Commonwealth of Massachusetts
Office of the State Auditor
Suzanne M. Bump
Making government work better

Local Financial Impact Review – Issued January 17, 2017

Costs, Regulation, and Financing of Massachusetts Water Infrastructure: Implications for Municipal Budgets

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January 17, 2017

His Excellency, Charles D. Baker, Governor
The Honorable Karyn E. Polito, Lieutenant Governor
The Honorable Stanley C. Rosenberg, President of the Senate
The Honorable Robert A. DeLeo, Speaker of the House
Honorable Members of the General Court

Dear Colleagues:

It is my privilege to submit this study of costs, regulation, and financing of Massachusetts water infrastructure—and their implications for local budgets. This study was undertaken pursuant to Section 6B of Chapter 11 of the Massachusetts General Laws, which grants the Office of the State Auditor's Division of Local Mandates (DLM) authority to review any law or regulation that has a significant financial impact on local government.

I would like to offer my sincere appreciation to the hundreds of municipal and water district officials who took time from their other professional obligations to complete the survey. Their generosity in devoting time and energy to this survey is yet another example of the service they provide daily to their fellow citizens. Most of us take our water systems for granted; the hard work of these public employees makes it possible for us to do so. I hope the information contained in this report will assist you in enhancing state law, policies, and procedures that directly affect the resources and revenues of the local governments and regional agencies that oversee the infrastructure that ensures the quality, abundance, and sustainability of our commonwealth's precious water resources.

Copies of the report are available on OSA's website, www.mass.gov/auditor, or by calling DLM at (617) 727-0025. Please don't hesitate to reach out to my office with any questions or comments.

As always, thank you for your continued support of our shared effort to improve the success, accountability, transparency and efficiency of Massachusetts state government.

Sincerely,

Suzanne M. Bump
Auditor of the Commonwealth

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LIST OF ABBREVIATIONS

CWT	Massachusetts Clean Water Trust
CSO	Combined Sewer Outfall
DCAMM	Massachusetts Division of Capital Asset Management and Maintenance
DCR	Massachusetts Department of Conservation and Recreation
DEP	Massachusetts Department of Environmental Protection
DFG	Massachusetts Department of Fish and Game
DBE	Disadvantaged Business Enterprises
DLM	Division of Local Mandates
EEA	Massachusetts Executive Office of Energy and Environmental Affairs
EPA	United States Environmental Protection Agency
FY	Fiscal Year
MassCEC	Massachusetts Clean Energy Center
MFN	Mansfield-Foxborough-Norton Regional Wastewater District
MMA	Massachusetts Municipal Association
MS4	Municipal Separate Storm Sewer System
MWRA	Massachusetts Water Resources Authority
MWWA	Massachusetts Water Works Association
NPDES	National Pollutant Discharge Elimination System
OSA	Office of the Massachusetts State Auditor
OSD	Massachusetts Operational Services Division
P3	Public Private Partnership
SCADA	Supervisory Control and Data Acquisition
SRF	State Revolving Fund
SWMI	Sustainable Water Management Initiative
USDA	United States Department of Agriculture
USDM	United States Drought Monitor
WMA	Water Management Act

ABOUT THE DIVISION OF LOCAL MANDATES

The Division of Local Mandates (DLM) was established by Proposition 2½, an initiative to limit property tax increases, in order to determine the financial impacts of proposed or existing state laws, regulations, and rules on cities and towns. Proposition 2½ limits a city or town's authority to raise real estate and personal property taxes. Under the strict limits on taxing authority set by Proposition 2½, cities and towns could no longer simply raise property taxes to fund state-mandated programs. Thus, DLM was created to respond to municipal petitions to determine whether a state mandate falls within the purview of the Local Mandate Law.

The Local Mandate Law, Section 27C of Chapter 29 of the Massachusetts General Laws, generally provides that post-1980 laws, regulations, or rules that impose service or cost obligations on cities, towns, regional school districts, or educational collaboratives and meet certain thresholds shall be effective only if locally accepted or fully funded by the Commonwealth. Any protected party aggrieved by such a law, regulation, or rule may petition DLM for a determination of whether the law, regulation, or rule constitutes a mandate and to make a cost determination of the state funding necessary to sustain a mandate.

In 1984, the Massachusetts General Court expanded DLM's powers of review by authorizing DLM to examine any state law or regulation that has a significant local cost impact, regardless of whether it satisfies the more technical standards under the Local Mandate Law. This statute is codified as Section 6B of Chapter 11 of the Massachusetts General Laws. As a result of this law, DLM releases reports known as "municipal impact studies" or "6B reports" examining various aspects of state law that may impact municipalities.

Through these functions, DLM works to ensure that state policy is sensitive to local fiscal realities so that cities and towns can maintain autonomy in setting municipal budget priorities.

EXECUTIVE SUMMARY

In Massachusetts, water infrastructure of all kinds—drinking water, wastewater, and stormwater systems—is primarily a local responsibility. The Division of Local Mandates (DLM) within the Office of the State Auditor (OSA) has undertaken this Municipal Impact Study to examine the financial impact on local governments of infrastructure costs associated with water systems, supplies, and quality. This study is based on an extensive survey of Massachusetts's municipalities concerning their experience of costs associated with state and federal regulation of locally-owned and operated water infrastructure systems. The survey also inquired about municipal utilization of state and federal loan and grant programs, and sought estimates of the impacts of newly implemented regulatory frameworks associated with the federal government's Municipal Separate Storm Sewer System (MS4) permits.

The findings suggest that state government can create a more stable, holistic approach to water infrastructure, giving municipalities greater levels of confidence and encouragement to invest in water infrastructure improvements. Some of these involve additional investment at the state level so that municipalities do not bear the entire burden. Other reforms are regulatory, since a predictable, consistent, and collaborative regulatory framework will encourage municipalities to commit more resources to much-needed water system improvements.

A legislatively mandated 2012 study by the Massachusetts Water Infrastructure Finance Commission estimated that, at that time, there was a $20.4 billion gap in water infrastructure funding, which is largely the responsibility of local governments. The Commission Report made a series of recommendations concerning potential strategies for closing the gap, including a larger role for state dollars. The Commission also called for policies at the state level that would offer financial incentives and regulatory flexibility in order to encourage greater adoption of regional solutions, technological innovation, and public-private partnerships.

Four years later, and in light of the significant local cost implications of municipal water infrastructure, DLM decided to revisit and supplement the findings contained in the Commission Report with a fresh study. In addition, DLM wanted to obtain data about how the Commonwealth might best encourage enhanced local investment in water quality, supplies, and systems by fostering a more stable regulatory and fiscal environment.

To accomplish this task, DLM invited all 351 cities and towns in Massachusetts to participate in a survey on local water system investments and funding sources. A total of 146 cities and towns submitted completed surveys, representing 42% of the state's municipalities. Respondents include 88% of all cities and towns with populations greater than 50,000.

Below is a summary of our findings and recommendations, with links to each page listed.

Finding 1 **Page 25**	Massachusetts communities have combined water system spending needs in excess of $17 billion, including $7.24 billion for clean water delivery, $8.99 billion for wastewater treatment and handling, and $1.58 billion for stormwater management.
Recommendation **Page 28**	Given the continuing decline of overall state aid as a share of local budgets, the Legislature should expand the State Revolving Fund (SRF) as administered by the Clean Water Trust to provide full grants in addition to its current practices of low-interest loans and limited principal forgiveness for cities and towns undertaking water system repairs and enhancements. This finding also supports a recommendation contained in the Massachusetts Water Infrastructure Commission report that the Commonwealth establish a new Trust Fund for water infrastructure to provide at least $50 million annually for the next ten years in direct state aid for local water infrastructure projects. This funding should be provided in addition to, and run concurrent with, current loan and grant programs, and should focus entirely on grants for eligible water infrastructure projects. In addition—and as an incentive designed to respond to Finding 3 of this study (below)—priority in allocating these funds should be given to municipalities and regional entities seeking supports for projects and programs that enhance water infrastructure regionalization.
Finding 2 **Page 28**	Over the next twenty years, municipalities foresee significant increases in capital, operating, and staffing costs—$1.58 billion statewide, including $240 million in additional personnel costs—for implementation of new federal stormwater management regulations.
Recommendation **Page 29**	To provide additional funding for stormwater-related capital and operating requirements, Massachusetts municipalities should consider the creation of dedicated stormwater enterprises similar to local water and sewer enterprises in structure, operation, and fee-based revenue streams.
Finding 3 **Page 29**	For most municipalities, regional collaboration on water infrastructure remains a goal rather than a reality; only 36% of survey respondents reported that they are members of regional collaborations on water infrastructure planning and management.
Recommendations **Page 29**	1. The Legislature should approve legislation designed to promote municipal collaboration and regionalization throughout the Commonwealth by simplifying the process of creating regional public entities that have the power to operate facilities as well as to plan across multiple municipal jurisdictions. 2. As noted in the Recommendation under Finding 1, above, a special state trust fund for water infrastructure should give priority in allocating grants to municipalities and regional entities seeking support for projects and programs that enhance water infrastructure regionalization.

Finding 4 **Page 30**	Municipalities may not be taking full advantage of current loan and grant programs; only 42% of responding communities have received water infrastructure grants or loans from Massachusetts or the federal government in the past 10 years.
Recommendation **Page 31**	The Commonwealth should work to enhance municipal eligibility for state loans and grants by reviewing repayment options and further expanding the capacity of state agencies to reduce or forgive interest and / or principal repayments for smaller projects. At the same time, the Commonwealth should consider additional funding in the DEP budget for expanded outreach in order to educate municipalities about the availability, terms, and benefits for current and future water infrastructure loan and grant resources.
Finding 5 **Page 31**	The likely impact of climate change on vulnerable water infrastructure is not receiving the attention it deserves; only 6% of survey respondents indicated that they developed any formal climate change plans or policies that affect water infrastructure systems.
Recommendation **Page 32**	In following up on the stated goals of its recently promulgated executive order on climate change preparedness, the Baker-Polito Administration should, by July 1, 2017, convene a statewide summit on climate change implications for municipal water infrastructure systems, especially in coastal and riverine flood plain zones. In addition, the Legislature should consider the authorization of designated funds for the purpose of providing municipalities with expert assistance in developing and implementing water infrastructure resiliency and capital investment plans related to climate change impacts.
Finding 6 **Page 32**	Municipalities reported a low rate of adoption for innovative technologies with the potential to reduce cost and increase efficiency in municipal water systems.
Recommendations **Page 33**	The Commonwealth should consider additional incentives and support in this area, including: 1. a requirement that the Operational Services Division (OSD) and the Division of Capital Asset Management and Maintenance (DCAMM) undertake comprehensive reviews of their regulations and practices in order to develop proposed changes to liability standards and procurement requirements to support easier adoption of innovative technologies to improve performance and reduce costs in water infrastructure facilities. 2. adoption of legislation that would create an “innovative communities office” within the Executive Office of Housing and Economic Development to coordinate “the introduction of cutting-edge technologies into the marketplace and incentivize the adoption of these technologies by municipalities.” 3. adoption of legislation designed to encourage local governments to explore opportunities for public-private partnerships (P3).
Finding 7 **Page 34**	Municipalities favor state administration of stormwater permits, with 75 (51%) of all 146 responding municipalities—and 90% of the 84 communities expressing a preference—indicating that they would rather have DEP administer the MS4 stormwater permit program.

Recommendations Page 36	1. The Legislature should approve legislation allowing DEP to assume responsibility for issuing MS4 stormwater permits under EPA's National Pollutant Discharge Elimination System regulatory standards but mandate that funding for the change come from a combination of sources, including not only the state's general appropriations but also a user fee modeled on DEP's current Section 70 drinking water assessment and a fee paid by major point industrial and commercial sources based on impervious area or discharge flow rates, thereby minimizing cost impacts on any one state, local, or private sector source. 2. With this additional authority and the additional funding incentives outlined in Recommendations 1 and 3, above, DEP should work with municipalities to develop 10-year rolling capital investment compacts for water infrastructure in order to provide greater stability and predictability to communities in allocating water system dollars.

SITUATIONAL ANALYSIS

Existing Government Infrastructure

Massachusetts's water infrastructure systems[1] are generally the responsibility of municipal governments and local water districts. This is not uniformly the case: There are several large-scale examples of regional approaches to providing water systems infrastructure in Massachusetts, notably the Massachusetts Water Resources Authority (MWRA) and the Cape Cod Commission. In addition, there are a number of regional planning groups with advisory and coordinating roles in water systems planning and management, including such organizations as the Metropolitan Area Planning Council and Central Massachusetts Regional Stormwater Coalition. For the most part, however, water delivery, treatment, and management systems are the province of individual local governments and water districts.[2]

Regulation of these water systems is the responsibility of federal and state governments. Through enforcement of the U.S. Clean Water Act[3] and several water-related state laws,[4] the Massachusetts Department of Environmental Protection (DEP) maintains standards for water quality and water treatment. Separately, the U.S. Environmental Protection Agency (EPA) maintains and enforces stormwater discharge permits under the

Basic Types of Municipal Water Infrastructure

All water systems are interconnected: the quality of drinking water that flows into a community is directly affected by the quality of water that reenters the surrounding reservoirs, aquifers and watersheds after use or runoff. In general, however, municipal water systems take three different forms:

- **Potable Water Systems** that deliver tap water for drinking, bathing, cooking etc.
- **Wastewater Systems** that include sanitary sewers, waste treatment facilities, and storage and discharge systems
- **Stormwater Systems** to manage storm runoff from streets, driveways, roofs, and other impervious surfaces. Stormwater systems are designed to control flooding and may include gutters, catch-basins, storage tanks, transport lines, and designated zones for filtration and reabsorption of runoff.

Where elements of the waste- and stormwater systems are combined (as they still are in at least 24 Massachusetts communities), stormwater flooding can overwhelm treatment facilities and can result in untreated wastewater passing directly into rivers and coastal waters.

[1] For the purpose of this study, "water infrastructure" includes publicly-owned transport, treatment and discharge facilities including, pipelines, tanks, sewers, and integrated power generation sources, for clean water, wastewater, and stormwater.
[2] There are also several private water supply companies in Massachusetts that provide water supplies to municipal clients. (A partial list is available from the New England Chapter of the National association of Water Companies, http://www.nawc.org/membership/chapters-and-related-groups/new-england.aspx)
[3] 33 U.S.C. §1251 et seq. (1972) http://www.epw.senate.gov/water.pdf
[4] The Massachusetts Rivers Protection Act (Ch. 258 of the Acts of 1996); the Water Management Act (M.G.L. c. 21G); and the Wetlands Protection Act (M.G.L. c. 131, § 40)

National Pollution Discharge Elimination System (NPDES).[5] In order to ensure that municipalities are meeting regulatory requirements, DEP and EPA may require them to make investments in new or upgraded facilities in all areas of water infrastructure.[6]

Previous Recommendations—Water Infrastructure Finance Commission

In February 2012, the Water Infrastructure Finance Commission of the Commonwealth of Massachusetts produced a landmark report entitled *Massachusetts's Water Infrastructure: Toward Financial Sustainability*.[7] The commission—a bipartisan, blue-ribbon panel created by the legislature under Section 145 of Chapter 27 of the Acts of 2009[8]—concluded that "the Commonwealth conservatively faces a $10.2 billion gap in resources for drinking water and an $11.2 billion gap in resources for clean water (wastewater) projects over the next 20 years" while also noting that "$18 billion in stormwater investment may be required over the next 20 years depending on federal regulatory requirements."[9]

To help close these investment gaps, the Commission made specific recommendations, including:

- a significant increase in state spending above then-current levels, notably "the establishment of a new Trust Fund, to be funded annually at $200 million and used for a mixed program of direct payments to cities and towns, low interest loans, and grants"[10]
- assistance to municipalities, districts, and authorities in retiring existing debt through "a newly structured debt assistance program funded at $50 – $60 million annually through the General Fund

[5] EPA, *Stormwater Phase II Final Rule* (revised June 2012) https://www3.epa.gov/npdes/pubs/fact2-1.pdf
[6] Since its creation, DLM has received 18 requests for mandate determinations arising from water infrastructure regulation. Because state authority to regulate water quality was well-established prior to 1981, and because federal regulatory requirements are specifically exempted from Section 27C of Chapter 29 of the General Laws, DLM has never considered requirements to upgrade or enhance water infrastructure to be unfunded mandates.
[7] Water Infrastructure Finance Commission, *Massachusetts's Water Infrastructure: Toward Financial Sustainability* (2012)
http://www.mapc.org/sites/default/files/WIFC%20Report%20Final%20.pdf
[8] St. 2009, c. 27, § 145, *available at* https://malegislature.gov/Laws/SessionLaws/Acts/2009/Chapter27
[9] *Water Infrastructure Finance Commission*, op. cit., p. 4
[10] *Water Infrastructure Finance Commission*, op. cit., p. 10

- incentives for municipalities, districts, and authorities to use best management practices, including enterprise funds for stormwater mitigation
- incentives to encourage a more regional approach, including pooled resources and, potentially, system integration to achieve better-scaled, cleaner, more efficient systems and supply
- encouragement of innovative technologies, energy efficiency sustainable practices, and conservation
- "Increased regulatory flexibility to better direct funding to projects that deliver the highest public benefit,"[11] including reducing regulatory barriers to innovative practices and technologies
- support for appropriate public-private partnerships in water infrastructure[12]

In further elaborating on its recommendations about regulation, the Commission also noted that policymakers:

> *[N]eed to look at regulation more holistically so that we are purposeful in funding projects to give us the highest public benefit. A municipality, watershed or region should be encouraged to build infrastructure that is selected, sequenced, and phased to optimize the use of resources. It should be encouraged to use scarce resources in the most efficient way possible rather than be required to meet compartmentalized rigid requirements.*[13]

Legislative Response to the 2012 Commission Report

In the wake of the Commission Report, the Massachusetts legislature debated several bills designed to implement various aspects of the Commission's recommendations. Two of these bills were passed in July 2014 and were signed into law in August 2014:

[11] *Water Infrastructure Finance Commission*, op. cit., p. 12
[12] ibid., pp. 10-13
[13] ibid., pg. 87

- "An Act improving drinking water and wastewater infrastructure" [14] made a number of changes to the administration of the State Revolving Fund (SRF), a source of low-interest bonds for Massachusetts municipalities seeking financing for water infrastructure improvements. Among its key provisions are:
    - re-designating the "Water Pollution Abatement Trust" as the "Clean Water Trust"
    - providing an additional $50 million in the State Revolving Fund program capital and an increase in the cap on the dollar value of approved bonds from $88 million to $138 million per fiscal year, as well as a direction to distribute 80% of that amount annually
    - flexibility to reduce loan interest rates below the older statutory standard of two percent and forgive interest or principal entirely based on need once the Massachusetts Department of Environmental Protection (DEP) develops regulatory standards for this purpose
    - creation of a Water Infrastructure Advisory Committee to monitor the progress of closing the gap in funding
    - reimbursement to MWRA for the inflow/infiltration program for their member communities (subject to appropriation)
    - a one-to-one match for the cost of municipal entry fees to MWRA or another regional water or wastewater system (subject to appropriation)
    - authorization for municipal governments to assess property tax surcharges of up to 3% for water infrastructure[15]
    - $1.5 million for a technology innovation grant program to be administered by the Massachusetts Clean Energy Center

[14] https://malegislature.gov/Laws/SessionLaws/Acts/2014/Chapter259
[15] This change is modeled on the Community Preservation Act. See https://www.mma.org/public-works-energy-a-utilities/13660-gov-signs-water-infrastructure-finance-bill

- "An Act Providing for the Preservation and Improvement of Land, Parks and Clean Energy in the Commonwealth" was a four-year, $2.2 billion bond bill that also provided funds for water-related capital projects, including $49 million for repair or removal of municipal dams and would invest $120 million in coastal infrastructure, including seawalls. [16]

Significant Developments since the Commission Report

Since the Commission Report was issued in May of 2012, a number of significant developments in state-level analysis and policy-making have brought additional attention—and information—to the question of how to foster and enhance water infrastructure investment. These include:

1. EPA MS4 Stormwater Regulations and Permitting Authority

One key issue that received considerable attention in the 2015-2016 Legislative Session was a proposal from Governor Baker that the Commonwealth join forty-six other U.S. states in directly administering municipal stormwater permits.

Figure 1 - Rain gardens, such as this installation at the Mace Public Housing Project in Chelsea, help to reduce flooding and water pollution by collecting, storing, and naturally filtering stormwater runoff before it enters sewer systems. Source: City of Chelsea Dept. of Public Works

The U.S. Environmental Protection Agency (EPA) regulates public stormwater systems in all fifty states through National Pollutant Discharge Elimination System (NPDES) standards first promulgated in 1972. To operate a stormwater system, state and local governments must obtain Sewer System (MS4) permits.[17] Communities that do not own and operate sewer or runoff collection systems—81 of the Commonwealth's 351 cities and towns—need not obtain MS4 permits.

[16] https://malegislature.gov/Bills/188/House/H4375; Rothe, Amy http://blog.crwa.org/blog/legislature-enacts-2.2-billion-environmental-bond-bill-passes-water-infrastructure-bill
[17] https://www3.epa.gov/npdes/pubs/fact2-1.pdf

In 46 states, the permit process is managed to federal standards and with federal oversight by state environmental agencies. In four states—Idaho, Massachusetts, New Hampshire, and New Mexico—EPA issues the permits directly, although DEP, a Massachusetts state agency, administers other federal water quality regulations and standards, including those for water quality and wastewater treatment.

A 2014 *Draft Massachusetts Small MS4 General Permit* was released for public comment on September 30, 2014 and the comment period ended February 27, 2015. Final permit regulations covering approximately 260 municipalities were issued by EPA in April 2016 to become effective on July 1, 2017.[18] As part of its review of the costs required for municipalities to comply with the new permits, EPA commissioned an analysis that developed a range (low to high) of cost parameters for rural, suburban and urban communities but made no attempt to aggregate these range estimates into a statewide total cost impact.[19]

On April 29, 2016, the Baker administration filed legislation to allow DEP to assume control of issuing MS4 permits on behalf of EPA. The proposed bill[20] was reviewed by the Joint Committee on Environment, Natural Resources and Agriculture, and was sent to a study order, which effectively removes the bill from consideration during that session. The proposal is likely to be taken up again in the 2017-2018 Legislative Session.

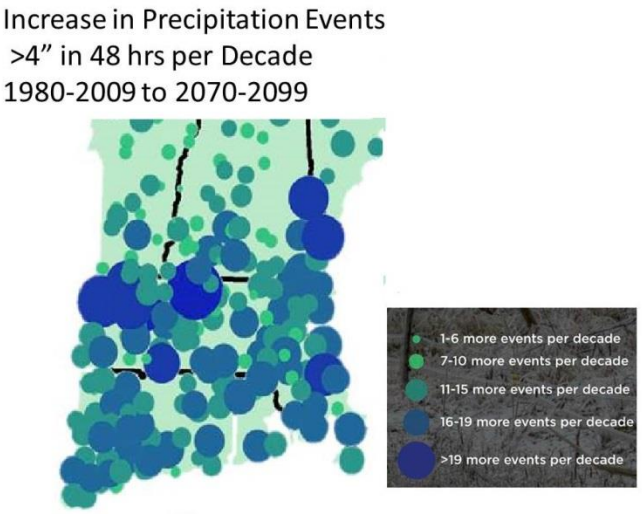

Figure 2: Projected Increase in Precipitation Intensity in New England
Source: Institute for the Study of Earth, Oceans and Space, University of New Hampshire

2. *A Sharper Focus on Climate Change*

The Commission Report cited climate change as an "emerging concern" for local

[18] https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/final-2016-ma-sms4-gp.pdf
[19] https://www3.epa.gov/region1/npdes/stormwater/ma/ma-stormwater-program-cost-evaluation.pdf
[20] "An Act to enable the Commonwealth's administration of the Massachusetts Pollutant Discharge Elimination System" https://malegislature.gov/Bills/189/House/H4254; https://www.bostonglobe.com/metro/2016/03/27/state-seeks-take-over-pollution-controls-from-federal-government/iwXuRG56OFHYB6FhDpPs5N/story.html#comments; "Lawmakers question state's capacity to take on water quality plan" http://www.tauntongazette.com/article/20160517/NEWS/160516100

governments, but did not specifically address climate change impacts in determining future water infrastructure cost requirements for cities and towns. Continuing study of regional climate change effects have, however, brought these issues into sharper relief.

For example, a June 2014 presentation at an MIT-sponsored conference entitled "Sustaining Coastal Cities" noted that, within 50 years, most of Massachusetts will be experiencing 11 or more additional "precipitation events" per decade that exceed 4 inches of rainfall within 48 hours. Several major urban areas, including Boston, Worcester, and Springfield, are projected to experience additional precipitation events on this scale at a rate of up 19 additional events per decade.[21] (According to data from the Northeast Regional Climate Center, communities in Massachusetts experienced a total of 12 such events in 2015 and 8 in 2015.[22]) Even a modest projected increase in the amount of very heavy rainfall events will, unless accommodated by new stormwater runoff strategies and systems, lead to massive flooding of paved urban environments and regional flood plains on a scale not previously experienced.

At the same time, rising sea levels and increased storm surges will inundate much of the Commonwealth's low-lying water infrastructure facilities. For example, MWRA Executive Director Frederick A. Laskey noted in a 2013 presentation that 21 of MWRA's coastal sewer facilities are within 15 feet of mean sea level.[23] By comparison, storm surge in New York for Hurricane Sandy was in the range of 11.5 feet above mean sea level.[24]

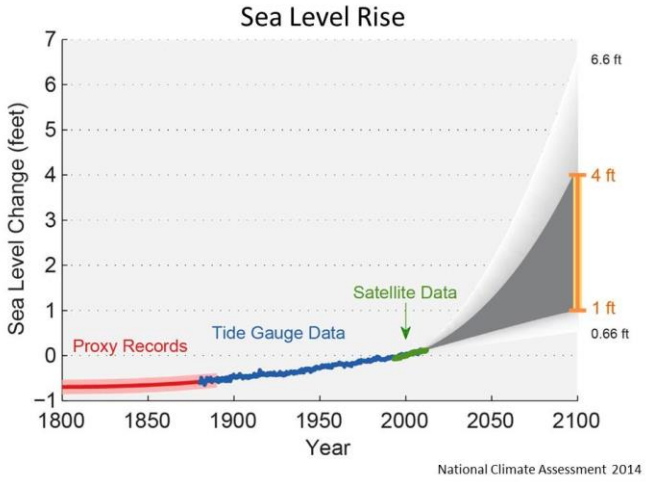

Figure 3 - Projected Atlantic Sea Level Rise

[21] https://seagrant.mit.edu/conferences/CCS2014/presentations/222/Cameron_Wake.pdf
[22] Northeast Regional Data Center At Cornell University: Custom Data from Community Collaborative Rain, Hail and Snow Network, "2-Day Total Precipitation in Massachusetts 2014-2016," Dataset produced on request, 12/12/16
[23] http://www.abettercity.org/docs/sustainability/Building%20A%20Resilient%20City%204-25-13.pdf (Laskey noted that some key facilities, including the Deer Island treatment plant and the Nut Island headworks in Quincy have been protected against wave levels of up to 14 feet, storm surges in the range New York experienced in Hurricane Sandy and a permanent sea level rise of up to 1.9 feet.)
[24] https://seagrant.mit.edu/conferences/CCS2014/presentations/199/Jeff_Donnelly.pdf

In the years following the 2012 Commission Report, climate scientists have reported mounting evidence that sea levels along the North Atlantic coast are rising three to four times faster than levels elsewhere in the world, a trend that supports increased investment to protect New England and Northeast coastal water infrastructure from flooding.[25]

On September 16, 2016, Governor Baker issued Executive Order No. 569, *Establishing an Integrated Climate Change Strategy for the Commonwealth*, which noted that "our state agencies and authorities, as well as our cities and towns, must prepare for the impacts of climate change by assessing vulnerability and adopting strategies to increase the adaptive capacity and resiliency of infrastructure and other assets."[26] Governor Baker's order requires that "The Secretary of Energy and Environmental Affairs and the Secretary of Public Safety shall coordinate efforts across the Commonwealth to strengthen the resilience of our communities, prepare for the impacts of climate change, and to prepare for and mitigate damage from extreme weather events." By September 2017, the Governor's order requires the Secretaries to "establish a framework for each City and Town in the Commonwealth to assess its vulnerability to climate change and extreme weather events, and to identify adaptation options for its assets; provide technical assistance to Cities and Towns to complete vulnerability assessments, identify adaptation strategies, and begin implementation of these strategies; implement the Climate Adaptation Plan upon its completion; and update the Climate Adaptation Plan at least every five years, incorporating information learned from implementing the Plan and the experiences of agencies, and Cities and Towns in assessing and responding to climate change vulnerability."[27]

3. Sustainable Water Management Initiative (SWMI)

In 2010, the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) created the Sustainable Water Management Initiative (SWMI) with support from the DEP, the Department of Fish and Game (DFG), and the Department of Conservation and Recreation (DCR). An Advisory Committee and a

[25] Asbury H. Sallenger Jr, et al, Nature Climate Change 2, pp 884–888 (2012) http://www.nature.com/nclimate/journal/v2/n12/full/nclimate1597.html
[26] http://www.mass.gov/governor/legislationexecorder/execorders/executive-order-no-569.html
[27] Ibid., Section 3, paragraphs c though f.

Technical Subcommittee, comprising a wide range of stakeholders, were established to advise EEA and its agencies on sustainable management of water resources that balance human and ecological needs.

Since November 2014, the framework established in the SWMI process has guided DEP's permitting of water withdrawals under the Water Management Act (WMA). This final framework summary describes how DEP will apply these elements to the WMA permitting program.

Key components of the framework include:

1. Safe Yield – Safe Yield establishes the maximum amount of water that a community may withdraw from its watershed during drought conditions. Safe Yield is calculated both on the basis of maintaining the natural environment and adequate reserves of water to sustain watersheds and aquifers as sustainable resources.

2. Seasonal Streamflow Criteria – Streamflow criteria are measurements that guide WMA permitting decisions on a seasonal and local basis. Based on multiple statistical analyses, stakeholder input, best professional judgment, and peer review science, these criteria are applied in determining whether seasonal flow rates and magnitudes within a given watershed are adequate to support a healthy aquatic environment.

3. Baseline – Baseline is a reference point against which a request to withdraw water will be compared to determine whether the request represents an increase in withdrawals over historic levels.[28]

In July of 2014, the Massachusetts Municipal Association (MMA) submitted comments on the SWMI framework that expressed concern that the SWMI framework as expressed in DEP's draft WMA Regulations (310 CMR 36.00) "would dramatically increase costs associated with permitting and mandated mitigation measures, reduce revenues needed to fund compliance, and limit economic growth across the state." MMA also noted the concerns of its member communities that the "new approach suggested by the proposed regulations would shift the focus from protecting public health and safety to

[28] http://www.mass.gov/eea/agencies/massdep/water/regulations/310-cmr-36-00-the-water-management-act-regulations.html

an over-emphasis on increasing fluvial fish and aquatic life" as well as overlooking "effective and feasible holistic approaches [to] . . . integrated water management policy for the Commonwealth."[29]

One of the ongoing concerns about SWMI standards has been a lack of specific cost estimates. For example, in their formal response to the Regulatory Review initiated by Governor Baker, the eight communities of the Ipswich River Basin wrote that:

> "The new regulations will require expensive mitigation projects to 'offset' increased water use. This is true even for communities that are well within their current permit limits or have achieved water use reductions. The mitigation projects, according to [DEP], may include dam removals and building fish ladders. These expensive capital projects will cause rate increases on residents and siphon money away from infrastructure projects that should be strengthening our water systems."[30]

As part of its 2014 "Act Providing for the Preservation and Improvement of Land, Parks and Clean Energy in the Commonwealth,"[31] the Legislature mandated that DEP submit a report by July 1, 2017 that provides "a comprehensive review of the impact of [SWMI regulations] on municipalities and public water systems." The report must include: "an analysis of those municipalities and water systems affected by new permit conditions . . . those municipalities and water systems required to develop minimization, cold water fishery or mitigation plans; and . . . any rate increases experienced by ratepayers which water system operators attributed to minimization, cold water fishery or mitigation requirements."[32]

4. Community Compact Initiative and Municipal Modernization

Governor Baker has introduced, through executive order, two initiatives that have had a direct impact on water infrastructure regulations and programs for cities and towns.

[29] Beckwith, Geoffrey C. MMA Executive Director, letter to Massachusetts Department of Environmental Protection, Bureau of Resource Protection, July 10, 2014
[30] Barth, Stephen, et al, letter to Governor Charles D. Baker RE: Regulatory Review Needed for Water Management Act Regulations, January 27, 2016 http://www.mass.gov/anf/docs/anf/reg-review/eea/ipswich-river-basin-1-27-16.pdf
[31] https://malegislature.gov/Laws/SessionLaws/Acts/2014/Chapter286
[32] op cit., Section 52

In one of his first official actions after taking office in January 2015, Governor Baker issued Executive Order No. 554, which created a Community Compact Cabinet "to create more effective, efficient and accountable governments" at the state and local levels.[33] The Governor's order listed key goals of this new partnership initiative for municipalities and state secretariats, including:

- "To develop, in consultation with cities and towns, mutual standards of best practices for both the state and municipalities . . .
- "To develop ideas to incentivize adoption of best practices . . .
- "To review state regulatory burdens on municipalities . . . and recommend reforms to lessen the burdens on municipalities . . .
- "To understand the major cost drivers of municipalities . . . and identify actions that the Commonwealth [and] municipalities can take to control them;
- "To identify and remove barriers to economic development opportunities for cities and towns; and
- "To empower cities and towns and school districts by finding new ways for local governments to leverage state resources and capacity."[34]

One of the "best practice areas" under which cities and towns may apply for Community Compact is "Comprehensive Water Resource Management." Communities or regional community groups that are approved for compacts under this best practice area are eligible for "incentives to communities for entering into a Community Compact, including prioritizing Commonwealth technical assistance resources to help reach your chosen best practice(s). Extra points on certain grants, and a grant program specifically for Compact Communities, are also incentives included for participation in the program." Of the 200 community compact agreements signed between the Commonwealth and Massachusetts communities as of May 19, 2016, six (Attleboro, Charlton, Eastham, Manchester-by-the-Sea, Salisbury, and Uxbridge) are focused on water management best practices.

In March 2015, Governor Baker also issued Executive Order No. 562 directing all state agencies "to promptly undertake a review of each and every regulation currently published in the Code of Massachusetts Regulations under its jurisdiction" in order to reduce burdensome duplication, adverse impacts, and obsolescence in state regulations, including those affecting cities and towns.[35] As part of that

[33] E.O. 554-2015, available at http://www.mass.gov/courts/docs/lawlib/eo500-599/eo554.pdf
[34] Ibid, pg. 2
[35] E.O. 562-2015, *available at* http://www.mass.gov/governor/legislationexecorder/execorders/executive-order-no-562.html

review, state officials received a wide range of written comments and public testimony—some of it specific to water-related regulations—from dozens of local governments, regional organizations and advocacy groups.[36]

This review led to Governor Baker's introduction in December 2015 of a legislative proposal to modernize state laws and regulations directly affecting municipal governments. Provisions to streamline municipal borrowing for water improvements and to make other adjustments in water infrastructure financing were included in the Municipal Modernization Act which was approved by the Legislature on July 31, 2016 and signed into law by the Governor on August 8, 2016, now known as Chapter 218 of the Acts of 2016.[37]

Specifically, Section 8 of the new law allows municipalities to "incur debt, by a two-thirds vote, [for projects costing $50,000 or more] for such purposes as . . . establishing or purchasing a system for supplying a city, town, or district and its inhabitants with water, for taking or purchasing water sources, either from public land or private sources, or water or flowage rights, for the purpose of a public water supply, or for taking or purchasing land for the protection of a water system . . . For conducting groundwater inventory and analysis of the community water supply, including pump tests and quality tests relating to the development of using said groundwater as an additional source or a new source of water supply for any city, town or district . . . For . . .the construction of filter beds, the construction or reconstruction or making extraordinary repairs to standpipes, buildings for pumping stations including original pumping station equipment, and buildings for water treatment, including original equipment therefor, and the acquisition of land or any interest in land necessary in connection with any of the foregoing . . . For remodeling, reconstructing or making extraordinary repairs to reservoirs and filter beds . . . For constructing or reconstructing, laying or relaying aqueducts or water mains or for the extension of water mains, or for lining or relining such mains, and for the development or construction of additional well fields and for wells . . . For the payment of the city, town or district share of the cost to increase the storage capacity of any reservoir, including land acquisition, constructed by the water resources commission for flood prevention or water resources

[36] http://www.mass.gov/anf/budget-taxes-and-procurement/regulatory-review/public-comments/
http://www.mass.gov/anf/budget-taxes-and-procurement/regulatory-review/web-comments/
[37] https://malegislature.gov/Laws/SessionLaws/Acts/2016/Chapter218

utilization . . . and for the purchase, replacement or rehabilitation of water departmental equipment.[38]

In essence, the new law makes borrowing easier, but—with the modest exception of allowing the charging of interest on delinquent water and sewer bills—does not provide additional funds or create new mechanisms for funding of water infrastructure.

"An Act Promoting Awareness for Safe Recreation in Public Waterways," Office of Representative Denise Provost

5. 2014 Water Economic Development Study

In January 2014, the Collins Center for Public Management and the University of Massachusetts-Boston published a report commissioned by the MWRA Advisory Board titled, "Study on Investment in Water and Wastewater Infrastructure and Economic Development."[39] This study collected academic analysis and Massachusetts-based case studies[40] that offer insights into the role that water infrastructure investment may play in supporting local and regional economic development. The study concluded that:

[38] ibid.

[39] "Study on Investment in Water and Wastewater Infrastructure and Economic Development, Edward J. Collins, Jr. Center for Public Management, 2014 https://www.umb.edu/editor_uploads/images/centers_institutes/center_collins_mgmt/MWRA_Economic_Development_Report.pdf

[40] ibid, pp 3-5. The MWRA Study looked at five case studies, in Boston, Somerville, Stoughton, Taunton, and Weymouth. While providing no overall return-on-investment (ROI) estimates for "the multibillion dollar investment to clean up the harbor, opening up the Boston Seaport District, and other areas, to new investment and development," the study noted that projected private investment in Boston's Seaport District alone was

- "The provision of potable water and wastewater treatment services in Massachusetts is highly fragmented . . . any comprehensive effort to improve water and wastewater infrastructure will need to work with multiple providers and take into account the unique circumstances of each community;

- "Municipalities across the state are facing significant challenges with major infrastructure systems reaching their reasonable useful lifetime at the same time as state and federal regulatory requirements are becoming increasingly stringent;

- "Delayed or stalled economic development projects have a real financial impact on local communities seeking to increase their commercial property tax base. . . .; and

- "[M]ultiple examples can be found today where access to adequate water and wastewater infrastructure has made the difference between economic development projects that quickly generate thousands of new jobs and those that have been delayed for years [by a lack of adequate infrastructure]."[41]

As with the other post-2012 developments listed here, this economic development study has provided additional context for municipalities to assess the urgency and impact of water infrastructure investment and given added impetus to DLM's survey of the impact of planned or projected investments on local finances.

Moreover, they suggest that any assessment of water infrastructure cost impacts should be made not only on the basis of funding but also on the basis of how changes—both actual and proposed—to regulatory and administrative frameworks might affect the ability and willingness of municipalities to increase their investments in critical water systems.

expected to reach $8.4 billion. In two of the four additional case studies—Taunton and Stoughton—the study noted that a combined investment of $3.3 million in water infrastructure "unlocked" economic development and private investment that yielded $12.3 million in annual commercial property tax revenues.

[41] ibid., pp 155-6

6. Widespread Drought in 2016

Massachusetts began to experience symptoms of drought in the spring and early summer of 2016. By July, the U.S. Drought Monitor (USDM)[42] had designated approximately one third of the state as experiencing "severe drought" and only Nantucket Island escaping designation as "abnormally dry."[43] By September, much of eastern and central Massachusetts had been rated as experiencing "extreme" or "severe" drought,[44] with USDM defining "extreme" as characterized by "Major crop/pasture losses [and] widespread water shortages or restrictions."[45]

Even with some additional precipitation in the month of October, drought conditions have worsened across the state. Currently, USDM rates nearly 64 percent of the Commonwealth as experiencing "severe" to "extreme" drought. (See Figure 5.)

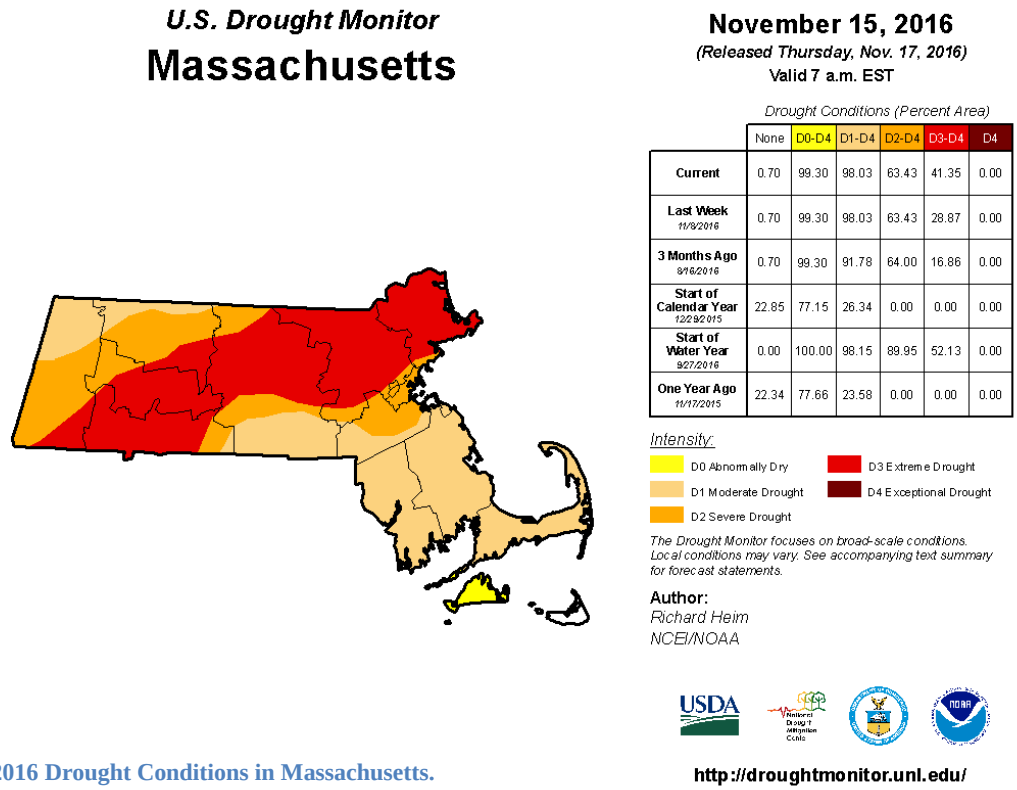

Figure 5: November, 2016 Drought Conditions in Massachusetts.

As of September, the United States Department of Agriculture (USDA) estimated drought-related crop losses in

[42] USDM is a national agency established in 1999 by the National Oceanic and Atmospheric Administration, the U.S. Department of Agriculture, and the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln to track the effects of drought http://droughtmonitor.unl.edu/AboutUSDM/Background.aspx
[43] http://droughtmonitor.unl.edu/MapsAndData/MapArchive.aspx
[44] http://droughtmonitor.unl.edu/MapsAndData/MapArchive.aspx
[45] http://droughtmonitor.unl.edu/AboutUs/ClassificationScheme.aspx

Massachusetts at approximately $14 million, a three percent loss of the state's annual agricultural output.[46]

The effect on municipal water supplies has been even more dramatic. Restrictions on water usage—some voluntary but most compulsory—affect communities in every region of the Commonwealth. (See Figure 6.)

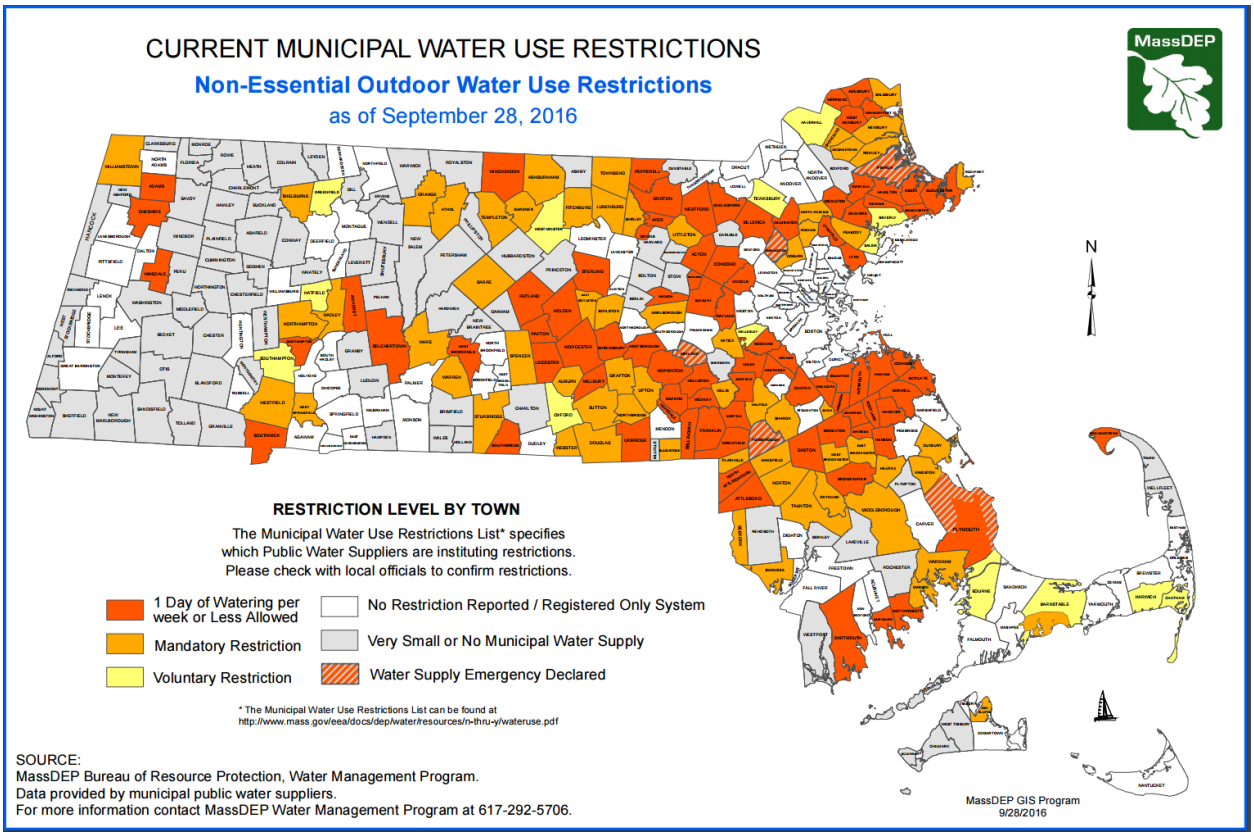

Figure 6: Current Water Use Restrictions in Massachusetts (5 communities have delcared water emergencies.) Source: Mass DEP

Depletion of local water supplies has prompted several municipalities—notably Ashland, Cambridge, Lynn, and Worcester—to develop agreements with the MWRA to purchase water on an emergency basis.[47] These agreements can place significant pressure on local budgets[48] and also represent additional

[46] Young, Colin "Mass. crop damage estimated at $14 Mil, aid available in four counties," State House News Service 9/6/16 http://wwlp.com/2016/09/06/mass-crop-damage-estimated-at-14-mil-aid-available-in-four-counties/
[47] Laskey, *op. cit,* page 1
[48] Kotsopoulos, N., "Drought forcing Worcester to buy water indefinitely" 10/3/16 http://www.telegram.com/news/20161003/drought-forcing-worcester-to-buy-water-indefinitely
Rocheleau, Matt "Communities scramble to find emergency water sources," 9/15/16 https://www.bostonglobe.com/metro/2016/09/14/reservoirs/qqc4NSXGye23330h1BsTVN/story.html

demand on the MWRA's supplies at a time when many of the Authority's regular clients have also increased their usage.[49] As a result, the MWRA's Quabbin Reservoir, which normally holds 412 billion gallons, has fallen below 80 percent of capacity for the first time since 2002, although MWRA managers believe that the Authority could continue to meet current levels of demand from all users—including emergency purchasers—even if the drought continues for "several more years." [50]

Toward a "Holistic" Approach

The Water Infrastructure Commission's call in 2012 for a more "holistic," integrated approach to both financing and regulation has been echoed repeatedly in subsequent years by stakeholders in the public sector and across the advocacy community.

As noted in the SWMI discussion above, the MMA has, in advocating for its member municipalities, called on DEP to develop coordinated policies that would "facilitate the good work of cities and towns so communities can maintain and expand" their "innovative strategies to conserve water and manage their water use."[51]

In calling for further study of Governor Baker's proposal that DEP assume MS4 permitting authority from the federal government—and in raising serious reservations about specific aspects of the current version—Representative (and Water Infrastructure Finance Commission member) Carolyn Dykema observed that "More comprehensive and integrated planning is expected to be an important potential benefit of delegation which may help optimize infrastructure investments . . . Understanding the extent to which delegation may facilitate implementation of more innovative or 'green' water management approaches would also be beneficial."[52]

[49] Laskey, *op. cit,* page 5
[50] Rocheleau, Matt, "Amid drought, Quabbin Reservoir now below normal level," 11/15/16, https://www.bostonglobe.com/metro/2016/11/15/state-largest-reservoir-falls-below-normal-for-first-time-years-drought-persists/FHZMN88TwUgZGC41pdJddM/story.html
Laskey, *op. cit*., page 3
[51] Beckwith, Geoffrey C. MMA Executive Director, letter to Massachusetts Department of Environmental Protection, Bureau of Resource Protection, July 10, 2014, pg. 3
[52] Dykema, Carolyn, State Representative, letter to Joint Committee on the Environment, Natural Resources and Agriculture June 16, 2016, pg. 3

The theory of a need for—and the benefits of—a "holistic" approach was summarized in a May, 2016 letter from Massachusetts Water Works Association Executive Director Jennifer A. Pederson to the Legislature's Joint Committee on the Environment, Natural Resources and Agriculture. Writing on behalf of a membership composed primarily of local water system officials throughout the Commonwealth, Ms. Pederson explained that:

> Communities across the nation are beginning to recognize that regulations within the historically isolated water resource "sectors" (i.e. drinking water, wastewater and stormwater) are becoming increasingly interrelated. As such, more progressive communities are already beginning to think about how they could manage these systems in a more economically viable and integrated way. In Massachusetts, the need for integrated water resource planning will be further highlighted when communities begin to respond to recently promulgated changes to the Water Management Act regulations, specifically informed by the Commonwealth's Sustainable Water Management Initiative (SWMI). Ironically, any system or community interested in pursuing the merits of an Integrated Water Management Plan have been thwarted due to the permitting "silos" administered under separate regulatory authorities (drinking water, wastewater and stormwater programs). Communities must deal with all of these regulatory programs simultaneously regardless of what is considered to be most convenient for the regulators. Unlike the regulators, they do not have the luxury of only concentrating on each program one at a time. Integrated planning is not cheap or easy, but if done effectively, can help communities prioritize water resource needs, investments, and benefits—including infrastructure and the environment.[53]

Surveying Municipal Cost Impacts and Concerns

Collectively, these post-2012 developments also point to the value of updating and enhancing basic data on municipal costs for maintaining and enhancing water infrastructure. Better understanding of these costs is especially important in the context of the continuing trend since Fiscal Year 2003 for state aid to

[53] Pederson, Jennifer, letter to Joint Committee on the Environment, Natural Resources and Agriculture, May 27, 2016, pp. 1-2

account for declining shares of annual local expenses.[54] To provide additional data on this topic, DLM began in November 2015 to survey cities and towns directly concerning:

- their planned expenditures for water infrastructure of all kinds;
- their sources of funding;
- their knowledge and experience of state and federal funding sources;
- their strategies for and experience with the adoption of technological and managerial innovation in water infrastructure;
- their specific initiatives to address climate change impacts on water infrastructure; and
- their views on state and federal regulation frameworks.

The 2012 State Water Infrastructure Commission Report had been based on careful estimates of water infrastructure needs. By contrast, the DLM survey was intended to quantify known and documented expenditures using figures supplied directly by local governments and to begin collection of stormwater cost data.

Methodology

DLM used a hosted, online survey tool to generate emailed invitations to all 351 cities and towns.[55] (See Appendix A for invitations and survey format.)

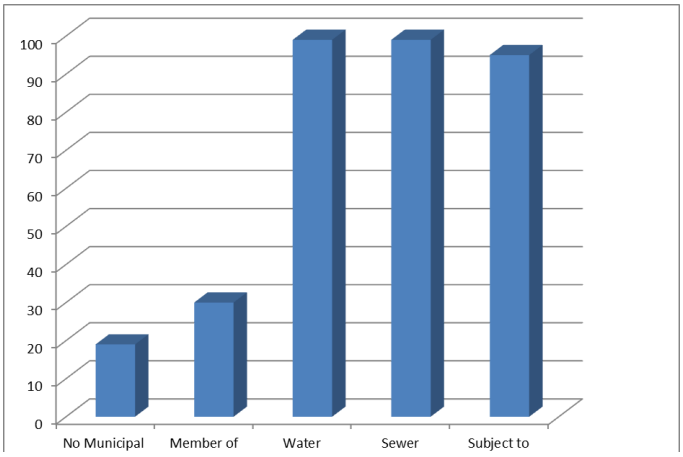

Figure 7 –Key Characteristics of 146 Responding Communities

Survey invitations were emailed to heads of municipal governments in November 2015 and were followed up with phone calls and additional emails in January, February and March of 2016. The

[54] http://www.mass.gov/auditor/docs/dlm-mandate/2016/040616-5-year-fiscal-impact-report-2011-2015.pdf, p.3 "Specifically, in FY03, tax levies accounted for 50.79% of total municipal revenue and state aid accounted for 27.08% of total municipal revenue. FY15, tax levies increased to account for 57.58% of total municipal revenue and state aid dropped to 20.22% of total municipal revenue."

[55] With the assistance of the Massachusetts Water Works Association, DLM also provided survey invitations to local independent water districts, although data submitted by these organizations was aggregated by municipality.

survey was closed on April 12, 2016. Respondents were encouraged to complete the survey online although responses were also accepted by email, postal mail and fax.

Respondent Characteristics

A total of 146 cities and towns submitted completed surveys. Of these:

- 19 (13%) reported that they owned no municipal water systems;
- 30 (20%) reported that they were MWRA members;[56]
- 99 (68%) reported that they had a dedicated enterprise fund for drinking water delivery;
- 99 (68%) reported that they had a dedicated enterprise fund for waste water management; and
- 95 (65%) reported that they were subject to the MS4 process

The 146 respondents represented 42% of the state's 351 municipalities but included 88% of all cities and towns with populations greater than 50,000. The sample therefore included almost all of the state's large urban communities. Responding communities contained 64% of the total state population. To model statewide estimates using the responses obtained in the survey, DLM therefore used a multiplier of 1.36 on the actual figures provided.

[56] Of the state's 351 municipalities, MWRA serves a total of 61, or 17.4%.

FINDINGS AND POLICY RECOMMENDATIONS

1. Massachusetts communities have combined water system spending needs in excess of $17 billion

Based on survey data, Massachusetts municipalities can conservatively anticipate *at least* $17.8 billion in water infrastructure expenditures over the next 20 years. This includes an estimated $7.24 billion for clean water delivery, $8.99 billion for wastewater treatment and handling, and $1.58 billion for stormwater management.[57]

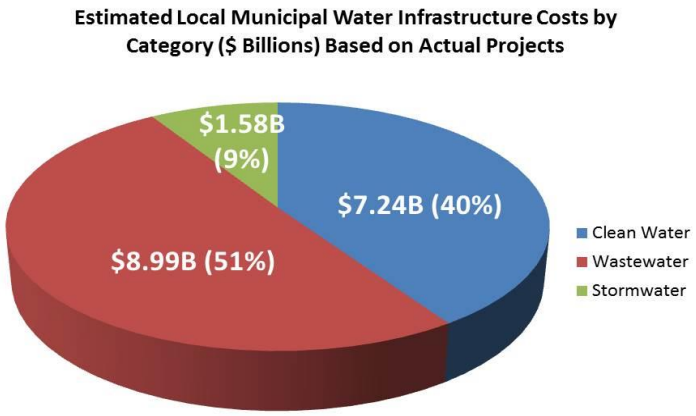

Figure 8 - Cost Estimates Derived from DLM Survey

During the 10-year period covered by the survey, the Department of Environmental Protection's (DEP) Division of Municipal Services has approved over $1 billion in municipal water infrastructure projects for low-interest loans from the State Revolving Fund (SRF).[58] These loans can result in substantial savings for municipalities, although they come with requirements to use American-made iron and steel that may undercut the reduction in interest. Repayment of SRF loans is made in twice-yearly debt service remittances to the state. Local aid payments may be garnished in the event of non-payment, although such action is rarely needed. [59]

[57] Several communities indicated that they were still preparing capital plans and cost estimates for stormwater management costs. Most communities that have developed specific cost estimates have done so on the basis of five or ten year capital plans, another reason that the total cost figure provided here is conservative. To compensate for the fact the cost estimates supplied by municipalities account for 64 percent of the state's population (although the sample is broadly representative on both a demographic and a geographic basis), the estimates in this study have been adjusted upward. Thus, although using a different methodology, these estimates are therefore comparable in overall magnitude to those in the 2012 Water Infrastructure Commission analysis.
[58] Source: Mass DEP Division of Municipal Services.
[59] ibid.

The state announced in January 2016 that it was authorizing cities and towns to borrow up to $538 million at interest rates of two percent or lower, but this increase—though it may provide significant savings on interest payments—does not mean the state is boosting direct aid to municipalities. A guaranteed loan rate is useful but the accompanying requirements to use U.S.-sourced materials may also increase the capital cost of water infrastructure projects. These changes may, in some cases, reduce the overall benefit of a lower interest rate.

The State Qualified Bond program[60] provides another means for municipalities to borrow for various purposes, including water infrastructure projects. Municipalities that issue bonds through the State Qualified Bond program benefit from the strength of the state's credit rating, because the state pays the debt service directly from the municipality's local aid. The security provided by the State Qualified Bond program improves the bonds' marketability, and in turn, municipalities often benefit from lower interest rates on the debt issuance. Nevertheless, while municipalities may benefit from lower interest rates by bonding for water infrastructure projects through the State Qualified Bond program, municipalities are still paying for these projects with their own resources[61].

Smaller municipalities that do not receive sufficient local aid to cover the debt service amounts are, regardless of need, ineligible to participate in the State Qualified Bond program. The way in which both the SRF and State Qualified Bond programs are administered therefore restricts access by smaller communities with limited ability to repay loans through local aid—even loans offered at lower interest rates guaranteed through the state. In some other New England states, smaller communities are given special consideration through grant programs designed to address water infrastructure projects with significant public impact.[62]

In Maine for example, the Small Community Grant Program is available to municipalities and water districts that do not have municipal sewer systems but face wastewater disposal and pollution problems.[63]

[60] The program is administered by the Municipal Finance Oversight Board, which is chaired by State Auditor and consists of the State Treasurer (or designee), Attorney General (or designee), and the Director of Accounts for the State Department of Revenue.
[61] "Understanding Municipal Debt," Massachusetts State Department of Revenue, Division of Local Services, May, 2016, pg. 2 http://www.mass.gov/dor/docs/dls/mdmstuf/technical-assistance/best-practices/understandingmunicipaldebt.pdf
[62] https://www3.epa.gov/region1/eco/drinkwater/pdfs/waterfundletterweb.pdf
[63] http://legislature.maine.gov/statutes/38/title38sec411.html; http://www.maine.gov/dep/water/grants/scg/scgfaq.pdf

In Connecticut, the state offers large-scale capital grants as well as loans for water infrastructure projects in eligible local communities: In 2015, the state's Bond Commission authorized general obligation bonding that would underwrite not only $370 million in loans for local and regional wastewater improvement projects but also an additional $110 million in grants that cover anywhere from 20 to 50 percent of project costs for participating communities.[64]

Vermont's Department of Environmental Conservation provides grants to eligible communities participating in that state's Clean Water State Revolving Fund program, with available support ranging from 25 to 50 percent of planning and capital costs.[65]

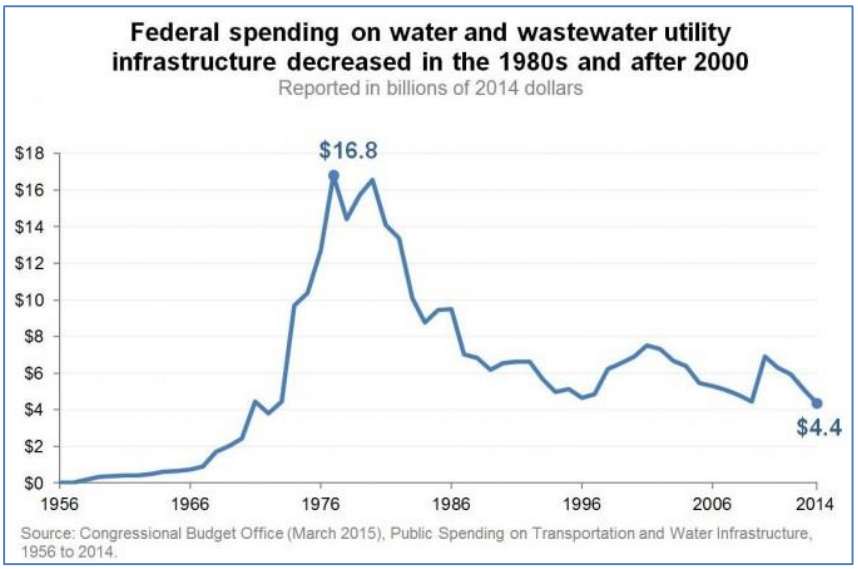

Figure 9 – From "Federal Funding Trends for Water and Wastewater Utilities (1956-2014),"UNC-Chapel Hill Environmental Finance Center

These direct grant programs assume increased importance in an era during which federal spending on water and wastewater utility infrastructure has declined precipitously. According to the University of North Carolina's Environmental Finance Center, federal funding for water and wastewater utilities "decreased dramatically—nearly fourfold between 1980 and 2014. The consequence for communities nationwide is even more significant when considering that a majority of the federal funds in the 1970s and 1980s were provided as grants, while the majority of the funds provided since the 1990s have primarily been loans."[66] (See Figure 9.)

As documented in this municipal impact study and in the 2102 Commission Report—and especially in light of the decline of federal investment—the statewide cost of necessary upgrades to the Commonwealth's

[64] "Gov. Malloy Announces $480 Million In Grants And Loans For Wastewater Treatment Projects," Press Release, Department of Energy and Environmental Protection, January 29, 2015
[65] http://dec.vermont.gov/facilities-engineering/water-financing/vt-pollution-control-grants
[66] Stefan, Francine, "Snapshot: Federal Funding Trends for Water and Wastewater Utilities (1956-2014)," University of North Carolina's Environmental Finance Center, May 14, 2015 http://efc.web.unc.edu/2015/05/14/federal-funding-trends-for-water-and-wastewater

water infrastructure is likely to exceed the ability of municipalities to pay the bill—with or without access to lower-cost, state-backed loans.

Recommendation

Given the continuing decline of overall state aid as a share of local budgets, the Legislature should expand the State Revolving Fund (SRF) as administered by the Clean Water Trust to provide full grants in addition to its current practices of low-interest loans and limited principal forgiveness for cities and towns undertaking water system repairs and enhancements. This finding also supports a recommendation contained in the Massachusetts Water Infrastructure Commission report that the Commonwealth establish a new Trust Fund for water infrastructure to provide at least $50 million annually for the next ten years in direct state aid for local water infrastructure projects.[67] This funding should be provided in addition to, and run concurrent with, current loan and grant programs, and should focus entirely on grants for eligible water infrastructure projects. In addition—and as an incentive designed to respond to Finding 3 of this study[68]—priority in allocating these funds should be given to municipalities and regional entities seeking supports for projects and programs that enhance water infrastructure regionalization.

2. Municipalities foresee significant increases in capital, operating, and staffing costs for implementation of new federal stormwater management regulations.

Asked directly whether they would face higher annual operating costs as a result of EPA's Municipal Separate Storm Sewer (MS4) Permit requirements issued in April of 2016 (effective July 1, 2017), 65 percent of survey respondents indicated that they were affected by the new permit requirements. Responding communities cited projected spending increases over the next twenty years of more than $1 billion, including $160 million in staffing costs alone. Population-based modelling of stormwater-related costs for municipalities yields a statewide total of $1.58 billion over the next 20 years, including $240 million in additional personnel costs.

[67] *Water Infrastructure Finance Commission*, op. cit., p. 10
[68] See Page 31

Recommendation

To provide additional funding for water infrastructure investment, Massachusetts municipalities should consider the creation of dedicated stormwater enterprises similar to local water and sewer enterprises in structure, operation, and fee-based revenue streams. [69]

3. For most municipalities, regional collaboration on water infrastructure remains a goal rather than a reality

Only 36% of survey respondents reported that they are members of regional collaborations on water infrastructure planning and management. Of these, only five municipalities reported that they belonged to organizations that had spending/purchasing authority.[70]

Figure 10 - The MFN Regional Wastewater Facility in Norton is managed by a regional entity that took six years to create.

Recommendation

1. Streamline start-up requirements and regulations to allow municipalities to pool resources more easily and achieve greater efficiencies of scale in watersheds and water systems that extend across multiple municipal boundaries. In addition to the recently enacted municipal modernization law, which prioritizes state grants for communities that present regional approaches for eligible projects

[69] Another related bill currently under legislative review, H657, would explicitly authorize municipalities and other public operators of water infrastructure systems to charge a separate user fee to support the creation and use of "Sustainable Water Resource Funds." The funds could be used "exclusively for measures to remedy and offset the impacts on the natural environment of new and/or increased water withdrawals, sewering, wastewater discharges, stormwater discharges, or impairment of recharge of groundwater through depletion of ground or surface waters, and to sustain the quantity, quality, and ecological health, of waters of the commonwealth. https://malegislature.gov/Bills/189/House/H657

[70] 94 Massachusetts municipalities have joined forces to establish six regional stormwater coalitions throughout the state. While they do not own or operate facilities, these coalitions do share planning resources and information in order to coordinate watershed-based approaches to stormwater management. The six current coalitions are: the Central Massachusetts Regional Stormwater Coalition, the Connecticut River Stormwater Collaborative (Pioneer Valley Planning Commission), the Northern Middlesex Stormwater Collaborative, the Neponset Stormwater Partnership, the Merrimack Valley Planning Commission, and the Southeast Regional Services Collaborative's Stormwater Group. Earlier this year, these organizations established a Statewide Municipal Stormwater Coalition to provide a framework for sharing cost information, technical products, field procedures, public education tools, documentation, and training opportunities. Source: http://www.mma.org/statewide-coalition-forms-share-stormwater-resources

and programs, the Legislature should also approve legislation designed to promote municipal collaboration and regionalization throughout the Commonwealth by simplifying the process of creating regional public entities that have the power to operate facilities as well as to plan across multiple municipal jurisdictions.[71]

2. As noted in in the recommendation under Finding 1,[72] a special state trust fund for water infrastructure should give priority in allocating grants to municipalities and regional entities seeking support for projects and programs that enhance water infrastructure regionalization.

4. Municipalities may not be taking full advantage of current loan and grant programs

Benefits of Financing thru State Revolving Fund vs Market rates

	Financing rate	Principle Borrowed	Term of years	Debt Service Payments		Savings: SRF vs Market		
				Annual	Life of Loan	Annual	Life of Loan	Grant Equivalency
SRF	2.00%	$ 1,000,000	20	$61,156.72	$1,223,134.36	n/a	n/a	
Market	3.00%	$ 1,000,000	20	$67,215.71	$1,344,314.15	$6,058.99	$121,179.79	12.12%
	3.25%	$ 1,000,000	20	$68,778.88	$1,375,577.68	$7,622.17	$152,443.31	15.24%
	3.50%	$ 1,000,000	20	$70,361.08	$1,407,221.54	$9,204.36	$184,087.17	18.41%
	3.75%	$ 1,000,000	20	$71,962.10	$1,439,241.95	$10,805.38	$216,107.58	21.61%
	4.00%	$ 1,000,000	20	$73,581.75	$1,471,635.01	$12,425.03	$248,500.64	24.85%
	4.25%	$ 1,000,000	20	$75,219.83	$1,504,396.70	$14,063.12	$281,262.33	28.13%
	4.50%	$ 1,000,000	20	$76,876.14	$1,537,522.89	$15,719.43	$314,388.52	31.44%
	4.75%	$ 1,000,000	20	$78,550.47	$1,571,009.35	$17,393.75	$347,874.98	34.79%
	5.00%	$ 1,000,000	20	$80,242.59	$1,604,851.74	$19,085.87	$381,717.38	38.17%
	5.25%	$ 1,000,000	20	$81,952.28	$1,639,045.66	$20,795.57	$415,911.30	41.59%
	5.50%	$ 1,000,000	20	$83,679.33	$1,673,586.60	$22,522.61	$450,452.24	45.05%
	5.75%	$ 1,000,000	20	$85,423.50	$1,708,469.98	$24,266.78	$485,335.61	48.53%
	6.00%	$ 1,000,000	20	$87,184.56	$1,743,691.14	$26,027.84	$520,556.78	52.06%
	6.25%	$ 1,000,000	20	$88,962.27	$1,779,245.37	$27,805.55	$556,111.01	55.61%
	6.50%	$ 1,000,000	20	$90,756.40	$1,815,127.91	$29,599.68	$591,993.54	59.20%
	6.75%	$ 1,000,000	20	$92,566.70	$1,851,333.91	$31,409.98	$628,199.55	62.82%

Project cost $ 1,000,000
Term of loan (years) 20

Figure 11 - DEP's Division of Municipal Services uses this table to demonstrate the potential cost savings (depending on project size and current market interest rates) for cities and towns using the SRF loan program. Source: DEP

Through its Division of Municipal Services, DEP already provides annual outreach and education efforts to Massachusetts communities on the topics of Clean Water Trust and State Revolving Fund program eligibility, financial benefits, and application procedures. Each year, DEP holds regional training sessions, meets with local officials on an ad hoc basis, and provides an extensive online library of materials for potential borrowers. Yet only 42% of communities responding to the DLM survey reported that they have received water infrastructure grants or loans from Massachusetts or the federal government in the past 10 years—and only 38% indicated familiarity with legislative changes to loan availability and terms in 2014, which were specifically designed to expand eligibility for loans and increase the scale of benefits for municipal borrowers.[73]

[71] https://malegislature.gov/Bills/189/House/H4419/History
https://malegislature.gov/Bills/189/Senate/S1077
[72] See Page 28
[73] https://malegislature.gov/Bills/188/Senate/S2342/History

This response suggests that eligibility requirements and a lack of awareness about available resources may continue to impede the ability of communities to invest in necessary water infrastructure. As noted in the recommendations associated with Finding 1, above, the Commonwealth's existing water infrastructure loan programs are insufficient to meet the need for necessary investment in maintenance and expansion. Yet, even these current programs remain under-utilized resources that could be deployed by more communities if they had additional information and incentives.

Recommendation

The Commonwealth should work to enhance municipal eligibility for state loans and grants by reviewing repayment options and further expanding the capacity of state agencies to reduce or forgive interest and/or principal repayments for smaller projects. At the same time, the Commonwealth should consider additional funding in the DEP budget for expanded outreach in order to educate municipalities about the availability, terms, and benefits for current and future water infrastructure loan and grant resources—including and especially the long-term advantages of borrowing in the near term when both state-sponsored and private interest rates remain near historic lows.

5. Municipalities are not focused on the likely effect of climate change on vulnerable water infrastructure.

Only 6% of survey respondents indicated that they developed any formal climate change plans or policies that affect water infrastructure systems. This data suggests that, despite guidance offered in comprehensive state-level reviews, such as the Massachusetts Climate Change Adaptation Report issued in September 2011 by the Executive Office of Energy and Environmental Affairs, and despite recent advances in understanding of the scope and speed of climate change impacts, many Massachusetts cities and towns have not yet integrated climate change impacts into their long-term water infrastructure plans. This is a serious issue, as the effects of climate change should be factored into location, replacement and capacity of water systems.

Governor Baker's recently-promulgated Executive Order No. 569, *Establishing an Integrated Climate Change Strategy for the Commonwealth*,[74] calls for a statewide planning process for developing standards and strategies for preserving or relocating vulnerable water infrastructure, but it does not include any

[74] http://www.mass.gov/governor/legislationexecorder/execorders/executive-order-no-569.html

initiatives to raise the public profile of this vital aspect of climate change preparation, nor does it suggest new funds or funding sources for this purpose. The Executive Order directs the Secretary of Energy and Environmental Affairs and Secretary of Public Safety to "provide technical assistance to Cities and Towns to complete vulnerability assessments, identify adaptation strategies, and begin implementation of these strategies."[75] However, the Executive Order does not specify how those resources will be provided—or in what quantity—to communities that lack the staff or funds to develop and implement climate change resiliency plans for their vulnerable infrastructure.

Recommendation

In following up on the stated goals of its recently promulgated executive order on climate change preparedness, the Baker-Polito Administration should, by July 1, 2017, convene a statewide summit on climate change implications for municipal water infrastructure systems, especially in coastal and riverine flood plain zones. In addition, the Legislature should consider the authorization of designated funds for the purpose of providing municipalities with expert assistance in developing and implementing water infrastructure resiliency and capital investment plans related to climate change impacts.

6. Municipalities reported a low rate of adoption for innovative technologies with the potential to reduce cost and increase efficiency in municipal water systems.

There is a long list of new and innovative technologies for water infrastructure that includes solar energy arrays, trenchless pipe rehabilitation (coatings and linings), SCADA (supervisory control and data acquisition) remote control systems (see Figure 12), tree pits, and rain gardens for stormwater management. Innovative and alternative technologies can offer potential cost savings and/or performance improvements, yet many communities are reluctant to assume the potential risk and liability for adopting technologies and management systems. Through the Massachusetts Clean Energy Center, the Commonwealth has taken important steps to promote new technologies and best practices in water infrastructure with initiatives such as the Catalyst program and DeployMass. Through the Water Innovation Trust, DEP provided $800,000 in Fiscal Year 2016 for direct funding of water system innovation. Yet only 18% of survey respondents indicated that they had adopted any innovative or alternative

[75] ibid., section 3, paragraph d.

technologies to achieve cost savings, enhanced capacity or improved performance in any aspect of their water infrastructure.

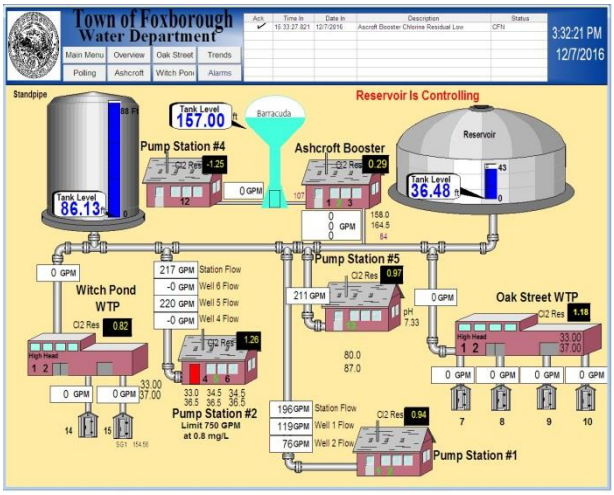

Figure 12 - As shown in this screen capture Foxborough's SCADA system gives managers easy-to-use, real-time data on key performance metrics. (Source: Town of Foxborough Water Dept.)

Recommendation

The Commonwealth should consider additional incentives and support in this area, including:

- a requirement that the Operational Services Division (OSD) and the Division of Capital Asset Management and Maintenance (DCAMM) undertake comprehensive reviews of their regulations and practices in order to develop proposed changes to liability standards and procurement requirements that would encourage easier adoption of innovative technologies that could improve performance and reduce costs in water infrastructure facilities.

- adoption of legislation that would create an "innovative communities office" within the Executive Office of Housing and Economic Development to coordinate "the introduction of cutting-edge technologies into the marketplace and incentivize the adoption of these technologies by municipalities."[76]

- creation of legislation that would provide interest rate and/or principal forgiveness on projects that may require additional investment if innovative technologies do meet performance standards.

- if the Commonwealth assumes responsibility for municipal stormwater permitting (See finding 7, below), the adoption of regulatory flexibility for communities that adopt and deploy innovative solutions that may need extra time to achieve full compliance with applicable standards.

- adoption of legislation to encourage local governments to explore opportunities for public-private partnerships (P3).[77]

[76] https://malegislature.gov/Bills/189/Senate/S1986
[77] https://malegislature.gov/Bills/189/Senate/S1722 For more information on P3s in water infrastructure projects and facilities, see also http://knowledge.wharton.upenn.edu/article/making-the-most-of-public-private-partnerships/, http://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2016/03/30/as-water-infrastructure-crumbles-many-cities-seek-private-help

7. Municipalities favor state administration of stormwater permits

Municipalities favor state administration of stormwater permits, with 75 (51%) of all 146 responding municipalities—and 90% of the 84 communities expressing a preference—indicating that they would rather have DEP administer the MS4 stormwater permit program. Only 9% indicated a preference for EPA to continue direct administration of the program.

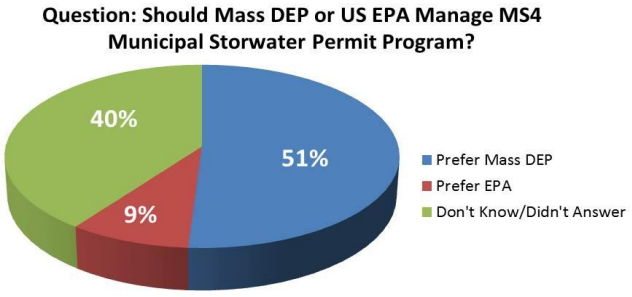

Figure 13 -Responses to: "Would your municipality prefer to have Mass DEP issue MS4 permits or have US EPA retain this role?"

Assumption of operational responsibility for the MS4 permit program would make DEP a "one-stop shop" for water system regulations in Massachusetts. This change has financial implications for the state: DEP estimated in 2013 that the cost of assuming responsibility for issuing and enforcing MS4 permits would be in the range of $9 to $10 million annually.[78] In actually proposing the change earlier this year, DEP noted that integration and automation of water quality data-gathering and analysis would reduce this cost to $4.325 million per year.[79]

In response to an inquiry from the Legislature's Joint Committee on the Environment, Natural Resources and Agriculture, DEP officials indicated that it investigated the possibility of funding the change through an assessment on users but that they rejected the idea, preferring to have the Legislature direct that the program be funded through a line-item in the DEP budget. In its written comments to the Joint Legislative Committee, DEP noted that, "[o]ne of the downsides of the assessment approach is that as program costs increase each year, the assessment would have to be re-evaluated and adjusted; a process that could be time intensive and potentially uncertain to complete on an annual basis."[80]

[78] "Massachusetts Department of Environmental Protection Report to the General Court of the Commonwealth on the Topic of NPDES Authorization," 07/01/2013, pg. 4
[79] "MassDEP Responses to June 16, 2016 Memo from Representative Dykema," 06/27/2016, pg. 1
[80] Ibid.

DEP discussed this funding issue at greater length in its 2013 report to the Legislature, noting that possible sources included not only general appropriations but also permit fees for commercial users and a wastewater assessment fee. Observing that the "wastewater assessment fee would be the most significant and reliable source of funding," the report concluded that "a combination of these funding sources would likely be necessary."[81]

The proposal to have the DEP assume administrative control of the MS4 stormwater permit program has placed renewed focus on the idea of a "unified" or "holistic" regulatory system. Some stakeholders believe that such an approach might lead to a weakening of current standards and enforcement due to lack of staffing and resources at the DEP, leading to "a backlog in issuing water supply permits and conducting five-year permit reviews; multi-year delays in monitoring, assessing and reporting on water quality around the state; discontinued developing pollution control plans; and inconsistently enforced water protection rules."[82]

By contrast, advocates argue that a consolidated regulatory framework—especially when coupled with additional financial incentives—would provide more certainty to municipalities about:

- where, when and how to make water infrastructure investments;
- embarking on long-term regionalization plans; and
- embracing innovation and best practices.

For example, in his written testimony in support of DEP's assumption of the MS4 administrative role, Northborough Town Administrator John W. Coderre noted that "MassDEP ownership of the program would provide greater opportunity for municipalities to successfully implement integrated water resources planning and address multiple regulatory requirements and community infrastructure needs, all while maintaining affordable water and sewer rates."[83]

[81] "Massachusetts Department of Environmental Protection Report to the General Court of the Commonwealth on the Topic of NPDES Authorization," op. cit.
[82] Blatt, Julia, Letter to the Joint Committee on Environment, Natural Resources, and Agriculture, May 5, 2016, Pg. 2
[83] Letter, Town of Northborough town Administrator to Joint Committee on Environment, Natural Resources and Agriculture, 06/28/2016, pg. 2

DEP's response to the Joint Committee made a similar point: "MassDEP would work with [communities] and other stakeholders to identify the long term needs within the municipal wastewater, stormwater and water supply infrastructure. Based on environmental and public health impacts, municipal priorities and associated costs, projects would be prioritized in order to develop a master plan for the long term management of all wastewater, stormwater, and water supply infrastructure within the municipality."[84]

Some environmental advocates have expressed concern that state officials would be less rigorous in enforcement of federal rules than the EPA has been. There is relatively little scholarly literature examining the effect of delegation on the rigor of enforcement, but a 2007 doctoral dissertation by Northeastern University's David L. Whelpley focused on precisely this question. Comparing federal Clean Water Act regulatory enforcement and water quality outcomes in Boston Harbor and San Diego Harbor, Whelpley concluded that "[t]he evidence in this study suggests that the EPA, even when policy responsibility is delegated to the states, maintains an active role in enforcing the Clean Water Act." Evaluating the results, he found that no erosion or mitigation of enforcement in California, where state officials applied the federal standards.[85]

Recommendation

The Legislature should approve legislation to allow DEP to assume responsibility for issuing MS4 stormwater permits under EPA's NPDES regulatory standards but mandate that funding for the change come from a combination of sources, including not only the state's general fund but also:

- a user fee modeled on DEP's current Section 70 drinking water assessment and
- a fee paid by major point industrial and commercial sources based on impervious area or discharge flow rates.

In this way, cost impacts on any one state, local, or private sector source can be minimized.[86]

[84] Ibid., pg. 6
[85] Whelpley, David L., The State and Municipal Effect: Enforcing the Clean Water Act in Massachusetts/California – Boston/San Diego, Northeastern University, Boston, 2007, pp. 166-7
[86] "Massachusetts Department of Environmental Protection Report to the General Court of the Commonwealth on the Topic of NPDES Authorization," 07/01/2013, pg. 4, pp. 38-39, pg. 43

With this additional authority and the additional funding incentives outlined in Recommendations 1 and 3, DEP should work with municipalities to develop 10-year rolling capital investment compacts for water infrastructure in order to provide greater stability and predictability to communities in allocating water system dollars.

APPENDIX A

DLM Survey: Local Cost Impacts of Required Water Systems Maintenance, Upgrade and Innovation – Invitation and Online Form

From: Thomas Champion
Sent: Monday, November 09, 2015 3:08 PM
To:
Subject: State Auditor Suzanne M. Bump Seeks Your Participation in Water Infrastructure Cost Survey

Dear Municipal Executive:

The Division of Local Mandates (DLM) – a unit within the Office of State Auditor Suzanne M. Bump – is asking your assistance with a project of direct and vital significance to every community in the commonwealth.

Whether the topic is drinking water, wastewater or stormwater, the challenge posed by aging, obsolete and, in some cases, inadequate water infrastructure constitutes a serious threat to the long-term economic and physical health of communities across Massachusetts.

In 2012, the Massachusetts Water Infrastructure Commission cited a statewide, 20-year funding gap of $21.4 billion between currently planned public investment and the actual funding necessary to maintain capacity, ensure quality and meet future demand in our state's water systems.

That estimate did not, however, take account of new regulatory requirements at the federal level (such as the EPA's recently promulgated Municipal Separate Storm Sewer System permit regulations, aka MS4) and at the state level (notably the Sustainable Water Management Initiative, or SWMI). The Commission's 2012 estimate also did not include potential infrastructure costs resulting from sea and river level increases or increased storm intensity and runoff amounts due to climate change.

Many local governments have already indicated that these new costs have not been adequately analyzed – and that they will add greatly to the fiscal burdens of cities and towns across the commonwealth.

While DLM may be best-known as the agency responsible for determining whether a state statute, regulation or policy imposes an unfunded mandate under the state's local mandate law (M. G. L. c. 29, s. 27C), it is also empowered to review any law or regulation that has a significant impact on local government (M.G.L. c. 11, s. 6B).

Given the enormous potential impact of state regulations and policies on the water infrastructure costs confronting Massachusetts cities and towns, DLM is therefore undertaking a Municipal Impact Study to update the estimate of water infrastructure investment gap and to examine potential best practices, regulatory strategies and funding mechanisms designed to help close that gap.

A crucial first step in developing this study is to ask cities and towns to share their own best estimates of costs and resources – as well as to solicit local input on the current use of various funding sources and the embrace of new water system strategies and technologies designed to improve efficiency and manage costs.

DLM is therefore seeking your assistance in fast-tracking the online survey you will find at this link
Click here.

Please note that some questions require only a yes-or-no response. Some require a monetary figure. (Please use numbers, not words; i.e., "1,000,000" not "one million" and do not insert dollar signs.) Some questions require a narrative text response; if you need more space than has been provided, please send me an email at thomas.champion@sao.state.ma.us with the text of your full replies.

Please also feel free to call or email me (see contact info below) if you have questions or concerns.

This is a substantial request, but we hope you will agree that this survey can provide both context and an added sense of urgency to state and local efforts to address one of the greatest challenges to the continued health, economic vitality and quality of life of communities throughout Massachusetts.

Please respond as quickly as you can – and thank you in advance for your invaluable assistance.

Thomas P. Champion
Policy Research Analyst
Office of the State Auditor, Suzanne M. Bump
Division of Local Mandates
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Boston, MA 02108
Direct Tel: 857-242-5427
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Unsubscribe from this list

Our mailing address is:
Commonwealth of MA, Office of the State Auditor
One Ashburton Place
Room 1819
Boston, MA 02108
United States

DLM Survey: Local Cost Impacts of Required Water Systems Maintenance, Upgrade and Innovation

Instructions

Welcome to the Division of Local Mandates water systems cost impact survey. Please review the following instructions.
As the electronic form may 'time-out' after a period of inactivity, please print a copy of the form and complete the printed copy first, and then enter the information into the electronic form.
Please enter all financial answers as numbers (i.e., "1500000" not 1.5 million).

*Name of City or Town:
Select:

*Name:

*Title:

*Email:

*Phone:

Section 1: Drinking Water Funding and Improvement Programs

1a. Is your municipality a Massachusetts Water Resources Authority customer?
○ Yes ○ No

1b. If yes, what MWRA services does your community use?

- ☐ Water
- ☐ Emergency Back up Only
- ☐ Partial Water

2. Does your municipality currently have a dedicated enterprise fund set up for your water system?

- ○ Yes ○ No

3. How does your municipality assess drinking water rates?

- ○ Fixed Fee ○ Block Rate ○ Other (Describe):

4. If a fixed fee, what is the amount charged?

5. If a block rate, what is the water rate (per 100 cubic feet or 1000 gallons)?

6. How much revenue did your municipality receive from this source in the following fiscal years?

	Amount ($)
FY2014	
FY2015	

7. Does your municipality have a drinking water system master plan (or water utility capital improvement plan)?

- ○ Yes ○ No

8. What is the total cost estimate to address the needs described in the water system master plan?

9a. Does your municipality have a proposed implementation schedule in the master plan and does it include projected impacts to the water rates?

- ○ Yes ○ No

9b. What are the projected impacts?

10. What percent increase to water rates would be required to complete the required water treatment system improvements (include both O&M costs and bond repayment)?

Section 2: Wastewater Funding and Improvement Programs

11. Does your municipality currently have a dedicated enterprise fund set up for your sanitary sewer and treatment system?

○ Yes ○ No

12a. How does your municipality assess sewer rates?

○ Fixed fee ○ Block Rate ○ Other (Describe):

12b. If a fixed fee, what is the amount charged?

12c. If a block rate, what is the rate?

13. How much revenue did your municipality receive from this source in the following fiscal years?

	Amount ($)
FY2014	
FY2015	

14. Does your municipality have a wastewater system master plan (or water utility capital improvement plan)?

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Yes No

15. What is the total cost estimate to address the needs described in the master plan?

16a. Do you have a proposed implementation schedule in the master plan and does it include projected impacts to the sewer rates?

Yes No

16b. What are the projected impacts?

17. What percent increase to sewer rates would be required to complete the required water treatment system improvements (include both O&M costs and bond repayment)?

Section 3: Stormwater Compliance and Capacity Programs

18. Is your municipality subject to the exiting MS4 permit?

Yes No

19. How are necessary funds currently obtained for MS4 permit compliance?

Local property taxes State Grants Other (Describe):

https://massosa.checkboxonline.com/2015-Local-Cost-Impact-Require-Water-Systems.aspx 4/9

☐ User fees ☐ State-backed Bonds

20. Is your municipality:

	Response	
	Yes	No
Located within the Charles River watershed?	◯	◯
Contain a lake/pond watershed with an approved Total Maximum Daily Load (TMDL) for phosphorus?	◯	◯
Contain a water body with an approved TMDL for bacteria or pathogens?	◯	◯
Located within the Cape Cod or Buzzards Bay watersheds?	◯	◯
Located within the Assabet River watershed?	◯	◯
Located within the watershed of Long Island Sound?	◯	◯

21. Does your municipality discharge into other out of state water bodies with approved TMDLs?

◯ Yes ◯ No

22. What are your municipality's current annual expenditures for stormwater systems?

23. What are your municipality's projected annual expenditures for stormwater compliance over the next 20 years assuming the draft MS4 permit is adopted as it is currently written?

24a. Does your municipality anticipate a need to hire additional staff to ensure compliance with the new MS4 permit?

◯ Yes ◯ No

24b. If yes, how many additional employees?

24c. If yes, what is the additional annual cost?

Section 4: Additional Required Questions for all Communities

25. To what new requirements is your municipality subject concerning treatment of drinking water, wastewater, or stormwater over the next 5 years? (DEP, Water Management Act Permits, Disinfectants and Disinfection Byproducts; increased Infiltration and Inflow correction; MS4; Nitrogen or Phosphorus removal, etc.)

26a. Has your municipality adopted any innovative or alternative technologies to achieve cost savings, enhanced capacity or improved performance in any aspect of its water infrastructure?

○ Yes ○ No

26b. If yes, please describe the technology and its impact:

27. Has your municipality developed any formal climate-change plans or policies that affect water infrastructure systems?

○ Yes ○ No

27b. If yes, please describe:

28a. Is your municipality a member of any regional (non-state, non-federal) entity or agency that collaborates on water infrastructure planning and/or management?

○ Yes ○ No

28b. If yes, does the entity/agency have spending/purchasing authority? What is the name of the entity?

29a. Has your municipality received water infrastructure ***bond support or loans*** from the Commonwealth of Massachusetts in the 10-year period from 2004 to 2014?

○ Yes ○ No

29b. If yes, please describe the amount, purpose and source of the funding:

30a. Has your municipality received water infrastructure grants from the U.S. Environmental Protection Agency or Commonwealth of Massachusetts in the past 10 years?

○ Yes ○ No

30b. If yes, please describe the amount, purpose and source of the funding:

31a. Has your municipality reviewed 2014 changes to the state's water infrastructure financing programs – changes that may include forgiven or reduced interest on loans; MWRA entry fee match and/or a local property tax water infrastructure surcharge (similar to the Community Preservation Fund model)?

○ Yes ○ No

31b. If yes, do you believe these changes will increase the likelihood that your community will apply for state funding through the Massachusetts Clean Water Trust (formerly the Water Pollution Abatement Trust)?

○ Yes ○ No ○ Don't Know

32. On a scale of 1 through 5, where 1 is "very difficult" and 5 is "very easy," how would your municipality rate its interactions since 2010 with the U.S. Environmental Protection Agency?

Very Difficult

Very Easy
○ 1
○ 2
○ 3
○ 4
○ 5
○ n/a

33. On a scale of 1 through 5, where 1 is "very difficult" and 5 is "very easy," how would your municipality rate its interactions since 2010 with the Massachusetts Department of Environmental Protection?

Very Difficult

Very Easy
○ 1
○ 2
○ 3
○ 4
○ 5
○ n/a

6/21/2016 2015 Local Cost Impact Require Water Sys - Municipalities

34. Massachusetts is one of four states in the nation in which the U.S. Environmental Protection Agency (EPA) issues MS4 permits directly. Would your municipality prefer to have the Massachusetts Department of Environmental Protection (DEP) issue these permits or have the US EPA retain this role?

○ Prefer US EPA ○ Prefer MassDEP ○ Don't know

Save And Exit | Finish |

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APPENDIX B

Summary of Responses

DLM Survey: Local Cost Impacts of Required Water Systems Maintenance, Upgrade, and Innovation

Total municipalities responding: 146
Total municipalities without public water system infrastructure (wells/septic-tanks only): 19
Total municipalities reporting public water systems: 127
State population living in responding municipalities (2010 Census): 4,205,959 (64% total state pop.)

Section 1: Drinking Water Funding and Improvement Programs

1a. Is your municipality a Massachusetts Water Resources Authority customer?
Yes 30 (20%) No 116 (80%)
1b. If yes, what MWRA services does your community use?
Water 22 Partial Water 5 Emergency Back-up Only 4

2. Does your municipality currently have a dedicated enterprise fund set up for your water system?
Yes 99 (68%) No 47 (32%)

3. How does your municipality assess drinking water rates?
Fixed Fee: 11 Block Rate: 71 Blend of Fixed, Block, Tier, or Other: 17

4. If a fixed fee, what is the amount charged? [Responding communities only]

City/Town	Reply
Bellingham	$290
Beverly	$3.56
Blackstone	$60.00 per 10,000 gallons
Bolton	$0
Charlton	N/A
Gloucester	$7.00
Hinsdale	$460 annual
Hubbardston	$0
Ipswich	$8.01
Lakeville	$0
Lancaster	$48.75
Lawrence	$3.10
Marlborough	$6.89
North Attleborough	$28.16
Norwood	$2.68
Orleans	$88.95
Pittsfield	$181.80
Reading	$0
Royalston	$0
Salisbury	$4.16
Topsfield	$22.50
Wenham	$32.50

5. If a block rate, what is the water rate per 100 cubic feet (ccf) or 1000 gallons? [Responding communities only]

City/Town:	Unit and Rate
Abington	$3.75 per 100 cubic foot unit (ccf)
Acton	4.3 cents [no unit provided]
Agawam	$1.90 per ccf up to 4000 cubic feet > 4000 cubic feet at $2.38 per ccf
Amesbury	$8.10 per ccf
Arlington	0-15 ccfs at $4.75 per ccf, 15-30 ccfs at $5.08 per ccf, 30 or more ccfs at $6.16 per unit
Attleboro	$4.47 [no unit provided]
Barnstable	$2.3637 per ccf
Bellingham	$3.95 [no unit provided]
Belmont	$6.06 per ccf
Boston	7.46 per 1000-gallon unit
Brockton	2.99 - 6.11 [no unit provided]
Brookline	Blk 1: $1.85 Blk 2: $5.50
Canton	0-15 $3.44, 16-40 $6.10, 40-100 $10.07, 100+ $12.79
Chatham	$4.90 [no unit provided]
Chelmsford	1000 gallons [no rate provided]
Chelsea	1-1000 cubic feet: $4.26 per ccf; 1,001-2,500 cubic feet: $5.19 per ccf; over 2,500 cubic feet: $6.21 per ccf
Chicopee	$3.24 up to 1000 cubic feet, then $3.60 at greater than 1000 cubic feet
Concord	$4.77 [no unit provided]
Danvers	100 cubic feet [no rate provided]
Dover	$5.20 per thousand
East Longmeadow	$2.95 [no unit provided]
Edgartown	1 - 50,000 gal = $2.00/1,000 gal. >50,000 gal. = $2.25 / 1,000 gal.
Everett	$2.08
Fall River	$2.65 per ccf
Fitchburg	$3.16 [no unit provided]
Framingham	$5.69-$10.50
Gardner	$4.86 per ccf
Great Barrington	$36.57 per billing includes 3,750 gals.; $1.37/1000 gals. - 3,750 - 7,500 gals.; $1.42/1000 gals. - 7,500 - 11,250 gals.; $1.47/1000 gals. - 11,250-22,500 gals.; $1.49/1000 gals.22,501+ gals.
Greenfield	$2.67 per ccf
Groton	$4 up to 40 units; $5 41-80 units; $6 81 units and over
Halifax	0 to 50,000 gallons - $3.45 per thousand gallons; over 50,000 gallon, $5.50 per thousand gallons
Hanover	“varies depending on usage” [no unit or rate provided]
Harwich	$1.29 per 0-15000, $2.65 per 15001-30000, $3.95 per 30001-70000, $5.72 per 70000+

Haverhill	$2.78 per ccf
Holliston	5.6 [no unit or rate provided]
Holyoke	4.509 [no unit or rate provided]
Hudson	$3.67/1400CF 4.19/next 1400cf 4.26/ next2200cf 4.33/ next 5000 4.41/ balance
Huntington	4.50 per 1000 gallons; over 18000 5.50 per 1000 gallons
Lexington	7.09[no unit or rate provided]
Littleton	[By separate email, Littleton provided a detailed rate structure that is appended at the end of this table]*
Lowell	51-100 $2.451 ccf
Medford	6.07 [no unit or rate provided]
Methuen	varies
Milford	$4.095/$6.143 [no unit provided]
New Bedford	$2.17/ CCF
Newton	6.1
North Andover	$3.80/100 cubic feet
North Attleborough	2.59
Northbridge	4.2389
North Reading	8.08/100 gal up to 10,000 gal; 11.85/1000 gal 10,000-22500 gal; 16.16/1000 gal >22,500 gal
Norton	$3,37 $5.25
Norwood	2-steps - see item #9b
Orleans	0-15000 $1.88, 15001-30000 $4.64, 30001-50000 $5.97, over 50000 $7.23
Peabody	2.44, 2.66, 2.90 per 100 cubic ft
Pittsfield	$1.31 per ccf
Provincetown	varies, seasonal rate structure
Quincy	5.92/100 cu ft
Reading	$8.83/ 100 cubic feet
Rockland	3.75 per 100 cubic feet
Rowley	<3000g - $20.13/1000gal, 3001-20,000g - $24.18/1000g, >30,000 - $26.88/1000g
Sandwich	Inclining $1 $2 and $3 / 1000 gal
Saugus	Various
Scituate	$1.16 per 100 cubic feet up to 1,200; $5.04 to 3,400 and $8.19 over 3,000 plus $61.75 per quarter meter charge
Shrewsbury	Residential - $21 + $3.40-10/1000 gal, Commercial $36 + $2.80-3.80/1000 gal
Somerville	Tiered
South Hadley (Town)	$4.80
South Hadley (Water District 1)	3.77/100 cu.ft.
Southwick	4.75

Spencer	13.6
Stockbridge	3.95 per 100 cuft
Sturbridge	$6.43 per 100 c-f
Topsfield	$7.50 per 1000 gal 0-12, 8.85 per thousand 12-24, 12.50 per thousand 24+ per quarter
Ware	$3.73 [no unit provided]
Wellesley	Winter Block 1-5 CCF/month @ $2.99, additional CCF @$3.51; Summer block 6-12 CCF @$3.51, 13-24 CCF @$5.57, 25-36 CCF @ $7.21, Additional @ $9.18
Wenham	$2.40/gallon for 5001-15000 gallons; $4.90/gallon for 15001-25000 gallons; $8.25/gallon over 25000 gallons
West Bridgewater	5.53 per 100 cu ft
West Newbury	$9.68/1000 (0-35k) $12.31/1000(35<)
West Springfield	2 [no unit rate provided]
Weston	0-500 HCF = $1.35 & 500 + HCF = $5.10
Westport	$8.80/100 cu ft
Whitman	7.25[no unit provided]
Yarmouth	$1.68/1000 gallons

* Littleton: Base charge of $20.00 per customer per quarter and debt service charge of $1.40 per hundred cubic feet per quarter, plus:

	Hundred Cubic Feet per Quarter	Dollars per Hundred Cubic Feet
Residential Level 1	0-25	$ 3.84
Residential Level 2	25-50	$ 3.94
Residential Level 3	50-75	$ 4.70
Residential Level 4	75-100	$ 4.82
Residential Level 5	Greater than 100	$ 4.92
Commercial & Industrial	All	$ 4.82

6. How much aggregate revenue did responding municipalities receive from this source in the following fiscal years?
Total amount for all reporting communities:
FY2014: $677,867,833.66
FY2015: $713,746,070.20

7. Does your municipality have a drinking water system master plan (or water utility capital improvement plan)?
Yes # 86 (59%) No # 60 (41%)

8. What is the total cost estimate to address the needs described in the water system master plan?
Total amount for all reporting communities:
$4,634,041,720 [$7.24 Billion statewide estimate based on population factors]

9a. Does your municipality have a proposed implementation schedule in the master plan and does it include projected impacts to the water rates?
Yes # 47 (32%) No # 99 (68%)

9b. What are the projected impacts? [Responding communities only]

City/Town:	Projected Impacts
Acton	Will require an approximate 5% increase in three year increments.
Agawam	Currently reviewing projects and implementation schedule. Once complete, a rate analysis will be done to accommodate the project schedule.
Amesbury	Fire protection is lacking selected areas of town, increasing insurance rates and hindering development. Water quality issues persist in several areas. Service interruptions are frequent in areas with older mains.
Arlington	Our costs to maintain the system and construct the required capital improvements requires an approximate 4% rate increase per year
Barnstable	Increase in water rates. 6% per year
Bellingham	A capital fee was added to the fixed fee portion of the bill in 2014. The average rate payer pays $210 per year which generates $1,000,000 per year for capital projects. Sort of a forty year plans. To reduce the plan would require almost $400 per year per customer.
Belmont	5% or less
Blackstone	We are up to date with the Corrosion Control Mandates
Boston	Increase in debt service and increase in rate revenue projects
Brookline	Proposed improvements to the Singletree Storage Tank through FY22
Cambridge	Dropping debt service has allowed for no water rate increases in the last five years. Water debt service to drop to zero in two years. Pay as you go capital will be used to support master plan.
Charlton	Currently we are a water customer of a neighbor town, the cost to become our own water supplier and service provider are prohibitive. The debt already incurred, presents a large potential impact on the entire town at least to the amounts owed $6,500,000
Chatham	No increases anticipated at this time to existing water rates structure.
Chelsea	Over the next 5 years almost $6M in water work is programmed into the City of Chelsea's CIP, currently based on water sold a cost of nine cents additional on the average water rate to raise $100K. Each $1M borrowed over a 10 year period of borrowing roughly costs $100K a year. The impact of borrowing $6M million over five years would cause a minimum of a fifty-four cents in water rates over five years of the work.
Chicopee	Water rate increases are anticipated during the expected implementation of the master plan. The rate increases range from an estimated 10% in year FY 2017, then fluctuating between 3% and 5% in subsequent years.
Concord	4% rate increase annually in 1st step up to 2400 cubic feet bimonthly through 2026
Danvers	The projected rate impact has not been determined. Retained earnings are utilized to fund capital improvement projects to avoid financing and/or bonding.

Deerfield	Impacts of what? do you mean improved piping and equipment, or do you mean improved availability and quality?
East Longmeadow	Rates would need to rise to 4.122 by 2031
Eastham	The town wide system is under construction and expected to be complete by 2024. The town currently has no municipal water system.
Edgartown (Consolidated)	Meter replacement is included in the Operating Budget. This line item is for meter replacement only, not new installs. Based on our customer base, all meters will have a service life of no more than 20 years
Fitchburg	Only most critical projects are being considered due to funding constraints - fully funding a "proper" capital improvement plan would be devastating in terms of rate increases to water system customers. The estimate of $100 million in needed improvements, etc. is work that is needed but not realistic in terms of funding - too much work has been put off over the decades and it is now beginning to "snowball" in terms of cost/extent to "catch up".
Foxborough	Relining 21 miles of A/C pipe; Building a third green sand filtration plant at Station #1, Adding a chlorine Contact Chamber at Station #2; Rehabilitation of wells #1, #2 and #3; adding a valve maintenance and rehabilitation program; adding a meter replacement program and remote reading capability throughout the system; improving the IT capabilities of the system; replacing 25 miles of ancient undersized water main; adding a new water tank at Dudley Hill; extending and looping of poorly planned mains;
Framingham	TBD
Georgetown	Implementation and rate impact is still being developed.
Grafton	3% per year increase over the next 8 years
Great Barrington	The traffic flow will be the only thing impacted.
Greenfield	yes we are planning on a 5% annual increase for the next 4 to 5 years
Groton	The implementation was projected over the next 10 years; however, projected impacts to water rates have not been assessed.
Hanover	We have recently completed a draft of the Water CIP - the impact includes budgetary increases for main replacement and an addition to our debt commitment for capital improvements to the three water treatment plants. The capital needs of the water infrastructure have been long neglected to keep rates low. We are committed to reversing this troubling trend.
Harwich	The master plan does have an implementation plan but no projected fee structure., The implementation plan does not include rate impacts
Haverhill	Rates are projected to increase 50% in year 2021. We do not project rates beyond 5 years. Beyond 5 years we expect rates will continue to increase significantly to continue to fund system improvements.
Hinsdale	water meter replacement
Holliston	The Town of Holliston has imposed a quarterly water infrastructure fee of $75 per quarter per customer to finance infrastructure improvements. Anticipated revenue is approximately 1.4 million per year. Holliston has approximately 100 miles of water main of which 60 miles are AC (transite) water main and are in need of immediate replacement. The infrastructure fee is not the complete funding answer

	but it is a start in the process and the plan is to replace approximately 1 mile of water main a year given no additional funding is available. Other fees include a $7.50 quarterly water meter fee dedicated to water meter replacement and software upgraded related to meter reading .Annually we visit the water rates and adjust accordingly.
Hudson	Funding would be borrowed and added to existing rate structure.
Huntington	Doing projects as Highway Dept. road upgrades are being done.
Lancaster	Ability of residents to pay and needs of system short vs long-term.
Leominster	Rate and fee increases will be necessary. Each $500,000 in new money requires a $.35 rate increase.
Littleton	Due to the recent adoption of a debt service charge, we do not anticipate needing to raise water rates over the next 5 years.
Lowell	We are currently looking to have a new master plan developed to accurately assess the impact on rates.
Middleborough	unknown at this time
Milford	1,000,000/yr. Increased rates 15-20%/yr
Needham	Unknown, water rates are evaluated each year.
New Bedford	11% increase & rate increase.
Newton	Annual increase in the water rates
North Andover	It has been programmed over the 5 year Capital Improvement Planning to have no impact on the water rates.
North Attleborough	Impacts from main replacement projects and treatment facilities will increase rates by 3-4% per year. Mains are over 115 years old or failing asbestos cement. Downtown Water main to be replaced, which will impact small businesses.
Northbridge	Not determined at this time
North Reading	The $28 M in projects will have a significant impact on the water enterprise fund annual budget. Over the next 10 years the annual budget increase ranges from 3.2-11.1%, this is a 10 year average of 6.9%.
Norwood	Higher Rates. Note: Water - Flat-Rate Meter Charge = $2.66 (flat rate - 98% of customers) PLUS usage rate: 1st step = 1st 500 cu.ft. @ $3.83 per 100 cu.ft. 2nd step = 501 cu.ft.+ @ $5.65 per 100 cu.ft.
Orleans	FY15 5%, FY16 7%, FY17 7%, FY18 7%, FY19 5%, FY20 5%, FY21 5% FY22 3.5%, FY23 3.5%
Peabody	The current water system improvement projects are performed as needed. The City has not increased the water rate since 2008. The increase in the water rate is warranted in order to implement the capital improvement projects.
Pepperell	We do not have a formal cap plan in place for large cap water projects, but we do allocate ~ $100k/yr for small cap projects, vehicle and equip replacement. We are in the process of creating a large cap project plan. The first project is likely to be a green sands filter at the Bemis Well, and this is projected to cost $3-5M. We will explore all potential funding sources including SRF. Future projects could include water main and hydrant replacements. The cost of the program will be integrated into the rate increases over some number of years as existing debt is retired. Due to

	the very preliminary state of the large cap project program, the actual % increases have not yet been determined.
Pittsfield	By the year 2025, the water rates would increase at least 100% in order to pay the debt service attributed to the water CIP.
Reading	Debt payments to increase and use of MWRA Pipeline Assistance grant loans, and will most likely be offset by rate increases
Salisbury	Water Rates increased on 1-1-2015 for 5 years.
Sandwich (Consolidated)	There is currently a Capitol needs plan commissioned for the Sandwich Water District a Special District that provides water for approximately 75% of the town of Sandwich. The rest of the Town is currently on private wells.
Scituate	$22M water pipe replacement project approved November 2013 (included in #8) - approx. 21 miles of cast iron pipes replaced over 3 phases. Phase I complete, Phase II ongoing & Phase III in 2016. FY14 rates increased 10%, FY15 rates increased 19.2% and FY16 rates increased 19.5%.
Shrewsbury	There will be increases to the water rates as needed to support necessary capital projects.
Somerville	Anticipated impacts:2% increase per year
Springfield	substantial rate increases
Sturbridge	Whittemore Road Booster Station Replacement, Water Main & Hydrant Replacement, Storage Tank Painting, Perchlorate Study, EPA & MADEP mandates, Other. Impact to small customer base is unaffordable as water rates are already very high due to recent capital improvements and system mandates.
Topsfield	Replacement of distribution mains, tanks, wells, and station upgrades.
Truro	Truro does not own or operate water infrastructure. Areas of North Truro that are served by town water is managed and operated by Provincetown.
Waltham	Projects are scheduled in a manner to have minimal impacts on rates
Wellesley	Built into overall rates (see #10)
West Bridgewater	We recently completed several capital projects. We painted and rehabbed two water tanks, built a 1 million gallon tank, ran new water mains to it, replaced water meters town wide, replace fire hydrants, built a treatment plant. This is about to increase our water rates 45%
West Newbury	Water supply ($4,685,000) Storage/Transmission ($2,039,000) High/low service area ($2,095,000) Secondary transmission ($777,000) Restrictions (fire flow) ($1,336,000)
Whitman	We have been systematically replacing water mains as we are able to fund the improvements. While there is no master plan in place, much of the old cast iron and asbestos pipes have been replaced or are being done so in our current construction project.
Worcester	for 5-year capital improvement plan water rates would increase by $0.45 per hcf ($0.09 per year)
Yarmouth	Projects can be done within available funds.

10. What is the average percentage by which rates would be required to increase in order complete the required water treatment system improvements (include both O&M costs and bond repayment)? [Responding communities only]

City/Town	Projected Rate Increase
Abington	58
Acton	5 percent per 3 yrs
Agawam	TBD
Amesbury	60%
Barnstable	6%
Bellingham	45% estimated
Belmont	5%
Beverly	100%
Bolton	$0
Boston	2.83%
Brockton	30% +
Brookline	<1%
Cambridge	0 to 3%
Chatham	0%
Chelmsford	pending permit conditions
Chelsea	2% per annum
Chicopee	range of 3% to 5% annually
Clarksburg	250
Concord	4%
Danvers	18%
Deerfield	300%
East Longmeadow	65%
Eastham	Tax rate increase is projected to be 30% or $800 for the average home in a single year.
Edgartown	Depending on how we plan our capital needs will dictate the rate structure. A 10% increase would provide the revenue for near distant needs, but we must work within reasonable needs.
Falmouth	Doing a study
Fitchburg	300%
Foxborough	15-25%
Framingham	TBD
Georgetown	80-100% (rough estimate)
Gloucester	>20%
Grafton	15%
Great Barrington	Without knowing what the costs associated with materials is I cannot say if an increase to water rates would be implemented.
Greenfield	25 -30

Groton	unknown
Hanover	At least 10%
Harwich	5-6%, 5-6%
Haverhill	See 9b above
Hawley	0
Holliston	more than rate payers could absorb
Hudson	5-10%
Huntington	50%
Lancaster	60
Leominster	$5 MM @ 2% is about $350,000/yr. $.24 or 7%
Lexington	no water treatment
Littleton	0
Middleborough	under review
Middleton	8
Milford	50-80
Needham	Unknown
New Bedford	11% per year for 3 years
Newton	4
North Andover	0%
North Attleborough	20
Northbridge	Not determined at this time
North Reading	over 70% increase over 10 years
Norwood	15%-20%
Orleans	35%
Paxton	50% each year
Peabody	10% per year for 10 years
Pittsfield	100% by 2025
Quincy	unknown
Reading	10%
Rockland	50
Salisbury	33%
Saugus	300
Scituate	at minimum, another 19-20%
Shrewsbury	Depends on implementation structure
South Hadley (Town)	100%
South Hadley (Water District 1)	10%-15%
Springfield	unknown at this time

Sturbridge	Unknown
Topsfield	~100%
Waltham	See 9b
Wareham	700
Wellesley	Average 6.2% increase per year
West Bridgewater	45
West Newbury	50%
West Springfield	100
Weston	N / A - No treatment in community
Whitman	0.5
Worcester	12%

Section 2: Wastewater Funding and Improvement Programs

11. Does your municipality currently have a dedicated enterprise fund set up for your sanitary sewer and treatment system?
Yes # 69 (47%) No/No answer # 77 (53%)

12a. How does your municipality assess sewer rates?
Fixed Fee: 15
Block Rate: 47
Blended Fixed + Block, Tier or Other: 24
No fees charged/left blank: 60

12b. If a fixed fee, what is the amount charged? [Responding communities only]

City/Town	Amount
Bellingham	$170.00
Beverly	$5.61
Blackstone	100.00 per 10,000 gallons
Bolton	$0.00
Charlton	$70 per bedroom
Chicopee	$0.00
Concord	$10.86
Falmouth	$6.10
Gloucester	$13.80
Great Barrington	$460.00
Hinsdale	100.00,210.00 & 230.00
Hubbardston	$0.00
Lakeville	$0.00

Lawrence	$3.35
Lowell	$3.42
Marlborough	$7.11
North Attleborough	$61.36
Palmer	$460.00
Pittsfield	$151.20
Reading	$0.00
Royalston	$390.00
Salisbury	$40.00
Wareham	$695.00

12c. If a block rate, what is the rate?

City/Town:	Block Rate
Agawam	3.04/ccf
Amesbury	6.75
Attleboro	9.1
Barnstable	4.42 per ccf
Bellingham	9.25
Belmont	$11.81
Bolton	$0
Boston	$9.89
Brookline	$3.90
Canton	0-15 7.77, 16-40 8.79, 40-100 11.61, 100-14.88
Charlton	$0.08 per cubic foot
Chatham	$7.35
Chelsea	$8.11
Chicopee	6.79
Danvers	6.6
East Longmeadow	2.8
Essex	20.88
Everett	$5.68
Fall River	4.29 per ccf
Fitchburg	$7.30
Framingham	$7.07
Gardner	$4.50
Haverhill	4.12
Holyoke	5.4
Hubbardston	0
Hudson	$5.29/100cf based upon water consumption

Huntington	12.5
Ipswich	7.06
Lakeville	0
Lexington	17.46
Medford	7.93
Methuen	varies
New Bedford	4.15
Newton	9.25
North Andover	$5.95
North Attleborough	4.32
Norton	$7.21
Peabody	290, 3.16, 3.44 per 100 cubic ft
Pittsfield	$1.79
Provincetown	$13.85
Quincy	$12.98
Reading	$9.76
Scituate	$4.70
Shrewsbury	$7.50
Southwick	7.65
Stockbridge	4.26
Sturbridge	9.82
Ware	$3.93
Wellesley	$8.28 per ccf
West Springfield	2.03
Whitman	3.75

13. How much revenue did your municipality receive from this source in the following fiscal years?
Total amount for all reporting communities:
FY2014: $766,421,162.68
FY2015: $821,441,933.72

14. Does your municipality have a wastewater system master plan (or water utility capital improvement plan)?
Yes # 59 (40%) No/No Answer # 87 (60%)

15. What is the total cost estimate to address the needs described in the master plan?
Total amount for all reporting communities: $5,756,047,507 [$8.99 Billion statewide estimate]

16a. Do you have a proposed implementation schedule in the master plan and does it include projected impacts to the water rates?

Yes # 35 (24%) No/No Answer # 111 (76%)

16b. What are the projected impacts? [Responding communities only]

City /Town	Projected impacts
Agawam	Currently reviewing projects and implementation schedule. Once complete, a rate analysis will be done to accommodate the project schedule.
Amesbury	Minimal in the near future. Long term the Inflow and Infiltration will hinder development or force a treatment plant upgrade costing millions.
Arlington	Our costs to maintain the system and construct the required capital improvements requires an approximate 4% rate increase per year
Barnstable	Increase in rates.
Bellingham	Treatment plant upgrade capital costs have driven a 20% rate increase applied 12/1/2016.
Boston	Increase in debt service and increase in rate revenue projects
Brookline	12-Year Sanitary Sewer CIP focusing removal of Inflow and Infiltration
Cambridge	We have $150M budgeted over the next 5 years, but the budget need is significantly greater (3x).
Charlton	Currently the annual budget is managing the expenses and capitalization needed
Chatham	Impacts to rates are unknown at this time.
Chelsea	Over the next 5 years almost $7.5M in water work is programmed into the City of Chelsea's CIP, currently based on water sold a cost of nine cents additional on the average sewer rate to raise $100K. Each $1M borrowed over a 10 year period of borrowing roughly costs $100K a year. The impact of borrowing $6M million over five years would cause a minimum of a sixty-seven cents in water rates over five years of the work.
Chicopee	Sewer rate increases are anticipated during the expected implementation of the master plan. The rate increases range from an estimated 35% in year FY 2017, then fluctuating between 20% and decreasing to 6% in subsequent years.
Concord	3% per year rate increase through 2026
Conway	undetermined
Danvers	The projected rate impact has not been determined. Retained earnings are utilized to fund capital improvement projects to avoid financing and to bonds where possible.
Fall River	Residential Indicator (% of median household income) would increase from 0.84% to 2.66% in the first 20 years of implementation.
Falmouth	Minimal. Plan increases user base with limited added operational costs
Fitchburg	Rate impacts not yet known. In FY17 the Wastewater Enterprise Fund will be undertaking a rate study and affordability analysis and initiating an asset management system and fiscal sustainability plan in accordance with CWSRF 2016 requirements.
Foxborough	Adding additional mains to serve failing septic areas in town; future treatment plant additions due to new mandates.

Framingham	TBD
Greenfield	Increases to the sewer rate for the next two years of 5%
Haverhill	Rates are projected to increase 48% in year 2021. We do not project rates beyond 5 years. However, based on the additional capital needs beyond 5 years, we expect rates will continue to increase significantly to continue to fund system improvements.
Holliston	Holliston does not have a residential municipal waste water system
Hudson	Funding would be borrowed and added to rate structure.
Huntington	No data available
Lancaster	South Lancaster is under a separate Sewer District. North Lancaster does not have sewer infrastructure in place, but the town is discussing the need as that is the location of the most commercial development potential (700 acres!)
Leominster	Sewer rates will need an additional $.45 beginning in FY'21.
Lowell	Master Plan and CIP are being updated in 2016 to assess impacts.
Mashpee	Mashpee currently has no public wastewater treatment works. The new master plan addresses the wastewater management needs for the Town and includes traditional and non-traditional approaches. The development of a finance plan is still pending so no decisions have been made about cost allocation and rate impacts.
Needham	Unknown sewer rates are evaluated each year.
New Bedford	NPDES Violations, CSO Violations, MS-4 Violations, CMOM Violations
Newton	Annual increase to the sewer use charge
North Andover	It has been programed over the 5 year Capital Improvement Planning to have no impact on the water rates.
North Attleborough	Sewer Lining and removal of infiltration and inflow.
Northbridge	TBD
Norwood	Higher Rates. Note: No min. charge. Sewer Use = 60% of metered water use in cu.ft. Usage rate: 1st step = 1st 300 cu.ft. @ $7.86 per 100 cu.ft. 2nd step = 301+ cu.ft. @ $15.17 per 100 cu.ft. Norwood's Sewer System dates pre-1920's and has major infiltration problems. In addition, the Sewer System in older parts of the community were laid with under-drains, meant to siphon off groundwater before it infiltrated the sewers. The under-drains in turn feed into the storm drainage system and ultimately into local water-ways. However, the clay pipes used in that era tended to leak, causing exfiltration of sewage into the under-drains and then into the storm drainage system and local water-ways.
Peabody	The City's capital plan identifies $11 million worth of projects over the next 5 years. The sewer rate has not adjusted since 2008. The increase is the sewer rate is warranted in order to implement the capital improvement projects.
Pepperell	We do not have a formal cap plan in place for large cap sewer projects, but we do allocate ~ $100k/yr for small cap projects, vehicle and equip replacement. We are in the process of creating a large cap project plan. The first project is likely to be a WWTF upgrade to meet the requirements of the pending NPDES Discharge

	Permit, and this is projected to cost $4-5M. We will explore all potential funding sources including SRF. Future projects would likely include wide scale collection system repairs. The cost of the program will be integrated into the rate increases over some number of years as existing debt is retired. Due to the very preliminary state of the large cap project program, the actual % increases have not yet been determined.
Pittsfield	By the year 2025, the sewer rates would increase at least 160% in order to pay the debt service attributed to the sewer CIP.
Reading	Debt payments to increase and use of MWRA I/I grant loan assistance, and will most likely be offset by rate increases
Revere	Maximum of 2% of mean household income
Salisbury	Raised the sewer rates as part of the Towns 5 year capital improvement plan in the amount of $10/EQR. [Equivalent Residential Unit] The old rate was $30/EQR. Effective January 1, 2015 it went up to $40/EQR.
Sandwich (Consolidated)	Currently in process of developing a CWRMP-Comprehensive Water Resource Management Plan. Impacts are nitrogen impacts on embayments and groundwater protection. No cost has been established at this time.
Scituate	Expansion of system has been and would be financed by betterments.
Shrewsbury	There will need to be increases in the sewer rates depending on project implementation.
Somerville	5% increase per year
Spencer	This is not my department. I am not going to be able to answer these questions.
Springfield	significant impacts to traffic and services, potential finance issues
Sturbridge	Sewer main / Manhole Replacement, Pump Station Upgrades, Improved Sewer Service Area Coverage. Impact to small customer base is unaffordable as sewer rates are already very high due to recent capital improvements and system mandates.
Waltham	Projects are scheduled in a manner to have a minimal impact on rates
Wareham	The rates will increase yearly
Wellesley	Built into overall rates (see #17)
Whitman	The Town of Whitman is connected to the City of Brockton Sewer treatment plant and pays the City of Brockton based on flow.
Worcester	For 5-year capital improvement plan rates would increase by $1.10 per hcf ($0.22 per year)
Yarmouth	Sewer rates to be established in the future.

17. What percent increase to water rates would be required to complete the required water treatment system improvements (include both O&M costs and bond repayment)? [Responding communities only]

City/Town:	Estimated Percentage Increase
Agawam	TBD
Amesbury	30%
Barnstable	3% increase per year
Bellingham	That was done on 12/1/2016 - 20% increase
Beverly	110%

Bolton	$0
Boston	4.70 % annually
Brockton	15%
Brookline	2.5% +/-
Cambridge	7.5 to 8.5%
Charlton	Estimating an 8 percent
Chatham	None anticipated at this time
Chelsea	1.5% per annually for the proposed five year program
Chicopee	Range from 20% to 6% annually
Clarksburg	10
Concord	3%
Danvers	The Town of Danvers received an SRF Loan for the rehabilitation of the Water Treatment Plant. The principal and interest payment for FY 2015 is $1,294,023 which represents approximately 16.4% of the budget.
Eastham	n/a The town does not have any sewer systems. we are working with the regional planning agency to participate in regional watershed protection plans.
Fall River	Annual revenue requirement increases from $17,097,344 in FY16 to $65,729,250 in FY36.
Falmouth	0
Fitchburg	Not yet known, wastewater rate study will be completed in FY17.
Foxborough	Unknown
Framingham	TBD
Greenfield	10 to15%
Haverhill	See 16b above
Hudson	10-15%
Huntington	No data available
Lancaster	need to establish rates for any new system in north Lancaster.
Leominster	11-12%
Lexington	no waste treatment sent to MWRA
Mashpee	see above
Methuen	10% for the next 4 years
Milford	Plan to implement without increasing rates
Needham	Unknown sewer rates are evaluated each year.
New Bedford	11% per year for 3 years until 2020
Newton	+/-4%
North Andover	0%
North Attleborough	10%
Northbridge	TBD
Norwood	annual 8%-10% increase, compounded.
Peabody	unknown
Pittsfield	Poorly drafted question.

Quincy	unknown
Reading	5%
Salisbury	30% increase as part of the Town's 5 year capital improvement plan.
Saugus	300
Scituate	Expansion of system has been and would be financed by betterments.
Shrewsbury	Depends on yearly scheduling of capital improvements.
Southwick	Currently evaluating an increase up to $9.00/1,000 gallons to offset increase in treatment costs (through Westfield WWTP) and in-Town pump station upgrades, grinder pump maintenance, and other costs.
Springfield	rate increase between 5-15% every year
Sturbridge	Unknown
Waltham	See 16b
Wareham	200% over 20 years
Wellesley	Average 5.2% increase per year
West Springfield	100
Whitman	Undetermined.
Worcester	17% for our planned CIP. That figure could increase dramatically if EPA issues new permits for stormwater, cso control and wastewater treatment for the regional wastewater treatment facility.

Section 3: Stormwater Compliance and Capacity Programs

18. Is your municipality subject to the exiting MS4 permit?
Yes # 95 (65%) No/No Answer # 51 (35%)

19. How are necessary funds currently obtained for MS4 permit compliance?
Local property taxes/Operating Budget: 62
User Fees/Enterprise Fund: 12
Water and/or sewer rates: 6
State Grants, Multiple Sources, Other (Describe):16
Not Subject to stormwater permit or no answer: 50

20. Is your municipality:
Located within the Charles River watershed?
Yes 14 No/No answer 132
Contain a lake/pond watershed with an approved Total Maximum Daily Load (TMDL) for phosphorus?
Yes 18 No/No answer 128
Contain a water body with an approved TMDL for bacteria or pathogens?
Yes 32 No/No answer 114
Located within the Cape Cod or Buzzards Bay watersheds?
Yes 17 No/No answer 129
Located within the Assabet River watershed?

Yes 5 No/No answer 141
Located within the watershed of Long Island Sound?
Yes 12 No/No answer 134

21. Does your municipality discharge into other out of state water bodies with approved TMDLs?
Yes 8 No/No answer 138

22. Aggregate current annual expenditures for stormwater systems?
$57,456,957.00
23. Projected aggregate annual expenditures for stormwater compliance over the next 20 years?
$1,009,494,219.00 [$1.58 Billion statewide estimate] [$50,474,710 annually or statewide estimate of $78.9 million annually]
24a. Does your municipality anticipate a need to hire additional staff to ensure compliance with the new MS4 permit?
Yes # 62 (42%) No/No Answer # 84 (58%)
24b. Aggregate additional employees?
130 [Statewide estimate: 203]
24c. Aggregate additional annual cost?
$8,076,000.00 [$12.6 Million statewide estimate]

Section 4: Additional Questions for all Communities

25. What new requirements is your municipality subject to relating to the treatment of drinking water, wastewater, or stormwater over the next 5 years? (Disinfectants and Disinfection Byproducts; increased Infiltration and Inflow correction, MS4, Nitrogen or Phosphorus removal, etc.) [Responding communities only]

Abington	Disinfection Byproducts. Possibly Manganese removal
Acton	Water Management Act Permit renewal, Abatement of industrial contamination from two EPA Superfund sites specifically 1,4-Dioxane (Emerging Contaminant) removal
Agawam	Water Management Act Permits, Disinfection and Disinfection Byproducts, Increased Infiltration and inflow correction, MS4
Amesbury	All of them?
Arlington	II correction, MS4, Phosphorous reduction, Sewer System overflow elimination
Attleboro	All listed above.
Barnstable	All the above and: 208 plan, CEC, UCMR3, watershed permits, etc.
Bellingham	Charles River MS4 TMDL (Phosphorus), Enhanced Sewer I&I, Drinking water we just completed 15.4 Million filtration plant construction project
Belmont	all of the above.
Beverly	DEP, WMA, I/I, MS4, TMDL (bacteria)
Blackstone	CLEAN BASINS AND FIXING OUTFALLS AND WATER SAMPLING.

Bolton	None
Boston	Phosphorus removal and removal of illegal sanitary connections
Bourne	The Town of Bourne has three separate Water Districts. None of the three are affiliated with the Town of Bourne Municipal operations.
Brockton	DEP, Water Management Act Permits, Disinfectants and Disinfection Byproducts; increased Infiltration and Inflow correction; MS4;NPDES, Lead and Copper; CMOM
Brookline	MS4; Nitrogen & Phosphorous removal
Cambridge	non anticipated for drinking water. Stormwater: MS4 changes, Phosphorous TMDL, Bacteria TMDL, sodium restrictions, infiltration and inflow corrections
Charlton	Our treatment plant permit is currently being reviewed, it is not known what new requirements will have to be faced. The last Permit required a plant upgrade costing $1,800,000. Water recently required addition to the current water lines $1,855,000
Chatham	Treatment for Manganese; ground water discharge permit; water withdrawal permit; & water management act
Chelmsford	The Chelmsford Water District currently has concerns over the flowing regulations and the costs associated with them: WMA permits and requirements, DBPR2 compliance in combination with ground Water Rule Compliance, Iron and Manganese Residual disposal.
Chelsea	All drinking water supplied by the City of Chelsea is provided by the Massachusetts Water Resources Authority. All sanitary sewer flows collected by the City of Chelsea are treated by the MWRA. As such, the impact of regulatory requirements is mostly felt financially by increases in the wholesale rates for water and sewer from the MWRA. Since the city still contains many streets with combined sewers, the city is approaching I&I correction typically by the wholesale replacement and separation of combined sewers through both self funding by borrowing and by application of grant receipts for the projects. Standard operating procedures in the City of Chelsea such as bi-weekly sweeping of each side of each street from March 1 through December 31 each calendar year, programmed catch basin cleaning where one third of all catch basins are cleaned each calendar as well as a lack of TMDL for the receiving waters of Chelsea and Mystic Rivers and low count of public stormwater outfalls (24), the small size of the city help the city efforts to comply with the MS4 program requirements. The amount of impervious surface (77%) and impermeable soils in the city make some aspects of compliance difficult.
Chicopee	Currently: MS4, I/I correction, NPDES for wastewater, Consent Decree, Lead and Copper removal.
Clarksburg	Our greater concern is that our Residents on the east side of Town, run by a co-op are experiencing frequent water outages, and capacity problems (failure to meet). There needs to be significant investments in water line replacements that neither the Town nor Co-op has.
Concord	Water Management Act Permitting MS4 compliance and NPDES Wastewater Permitting
Danvers	Danvers is most concerned about the impacts of WMA Permit Renewal and SWMI Regulations. Initial data provided by MADEP indicates that the Town's Water Withdrawal permit will be reduced by 10%. Second is the cost implications, staffing requirements, new stormwater permitting of local discharges, IDDE Investigations, funding source and other permit requirements under the NPDES Phase II

	Stormwater Program. Next is the cost implication (rate Increases) to meet the New State Sewer Regulations in 2017 with the permit & reporting requirements, mandatory I&I removal requirements.
Dartmouth	All of the above and THM's [Trihalomethanes] & HAA's [Haloacetic acids]
Deerfield	The Federal government, (EPA) is continually inventing new and challenging hoops to jump through, with increased testing and more stringent levels which are acceptable being enacted, the state level (DEP) has no other option to accept the EPA requirements. Right now it is the Total Coliform Rule, following in the near future will be Iron and Manganese rules and testing, it just never stops.
Dover	MS4
Duxbury	Drinking water will most likely require filtration and disinfection. We will most certainly require inflow correction to the collection system.
East Longmeadow	Disinfectants and Disinfection Byproducts; increased Infiltration and Inflow correction; MS4
Eastham	n/a
Edgartown (Consolidated)	Based on the iron and manganese regulations, we may have a non compliant source in the near future. We are presently looking into other sources and increasing the yield on another source. It is unclear if there will be costs associated with permitting, as the process has not yet been finalized.
Egremont	DEP, Water Management Act Permits
Essex	DEP and EPA requirements and permits.
Everett	Increased reduction of Infiltration and Inflow
Fall River	Federal Sewage SIudge Incinerator regulations: shutting down our sludge incinerator increasing sludge trucking costs by $1,500,000/year; NPDES nitrogen removal requirements expecting to cost $88,000,000; CSO Project Completion projected to cost $113,700,000; SSO resolutions projected to cost $57,300,000; Disinfectant Byproducts potentially costing $25,000,000; this is all in addition to our needs to replace aged infrastructure.
Falmouth	Disinfection Byproducts, Nitrogen TMDLs at WW plant, Water Management Act Permit mitigation requirements.
Fitchburg	Water Management Act Permits, Disinfectants and Disinfection Byproducts, new MS4 permits, stipulations in Wastewater Consent Decree with US EPA and MA DEP (multi-faceted).
Foxborough	Unknown
Framingham	MS4 permit
Gardner	Water- Water Management Act. Sewer-Nitrogen and Phosphorous Removal MS4 Sampling and Treatment expenses
Georgetown	DRINKING WATER: Disinfection Byproducts was added a few years ago, but Georgetown has maintained compliance consistently. No additional treatment seems needed. Manganese was recently added, but Georgetown already has a water treatment plant designed to remove iron and manganese. WASTEWATER: Georgetown does not have a municipal sewer system. STORMWATER: New MS4 testing requirements to be determined.
Gloucester	MS4 and denial of our 301(H) waiver for primary treatment
Granville	N/A

Great Barrington	PHOSPHORUS / NITROGEN LIMITS
Greenfield	We are not sure. Our NPDES permit is under review and we have not heard about MS4 permit.
Groton	Disinfectants and Disinfection Byproducts
Halifax	DEP, Water Management Act, MS4 and while the new requirements are not connected with water quality at Monponsett Pond, that remains the Town's number one environmental concern because the City of Brockton has failed to maintain the water quality of the Pond as required under the 1964 legislation permitting them to divert water from the Pond for the City's water supply.
Hanover	Disinfection byproducts - spending $1.4 million next year
Harwich	none in next 5 years
Haverhill	DEP regulations, Water Management Act Permits, Disinfectants and Disinfection Byproducts; increased Infiltration and Inflow correction; MS4; new NPDES permit requirements from EPA (Nitrogen or Phosphorus removal, etc.); combined sewer overflows; sanitary sewer overflows; operator licensing requirements;
Hudson	Water Management Act Permit, NPDES Permit, MS4
Huntington	Nitrogen or Phosphorus removal, Infiltration and Inflow correction as road work permits.
Ipswich	UCMR3 Testing, Groundwater Rule Compliance, Chemical Safety Control Strategy Compliance, WMA Permit Renewal, Manganese advisory management, New Wastewater NPDES Permit - Increased Testing, I/I Removal
Kingston	New MS4, TMDL's
Lakeville	MS4
Lancaster	Disinfectants
Lawrence	Disinfectants and Disinfection Byproducts; increased Infiltration and Inflow correction; MS4
Leominster	MS4, Inflow/Infiltration correction,
Lexington	MS4 permit - phosphorus removal 1/1
Littleton	MassDEP Revised Water Management Act with SWMI provisions New EPA MS4 Permit
Lowell	MS4 Permit; Lead and phosphorus limits in NPDES permit
Malden	Revised total coliform rule. Anticipated lead & copper rule change
Marlborough	I & I DEP Sewer regulations, water and sewer master plan, MS4, phosphorous limits-winter sewer side.
Mashpee	Nitrogen removal is the major concern confronting the Town right now. Nitrogen management and restoration of water quality is the largest challenge we face and the most expensive problem on our agenda. Stormwater is not a major concern in Mashpee and we have been making improvements in concert with road upgrades for years. Mashpee has no public water supply system; that is managed by the Mashpee Water District so the Town budget is not impacted by water supply related issues.
Medford	Increased Infiltration and Inflow correction, bacteria removal from the Mystic River.
Methuen	DEP, MWA permit, MS4

Middleborough	Total coliform rule starting April 2016
Middleton	Water Management Act Permit, Disinfectants and Disinfection Byproducts, MS4
Milford	MS4,P removal
Needham	Infiltration, Inflow corrects, MSR4- Phosphorus Removal - TMDLs
New Bedford	SWMI Regulations, Replacing lead service lines, UCMR Testing, & Ground water discharge permit.; Administrative order with EPA, Combine Sewer outfall; SSO
Newton	Increase Infiltration & Inflow, MS4 compliance
North Andover	Water Management Act Permits, Disinfectants and Disinfection Byproducts, increased Infiltration and Inflow correction, MS4
North Attleborough	Water Management Act Permit withdrawal limits. NPDES Wastewater Discharge Permit reduction of Nitrogen discharge, MS4.
Northbridge	CMWP planning effort underway to address these
North Reading	Disinfectants and Disinfection Byproducts; MS4, Nitrogen & Phosphorus removal from stormwater
Norwood	Continuing Infiltration/Inflow corrections; MS-4 Storm-water Requirements. Note: MS-4 Permit has not yet been issued to MWRA communities.
Orleans	Water Management Act Permits, Manganese removal
Palmer	Awaiting the new MS4 permit and NPDES permit
Peabody	Water Management Act Permits, Disinfectants and Disinfection Byproducts, Nitrogen and Phosphorus levels.
Pepperell	Water: WMA, SWMI, DEP SMCL (Fe, Mn) Sewer: NPDES Discharge Permit (Ph, Cu), CMOM Stormwater: NPDES MS4
Pittsfield	Wastewater: NPDES permit requirements for aluminum and phosphorous
Quincy	MS4
Reading	Unknown at this time
Revere	Illicit Discharge Detection and Elimination
Rockland	Disinfection Byproducts. Possibly Manganese Removal
Salisbury	MS4 permit, Administrative Order to remove nitrogen and copper.
Sandwich (Consolidated)	Reduction of existing water management permitted withdrawals is a concern. Please be advised the Sandwich Water District is a separate entity from The Town of Sandwich that provides water to approximately 75% of the Town.
Saugus	I/I, MS4, Drinking Water, WMA, DPR,
Scituate	Drinking water = manganese reduction; Wastewater = copper reduction; Stormwater = TSS
Shrewsbury	MS4 - Entire town located with regulated area (2-different watersheds). Water Management Act Permit - Town recently received new water withdrawal permit largely based upon SWMI. Due to potential changes to manganese limits, modifications to water treatment plant required. Potential changes to metal discharges and lowering of other nutrient levels from wastewater treatment plant may require additional upgrades (just finished construction on last upgrade) with no potential for increased discharge volumes.
Somerville	I/I, MS4
South Hadley	Disinfection By products and lack of funding for infrastructure improvements

Southwick	Water Management Act - 310 CMR 22.11B- PWS Certified Operator Staffing Requirement: Currently, Southwick uses only disinfection for treatment and is permitted to operate the water system under a D-2 license. Under the proposed regulations, Southwick would be required to operate the water system under a D-2 license, plus a T-1 license. None of the Town's operators possess a T-1 license. Should the new rating system for classification of Public Water Systems result in a reclassification to a higher grade, MassDEP should grandfather the operators working in that system and not require them to receive a different or higher grade license. MS4 - The requirements in the draft permit are quite burdensome and will require the Town to expend additional resources to meet the requirements. Further, the fact that the permit has not been released created a burden on communities to have to plan accordingly for when the permit is expected to be in effect on July 2016. Southwick is near the end of the budgeting circle, and any new changes to the permit that has not been released in prior versions could impact how Town and Cities plan the FY17 budgets.
Springfield	All water, wastewater, and stormwater regulations are applicable and impact master plans, long term finance, and rates
Stockbridge	possible waste water phosphorous limits being lowered. Our biggest expense is the replacement of our 125 year old sewer and water infrastructure.
Sturbridge	Water Management Act Permit, MS4,Watch Phosphorus & Zinc Removal Limits
Topsfield	We are subject to DEP, Water Management Permits, MS4. We are currently designing a $7 million drinking water treatment facility to remove manganese in order to comply with new DEP regulations.
Waltham	Unsure - rely on MWRA water system
Ware	All of these items listed above may present funding related problems in the next five years.
Wareham	Water Management Act permit - Daily withdrawals are possibly being reduced due to the involvement of DCR. Wastewater is CMOM CAPACITY, MANAGEMENT, OPERATION, AND MAINTENANCE) Clean Water Act related to Inflow and infiltration removal. We have a 4 ppm nitrogen load to the river and a 1 ppm phosphorus load to the river. The MS4 program and nitrogen discharge to the water body. All these concerns need to be addressed with limited funds and increased burden to tax/rate payers
Wellesley	UCMR4; Mass Water Management Act
Wellfleet	Update the master plan and obtain voter's authorization to borrow funds to expand the water system,
Wenham	Water Management Act permits; increased biological testing mandates, regulation of manganese in drinking water
West Bridgewater	Possible treating with disinfectants, Possible treating for Manganese
West Springfield	Creation of a Combined Utility (Water , Sewer and Storm Water)
Weston	Stormwater (MS4)
Westport	MS4 and Nitrogen removal
Whitman	Storm water management plan is being prepared by Public Works. Impact is unknown at this time

Worcester	MS4, CSO CONTROL VIA NPDES, I/I REMOVAL UNDER NEW DEP REGS, NITROGEN AND PHOSPHORUS REDUCTION AT REGIONAL WASTEWATER TREATMENT PLANT WHICH WORCESTER FUNDS 85%, WATER TREATMENT PLANT NPDES DISCHARGE PERMIT FOR FILTER BACKWASH, WATER MANAGEMENT ACT PERMIT
Yarmouth	Water Management Act, and MS4

26a. Has your municipality adopted innovative or alternative technologies to achieve cost savings, enhanced capacity or improved performance in any aspect of its water infrastructure?

Yes # 45 (31%) No/No Answer # 101 (69%)

26b. If yes, please describe the technology and its impact [responding communities only]:

Arlington	automatic meter reading system. has allowed us to redirect staff resources away from reading meters and to maintaining the infrastructure
Barnstable	Installed PV, wind turbines, and energy efficiency units. Lower energy use and generated energy to lower system costs.
Beverly	trench-less technologies - Cement Lining
Blackstone	WE HAVE AECOM COME AND DO YEARLY INSPECTIONS AND PROVIDE REPORTS
Brockton	State of the art WWTP technology, alt energy supply - solar
Cambridge	Water infrastructure: Solar on roof of Water Treatment Plant ~2% of electrical demand 5 million dollar pumping systems enhancement project underway to improve pumping efficiency, VFDs [Variable Frequency Drive pumps], new control valves to improve hydraulic, etc. Pursuing in conduit hydro power based on previous feasibility study.
Chatham	Solar- PV-Wastewater Treatment Plant; Cap Landfill; Police Station; Town Annex & Proposed Water Treatment Plant LED-Street Lights
Chelmsford	The CWD took advantage of the ARRA to build a 0.5 MW Solar Array that ties directly into the Crooked Spring WTP. The CWD operates and controls the array and its credits. This has allowed the District to both significant energy cost and retain the annual values for the REC credits. Continuing in that vein, the CWD has availed itself of a net metering arrangement to further reduce energy costs. Operational, the District has employed solar power Storage Tank mixers in an effort to reduce water age in distribution, thereby reducing THM [trihalomethanes] production. The District has employed smart metering in a successful effort to combat unaccounted water loss. In another effort to help with water taker's understanding and as part of a coordinated outreach program, the District uses a full range weather station to better explain water restriction needs and to double check the solar array.
Chelsea	The City of Chelsea has implemented two green infrastructure projects. Four stormwater tree pits have been implemented on Chester Avenue and Mace Rain Garden has been constructed on Crescent Avenue. The city hopes to install additional green infrastructure over time.
Chicopee	Aeration/Oxygenation improvements at the Wastewater Treatment plant reduces energy demands. Rainwater reuse/capture is purposed for cleaning of chlorine

	contact tanks reduces City water usage. The City has a complete Integrated Management Plan (IMP) for management and improvements of City infrastructure and utilities. Infiltration basins are utilized for recharge of groundwater and allows for enhanced capacity of sewer systems. Redundant Water line is being established for purposes of enhanced capacity and reliability of the drinking water system. Tree Planting program to reduce burden of outfalls of storm water discharge.
Concord	CoMag Phosphorus Removal, Water Treatment Technologies including DAF, Dual Filter Media and stormwater LID
Deerfield	Energy efficient pump, attempting to get a Solar installation installed, trying to address any item which could save the District and its customers' money, which could be used to do improvements. Electricity is a big issue, with the four bills we receive each month doubling in one month, doubling with no explained or obvious reason.
Eastham	IA systems are required by the board of Health in environmentally sensitive areas.
Edgartown (Consolidated)	Wastewater: Energy upgrades including photovoltaic array. Resulted in 18% decrease in usage and about $45,000 per year savings. Carbon emissions reduced 18,600 lbs/years.
Egremont	Installed solar panels 2015
Falmouth	Town is constructing new water treatment plant to address TTHM issues.
Fitchburg	Wastewater - chemically enhanced primary treatment at WWTF to enhance treatment performance in wet-weather events.
Foxborough	SCADA control of system - reduced overtime costs. Hydraulic System Model - greatly improved flushing program, reduced or eliminated black water complaints, identified low fire pressure areas and created upsizing needs plan. Remote Meter Reading (partial, not fully completed) - reduced meter reading costs, improved ability to assess accurate rates.
Gloucester	West Gloucester Water Treatment Plant filter backwash recycling that saves 30-80 million gallons per year. This volume is also not discharged to the POTW.
Greenfield	Pipe lining, and we are in the process of installing a fixed network meter system
Hanover	No - but we would be interested in learning more.
Harwich	Muddy Creek attenuation project- opening up & removing the existing muddy creek culvert to allow the freshwater turnover from 3 days to multiple times a day. Also removing catch basins and installing porous pavement in critical areas near the harbors., Removal of catch basins in the groundwater and replace w porous pavement @ harbors. Also in the process of completing the Muddy Creek Attenuation Project which is designed to increase water turnover from 3 days to 3 hours.
Haverhill	We have not identified any alternatives that would apply to our systems.
Holyoke	City's contract operator implemented more efficient aeration and sludge dewatering for cost savings. Contractor employs chemicals to enhance treatment and maximize capacity of treatment plant during high stormwater flows.
Lakeville	N/A
Lawrence	Automated Meter Reading System (+$1.1M); Energy efficient pumps and VFDs (+$5,000); Photovoltaic array (+$120,000)

Leominster	Clarification and air scour systems were installed for THM and HAA5 [haloacetic acids] compliance for drinking water compliance. A treatment plant went on line in 2011 for surface water treatment. An Actiflo phosphorous treatment system and backup power were installed in 2012 at a cost of $15,000,000. Ongoing wastewater treatment is being finished at a cost of $17.5 million. for enhanced performance and energy reduction.
Lexington	We are involving interns to expand our storm water sampling program
Littleton	Award-winning source water protection program to minimize the potential for groundwater contamination and maximize groundwater recharge within the aquifer system that our town relies on for drinking water.
Lowell	Turbo aeration blowers for cost savings; solar walls and pv panels for cost savings; use of green roofs and pervious pavement for ground water recharge
Mashpee	Mashpee has invested heavily in large scale aquaculture as a primary nitrogen management strategy as a means of eliminating the need for excessive infrastructure development, to lower costs and to restore an historic resource.
Medford	Medford is investing in WaterSmart, a customer-service engagement program that will help our water customers manage their daily usage. The intent is to find and correct high consumption from such problems like toilet leaks.
New Bedford	Solar panel installations: 446,200; CMMS System; Wastewater SLRAT, Digitized and put into GIS, Distribution system mapping; CCTV; CMMS
North Andover	We have done an ESCO process to save energy at the Water Treatment Plant.
Norwood	Wastewater: Norwood is now lining old clay sewer mains and individual building services along those mains. The ability to line individual small-diameter sewer services is technology that was not in wide use until five years ago.
Provincetown	Manganese removal date
Reading	Installing a mixer in the water tower; developed a plan to clean/line all cast iron mains. Development of GIS infrastructure of all utilities.
Revere	City is in process of installing new, highly efficient and accurate water meters and is schedule to install system leak detection (Permaloggers) in the next 12 months
Salisbury	Leak detection (water and waste water), less water is being used or treated. Converted telemetry to SCADA making it easier to more actively monitor the systems.
Shrewsbury	Considering biological removal of manganese versus conventional green sand filtration.
Somerville	Hydraulic Model that calculates pressure flow and water age (chlorine residual)
South Hadley	Implemented SCADA in our system to identify leaks quicker resulting in quicker response
Springfield	Water Coagulation Study, Green Infrastructure Groundwater Recharge
Stockbridge	Installed open loop (with recycle) water source heat pumps in drinking water treatment plant to replace electric heat.
Waltham	Installation of new meters for commercial accounts with an automated reading system. Enhanced ability to measure all water consumption. Enhancements to customer billing and notifications.
Wareham	Upgraded the entire pumping system to SCADA (Supervisory Control And Data Acquisition) controls. Add in revenue streams to add in rate stability. We have added a grease process to extract oil to be sold on the open market, reduce solids to

	be carted from the facility to reduce dewatering expenses with an eye towards digestion to generate fuel for vehicles and heat within plant.
Wenham	Installed variable frequency drives on our wells to reduce energy consumption
West Spfld	New Water Transmission Main VFD pumps..
Worcester	USE OF TABLETS TO FIELD RECORD CATCH BASIN CLEANING AND STORMWATER SAMPLING, SOLAR PV AT WATER TREATMENT PLANT

27. Has your municipality developed any formal climate change plans or policies that affect water infrastructure systems?
Yes # 9 (6%) No/No Answer # 137 (94%)

27b. If yes, please describe:

Barnstable	Resilient methods to harden infrastructure.
Beverly	The City is pursuing a vulnerability assessment study though a CZM grant opportunity.
Cambridge	Climate Change Vulnerability Assessment FY17 Water budget includes vulnerability and mitigation plan for CWD treatment facilities
Chicopee	n/a
Concord	Select Board Municipal Sustainability Principles
Edgartown (Consolidated)	The Board of Water Commissioners has voted to implement Voluntary Water Conservation Measures. In doing so, it is not triggered by climate, but by education and conservation minded customers. Wastewater: Hazard mitigation grant program upgrade of primary pump station in the tidal flood zone.
Falmouth	Planning Department has CAP.
Lakeville	N/A
Lawrence	In progress
New Bedford	Critical Asset Assessments
Salisbury	The Great Marsh Resiliency Municipal Task Force (Ipswich Watershed)- formed a task force with surrounding communities to discuss flood resiliency and solutions.
Scituate	We have been studying climate and ocean level rising and the effect on infrastructure.
Wareham	With a CZM Grant, we have developed a mitigation plan to address climate change and sea level change

28a. Is your municipality a member of any regional (nonstate, nonfederal) entity or agency that collaborates on water infrastructure planning and/or management?
Yes # 53 (36%) No # 70 (47%) N/A 25 (17%)

28b. If yes, does the entity/agency have spending/purchasing authority? What is the name of the entity?

Regional entities/agencies included:
Cape Cod Commission, Salem Beverly Water Supply Board, MWRA, Pleasant Bay Alliance, Pioneer Valley Planning Commission, City of North Adams and the Briggsville Water District, Martha's Vineyard

Commission, Central Massachusetts Regional Stormwater Coalition, Merrimack Valley Planning Commission, Central Plymouth County Water District, Metropolitan Area Planning Council (MAPC), Old Colony Planning Council (OCPC), Barnstable County Water Utility Association, Southeastern Massachusetts Stormwater Collaborative, Merrimack Valley Planning Commission

Professional Associations included:
American Water Works Association, Mass Water Works Association, New England Water Works Association, New England Water Environment Association, New England Public Works Association, Mass Coalition for Water Stewardship, Plymouth County Water Works Association, Mass Rural Water Association,

29a. Has your municipality received water infrastructure *bond support or loans* from the Commonwealth of Massachusetts in the 10year period from 2004 to 2014?
Yes # 62 (42%) No # 60 (41%) N/A 24 (16%)
29b. If yes, please describe the amount, purpose and source of the funding [responding communities only]:

Abington	1700000 SRF
Acton	13,500,000 for construction of a water filtration plant from the MA Clean Water Trust through the MA SRF program.
Amesbury	SRF funding for WTP upgrade and distribution improvements.
Arlington	MWRA zero interest loans in the amount of 800000-100000 per year for the last 5-8 years
Barnstable	1950000 Nutrient Management Planning Project SRF 7205442 Hyannis WPCF Improvement Project SRF 8850000 Route 132 Sewer Force Main Project SRF 3494137 Hyannis Water Improvement Projects SRF 9780000 Sewer Mains & Pump Stations Projects SRF 5828000 Wind Turbine, PV & Energy Eff. Projects SRF 621000 New Hyannis Water Tank(s) Project SRF 1050000 Hyannis Water Improvement Projects SRF 3127185 Hyannis Water Improvement Projects SRF 1556339 Hyannis Water Improvement Projects SRF Total = 43462103@
Bellingham	Water Filtration Plant (Greensand) iron and manganese removal 13.1 Million DWSRF loan
Belmont	MPAT. approx. $15,000,000
Boston	MWRA Water Infrastructure Loans
Brockton	Several million for water and sewer. Loans are utilized annually
Cambridge	$40M from State Revolving Fund (SRF) for sewer separation and stormwater management projects and >$5M from MWRA Infiltration and Inflow (I/I) removal funds.
Charlton	sewer $1,800,000. loans water $8,300,000 loans
Chatham	2012 SRF Loan for Water Treatment Plant
Chelsea	MWRA Local Pipeline Assistant Program and MWRA Inflow and Infiltration Removal Grant/Loan Program
Chicopee	MWRA has two loans: 1) $1,150,000.00 Water Main infrastructure improvement 2) $935,000 Water Main infrastructure improvements; Mass Clean Water Trust has 10

	permanent loans totaling $101,277,000 for purposes of unfunded mandate of the Sewer Separation Project.
Concord	SRF Loan - 13 Million wastewater treatment plant upgrade
Danvers	The town received an SRF Loan for the Rehabilitation of the Danvers Water Treatment Plant in the amount of $20,378,277.
Deerfield	875,000 from Mass Water Pollution Abatement Trust or whatever they call themselves now, back in 2009 to do infrastructure improvements such as a new 400,000 gallon Storage Tank, pipeline improvements, and an improved interconnection with a neighboring town. And although the loan was very helpful, the 2% was way offset by the high administrative costs.
Duxbury	2805500 was borrowed through SRF to build an elevated water storage tank and lay water main to create a high pressure zone.
East Longmeadow	Estimated $800,000, stormwater master planning and mapping
Eastham	authorized $28 million SRF for water project for FY16
Everett	State Revolving Funds, 10000000,
Fall River	Drinking Water SRF loans for replacement of old cast iron water mains and treatment facility improvements totaling over $40,000,000. Wastewater CSO Abatement Project SRF loans totaling over $150,000,000.
Falmouth	SRF funding in 2014 for Water Treatment Plant - 18600000 also SRF funding for wastewater improvements SRF 3928 @ 32800000
Fitchburg	Wastewater - CWSRF loans.
Framingham	The Town of Framingham participates in several funding assistance programs provided by the Commonwealth. Our funds distributed for the MWRA's Local Water System Assistance Program through Feb 2016 are $3,678,500 and $5,874,650 for the I/I Local Financial Assistance Program. We plan to request available funding for appropriated projects: Union Ave./Evergreen Area water and wastewater improvements and the Worcester Road Pump Station project. The Town has also participated in the SRF program: over the last 10 years Framingham has borrowed over $65M to fund eligible projects.
Gardner	Snake Pond Well improvements
Georgetown	Georgetown Water Department bonded (20-year term) the Commissioners Well Transmission Loop pipeline project in 2007 for $700,000.
Gloucester	WPCF: $20,000,000 PWS:$30,000,000 Dams:$1,200,000 CSO: $30,000,000
Groton	$1,500,000 loan to construct well and treatment plant
Hanover	No - but we intend to apply for MWPAT funds.
Haverhill	State revolving fund loans for wastewater, drinking water and landfill closure
Holyoke	Mass Water Pollution Abatement Trust -17.9 million - 1.037 million
Ipswich	$2,640,413 for 3 water main replacement projects funded through SRF and municipal general obligation bonds
Kingston	2009 CWSRF Loan Stormwater Management Plan ($322,750), Community Septic Management, Drinking Water
Lakeville	N/A
Lawrence	Various SRF loans totaling over $60M

Leominster	SRF loans - $19.2 million for water treatment plant construction and rehabilitation. $30.5 million for wastewater treatment plant upgrades.
Lexington	loans received by the MWRA
Lowell	$75,000,000 in SRF loans - sewer separation and treatment plan upgrades
Malden	$20,000,000.00 SRF funds for water improvements and $4,000,000.00 SRF funds for sewer improvements.
Marlborough	$37,000,000 SRF Westerly Wastewater Treatment Plant, $57,000,000 SRF Easterly Wastewater Treatment Plant, $6,000,000 Water Treatment Plant. All within last 6 years.
Mashpee	Roughly $1,000,000 in SRF planning loan
Medford	$956000 for water main and service replacement, funded by MWRA 0% loan. $2,367475 for water main and service replacement, funded by MWRA 0% loan.
Methuen	$27,518,551.00 TOTAL 11/6/2005 - $5,786,500.00 WATER TANK, 12/18/2007 - $18,550,000.00 - WATER TREATMENT PLANT, 12/18/2007 - $200,000.00 - STORM WATER, 12/18/2007 - $750,000.00 - WATER TANK , 3/8/2009 - $1,117,204.00 - SEWER REHABILITATION, 7/8/2010 - $12,243.00 - SEWER REHABILITATION, 7/8/2010 - $650,000.00 - SEWER REHABILITATION, 6/3/2012 - $452,604.00 - SEWER REHABILITATION
Needham	SRF, MWRA, MWPAT
New Bedford	SRFS LOANS: $2,385,454.93 DWSRF0923- QTP Improvements;; $6,000,000 DWSRF1405-TRANSMISSION MAIN; $600,000 CWSRF0428 CSO Control Plan; $6,628,741 CWSRF0912-Grit Removal; $10,409,184 CWSRF0912A- Grit Removal; $2,095,000 CWSRF1304 Admin Order; $8,063,124 CWSRF1419 Coggeshall Street
North Andover	Yes, approximately $5M to construct 2 water storage tanks about 8 to 10 years ago.
North Reading	$500,000 SRF loan to develop Stormwater Master Plan
Norwood	Wastewater: 10-year loans for Sewer lining projects - from the Mass. Clean Water Trust. We have received three-plus loans of approx. $1.2 to $1.8 Million each. Award for $2.7 million pending.
Palmer	SRF funding for the Phase 4 CSO Separation Project-5,060,000 and for sewer replacement project in 2014-6,090,000
Pittsfield	ARRA
Quincy	$9,679,459 MWRA Local Water System Assistance Program
Revere	Drinking Water State Revolving Funds utilized for the new water meter program and leak detection installations
Rockland	800000 SRF
Salisbury	Water Tank at 91 North End Blvd, SRF Funding in the amount of $3 million.
Saugus	SRF
Scituate	Received MWPAT (CWT) loans for sewer projects in that period but not drinking water. Sewer projects for that period were for expansion of system - $5,783,959.
Somerville	Unsure
South Hadley	We received 1.1 million for a treatment plant upgrade from the Water abatement trust
Spencer	see your records, mine are in storage

Springfield	SRF for water and sewer projects $142,733,169
Stockbridge	2010 SRF water system mains and new water tank $3.5M. 2015 SRF $1.8M for water system mains and new water storage tank.
Sturbridge	SRF Funding & small grants for water and sewer projects
Waltham	$1,716,518 - water mains (various streets) MWRA 0% interest loan / $836,450 - water mains (various streets) MWRA 0% interest loan / $1,320,000 - water meters (commercial) MWRA 0% interest loan / $478,370 - water mains (various streets) MWRA 0% interest loan
Wareham	SRF funding for $20,000,000 for sewer extensions and 23,000,000 for plant upgrades
West Springfield	10000000 Water Transmission Main.
Weston	MWRA loans for upgrades on existing water booster pump station and upgrades at water tank.
Worcester	SRF FOR I/I REMOVAL PROJECTS APPROXIMATELY $5 MILLION

30a. Has your municipality received water infrastructure grants from the U.S. Environmental Protection Agency or Commonwealth of Massachusetts in the past 10 years?
Yes # 62 (42%) No # 97 (41%) N/A 22 (16%)

30b. If yes, please describe the amount, purpose and source of the funding [responding communities only]:

Amesbury	ARRA funding for WTP upgrade and distribution improvement.
Barnstable	EPA Region 1, Southeast New England Program (SNEP) - pilot-scale Permeable Reactive Barriers (PRBs) for nitrogen reduction in groundwater on Cape Cod. - EPA Region 1, Southeast New England Coastal Watershed Restoration Program, the EPA Stormwater BMP Project Opportunity for South Coastal Cape Cod Communities.
Cambridge	Hydro feasibility study Solar feasibility study DOER grant funding for solar and VFD project $200,000 DOER grant funding for resiliency project $900,000
Chelmsford	The Chelmsford Water District received money through the ARRA process for a 0.5 MW ground mount solar array that ties directly into the Crooked Spring WTP. The costs I believe were roughly around $2 million and the agreement was 100% principal forgiveness.
Chelsea	MWRA Infiltration and Inflow Grant/Loan Program
Chicopee	Environmental Justice Grant $4,249,920 the purpose Sewer Separation unfunded mandates; Mass DOER Grant $99K for purposes of Waste Water Treatment Plant upgrade; Mass Works Grant $2.6M for purposes of infrastructure improvements to support private development
Edgartown (Consolidated)	Wastewater: $122,900- Mass DOER/ARRA Energy Efficiency and Conservation Block Grant - 2010. $58,000 - DOER Energy Audit Program (EAP) Heating Grant - 2009.
Everett	MWRA - Infiltration and Inflow Financial Assistance Program MWRA - Pipeline Assistance Program 10,000,000
Fall River	Asset Management Grants from MA DEP.

Gloucester	ARRA $400,000 PWS EOEA dams $320,000
Harwich	A grant was provided to the Town of Harwich & Town of Orleans for leak detection equipment., Water Dept received a grant from the state for the purchase of leak detection equipment for 9,000. The town has received grants from various agencies, USDOI, NOAA, NCWC
Holyoke	Congressional earmarks through EPA for CSO abatement. 2005 42,000, 2006 175,000, 2008 385,934, 2009 571,700, 2010 151,063
Kingston	s. 319 (2001 Gray's Beach Restoration $300K & 2005 KIS SW Retrofits $152,780(NSRWA)), s. 604b (2003 DKP Estuaries Monitoring $85,240 & 2012 Town Center Water Quality Assessment $48,620), CZM CPR SW Retrofits (2013 $124,495, 2014 $116,627, 2015 $118,262 & 2016, $125,000) , Mass Bays Research & Planning (2012 Kingston Bay & Jones River Estuary SW Assessment Project)
Lakeville	N/A
Lowell	$6.6 million in ARRA funding in 2009
Malden	$1,000,000.00 STAG funds for water improvements
New Bedford	American Resource Recovery Act (ARRA) for solar Panels, Water Treatment Plant building improvement. $2,950,000; Water Loss Prevention Grant-$43,000 for leak detection and conservation kits 2006 from MassDEP; Drinking Water Supply Protection grant- $470,000
North Attleborough	Water conservation grants through DEP
Palmer	CSO Project- 730,000 for principal forgiveness and 139,000 for principal forgiveness for the sewer replacement project in 2014.
Paxton	$1.37 State Revolving Fund Grant of 2% interest for replacing a 50 year old water tank with an elevated tank
Pittsfield	Clean Water Projects: ARRA Funding 1. Solar Photovoltaic (PV) Project at WWTP, Project Cost: $7,969,216 100% principal forgiveness, Renewable energy project 2. Combined Heat & Power System at WWTP Project Cost: $2,508,450 100% principal forgiveness, Renewable energy project 3. Aeration System Upgrade Project at WWTP Project Cost: $2,976,956 100% principal forgiveness, Energy conservation project 4. Bar Rack Replacement Project at WWTP, Project Cost: $2,380,400 2% SRF loan on balance, 11.72% principal forgiveness: $278,983 Replaces 1960â€™s vintage equipment Drinking Water Projects: 1. Coltsville Flow Control Station Replacement Project, Project Cost: $3,542,000 2% SRF loan on balance, 20.18% principal forgiveness: $714,746 Water distribution system project 2. Water and Sewer System SCADA Project, Project Cost: $1,334,450, 2% SRF loan on balance, 20.18% principal forgiveness: $189,258 Replaces existing SCADA system and expands it to Sewer.
Salisbury	MassWorks Grant, replaced 3,000 linear feet of water mains, $1,708,789
Saugus	SRF
Southwick	2016 - SWMI Grant for WMA Permit Renewal - $113,189
Springfield	$6,228,474 in debt forgiveness
Stockbridge	water source heat pumps in water treatment plant, $39K
Topsfield	We received a grant from the DCR for $50,000 to study whether or not monthly billing encouraged water conservation.

Wareham	Water Conservation Grant in 2009 to complete a leak detection survey
Worcester	DEP WATER SUPPLY PROTECTION GRANTS-LAND ACQUISITION $2.6 MILLION, DRINKING WATER SECURITY GRANT $750,000, ARRA VIA SRF FOR SOLAR PV AT WATER FILTRATION PLANT $1.2 MILLION

31a. Has your municipality reviewed 2014 changes to the state's water infrastructure financing programs – changes that may include forgiven or reduced interest on loans; MWRA entry fee match and/or a local property tax water infrastructure surcharge (similar to the Community Preservation Fund model)?

Yes # 54 (37%) No/No Answer # 92(63%)

31b. If yes, do you believe these changes will increase the likelihood that your community will apply for state funding through the Massachusetts Clean Water Trust (formerly the Water Pollution Abatement Trust)?

Yes # 25 (17%) No # 14 (10%) DK/NA # 117 (73%)

32. On a scale of 1 through 5, where 1 is "very difficult" and 5 is "very easy," how would your municipality rate its interactions since 2010 with the U.S. Environmental Protection Agency?

Very Difficult 1- 15 (10%) 2-18 (12%) 3- 42 (29%) 4- 19 (13%) 5- 8 (6%) Very Easy N/A - 44 (30%)

33. On a scale of 1 through 5, where 1 is "very difficult" and 5 is "very easy," how would your municipality rate its interactions since 2010 with the Massachusetts Department of Environmental Protection?

Very Difficult 1- 4 (4%) 2-15 (10%) 3- 44 (30%) 4- 45 (30%) 5- 16 (11%) Very Easy N/A - 22 (15%)

34. Massachusetts is one of four states in the nation in which the U.S. Environmental Protection Agency (EPA) issues MS4 permits directly. Would your municipality prefer to have the Massachusetts Department of Environmental Protection (DEP) issue these permits or have the US EPA retain this role?

Prefer US EPA # 9 (6%) Prefer MassDEP # 75 (51%) DK/NA # 62 (43%)