Upper Narragansett Bay Regional Stormwater Utility Feasibility Study Phase I

Draft Final Report
April 2014

Prepared for:

City of Providence
On behalf of the Upper Narragansett Bay Regional Stormwater Utility Feasibility Steering Committee

With funding from:
RI Department of Environmental Management

Prepared by: AMEC Environment & Infrastructure, Inc.
271 Mill Road, Chelmsford, Massachusetts 01824

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Table of Contents

Appendices

Executive Summary

This section will be completed following the initial round of review and comments.

1.0 Introduction and Background

The City of Providence initiated this Phase I Study to evaluate the feasibility of establishing a regional stormwater utility with local communities and the Narragansett Bay Commission (NBC). Interest in the concept began following the December 4, 2012 workshop *"Regional Solutions: Exploring Stormwater Utility Districts".* Subsequently, the Phase I Feasibility Study was funded by the RI Department of Environmental Management (RIDEM) and included the following participants:

- Central Falls
- Cranston
- East Providence
- North Providence
- Providence
- Pawtucket
- Warwick
- Narragansett Bay Commission

It is important to note that this is a preliminary study to evaluate the feasibility of a regional solution that will address the financial, operational, environmental, and management issues and needs of communities in the Upper Narragansett Bay (UNB) Watershed.

<u>This Study</u>:

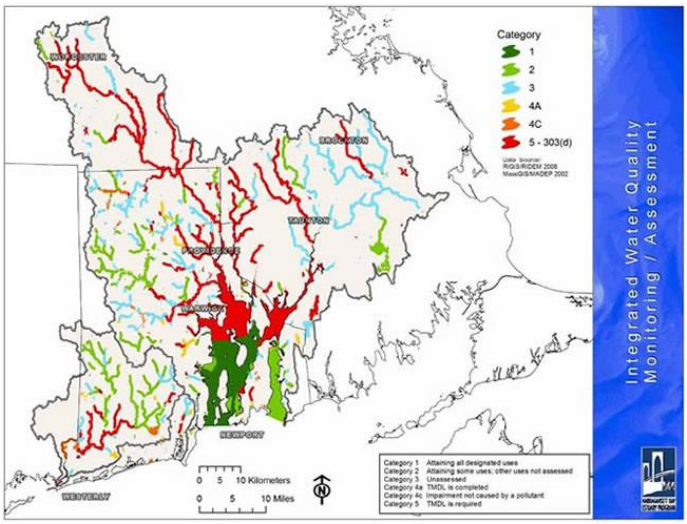
- It is the first of several phases.
- It is a concept level assessment.
- It is an initial characterization of stormwater issues, costs and drivers in each community.
- It explores regional framework alternatives.
- The outcome is a "go" or "no-go" decision on continuing the path of in-depth planning for a regional stormwater management and funding approach.

<u>Primary Objective:</u>
"Work with representatives from the participating communities to evaluate the feasibility of establishing a regional stormwater utility"

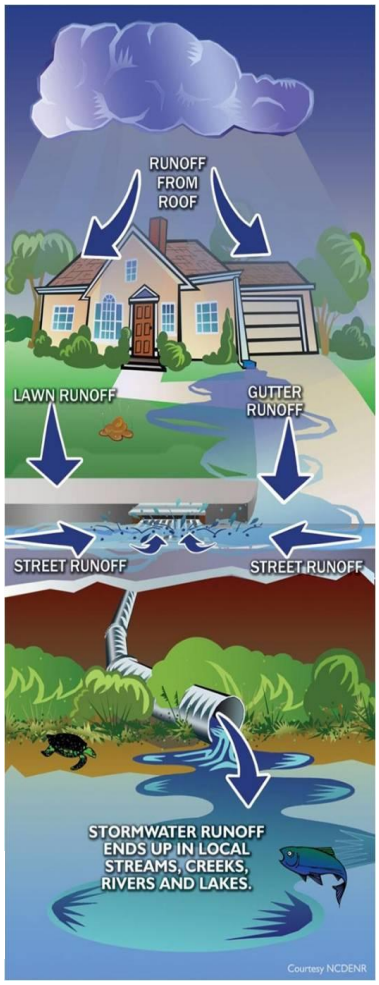
<u>This Report</u>:

- Provides an overview of water quality and stormwater management issues in the Upper Narragansett Bay area.
- Provides background information related to stormwater utilities and regional stormwater management approaches.
- Synthesizes the results of the analysis by the Project Team and information discussed at meetings with the Sustainable Stormwater Solutions Steering Committee (Steering Committee) and the Sustainable Stormwater Solutions Stakeholder Group (Stakeholder Group).
- Provides a "roadmap" to lay out the next steps for in-depth planning to support potential implementation of a regional stormwater management approach.

Ecological Context



The Narragansett Bay's 700 billion gallons of water cover 150 square miles. The watershed nurtures thousands of species of plants, fish, and wildlife as well as more than two million residents and ten million tourists each year. It welcomes more than 100,000 fishermen each year, and over 32,000 recreational boats cruise the waters. It's annual contribution to Rhode Island's economy totals billions of dollars. Additional resource information can be found at http://www.dem.ri.gov/bart/nbay.htm. Water quality in the Upper Narragansett Bay and many of its contributing tributaries (Providence River, Seekonk River, Ten Mile River, Woonasquatucket River and Blackstone River) is impaired largely due to stormwater runoff, as indicated on the above watershed map for water bodies highlighted in red. Additional information for impaired waters and the requirements to meet the Total Maximum Daily Load (TMDL)[1] studies for each of the Study Area Communities is provided in **Appendix I**.



There are multiple driving forces for enhanced stormwater management and water quality in the UNB region.

From the residents' perspective these drivers may include:

- Polluted waterways that negatively impacts recreation and fishing opportunities, including beach and shellfish closures;
- Aging and inadequate stormwater infrastructure that results in flooding of streets and private property;
- Failing infrastructure that results in emergency road closures;
- River flooding that damages property and disrupts the community; and
- Erosion of stream banks and sediment deposits in fresh water streams.

[1] A TMDL study is an evaluation of the maximum amount of a pollutant that a water body can accept and still meet the state's water quality standards for public health and healthy ecosystems. The federal Clean Water Act requires all states to identify water bodies that do not meet state standards and develop TMDL studies for them.

From a regulatory perspective, these drivers primarily include:

- The RI Pollution Discharge Elimination System (RIPDES) Phase II General Permit for regulated Municipal Separate Storm Sewer Systems (MS4s);
- TMDL studies for waters in the UNB communities; and
- NBC's Consent Agreement with RIDEM for the combined sewer system (CSS) in areas of Providence, Central Falls and Pawtucket.

These regulations provide a framework to address the root causes of water quality problems that encompass:

- Storm drain system operation, maintenance and rehabilitation; and
- Inadequate infrastructure for stormwater conveyance and treatment in MS4 and CSS areas.

This information was explored in greater detail to frame the discussion of community-specific issues and the potential benefit of regionalization to address common and broader issues in the Upper Narragansett Bay Watershed.

Regionalization

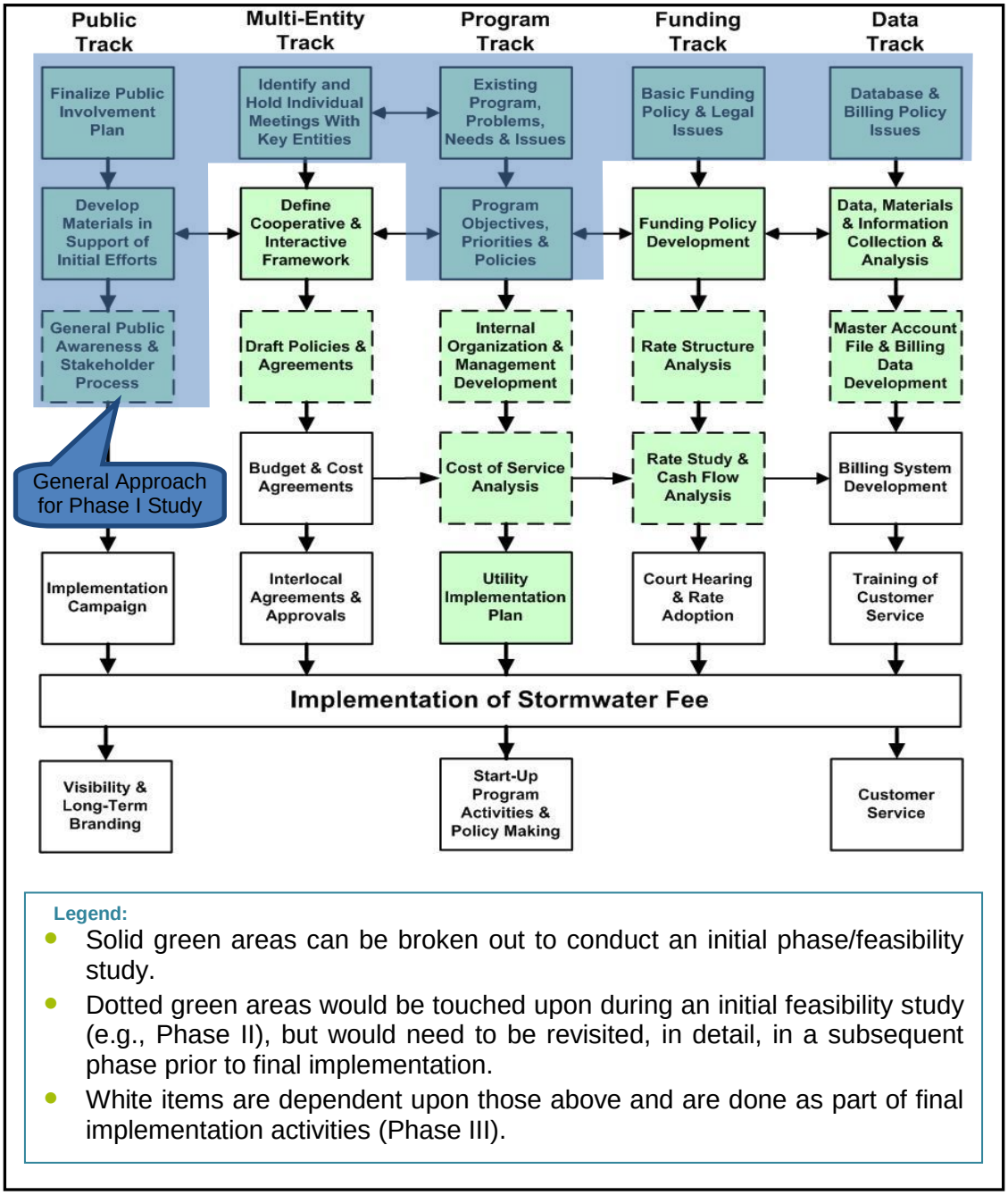
Regional programs can be created with great flexibility, tailored to the participating municipalities' needs and the level of cooperation to which they are comfortable. In order for municipalities to achieve the efficiencies available through regional stormwater programs, each community must be willing to resign some local authority to the regional effort. Stormwater program regionalization can have many benefits, as outined below:

- Economies of scale when performing services and pursuing contracts for services such as monitoring, street sweeping and specialized stormwater management expertise;
- Greater access to sources of specialized expertise;
- Ability to direct resources to projects watershed-wide that will have greater benefits to water quality and flooding, for example;
- Spread costs across a larger rate payer base;
- Increased ability to gain outside funding (i.e., state and federal grants);
- Consistency of programs at a watershed level – across jurisdictions;
- Ability to address larger problems;
- More stable organizational structure that is less influenced by politics and elections; and
- Consistency in services across watersheds.

It is important to note that the **Rhode Island Stormwater Management and Utility District Act of 2002** allows municipalities to create stormwater management and utility districts separately or with other muicipalities in order to "eliminate and prevent the contamination of the state's waters and to operate and maintain existing stormwater conveyance systems."

Figure 1.1 provides a detailed outline of elements and considerations in developing a regional stormwater management and funding (utility) approach. See Section 1.1 for an overview of stormwater utilities.

Figure 1.1 Regional Stormwater Utility Implementation Framework



In general, the steps for developing a multi-entity stormwater program and utility begin with a feasibility study that could progress to implementation along the five parallel "tracks" above. The scope of services for this study touched upon elements within each track that are part of an initial feasibility study. While there are almost infinite variations of this figure that can be

customized based on local realties, the key activities within the figure are all important and cannot, or should not, be skipped as further study and/or implementation proceeds.

The scope of services completed for this study is discussed in Section 1.3.

1.1 Stormwater Utilities

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 generally understood in three ways:

- A means of generating revenue – the utility is a fee for stormwater services provided;
- A program concept – the utility is a stormwater program, driven by local needs; and
- An organizational entity – the utility is a specific entity that performs stormwater services.

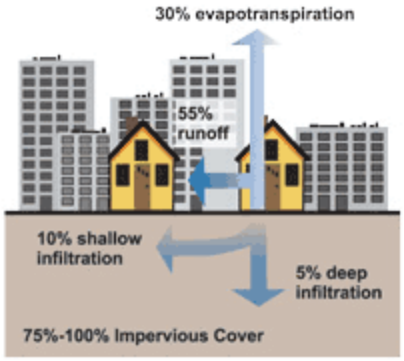
It is important when establishing a stormwater utility to determine which of these three the "utility" actually is. If the only reason for the establishment of a utility is to generate revenue and to free up additional tax revenues, the test for fee for service is not met. Citizens who thought they were getting stormwater services for free and now see a line item on a bill will pick up the phone and expect better service than before. Therefore, it is important to offer a better level of service (and a well-defined, program concept) if a utility is to be formed.

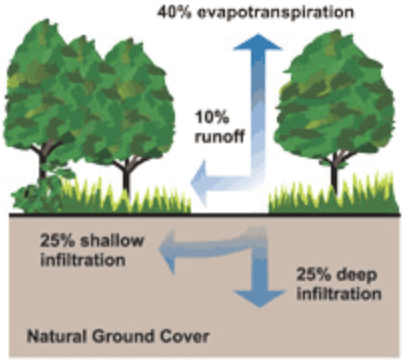
A stormwater utility is a funding mechanism for a stormwater program. Much like water and sewer utilities, an equitable fee is collected for stormwater services provided.

A Stormwater Utility Provides a Vehicle for:

- Consolidating or coordinating responsibilities that were previously dispersed among several departments and divisions;
- Generating funding that is stable, adequate, equitable and dedicated solely to the stormwater function; and
- Developing programs that are comprehensive, cohesive and consistent year-to-year.

It is based on the premise that the stormwater drainage system is a public system, similar to a wastewater or water supply system. When a demand is placed on either of these two latter systems, the user pays a service charge. When a natural area is paved, a greater flow of water is placed on the drainage system; thus, creating an increased demand. The greater the demand (i.e., the more the parcel of land is paved), the greater the user fee should be.





Source: US EPA Fact Sheet 841-F-03-003

Key Advantages of a Stormwater Utility are:

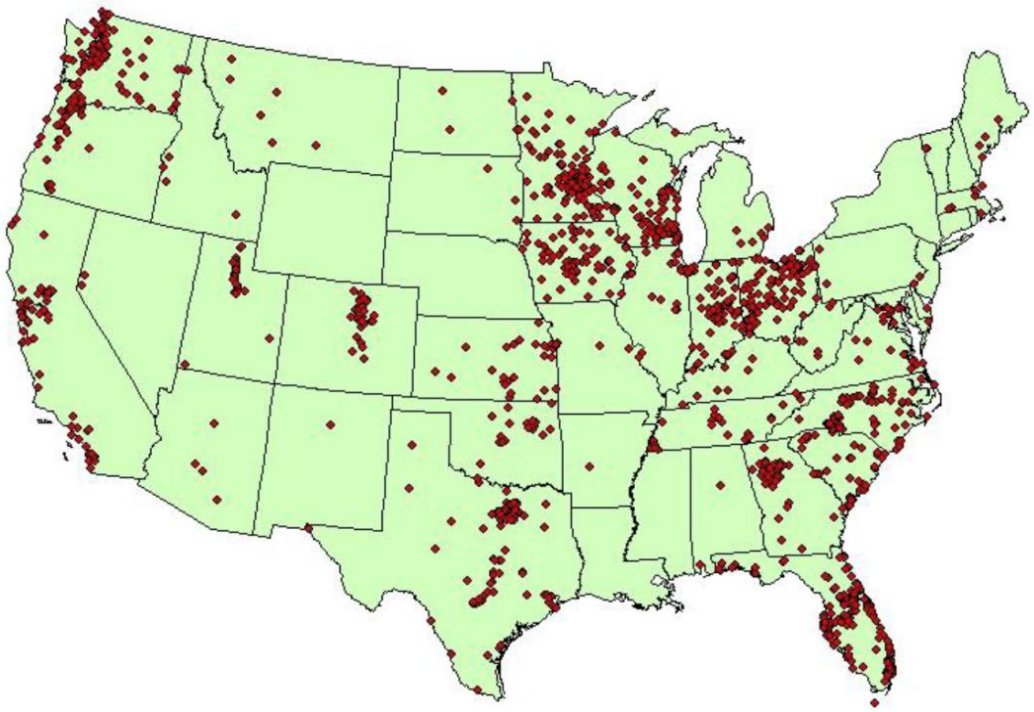
- **It is Stable** because it is not as dependent on the vagaries of the annual budgetary process as taxes are.
- **It is Adequate** because a typical stormwater fee is based on a well thought out stormwater program to meet the needs and demands of the community, as well as other program drivers (e.g., water quality, regulations).
- **It is Flexible** because fees can be established in a variety of manners and the program can be managed to fund activities based on changing priorities and needs.
- **It is Equitable** because the cost is borne by the user on the basis of demand placed on the drainage system.

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.

According to the Western Kentucky University 2013 Stormwater Utility Survey:

- There are over 1,400 stormwater utilities in 39 states across the country[2] and in these communities, the average population is 73,900 and the median is 19,200.
- The average fee for a single family residence is $4.57/mo and the median fee is $3.75/mo.

Figure 1.2 Existing Stormwater Utilities (source: Campbell, C. Warren, 2013)



[2] The Western Kentucky University survey captures data for known stormwater utilities nationwide based on information that is readily available and various other sources. As noted in the 2013 study and based on AMEC's experience, there are likely closer to 2,000 stormwater utilities in the U.S.

1.2 Regional Stormwater Utilities

Regional stormwater management and funding approaches are generally formed when there are common drivers and economies of scale/efficiency to be gained. A regional approach to managing stormwater can take on several different forms based on the needs of the participating communities in the Upper Narragansett Bay region. First, it is important to consider what "regional" means:

- **Regional Program:** "we share common elements to address local and regional needs"
- **Regional Organization:** "our administration is cooperative and our mission is clear"
- **Regional Funding:** "our funding approach looks the same and saves cost"

Regional stormwater utilities can have varying authority, purpose and structure. **Table 1.1** illustrates the range of governance/administration and funding options for a regional stormwater management and funding approach.

Table 1.1 Variations in Regional Stormwater Management and Funding Approaches

Regional Approaches	Independent Funding	Each Has Similar Fee Structure	Utility & Fee*
Independent Programs	Move ahead independently	Gain economies in fee development only	Create an organization to collect and disburse funds only
Cooperative Multi-Municipal Programs	Each decides how to pay for partially cooperative program	Cooperate on similar fee and shared program where it makes sense	One "look" to citizens with cooperation in parts of program
Regional Umbrella Program	Each decides how to pay share of one program	Avoid financial entanglement but gain economies of scale	Each gives program and authority to separate entity

*Fees still may be different among the participating municipalities

Advantages and Disadvantages of a Regional Stormwater Program

In order for municipalities to achieve the efficiencies available through regional stormwater programs, each community must be willing to resign some local authority to the regional effort. Municipalities may be reluctant to participate in a regional effort because of the perception that:

- Their constituents' money may be spent on projects outside their jurisdiction;
- Uncooperative regional members may threaten compliance with permits;
- Administrative costs may be too high to coordinate a regional effort and for creating a new organization;
- Concerns over creating a new "bureaucracy";
- Loss of local control on decision making and adequate response to local needs; and/or
- Loss of control on priority setting.

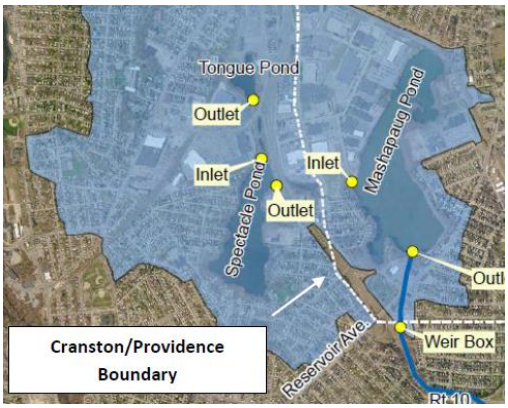
However, regional programs can be created with great flexibility, tailored to the participating municipalities' needs and the level of cooperation to which they are comfortable. As with all regional planning efforts, individual municipalities must sacrifice some control to the larger community or authority in order to achieve long term gain. Possible advantages may include:

- Economies of scale when performing services and pursuing contracts for services such as monitoring, street sweeping and specialized stormwater management expertise;
- Greater access to sources of specialized expertise;
- Ability to direct resources to projects watershed-wide that will have greater benefits to water quality and flooding, for example;
- Spread costs across a larger rate payer base;
- Increased ability to gain outside funding (i.e., state and federal grants);
- Consistency of programs at a watershed level – across jurisdictions;
- Ability to address larger problems;
- More stable organizational structure that is less influenced by politics and elections; and
- Consistency in services across watersheds.

Specific to the Upper Narragansett Bay communities, the following examples highlight the advantages of a regional stormwater program:

- **Flooding Problems:** the Pawtuxet River and Woonasquatucket River regularly flood and have significantly impacted the communities of Cranston, Warwick, Providence and North Providence. Flooding is a regional issue and requires significant resources for flood protection and mitigation.
- **Water Quality Issues:** the Blackstone, Ten Mile, Woonasquatucket and Pawtuxet Rivers as well as Upper Narragansett Bay and Greenwich Bay all suffer water quality impacts from stormwater runoff. Restoring the quality of these waters and the recreational and commercial uses dependent upon improved water quality requires action across the contributing watershed spanning multiple municipalities. Freshwater ponds in the area are also affected. For example, the Roger Williams Park Ponds experience excessive algal growth and routine cyanobacteria blooms due to phosphorous primarily from stormwater runoff. Close to half of the phosphorus comes from the upper watershed (Tongue Pond, Spectacle Pond and Mashapaug Pond) located in Cranston and Providence – all of which experience similar water quality problems. Improvements to these ponds can only be addressed through a watershed-based management approach.

Photo courtesy City of Warwick DPW



Source: Restoring the Ponds in Roger Williams Park, Horsley Witten Group, October 2013

- **Lack of Specialized Resources:** many communities do not have trained staff or adequate resources for detailed infrastructure assessment to adequately evaluate drainage needs, water quality sampling, and investigation of stormwater improvements to address the RIPDES MS4 permit and TMDL requirements. An adequately funded regional program can more cost-effectively establish in-house technical capacity or contract out for the services needed to address local needs.
- **Interconnected Infrastructure:** the drainage systems in nearly all communities are interconnected with adjacent communities and/or the Rhode Island Department of Transportation (RIDOT). Correcting a flooding or water quality problem often requires that multiple entities "fix" their system and coordination amongst independent departments can be very difficult. Additionally, the delineation of drainage systems and combined sewer systems in the communities of Pawtucket and Providence are poorly defined and the management of this infrastructure has an impact on the Narragansett Bay Commission's interceptors and overall operations.

Additional feedback from the Steering Committee and Stakeholder Group regarding the pros and cons of a regional stormwater program is discussed further in Section 4.2.

Examples of Regional Stormwater Utilities

Regional stormwater utilities across the country provide examples of what can be done and how it can be managed on a regional basis. Some national and local models are shown below to provide some perspective.

The Louisville, Kentucky Metropolitan Sewer District (MSD) is a regional entity that provides the following core services throughout the Louisville Metro:

MSD Metropolitan Sewer District

- Wastewater Collection and Treatment (270,000 accounts)
- Stormwater Drainage and Management (376 mi^2 area)
- Flood Protection (Ohio River)

Under the stormwater program, the Louisville MSD's responsibilities begin at the bottom of the catch basin and continue to the stream systems. Small communities were required to participate in the program under state law and large communities have a choice to be part of the cooperative program. http://www.msdlouky.org

Other Regional Stormwater Utilities Include . . .

BEAUFORT COUNTY SOUTH CAROLINA 1769

Charlotte-Mecklenburg STORM WATER Services

While Not the Same, Similar New England Examples Include . . .

The Long Creek Watershed Management District (LCWMD) was created by interlocal agreement among the municipalities of South Portland, Portland, Westbrook and Scarborough, Maine to create a collaborative organizational structure with public entities and private businesses to implement the Long Creek Watershed Management Plan. The program focuses on restoration of the stream and 3.45 mi^2 watershed using cost-effective strategies that are funded by a fee of $3,000/year for each acre of impervious area on properties with at least one acre of total impervious area. http://www.restorelongcreek.org

The Central Massachusetts Regional Stormwater Coalition (CMRSWC) was originally formed by a group of 13 communities working together to address municipal stormwater management. The CMRSWC has grown to 30 communities with inter-municipal agreements to participate in collaborative planning efforts for surface water resource protection and to meet the requirements of the EPA NPDES MS4 Permit in an efficient and cost-effective manner. The CMRSWC was originally funded by a Community Innovation Grant by the Massachusetts Executive Office of Administration and Finance. Although the CMRSWC is not a legal entity that collects a fee, it is an example of a regional approach to stormwater management to maximize the benefit and efficiency of activities across numerous communities. http://centralmastormwater.org

Local (Rhode Island) Regional Example

Although it is focused solely on wastewater, the most familiar example of a regional entity is the Narragansett Bay Commission. The NBC's mission is to "maintain a leadership role in the protection and enhancement of water quality in Narragansett Bay and its tributaries by providing safe and reliable wastewater collection and treatment services to its customers at a reasonable cost." NBC's service area encompasses the metropolitan Providence and Blackstone Valley areas, which include Providence, North Providence, Johnston, Pawtucket, Central Falls, Cumberland, Lincoln, the northern portion of East

See Section 4.2 for a more detailed discussion of the regional approaches evaluated as part of this study.

Providence and small sections of Cranston and Smithfield. The service area incorporates the combined sewer system (CSS) for stormwater and sanitary sewer in areas of Providence, Central Falls and Pawtucket.

It should be noted that this Phase I Feasibility Study considered the NBC in the context of a regional stormwater management and funding approach based on the physical infrastructure (i.e., CSS) and inter-relationship with the study communities.

1.3 Study Approach

This study was completed by a Project Team consisting of representatives from RIDEM, the City of Providence and a group of consultants. The Project Team worked with members of the Steering Committee and Stakeholder Group to consider and evaluate a variety of topics according to the following Scope of Work:

- Task 1 – Facilitation of Sustainable Stormwater Solutions Steering Committee: 4 meetings
- Task 2 – Facilitation of Stormwater Stakeholder Group: 3 meetings
- Task 3 – Analysis of Local Stormwater Programs
- Task 4 – Exploration of Regional Stormwater Management Alternatives
- Task 5 – Roadmap for Implementation, Upper Narragansett Bay Regional Stormwater Utility
- Task 6 – Phase I Feasibility Report
- Task 7 – Briefing Material and PowerPoint for Local Elected Officials (pending)
- Task 8 – Presentation to Local Officials (pending)

A more detailed discussion of each of these tasks and the overall process for this initial feasibility study is provided in **Appendix II**.

1.4 Steering Committee

The Project Team worked with the participating municipalities to establish a Sustainable Stormwater Solutions Committee (Steering Committee). Representatives were designated by the Mayor or City/Town Manager of each participating municipality, as well as the Narragansett Bay Commission. The Steering Committee provided direction during the feasibility study process and reviewed the final recommendations and Phase I Feasibility Report. Steering Committee members were also responsible for communication to and from their respective department and/or board chairs. Copies of the Steering Committee meeting agendas, presentations and meeting summaries are provided in **Appendix III**.

The members of the Steering Committee represent the participating municipalities, which are key stakeholders in this process. The Steering Committee members generally consisted of technical staff involved in stormwater management activities and/or financing of municipal programs. Therefore, these members met separately from the community-based Stakeholder Group based on their level of engagement and technical expertise related to the project.

Table 1.2 Sustainable Stormwater Solutions Steering Committee

Name	Affiliation
Elaine Partridge	Central Falls - Director of Public Works & Code Enforcement
Marie Twohey	Central Falls - City Clerk
Ken Mason	Cranston - Director of Public Works
Jason Pezzullo	Cranston - Principal Planner
Erik Skadberg	East Providence - City Engineer
Louis Lanni	North Providence - Administrative Assistant to the Mayor
Lance Hill	Pawtucket - Director of Public Works
Andrew Silvia	Pawtucket - Chief of Project Development
Bill Bombard	Providence - Acting Director of Public Works
Josh O'Neill	Providence - Emergency Management Agency Recovery Coordinator
Dave Everett	Providence - Principal Planner
Eric Earls	Warwick - Engineering Division
Eric Hindinger	Warwick - Engineering Division
Ray Marshall	Narragansett Bay Commission - Executive Director
Tom Uva	Narragansett Bay Commission - Director of Planning, Policy & Regulation

During Steering Committee Meeting #1, the members provided the following thoughts regarding what they hoped to get out of the process and what concerns they had at the outset.

Education and Involvement

- Create an ability to explain this to political leadership
- Create an ability to explain the benefits even to local municipalities that are facing financial hardship
- Define long term benefits and short term costs in an attractive and real way
- Be able to quantify the financial gap in simple clear terms
- Understand and be able to speak to the public perceptions and natural opposition to higher fees
- Be able to differentiate between sewer and stormwater fees, and fees and taxes
- Understand the value of past investments – and the return on investment going forward

Cooperation

- Facilitate cooperation among communities
- Create realistic expectations or objectives, cost and time frame
- Define a geographic size or membership for the group that is realistic
- Define an approach wherein a single entity cannot stall progress

- Define a realistic and helpful state role
- Define a realistic and helpful RIDOT role
- Ensure we gain efficiencies through cooperation

Program

- Take full advantage of experiences elsewhere
- Insure all stormwater needs are met, not just water quality (e.g., FEMA)

This was the group's initial reaction to and understanding of the project and process, but it provides a good sense of the topics and issues that need to be addressed moving forward with the broader public. This information is revisited in Section 3.3 to discuss the overall message for an enhanced stormwater management program and regional approach.

1.5 Stakeholder Group

A Stakeholder Group was established to provide a broader perspective and ensure that the larger community of interests was informed of the feasibility study process. Members of the Stakeholder Group represented residents, businesses, developers, labor, academic institutions, health professionals, community and environmental organizations, and other non-profits to review the implications of creating an enhanced stormwater program with a sustainable revenue source. Copies of the Stakeholder Group meeting agendas, presentations and meeting summaries are provided in **Appendix III**.

The formation of the Stakeholder Group was led by the City of Providence and RIDEM with input from the Project Team and Steering Committee to invite a diverse group of potential stakeholders. The invitation and list of stakeholders invited is provided in Appendix III. **Table 1.3** represents the stakeholders that participated in the Phase I Feasibility Study.

Table 1.3 Stormwater Stakeholder Group

Name	Affiliation
Mark Van Noppen	Armory Revival Company
Jonathan Ford	Blackstone Park Conservancy
Meggie Patton	Brown University
Kurt Teichert	Brown University
Lauren Carson	Clean Water Action
Jamie Rhodes	Clean Water Action
Scott Duhamel	Construction and Building Council
Len Bradley	DiPrete Engineering
Meg Kerr	Environment Council of RI/Blueways Alliance
John Sinnott	Gilbane Building Company

Name	Affiliation
Beshka Kendell	Groundwork Providence
Sheri Lupoli	Groundwork Providence
Marcus Mitchell	Mt. Hope Neighborhood Association
Harold Gadon	NBC Citizens Advisory Committee
Gale Gennaro	Providence College
Dave Caldwell, Jr.	RI Builders Association
Bob Vanderslice	RI Department of Health
Marc Petrowicz	RI Nursery & Landscape Association
Shannow Brawley	RI Nursery & Landscape Association
Topher Hamblett	Save the Bay
Barnaby Evans	Waterfire

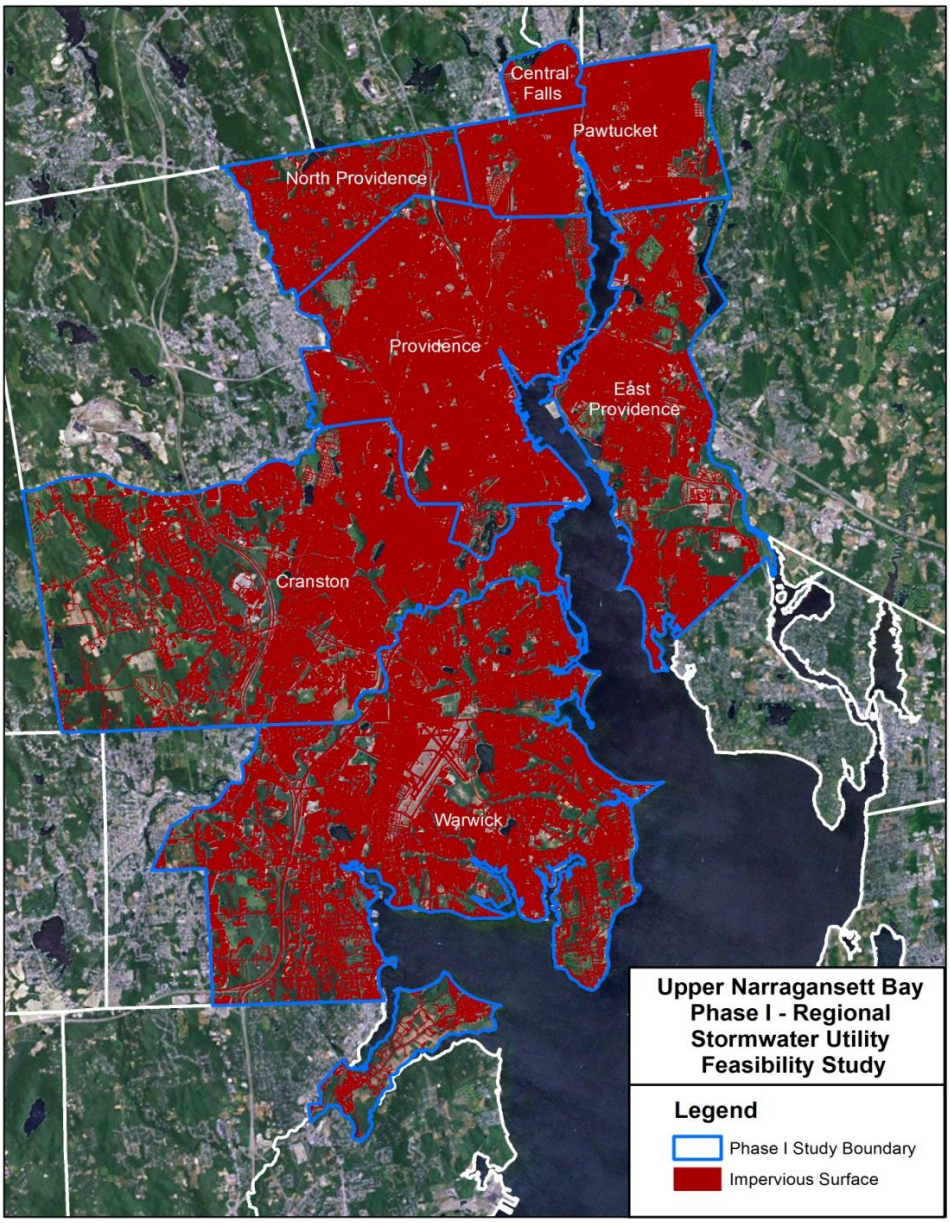
2.0 Current Stormwater Programs

This section provides a description of the stormwater programs within the Upper Narragansett Bay (UNB) study area. A brief description of the region is provided below followed by the data provided by each of the municipalities and a summary of the data analyzed. Information was requested through a survey (see **Appendix IV** for template) and one-on-one interviews.

2.1 Regional Overview

For the purpose of this study, the UNB study area is defined as the following: Central Falls, Cranston, East Providence, North Providence, Pawtucket, Providence and Warwick. The UNB study area is home to approximately 510,740 residents and covers an area of nearly 113 square miles that drains to the Narragansett Bay, as illustrated in **Figure 2.1**.

Figure 2.1 Upper Narragansett Bay Study Area



Water quality monitoring within the Upper Narragansett Bay Watershed shows that a number of streams and other water bodies are listed as impaired. Additional information regarding the impaired waters for each of the participating municipalities and **Total Maximum Daily Load (TMDL) study** requirements[3] is provided in Appendix I. To date, the RI Department of

[3] TMDL requirements will be incorporated into the re-issuance of the RIPDES MS4 Permit and require regulated municipalities to implement the recommendations of the TMDL study, which include: increased pollution prevention activities (e.g., operation and maintenance of the MS4); illicit discharge detection and elimination activities to remove pollutant sources; and capital construction projects to treat stormwater.

Environmental Management has completed the following TMDL studies for waters that are located partially or wholly within one or more of the participating municipalities:

- Blackstone River
- Greenwich Bay and Watershed
- Mashapaug Pond
- Runnins River
- Ten Mile River (in development)
- Woonasquatucket River
- Eutrophic Ponds (includes five urban ponds in Cranston, Providence and Warwick)
- Statewide Bacteria TMDL (includes several lakes and rivers in the study area)

Permit requirements may be a driver for improvement; however, there are many reasons to change the stormwater management status quo. (see Section 3.0)

The impacts of stormwater runoff on water quality, as well as flooding, are primarly assocaited with impervioius surface and have become a significant concern at the local and national level. Stakeholder awareness of water quality and stormwater management issues can vary significantly and it takes a focused, collaborative effort to recognize the needs and develop a plan for improvement. However, there are existing regulations that provide a framework for improving water quality. In Rhode Island, municipal stormwater discharges are regulated through Municipal Separate Storm Sewer (MS4) permits under the Rhode Island Pollutant Discharge Elimination System (RIPDES), as authorized by the Federal Clean Water Act. Rhode Island is a "delegated" state and therefore oversight of this MS4 permit is the direct responsibility of the Rhode Island Department of Environmental Management and not Region I of the U.S. Environmental Protection Agency (USEPA).

The municipalities in the study area have been managing their stormwater programs under the initial MS4 permit issued in 2003, which expired in 2008 and has yet to be reissued. A substantial increase in responsibilities and costs for stormwater management is anticipated based on the changes expected in the draft MS4 permit. Once issued, the MS4 permit will require municipalities to:

- **Enhance the operation and maintenance** of the storm drain system such that it functions as originally designed to maximize the removal of pollutants;
- **Develop a better understanding** of the storm drain system, causes of water quality impacts and options for mitigation or improvement; and
- **Begin planning to implement stormwater BMPs** to address impaired waters and meet the requirements of TMDL studies.

The analysis by the Project Team identified the following characteristics for the study area:

- **Programs:**
  - Many municipal programs are very limited with reactive maintenance of the collection system for both the CSS and MS4 systems. These activities include street sweeping and catch basin cleaning.
  - Capital expenditures are limited and there is no clearly defined approach to address impaired waters and TMDLs.
  - Understanding of the CSS and MS4 systems is poor in areas of some communities.
- **Systems (see Table 2.1):**
  - In some communities, the CSS and MS4 collection areas are complex, interspersed and poorly defined.
  - Some communities have separate MS4 and sanitary sewer systems.
  - MS4 collection areas range from limited systems with 49 outfalls (North Providence) to extensive systems with up to 800 outfalls (Warwick).

Table 2.1 Summary of Study Area MS4 & CSS System Characteristics

Municipality	MS4	CSS	MS4 Outfalls	Total Catch Basins & Manholes*	MS4 Catch Basins & Manholes (estimated)
Central Falls	0%	100%**	0	1,158	0
Cranston	100%	0%	550	7,222	7,222
East Providence	100%	0%	130	4,468	4,468
North Providence	100%	0%	49	780	780
Pawtucket	10%	90%	49	6,000	600
Providence	35%	65%	175	16,000	5,600
Warwick	100%	0%	800	4,000	4,000
Totals	**-**	**-**	**1,756**	**39,628**	**22,670**

Notes: *Total includes catch basins, manholes, curb inlets and drywells. **Central Falls has been unable to identify a separate a MS4 discharge and all drainage is believed to discharge to the CSS and NBC interceptors.

- **Funding:**
  - Municipalities currently fund their stormwater programs through tax revenue (General Fund) with some grants and low interest loans for planning and capital projects.
  - There is a lack of financial and operational resources to meet MS4 requirements. For example, the MS4 is not completely mapped and catch basins are clogged in some communities.
  - There are multiple competing demands with stormwater through the General Fund.
  - The level of investment in stormwater programs for a region of this size is “minimal to low” when compared to other programs across the country.
  - The sanitary sewer collection systems are funded differently in communities with some through the general fund and others through an enterprise fund.

Table 2.2 summarizes some of the characteristics by municipality that are discussed further in subsequent sections of this report. It is worth noting that there are significant differences in

demographics, land area and land use across the communities in the study area. This information needs to be considered in a regional stormwater management approach to balance needs, level of service and equity.

Table 2.2 Summary of Study Area Characteristics

Municipality	Population	Land Area (mi^2)	Density (people/mi^2)	Impervious Area (acres)	Impervious Area (%)	Current Budget Est.
Central Falls	19,376	1.3	14,905	548	66.4%	$17,723
Cranston	80,387	28.9	2,782	6,067	32.8%	$1,354,073
East Providence	47,037	14.0	3,360	3,292	36.9%	$275,400
North Providence	32,078	5.8	5,531	1,667	44.9%	$117,847
Pawtucket	71,148	8.7	8,178	3,481	61.4%	$82,311
Providence	178,042	18.3	9,729	7,672	63.8%	$1,346,343
Warwick	82,672	35.9	2,303	7,931	34.5%	$596,729
Totals	**510,740**	**112.9**		**30,658**		**$3.8M**

Data Sources: 2010 U.S. Census (population) and State of Rhode Island Office of GIS (impervious area).

The current stormwater program cost was estimated based on budget categories for labor, materials and equipment across multiple City departments. In most cases, the study area communities do not have detailed budgets for activities specifally related to stormwater management due to the current de-centralized management structure that is typical for these programs. Therefore, costs were estimated based on an evaluation of budgets and allocation of stormwater-related costs by the Project Team and community staff.

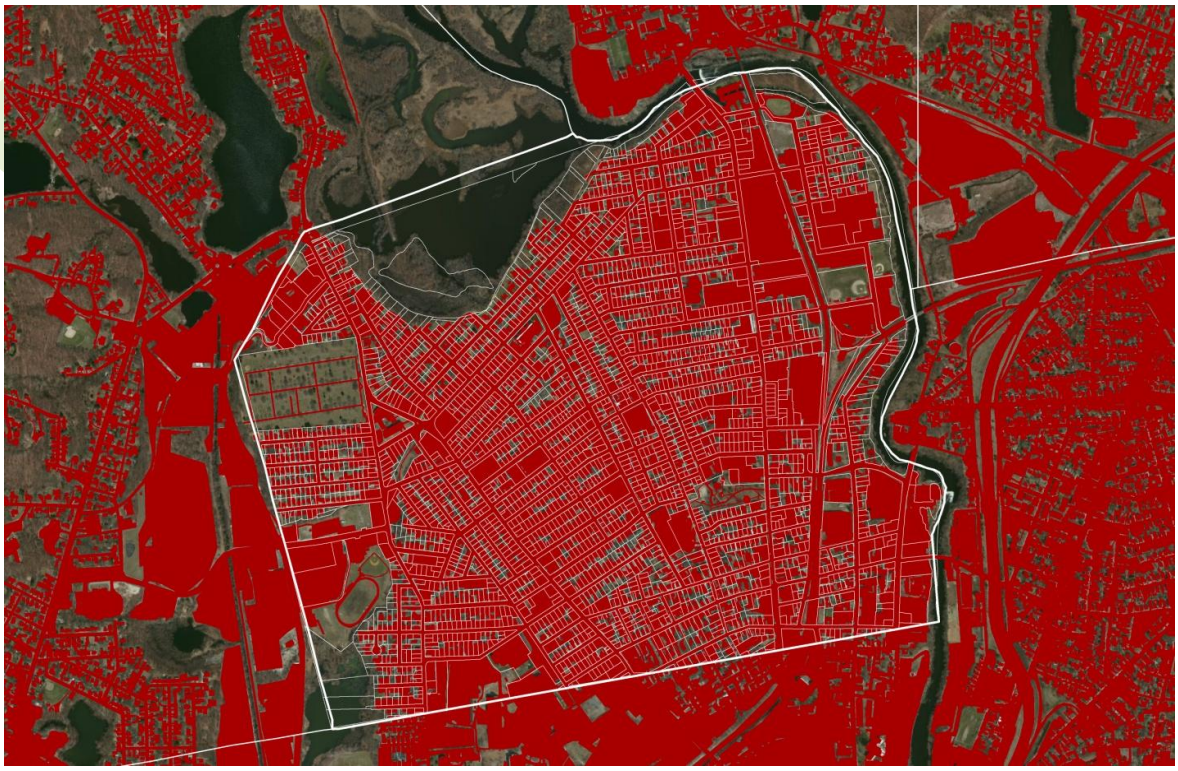
It is important to note that the current stormwater program level of service varies in each community and the communities of Pawtucket and Providence have combined sewer systems that serve up approximately 65% to 90% of the City. It appears that 100% of Central Falls is served by a combined sewer system. However, additional information may need to be provided to demonstrate that Central Falls is not subject to the RIPDES MS4 Permit.

Table 2.3 summarizes the current stormwater program costs by major cost center to be consistent across the study area. Refer to the survey in Appendix IV for the cost template that was used to evauate current expenditures during the one-on-one interviews and subsequent conference calls with staff from each community. Costs are presented for each community with assumptions in Sections 2.2 through 2.8.

Table 2.3 Summary of Current Budgets by Cost Center for Study Area (2014)

Key Cost Center	Totals	Central Falls	Cranston	East Providence	North Providence	Pawtucket	Providence	Warwick
Administration	$ 133,067	$ 2,508	$ 23,504	$ 15,000	$ 15,000	$ 497	$ 70,129	$ 6,429
Indirect cost allocation (20%)	$ 631,738	$ 2,954	$ 225,679	$ 45,900	$ 19,641	$ 13,719	$ 224,390	$ 99,455
Operations & Maintenance	$ 1,902,633	$ 12,261	$ 536,551	$ 157,000	$ 70,750	$ 38,279	$ 899,112	$ 188,681
Engineering & Master Planning	$ 319,547	$ -	$ 8,481	$ 37,000	$ -	$ 11,118	$ 107,262	$ 155,687
Regulation/ Enforcement	$ 68,671	$ -	$ 9,858	$ -	$ -	$ 3,700	$ 45,450	$ 9,663
Capital Improvement Projects*	$ 685,614	$ -	$ 550,000	$ -	$ -	$ 15,000	$ -	$ 135,614
Major Capital Projects	$ 337,434	$ -	$ 300,000	$ -	$ -	$ -	$ -	$ 37,434
Minor Capital Projects	$ 363,181	$ -	$ 250,000	$ -	$ -	$ 15,000	$ -	$ 98,181
Water Quality Monitoring	$ 34,156	$ -	$ -	$ 20,500	$ 12,456	$ -	$ -	$ 1,200
Totals	**$ 3,790,426**	$ 17,723	$ 1,354,073	$ 275,400	$ 117,847	$ 82,311	$ 1,346,343	$ 596,729

2.2 Central Falls



The City of Central Falls is approximately 1.3 square miles in area. The City is mostly comprised of dense residential, industrial and commercial areas. **Table 2.4** below summarizes the land use in the City from 2011 data available through the State of Rhode Island GIS database.

Table 2.4 Land Use in Central Falls

Land Use Type	Percent Coverage in Central Falls
High Density Residential	30.1%
Industrial	19.3%
Commercial	15.4%
Water	11.9%
Wetland	7.8%
Railroad Facilities	6.5%
Institutional	2.8%
Deciduous Forest	1.8%
Cemeteries	1.5%
Developed Recreation	1.4%
Other	1.5%

Leadership/ Governance: Central Falls currently operates under a Mayor and City Council form of government. The current mayor is James A. Diossa and the City Council has five members each from one of five City wards. The council is comprised of a president, claims committee chair, pro tempore and two other members.

Population: As reported by the Rhode Island Department of Labor and Training the 2000 census reported a population of 18,928 and the 2010 census reported a population of 19,376 marking a 2.4% percent increase in population over the ten year span.

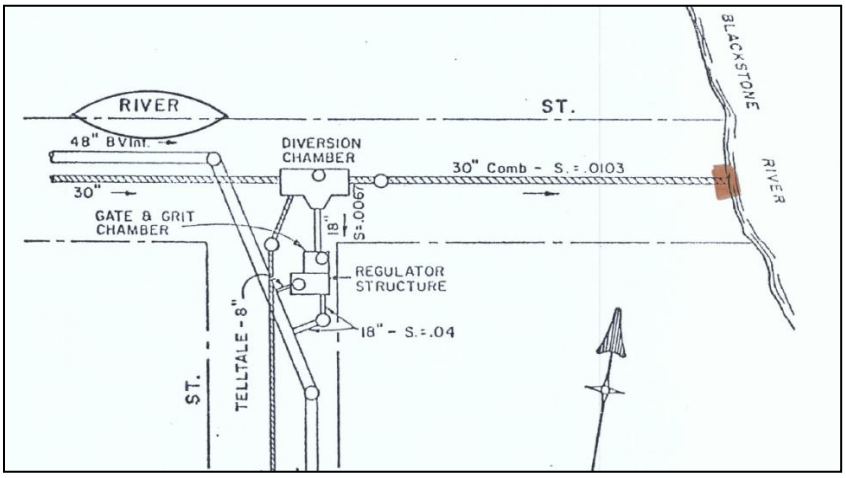
Economic Condition: The State of Rhode Island categorizes the City of Central Falls as a financially depressed community. This status is assigned when a community has an average income less than 80% of the average income of the state. The City declared bankruptcy in 2011 and is currently operating under a 5 year recovery plan.

Key Industry: The largest employers in Central Falls include Murdock Webbing Company, Osram Sylvannia and Fuller Box, making manufacturing (textiles, lighting and packaging) the leading industry.

2.2.1 Stormwater System & Local Issues

Based on discussions with City staff, 100% of Central Falls is served by a gravity fed combined sewer system with approximately 1,158 structures that are treated by the NBC's Bucklin Point Wastewater Treatment Facility (WWTF) in East Providence. Some stormwater flows overland to the Blackstone and Moshassuck Rivers, but there are no drainage conveyance structures. Since 2003, the City of Central Falls has been participating in the RIPDES MS4 Permit program due to the lack of definitive mapping information for the MS4 and CSS systems. The Rhode Island Department of Transportation (RIDOT) provided outfall mapping information to the City of Central Falls in 2006 and identified 7 outfalls associated with the CSS system that represent combined sewer overflows (CSOs). A drawing of CSO 001 is provided as **Figure 2.2**.

Figure 2.2 CSO Discharge 001 in Central Falls



The RIDOT 2006 report also discussed dry weather inspections of the CSOs and identified some locations with dry weather flow that may require further investigation. Based on this information, it appears that the City's combined sewer system should be addressed with RIDEM and NBC, as appropriate and required by existing regulations. CSO #102 has been blocked according to NBC's *Concept Design Report Amendment – 2nd Reaffirmation,* dated 2011. In Phase 3 of NBC's CSO program, the NBC plans to either block, modify regulators or do floatables control at CSOs #101 and #107. The NBC plans to divert CSO #103, #104 and #105 via a new CSO pipeline to the proposed Phase 3 tunnel that will receive treatment at the Bucklin Point WWTF.

In addition to the CSS, the City has approximately 27 miles of roads that they are responsible for operating and maintaining. No data is available for structural stormwater BMPs, except for pervious pavement at the Ledge Street parking lot (muncipal property).

Funding Sources: The City has not set aside funding for capital improvements and current DPW operations are funded under the general fund, which includes the stormwater program. Some fees are collected for road opening and sewer permits.

Compelling Issues and Concerns About a Regional Stormwater Utility: During the one-on-one interview to gather information for this study, City staff identified the following stormwater-related issues in the City in order of importance:

1. Aging infrastructure
2. Compliance requirements
3. Quality of life and aesthetics

City staff indicated that flooding is not a significant concern, but some localized street flooding occurs when inlet structures become clogged with debris. For example, this occurs frequently along Higginson Avenue at the High Street underpass, near the Wyatt Detention Facility.

The concerns for implementing a regional stormwater utility for Central Falls were identified in the following order of importance:

1. One area "bailing out" another one – "paying for another's past sins" (tied for first)
2. Building a bureaucracy – "fee creep" (tied for first)
3. Consistency in treatment, fairness – "getting my share"
4. Responsiveness – "who controls priorities"
5. Being penalized for another's non-compliance
6. Being dominated by one entity

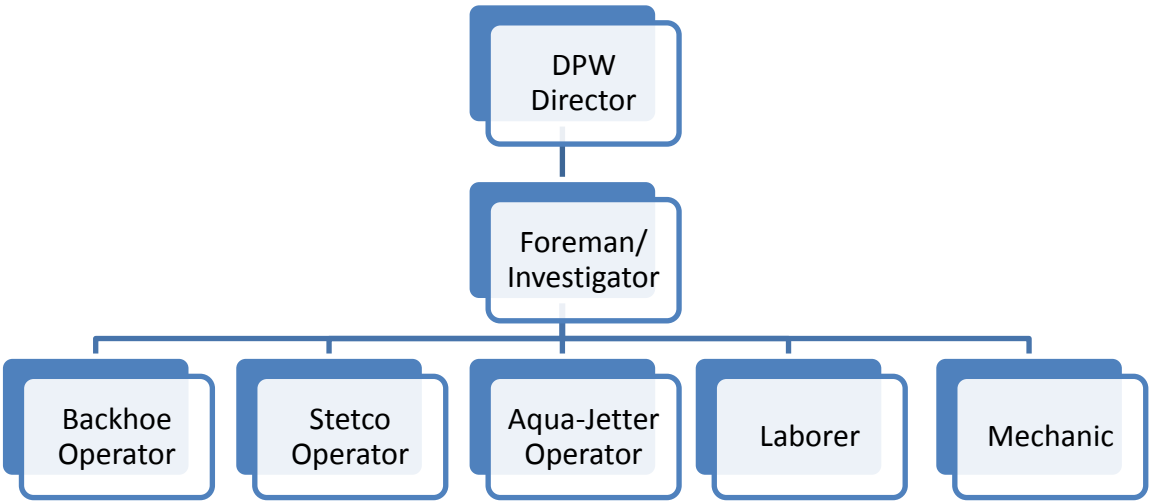
In general, City staff felt that a regional stormwater utility does not seem appropriate for the City of Central Falls since there is no separate storm sewer system. However, City staff felt that a regional planning and collaboration may benefit the City to address stormwater issues as they related to the operation and maintenance of the CSS.

Public Awareness: City staff rated the level of community awareness as low and the following sensitive issues were noted: rate affordability; no new fees or taxes; and political issues.

Available Data: The City of Central Falls does not maintain a geographic information system (GIS) and relies on the GIS available through the state. As a result, the updated Statewide Impervious Cover layer is the best available data for Central Falls. A GIS parcel layer was acquired from RIDEM, but this layer consisted strictly of physical data and did not contain attributes such as land use by parcel. The Tax Assessor's database was not provided during this study to provide data for land use by parcel. This data will be necessary for a more detailed revenue and rate analysis under a stormwater utility.

2.2.2 Program Management & Level of Service

Stormwater in the City of Central Falls is handled through the combined sewer system (CSS); therefore, the management (operation and maintenance) of the system falls under the Wastewater Collection System Maintenance Department. No significant activities (e.g., stormwater master planning, floodplain management) are conducted by other City departments. An organizational chart for the Wastewater Collection System Maintenance Department is provided below.



The stormwater program is nearly non-existent in Central Falls since 100% of the City is served by a combined sewer system. Therefore, activities such as street sweeping and catch basin cleaning are conducted within areas that drain to the CSS. Approximately 20-30% of the catch basins within the City are cleaned annually and about 5% of the trunk lines are jetted annually. The City recently purchased a truck for catch basin cleaning to increase the annual cleaning frequency and the City has increased street sweeping to 4 days a week from spring to fall. City staff indicate that grease is a significant issue in the CSS.

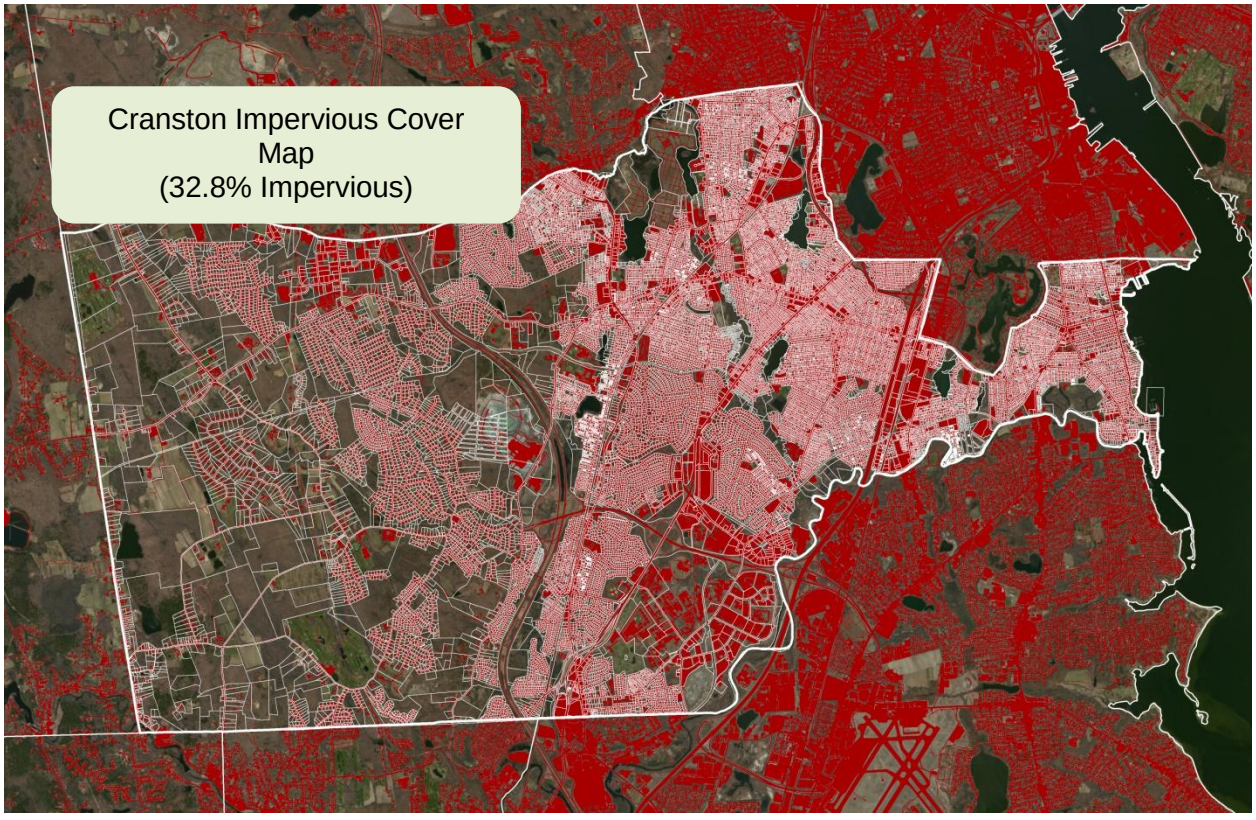
The stormwater program cost was estimated based on the percent of DPW labor related to stormwater program planning (e.g., MS4 annual reports) and coordination of stormwater related

maintenance activities with other entities (i.e., NBC, neighboring communities). This information was organized by major cost center to be consistent across the study area, as summarized in **Table 2.5** below.

Table 2.5 Central Falls Current Stormwater Program Cost

Major Cost Center	Cost	Notes/Assumptions
Administration	$2,508	Labor for DPW administration (<1%)
Indirect Cost Allocation (20%)	$2,954	% total budget
Operations and Maintenance	$12,261	Labor for DPW activites (<1%)
Engineering and Master Planning	$0	CSS only, none for MS4
Regulation/Enforcement	$0	CSS only, none for MS4
Capital Improvement Projects	$0	CSS only, none for MS4
Major Capital Projects	$0	
Minor Capital Projects	$0	
Water Quality Monitoring	$0	None conducted
Total	**$17,723**	

2.3 Cranston



The City of Cranston is 28.9 square miles in area and is mostly comprised of forest, roadways, and residential areas. **Table 2.6** below summarizes the land use in the City from 2011 data available through the State of Rhode Island GIS database.

Table 2.6 Land Use in Cranston

Land Use Type	Percent Coverage in Cranston
Deciduous Forest	26.0%
Water	12.7%
Roads	11.2%
High Density Residential	10.0%
Medium High Density Residential	9.0%
Medium Density Residential	6.3%
Commercial	5.7%
Mixed Forest	2.6%
Mines, Quarries, Gravel Pits	2.6%
Industrial	2.3%
Institutional	2.1%
Cropland	2.0%
Developed Recreation	1.6%
Other	5.9%

Leadership/ Governance: Cranston operates under a Mayor-City Council form of government. The current mayor is Allan Fung and the City Council is comprised of members representing six wards and three councilors at large.

Population: As reported by the Rhode Island Department of Labor and Training the 2000 census reported a population of 79,269 and the 2010 census reported a population of 80,387 in the City of Cranston. This represents a 1.4% increase in population over the ten year span.

Economic Condition: Staff reports that the City currently operates with no deficits, but that budgetary flexibility is minimal.

Key Industry: Key industries in Cranston include retail, light manufacturing, and dining. Large businesses in the City include Pepsi Bottling Group, Falvey Linen & Uniform Supply, and Walmart.

2.3.1 Stormwater System & Local Issues

Cranston has a completely separate MS4 system. City staff report that the MS4 system was originally constructed as a separate system and was never combined with the sanitary sewer system. The City maintains approximately 318 miles of City roads, 117 miles of drainage piping,

7,222 catch basins and manholes and 550 MS4 outfalls. The City inspects and maintains 6 BMPs that were installed as part of the Stillhouse Cove revetment and drainage improvements to Narragansett Bay.

Funding Sources: The City currently has $300,000 available from a $6M bond (2008) for capital improvement projects for stormwater infrastructure. The remaining stormwater program is funded through the General Fund.

Compelling Issues and Concerns About a Regional Stormwater Utility: During the one-on-one interview to gather information for this study, City staff identified the following stormwater-related issues in the City, in no particular order:

- Flooding problems
- Aging infrastructure
- Development pressures
- Ecological concerns
- Preservation of property value

City staff indicated that the Labor Day floods of 2010 had a major impact and the City is still recovering. In March 2010, after 5 inches of rain, the Pawtuxet River overflowed and impacted many sites such as the Warwick Mall, Contour Dental Laboratories, and the CLCF Building.

The following concerns for implementing a regional stormwater utility in Cranston were identified, in no particular order:

- One area “bailing out” another one – “paying for another’s past sins”
- Losing local control of zoning, land use, etc. – “big brother decides for me”
- Building a bureaucracy – “fee creep”
- Consistency in treatment, fairness – “getting my share”
- Being dominated by one entity

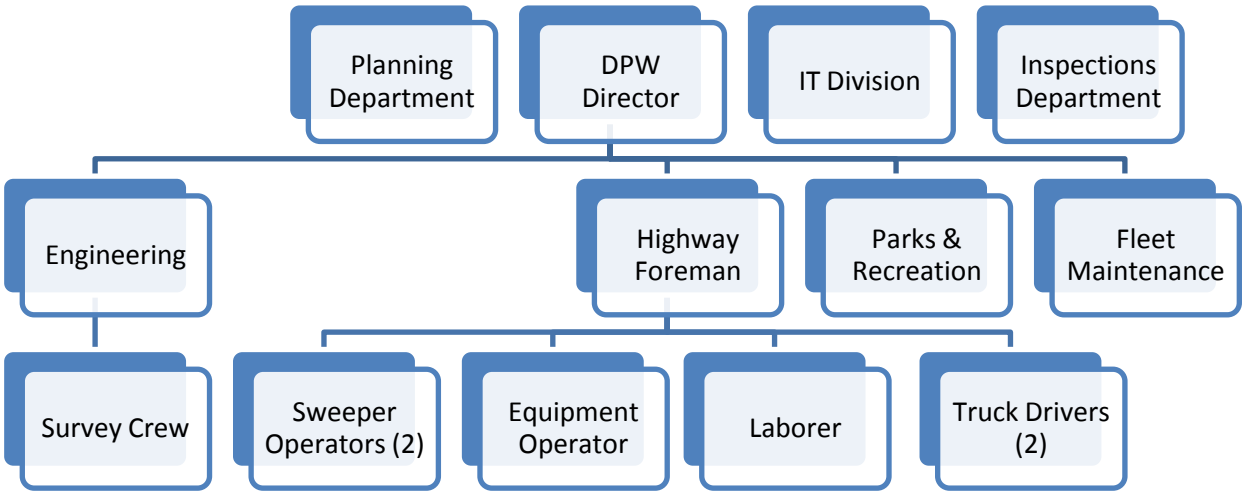
Public Awareness: Outreach and education efforts in the City include distribution of brochures regarding stormwater related issues in the City, updates on the City webpage and coordination with nonprofit organizations. City staff reported the overall stormwater awareness in the general population to be fairly low; however, a fraction of the population is aware of stormwater related issues. This group is mostly comprised of individuals in environmental groups and those subject to recent flooding events. The following sensitive issues were noted: rate affordability; no new taxes or fees; and flooding issues.

Available Data: The City of Cranston has mapped their storm sewer system in GIS including outfalls, catch basins, and manholes. In 2012, a cursory update to the 2003 Statewide

Impervious Cover layer was conducted for Cranston as part of an initial stormwater utility feasibility study conducted by the RIDEM Office of Water Resources. In order to maintain a consistent methodology for the capture of impervious area in the UNB region, the recently updated Statewide Impervious Cover layer was used for the Phase I Study. A GIS parcel layer, containing land use data by parcel, was acquired from RIDEM as part of the study. The Tax Assessor's database was not provided during this study to provide data for land use by parcel. This data will be necessary for a more detailed revenue and rate analysis under a stormwater utility.

2.3.2 Program Management & Level of Service

Management of the stormwater program in the City of Cranston primarily falls under the Department of Public Works, which includes the Department of Highway Maintenance, Department of Enginering and the Division of Fleet Maintenance. Other City departments play a role in stormwater management, including: Department of Planning for floodplain management and stormwater master planning; Department of Inspections for enforcement; and Division of Information Technology for GIS and stormwater program data management. An organizational chart for management of the stormwater program is provided below.



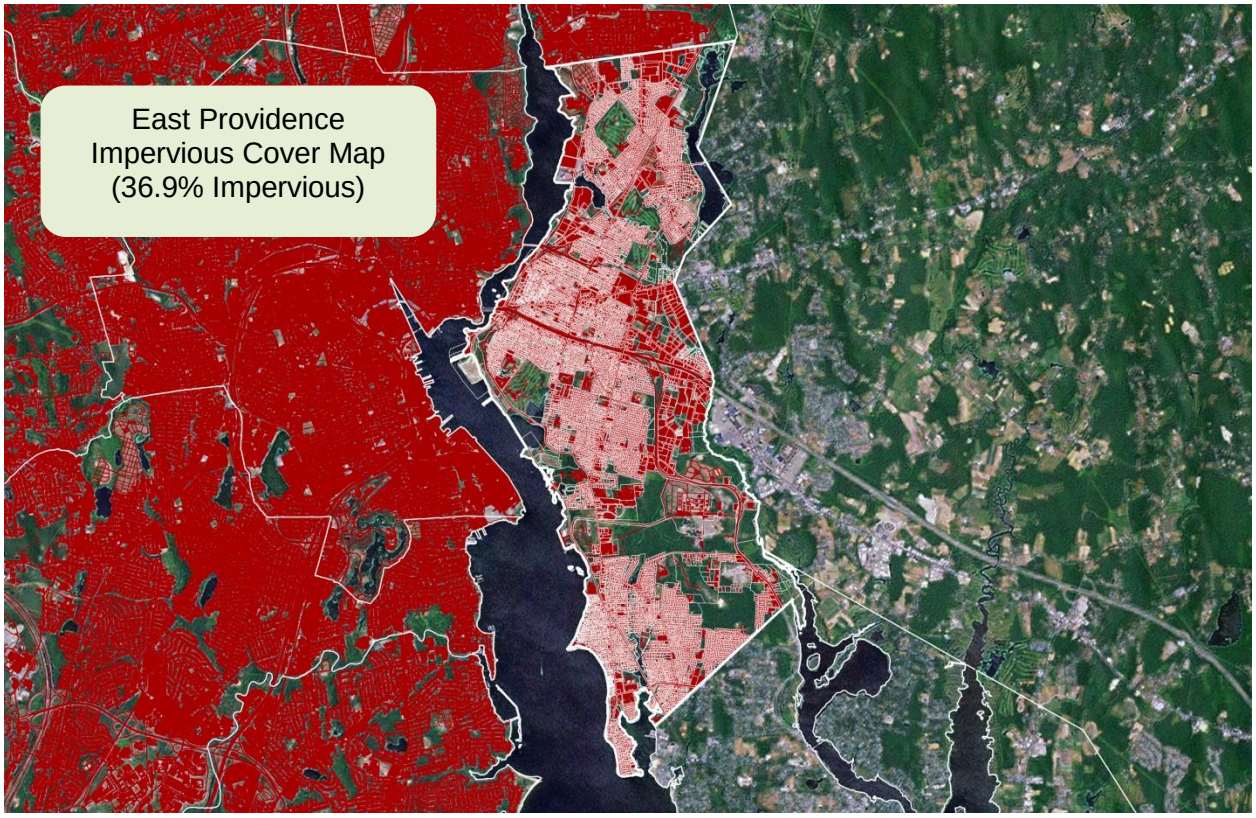
The MS4 system in Cranston is extensive and requires a significant effort for operation and maintenance. Approximately 1,500 (20%) catch basins within the City are cleaned annually and over 1,000 road miles are swept annually. The City has a more frequent inspection and maintenance schedule for catch basins in areas that drain to impaired waters with a completed TMDL Study, which include: Stillhouse Cove, Spectacle Pond and the Roger Williams Park Ponds. The City evaluated the TMDL study for Spectacle Pond and subsequently developed the Lake Street Outfall Maintenance Project to address stormwater management and nutrient issues that are impacting Spectacle Pond. The project is scheduled to be constructed in 2014.

The stormwater program cost was estimated based on DPW budget categories for labor, materials and equipment and the percent that City staff felt was solely dedicated to stormwater. This information was organized by major cost center to be consistent across the study area, as summarized in **Table 2.7** below.

Table 2.7 Cranston Current Stormwater Program Cost

Major Cost Center	Cost	Notes/Assumptions
Administration	$23,504	Labor for DPW administration
Indirect Cost Allocation (20%)	$225,679	% total budget
Operations and Maintenance	$536,551	Labor across multiple depts., materials & expenses
Engineering and Master Planning	$8,481	Labor across multiple departments
Regulation/Enforcement	$9,858	Labor across multiple departments
Capital Improvement Projects	$550,000	Total
Major Capital Projects	$300,000	City-wide drainage improvements
Minor Capital Projects	$250,000	Water quality projects (Lake St. Outfall)
Water Quality Monitoring	$0	None conducted
Total	**$1,354,073**	

2.4 East Providence



The City of East Providence is approximately 14 square miles and land use is generally more residential than many of the other municipalities in the study area, but also includes significant forested area and commercial areas. **Table 2.8** below summarizes the land use in the City of East Providence from 2011 data available through the State of Rhode Island GIS database.

Table 2.8 Land Use in East Providence

Land Use Type	Percent Coverage in East Providence
Medium High Density Residential	24.0%
Deciduous Forest	20.7%
High Density Residential	11.6%
Commercial	9.9%
Developed Recreation	6.0%
Industrial	4.3%
Water	3.5%
Institutional	2.8%
Wetland	2.6%

Land Use Type	Percent Coverage in East Providence
Roads	2.4%
Medium Density Residential	1.8%
Vacant Land	1.6%
Brushland	1.4%
Cemeteries	1.4%
Other Transportation	1.3%
Transitional Areas	1.2%
Other	3.5%

Leadership/ Governance: East Providence has a City Council with a City Manager (currently Paul Lemont). The City Council consists of five elected officials, one from each of the four wards within the City and one elected at-large. The Mayor and Assistant Mayor are elected by the Council from among its members. The Mayor presides at Council meetings and is the ceremonial head of City Government. The Assistant Mayor acts as Mayor during the absence or disability of the Mayor.

Population: As reported by the Rhode Island Department of Labor and Training the 2000 Census reported a population of 48,688 and the 2010 Census reported a population of 47,037 in the City of East Providence, marking a -3.4% percent change in population over the ten year span.

Economic Condition: The City of East Providence is considered to be financially stable. The City initiated a budget commission to assure the implementation of appropriate measures to secure the financial stability of the City. The Commission was established by the Director of Revenue on December 11, 2011 and was dissolved by the Director of Revenue on September 16, 2013, pursuant to the determination of fiscal stability.

Key Industry: Key Industries in East Providence include manufacturing (Aspen Aerogels), energy management (Eaton Corporation), automotive sales, banking, technology, insurance provision, recreation and medical services.

2.4.1 Stormwater System & Local Issues

East Providence has a fully separate storm sewer system. Staff report that the system was built as a separate system. The existing storm drain system was constructed between the 1800s and 1980s. There are 66 miles of drains all connected to a MS4. Additionally there are two miles of drainage swales. The City has 2,109 catch basins, 955 curb inlets, 1,354 drainage manholes, 50 drywells and 133 outfalls. The City also maintains 28 BMPs annually and sweeps 150 City-owned miles of road twice a year. BMPs maintained by the City include: detention basins, grass swales, and proprietary systems (e.g., Stormceptors).

Funding Sources: Funding for the City's stormwater services is budgeted through the General Fund. Additional funding for water quality improvement projects has historically been provided through grants.

Compelling Issues and Concerns About a Regional Stormwater Utility: During the one-on-one interview to gather information for this study, City staff identified the following stormwater-related issues in order of priority:

1. Flooding problems
2. Quality of life and aesthetics
3. Aging infrastructure
4. Water quality protection

The following concerns for implementing a regional stormwater utility in East Providence were identified, in no particular order:

- One area "bailing out" another one – "paying for another's past sins
- Losing local control of zoning, land use, etc. – "big brother decides for me"
- Building a bureaucracy – "fee creep"
- Consistency in treatment, fairness – "getting my share"
- Being dominated by one entity

Public Awareness: The City of East Providence has developed a number of community outreach programs. Recently the City distributed recycling pamphlets, completed a shoreline clean-up project and included educational brochures in water bills. City staff reported the overall stormwater awareness in the general population to be low and noted the following sensitive issues in the community, in no particular order:

- Rate affordability
- No new fees or taxes
- Political issues
- Flood reduction

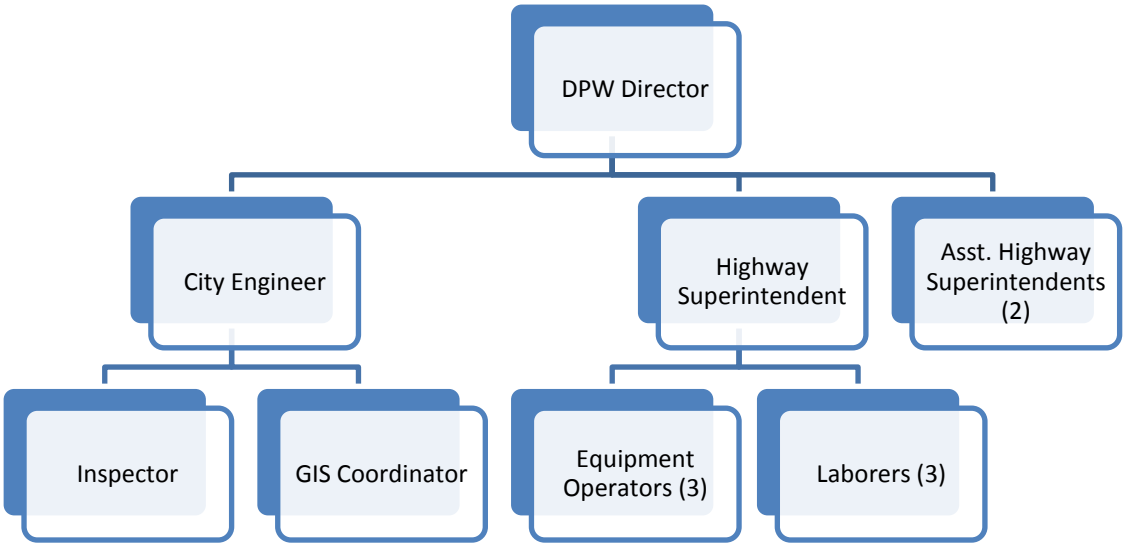
Regarding rate affordability, the City is well aware of the recent sanitary sewer rate increases due to the upgrades at the Wastewater Treatment Plant for nitrogen removal and pump station rehabilitation that were completed in May 2013 at a cost of $52M. Also, water rates will likely increase due to system improvements that are needed. A $19M bond for the improvements is currently before the City for approval.

Available Data: The City of East Providence has a GIS database that includes parcel boundaries, the storm drain network and sanitary sewer network. However, this database does not include an impervious cover layer. As a result, the updated Statewide Impervious Cover layer was used for East Providence. A GIS parcel layer was acquired from RIDEM, but this layer contained geospatial data and did not contain attributes such as land use by parcel. The Tax Assessor's database was not provided during this study to provide data for land use by

parcel. This data will be necessary for a more detailed revenue and rate analysis under a stormwater utility.

2.4.2 Program Management & Level of Service

Management of the stormwater program in the City of East Providence primarily falls under the Department of Public Works. The DPW coordinates with staff in the Planning Department, but these staff do not have a significant role in stormwater management. An organizational chart for management of the stormwater program is provided below.



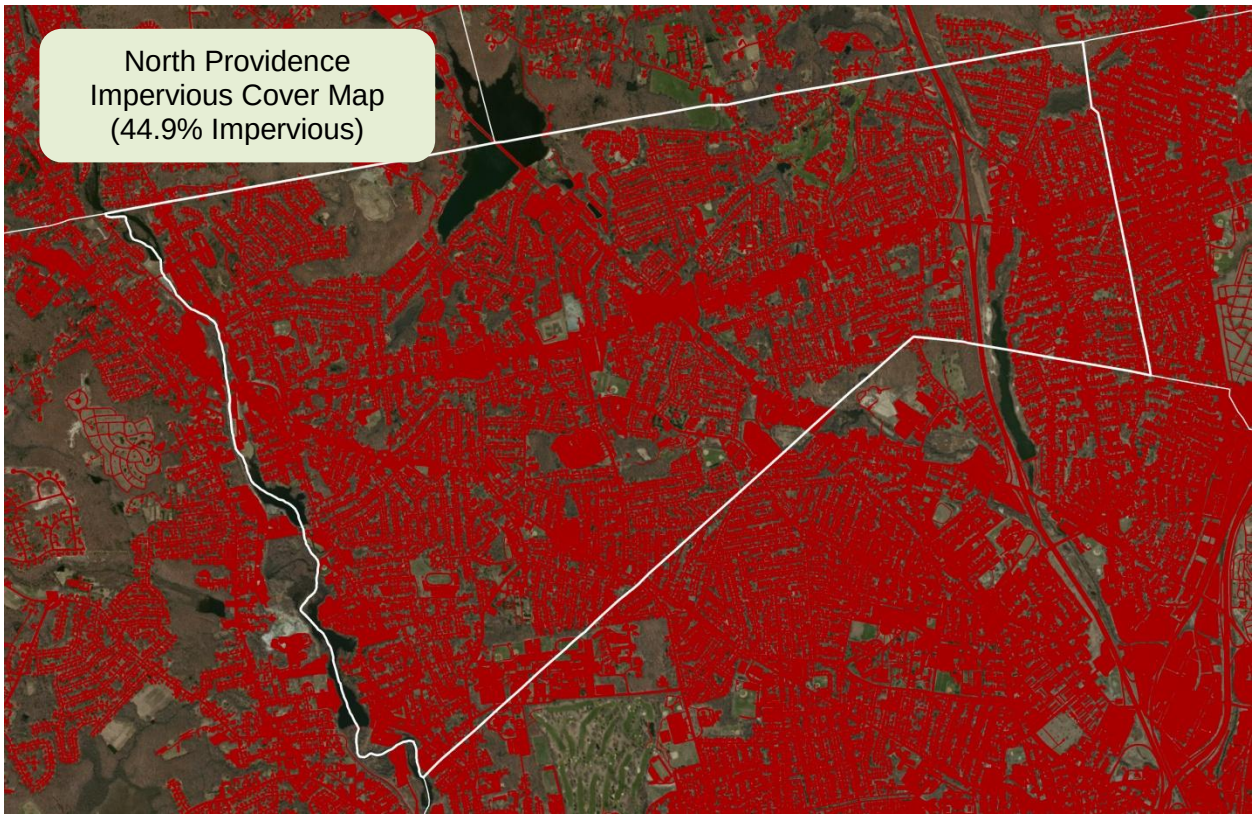
The MS4 system in East Providence requires a significant effort for operation and maintenance, including the inspection and maintenance of BMPs by the Public Works Department. Approximately 525 (25%) catch basins within the City are cleaned annually and pipes are cleaned as needed using a jet/vac truck.

The stormwater program cost was estimated based on DPW budget categories for labor, materials and equipment and the percent that City staff felt was solely dedicated to stormwater. This information was organized by major cost center to be consistent across the study area, as summarized in **Table 2.9** below.

Table 2.9 East Providence Current Stormwater Program Cost

Major Cost Center	Cost	Notes/Assumptions
Administration	$15,000	Labor for DPW administration
Indirect Cost Allocation (20%)	$45,900	% total budget
Operations and Maintenance	$157,000	Labor across multiple depts., materials & expenses
Engineering and Master Planning	$37,000	Labor across multiple departments
Regulation/Enforcement	$0	No significant costs
Capital Improvement Projects	$0	None at this time
Major Capital Projects	$0	N/A
Minor Capital Projects	$0	N/A
Water Quality Monitoring	$20,500	RIPDES Permit, water quality monitoring, IDDE
Total	**$275,400**	

2.5 North Providence



The Town of North Providence is approximately 5.8 square miles and is made up of primarily residential land use with some forest, commercial and industrial areas. **Table 2.10** below summarizes the land use in North Providence from 2011 data available through the State of Rhode Island GIS database.

Table 2.10 Land Use in North Providence

Land Use Type	Percent Coverage in North Providence
Roads	26.8%
High Density Residential	23.3%
Deciduous Forest	22.2%
Medium High Density Residential	18.4%
Commercial	2.4%
Institutional	1.5%
Water	1.3%
Medium Density Residential	1.0%
Other	3.1%

Leadership/ Governance: North Providence is governed by a Mayor and Town Council form of government. The current Mayor is Charles Lombardi, who serves as the executive chief and administrative officer, as well as the Town's Public Safety Director. The Town Council consists of seven members: two elected from each of three Town districts and a Council-at-Large.

Population: As reported by the Rhode Island Department of Labor and Training the 2000 Census reported a population of 32,411 and the 2010 Census reported a population of 32,078 in the Town of North Providence, marking a -1.0% percent change in population over the ten year span.

Economic Condition: Educational, health care and social assistance industries experienced the most growth in recent years while the manufacturing industry experienced a downturn.

Key Industry: Based on 2009 employment rates from the North Providence Comprehensive Plan, key industries in the Town include manufacturing; retail trade; finance and insurance; educational, social and health care services; and arts, entertainment and recreation.

2.5.1 Stormwater System & Local Issues

The existing storm drain system is approximately 100 years old and several areas of flooding in North Providence have been noted during wet weather by Town representatives. North Providence is partially built on the Woonasquatucket River and West River, which occasionally experience flooding and overtopping. Each river has a number of tributaries throughout North Providence which also experience flooding during wet weather, causing issues for many neighborhoods throughout the Town. The Town has approximately 115 miles of public streets, 780 municipally owned catch basins and 49 outfalls.

Funding Sources: The DPW has an annual budget of approximately $70,000 for all stormwater related activities that is paid through the General Fund. An additional $15,000 budget for a part time Stormwater Coordinator has historically been paid for through grants. Since the beginning

of the MS4 General Permit the Town has spent approximately $12,500 per year on permit compliance activities that include: annual reporting, equipment, ordinances, BMP surveys and planning documents. This money has been paid with reimbursable grant funding. **Tables 2.11 and 2.12** below show recent fiscal year budgets and MS4 costs incurred from 2003 - 2012, respectively.

Table 2.11 Department of Public Works Stormwater-Related Budget for Two Recent Fiscal Years

Budget Item	Existing FY 2011 - 2012	Proposed FY 2012 - 2013
Street Sweeping	$20,000	$20,000
Water Jet Operator	$34,174	$35,193
Sand, Gravel and Pea Stone	$1,000	$1,000
Weed and Pest Control	$750	$750
Sewer Maintenance	$10,000	$10,000
Pipes and Collars	$1,500	$1,500
Supplies	$2,500	$2,500
TOTAL	**$69,924**	**$70,943**

Table 2.12 Costs Incurred by North Providence for MS4 Storm Water General Permit Compliance from 2003-2012

Item	Approximate Cost
Annual Reporting (x8)	$24,000
Outfall Surveys and Equipment	$30,500
Ordinances (x3)	$9,000
BMP Surveys	$2,000
Planning Documents	$34,150
Total (8 years)	$99,650
Approximate Annualized Cost	**$12,456**

Available Data: The Town of North Providence does not currently maintain its own GIS. The Town does have its outfalls mapped in GIS and this was completed by its on-call engineer in 2012. The Town has digitally mapped its parcels; however, remapping is underway to enhance the current accuracy of this data. As a result, the updated Statewide Impervious Cover layer was used for North Providence and no parcel layer was provided during this study. The Tax Assessor's database was not provided during this study to provide data for land use by parcel. This data will be necessary for a more detailed revenue and rate analysis under a stormwater utility.

2.5.2 Program Management & Level of Service

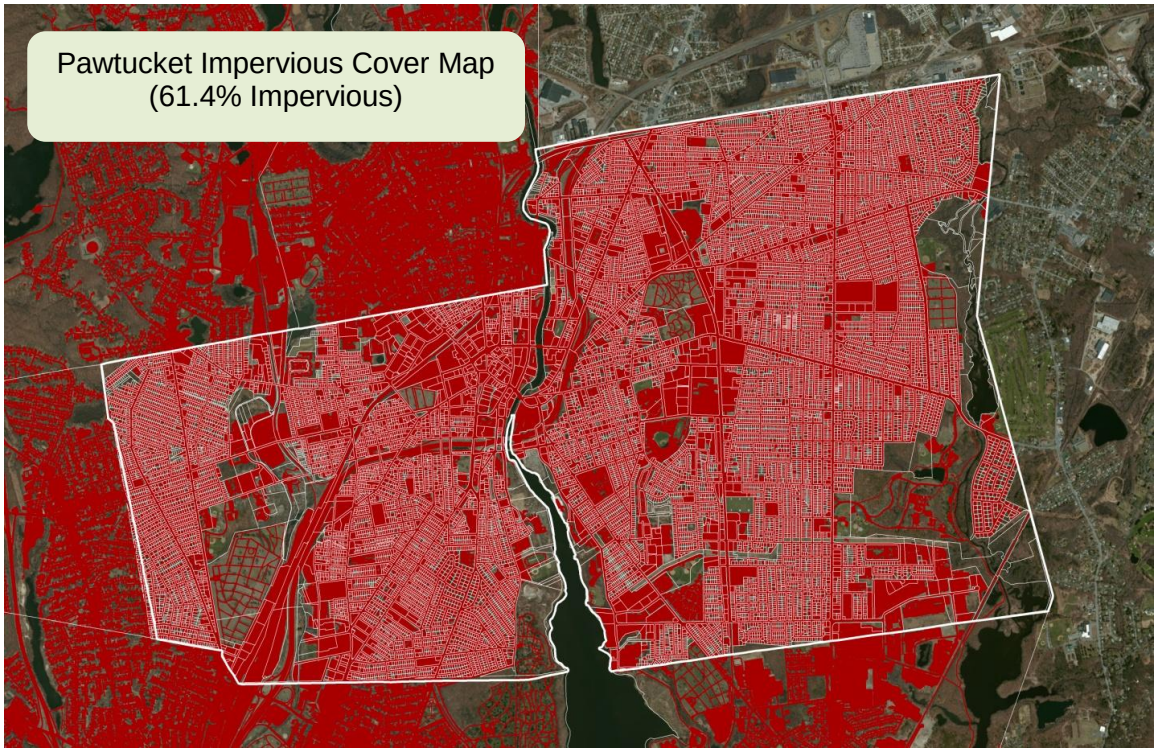
Management of the stormwater program in the Town of North Providence primarily falls under the Department of Public Works. The DPW coordinates with staff in the Planning Department, but these staff do not have a significant role in stormwater management. Detailed information regarding the program management and level of service was not provided for this study.

The Project Team estimated the current stormwater program cost based on past stormwater-related work in North Providence by Fuss & O'Neill. This information was organized by major cost center to be consistent across the study area, as summarized in **Table 2.13** below.

Table 2.13 North Providence Current Stormwater Program Cost

Major Cost Center	Cost	Notes/Assumptions
Administration	$15,000	Labor for DPW administration
Indirect Cost Allocation (20%)	$19,641	% total budget
Operations and Maintenance	$70,750	Labor across multiple depts., materials & expenses
Engineering and Master Planning	$0	No significant costs
Regulation/Enforcement	$0	No significant costs
Capital Improvement Projects	$0	None conducted
Major Capital Projects	$0	N/A
Minor Capital Projects	$0	N/A
Water Quality Monitoring	$12,456	RIPDES Permit compliance activities
Total	**$117,847**	

2.6 Pawtucket



The City of Pawtucket is approximately 8.7 square miles and is heavily residential with some commercial and industrial land. **Table 2.14** below summarizes the land use in the City from 2011 data available through the State of Rhode Island GIS database.

Table 2.14 Land Use in Pawtucket

Land Use Type	Percent Coverage in Pawtucket
High Density Residential	31.4%
Roads	26.8%
Deciduous Forest	16.7%
Commercial	6.2%
Industrial	4.0%
Water	3.3%
Cemeteries	2.6%
Medium High Density Residential	2.2%
Institutional	1.6%
Developed Recreation	1.4%
Railroads	1.2%
Other	2.6%

Leadership/ Governance: The City is has a Mayor and City Council form of government. Pawtucket's current Mayor is Donald R. Grebien, who is responsible for chief executive and administrative duties, as well as overseeing all other City departments. The City Council is comprised of nine members: three councilors-at-large and six district councilors from each of six districts. The current City Council is in term from 2013 - 2015.

Population: As reported by the Rhode Island Department of Labor and Training 2000 census, the City had a population of 72,958 and the 2010 census reported a population of 71,148 indicating a -2.5% percent change in population over the ten year span.

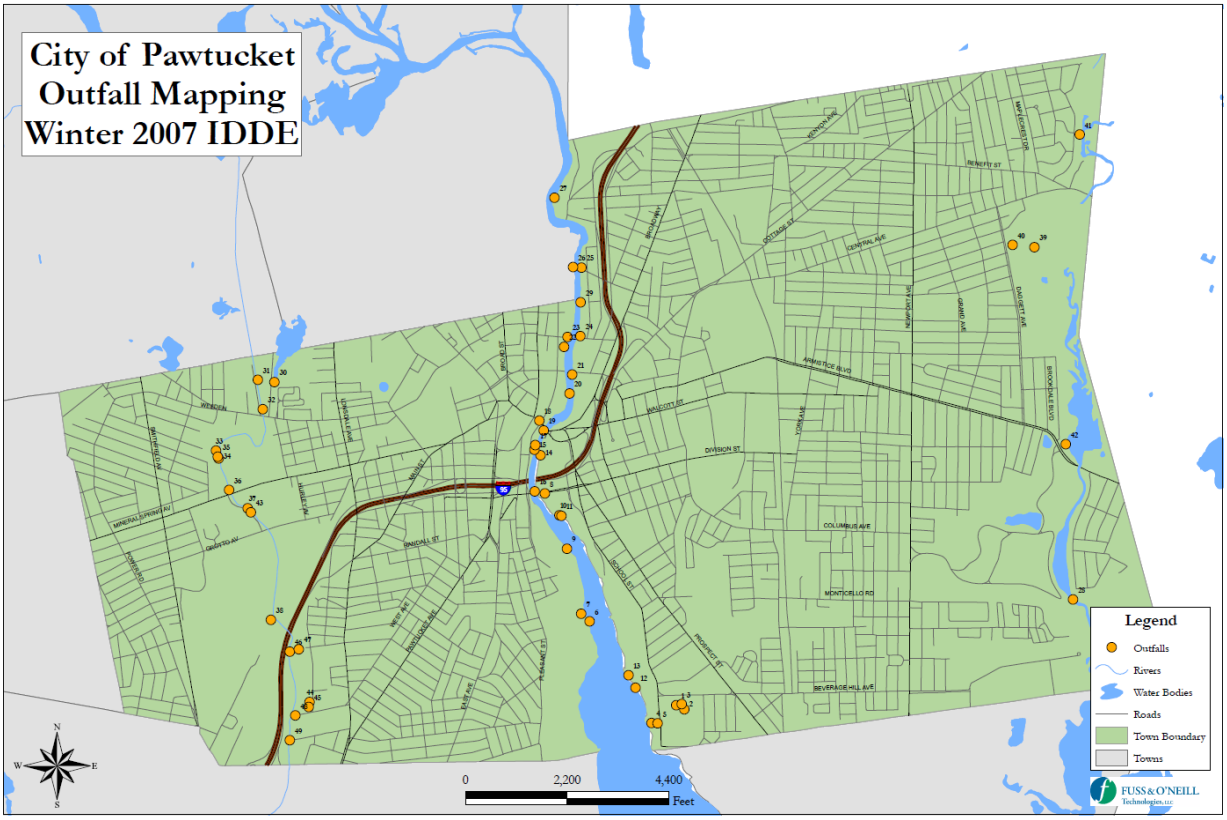
Economic Condition: Although the City has struggled economically in recent years, discussions with City staff and review of the 2011 Community Comprehensive Plan indicate conditions are improving.

Key Industry: The largest employers in Pawtucket include Hasbro, Pawtucket Red Sox, and Apex, tenants of the shopping plaza on Newport Avenue and the tenants of the Narragansett Industrial Park.

2.6.1 Stormwater System & Local Issues

The City of Pawtucket currently maintains approximately 182 miles of road, 200 miles of combined sewer and separate storm drain pipes, 6,000 catch basins and manholes (city-wide), and 49 MS4 outfalls. Stormwater outfalls are shown on **Figure 2.3**. The City inspects and maintains one stormwater BMP (detention basin). City staff estimate that approximately 90% of Pawtucket drains to a combined sewer system and the remaining 10% drains to the separate MS4.

Figure 2.3 Stormwater Outfalls in Pawtucket



The City of Pawtucket is nearly 100% sewered and the sanitary sewer and combined sewer systems discharge to NBC interceptor sewers that convey flow to the Bucklin Point wastewater treatment plant in East Providence. A total of 19 CSO structures are located within Pawtucket along the Blackstone and Seekonk Rivers to provide relief of excess flows in the combined system.

Funding Sources: The City funds the stormwater program through the General Fund.

Compelling Issues and Concerns About a Regional Stormwater Utility: During the one-on-one interview to gather information for this study, City staff identified the following stormwater-related issues in order of importance:

1. Aging infrastructure
2. Preservation of property value
3. Compliance requirements

Obstacles identified against implementation of a stormwater utility district in Pawtucket include the following in order of severity:

1. Losing local control of zoning, land use, etc. - “big brother decides for me”
2. Responsiveness - “who controls priorities”

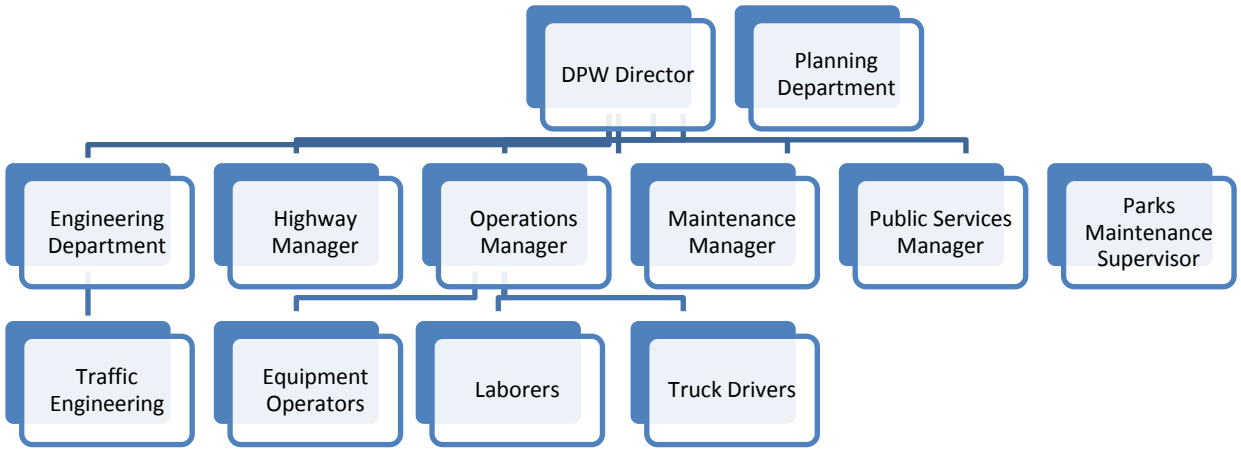
3. Consistency in treatment, fairness - “getting my share”
4. Being dominated by one entity
5. One area “bailing out” another one - “paying for another’s past sins”

Public Awareness: The City relies upon the Stormwater Education and Outreach Program in cooperation with the University of Rhode Island (URI) to assist in meeting the RIPDES MS4 Permit requirements. City staff have indicated that the community level of awareness regarding stormwater-related issues is low and the key sensitive issue is not wanting a new fee or tax. City staff also felt that the community perception is such that a new fee would scare businesses and that most people think they are already taxed for such programs.

Available Data: The City of Pawtucket has zoning boundaries as well as parcel boundary data available in GIS. City outfalls have also been mapped in GIS, but Pawtucket does not have an impervious cover layer. As a result, the updated Statewide Impervious Cover layer was used for Pawtucket. A GIS parcel layer was acquired from RIDEM, but this layer consisted strictly of physical data and did not contain attributes such as land use by parcel. An extract from the Tax Assessor’s database was provided for Phase I of the study, but the extract only contains basic residential vs. non-residential data. The database does not differentiate between single family residential and other residential, which will be necessary for a more detailed revenue and rate analysis under a stormwater utility.

2.6.2 Program Management & Level of Service

Management of the stormwater program in the City of Pawtucket primarily falls under the Department of Public Works and Engineering Department. The DPW and Engineering Department coordinate with staff in the Planning Department, but these staff do not have a significant role in stormwater management. An organizational chart for management of the stormwater program is provided below.



The MS4 system is estimated to be encompass approximately 10% of the City, but the extent and drainage areas for the MS4 and CSS have not been accurately mapped. Approximately

250 (4%) catch basins within the City (MS4 & CSS areas) are cleaned annually and all City streets are swept at least once annually.

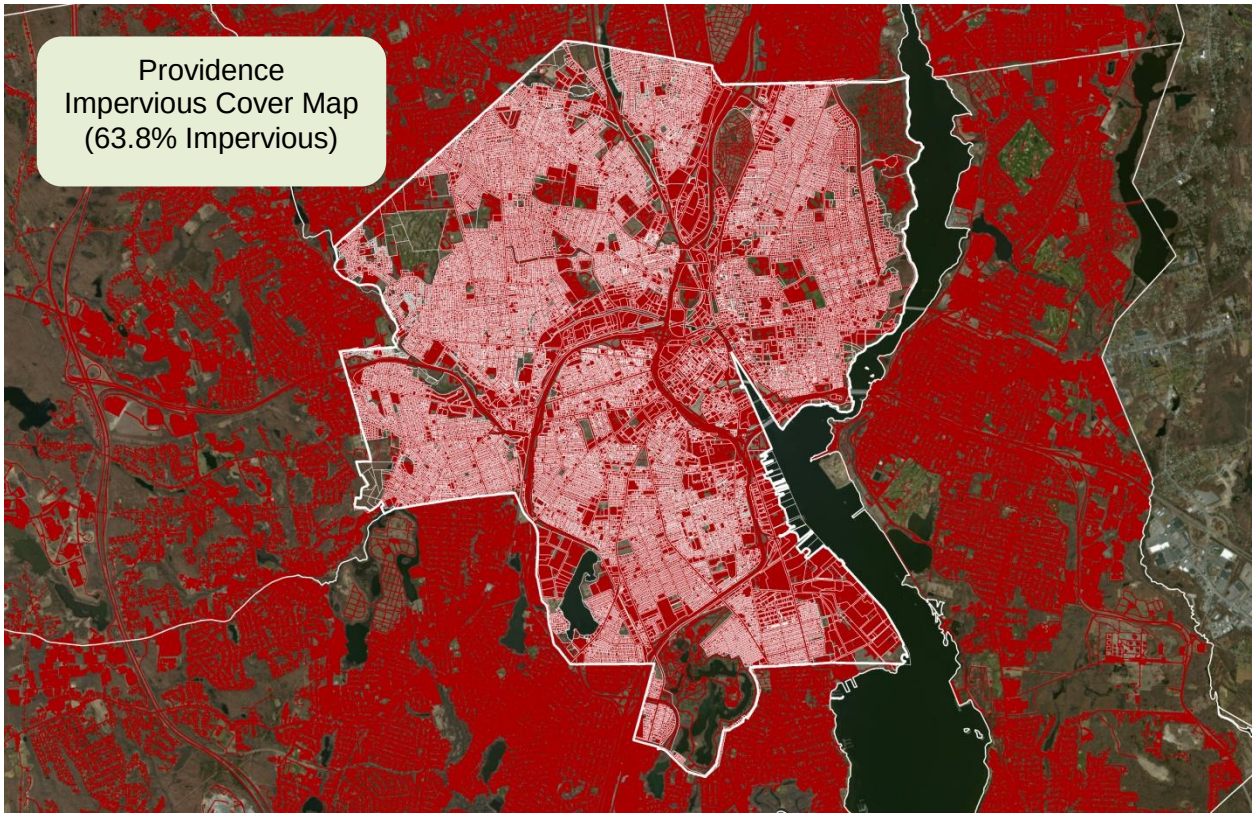
The stormwater program cost was estimated based on DPW budget categories for labor, materials and equipment and the percent that City staff felt was solely dedicated to stormwater (i.e., 10% MS4 allocation). This information was organized by major cost center to be consistent across the study area, as summarized in **Table 2.15** below.

Table 2.15 Pawtucket Current Stormwater Program Cost

Major Cost Center	Cost	Notes/Assumptions
Administration	$497	Labor for DPW administration
Indirect Cost Allocation (20%)	$13,719	% total budget
Operations and Maintenance	$38,279	Labor for DPW, materials & expenses (5-10% MS4)
Engineering and Master Planning	$11,118	Outside services
Regulation/Enforcement	$3,700	Development plan review
Capital Improvement Projects	$15,000	Total
Major Capital Projects	$0	N/A
Minor Capital Projects	$15,000	Minor repairs for MS4 only
Water Quality Monitoring	$0	None conducted
Total	**$82,311**	

It is worth noting that the City of Pawtucket has a cost-sharing program for tree planting and recently began providing trees at no cost. The City pays a contractor to plant the trees in right-of-way locations on a first-come, first-serve basis for interested abutting property owners. There will be 100 planned plantings in 2014. While this program was not intended to be part of the stormwater program, urban tree plantings can provide stormwater benefits, ecological benefits and improve property value.

2.7 Providence



The City of Providence is approximately 18.8 square miles and is mostly comprised of high density residential, roads and commercial/industiral areas. **Table 2.16** below summarizes the land use in the City from 2011 data available through the State of Rhode Island GIS database.

Table 2.16 Land Use in Providence

Land Use Type	Percent Coverage in Providence
High Density Residential	37.9%
Roads	18.8%
Medium High Density Residential	9.7%
Commercial	6.5%
Institutional	6.1%
Deciduous Forest	4.2%
Industrial	4.2%
Developed Recreation	3.7%
Other Transportation	1.9%
Cemeteries	1.6%

Land Use Type	Percent Coverage in Providence
Commercial/Industrial Mixed	1.5%
Water	1.3%
Railroads	0.9%
Vacant Land	0.6%
Transitional Areas (urban open)	0.4%
Water and Sewage Treatment	0.2%
Mixed Forest	0.1%
Brushland	0.1%
Waste Disposal	0.1%
Medium Density Residential	0.1%
Commercial/Residential Mixed	0.1%
Wetland	0.1%

Leadership/ Governance: Providence has a Mayor and City Council form of government. The current mayor is Angel Taveras and the City Council consists of fifteen (15) City Councilors, one for each of the City's wards.

Population: According to the Rhode Island Department of Labor and Training the 2000 census reported a population of 173,618 and the 2010 census reported a population of 178,042 in the City of Providence. This represents a 2.5% increase in population over the ten year span.

Economic Condition: The following information was obtained from the City of Providence Comprehensive Annual Financial Report (FY ending June 30, 2013): "Upon taking office in January 2011, Mayor Angel Taveras signed an Executive Order creating an independent Municipal Finances Review Panel to conduct a full review of the City's finances. On March 3, 2011, the Panel delivered a report that identified a $110 million structural deficit in FY2012. Through collaborative efforts and shared sacrifice, the Taveras administration, with the partnership of the Providence City Council and stakeholders across the City, has all but eliminated the City's $110 million structural deficit and ended FY2013 with a $1.57 million surplus in the general fund."

Key Industry: Key industries in Providence include education, healthcare, finance and trade. Large businesses in the City include Rhode Island Hospital, Brown University, Bank of America, Women and Infants Hospital, Miriam Hospital, Roger Williams Medical Center, Citizens Bank, Verizon, Johnson & Wales University and Pinkerton Government Services. The Port of Providence is the second largest deepwater seaport in New England and handles cargo such as cement, chemicals, heavy machinery, petroleum and scrap metal.

2.7.1 Stormwater System & Local Issues

City staff estimate that approximately 60-70% of the land area in the City of Providence drains to the combined sewer system. Maps of the CSS and MS4 systems do not fully delineate the drainage areas and inter-connections for each of these systems. City staff estimate that the MS4 system is approximately 75% mapped and the City has started an asset evaluation program that will include additional detailed mapping.

The City is responsible for maintaining approximately 12,000 catch basins and 4,000 gutter inlets along 370 miles of City roads. The exact number of catch basins and inlets draining to each of the CSS and MS4 systems is unknown at this time. The City mapped all of its MS4 outfalls 2008 and identified 175 discharges.

Funding Sources: The stormwater program is funded through the General Fund. In November 2012 the City approved a $40M Road Bond to improve over 65 miles of streets from 2013-2015. While the Road Paving Plan focuses primarily on reconditioning the roads, the construction activities will result in minor repairs and inspection/cleaning of the storm drain infrastructure.

Compelling Issues and Concerns About a Regional Stormwater Utility: During the one-on-one interview to gather information for this study, City staff identified the following stormwater-related issues in the City, in no particular order:

- Aging infrastructure
- Flooding problems (local streets)
- MS4 Permit compliance
- Water quality concerns

City staff indicated that there is a significant gap in funding for routine maintenance of the CSS and MS4 systems, as well as capital improvements to address water quality. City staff were interested in regionalizing the operation and maintenance of the CSS and MS4 systems to be performed by a separate entity.

City staff did not express any significant concerns regarding the implementation of a regional stormwater utility and noted that a regional approach seemed to be the most appropriate.

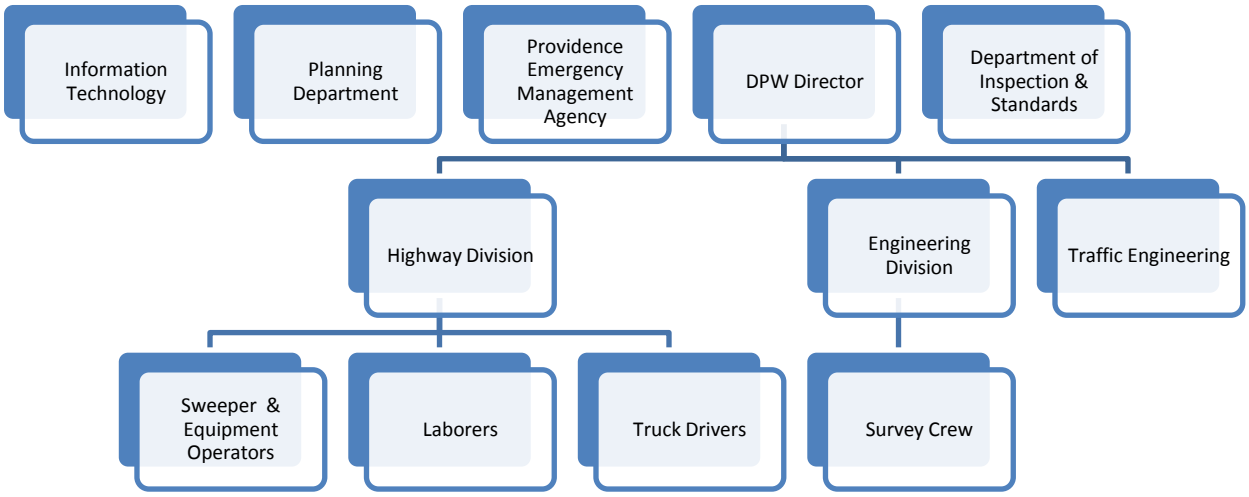
Public Awareness: Outreach and education efforts in the City primarily include working with Save The Bay for a marine science based education program with the Providence Public Schools. City staff reported the overall stormwater awareness in the general population to be fairly low; however, a fraction of the population is acutely aware of stormwater related issues. This group is mostly comprised of individuals in local environmental organizations. City staff noted that the general public would likely be sensitive to the following issues:

- Building a bureaucracy – fear of creating an effective entity to manage stormwater.
- Rate affordability – ability to bear the cost of aging infrastructure and stormwater issues.
- No new fees or taxes – rate payers may not support the need for a better program and only see a new fee or tax burden.

Available Data: The City of Providence has a comprehensive GIS database that includes parcel boundaries, the storm drain network and sanitary sewer network, impervious cover, etc. GIS data, including a parcel layer containing land use attributes and an impervious cover layer was acquired from the City. The Tax Assessor's database was not used during this study to provide data for land use by parcel. This data will be necessary for a more detailed revenue and rate analysis under a stormwater utility.

2.7.2 Program Management & Level of Service

Management of the stormwater program in the City of Providence primarily falls under the Department of Public Works, which includes the Highway Division, Enginering Division and Traffic Engineering. Other City departments play a role in stormwater management, including: Department of Planning for floodplain management, master planning and GIS related analysis; Providence Emergency Management Agency for flooding and emergency reponse; Department of Inspections and Standards for enforcement; and Information Technology Department for GIS support. It is worth noting that the Providence Water Supply Board provides an advisory role and coordinates with other departments in the City to assist with various planning efforts and collaborative efforts to promote water conservation. An organizational chart for management of the stormwater program in Providence is provided below.



The MS4 and CSS systems in Providence are extensive and require a significant effort for operation and maintenance, but the City lacks the resources to adequately inspect and maintain MS4 and CSS structures. Approximately 760 (5%) catch basins within the City (MS4 & CSS areas) are cleaned annually to address key areas of concern based on public complaints and to prevent local street flooding. The DPW sweeps all streets in the City 3-4 times a year, and some of the downtown areas are swept more often.

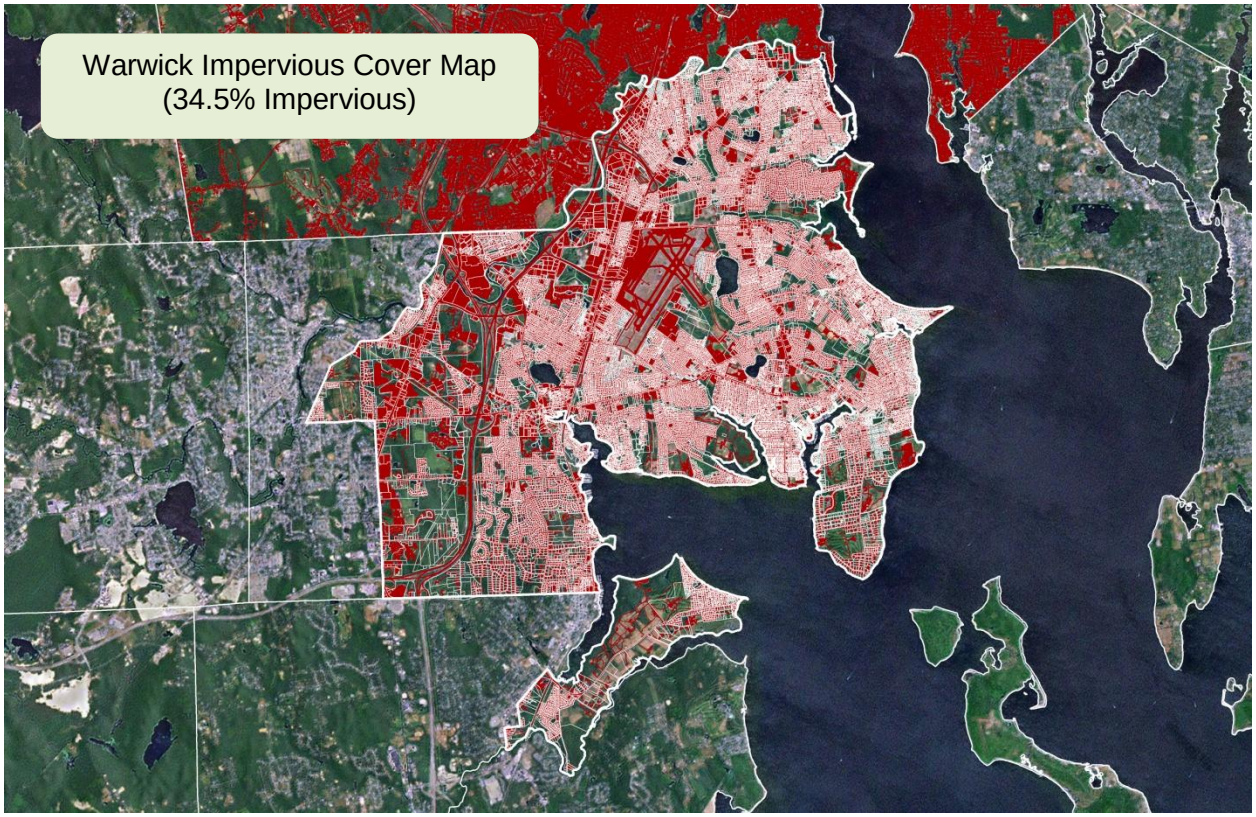
The stormwater program cost was estimated based on DPW budget categories for labor, materials and equipment and the percent that City staff stated was dedicated to stormwater (i.e.,

30-40% MS4 system). This estimate considered the effort and cost associated with management of the CSS and MS4 systems. This information was organized by major cost center to be consistent across the study area, as summarized in **Table 2.17** below.

Table 2.17 Providence Current Stormwater Program Cost

Major Cost Center	Cost	Notes/Assumptions
Administration	$70,129	Labor for DPW administration
Indirect Cost Allocation (20%)	$224,390	% total budget
Operations and Maintenance	$899,112	Labor across multiple depts., materials & expenses
Engineering and Master Planning	$107,262	Labor across multiple departments
Regulation/Enforcement	$45,450	Labor across multiple departments
Capital Improvement Projects	$0	None conducted, periodic grants only
Major Capital Projects	$0	N/A
Minor Capital Projects	$0	N/A
Water Quality Monitoring	$0	None conducted
Total	**$1,346,343**	

2.8 Warwick



The City of Warwick is approximately 35.9 square miles in area. The City is mostly comprised of forest, roadways, and residential areas. **Table 2.18** below summarizes the land use in the City from 2011 data available through the State of Rhode Island GIS database.

Table 2.18 Land Use in Warwick

Land Use Type	Percent Coverage in Warwick
Medium High Density Residential	24.9%
Deciduous Forest	17.7%
Water	13.3%
Roads	11.5%
Commercial	6.7%
Medium Density Residential	3.9%
High Density Residential	3.5%
Developed Recreational	3.2%
Airports	2.7%
Mixed Forest	2.2%
Industrial	2.0%
Institutional	1.4%
Other	7.0%

Leadership/ Governance: Warwick has a Mayor and City Council form of government. The current mayor is Scott Avedisianand the City Council is comprised of nine members representing nine wards.

Population: As reported by the Rhode Island Department of Labor and Training the 2000 census reported a population of 85,880 and the 2010 census reported a population of 82,672 in the City of Warwick. This represents a 3.7% decrease in population over the ten year span.

Economic Condition: The 2014 City budget indicates that the City is in relatively good financial condition, noting "Warwick has weathered the economic crises far better than many other cities and towns." The City has reported a surplus in 12 of the last 13 years.

Key Industry: Key industries in Warwick include air transportation and hotels/lodging (TF Green Airport is located in Warwick) and retail shopping. Warwick is home to two regional shopping malls: the Warwick Mall and the Rhode Island Mall, as well as a large area of commercial development along Bald Hill Road.

2.8.1 Stormwater System & Local Issues

Warwick has a fully separate storm sewer system and nearly 100% of the system is mapped on paper. Approximatley 30% of the system is mapped in GIS. Staff report that the system was

built as a separate system and was never combined. The City estimates it includes approximately 450 miles of road, 3,000 catch basins, 1,000 manholes and 800 outfalls.

Funding Sources: Funding for stormwater management is through the general fund.

Compelling Issues and Concerns About a Regional Stormwater Utility: During the one-on-one interview to gather information for this study, City staff identified the following stormwater-related issues in the City, in order of priority:

- Flooding problems & preservation of property value
- Ecological concerns: minimize beach and shellfish closures (e.g., Greenwich Bay)
- Aging infrastructure & maintenance of infrastructure
- Regulatory compliance

City staff indicated that the floods of 2010 had a major impact on the City similar to that in the City of Cranston. As discussed previously, in March 2010, after 5 inches of rain, the Pawtuxet River overflowed and impacted many sites such as the Warwick Mall. Additionally, the City's wastewater treatment plant was completely inundated during the flood.

Warwick Wastewater Treatment Plant under water. Photo courtesy: City of Warwick DPW.

The following concerns for implementing a regional stormwater utility in Warwick were identified, in the following order of concern:

- Building a bureaucracy – "one new fee" and "fee creep"
- Responsiveness to and prioritization of local issues
- Consistency in treatment, fairness – "getting my share"
- One area "bailing out" another one – "taking on other people's bigger problems"
- Being dominated by one entity

Public Awareness: Stormwater and water quality outreach and education efforts in the City of Warwick include:

- DPW created an informational brochure to inform the public about the benefits of improving water quality, the steps currently being taken, and what the public can do to assist. Brochures will be distributed at City Hall, libraries, recreation facilities, and other public areas.
- Buckeye Brook Coalition – the City is working with the Buckeye Brook Coalition on a plan for implementing the recommendations of the RIDEM 2007 TMDL study. DPW is also working to establish a team of volunteers to assist with storm drain inspections, monitoring and to educate residents in the Buckeye Brook Watershed.
- DPW assists various Neighborhood Associations with collection of wastes after volunteer clean-ups.

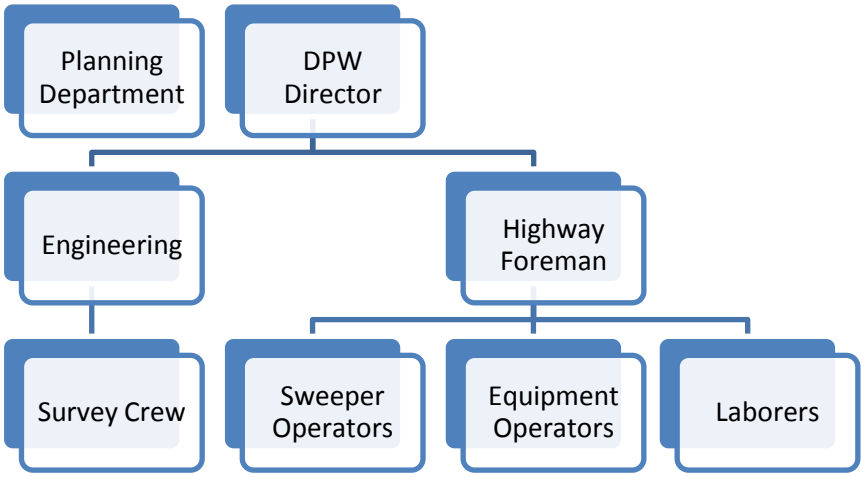
- DPW maintains pet waste stations at several locations throughout the City.
- The City of Warwick Recycling Calendar is sent to every home owner in the City to inform residents of how to properly dispose of household and yard wastes.

City staff reported the overall stormwater awareness in the general population to be fairly low, but there is a moderate level of awareness for specific issues, such as flooding, beach closures and shellfish closures (e.g., Greenwich Bay). The following sensitive issues were noted: rate affordability; no new taxes or fees; and flooding issues.

Available Data: The City of Warwick has paper maps of nearly their entire storm sewer system including outfalls, catch basins, etc. GIS data for the stormwater system is limited (30%) and the City does not have an impervious cover layer. As a result, the updated Statewide Impervious Cover layer was used for Warwick. A GIS parcel layer was acquired from RIDEM containing land use attributes for each parcel. The Tax Assessor's database was not provided during this study to provide data for land use by parcel. This data will be necessary for a more detailed revenue and rate analysis under a stormwater utility.

2.8.2 Program Management & Level of Service

Management of the stormwater program in the City of Warwick primarily falls under the Department of Public Works and Engineering Department. The DPW and Engineering Department coordinate with staff in the Planning Department, but these staff do not have a significant role in stormwater management. An organizational chart for management of the stormwater program is provided below.



The MS4 system in Warwick requires a significant effort for operation and maintenance. Approximately 900 (30%) catch basins within the City are cleaned annually and all streets are swept at least once annually. A catch basin cleaning and insection form is completed and the City is planning to sweep more sensitive areas twice a year.

The stormwater program cost was estimated based on DPW budget categories for labor, materials and equipment and the percent that City staff felt was solely dedicated to stormwater. This information was organized by major cost center to be consistent across the study area, as summarized in **Table 2.19** below.

Table 2.19 Warwick Current Stormwater Program Cost

Major Cost Center	Cost	Notes/Assumptions
Administration	$6,429	DPW Labor
Indirect Cost Allocation (20%)	$99,455	% total budget
Operations and Maintenance	$188,681	Labor & expenses across multiple departments
Engineering and Master Planning	$155,687	Labor & expenses across multiple departments
Regulation/Enforcement	$9,663	Labor for Building Inspection Department
Capital Improvement Projects	$135,614	None conducted
Major Capital Projects	$37,434	Debt service on drainage bonds
Minor Capital Projects	$98,181	Minor drainage repairs & rehabilitation
Water Quality Monitoring	$1,200	Beach testing
Total	**$596,729**	

3.0 Compelling Case for Enhanced Stormwater Programs

This section discusses the importance of making a compelling case when considering a stormwater utility and the information that was considered by both the Steering Committee and the Stakeholder Group. Commonly utilized "drivers" are called out and examples that were voted most relevant to the study area by participants are highlighted. Section 2.0 identified compelling issues in each community with specific examples and this section represents the thought process for creating a compelling case and summarizes the collective feedback from the Steering Committee and Stakeholder Group.

3.1 Drivers for Change

Understanding the stormwater issues and concerns that face the Upper Narragansett Bay region is the starting point for building a "compelling case for action". In every community there are good, even compelling, reasons to improve the way stormwater programs are executed. When we look at stormwater programs around the country and identify the impetus for improved stormwater programs, we have found that the reasons for change are generally motivated by some combination of key common "drivers" or forces. Each of these drivers can be understood and expressed in various ways depending on the local situation, but the generic categories are provided below with examples.

Water quality and ecology: beach and shellfish bed closures; nutrient-impaired embayments and recreational waters; fish kills; reduced ecological health; reduced number of game fish, destroyed habitat; toxic pollution; eutrophication of lakes and ponds; bacterial pollution; illicit connections and illegal dumping; combined sewer or sanitary sewer overflows, or other point discharge issues; urban hot spot pollution.

Quality of life and aesthetics: degrading water quality near beaches and subsequent loss of tourism; detention basin safety hazards or appearance; weeds, erosion or other stream impacts; loss of natural appearance; desire for greenways or trails; toxic or dangerous organisms that can effect human health and safety, and curtail recreational use.

Preservation of property value: reduction in waterfront property values; floodplain property values declining; opportunities for waterfront enhancement; loss of reputation for safety or for natural features; development pressures eroding natural features; protection of unique water-related features.

Drinking water supply protection and enhancement: pollution of groundwater and drinking water supplies; well head pollution issues; filling of reservoirs; eutrophication and water taste issues; declining low flows for water treatment; effluent pollution.

Flooding problems: flooding along both major and minor streams; system backups and other capacity issues; tidal influenced flooding; culvert and other conveyance infrastructure under sizing or failure.

Aging infrastructure: limited life and need to replace leaching facilities; clogged systems; erosion of property; damaged systems; rusted culvert inverts; cracked and failing concrete; undersized systems due to new development; failing dams and detention ponds.

Development pressures: development related increased flows and flooding; filled detention ponds; increasing pollution and erosion.

Erosion of channels and creeks: major stream erosion; bridge undermining; infrastructure failure due to erosion; minor ditch erosion; head cutting; sediment buildup; filling lakes and ponds.

Regulatory mandates: RIPDES permit (including anticipated requirements of renewed MS4 general permit); FEMA regulations; TMDLs; endangered species act; drinking water protection; well head protection; wetlands permitting; other state, regional, or local regulations.

Lawsuits: flooding caused by roads; environmental compliance law suites; nuisance flooding; erosion or other issues; health and safety suits.

UNB Regional Drivers

During the first meetings, the Steering Committee and Stakeholder Group identified the key issues and concerns that participants felt were compelling reasons (needs) they could address through an enhanced stormwater program if they had an adequate source of revenue. Responses are listed in **Table 3.1** and the Meeting #1 summaries in Appendix III provide a more detailed breakdown of the issues and voting.

Table 3.1 Compelling Case Voting Summary

Stakeholder Group			Steering Committee		
Rank	**Category**	**Votes**	**Rank**	**Category**	**Votes**
1	Policy	29	1	Water Quality	26
2	Education	25	2	Flooding	26
3	Flooding	20	3	Infrastructure	24
4	Cost Related	18	4	Policy & Administration	11
5	Social & Land Use	15			
6	System	13			
7	Water Quality	11			

The contrast in voting between the Stakeholder Group and Steering Committee is noteworthy in the case of “policy” issues where it received 29 votes by Stakeholder Group members and 11

votes by Steering Committee members. Examples of "policy" issues identified by the Stakeholder Group include: zoning and other hurdles, incentives and uncontrolled infill. While the Stakeholder Group is clearly more focused on policy and education issues, the Steering Committee is more concerned about water quality and flooding issues based on this group's understanding of infrastructure needs and concerns about the level of effort to mitigate stormwater impacts and address water quality issues.

While the Stakeholder Group is clearly more focused on policy and education issues, the Steering Committee is more concerned about water quality and flooding issues.

"Compliance with RIPDES Permits" did not rate high as compared to the other stormwater management categories. This is a very important distinction to make when framing the compelling case and supporting rationale for an enhanced stormwater management program and implies that **there are real stormwater needs that communities need to address, not just because the "RIPDES MS4 Permit requires it"**. In the same breath, each community needs to remember that TMDLs have been developed for numerous water bodies in the UNB study area. These TMDL studies outline specific activities that are required to be completed. A summary of these activities by community is provided in Appendix I.

Where stormwater is found to be contributing to water quality impairments, RIPDES MS4 General Permit requires the regulated municipalities to implement the recommendations of the TMDL study. TMDL requirements become effective once the MS4 operator is notified by RIDEM that the TMDL has been approved and contains provisions that must be addressed in a revised Stormwater Pollution Prevention Plan (refered to as a TMDL Implementation Plan). These requirements generally include:

- Targeted public education and outreach activities;
- Detailed mapping, investigation and condition assessment for MS4 infrastructure;
- Litter and pet waste management programs;
- Increased pollution prevention activities (e.g., operation and maintenance of the MS4);
- Illicit discharge detection and elimination activities to remove pollutant sources; and
- Capital construction projects for installing structural BMPs to treat stormwater.

It makes sense to address needed infrastructure issues that are also impacting water quality and an enhanced (and adequate) stormwater program is the intended outcome of the RIPDES MS4 Permit. The estimated level of effort to meet the RIPDES MS4 Permit for the next permit cycle (anticipated 2015-2019) was considered in the development of the future stormwater program costs for each community in Section 4.2.

3.2 Building a Compelling Case

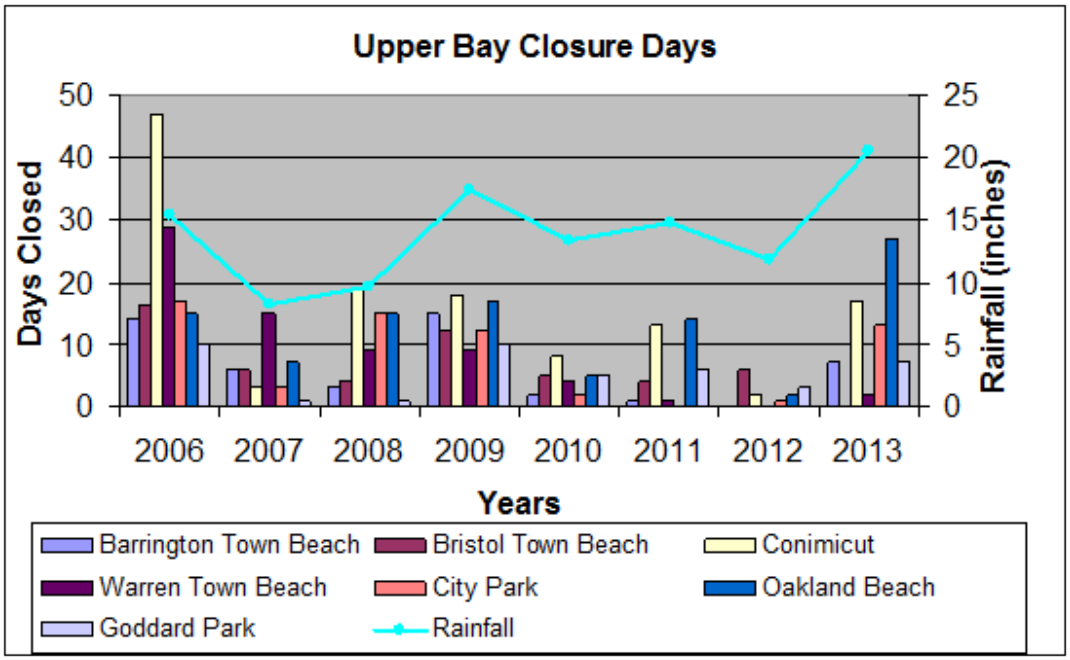
Assembling a "compelling case" is an initial step in framing the key reasons for change to improve the stormwater program. Now that the UNB municipalities have initially identified the drivers for change, the next step is to use this information to develop a compelling case. This

compelling case serves as the municipality's publicly-stated rationale for why an enhanced stormwater management program is needed and a regional approach may be the most appropriate and effective strategy.

In creating a compelling case to address a wide variety of stakeholders it will be helpful to remember that, in general, people are motivated along two complimentary courses of persuasion: information (data) and stories. Some people, classified as Left Brain thinkers, want facts and statistics (data), while others, known as Right Brain thinkers, are moved to action by horror stories and pictures. When begining to quantify the community's perception of program need or make the case for change and new funding, it is important to address both types of people. **Table 3.2** gives some examples taken from successful stormwater utilities and some visual illustrations specific to UNB municipalities are provided below.

Table 3.2 Compelling Case Examples

"Left Brain"	"Right Brain"
• Statistics on repair costs • Cost information • Infrastructure information • Lost revenue or tourist dollars • Regulatory facts • Backlog information on flooding • Unfunded mandate information	• Flooding pictures • Horror stories • Movies • Testimonials • Environmental or aesthetic appeals • Drawings of a future greenway, trail, etc.



Sediment deposits at Waterplace Park in Providence

Example of maintenance needs

Building a compelling case and knowing when, how, and to whom it should be presented is more of a political and technical art form than it is a science. Taking time to build an informed consensus to move forward and to support program change and new funding methods is vitally necessary. It is important to note that in some cases what could end up being the most compelling case may not yet be on the rate payer's radar screen. It will therefore be incumbent upon the municipalities and advocates to first educate stakeholders about the importance of an issue. During the last meeting for this study, several of the members of the Stakeholder Group volunteered to participate in outreach to their colleagues and other community leaders in order to help explain the case for a regional approach to stormwater management.

Water quality, flooding, policy and education issues received the greatest number of votes as the most compelling reasons to improve stormwater management. In general, the study participants provided "left brain" and "right brain" examples of stormwater issues that support the need for changing the current status quo. The study participants also discussed a "no action" alternative/option, understanding there are consequences for such an approach. The most compelling reasons to improve stormwater management in each of the study area communities are summarized in **Table 3.3**.

Table 3.3 Compelling Case Summary by Community

Municipality	Flooding	Preservation of Property Value	Water Quality & Ecological Concerns	Aging Infrastructure	Compliance Requirements	Quality of Life & Aesthetics	Development Pressures
Central Falls				✓	✓	✓	
Cranston	✓	✓	✓	✓			✓
East Providence	✓		✓	✓		✓	
North Providence*							
Pawtucket		✓		✓	✓		
Providence	✓		✓	✓	✓		
Warwick	✓	✓	✓	✓	✓		

Note: *North Providence did not participate in a one-on-one meeting with the Project Team or provide compelling case information.

Section 4.3 discusses the feedback from the Steering Committee and Stakeholder Group meetings regarding a regional approach to manage and fund the stormwater program. In general, the Steering Committee felt that **a regional stormwater management and funding approach is the "best among options"** and the Stakeholder Group voiced stong support for a regional approach with several members even stating that it was the only way that the region's stormwater problems would be resolved.

3.3 Summary & Key Messages

The impetus for this study was a local understanding that there is inadequate funding to address known stormwater issues and a regional solution may be an effective strategy to address these issues. While there are many competing interests and issues for funding across all of the study area communitites, there is a need to invest in a more robust stormwater management program and avoid future costs associated with flooding, aging infrastructure and water quality degradation.

The following **logical argument** was developed during the study to summarize the thought process and key messages to the greater public:

1. We have real, growing, shared and unresolved stormwater problems.
2. We can solve these problems and there will be tangible benefits.
3. It will cost more than we are now spending.
4. It will be more efficient and effective doing so together.
5. A stormwater user fee is the best and fairest way to pay for the improvements.

Key Stakeholder Group Messages: at the last meeting the Project Team asked the Stakeholder Group to reflect upon the study with the following questions in mind:

1. *What resonates most to you based on what you've heard so far?*
2. *What are the most meaningful results of this preliminary feasibility study?*

The Project Team summarized the following key themes from the discussion:

- Regional Concept is Needed
- **Education is Key** (lack of understanding, "how to best solve")
- Need Good Data/Program
- Emphasize Infrastructure Needs
- Regional Entity Needs to be an Effective Problem Solver
- Defined and Dedicated Resources/Responsibilities
- Different Concept – Must Sell Well
- Need a Strong Compelling Case *(and consequence)*

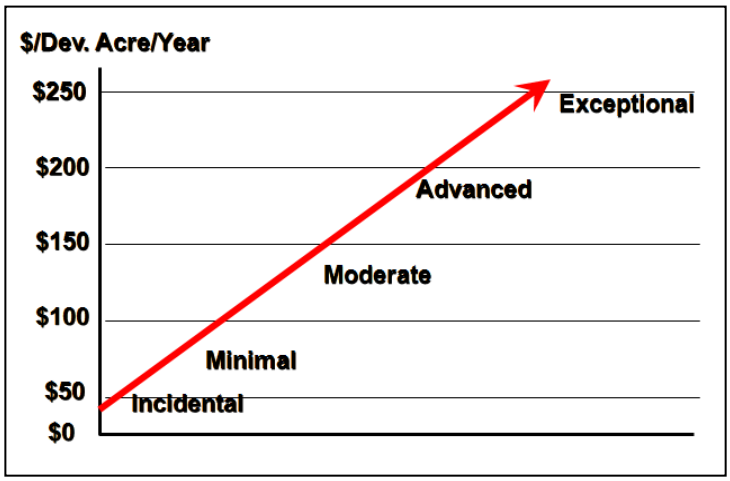
Each of the above themes are touched upon in this report and incorporated into the recommendations/next steps.

4.0 Proposed Future Stormwater Program

This section provides a discussion of the level of service and cost estimate for the future stormwater programs in the study area. Potential regional stormwater management approaches are presented with a more detailed discussion of a preferred regional approach by the Steering Committee. A preliminary revenue analysis is provided to consider a stormwater utility funding mechanism, followed by a brief discussion about credits to illustrate one of many future policy decisions that need to be made under the next phase of study.

4.1 Level of Service

It is important to understand the needs or "level of service" for the future stormwater program as this will drive the cost and approach for funding and implementation. In the context of a regional management and funding approach, the level of service can also drive the organizational structure and rate approach. During the study, the Steering Committee noted that the level of service needed to be clearly defined across the region and that each municipality should be held to certain minimum standards.



The figure to the right illustrates the typical investment (cost) per developed acre of land per year for stormwater programs with increasing levels of service. For example, communities that invest $50-$100/developed acre/year typically have a very minimal stormwater management program. Programs within the "moderate" range are generally considered to provide a level of service that adequately maintains the current MS4 system and incorporates a moderate effort to address priority stormwater management areas. **A moderate to advanced level of service should be the minimum starting point in the UNB study area given the current understanding of stormwater issues and the need to develop and construct capital projects to improve water quality.**

The future level of service was estimated using available data, information provided by participating municipalities and best professional judgement by the Project Team. One of the most critical components necessary to gauge an appropriate level of service is a detailed understanding of the CSS and MS4 systems, specifically: age and condition of infrastructure; system capacity and the level of stormwater treatment provided. The Steering Committee and Stakeholder Group both noted at multiple meetings that the MS4 systems need to be assessed to determine the most appropriate level of service to be provided through a local or regional

stormwater management program. Since this detailed information was not available for this study, the Project Team estimated a future level of service based on the following criteria:

- At a minimum, communities need to meet the requirements of the RIPDES MS4 Permit:
  - Implement the six (6) Minimum Control Measures
  - Perform maintenance and repairs of the MS4 to prevent failure
  - Conduct a planning analysis for impaired waters, focusing on those with TMDL studies
  - Design at least 1 BMP annually for impaired waters and/or TMDLs: this will develop "shovel ready" projects to seek/obtain alternative funding and/or leverage with upcoming redevelopment projects.
  - Construct at least 1 BMP in the first 5 years targeting an impaired water body: this is a reasonable goal for a municipal program given the upfront planning effort and timeline for design, permitting and construction. In subsequent years, the planning and design expenditures will shift to provide for more capital construction.
- The estimated effort, as a percent (%) increase from current efforts, with an understanding of the current level of service provided and needs stated by City staff.
- Future stormwater program estimates are for each community and do not assume a regional approach and associated economies of scale.
- The majority of the future program is funded through annual revenues to avoid debt service.

It is important to note that insufficent data were available for each municipality to specifically determine the costs of future level of services that will result in compliance with MS4 permit requirements. Also, the estimate for the future level of service did not incorporate an analysis of the following components, which will likely increase future program costs that will have to be balanced with other competing interests in the region:

- Major capital expenditures to retrofit MS4 systems and meet all TMDL recommendations;
- Major MS4 system rehabilitation or "capital replacement" costs (due to lack of data); and
- Major capital expenditures for flood mitigation (not yet defined).

The estimates of program expenditures in Section 4.4.2 provide a comparative analysis based on a moderate level of service for similar communities across the country and the cost on the basis of developed acres for the UNB study area communities.

Steering Committee Feedback: during the study, the Steering Committee noted that "the program needs to be affordable, utilize an integrated approach, and push back schedules for compliance. This is a new permit process so there will be changes over time." These are legitimate concerns considering the potential level of effort to address infrastructure needs within a specific timeframe given the level of investment in public infrastructure, such as the sanitary wastewater and the combined sewer system in some communities. The Project Team emphasized that the program will take time to develop and priorities for infrastructure and funding will need to be balanced.

4.2 Future Cost Estimate

A preliminary analysis of future program costs was presented at Steering Committee Meeting #3 and updated following further review and discussion with the participating communities. The future estimated annual costs for the UNB study area communities are summarized in **Table 4.1** and represent a significant increase above current expenditures. Table 4.1 includes an initial estimate of the future program cost by the Project Team and an estimate based on a moderate-advanced level of service using a cost of $175/developed acre for developed acres in each community, assuming that each community has no CSS system.

It is important to note that the current level of service is minimal in most communities, although some communities have significant CSS systems. The cost difference may be even greater once more data is avilable and future needs are better understood.

Table 4.1 Estimated Future Stormwater Cost Estimate & Comparison

Municipality	Current Budget	Future Program* Initial Estimate	Future Program Assuming $175/developed acre/year
Central Falls *(100% CSS)*	$17,723	$29,510	$134,400
Cranston	$1,354,073	$1,635,193	$2,562,560
East Providence	$275,400	$692,700	$1,500,800
North Providence	$117,847	$490,853	$649,600
Pawtucket *(90% CSS)*	$82,311	$388,237	$974,400
Providence *(65% CSS)*	$1,346,343	$3,315,647	$2,072,000
Warwick	$596,729	$1,177,473	$3,180,800
Totals	**$3,790,426**	**$7,729,612**	**$11,074,560**

Note: *as determined by municipal officials.

It appears that the future level of service and annual cost for the UNB study area is at least in the range of $7.7-11 million, but may be even higher once additional infrastructure data is available. **Table 4.2** provides a more detailed breakdown of the estimated future stormwater program costs by key cost center. A summary of future costs with assumptions for each community are provided in **Appendix VI**.

Table 4.2 Estimated Future Stormwater Costs by Key Cost Center*

Key Cost Center	Totals	Central Falls	Cranston	East Providence	North Providence	Pawtucket	Providence	Warwick
Administration	$ 166,632	$ 3,135	$ 28,205	$ 18,000	$ 22,500	$ 993	$ 84,155	$ 9,643
Indirect cost allocation (20%)	$ 1,288,269	$ 4,918	$ 272,532	$ 115,450	$ 81,809	$ 64,706	$ 552,608	$ 196,245
Operations & Maintenance	$ 3,623,464	$ 21,457	$ 804,827	$ 235,500	$ 141,500	$ 66,988	$ 2,023,002	$ 330,191
Engineering & Master Planning	$ 719,408	$ -	$ 39,841	$ 89,750	$ 32,500	$ 75,000	$ 212,708	$ 269,609
BMP Design	$ 300,000	$ -	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000
Regulation/ Enforcement	$ 108,091	$ -	$ 14,788	$ 7,500	$ -	$ 5,549	$ 68,174	$ 12,079
Capital Improvement Projects**	$ 1,259,705	$ -	$ 375,000	$ 125,000	$ 125,000	$ 100,000	$ 275,000	$ 259,705
Major Capital Projects	$ 837,434	$ -	$ 300,000	$ 75,000	$ 75,000	$ 75,000	$ 200,000	$ 112,434
Minor Capital Projects	$ 422,271	$ -	$ 75,000	$ 50,000	$ 50,000	$ 25,000	$ 75,000	$ 147,271
Water Quality Monitoring	$ 264,044	$ -	$ 50,000	$ 51,500	$ 37,544	$ 25,000	$ 50,000	$ 50,000
Totals	**$ 7,729,612**	**$ 29,510**	**$ 1,635,193**	**$ 692,700**	**$ 490,853**	**$ 388,237**	**$ 3,315,647**	**$ 1,177,473**

Notes: *as determined by municipal officials. **Represents the total of major and minor capital projects.

4.3 Regional Approaches Considered

The Steering Committee was asked to narrow the universe of options to one preferred regional approach to be considered for further evaluation in this initial feasibility study. The Project Team developed a suite of regional programs considerations, potential regional frameworks, assumptions, and objective criteria that were presented to the Steering Committee with an explanatin of each. "Regional" stormwater programs were described and discussed in the context of 3 essential building blocks:

A. **Regional Program Management:** activities are done together and/or consistently across the region with consideration of the varying MS4 and CSS systems. The Project Team provided several potential regional program approaches with a combination of the following regional or local major program elements:

    1. Combined Sewer System (CSS) lateral collection systems
    2. Water quality programs
    3. Municipal Separate Storm Sewer (MS4) collector systems & local flooding
    4. Streams and floodplain management
    5. Stormwater review and support for development

    The Steering Committee was then asked to consider their preference for how each of those above 5 elements should be handled: regionally or locally. The preliminary approaches focused on preferences for regional program management.

B. **Regional Organization:** work is done or administered by multiple cooperative entities, an existing entity or a new "regional entity". The NBC's potential role in the organizational structure was reviewed and relevant discussion is provided following the review of preliminary regional approaches. Regional organization preferences included options for either "NBC" or "Regional" as the regional entity in which "Regional" would be a new, separate regional entity.

C. **Regional Funding:** programs across the region are funded using a consistent or similar approach, such as a stormwater utility. For simplification purposes, fees were assumed to be collected regionally but redistributed to the communities for implementing "local" options. The Steering Committee voiced concern about the complex allocation of funds and expressed a desire to ensure that each participating community got value back.

The Project Team emphasized that although one preferred regional approach would be considered for further evaluation, the approach may be transitional and not permanent to accommodate changes and growth over time. The preliminary approaches presented to the Steering Committee are summarized in **Table 4.3** and described below.

Table 4.3 Preliminary Regional Approaches Considered by the Steering Committee

Approach	#1 CSS Laterals	#2 Water Quality	#3 MS4 Collector & Flooding	#4 Streams & Floodplain Mgmt.	#5 Stormwater Review
A Regional	Local	Regional	Regional	Regional	Regional
A1 Regional	NBC	Regional	Regional	Regional	Regional
A2 Regional	NBC	Regional	Regional	Regional	Local
B Regional/local	NBC	Regional	Regional	Local	Local
B1 Regional/local	NBC	Regional	Local	Local	Local
C NBC/local	NBC	NBC	NBC	Local	Local
C1 NBC/local	NBC	NBC	Local	Local	Local

Approach A: Regional

- Local governments manage CSS laterals, explained as everything up to the interceptors.
- Regional entity responsible for all other elements.
- Local governments would have little stormwater responsibility.

Approach A1 – NBC is Responsible for (#1) CSS Laterals

- Similar to Approach A, but NBC would have responsibility for all CSS infrastructure. This approach for management of the CSS infrastructure has already been discussed between NBC and CSS communities.

Approach A2 – Local Community is Responsible for (#5) Stormwater Review

- Similar to Approach A1, but local communities maintain control of stormwater review to provide more local control and reduce burden on developers.

Approach B: Regional/Local

- Regional entity would be responsible for (#2) Water Quality and (#3) MS4 collector systems (e.g. pipes, catch basins, man holes, outfalls, BMPs) and local flooding resulting from issues with infrastructure.
- Local governments would be responsible for (#4) streams and floodplain management and (#5) review of stormwater designs for permitting and development.

Approach B1 – Local Community is Responsible for (#3) MS4 Collector System

- Similar to Approach B, but local communities would also have responsibility for their own MS4 infrastructure and local flooding resulting from issues with infrastructure.
- In Approach B1, the regional entity is only responsible for water quality and not the MS4 infrastructure.

Approach C & C1: NBC/Local

- Similar to Approach B & B1, but NBC was recognized as the specific organization for the regional entity.

The following pros and cons were discussed by the Steering Committee for Approach A:

PROS	CONS
Takes burden off of understaffed municipalities.	One more level for developers to have to go through for approvals. Could be overcome through a one-stop shop service.
Watershed planning for water quality and flooding.	Residents being concerned about regional authority's responsiveness to local issues like flooding events.
Dedicated professional stormwater staff can provide technical support.	Additional overhead costs.
TMDLs addressed regionally.	Prioritization of projects may result in funding going to projects in other communities. Fee payers may not immediately see what their money is going towards since it's not in their city.
Economies of scale – work shared and equipment shared means lower local operating costs.	Might not see local projects.

The following pros and cons were discussed by the Steering Committee for Approach B:

PROS	CONS
More local control and flexibility.	Concern about fees returning to local towns.
More responsive to citizens.	Spending controlled by local councils.

The following pros and cons were discussed by the Steering Committee for Approach C:

PROS	CONS
NBC already successfully runs a regional program.	Currently, the NBC is only responsible for CSS from the interceptors to the plant.
NBC already has a billing system and administrative support. Wet weather fee component can be added.	Not all the communities in the regional study are serviced by NBC. What would be the perception of those users receiving a bill from NBC?
Integrated approach for water quality.	NBC does not currently have the regulatory authority to manage stormwater.

Discussion of NBC Role as Regional Entity

In addition to the pros and cons of NBC acting as the "regional entity" under Approach C, the Stakeholder Group discussed the following important question: Can we build on NBC instead of creating a separate program? The following key points were discussed:

- The NBC is already a regional entity. It is respected, well run and their program incorporates stormwater management for areas that drain to NBC interceptors.
- There are concerns that the early wastewater program track record was not as good as it is today and people may remember that.
- NBC just raised their rates and won't want to add another fee.
- The CSO initiative (long-term control plan) is demanding on NBC staff.
- NBC does interceptors and treatment. Smaller pipes belong to town.
- NBC does permitting for projects.
- NBC handles large infrastructure and may not be willing to take on lots of smaller projects, as well as operation and maintenance.
- NBC is not currently authorized to charge a stormwater fee.
- Local communities still have to deal with flooding issues and NBC is not well equipped to handle these types of issues.

In the past, NBC proposed to conduct a study and report about the organization potentially taking over community wastewater collection systems through state legislature. NBC did not want to force communities into this model if they didn't want to participate. They decided to go forward with the plan internally and a legislative proposal was introduced but did not pass in the senate. As far as NBC taking over the CSS laterals under the regional approaches discussed above, this would be less than taking over the entire NBC service area and would focus on the CSS systems in Central Falls, Pawtucket and Providence. See Section 4.5 for a discussion of the NBC's thoughts on billing for a regional stormwater utility.

Approach D – "Do Nothing"

The Steering Committee also suggested an Approach D – "Do Nothing" in which all program elements remained local. The following information was provided in support of a "Do Nothing" approach:

- There are concerns about another fee for residents, particularly in economically challenged communities where people are already struggling to pay existing utility fees.
- Cities who are doing things well don't want to pay/support others who aren't.

Regional Approach "Straw Poll"

Following the review of preliminary options and a discussion of the pros and cons, the Steering Committee participated in a straw poll to rank each of the approaches from 1 – 5, with 1 being

the least appealing and 5 being the most appealing. This ranking is displayed in the left hand column of **Table 4.4** below. The results were given a weighted score by multiplying the number of votes by the rank. For example, Approach A received a score of 37 as follows: 1 x 1 vote = 1; 2 x 1 vote = 2; 3 x 2 votes = 6; 4 x 7 votes = 28 (1 + 2 + 6 + 28 = 37).

Table 4.4 Straw Poll Results for Regional Approaches

Appeal Factor (1=least, 5=most)	Approach A (# votes)	Approach B (# votes)	Approach C (# votes)	Approach D (# votes)
1	1	0	3	4
2	1	4	5	2
3	2	4	2	1
4	7	3	0	2
5	0	0	1	2
Totals	**37**	**32**	**24**	**29**

Based on the straw poll, Approach A was considered the most popular option, indicating that the Steering Committee desires a regional approach that reduces the local responsibility and effort.

- Approach A was advanced for consideration:
  - Local governments or NBC manage (#1) CSS laterals up to the interceptors.
  - Regional entity (not NBC) is responsible for all other elements.
  - Local governments would have little stormwater responsibility.

Based on further discussion after the straw poll about Approaches A, A1 and A2, Approach A2 was considered to be the most favorable by the Steering Committee.

- Preferred Approach A2
  - NBC would have responsibility for all CSS infrastructure, including CSS laterals (everything up to the interceptors).
  - A new “regional entity” would be responsible for all other elements.
  - The new regional entity would collect a uniform fee for its services, calibrated to varying local needs.
  - Local governments would have little stormwater responsibility, except for development related reviews.

During Steering Committee Meeting #3, the benefits of a regional entity were discussed in greater detail and participants felt that a regional entity could:

- Eliminate bureaucracy;
- Allow greater access to sources of specialized expertise;
- Direct projects within watersheds;
- Spread costs across a larger rate base; and
- Have a greater chance for outside funding. It was also pointed out that there would be monetary benefits when applying for matching grants and other sources of revenue.

Using the preferred Approach A2, the Steering Committee members were asked what they felt a Regional Entity might do. Participants were given 2 votes for their top priorities and the results are summarized in **Table 4.5** below.

Table 4.5 Priorities for New Regional Entity

Top Duties for "New" Regional Entity	Votes (2/person)
1. Construction & Engineering	8
2. MS4 Collection System Operator	8
3. Compliance Manager	3
4. Information Manager	3
5. Floodplain Manager	1
6. Regulator and Inspector	1
7. Watershed Manager	0
8. Development Partner	0
9. Public Educator	0
10. Finance and Administration	0

The Steering Committee provided feedback about what they liked and did not like about the concept of regionalization. The following is a summary of the information discussed:

Likes about the Regional Approach

- Watershed wide approach.
- Consistency of funding.
- Municipalities could move stormwater off their plate.
- Consistency of services and solutions.
- Only way problem will be addressed (current approach isn't working).
- Consistent regulation/enforcement and inspection.
- Expertise fixing the problem.
- Project consistency.

Dislikes about the Regional Approach

- Loss of control over system.
- Cities will be less accountable for stormwater issues.
- Cost is going to be significant – the entire project costs are significantly underestimated.
- Fee creep.
- Public perception of a "rain tax".
- Unforeseen challenges (e.g., lawsuits, costs).
- Concerns about fair play and municipal priorities.

Following discussion of likes and dislikes about the regional approach, both the Steering Committee and Stakeholder Group were asked if this approach should be explored further. **Table 4.6** summarizes the results of the voting and indicates that the members felt that a regional user fee approach warrants further investigation.

Table 4.6 Voting to Continue Exploring a Regional User Fee Approach

Continue w/Regional User Fee Approach	Steering Committee Votes	Stakeholder Group Votes*
1 (Strong No)	0	0
2 (Don't Like It)	2	0
3 (Neutral)	3	0
4 (Best Among Options)	5	1
5 (Strong Support)	2	11
6 (Other/ No Vote)	0	0

Note: *one member left early.

Table 4.7 summarizes the Project Team's review of the potential benefits of regionalization using Approach A2 and the current understanding of compelling issues in each community. Benefits are color-coded according to their potential to provide a positive benefit to address community specific needs. Further analysis is provided in Section 4.4 to consider the future cost of a regional versus independent program.

Table 4.7 Qualitative Summary of Regionalization Benefits Using Approach A2

Municipality	Flooding	Preservation of Property Value	Water Quality & Ecological Concerns	Aging Infrastructure	Compliance Requirements	Quality of Life & Aesthetics	Development Pressures	CSS Laterals Operation & Maintenance
Central Falls				✓	✓	✓		✓
Cranston	✓	✓	✓	✓			✓	
East Providence	✓		✓	✓		✓		
North Providence*								
Pawtucket		✓		✓	✓			✓
Providence	✓		✓	✓	✓			✓
Warwick	✓	✓	✓	✓	✓			

Relative Benefit: **High** **Moderate** **Low**

Note: *North Providence did not participate in a one-on-one meeting with the Project Team or provide compelling case information.

As outlined in Table 4.7 above, the regional Approach A2 has the potential to provide a relatively high benefit for communities in the Upper Narragansett Bay to address multiple compelling issues and stormwater management needs.

4.4 Preliminary Stormwater Utility Rate Analysis

This section discusses the preliminary analysis for a stormwater utility rate that was considered to illustrate the concept of a stormwater utility and obtain Steering Committee and Stakeholder Group feedback. It is important to note that this analysis is very preliminary and detailed data for land use by parcel was not readily available in most communities and the level of service for the future stormwater program is not finalized. However, this information provides a sense of what a stormwater utility might look like for participating communities in the Upper Narragansett Bay region based on what we know now.

4.4.1 Rate Methodology – Basic Structure & ERU

Background

A stormwater utility recognizes a property's demand on the stormwater system for discharging their runoff. The stormwater system is a public system that carries runoff away from both public and private properties. The framework that describes how much each property pays is called the "rate structure". The rate structure developed for a particular utility is divided into three modules:

- Basic rate methodology;
- Modification factors, which can be applied to any of the rate concepts to enhance equity, reduce costs, and meet other objectives; and
- Secondary funding methods that can be adopted in concert with the service charges.

Rate structures differ among utilities and the differences sometimes reflect program goals or priorities such as the desire to encourage green designs or preserve open space, the influence of other policy objectives such as growth management or economic development, technical constraints, or the availability of resources like GIS or other databases.

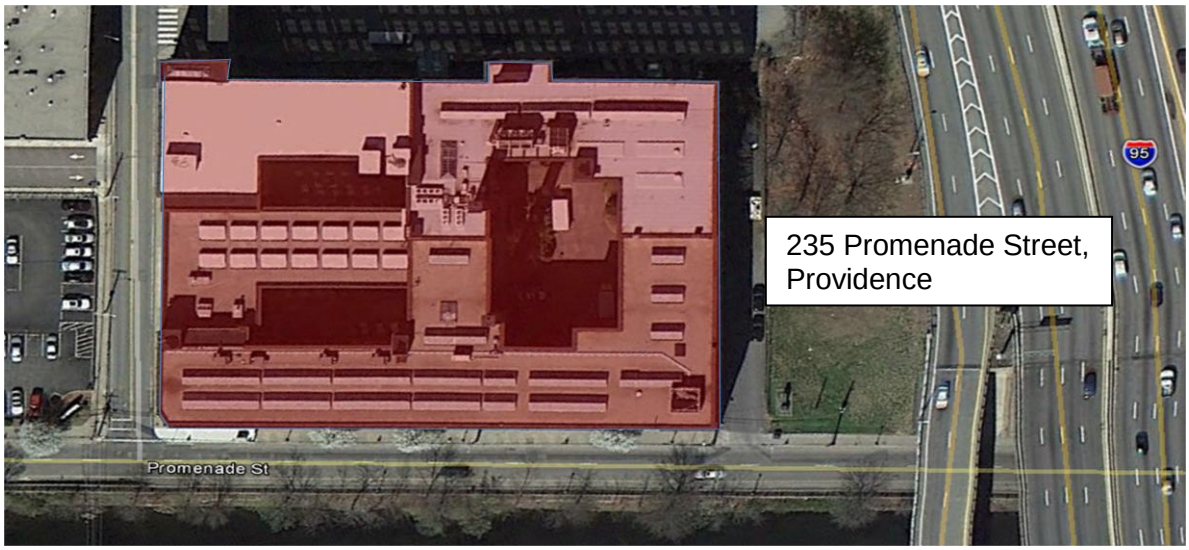
A key attribute of utility service fee funding is that the governing body of a utility's jurisdiction has broad authority to design its rate methodology to fit local circumstances and practices and achieve an allocation of the cost of services and facilities that it desires, while staying within legal boundaries. The goal of a utility's funding decisions is to design a user fee structure that reflects the character and desires of the community and that meets five tests:

1. It is equitable and reasonable;
2. It is not discriminatory or confiscatory;
3. It has costs that are substantially related to provision of facilities and services;
4. It has a rate that is related to demand of the stormwater systems and services for each individual property (rational nexus); and
5. It reflects the authority inherent in state law.

Basic Rate Methodology

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. Accommodating the runoff that occurs when pervious area that typically absorbs rainwater, is converted to impervious area requires the City to invest in the public drainage system. Therefore, it is appropriate to use a measurement of impervious area or surrogate of impervious area in rate methodologies. Stormwater billing is often based on a unit of imperviousness that reflects a typical residence – called the Equivalent Residential Unit (ERU). **Figure 4.1** shows an example of the impervious coverage on a non-residential parcel in Providence that has approximately 67,200 square feet of impervious area. Using an ERU size of 2,500 square feet results in this parcel containing 27 ERUs (rounded) and would be billed based on the stormwater program cost/ERU.

Figure 4.1 Sample Non-Residential Parcel ERU Calculation



Analysis Completed

This initial feasibility study did not include a detailed rate evaluation or consideration of multiple rate options and policies. Land use data by parcel was not available for each of the participating communities to calculate a median ERU by community. Therefore, the Project Team calculated the total number of billed impervious acres, billable parcels and total number of ERUs by community assuming an ERU size of 2,500 sqft. Non-billable parcels were assumed to be roads, state properties and parcels with <400 sqft of impervious area. These parcels and their associated impervious area from the 2012 RI GIS state-wide impervious GIS data layer were excluded from the analysis. The results are presented in **Table 4.8**.

Table 4.8 Total Equivalent Residential Units (ERUs)

Municipality	Parcels	Total Acres	IA Acres	Billed IA Acres	ERUs
Central Falls	2,854	825	548	344	5,991
Cranston	32,130	18,505	6,067	3,805	66,305
East Providence	15,544	8,953	3,292	2,064	35,971
North Providence	11,124	3,708	1,667	1,064	18,222
Pawtucket	19,305	5,670	3,481	2,184	38,046
Providence	40,840	12,037	7,672	4,812	83,839
Warwick	38,086	22,971	7,931	4,974	86,672
Totals	**159,883**	**72,669**	**30,658**	**19,229**	**335,048**

4.4.2 Preliminary Rate Analysis

The stormwater program drives the utility rate resultin in a cost/ERU based on total progrm cost and total ERUs, assuming a basic rate approach. Based on the total number of ERUs across the study area, a fee of $1.00/ERU/Month could support a stormwater program cost of approximately $4M, as outlined in **Table 4.9** below.

Table 4.9 Potential Revenue at $1.00/ERU/Month

Municipality	Parcels	ERUs	Annual Revenue $1/ERU/Month Fee
Central Falls	2,854	5,991	$71,892
Cranston	32,130	66,305	$795,660
East Providence	15,544	35,971	$431,652
North Providence	11,124	18,222	$218,664
Pawtucket	19,305	38,046	$456,552
Providence	40,840	83,839	$1,006,068
Warwick	38,086	86,672	$1,040,064
Totals	**159,883**	**335,046**	**$4,020,552**

Due to a lack of data and for simplification purposes, the Project Team evaluated the rates for the study area communities based on the current and future estimated stormwater program costs. This information is summarized in **Table 4.10** below and indicates that initial rates would be less than $4/ERU/month. However, it is important to note that the service area for the stormwater utility in Central Falls, Pawtucket and Providence would be significantly less and result in a higher fee based on the number of ERUs for properties that drain to the MS4. This analysis requires additional work to better define the necessary level of service and cost for the future stormwater program, as well as an appropriate rate structure using better data.

Table 4.10 Rates Based on Future Stormwater Program Costs

Municipality	ERUs	Current Budget	Future Program Initial Estimate	Fee $/ERU/Mo	Future Program $175/dev. acre/year	Fee $/ERU/Mo
Central Falls	5,991	$17,723	$29,510	$0.41	$134,400	$1.87
Cranston	66,305	$1,354,073	$1,635,193	$2.06	$2,562,560	$3.22
East Providence	35,971	$275,400	$692,700	$1.60	$1,500,800	$3.48
North Providence	18,222	$117,847	$490,853	$2.24	$649,600	$2.97
Pawtucket	38,046	$82,311	$388,237	$0.85	$974,400	$2.13
Providence	83,839	$1,346,343	$3,315,647	$3.30	$2,072,000	$2.06
Warwick	86,672	$596,729	$1,177,473	$1.13	$3,180,800	$3.06
Totals	**335,046**	**$3,790,426**	**$7,729,612**	**$1.66**	**$11,074,560**	**$2.68**
				(avg.)		**(avg.)**

The Steering Committee and Stakeholder Group were polled to gauge the following:

- **Steering Committee Willingness to Pay –** the monthly fee per billing unit (ERU or single-family residence) that each member would be willing to pay based on the current understanding of stormwater program needs.
- **General Population Willingness to Pay –** the amount that members felt the general population would be willing to pay.

Table 4.11 Evaluation of "Willingness to Pay"

	Steering Committee Voting		Stakeholder Group Voting	
Willingness to Pay ($/Mo/ERU)	SC Members	General Population	Stakeholder Members	General Population
$0	0	2	0	0
$1	0	1	0	0
$2	0	1	0	0
$3	0	1	0	1
$4	**3**	**4**	**0**	**9**
$5	1	2	3	2
$6	0	1	1	-
$7	1	-	1	-
$8	2	-	0	-
$9	0	-	0	-
$10	2	-	5	-
$15	0	-	3	-
$20	1	-	0	-

The voting generally indicates that some of the Steering Committee and Stakeholder Group members are willing to pay a much higher fee than the perceived willingness of the general

population. Most felt that $4/month/ERU was the most that the general population would be willing to pay for stormwater, assuming a basic level of understanding for an enhanced stormwater program.

Benefits of Regionalization

The qualititative benefits of regionalization were considered in Section 4.3 (refer to Table 4.7) and it is difficult to quantify the economic benefits during an initial feasibility study. However, the information provided in Table 4.10 and an understanding of the participating community characteristics can be used to further consider the economic benefits. Due to the extent of CSS systems in Central Falls and Pawtucket, it appears that an individual stormwater utility is not an attractive funding method, but participating in a regional approach would provide some benefits without the burden of managing such a program. The remaining participating commmunities may be able to gain additional economies of scale for specialized services and other program costs, as outlined in **Table 4.12** below.

Table 4.12 Summary of Regional Costs & Economy of Scale

Major Cost Center	Current Annual Cost	Future Cost (5-yr avg.)
Administration	$133,067	$166,632
Indirect Cost Allocation (20%)	$631,738	$1,288,269
Operations and Maintenance	$1,902,633	$3,623,464
Engineering and Master Planning	$319,547	$719,408
BMP Design	$ -	$300,000
Regulation/Enforcement	$68,671	$108,091
Capital Improvement Projects	$700,614	$1,259,705
Major Capital Projects	$337,434	$837,434
Minor Capital Projects	$363,181	$422,271
Water Quality Monitoring	$34,156	$264,044
Total	**$3,790,426**	**$ 7,729,612**

Relative Economy of Scale:

- **High**
- **Moderate**
- **Low**

4.4.3 Credits

Under the Rhode Island enabling legislation, municipalities are required to offer credits as a part of all stormwater utilities. Offering credits typically has little impact on revenue (less than 5%) and often provides incentive for property owners to engage in activities such as removing unnecessary impervious cover or constructing stormwater BMPs onsite. The scope of work for this study did not include an evaluation of credits, but background information related to credits is provided below for future consideration.

Credits…

- Are a legal “requirement”

- Normally little revenue impact (<5%)
- Offers a carrot
- Credits are earned, not given, and not an “exemption” or “incentive”
- Ongoing recognition of ongoing private investment for a public good

Credit systems are becoming increasingly important in stormwater utilities because they create incentives for property owners to reduce the amount or improve the quality of stormwater generated on their property. It is not enough to simply provide funding for the stormwater program, property owners need to help manage stormwater on-site, at the point it is generated. For example, roof runoff can be directed to a dry well on the property, and depending on the size, parking lot runoff can also be “disconnected” by draining to a lawn area, rain garden or other on-site infiltration or treatment system. Improvements made by property owners reduce the volume of runoff that must be managed by the town and thus reduce the town’s overall stormwater program costs.

There are two types of credits:

1. Impact Reduction – Measure of IA does not reflect a property’s true impact to the system
   - Often tied to managing stormwater on-site and thus reducing impact to the larger system or meeting design criteria.
2. Cost Reduction – Reduces the City’s or regional entity’s costs through private efforts (less common)
   - Take on a public responsibility such as education or maintenance (i.e. education on water quality, maintenance of larger areas or RIPDES permit compliance).

The following policy questions must be considered:

- Policy Question #1: What private action and investment should qualify for a credit?
- Policy Question #2: How much of the stormwater program should be available for crediting and how generous should the credit be?

There are a few additional things worth noting about credits. Credit systems can be complex to administer and may not be large enough to cause any real change. The majority of property owners will likely decide that their bill is not large enough to necessitate behaviors that will qualify for credits. Credits are also mismatched to development. The owner of the property, not the developer, receives the credit. This reduces the incentive for developers to take credits into consideration when designing and constructing new developments. Credits are also a “zero sum game.” The more credits the City of regional entity gives away, the higher everyone else’s bill can become.

Reasons to cap credits:

- Fixed costs – 5%±
  - this cost will not decrease
- Irreducible and unrelated program costs – 15%±
  - this cost is not tied to impervious area

- Roads – everybody should pay – 35%±
  - this cost is allocated to everyone now
- Limits on treatment effectiveness
  - can't eliminate all impacts of development

If the UNB region moves forward with a regional stormwater utility, policy decisions addressing a credit system will need to be analyzed from both a policy and finance perspective.

4.5 Billing & Data Analysis

This subsection provides an introduction to billing and considerations for a regional stormwater utility. When most people think of municipal bills to support revenue or services the most common are tax, water and sewer bills. These bills are associated with a specific billing or physical address and are typically billed monthly, quarterly, or semi-annually. In the case of stormwater utility bills, the key association is "account," which may not be a unique address or a unique parcel. Therefore, a stormwater utility billing system requires the development of a new "master account file" (MAF) and potentially the development of a new mechanism to deliver the bill.

There are generally four options for billing systems: Tax bill; public utility bill (water or wastewater - most common); private utility bill (e.g., electric); and a new stand-alone bill. In Rhode Island, water and sewer billing account files are typically based on the Tax Assessor's database and the relationship of parcel ID to billing account is clear, including parcels with multiple accounts and multiple parcels with the same account. Water and sewer bills are often delivered with taxes, as would likely be the case with stormwater.

Data for existing billing systems was not reviewed since land use codes per parcel and parcel IDs were not available in all communities to evaluate properties that would receive a stormwater bill compared to what is available in other billing systems. The level of effort to develop a MAF for billing will be based on the quality of future data, which will determine the amount of cas-by-case analysis and manual matching that may be required.

NBC Discussion on Billing

Billing for a regional stormwater utility by the NBC was discussed during Steering Committee Meeting #3. In general, the NBC Board of Directors does not want to do billing for another entity in the case of a new "regional entity" that would be managing the stormwater program. The following feedback and information was provided during the meeting:

- The NBC doesn't want to be labeled as trying to impose new fees on the community, and therefore, has no interest in taking on those duties.
- Although there may be efficiencies through integration of administrative functions and customer service, the NBC service area does not include all communities.
- NBC's current position is that they don't want to take on billing for a regional stormwater entity. The two biggest hurdles to change that position are the NBC Board of Directors and

the Public Utilities Commission (PUC). There are other entities that serve more people that might be willing to do billing.

- NBC is regulated by the PUC so everything that appears on their bill has to be approved by them.

Data Evaluation and Future Needs

Based on the data reviewed during the initial feasibility study, the following data needs were identified to support an in-depth planning study to develop a regional stormwater utility:

- Impervious Data: the existing state-wide impervious cover GIS data layer provides good capture of impervious surfaces and may only need minor updating as new imagery is available. A basic review and update of major non-single family residential (NSFR) features is recommended to capture any significant data gaps in coverage. Prior to implementation-phase rate modeling or development of a billing master account file (MAF), AMEC recommends that the impervious for all properties be reviewed/updated on a finer scale to improve accuracy at a capture scale that would support measurements to the nearest 500 sq ft.
- Parcel/Imagery Alignment: the parcel data alignment in some communities such as North Providence is very poor and requires updates to the parcel GIS data layer. Other communities have less severe alignment issues, but may require some per-property spatial alignment to appropriately assign impervious area polygons to parcels. AMEC understands that the Town of North Providence is in the process of updating its parcel GIS data layer.
- Imagery: AMEC reviewed aerial imagery provided online by ESRI and Bing and it is anticipated that this image source is suitable for any future stormwater utility effort, unless another source is provided. That said, the available imagery is recent and of high-quality but has differing resolutions for some communities and may be from slightly different timeframes. Impervious capture should be planned based on lowest resolution available.
- Parcel Data: existing parcel data needs to provide enough information to cleanly separate detached-single-family (SFR) from NSFR properties.
- Parcel/Utility Account Association: using updated parcel GIS data layers, matching between parcels and existing water/sewer accounts will be needed to identify any stormwater-only properties and to develop the correct account/parcel associations in the MAF.
- Rate Model and Credit Support: an analysis/query/report of properties and impervious information will be necessary as rate structure, billing units, credits, and rate model are evaluated.
- MAF Development: one of the final steps in utility implementation includes the development of the MAF for billing. This effort incorporates all rate factors, parcel classification, final parcel/account association, fee calculation, fee-testing and verification, test-file integration with billing system, technical implementation support, and basic documentation. The development of the MAF will depend largely on how the new “regional entity” operates and carries out administrative functions.

5.0 Recommendations & Next Steps

5.1 Summary of Recommendations

Based on the results of the initial feasibility study, the weight of evidence indicates that:

1. Maintaining status quo is not an option: flooding, water quality problems, and deteriorating infrastructure require action;
2. The costs for the future stormwater management programs for each municipality will be significantly higher than current expenditures;
3. Compliance with TMDL requirements will require a combination of non-structural and structural controls implemented over time and through a comprehensive strategy; and
4. The likelihood that the general fund in each community can continue to fully support implementation is low.

The following recommendations were developed through meetings with the Steering Committee and Stakeholder Group:

1. **Continue to explore a stormwater user fee to fund an enhanced stormwater program:** the majority of the Steering Committee members felt that a user fee funding approach was the best approach among the available options and Stakeholder Group members showed strong support.

2. **Continue to explore a regional approach with a stormwater user fee:** the majority of the Steering Committee and Stakeholder Group members were neutral or felt that a regional approach for stormwater management with funding through a user fee versus tax revenue was the best approach among the available options.

3. **Pursue funding for the implementation of next steps:** a grant application was submitted on January 31, 2014 for the Hurricane Sandy Coastal Resiliency Competitive Grants Program with the National Fish and Wildlife Foundation (NFWF). The NFWF anticipates awarding grants in April 2014.

4. **Engage and update stakeholders in each of the participating communities:** schedule meetings with key municipal staff and other stakeholders to provide an update on the results of the project and develop support for next steps.

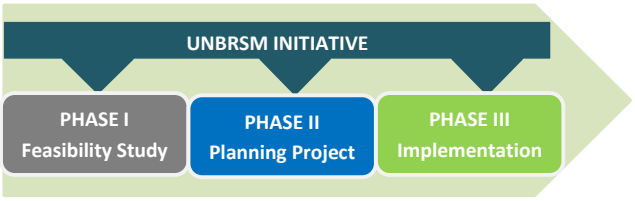
5. **Conduct public presentations for elected officials on the Phase I Study:** this is already planned as a continuation of the study to be completed by the Project Team.

6. **Engage the current stakeholder group in additional public presentations:** work with interested members to make presentations about the regional approach to other community leaders, including: trade associations, chambers of commerce, and other property owner groups.

5.2 Next Steps & Roadmap

Concurrent with the completion of the initial feasibility study, the City of Providence acting on behalf of the regional study participants, prepared an application for the Hurricane Sandy Coastal Resiliency Competitive Grants Program to continue what has become defined as the Phase II Upper Narragansett Bay Regional Stormwater Management (UNBRSM) Initiative. The application was submitted on January 31, 2014 and discussed the progress to date for the Phase I study with a proposed scope of work and road map for the Phase II Planning Project and a future Phase III for final implementation. The grant application included the following six communities from the Phase I Study:

- Central Falls
- Cranston
- East Providence
- Providence
- Pawtucket
- Warwick



The overall goal of the UNBRSM Initiative is to develop and implement a regional solution to address the financial, operational, environmental, and management issues and needs of communities in the Upper Narragansett Bay watershed. The Phase II Planning Project will explore the viability of a regional stormwater management and funding approach through a regional stormwater utility, which will address infrastructure improvements, water quality, habitat protection, and flooding issues. The UNBRSM initiative will provide a more integrated program across the six communities with model approaches for implementation of activities to meet each community's needs. Final adoption of a regional stormwater utility or an alternative funding approach will be completed under Phase III – Implementation.

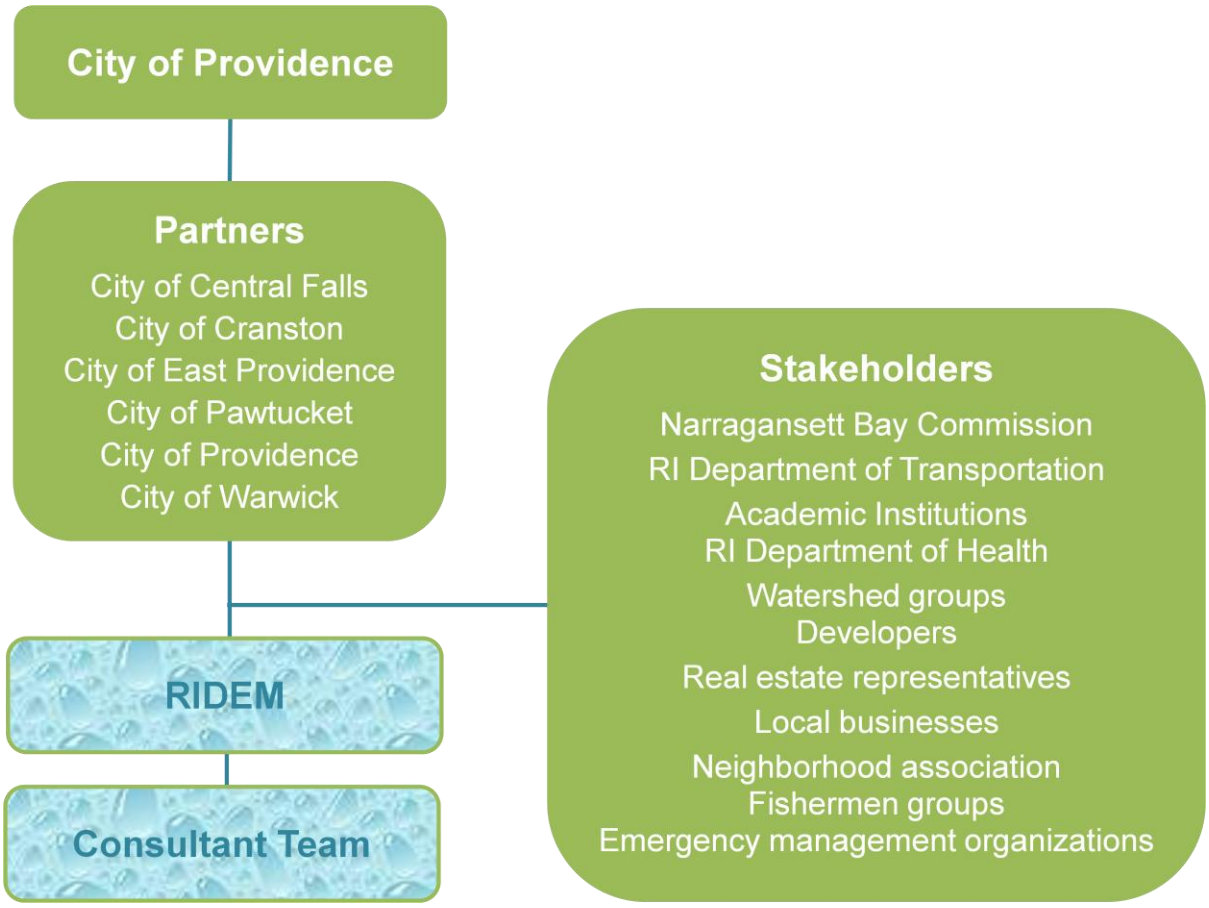
The five key goals of the Phase II Planning Project are as follows:

1. Evaluate priority areas and establish a process for consistent asset mapping, asset inventory, and condition assessment related to coastal resiliency and stormwater management planning;
2. Assess current and future stormwater management program operational and capital needs and costs;
3. Develop a strategic organizational structure and governance plan for sustainable UNBRSM and coastal resiliency;
4. Complete all aspects of tactical planning to support a regional stormwater utility under Phase III – Implementation; and
5. Enhance public awareness of the UNBRSM initiative and regional issues through planned public outreach.

As depicted on the organization chart in **Figure 5.1**, the City of Providence with support and assistance from RIDEM, a consultant team, and interns, will continue to lead a Project Team of partnering municipalities and stakeholders for the detailed planning phase of the Upper Narragansett Bay Regional Stormwater Management Initiative. The Project Team will be

supported by an advisory stakeholder group that has been actively involved in the Phase I Feasibility Study.

Figure 5.1 Phase II Project Team Organization



The project manager will be Sheila Dormody, City of Providence's Director of the Office of Sustainability. Sheila along with support from the Deputy Chief of RIDEM's Office of Water Resources, Elizabeth Scott, has been spearheading efforts to improve the City and region's resiliency efforts and was the project manager for the Phase I Feasibility Study for the regional stormwater utility.

UNBRSM Initiative (Phase II) Work Plan

Figure 5.2 presents the comprehensive work plan envisioned for the three-phased UNBRSM Initiative and the key activities associated with each of the three phases. For effective planning and implementation, the key activities are grouped into the following five distinct tracks:

- ***Stakeholders:*** Involves all activities pertaining to engaging internal and external stakeholders, and activities associated with the broader public/rate payer outreach.
- ***Program:*** Involves both strategic and tactical activity components ranging from program planning and prioritization to in-depth asset inventory development and mapping.
- ***Organization:*** Involves defining all activities that relate to policy, legislation, inter-governmental agreement issues and organizational authority, staffing and structure.
- ***Finance:*** Involves financial planning including funding strategies and rate structure, and defining all aspects of accounting, budgeting, and financing processes.
- ***Billing Systems / Management:*** Involves activities that relate to defining parcel data management and billing systems, and developing draft manuals, regulations, and business processes.

Phase II includes twenty-eight (28) key activities that span these five tracks. While some activities build upon each other, many others will be performed concurrently.

Figure 5.2 Comprehensive Work Plan: UNBRSM Initiative

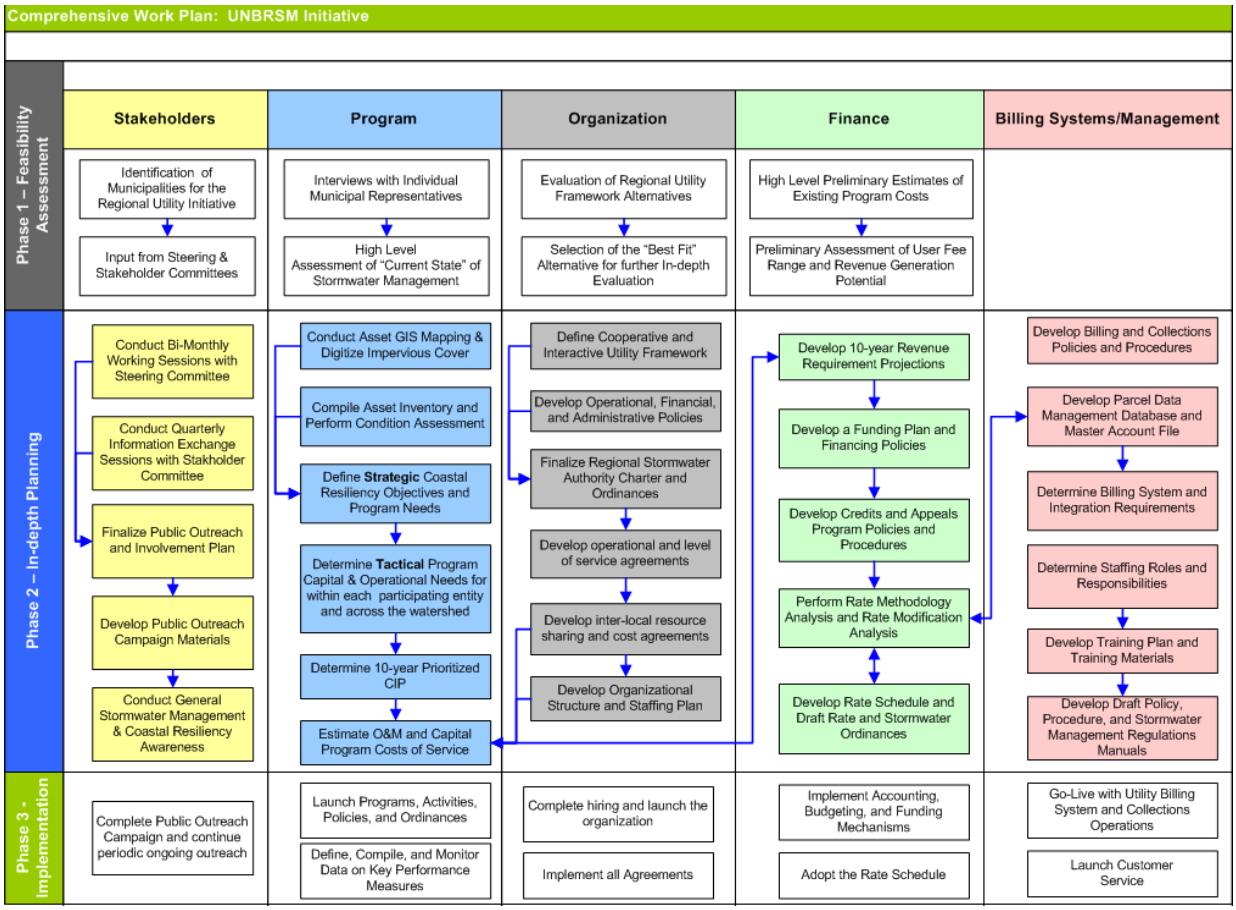


Table 5.1 provides a brief summary of the entities responsible, the anticipated outputs, and the proposed timeline for the Work Plan.

Table 5.1 Work Plan Logistics

#	Activity	Lead entity	Completion timeline	Key outputs
Stakeholders Track				
S1	Quarterly Steering Meetings	Consultant	September 2015	Presentations / Papers
S2	Quarterly Stakeholder Meetings	Consultant	September 2015	Presentations / Papers
S3	Public Outreach Plan	Consultant	March 2015	Outreach Plan
S4	Public Outreach Materials	Consultant	April 2015	Brochures / Media Info
S5	Awareness Campaign	Partners	August 2015	Six outreach events
Program Track				
P1	GIS Asset Mapping & Inventory	Interns	October 2014	GIS Asset Database
P2	Asset Condition & Impervious Cover Assessment	Consultant	December 2014	Parcel Database
P3	Coastal Resiliency Objectives, Needs & Priorities	Providence & Partners	December 2014	Strategic Objectives
P4	Storm Drain Infrastructure Vulnerability Assessment	Consultant	January 2015	Key Infrastructure Prioritization Scheme
P5	Capital & Operational Program Assessment	Consultant	January 2015	Tactical Needs Report
P6	10-year Prioritized CIP	Providence & Partners	February 2015	10-year CIP Project Schedule
P7	O&M and CIP Cost Estimates	Consultant	March 2015	Preliminary Costs
Organization Track				
O1	Co-operative and Interactive Regional Utility Framework	Consultant	March 2015	Regional Utility Organizational Plan
O2	Operational, Financial, Administrative Policy Development	Consultant	March 2015	
O3	Regional Utility Charter & Ordinances	Providence	April 2015	UNBRSM Draft Charter
O4	Service Level Agreements (SLAs)	Providence	May 2015	Draft SLAs
O5	Resource / Cost Sharing Agreements	Providence	June 2015	Draft MOUs
O6	Organizational Structure & Staffing	Consultant	March 2015	Regional Utility Organizational Plan

#	Activity	Lead entity	Completion timeline	Key outputs
Finance Track				
F1	10-year Revenue Requirement Projections	Consultant	May 2015	UNBRSM Financial Plan
F2	Financial Policies & Funding Plan	Consultant	April 2015	
F3	Credits/Appeals Program Policies & Procedures	Consultant	April 2015	Draft Credit Program Manual
F4	Rate Methodology & Structure Analysis	Consultant	May 2015	UNBRSM Financial Plan
F5	Draft Rate Schedule & Ordinances	Consultant & Providence	June 2015	Draft Rate Ordinances
Billing Systems/Management Track				
B1	Billing & Collections Policies / Procedures	Consultant	July 2015	Draft Billing Operations SOP
B2	Parcel Data Analysis Database	Consultant	March 2015	Master Account File
B3	Finalization of Billing System	Providence	July 2015	Billing System Plan
B4	Staffing Roles & Responsibilities	Providence	June 2015	Staffing and Training Plan
B5	Training Plan and Materials	Consultant	August 2015	Training Plan
B6	Draft Stormwater Management Regulations	Consultant	August 2015	Draft UNBRSM Regulations
Phase II – UNBRSM Planning Project Completion			**September 2015**	

5.3 Budget Estimate for Next Steps – Phase II

A budget summary was developed for the Phase II Planning Project and submitted as part of the Hurricane Sandy Grant. The grant proposal requested $499,685 that will supplement the existing $150,000 available from the RI Bays, Rivers and Watersheds Coordination Team and match (in-kind services) from the RIDEM and participating communities. The full project cost is summarized in **Table 5.2** below and includes in-kind services (staff time, fully-burdened labor) for the 6 municipal partners and the RIDEM.

Table 5.2 Budget Summary for Phase II Planning Project & NFWF Grant Application

Phase	Description	Cost
1	Stakeholder Track	$ 128,140
2	Program Track	$ 315,623
3	Organization Track	$ 70,560
4	Finance Track	$ 86,479
5	Billing System/Management Track	$ 86,682
6	Project Management / Project Meetings	$ 65,701
7	Draft & Final Plans	$ 39,920
8	Data Compilation & Analysis Contingency	$ 10,000
9	Project Meetings/Field Work Travel (Trips)	$ 18,000
	Total	**$821,105**
	In-Kind Match	$171,420
	Cash Match	$150,000
	Requested NFWF Grant	$499,685

If the NFWF grant is not successful, the Steering Committee discussed the options to continue the project with the current committed funds from the RI Bays, Rivers and Watersheds Coordination Team of $150,000 while continuing to seek additional grant funds. This would require additional community support (staff time and/or financial contribution) to accelerate the project with funding contributions and/or provide infrastructure mapping and assessment and an evaluation of future program needs. A preliminary 2-step approach was developed for future consideration: