



MS4 PROGRAM COST SAVINGS THROUGH COMMUNITY PARTNERSHIPS

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ARCADIS U.S., INC.

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Agenda

Introduction to the City

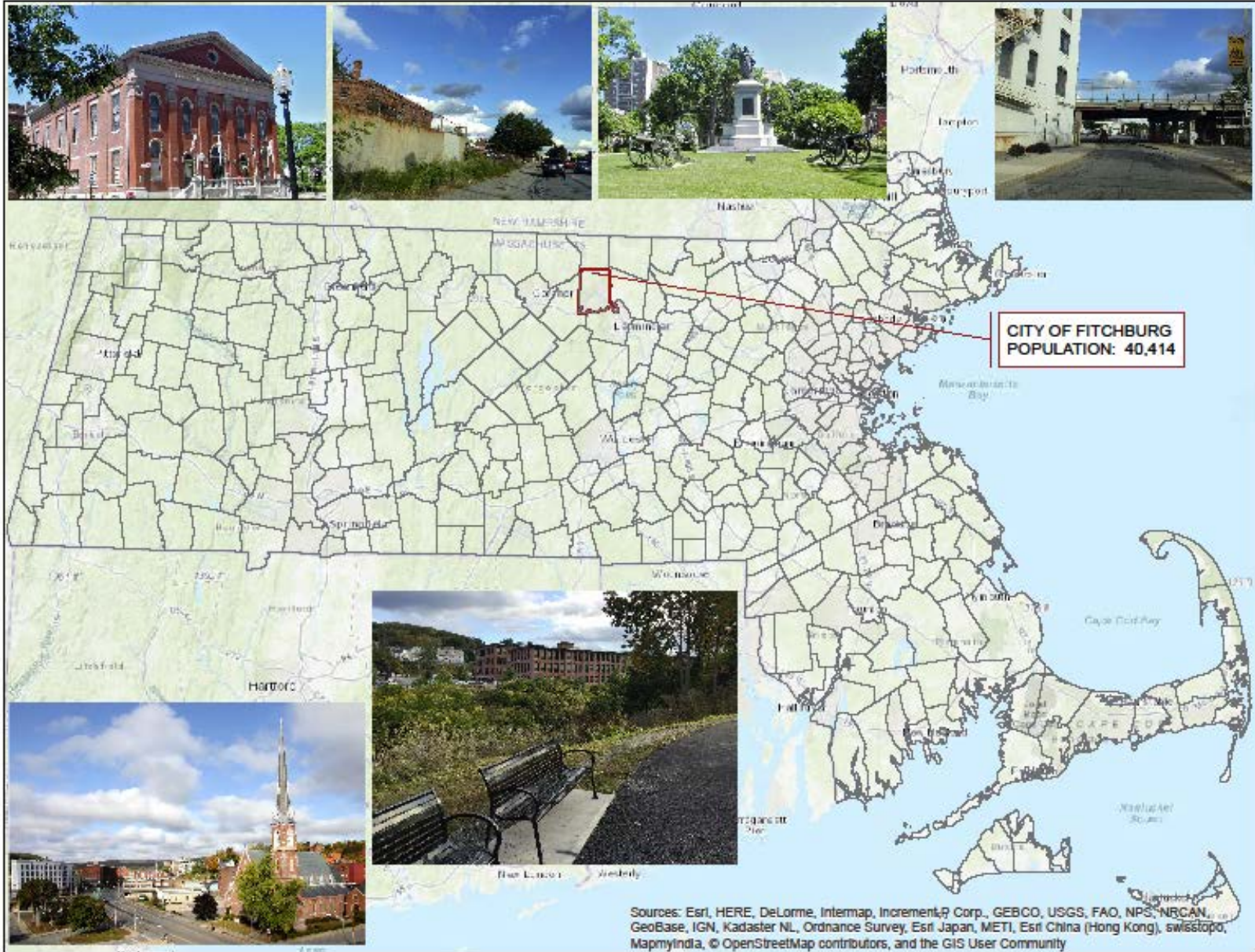
Program Cost Components

Partnerships & Savings Identified

Overall Cost of the Program

Funding Sources

City of Fitchburg





Municipal Separate Storm Sewer System (MS4)



MS4 & Ongoing Combined Sewer Separation Projects



421,500 LF of Pipe



1,590 Manholes



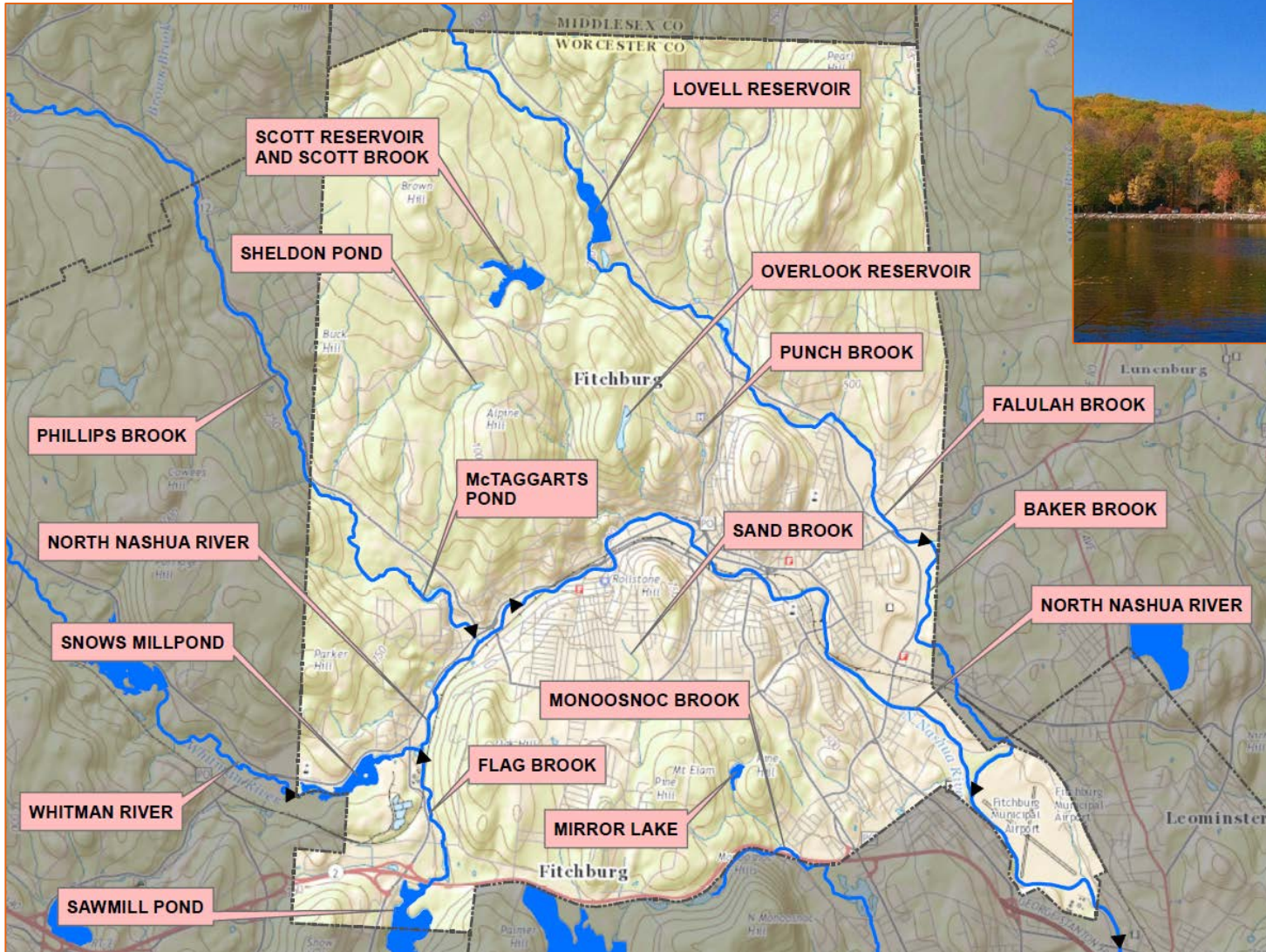
7,020 Catch Basins



450 Outfalls



City Receiving Waters





City Receiving Waters & Pollutants

Receiving Water	Watershed	Impaired	Impairment
North Nashua River	Nashua	YES	Escherichia coli, Ambient Bioassays -- Chronic Aquatic Toxicity, Aquatic Macroinvertebrate Bioassessments
Whitman River	Nashua	NO (Cat 2)	-
Flag Brook	Nashua	NO (Cat 2)	-
Philips Brook	Nashua	NO (Cat 2)	-
Sand Brook	Nashua		
Punch Brook	Nashua	NO (Cat 3)	-
FALULAH BROOK	Nashua	NO (Cat 3)	-
Baker Brook	Nashua	NO (Cat 3)	-
Fitchburg Reservoir	Nashua	NO (Cat 3)	-
Lovell Reservoir	Nashua	NO (Cat 3)	-
Mirror Lake	Nashua	NO (Cat 3)	-
Scott Reservoir	Nashua	NO (Cat 3)	-
Snows Millpond	Nashua	NO (Cat 3)	-
Sawmill Pond	Nashua	YES 4c	Non-Native Aquatic Plants

Draft Phosphorus TMDL for Nashua River



Program Cost Components

Costs include general administrative/staff, capital, and operation and maintenance activities, in addition to activities necessary to comply with the MS4 General Permit

Administrative

- Reporting & Permit Compliance
- Billing
- Management
- Equipment and Hardware
- Mapping
- Lab Costs
- Recordkeeping
- Written Procedures/Programs
- Establishing Requirements
- System Prioritizing/Ranking
- Public Education and Outreach Materials
- Public Stormwater Meeting
- Training
- Legal

Capital

- Stormwater System Infrastructure Rehabilitation, Replacement, and Improvements
- Eliminate Causes of Sanitary Sewer Overflows
- Remove Illicit Connections and Discharges
- Education and Outreach Materials
- Debt Service
- Equipment

O&M

- System Inventory, Mapping, and Assessment
- Stormwater System Maintenance, Cleaning, and Inspection
- Street Sweeping & Parking Lot Sweeping
- Closed-Circuit Television Inspection
- BMP Identification, Maintenance, and Inspection
- Pollution Prevention at Municipal Operations (Good Housekeeping)
- Outfall Inspection and Sampling
- Intermunicipal Connection Inspection and Sampling
- IDDE Program
- Landscaping
- Equipment



Community Partnerships





Central Massachusetts Regional Stormwater Coalition

Partnership

- Fitchburg Joined in 2017
- 32 member communities
- \$5,000 per community per year

**Potential Savings
Identified:**

\$125,000

Shared Goals & Resources:

- Workshops: Notice of Intent (NOI), Stormwater Management Plan (SWMP), funding options
- Guided technical BMP/LID/GI tour
- Annual Report, IDDE, SWPP, O&M Plan, and SOP templates
- Resource and guidance documents
- Equipment: GPS units, sampling kits, etc.



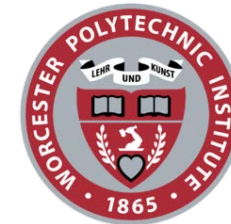
Permit Requirements: NOI, SWMP, IDDE Monitoring, Phosphorus Control



Local Colleges / Universities

- Partnership**
 - Leveraging existing relationships
 - Reaching out to other departments
- Interns**
 - Mapping
 - Water quality sampling
 - Data collection
- Student Projects**
 - WPI: STEM guide booklet on Green Infrastructure (GI) for use in Fitchburg Public Schools

Potential Savings Identified:
\$66,000



Permit Requirements: Public Education, IDDE Mapping and Monitoring, New Development/Redevelopment GI



WPI Massachusetts Water Resource Outreach Center

Goal

- Promote education on stormwater runoff and its impacts on the City's natural resources and infrastructure
- Promote education on Green Infrastructure

Deliverables

- A STEM multi-media Green Infrastructure Guide
- Green infrastructure BMPs and opportunities to implement GI
- Typical design, construction, O&M, and associated costs
- Engineering assessments of property runoff reduction and pollutant loading reduction from the implemented GI BMPs
- Geared towards Grades 5-7

Collaborators

- Fitchburg Public Schools
- Fitchburg Department of Public Works
- Fitchburg Conservation Commission
- Nashua River Watershed Association
- "Green" non-profit organizations





Montachusett Opportunity Council (MOC) & EPA's Clearwater Revival Grant

- Green Infrastructure Assessment
 - Review of City's code/regulations related to Green Infrastructure (GI)
 - Report
- Green Infrastructure Museum
 - Park renovation project
 - Collaborated with a Landscape Architect for design
 - Permeable pavement, rain gardens, educational signage
- Rain Garden Workshop
 - Montachusett Regional Vocational Technical School parking lot
 - Preliminary Design Report prepared by City Engineering Dept.
 - Educational rain garden presentation by local resident/environmental activist
 - Installation and plantings completed by environmental science classes
 - Excavator, dump truck, laborers, and construction administration provided by City DPW
 - Sign created by school staff

Potential Savings Identified:

\$27,000





MOC Rain Garden Workshop

Before and After



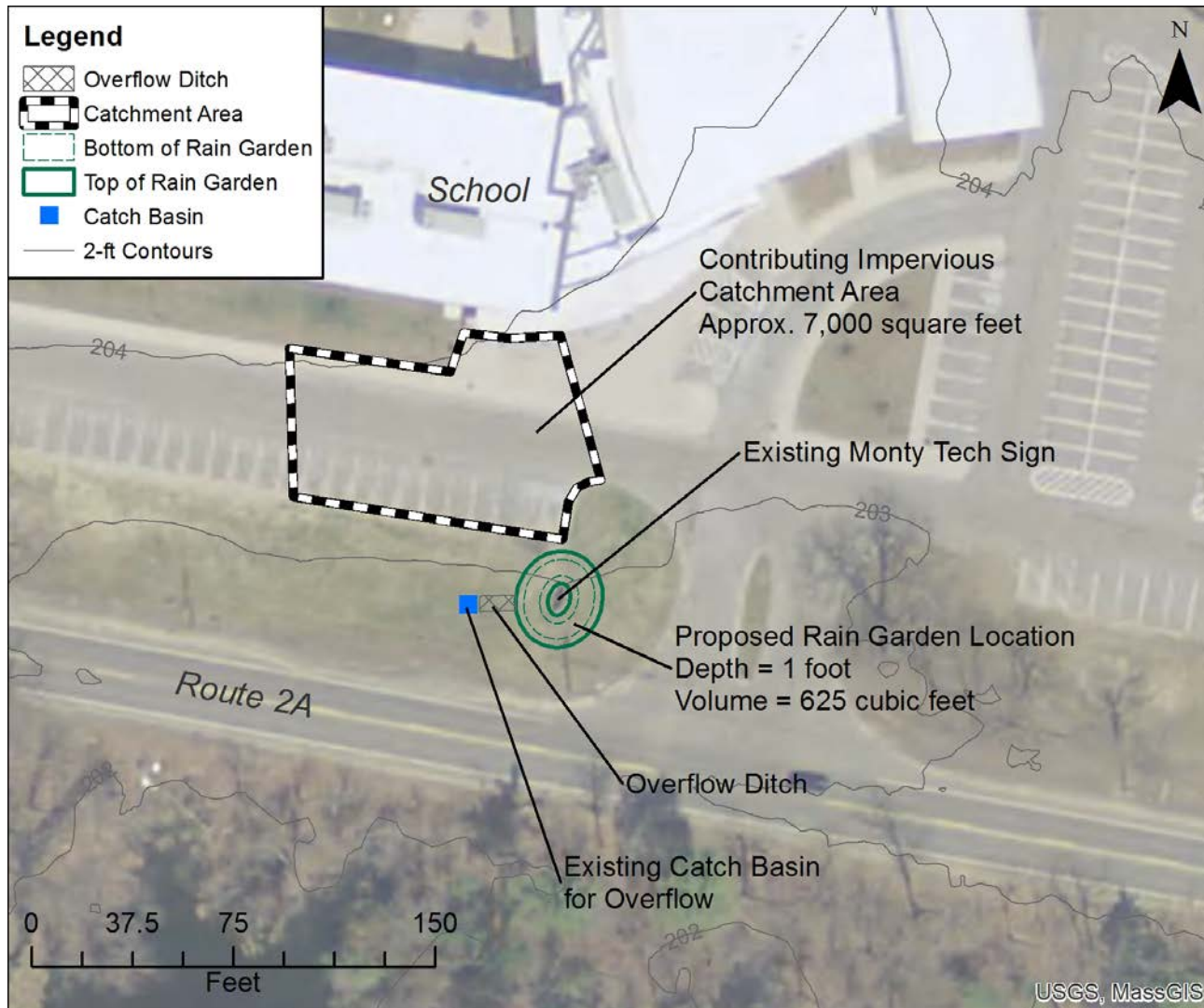
BEFORE



AFTER



MOC Rain Garden Workshop Design





MOC Rain Garden Workshop *Construction Video*





MOC Rain Garden Workshop *Construction Photos*





Nashua River Watershed Association

- Partnership
 - MOC Clearwater Grant partner
 - WPI Collaboration
 - Other City Projects/Departments
- Current
 - Storm drain stenciling (MOC)
 - Green Infrastructure Guide (WPI)
- Future
 - IDDE sampling assistance
 - Public education
 - Public involvement

Potential Savings Identified:
\$60,000



Permit Requirements: Public Education, Public Participation, IDDE



Fitchburg Greenway Committee

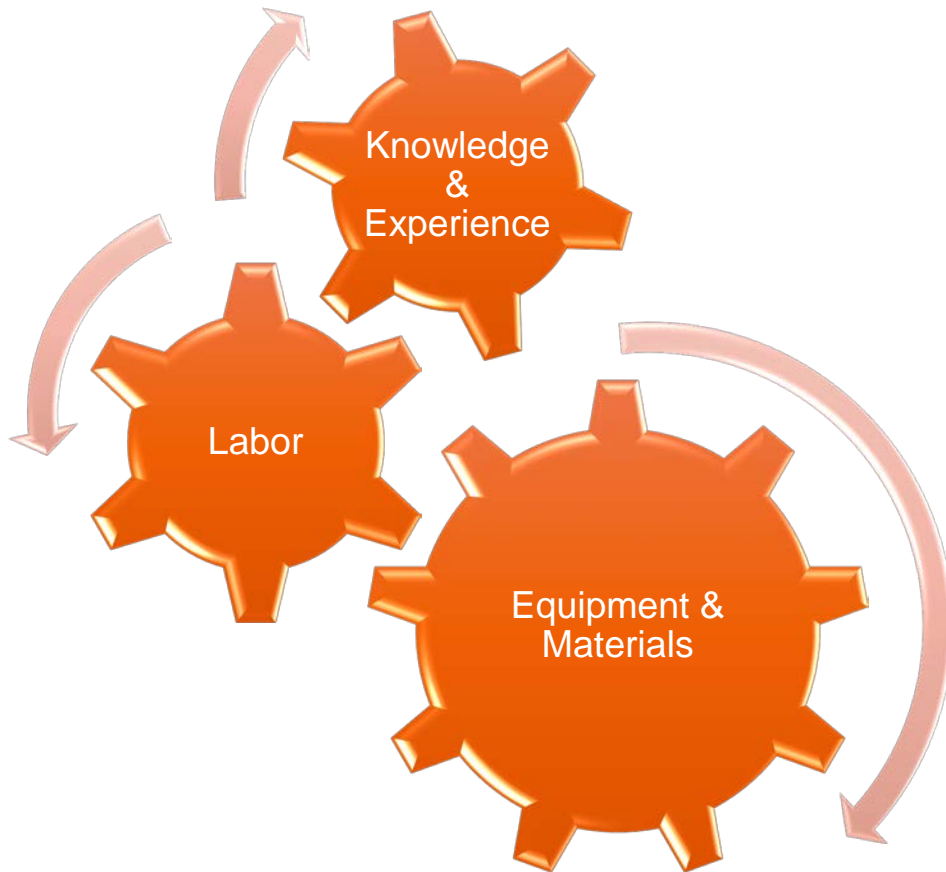
Partnership	<ul style="list-style-type: none">• Active citizens• North County Land Trust• Nashua River Watershed Association• Trustees of Reservations• Various City Departments
Mission	<p>• Advocates “for the protection, preservation, restoration and responsible use of Fitchburg's water resources, open space, natural habitat, riverfront lands, and recreational trails.”</p>
Future	<ul style="list-style-type: none">• Grant partnership opportunities• Public education & outreach• Public involvement



**Permit Requirements: Public Education, Public Participation,
Phosphorus Control & Addressing TMDLs**



Other City Department & Divisions



Streets	Parks & Rec.
Cemeteries	Water
Wastewater	Health
Fire	Police



Annual Cost of MS4 Permit Compliance for Fitchburg

Best Management Practices (BMPs)	Estimated Annual Cost	Anticipated Cost Savings
Public Education and Outreach	\$9,500	\$9,500
Public Involvement and Participation	\$4,700	\$4,700
IDDE Program & Phosphorus Control for Impaired Waters	\$783,000	\$170,000
Construction Site Stormwater Runoff Control	\$26,400	
Stormwater Management in New Development and Redevelopment	\$41,200	\$4,800
Good Housekeeping and Pollution Prevention	\$690,000	\$55,000
NOI and Reporting Requirements	\$81,200	\$34,000
Total	\$1,636,000	\$278,000



Funding Options

City's General Fund



Wastewater Enterprise Fund



Stormwater Utility



Design & Consultancy
for natural and
built assets



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