor" was entered into cell 'F7.' Once unit costs were entered, total costs were calculated for each structure type in the distribution.

Cost Summary

These totals were summed on the final worksheet, “Cost Summary.”

Program Costs

This is the program cost spreadsheet from the DIMS study. It has been modified to reflect several major changes based on Woodard & Curran input. The changes are highlighted in yellow and include: street sweeping, catch basin cleaning, and public involvement and education.

ATTACHMENT B: COST ESTIMATE WORKSHEETS

COMMITMENT & INTEGRITY
DRIVE RESULTS

41 Hutchins Drive
Portland, Maine 04102
Tel. 207-774-2112

CLIENT	City of Portland		
PROJECT	Stormwater Assets Inventory		
DESIGNED BY	ZH	DATE	1/21/2011
COST BY	MRD	DATE	1/21/2011
CHECKED BY	ZH and DS	DATE	
PROJECT NO.	222804.25		

Stormwater Infrastructure Maintenance - Opinion of Probable Cost

	Unit	Unit Cost	Notes
Pipe Replacement			
Pipe Diamenter <8-in	LF	$ 130.00	*For each pipe size range, the upper end of the size range is used for cost determination. Exception for pipe sizes greater than 18", where 36" diameter is used.*
Pipe Diamenter 8-in to 18-in	LF	$ 150.00	*8" to 18" diameter pipe assumed to be PVC. RCP is assumed material for pipe diameters greater than 18".*
Pipe Diamenter >18-in	LF	$ 240.00	*If location of old pipe is within 4' horizontal of excavation of new pipe, cost of demolition of old pipe is considered incidental to the cost of new pipe.*
			No structural rock removal is anticipated.

	Unit	Unit Cost	Notes
Structure Replacement			*Structure Replacement cost includes all appurtenances (barrel section, cone section, brick riser, frame and grate or cover).*
Catch Basin, 48-in Diameter			*If the center of the old manhole is within 8' horizontal of the center of the new manhole, cost of demolition of old manhole is considered incidental to the cost of new manhole.*
Depth to invert <=6ft	EA	$ 3,700.00	*Catch Basin replacement assumes re-use of existing granite curb sections.*
Depth to invert >6ft	EA	$ 6,000.00	*Replacement of brick riser only assumes re-use of existing frame/cover.*
Manhole, 48-in Diameter			*Replacement of brick riser only assumes 3-layers of brick.*
Depth to invert <=6ft	EA	$ 4,000.00	
Depth to invert >6ft	EA	$ 6,500.00	*No structural rock removal is anticipated.*
Brick Riser Replacement	EA	$ 1,000.00	

	Unit	Unit Cost	Notes
Pipe Maintenance			
Cured in place pipe (CIPP), <8-in	LF	$ 70.00	*CIPP cost estimate on City of Portland information.*
Cured in place pipe (CIPP), 8-in to 18-in	LF	$ 110.00	*CIPP cost includes flaggers and traffic control*
Cured in place pipe (CIPP), >18-in	LF	$ 370.00	
Jetting	LF	$ 0.50	*Jetting cost provided by City of Portland*

Additional Assumptions:

Unit costs provided for this estimate are installed costs based on those presented for projects recently completed in Portland, Maine.
Maintenance costs are not included at this time
All structure and pipe installation, invert fabrication, and materials are in accordance with City of Portland Design Standards

For Pipe Replacement, the following are included in the linear foot cost:

- Pavement Demolition
- Pipe bedding
- Granualar Borrow
- Test Pit Excavation
- Crushed Stone (Overdepth)
- Earth Excavation (Overdepth)
- Trench paving
- Altering Existing Catch Basin or Manhole
- Reset Type 1 Curb
- Insert-A-Tee Pipe
- White or Yellow Paint Pavement Marking Line
- Dust Control
- Density Test
- Flaggers
- Traffic
- Erosion Control

COMMITMENT & INTEGRITY
DRIVE RESULTS

41 Hutchins Drive
Portland, Maine 04102
Tel. 207-774-2112

CLIENT	Portland, ME
PROJECT	Portland Stormwater
DESIGNED BY	ZLH
COST BY	AJM
CHECKED BY	ZLH
PROJECT NO.	222804.25

DATE	1/21/2011
DATE	1/21/2011
DATE	1/21/2011
SHEET NO.	1 of 1

Compliance Street Sweeping Cost Estimates

STREET SWEEPING ASSUMPTIONS	
13 Lane-miles per day	290 CY disposed annually
2 No. of operators	12 CY disposed per trip
$23.99 Hourly Labor Rate	$149 per CY disposed

CAPITAL OPERATIONS AND MAINTENANCE

Equipment & Maintenance	Unit Cost per Hour	Hours per Event	O&M Cost per Event	Annual O&M Costs
Tymco 500x Street Sweeper	$ 85.00	95	$ 8,107.69	$ 32,430.77
Disposal		6	$ 10,911.19	$ 43,644.76
		Annual Capital Replacement and Maintenance		*$ 76,075.53*

SWEEPING LABOR

	Lane-Miles	Labor Cost per Event	Annual Sweeping Labor Costs
Town & State Roadways under responsibility of City	124.0	$ 4,576.55	$ 18,306.22
		Annual Street Sweeping Labor	*$ 18,400.00*
		TOTAL ANNUAL STREET SWEEPING COSTS	*$ 94,475.53*

Cost Analysis Assumptions:

1. Annual Street Sweeping Costs assume quarterly sweeping of all town- and state-owned roadways within impaired watersheds.
2. Capital Operations and Maintenance Costs have been normalized by the City of Portland and incorporated into an hourly rate of use.
3. Costs apply to sweeping of Town- and State-owned roads only.
4. Town and State roadway miles per GIS analysis. Two (2) lane-miles assumed per mile of roadway.
5. Ten (10) -hour work days.

COMMITMENT & INTEGRITY
DRIVE RESULTS

41 Hutchins Drive
Portland, Maine 04102
Tel. 207-774-2112

CLIENT	Portland, ME	DATE	1/21/2011
PROJECT	Portland Stormwater	DATE	1/21/2011
DESIGNED BY	ZLH	DATE	1/21/2011
COST BY	AJM	SHEET NO.	1 of 1
CHECKED BY	ZLH		
PROJECT NO.	222804.25		

Catch Basin Cleaning Cost Estimates

	No. Catch Basins	*Cost per Catch Basin*	*Cost per Event*	*Annual CB Cleaning Costs*
Catch Basin Cleaning	3111	$ 83.96	$ 261,199.56	$ 261,199.56
		TOTAL ANNUAL CATCH BASIN CLEANING COSTS		*$ 261,199.56*

Cost Analysis Assumptions:

1. Assumes 1/2 catch basins are cleaned annually.
2. Catch basin cleaning unit cost includes labor, equipment and disposal costs - as provided by City of Portland.
3. Number of catch basins were determined using GIS database.
4. Costs apply to catch basins located within the City of Portland or State roadway ROW only.

City of Portland Public Services
Stormwater Maintenance Cost Estimates
January 2011

Task	Man Hours	Labor Cost	Equipment Cost	Materials Cost	Cost Per Linear Foot (Estimated)	Total Repair Cost	Assumptions
Parging Brick / Manhole Riser	16	$381.44	$276	$150		$807.44	
Replace Cover	4	$95.36	$50	$130		$275.36	
Replace Headstone	40	$953.60	$680	$500		$2,133.60	
Install Casco Trap	8	$190.72	$100	$300		$590.72	
Parging Barrel / Shelf (Cracks / Loose Brick)	24	$572.16	$400	$200		$1,172.16	
Televise (Daily Rate)	20	$580.80	$248		$0.75	$828.80	Daily rate and cost per linear foot.
Jetting					$0.50		City jet vactor cost.
Outfall Maintenance (plunge pool touch up and erosion control)						$1,500	City estimate for repair does not include permitting.
Outfall Replacement (plunge pool rebuild and erosion control)						$2,000	City estimate for replace does not include permitting.

Note: Cost estimates provided by City of Portland Public Services Staff.
Labor Assumptions: Assumes based labor rate and fringe benefits.
Equipment Costs: Based on 2010 FEMA schedule.
Materials Costs: Supplier costs for materials.

ATTACHMENT C: FIELD DATA COLLECTION FORMS

(ADAPTED FROM CITY OF PORTLAND)

Asset Attribution Inspection

(W&C Modified 11-18-2010)

Date & Time: MM/DD/YYYY	Work Order #: [WorkOrderID] N/A
Inspector: W&C City of Portland	Asset ID: [EntityUIDs City Unique Identifier
Vehicle: N/A	Location: [EntLocation] Street Name
Catchment: N/A	Grate Type (Circle One): Cast Iron, Cascade, Beehive, Other
Grade: Above At Below	Ring Material: Barrel Block, Brick, Precast, Other Basin Material: Stone, Brick, Concrete, Other
Headstone (Circle One): 4 Foot 6 Foot	Trap/Hydrobrake: Yes or No
Rim to Invert: Inches	Pet Waste (Amount): Number of Bags
Needles (Number): Number of Needles	Photo ID: We have taken one photo of Asset ID number externally Then one internally

Asset Attribution Inspection

(W&C Modified 11-18-2010)

Feature	Condition
Cover/Grate	0-5 Rationale: 4 or 5 used to indicate if a replacement cover is necessary due to incorrect cover type as well as condition of cover.
Frame Type: Cast Iron or Other	0-5
Ring Type: Barrel Block, Brick, Precast, Other	0-5 Rationale: 3 indicate parging or other simple maintenance, 4 or 5 indicates saw cut, removal and replacement of entire riser structure.
Rungs Type: Cast Iron, Steel, Plastic, Aluminum, Brick	0-5
Basin Type: Stone, Brick, Concrete, Other	0-5
Trap: Yes or No	0 (Abandoned/NA), 1 (Good), 3 (Replace), 5 (Install) Rationale: If no trap then install.
Hydrobrake	0-5
Invert Out Type: Brick, Asbestos Concrete Pipe, Cast Iron Pipe, Corrugated Metal Pipe, Ductile Iron Pipe, High Density Polyethylene Pipe, Polyvinyl Chloride, Reinforced Concrete Pipe, Vitrified Clay Pipe, Wood	0 (Abandoned/NA) 1 - Good 3 - TV or inspect 5 - Replace Rationale: If any indication of issue then 3 even in underdrain or pipe connections.
Invert Depth: Inches	N/A
Headstone Type: 4 foot or 6 foot	0-5
Overall Structure Condition: Rationale: 4 or 5 indicate replace entire structure, 3 indicate that some level of service is needed, 1-2 means okay. If any of the individual structural condition assessment was a 3, 4 or 5 then this should be at least a 3.	0-5
IDDE	Yes or No Rationale: Indicates if IDDE inspection is required at this location

Asset Attribution Inspection

(W&C Modified 11-18-2010)

Comments:

Number of buckets removed: N/A

Grade	Condition	Description
0	Abandoned	No longer in service
1	Very Good	Operable and well-maintained
2	Good	Superficial wear and tear
3	Fair	Significant wear and tear; minor deficiencies
4	Poor	Major deficiencies
5	Very Poor	Obsolete

Manhole Asset Attribution Inspection

(W&C Modified 11-18-2010)

Date: **MM/DD/YYYY**	**Inspector & Vehicle:** **W&C** **City of Portland**	**Asset ID:** **City Unique Identifier**
Location: **Street Name**	**Work Order #:** N/A	

Feature	Attribute	Condition Rating
Cover Size:	(inches)	N/A
Cover Type:	No Hole, 1 Hole, Locking, Perforated	0-5 Rationale: 4 or 5 used to indicate if a replacement cover is necessary due to incorrect cover type as well as condition of cover.
Frame Size:	(inches)	N/A
Frame Type:	Cast Iron, Other	0-5
Riser Material:	Barrel Block, Brick, Precast, Other	0-5 Rationale: 3 indicate parging or other simple maintenance, 4 or 5 indicates saw cut, removal and replacement of entire riser structure.
Barrel Material:	Stone, Brick, Concrete, Other	0-5
Barrel Size:	(inches)	N/A
Rung Material:	Cast Iron, Steel, Plastic, Aluminum, Brick	0-5
Shelf Material:	Brick, Cast in Place Concrete, Fiberglass, Other	0-5
Invert Material: **This is the condition of the pipe out of the manhole visible from the structure**	Brick, Asbestos Concrete Pipe, Cast Iron Pipe, Corrugated Metal Pipe, Ductile Iron Pipe, High Density Polyethylene Pipe, Polyvinyl Chloride, Reinforced Concrete Pipe, Vitrified Clay Pipe, Wood	0-5
Depth From Rim To Invert:	(inches)	N/A
Surcharge:	Yes or No	N/A
Rim To Surcharge:	(inches if applicable)	N/A

Manhole Asset Attribution Inspection

(W&C Modified 11-18-2010)

Exterior Photo ID:	We have taken one photo of Asset ID number externally	N/A
Interior Photo ID:	Then one internally	N/A
Overall Structural Condition	Rationale: 4 or 5 indicate replace entire structure, 3 indicate that some level of service is needed, 1-2 means okay. If any of the individual structural condition assessment was a 3, 4 or 5 then this should be at least a 3.	0-5
IDDE	Yes or No Rationale: Indicates if IDDE inspection is required at this location	N/A
Notes		

Outfall Attribution Inspection

(W&C Created 11-18-2010)

Date: **MM/DD/YYYY**	**Inspector & Vehicle:** **W&C** **City of Portland**	**Asset ID:** **City Unique Identifier**
Location: **Street Name**	**Work Order #:** N/A	

Feature	Attribute	Condition Rating
Fortification	None, Loose Stone, Rip Rap, Stone Headwall, Concrete Headwall	0-5 Rationale: 3 is maintenance, 4 or 5 is rebuild/replace
Outfall Material Type:	Brick, Asbestos Concrete Pipe, Cast Iron Pipe, Corrugated Metal Pipe, Ductile Iron Pipe, High Density Polyethylene Pipe, Polyvinyl Chloride, Reinforced Concrete Pipe, Vitrified Clay Pipe, Wood	0-5 Rationale: 3 if minor maintenance needed, 4 or 5 used to indicate if a replacement is necessary.
Discharge Environment:	Plunge Pool, Rip Rap Swale, Rip Rap Apron, Rip Rap with Check Dam, Open Ditch, Stream	N/A
Submerged Outfall:	Yes or No	N/A
Screen Present:	Yes or No	N/A
Notes:		N/A
Photo ID:	One photo taken of outfall with ID	N/A

Attachment 4:

Case Studies

BUILDING A WORLD OF DIFFERENCE®

2010

STORMWATER UTILITY SURVEY

Sponsored and administered by
B&V Management Consulting.

BLACK & VEATCH
Building a world of difference.®

Table of Contents

Black & Veatch is pleased to present the results of its eighth national Stormwater Utility Survey. The primary objectives of the bi-annual survey are (i) to provide valuable benchmark information on a multitude of parameters specific to stormwater utility operations and user fee programs, and (ii) to help those involved with stormwater utilities stay well-informed regarding stormwater utility management issues and trends.

Survey Overview

- Organization/Administration
- Planning
- Operations
- Finance/Accounting
- Stormwater User Fees and Billing
- Quality Issues/Best Management Practices
- Public Information/Education
- Major Challenges/Events Affecting Utilities

Profile of Respondents

The survey was conducted online during fall of 2009. The profile of the respondents is as follows:

- Responses were received from 70 utilities in 20 states. All of these utilities are funded in whole or in part through user fees.
- Approximately 81% of the respondents serve a city, rather than a county or region.
- The population served by the respondents ranges from 5,800 (Fort Meade, FL) to 4 million people (Los Angeles, CA) and the area served varies from 6 to 2,000 square miles.
- For those utilities that base charges on gross property area, an Equivalent Residential Unit (ERU) ranged from 2,090 square feet to 14,500 square feet of total parcel area, with a mean of 7,253 square feet. For those utilities that base charges on impervious area, an ERU ranged from 305 square feet to 3,600 square feet of impervious area, with a mean of 2,453 square feet.

What's New

In this 2010 survey we have added questions pertaining to three additional stormwater related issues, namely:

- Combined Sewer Overflow (CSO) Mitigation
- Billing System
- Parcel Data Management

CSO Mitigation: As more and more utilities are dealing with the regulatory requirements associated with the mitigation of combined sewer overflow (CSO) issues, we added three questions to our survey on this topic. While 21% of respondents indicated that their stormwater utility is currently dealing with CSO issues, only 7 percent actually recover the costs associated with CSO mitigation in their stormwater user fee.

Billing System: One of the major issues that needs to be addressed when implementing a stormwater user fee program is defining the billing system that would facilitate stormwater user fee billing. Billing stormwater user fees through an existing water/sewer utility billing system is cost effective as the system could be configured with minimum programming. Further, this option reinforces the principle that a stormwater fee is another legitimate utility fee similar to water and sewer fees. However, some utilities have chosen alternative billing methods due to specific circumstances, such as lack of cross referencing between a parcel location and an existing water/sewer account or lack of access to an existing water/sewer utility billing system. In this survey, 64% of the respondents indicated they use the existing water or sewer utility billing system to bill user fees.

Parcel Data Management: Establishing the initial master account file for stormwater user fee billing is a large undertaking. However, maintaining the parcel information and updating it periodically to reflect the changes that occur to each parcel is even more of a challenge. Therefore, in this survey, we've added several questions related to the topic of ongoing parcel data management.

Comparative Results

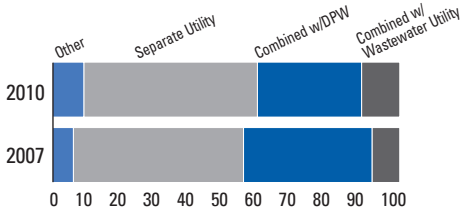
Black & Veatch has conducted similar national stormwater utility surveys since 1991. Comparisons of current and prior survey results provide insights into possible industry changes. Look for comparisons of responses to selected questions in the following survey results. Please note, however, that these comparisons are not necessarily indicative of trends, because the respondents may be different.

It is our hope that the information provided in this report will be a valuable resource to those involved in the stormwater industry. To learn more about Black & Veatch services, please refer to the back cover for contact information.

Organization/Administration

How is your operation organized?

50% Separate utility
30% Combined with Dept. of Public Works
11% Combined with wastewater utility
9% Other

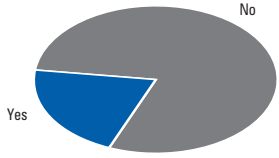


If organized as a separate utility, does the same governance manage both stormwater and wastewater?

55% Yes
45% No

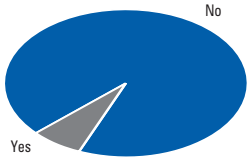
Is your utility currently dealing with regulatory requirements pertaining to the mitigation of CSO issues?

21% Yes
79% No



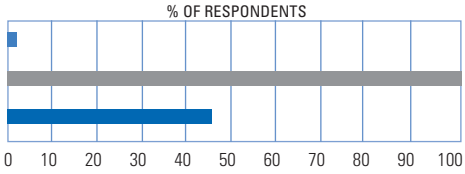
Does your stormwater utility recover costs related to CSO mitigation?

7% Yes
93% No



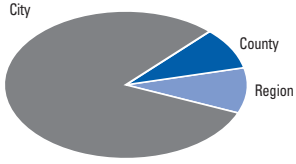
If yes, what percentage of stormwater costs relate to CSO Issues?

2% Minimum
100% Maximum
46% Average



What area does utility serve?

81% City
10% Region
9% County

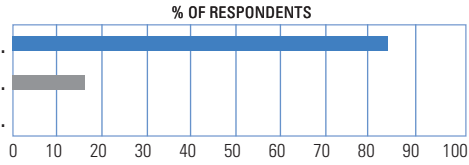


Planning

What is your NPDES Permit & Permit Status?

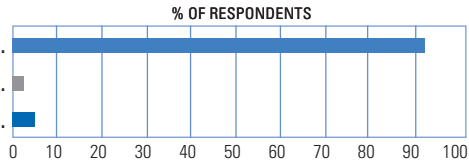
Phase 1 (100,000 population and over)

84% Application submitted and approved.....
16% Application submitted and pending. .....
0% Application has not been submitted. .....



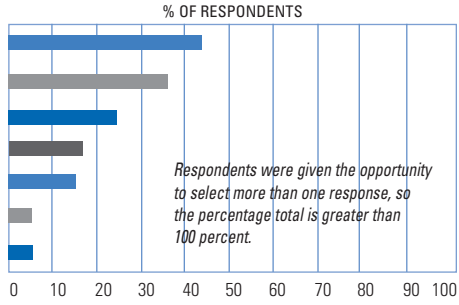
Phase 2 (under 100,000 population)

92% Application submitted and approved.....
3% Application submitted and pending. .....
5% Application has not been submitted. .....



What performance indicators do you consider most important in measuring improvements?

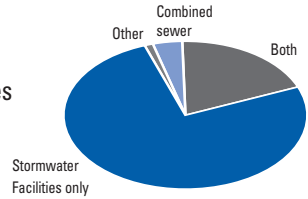
43% Flood control .....
37% Monitoring pollutants.....
23% Customer complaints/satisfaction.....
17% Cost control measures.....
16% Maintenance.....
6% Habitat.....
6% Erosion control.....



Operations

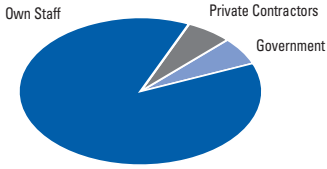
What is your utility responsible for?

76% Stormwater facilities only
4% Combined sewer (Sanitary/stormwater) facilities
19% Both
1% Other



Who provides the majority of your stormwater O&M services?

88% "Own Staff" provide majority of services
6% "Other Governmental Staff" provide majority of services
6% "Private contractors/agencies" provide majority of services



Finance/Accounting

What are your major (at least 90 percent of total income) revenue sources?

80% Stormwater user fee

20% Multiple Revenue Sources

How adequate is available funding?

7% Adequate to meet all needs

2007 = 8% • 2005 = 13% • 2002 = 8%

36% Adequate to meet most needs

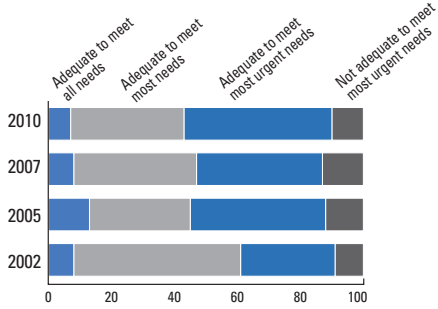
2007 = 39% • 2005 = 32% • 2002 = 53%

47% Adequate to meet most urgent needs

2007 = 40% • 2005 = 43% • 2002 = 30%

10% Not adequate to meet urgent needs

2007 = 13% • 2005 = 12% • 2002 = 9%



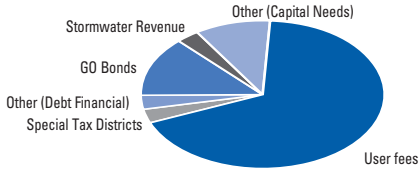
How is the majority of capital needs financed?

81% Cash financed

- 68% From user fees
- 3% From special tax districts
- 10% Other

19% Debt financed

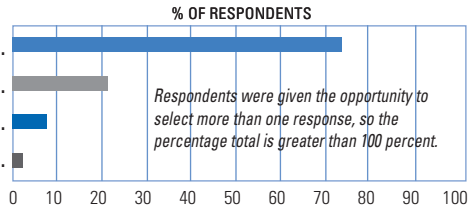
- 13% From General Obligation (GO) bonds
- 3% From Stormwater Revenue bonds
- 3% Other



Stormwater User Fees and Billing

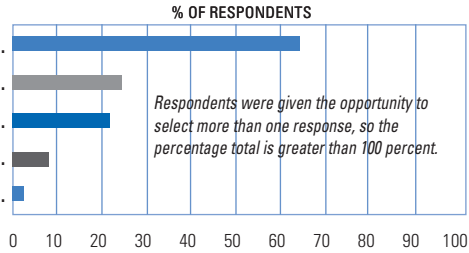
How are user fees billed?

75% Included with water/other utility bills
21% Included with tax bills
7% Special bills
3% Other



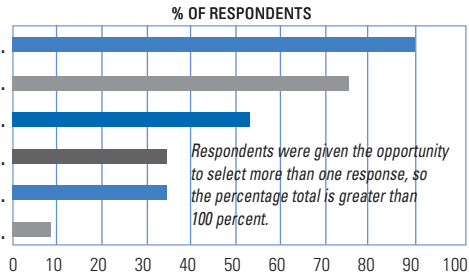
What system do you use to bill user fees?

64% Water or Sewer Utility Billing System
25% Stormwater Utility Billing system
22% Property tax billing system
8% Geographic Information System (GIS)
3% Other



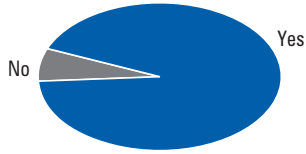
What customer classifications are recognized in you stormwater fee structure?

90% Residential
76% Commercial
53% Industrial
34% Combined commercial/industrial
34% Other
9% No designation



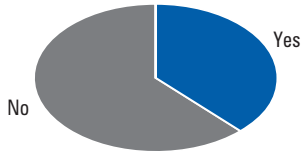
Are rates the same for all service areas or watersheds?

93% Yes
7% No



Are user fees for single family dwellings the same as for individual multiple residential units (e.g., apartments, condos)?

38% Yes
62% No



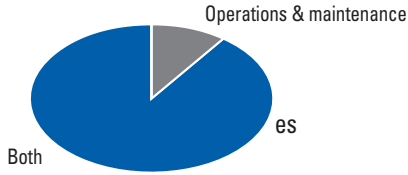
Stormwater User Fees and Billing (continued)

Were fee rates revised in last 12 months?

43% Yes
57% No

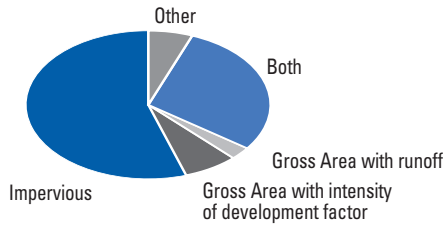
What are user fees designed to pay for?

90% Both operation & maintenance expenses, capital improvements
10% Operation & maintenance expens- only



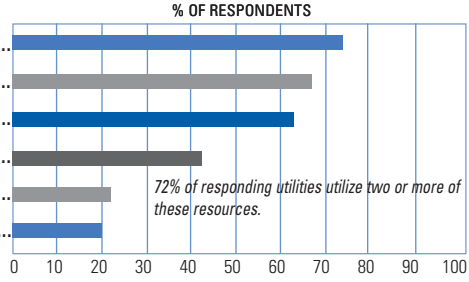
What is the basis for your user fees?

55% Impervious Area
7% Gross area with intensity of development factor
3% Gross are with runoff factor
29% Both impervious and gross areas
6% Other

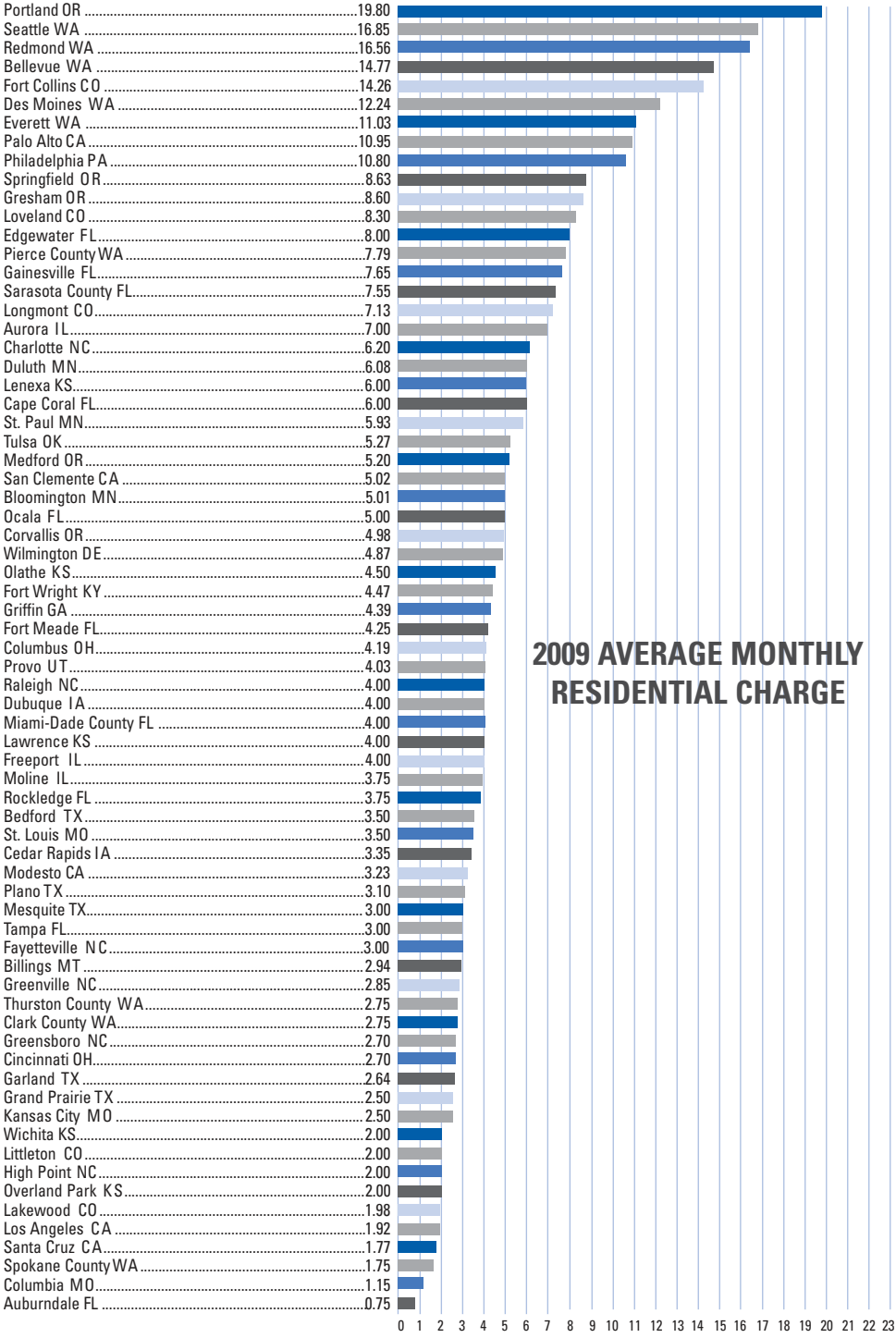


What principal resource(s) are employed to create and maintain customer data base used to compute charges?

73% Property tax assessor records
68% Geographic Information System (GIS)
63% Aerial Ortho Photographs
43% Onsite property measurement
22% Planimetric map take-offs
20% Other



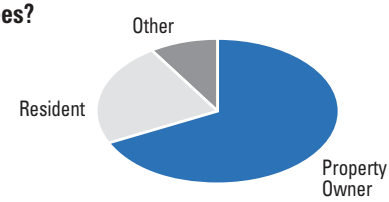
Stormwater User Fees and Billing (continued)



Stormwater User Fees and Billing (continued)

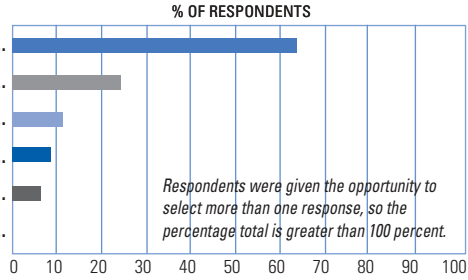
Who is responsible for payment of user fees?

68% Property owner
23% Resident
9% Other



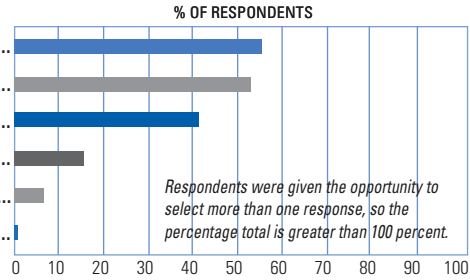
How frequently do you bill?

63% Monthly
23% Annually
11% Bi-monthly
9% Quarterly
7% Semi-annually
0% Other



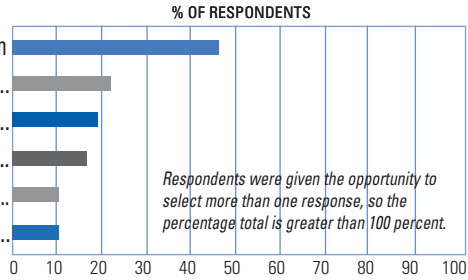
What system do you use to maintain and process customer parcel information?

55% Geographic Information System (GIS)
52% Stormwater Utility Billing System
41% Water or Sewer Utility Billing System
15% Stand-alone Stormwater Database
6% Other
1% Property tax assessment system



What is the level of integration between the multiple systems used to process parcel/billing information?

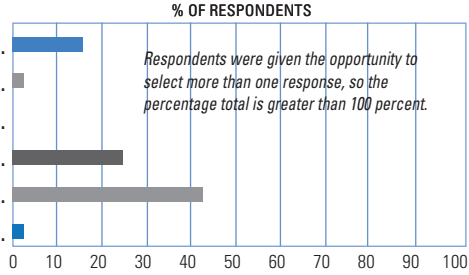
46% Stormwater database integrated with billing system
22% GIS integrated with billing system
19% Stand-alone Stormwater Database
16% Tax system integrated with billing system
11% Tax system integrated with stormwater database
11% Other



Stormwater User Fees and Billing (continued)

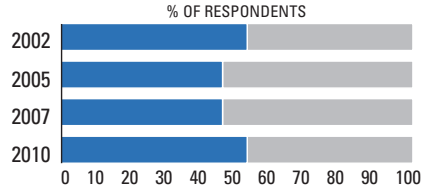
What is the frequency with which you update customer parcel information such as customer classes, gross and impervious areas, and stormwater exempt status, etc.

15% Monthly
3% Quarterly
0% Semi-Annually
24% Annually
42% No specified frequency
3% Other



Are credits provided for private detention/retention facilities?

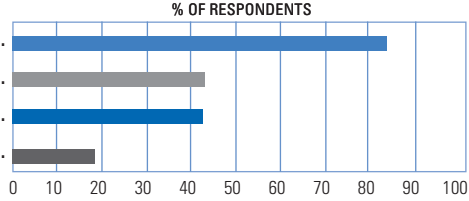
53% Yes
47% No



Do you offer credits for any of the following BMPs?

85% Retention ponds
42% Rain gardens
42% Other
18% Rain barrels

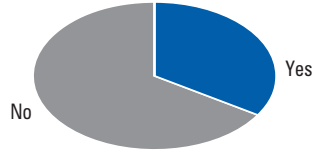
e.g. Bio-retention Swales, Green Roofs, Detention Tanks, Pervious Pavements



Respondents were given the opportunity to select more than one response, so the percentage total is greater than 100 percent.

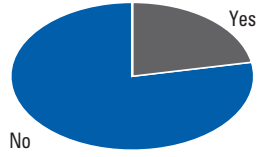
In your ordinance for new or re-development, do your planning guidelines allow for credits given for BMPS?

34% Yes
66% No



Have user fees faced a legal challenge?

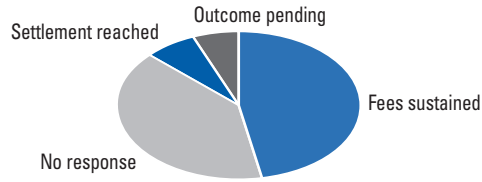
22% Yes
78% No



Stormwater User Fees and Billing (continued)

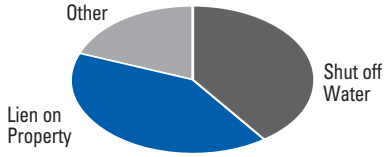
How was the challenge resolved?

47% Fees sustained
40% No response
7% Outcome pending
6% Settlement reached
0% Challenge sustained



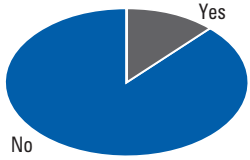
How is payment enforced?

41% Lien on property
40% Shut off water
19% Other (specify)



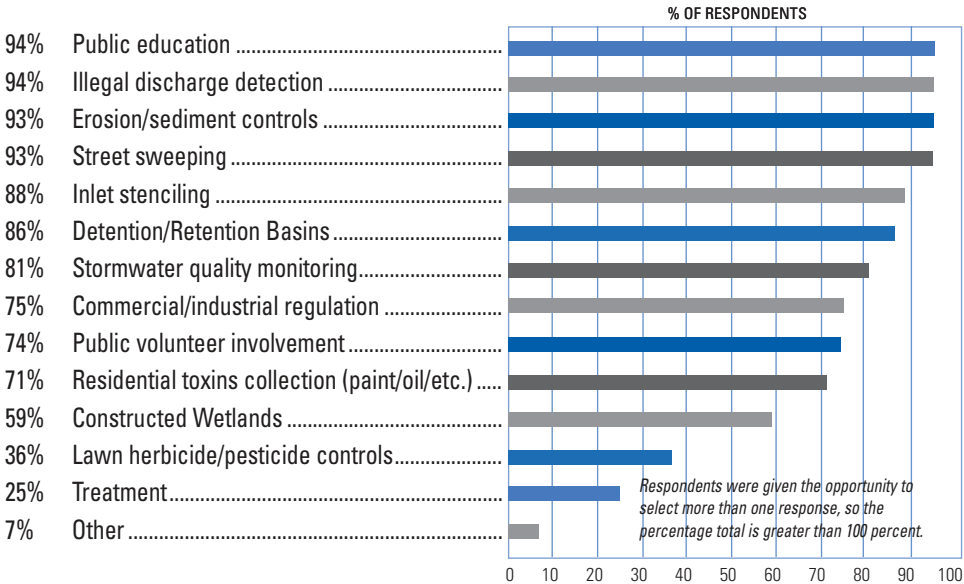
Is a significant share of utility costs attributable to stormwater from outside your service area?

12% Yes
88% No



Quality Issues/Best Management Practices

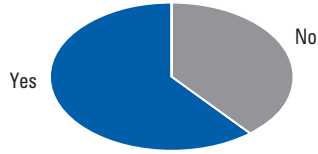
Which programs and practices are being using used to protect or improve stormwater quality?



Quality Issues/Best Management Practices (continued)

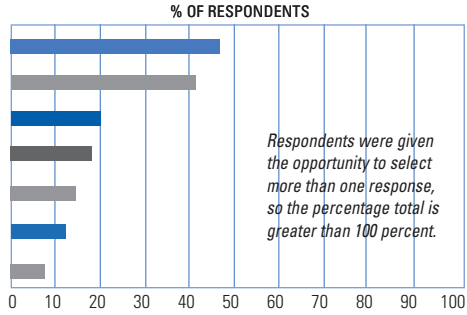
Have you installed any of these types of devices in your stormwater conveyance system?

61% Yes
39% No



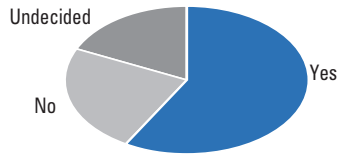
If yes, what devices were installed?

46% Other
41% Stormceptor
20% Downstream Defend
17% CDS Separator
15% StormFilter
12% Vortechnics
7% Bay Saver



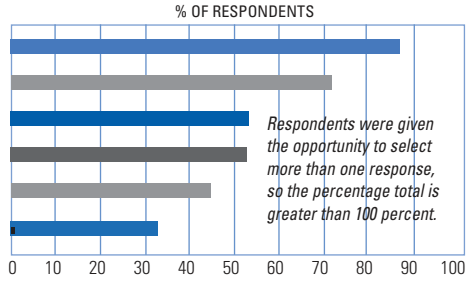
Have they met your expectations?

59% Yes
24% No
18% Undecided



What contaminants are your greatest concern?

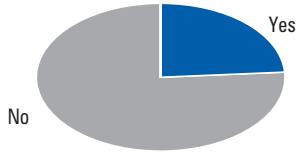
88% Sediments
71% Nutrients
52% Pesticides
52% Oil and Grease
45% Heavy Metals
32% Other



Quality Issues/Best Management Practices (continued)

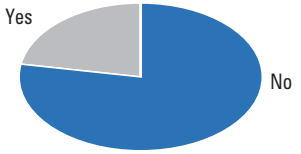
Is your utility providing end-of-pipe treatment at outfalls into waters of the states or US?

24% Yes
76% No



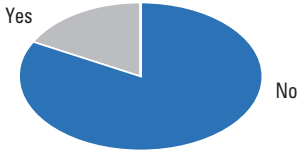
Are quantity-based user-fee credits provided to encourage customers to control or reduce stormwater pollution?

78% No
22% Yes



Are quantity-based incentives other than user-fee credits provided to customers to control or reduce stormwater pollution?

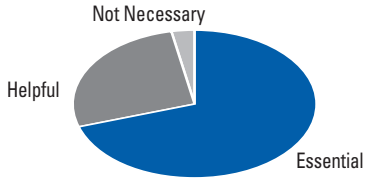
83% No
17% Yes



Public Information/Education

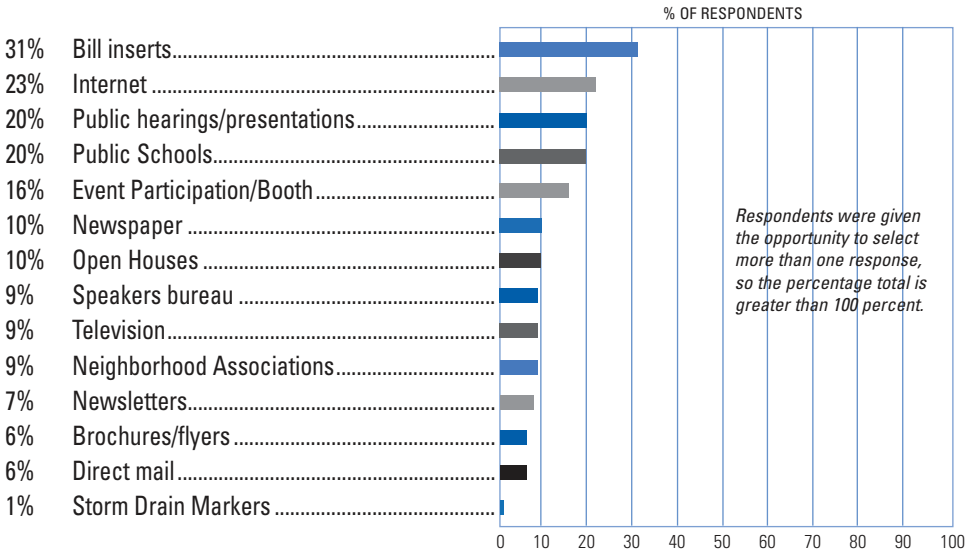
How important is an organized ongoing public information/education effort to the continuing success of a user fee funded stormwater utility?

70% Essential
27% Helpful
3% Not necessary



Public Information/Education (continued)

What means have you found to be most effective in educating the public?



Major Challenges Recently Faced

Please identify a major problem or challenge recently faced by your utility.

Financial, Rate, and Billing Related Issues ..... 21 utilities
Regulatory and Quality Control Compliance ..... 10 utilities
Infrastructure Planning Issues ..... 7 utilities
Public Education ..... 5 utilities
BMP Compliance ..... 3 utilities

Significant Events Affecting Utilities in Past Two Years

Identify two significant events that have positively or negatively affected your utility in the past two years.

Weather related (heavy rains, storms, drought) ..... 2 utilities
NPDES compliance ..... 15 utilities
CIP related (funding, projects started/completed) ..... 14 utilities
User fee related (increases, lack of increases, billing issues) ..... 12 utilities
Organization/administrative/staffing changes ..... 4 utilities
Public education/awareness ..... 2 utilities
Legal challenges ..... 1 utilities
Adoption of stormwater ordinances ..... 1 utilities

Municipal Stormwater Program Financing in Northern New England ~ May 2011

In the winter of 2010-11, USM Muskie School students[1] conducted interviews with 11 communities in Northern New England that are generally recognized as leaders in the development of municipal stormwater management programs. The broad goals of these interviews were to discover:

- what has motivated each community to be proactive in its approach to stormwater management;
- what techniques or tools each municipality has used to reduce the impacts of stormwater pollution;
- why each municipality has chosen the particular tools or techniques for stormwater management over other possible options; and
- how each community finances stormwater management.

This research should contribute to a better understanding of how municipal officials in Northern New England prioritize their stormwater management activities and needs. The data gathered will provide insight about the role local regulations play in effectively managing stormwater. It will also identify barriers and incentives for the implementation of low impact development techniques and/or watershed-based management tools.

Ultimately, the researchers hope the information gained from this effort will result in a summary of effective approaches for managing stormwater pollution while identifying any additional tools that could be useful to municipal stormwater program managers. Before the research findings are published, they will be shared with each municipality that has participated in the interviews to ensure all data has been accurately recorded.

Fourteen survey questions were developed through an extensive review process with some of Maine's prominent stormwater professionals to summarize relevant aspects of municipal stormwater management programs. The following three questions were specific to stormwater program financing:

- How does your municipality currently pay for the operation & maintenance of stormwater infrastructure and what is the total operating budget including any allocations for capital improvements?

- Do these funding sources adequately cover stormwater system O&M and capital costs and if not has the community been able to determine the approximate funding gap?

    - Has your community considered other funding mechanisms (e.g., stormwater utilities, impact fees, compensation fee utilization plans)?

---

[1] *Keisha Payson, Bowdoin College Sustainability Coordinator*
Rod Melanson, Town of Topsham Natural Resources Planner
Doug Roncarati, City of Portland Stormwater Program Coordinator
Fred Dillon, City of South Portland Stormwater Program Coordinator

- Does the municipality have enough understanding of its existing stormwater infrastructure to establish a process for considering or anticipating future infrastructure needs and associated costs?

    - If so, what does this process entail and is there a related process for prioritizing needs?

The summary of survey results is nearly completed and still needs to be vetted with all study participants. However, the following trends have emerged with respect to stormwater program financing:

- The primary financing strategies used by the municipalities include sewer user fees, general fund revenues and stormwater utilities (there were also a few cases where impact fees were used).

- Most municipalities have a fairly good idea of their current annual O&M costs though are less certain of the proportions of these costs from various program elements (e.g, planning & development review, construction inspection, noncompliance enforcement, etc.).

- Many municipalities have not yet identified their future capital needs but are currently working to improve their understanding of the various cost components.

- Most municipalities currently generate enough revenue to meet their basic MS4 permit requirements but not to meet their future anticipated capital replacement needs (particularly given regulatory uncertainties).

- Most municipalities have a fairly good understanding of their stormwater infrastructure – at least in terms of where it is as identified by GIS; their understanding of infrastructure conditions is less certain though many are actively working to develop asset management and tools.

The full summary of survey results should be available by early June. If there are other questions specifically related to stormwater program financing that would be helpful to Portland's Stormwater Funding Task Force, the researchers can inquire about them during the review process. For suggestions or more information please contact Fred Dillon at 321-9437 / fdillon@southportland.org.