



Integrating Sewer System Evaluation Surveys and Illicit Discharge Detection and Elimination...

And Helping the Community Understand Why They Matter

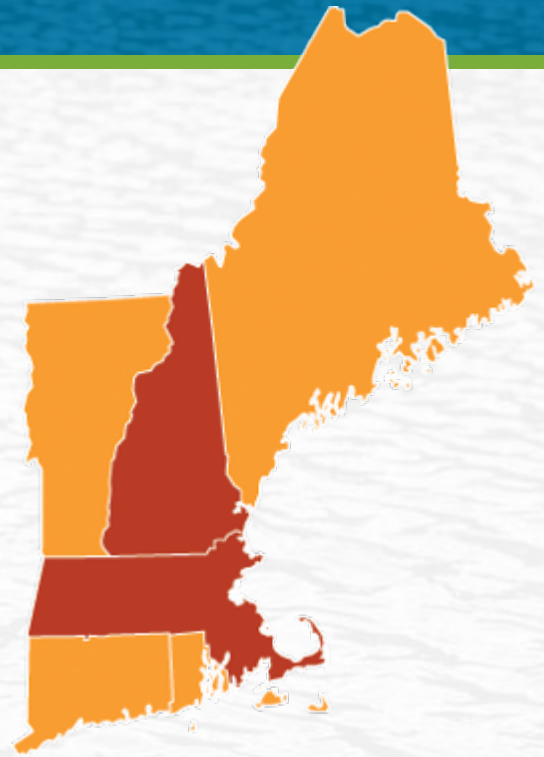
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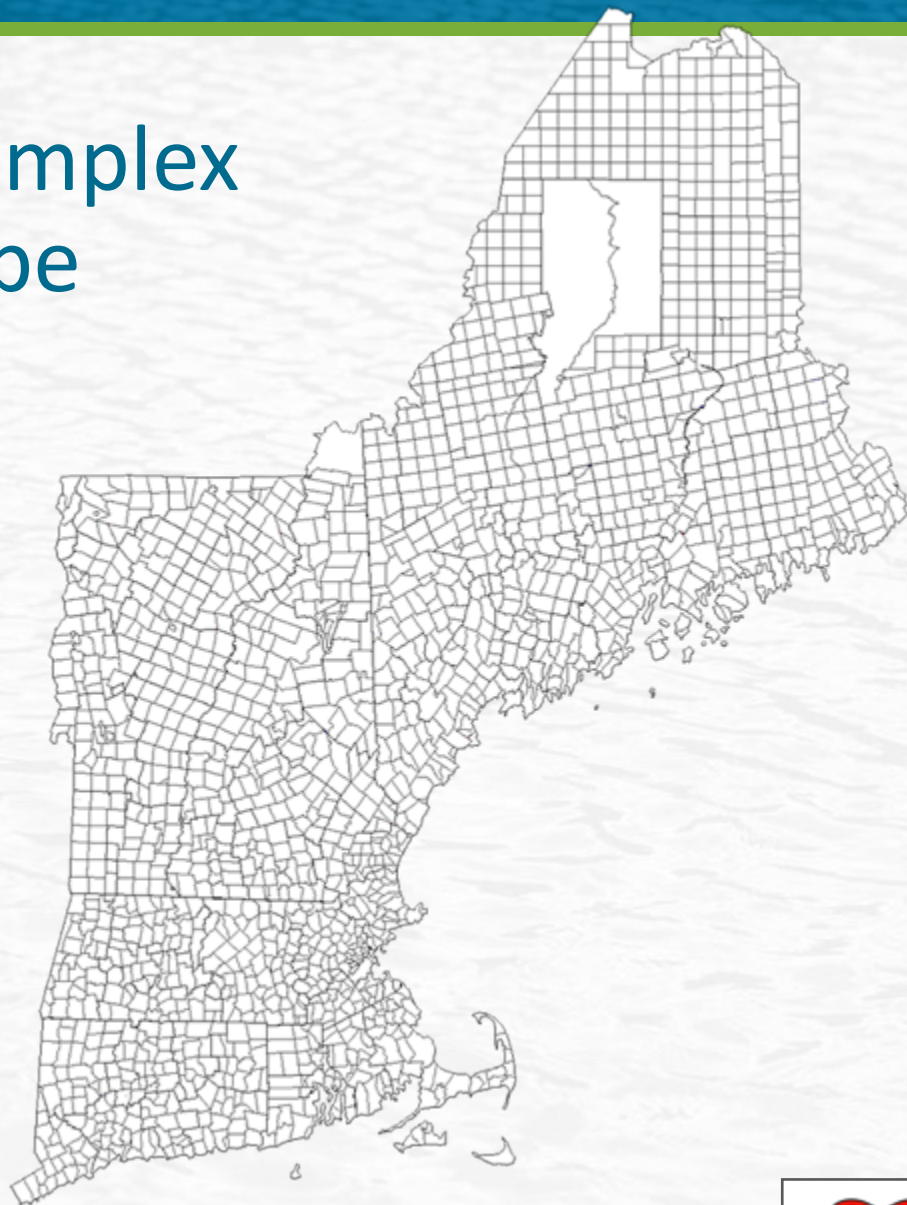
EPA Region 1 Perspective

- EPA Region 1 - Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and 10 Tribal Nations.
- NH and MA are non-delegated states
- Small MS4 Permit Regulated Communities
~ 450 Municipalities
- MA, CT, RI, NH operating on original 2003 Small MS4 permit
– 2017 renewal for MA, CT
- CSO Regulated Communities ~75 permittees
- MA DEP Northeast Region: 84 Communities – 20 Under High Level Enforcement for SSOs



New England: A Complex Municipal Landscape

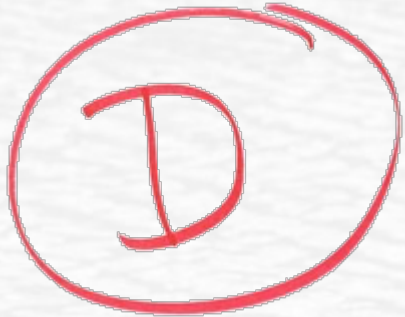
- MA 351 jurisdictions
- RI 39 jurisdictions
- CT 169 jurisdictions
- NH 234 jurisdictions
- VT 246 jurisdictions
- ME 488 jurisdictions



Population of Top 100 New England Cities

- Boston, MA: 645,966
 - Worcester, MA: 182,544
 - Lexington, MA: 31,394
-
- Average with Boston included: 66,388
 - **Total New England Population: 14,444,865**





AMERICAS WASTEWATER AND STORMWATER INFRASTRUCTURE GRADE

Our nation's aging wastewater infrastructure is aging and at risk.

- **\$298 billion** What we need to invest over the next twenty years to keep our wastewater and stormwater drainage systems functioning. This is twice what we currently invest.
- **Sewer pipes represent the largest costs.** Wastewater treatment facilities only represent 20%.
- **800,000 miles** of public sewer pipes in the U.S.
- **\$100 - \$200 per linear foot for sewer rehab**

Source: American Society of Civil Engineers



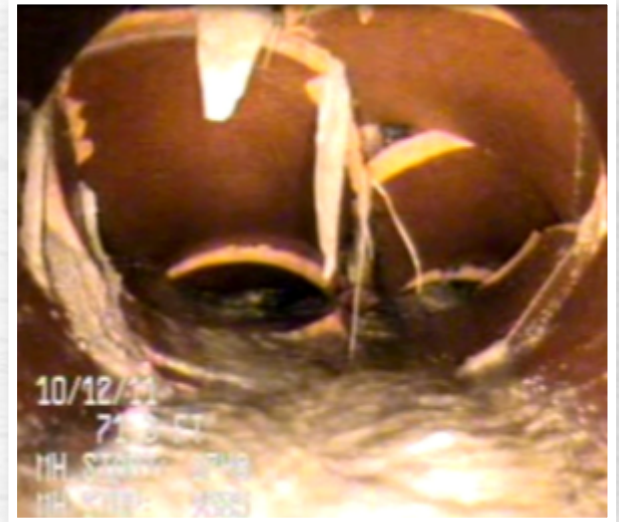
New England's Wastewater (and Stormwater) Infrastructure is Old!

47

average **AGE** of sewer
pipes in the US

92

average **AGE** of sewer
pipes in Quincy, MA



94

Average **AGE** of sewer
pipes in Lawrence, MA

70

miles of Portland, ME sewer pipe
that are greater than 70 years old

Aging Sewer Systems Leak

During the past 30 years in greater Boston, correction of leaking sewers has ensured that over 800,000 gallons per day of untreated wastewater has been removed from stormwater drainage systems in the Boston Harbor, through the correction of aging and incorrectly connected sewer systems.

~ EPA Region 1



What are we required to do?

Municipal Stormwater Compliance

ILLICIT Discharge

Six Minimum Control Measures

Detection and Elimination

Public Education

• Illicit Discharge Detection and Elimination

MS4 = Many Sanitary

• Post-Construction Stormwater Management

Sewers Sleeping S#*t!



What are we required to do?

MS4 Investigations

- Mapping of the full SW system not just outfalls
- Dry & wet weather monitoring of all outfalls
- Intensive IDDE program including investigation of every catchment – key junction manhole sampling
 - Outfall Screening
 - Manhole Inspections
 - CCTV Inspections
 - Dye Testing
 - Building Inspections
- Extensive Data Management and Reporting
- Compliance with TMDLs and Impaired Waters: pollutant specific!



What are we required to do?

Massachusetts Sewer Requirements

“All sewer system authorities shall develop and implement an ongoing plan to control infiltration and inflow (I/I) to the sewer system” 314 CMR 12.04

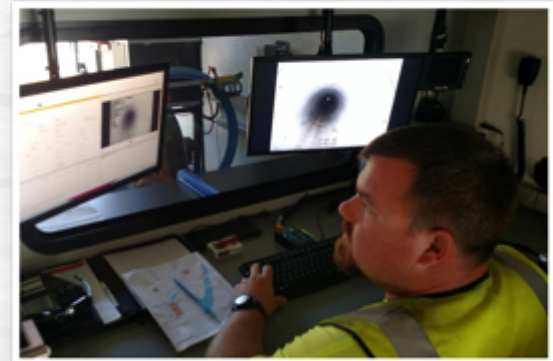
- Authorities shall conduct a phased evaluation of the sewer system to identify structural and O&M deficiencies in the system that may contribute to SSOs and I/I.
- Based on SSES findings, authorities must implement recommendations for system rehabilitation and improvement.
- Authorities must include budget and funding sources for phased system assessment and rehabilitation work.
- Plans must be submitted for MassDEP review and approval.



What are we required to do?

Sanitary Sewer Evaluation Surveys

- Asset Management and System Mapping
- Flow metering
- Manhole Inspections
- CCTV Inspection
- Dye Tracing
- Rainfall Simulations
- Flow Isolation
- Building Inspections
- Smoke Testing
- Data Management

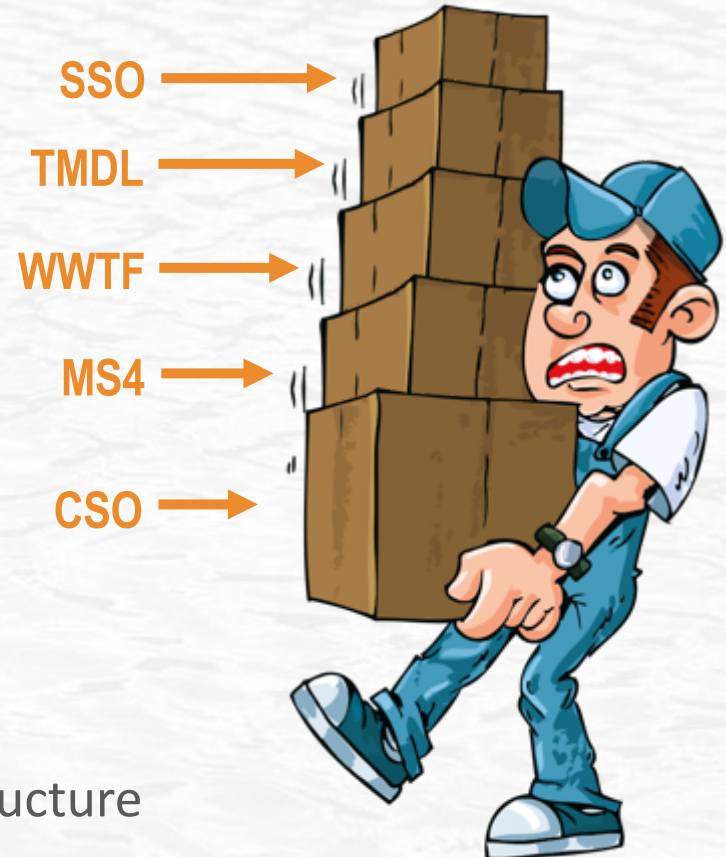


Why should we integrate SSES and IDDE efforts?



Clean Water Challenges

- Clean Water Act
 - Wastewater Treatment
 - Collection System
 - Separate Storm Sewer
 - Combined Sewer
- Impaired Waters/TMDLS
- Residual Designation Authority
- All are adding to requirements and new infrastructure to already burdened municipal utility operations and infrastructure



Comparison Of Investigation Programs

IDDE

- Base Flow Monitoring
- **Manhole Grab Sampling**
- Structural and O&M Condition Assessment
- **Visual Inspection For Illicit Connections**
- Pipe or Illicit Repair

SSES

- Flow Monitoring
- **Manhole Inspections**
- Structural and O&M Condition Assessment
- **Visual Inspection For Inflow and Infiltration Sources**
- Pipe/Manhole Repair

Comparison Of Investigation Prioritization

IDDE

- Outfall Sampling Results
- Sewer System Age and Materials
- SSO Reports
- Stormwater Drain/Sewer Collection Crossings
- Proximity of Discharges Public Water Bodies

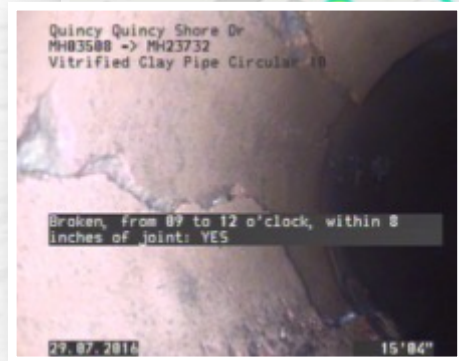
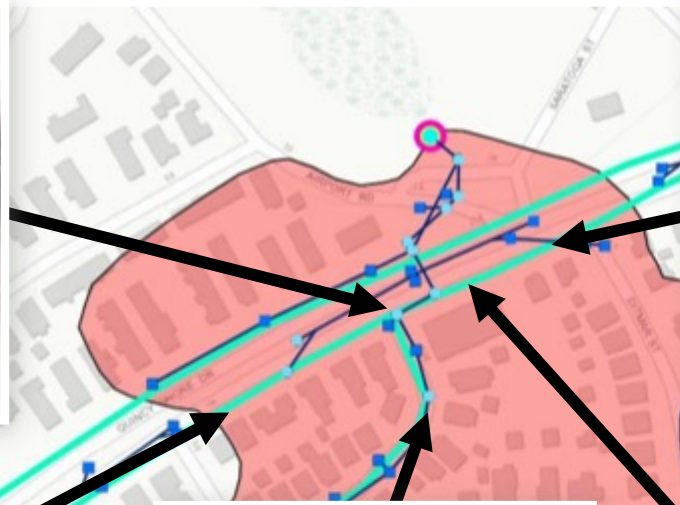
SSES

- Consequence of Failure Analysis
- Sewer System Age and Materials
- SSO Reports
- Known Hydraulic Limitations
- Proximity of Sewer to Tidal/Groundwater Areas

Integrated Sewer and Stormwater Investigations

- Enhanced Planning
- Improved Prioritization
- Efficient Use of Technology
- Compelling Public Outreach?

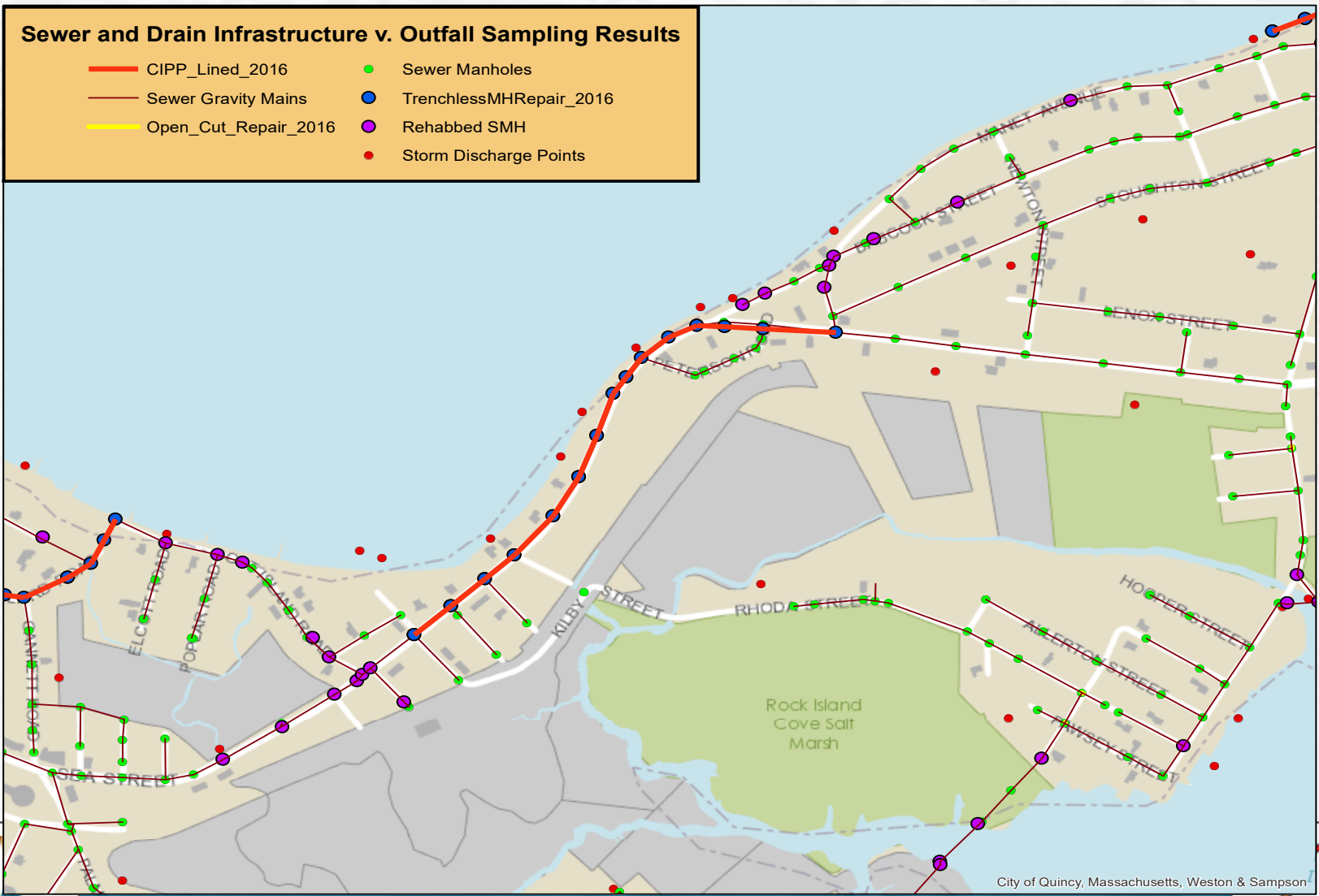
- Understanding System Flows
- **Analytical Sampling**
- Manhole Inspection
- **Pipeline Inspection**
- Targeted Repairs



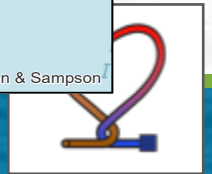
Legend

- Priority Catchment
- SSES Proposed CCTV 2016
- Outfall Inspection 2015
- City of Quincy Boundary
- Stormwater Gravity Mains
- Sample Obtained
- Stormwater Manhole
- Catchbasin
- Drainage Inlet
- Visual Inspection Only

Consequences for Lack of Integration

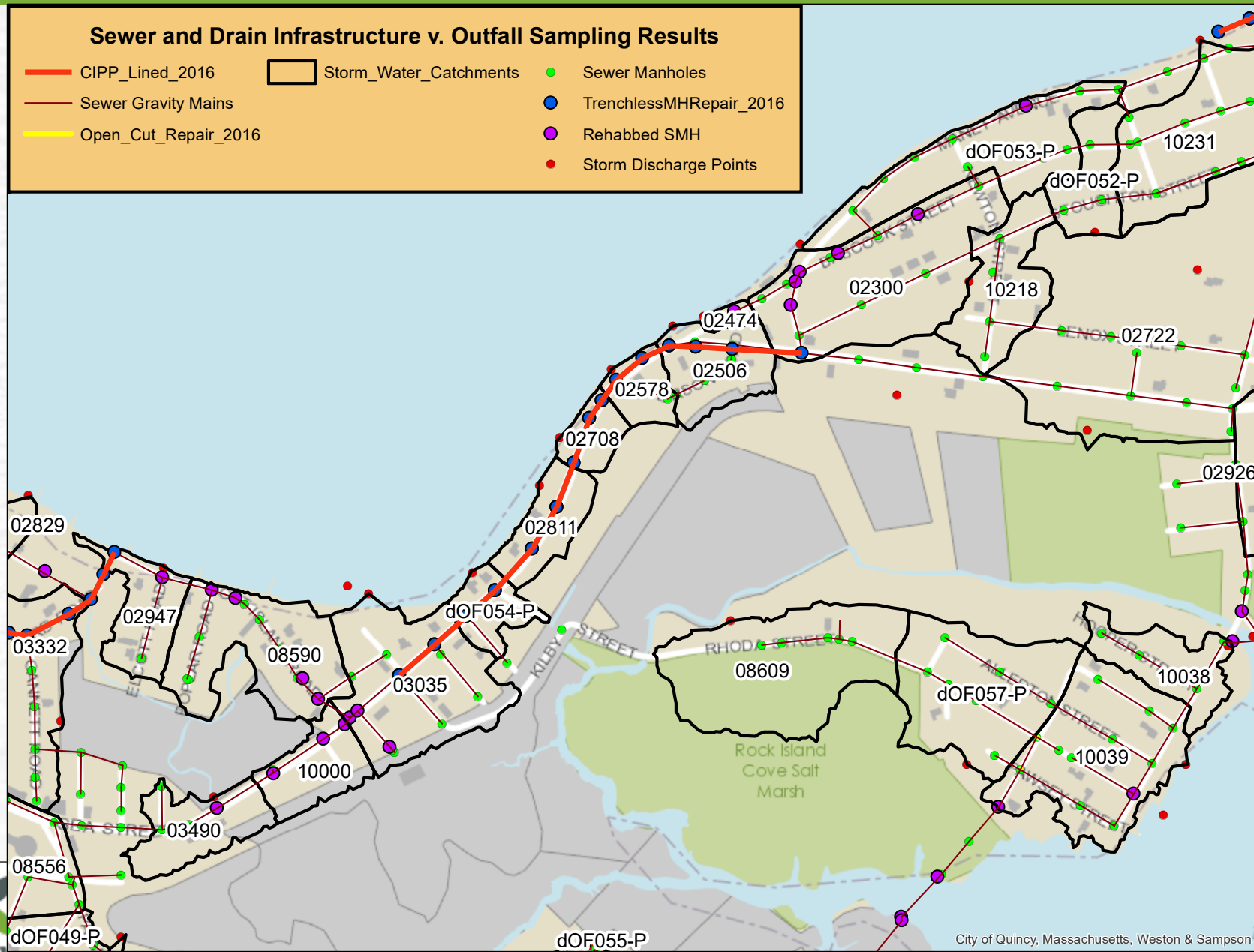


City of Quincy, Massachusetts, Weston & Sampson













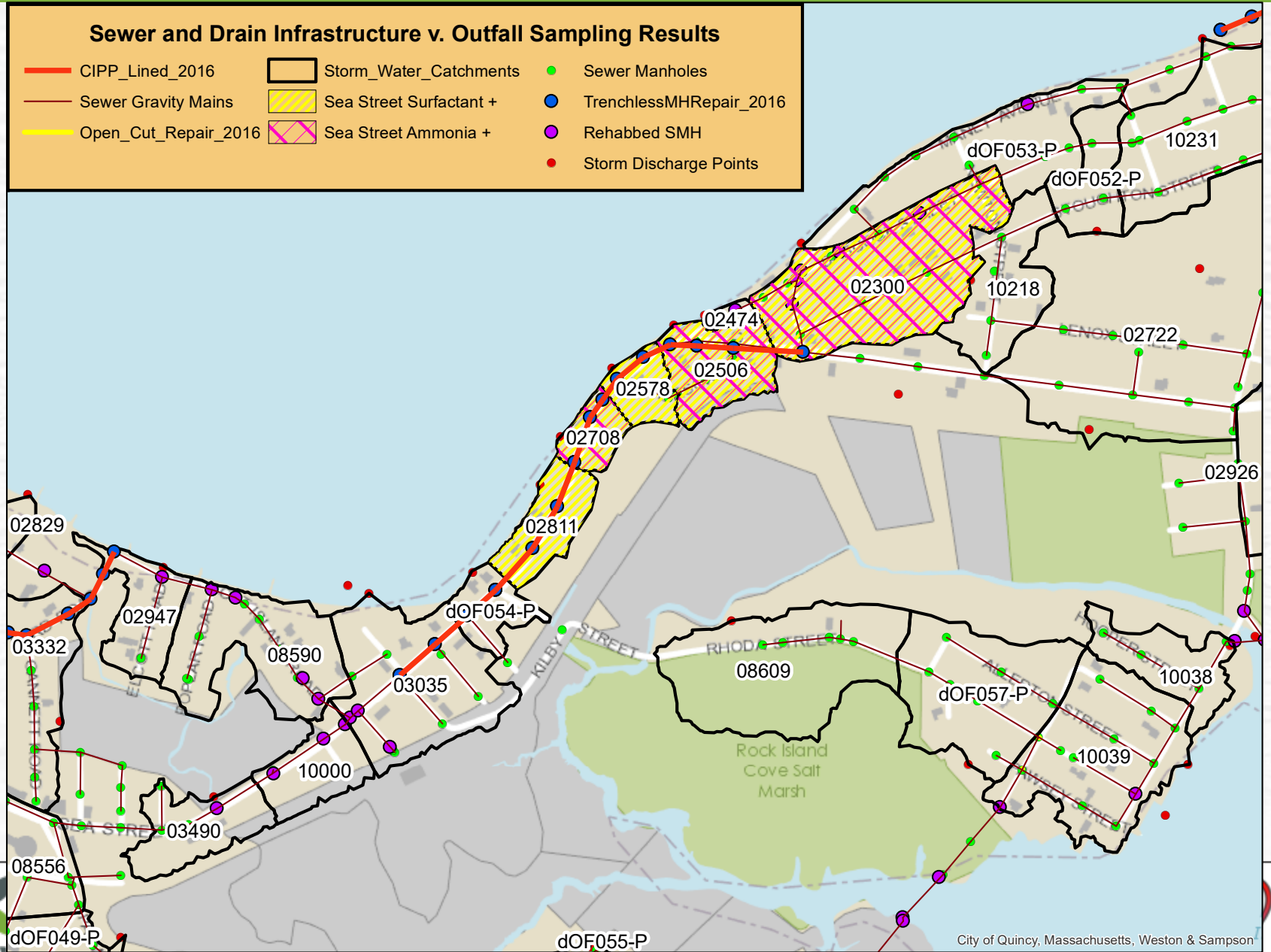
Sewer and Drain Infrastructure v. Outfall Sampling Results

- CIPP_Lined_2016
- Storm_Water_Catchments
- Sewer Manholes
- Sewer Gravity Mains
- TrenchlessMHRRepair_2016
- Open_Cut_Repair_2016
- Rehabbed SMH
- Storm Discharge Points

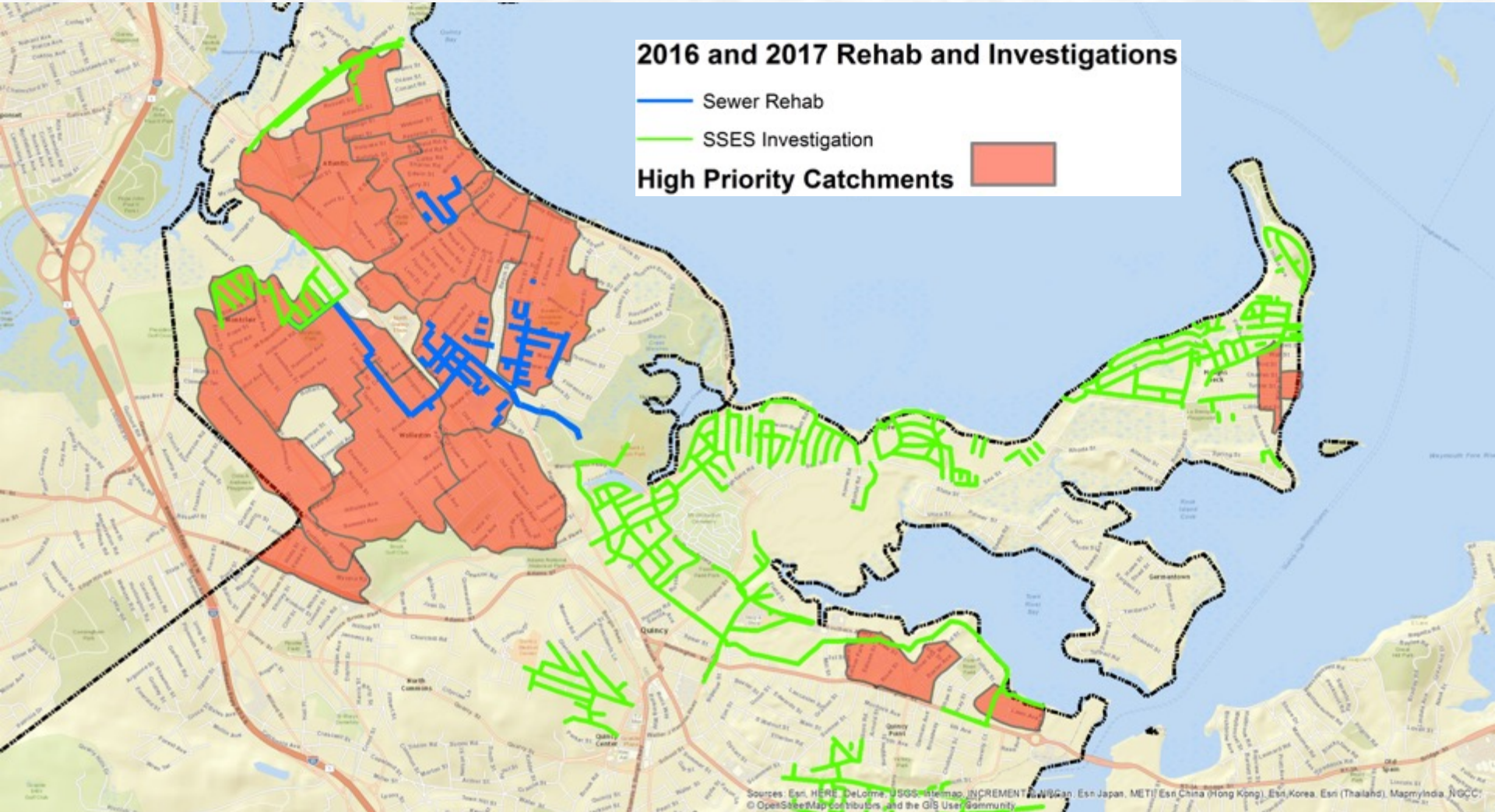


Sewer and Drain Infrastructure v. Outfall Sampling Results

- | | | |
|--|---|--|
|  CIPP_Lined_2016 |  Storm_Water_Catchments |  Sewer Manholes |
|  Sewer Gravity Mains |  Sea Street Surfactant + |  TrenchlessMHRRepair_2016 |
|  Open_Cut_Repair_2016 |  Sea Street Ammonia + |  Rehabbed SMH |
| | |  Storm Discharge Points |

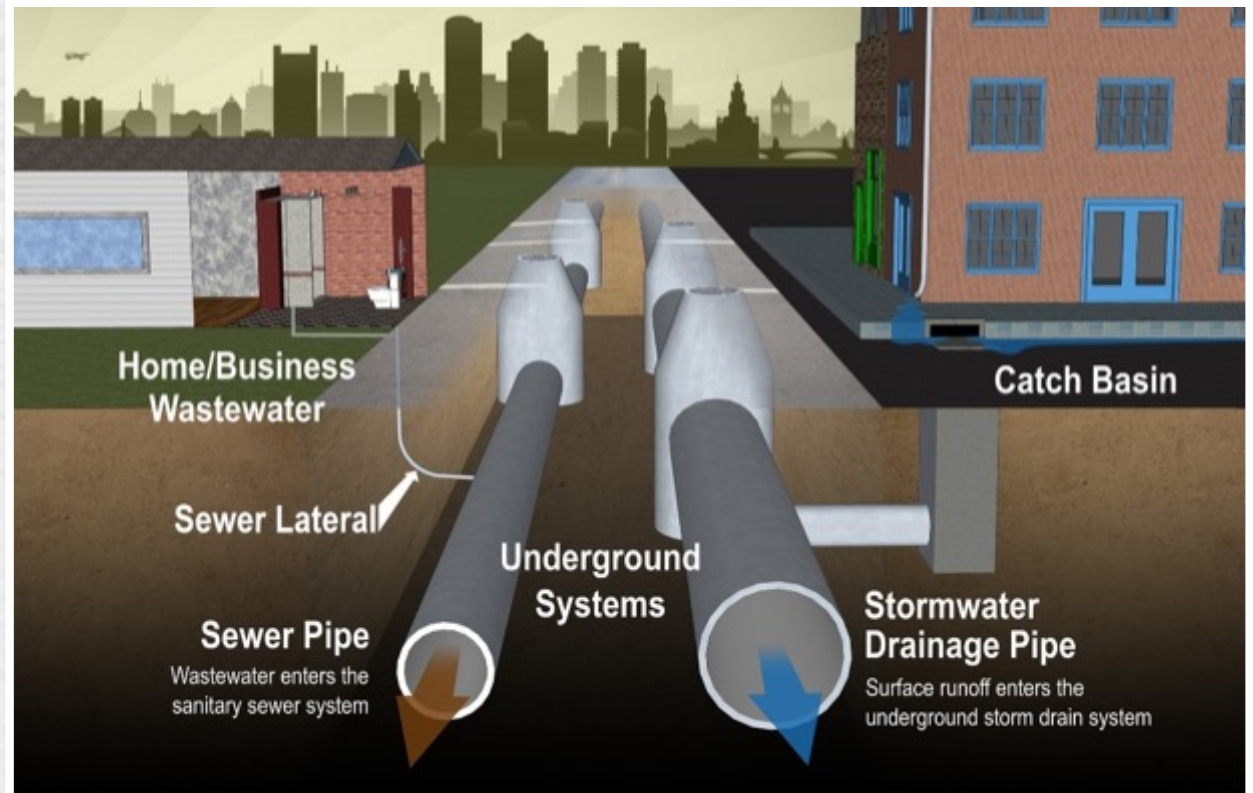


Quincy's Future Integrated Planning



Compelling Integrated Outreach?

Utilities 101





NEWEA
WORKING FOR WATER QUALITY

Why Is This Important?



Essential for Economy

- Fix things before they break!
- It is much less disruptive and expensive.



Reduce Inflow – Pay Less



Flood Planning & Prevention



Avoid Street Collapse

“You can’t build a vibrant economy on crumbling infrastructure”

A Part Of Our Quality of Life:

Clean water generates billions of dollars nationwide



\$50
billion/year
in recreation



\$225 billion/year
in coastal tourism



\$29 billion/year
in commercial
fishing

Clean water
retains and
improves the
market value
of properties
near water
bodies



Critical to Public Health...



Aging and leaking sewer pipes can result in increased waterborne illness due to unsafe swimming and closed beaches



Street collapse and infrastructure failure are dangerous



Intense rainfall and coastal storm surge can overwhelm drainage systems and result in threats to public safety

"Floods cause \$6 billion worth of damage and kill about 140 people every year."

~ National Geographic

What areas should the City prioritize?

1

Public Infrastructure Upgrades

2

Emergency Preparedness and Response

3

Wetlands and Coastal Restoration
and Protection

MAPC Climate Impacts
and Resiliency (2015)

Survey of Quincy Residents

Why the City of Quincy is Tackling This Problem

Short-term Benefits: →

Fixing leaky wastewater systems reduce costs to ratepayers by reducing inflow of seawater and stormwater. We don't need to treat this water!

Medium-term Benefits: →

Reduce likelihood of sewer and stormwater pipe failures (sinkholes) and more costly repairs. Reduce sewer blockages and flood risks.

Long-term Benefits: →

Healthy waters, protected flood prone areas, safe swimming, smart investments.



Integrated Public Outreach: “Give us something we can buy”

- Targeted Mailings In Infrastructure Assessment Areas
 - Invitation to Informational Public Meetings
 - Doorhangers Prior to Work
 - Quarterly DPW Info Letter
 - Department of Public Works Calendar
 - Public Service Announcements on Local Cable TV
-
- All Focused on Showing the Public What They Are Getting For Their Investment!



Integrated Public Outreach: Informational Meetings

Join us Thursday, October 6, 7:00pm
Fore River Clubhouse, 16 Nevada Rd.

As part of the City's ongoing efforts under the leadership of Mayor Koch to improve our beaches and waterways, ensure smart, sustainable reinvestment in utility infrastructure and reduce costs of service to ratepayers, we are conducting sewer and stormwater drainage investigation projects in your neighborhood this fall. Please join us at a community meeting where you'll learn...

- ✓ Why our sewer and stormwater drainage system is essential to economic vitality.
- ✓ How the sewer and stormwater drainage systems function.
- ✓ What you can do to help us keep these systems operating efficiently and effectively.
- ✓ What our work will consist of.

A Rain Barrel will be raffled!

City of Quincy
DPW

Daniel G. Raymondi
Daniel G. Raymondi
Quincy DPW Commissioner

Quincy Sewer System Facts

- ▶ 3,007 Sewer Manholes
- ▶ 205 Miles of Sewer Pipes
- ▶ 2 Miles of Sewer Pressurized Main
- ▶ 7 Sewer Pump Stations

Quincy Stormwater Drainage System Facts

- ▶ 3,007 Stormwater Manholes
- ▶ 150 Miles of Stormwater Pipes
- ▶ 9,329 Stormwater Catch-basins
- ▶ 304 Stormwater Discharge Points

Thomas P. Koch, Mayor
Daniel G. Raymondi, Commissioner

CLEAN WATER IS EVERYBODY'S BUSINESS

City of Quincy
DPW

Clean Water is Everybody's Business

CLEAN WATER IS EVERYBODY'S BUSINESS

City of Quincy
DPW



Integrated Public Outreach: Targeted Mailings and Doorhangers

What you can expect to occur in your neighborhood

- Private contractors SDE Engineering and National Water Main Cleaning Company, hired by the City will be in your area accessing city manholes.
- Measuring devices will be placed in the sewer system to monitor base and peak flows.
- Manholes may be accessed at night.
- If you have a manhole on your property, contractors may need pedestrian access to it.
- No equipment will be placed on properties without the owner's authorization.
- Work is anticipated to continue through the fall.
- SDE Engineering will be sampling drainage water from our stormwater drainage structures.
- You will be contacted if we need access to your home.
- You may notice and/or observe noise, odors and traffic control measures associated with the some of the work.
- Smoke testing is a way to diagnose pipe defects by introducing non-toxic, non-staining white smoke to system.
- Smoke can occasionally enter homes, but poses no harm.
- Just open a window, pour water down a drain and contact a representative for Flow Assessment Services who will be on site during the testing.
- You may notice equipment accessing manholes in order to video the interior of city pipes.

Quincy sewer customers send 13.7 million gallons of sewage to the MWRA treatment plant every day. Sewer customers are charged for treating their sewage in their water and sewer bill.

Any rainwater, sea water, and groundwater that enters the City's sewer system through cracked or leaky pipes is also sent to the MWRA. Sewer customers also pay to treat this infiltration and inflow ("I&I").

Thousands of ratepayer dollars are spent annually to find and fix I&I. Removing I&I from our sewer system helps to stabilize sewer rates.

Questions?
Contact Deirdre J. Hall, DPW Compliance Manager at 617-376-1525 or dhall@quincyma.gov


Thomas P. Koch, Mayor
David G. Raymond, Commissioner

CLEAN WATER IS EVERYBODY'S BUSINESS





Sewer and Drain Assessments in Your Area




What does this mean for you?

- Private contractors hired by the City will be in your area accessing city manholes.
- Contractors may need access to interior plumbing.
- If you have a manhole on your property, contractors may need access to it.
- No equipment will be placed on private property without the owner's authorization.

Work is anticipated to begin on _____ and continue until _____.

Questions? Contact Deirdre Hall, DPW Compliance Manager at 617-376-1525

CLEAN WATER IS EVERYBODY'S BUSINESS






Sewer and Drain Facts

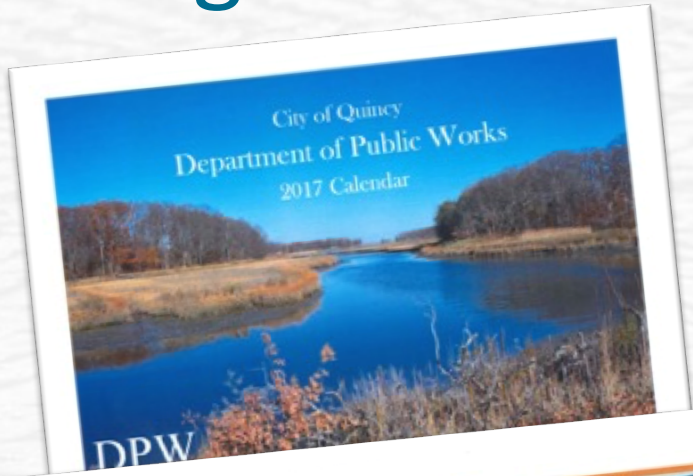
- The City of Quincy Water/Sewer/Drain Operations maintains 205 miles of sanitary sewer pipe and 150 miles of stormwater pipe to ensure proper and efficient utility service.
- Quincy sewer customers send 13.7 million gallons of sewage to the MWRA treatment plant every day. Sewer customers are charged for this sewage in their water and sewer bill.
- Any rainwater, sea water, and groundwater that enters the City's sewer system through cracked or leaky pipes is also sent to the MWRA. Sewer customers also pay to treat this infiltration and inflow ("I&I").
- The City spends thousands of your dollars annually to find and fix I&I. Fixing I&I stabilizes sewer costs and protects the environment.

THOMAS P. KOCH
MAYOR

DANIEL G. RAYMONDI
COMMISSIONER

Integrated Public Outreach: Branding Everywhere!



The "Clean Water is Everybody's Business" awareness campaign is an effort to brand the DPW's clean water programs. As part of our best management practices followed daily by the DPW, we urge residents to modify their own practices and behaviors regarding their use of Water/Sewer/Drain services. The DPW executed several outreach measures that included public service announcements on QATV, news articles in the Quincy Sun, a sticker campaign, brochures and mailers and a citywide Medallion Placement Program designed to educate the public about the vital role our storm drains play in the safety and health of our community. CLEAN WATER bumper stickers are available at the DPW.



Water/Sewer/Drain employees receive special training for testing the quality of stormwater run-off. The tests detect indicators of sanitary sewage in the drain system. This testing is a rapid and cost effective way for the department to identify deficiencies in the sanitary sewer system that are impacting the health of our waterways. This allows the Department to prioritize repairs that have the greatest impacts.



Integrated Public Outreach: Branding Everywhere!

City of Quincy DPW
2016 Fall/Winter InfoLetter
 Volume 5 Issue 1

Mayor Koch Presents Plan to Reduce Waste



Mayor Thomas P. Koch has presented the City Council with a proposal to distribute uniform trash and recycling carts to all eligible households. Subject to Council approval, the new trash program will take effect July 1, 2017.

Mayor Koch stated, "Quincy hopes to join thousands of cities and towns across America and dozens of its neighbors in switching to a cleaner, more efficient, semi-automatic waste collection system."

Based on the experiences of neighboring communities and data from the MA Department of Environmental Protection Quincy can expect to double its recycling tonnage.

According to DPW Commissioner Dan Raymond, "This important initiative will divert thousands of tons of trash into our recycling stream, thereby reducing our trash disposal costs." That decrease will save taxpayers approximately \$360,000 annually. While most municipalities are currently paying up to \$60 per-ton for recycling, Quincy's negotiated contract calls for the City to pay \$0 per-ton for recycling for the next several years.

Containing trash in a durable cart with a tight-fitting lid will reduce litter and keep our neighborhoods clean. Wheeled carts also make it easier to roll trash and recycling to the curb. Residents are advised not to purchase new trash or recycling containers unless absolutely necessary.

DPW Welcomes Two New Managers



Michael Norton is the newly appointed Highway Operations Manager at the DPW. He comes to the Department after 19 years in the automotive and fleet management industry. Most recently, Mike worked for the Commonwealth of Massachusetts Operational Services Division as an auditor to the Office of Vehicle Management. A life-long resident of Quincy, Mike graduated from Quincy High School where he captained both the basketball & cross country teams. He also attended Eastern Nazarene College & Bridgewater State University where he studied account management. In his spare time Mike likes to spend time with his family.



Paul Delta Barba, new Manager of Water/Sewer Operations, comes to the Department with a B.A. in Management from Boston College. Paul spent the first 20 years of his work experience in the financial services industry employed by State Street Corporation, Wellington Management and Fidelity Investments. For the past three years Paul served as Water Inspector in Water/Sewer Operations. His educational experience and financial background will enable him to be a successful manager and he states, "My years spent in Quincy's Water Operations were well spent and will provide me with a unique perspective."

CLEAN WATER
 EVERYBODY'S BUSINESS

Have you seen these bumper stickers? They're just one part of the DPW's awareness campaign to educate the public about the importance of clean water, sanitary sewers and storm drains.

There is a **BIG** difference between stormwater drains and sanitary sewers. Both systems are separate and distinct, both are underground and both play crucial roles in the health and safety of our residents. The sanitary sewer system starts inside your home and carries waste from your sinks, tubs and toilets to the Deer Island treatment facility in East Boston.

Storm drains, on the other hand, are designed to mitigate flooding and carry rain water from driveways, lawns, streets and sidewalks directly into our beaches, ponds, rivers and creeks. Storm drains are not connected to treatment facilities and should not be used to dispose of pet waste, oil, gasoline, trash or anything else.

You Can Make A Difference

- Never dump anything down stormdrains.
- Use fertilizers sparingly.
- Use non-toxic pesticides and herbicides.
- Direct downspouts into gardens.
- Check your car for leaks.
- Pick up after your pet.
- Don't litter.
- Bring hazardous waste to our Household Hazardous Waste Drop-off events.

Catch Basin Cleaning Program

Our comprehensive drain/catch basin cleaning, evaluation and repair program is the keystone to efficient flood control and preventing pollutants from entering our waterways. This year DPW crews removed over 879 tons of debris from over 2,000 catch basins across the City.



Infiltration and Inflow (I & I)

All of the city's wastewater is collected from your sinks, tubs and toilets and sent to the MWRA for processing and treatment. Any rainwater, sea water and groundwater that enters our sewer system through leaky or cracked pipes is also sent to the MWRA and billed to the City. This additional wastewater is called I&I. Utilizing grants and no-interest loans from the MWRA, Sewer Operations investigates and makes needed repairs to our sewer mains and man holes. Removal of I&I from our system helps stabilize our sewer costs. This important initiative was started by Mayor Koch in 2009.



Fats, Oils and Grease

Fats, oils and grease (FOG) poured into sinks, drains and toilets is a significant problem for the City's sewer system. As FOG hardens, it decreases pipe capacity requiring systems to be cleaned more often and replaced sooner. FOG can shut down a sewer pump station or cause messy backups in your home or business. FOG costs rate payers tens of thousands of dollars annually and may pose environmental hazards resulting from sewer overflows. Residents should store fats, oils and grease in a container until it hardens and then dispose of the contents in your regular trash.

Flushable Wipes Clog Sewer Pipes

Many products labelled "disposable" or "flushable" actually are not and can clog sewer pipes. You can prevent costly and unhealthy sewer back-ups in your home by flushing **ONLY** toilet paper and human waste in your toilet. Throw everything else in the trash!

Medallion Program

Another facet of our awareness campaign, the city-wide Medallion Placement Program is designed to educate the public about the vital role our storm drains play in the safety and health of our community. Crews placed another 2,000 medallions this summer.




In Summary

- Municipal SW/WW Integrated Planning is a Hot Topic – SSES and IDDE are a natural fit
- New England region - Aging infrastructure, combined sewer systems and SSO issues are driving IDDE and SSES requirements
- Integrated Programs, Planning and Outreach will drive efficiencies and increase public support





Questions?

Thank you!

Zach Henderson
Woodard & Curran

Deirdre Hall, Esq.
City of Quincy, MA

