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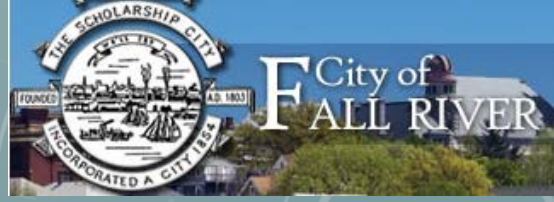


IDDE & CSO Investigations in the City of Fall River

Navigating the New Stormwater Permit

New Tools for Smooth Sailing through MS4 Compliance

March 30, 2017

Presented at CEI's Navigating the New Stormwater Permit on March 30, 2017 in Marlborough, MA

OVERVIEW

- About Fall River
- CSO Introduction
- Sewer & CSO Infrastructure
- CSO Projects – What's been Done
- Ongoing GIS and Field Work
- MS4 Program – How we'll Implement
- Funding – Stormwater Utility
- Lessons Learned


FOCUS: SEWER

Collection system technicians Mark Correia, left, and John Melo perform maintenance on a drop shaft in Fall River, Mass. (Photography by Kevin Trimmer)

DECADES IN THE MAKING

Fall River's massive CSO abatement project has made a big impact on local water quality

By Jim Force

The problems facing many of our older Northeastern cities are widely known — population loss, economic woes, deteriorating infrastructure.

Fall River, Mass., has had its share of hard knocks, too. Once the nation's leading textile manufacturer, the city has lost industry and population. Nonetheless, the Fall River Sewer Commission is nearing completion of a decades-long, $385-million combined sewer overflow abatement project that has already improved water quality and promises to help the city prosper in the future.

"As difficult as this has been for us," says Terry Sullivan, administrator of community utilities, "all of the public referendums required for the various phases of the project passed by a pretty good margin (around 60 percent to 40 percent). The public has understood the need to comply with regulations and improve water quality. It's a good reflection on the city and our ability to move forward."

Even the steep topography and granite bedrock have helped. A new 3-mile-long, 100-foot-deep stormwater storage tunnel needed hardly any liner because of its impervious granite walls, and the stored water drops by gravity 100 feet to the city's treatment facility, eliminating the need for pumping.

Fall River

Fall River lies on the eastern edge of Mount Hope Bay, which connects to the Atlantic Ocean, with much of the city built on steep hillsides rising 150 to 200 feet above the water's edge. Its population has declined to around 90,000 from a high of 120,000 in the 1920s, but it still ranks as the tenth largest urban center in Massachusetts.

The city's wastewater infrastructure includes one regional treatment plant and one satellite treatment facility; 179 miles of sewers (about 85 percent of them combined); 6,000 catch basins; 6,000 manholes; and 15 pumping stations.

The service area includes all of the city, as well as portions of several small abutting communities in Massachusetts and Rhode Island.

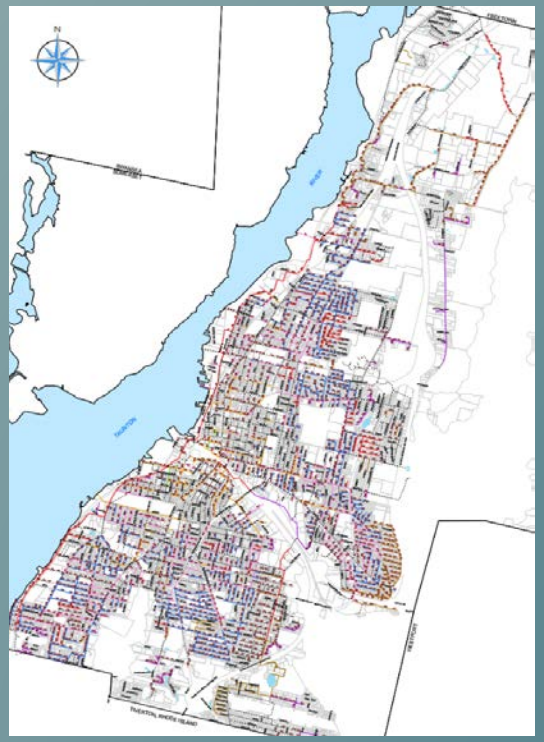
The sewer system dates back to 1857, and for many years, wastewa-

(continued)

22 February 2013 mswmag.com

ABOUT FALL RIVER

- Approx. 90,000 residents (high of 120,000 in 1920)
- 1 of 24 MA Communities with Combined Sewers
- 25% on MS4, rest on Combined Sewers (CSOs)
- Areas on CSO do NOT Need to Meet MS4 Requirements



Combined Sewer Area

MS4 Area

FALL RIVER'S INFRASTRUCTURE

- A Brief History
  - 1857 – 1st recorded sewer built
  - Prior to 1948 – Sewers directly to receiving waters
  - 1948 – Primary treatment WWTF built
  - 1948-1952 – Sewer outfalls converted to CSO
  - 1948-1952 – Central St. and Cove St. stations
  - 1978-1980 – WWTF secondary treatment
  - 1978-1980 – Central St. & Cove St. upgraded
  - 1992 – Federal court order to implement CSO Abatement Plan
  - Since 1997 – CSO abatement project construction ongoing

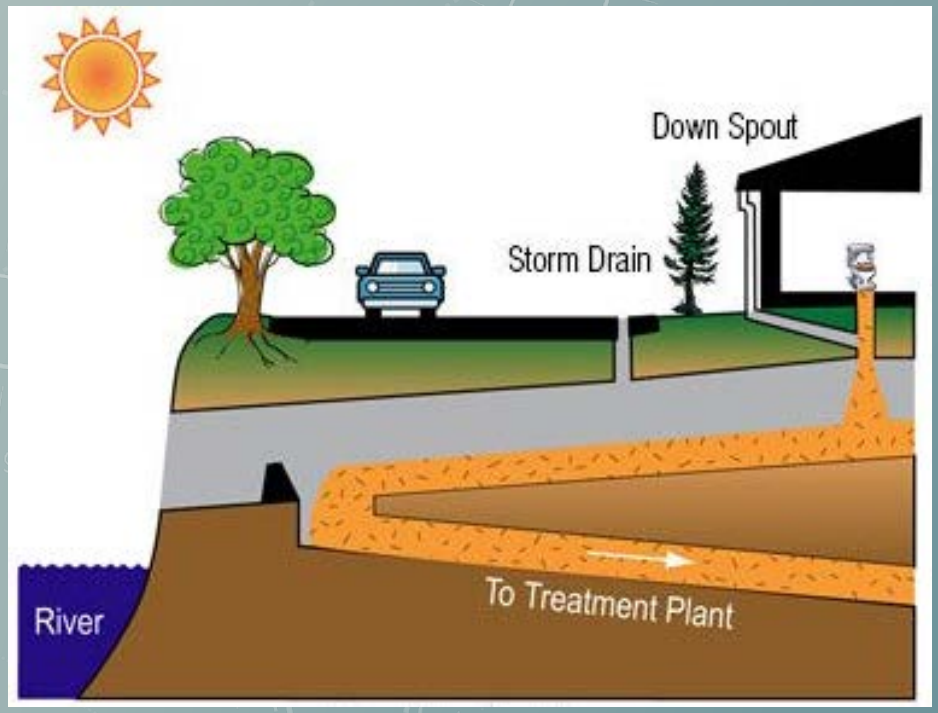
CSO ABATEMENT PLAN

- $185-million CSO Program
- $175-million Spent through 2016
- WWTF Upgrades (1997-2001)
  - Wet weather capacity expanded to 106 MGD
  - Improved solids handling
- CSO tunnel & drop shafts from existing sewers (2000 – 2015)

Image source: CSO Abatement Program Update, City of Fall River

WHAT IS A CSO? COMBINED SEWER OVERFLOW

Dry Weather



Wet Weather

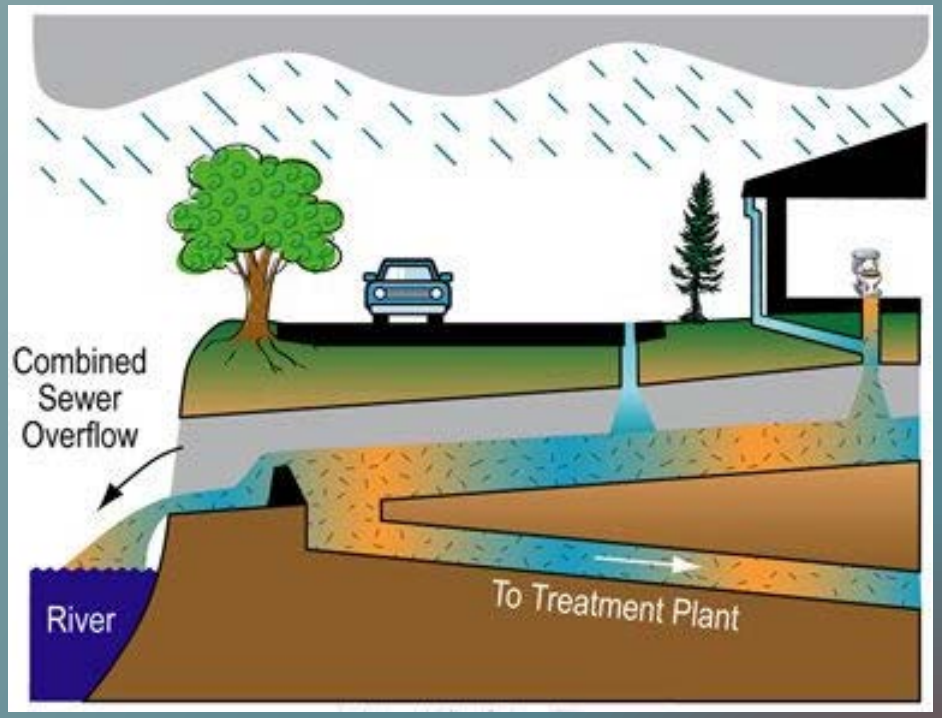


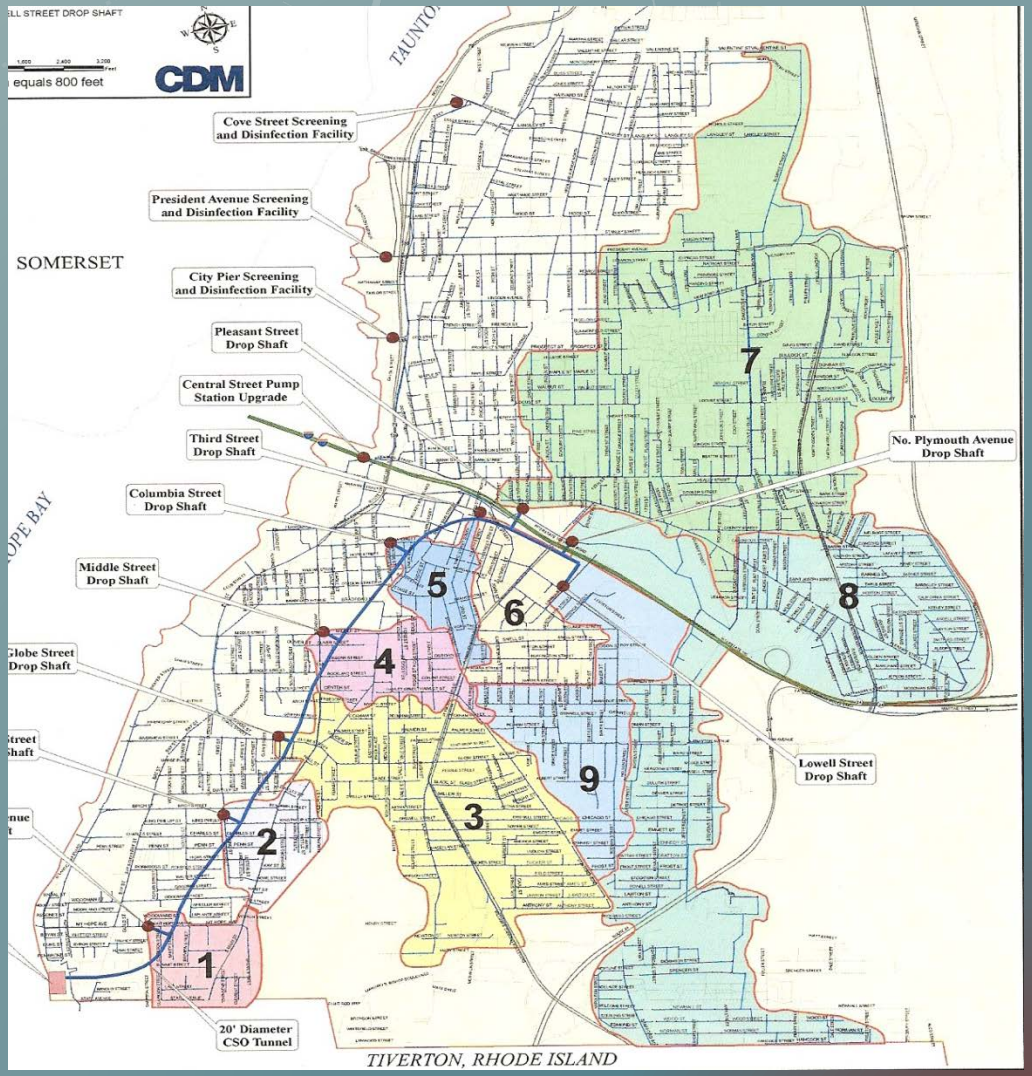
Image source: Clean Solutions for Omaha, http://omahacso.com

CSO - WHAT HAPPENS TO ALL THAT WATER????

CSO - WHAT HAPPENS TO ALL THAT WATER????

CSO TUNNEL

- CSO Storage Tunnel (2000 -2005)
  - 20-foot diameter
  - 3 miles long
  - Up to 100-feet deep
- 9 drop shafts and connecting tunnels 2004-2015)
  - Conveys flow to WWTF
  - 38-million gallon storage capacity



CSO'S TUNNEL

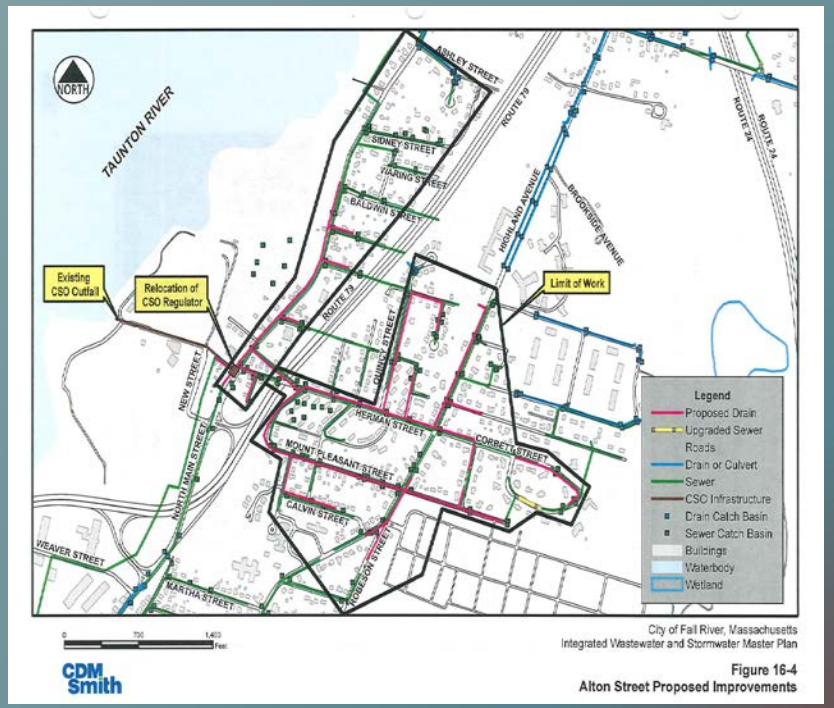
CSO's SCREENING & DISINFECTION

President Ave CSO Screening and Disinfection Facility

Cove St. CSO Screening and Disinfection Facility

CSO'S - SEWER SEPARATION

City Pier Improvements & Sewer Separation



Alton Street Sewer Separation

MAPPING AND CATCHMENT DELINEATION

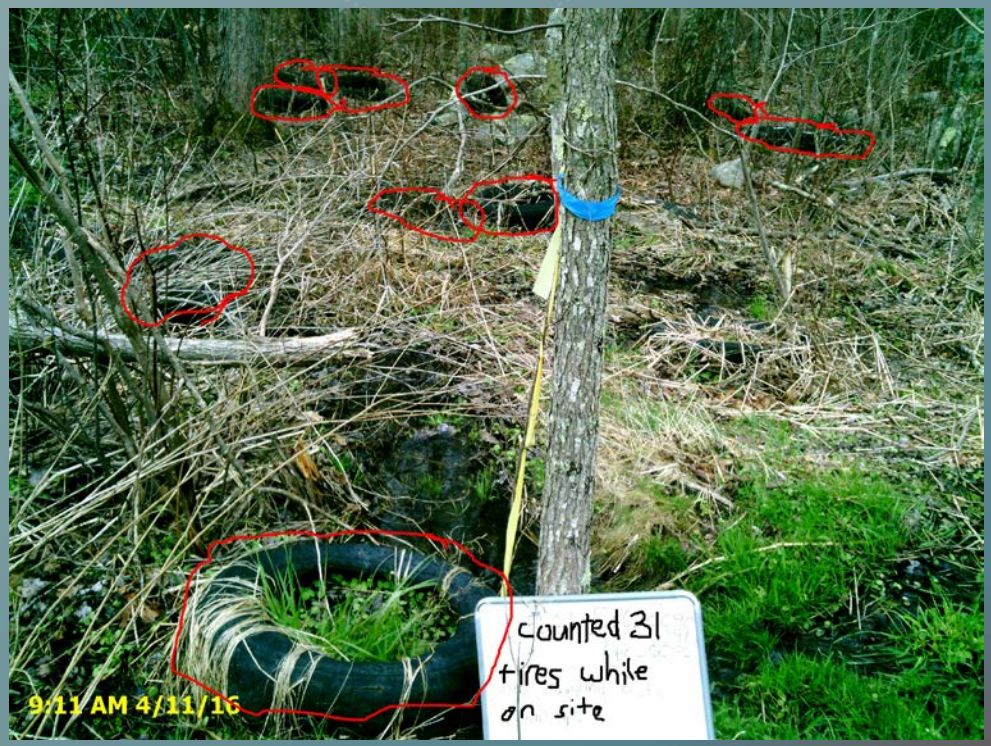
- City GIS Database - UGAM (Infonet) & ArcGIS
- Mapping & Catchment Delineation:
  - USGS hydrology
  - Topo, 2-foot contours
  - Aerial imagery
  - Assessors parcels & streets
  - BMPs, sewer & MS4 – public ~95% mapped, private ~70%
  - Field surveys with GPS
  - As-builts
- Status: Pretty Close to Done!

OUTFALL SCREENING & CATCHMENT INVESTIGATIONS

- Area maps with aerial imagery
- Outfall screening:
  - Locate, inventory, GPS, photo
  - Sample: dry, maybe wet?
- If no access, upstream MHs / CBs
  - Pole camera very helpful
- Results and Next Steps:
  - Illicit connections – CCTV, dye, sample, etc.
  - Maintenance, repair, cleaning needs
  - Notify City of results

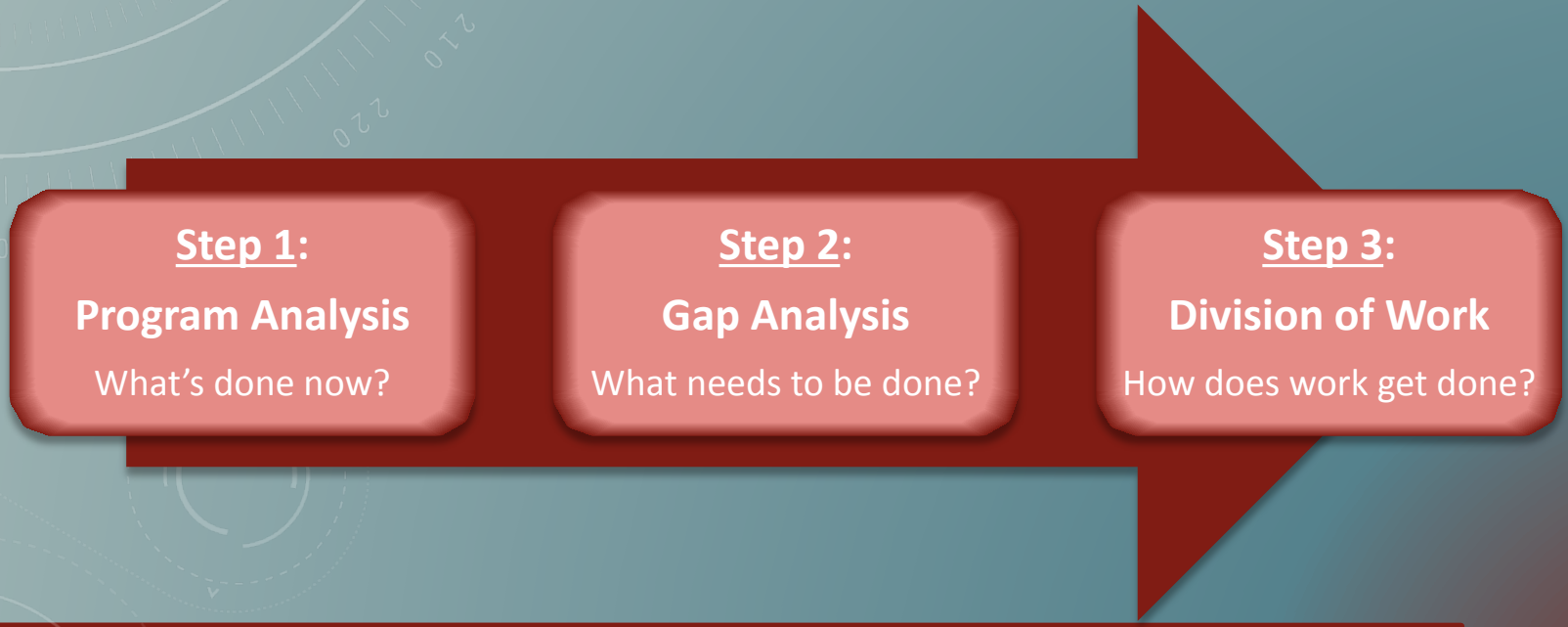
ISSUES ENCOUNTERED

- Illegal Dumping – Outfalls & BMPs
- Street Litter –> Blockages
- Unmapped Structures
- Lack of Maintenance
  - Overgrown
  - Sediment accumulation
- Illicit Connections
  - Broken lines, cross-contamination
- Old Systems (1857!) – Worn & Broken



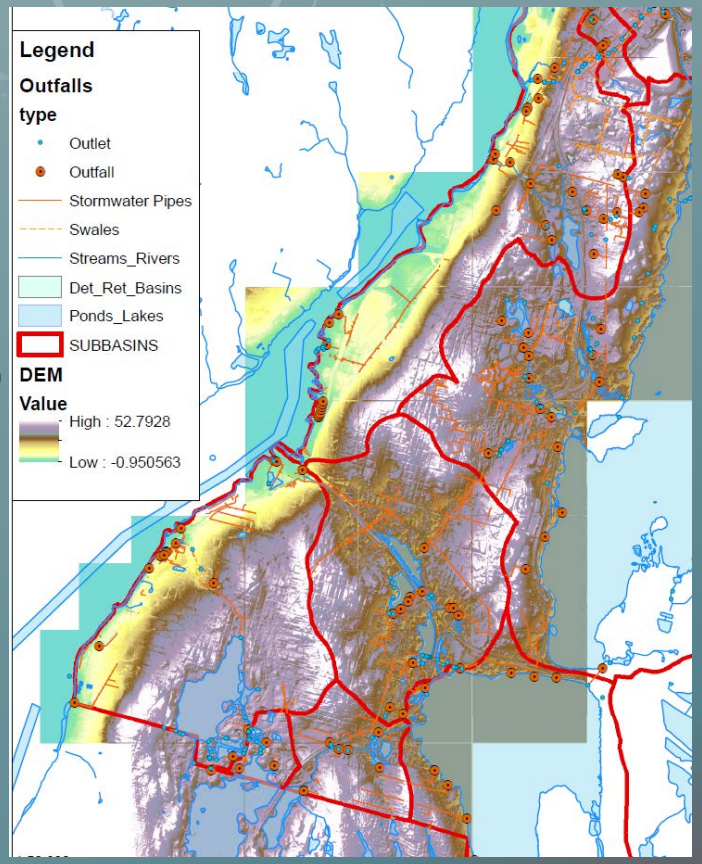
WHAT'S NEXT?

- 2016 Integrated Stormwater & Sewer Master Plan:
  - $334-million over the next 20 years
  - ….But that's another story….
- Current Mission: Stormwater Phase II, Effective July 1, 2017



STEP 1. PROGRAM ANALYSIS – WHAT'S DONE NOW?

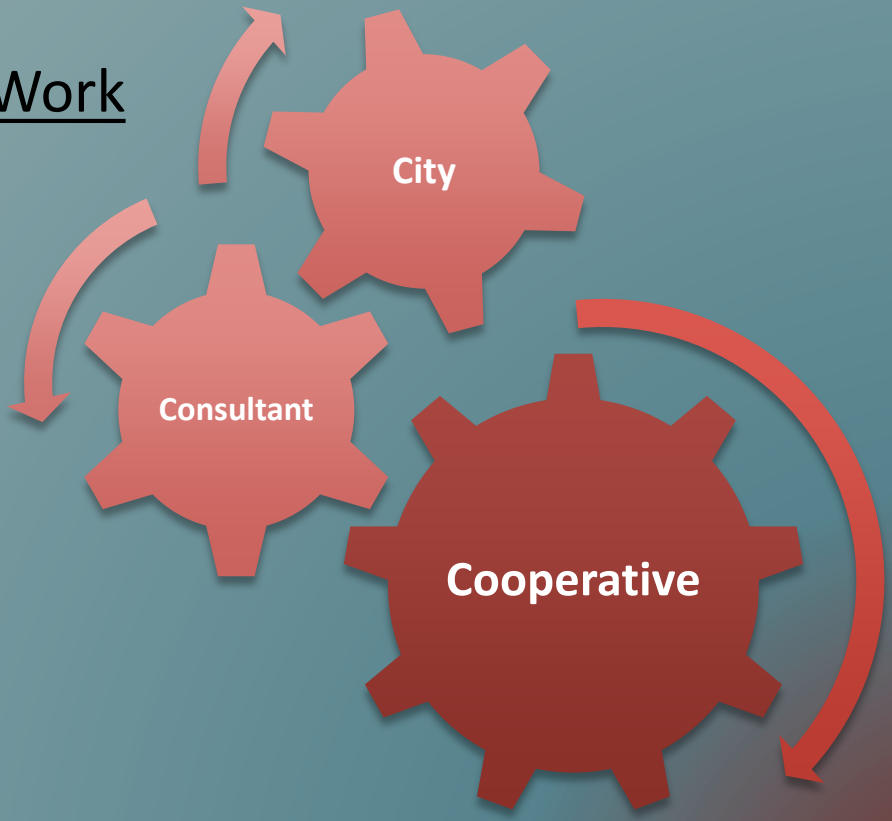
- "Big Ticket" Items
- Min. Measure 3, IDDE:
  - Inspect outfalls every 3 years (60/year)
  - Investigate illicit discharges (dye, TV, etc.)
  - GIS mapping & database
- Min. Measure 6, Maintenance:
  - Clean CBs every several years
  - Sweep streets and parking lots yearly



STEP 2. GAP ANALYSIS – WHAT'S NEXT?

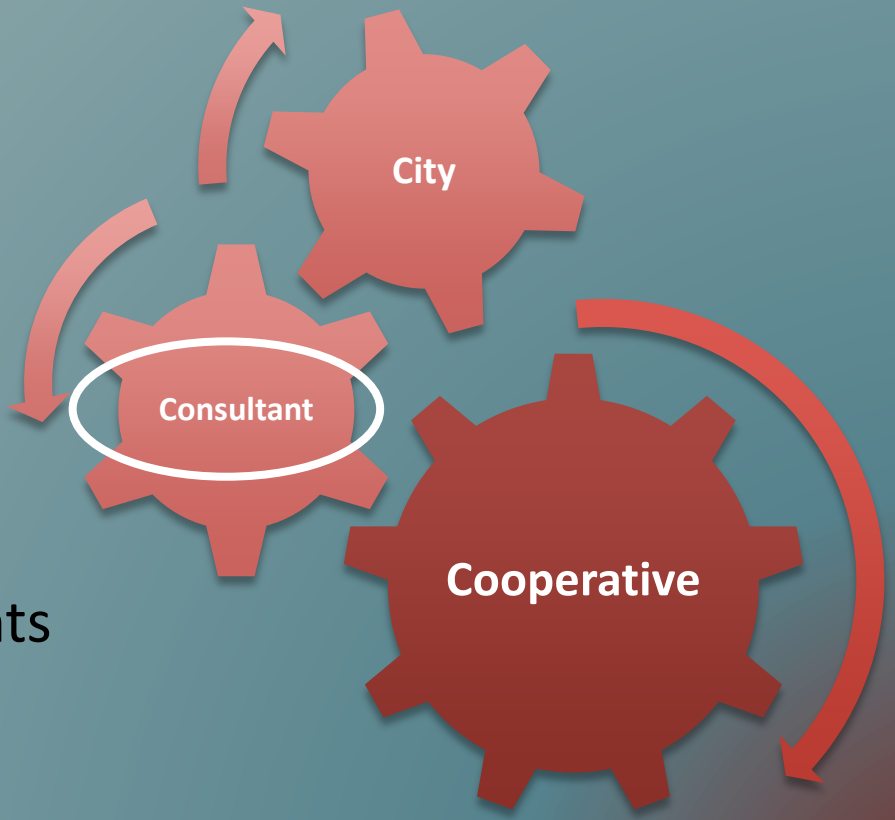
- Goal: Meet Permit while Minimizing Costs
- Translation: Maximize in-House Resources

- Leads to Step 3. Division of Work
- Program Components by:
  - City of Fall River
  - Consultant
  - Cooperative effort



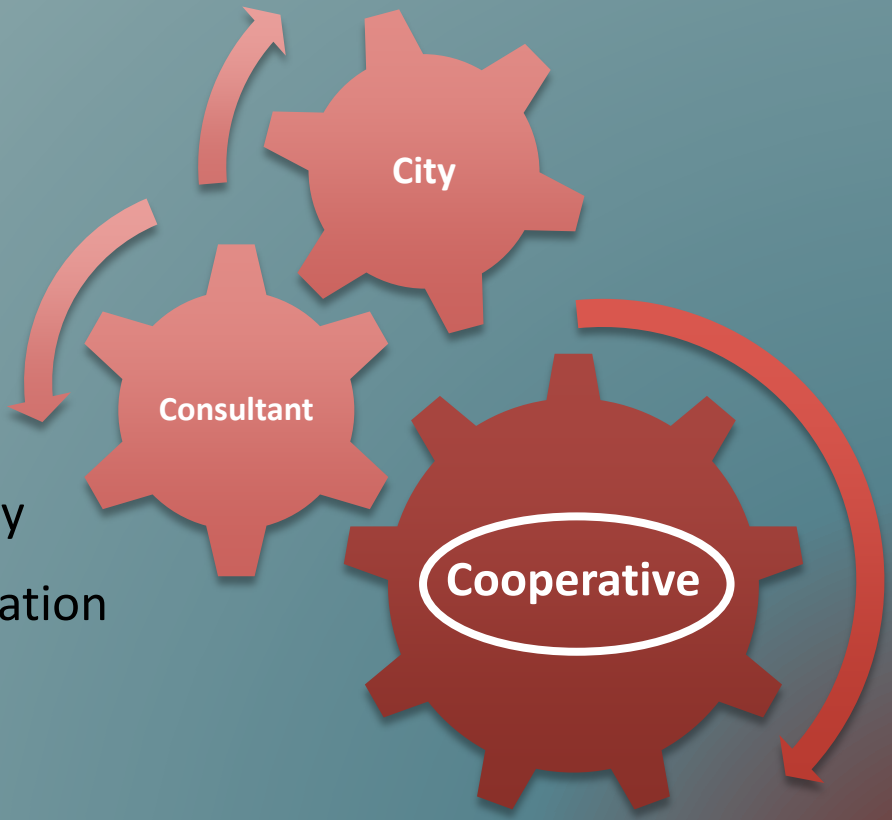
CONSULTANT TASKS – WHAT DO WE NEED HELP WITH?

- Written Program Plans and Program Setup
  - Notice of Intent – 90 days
  - SWMP Plan – Year 1
  - IDDE Plan – Year 1
  - O&M Procedures – Year 2
  - Written SWPPPs – Year 2
- Consultant Prepare Written Plans and Procedures
- City Implement Requirements



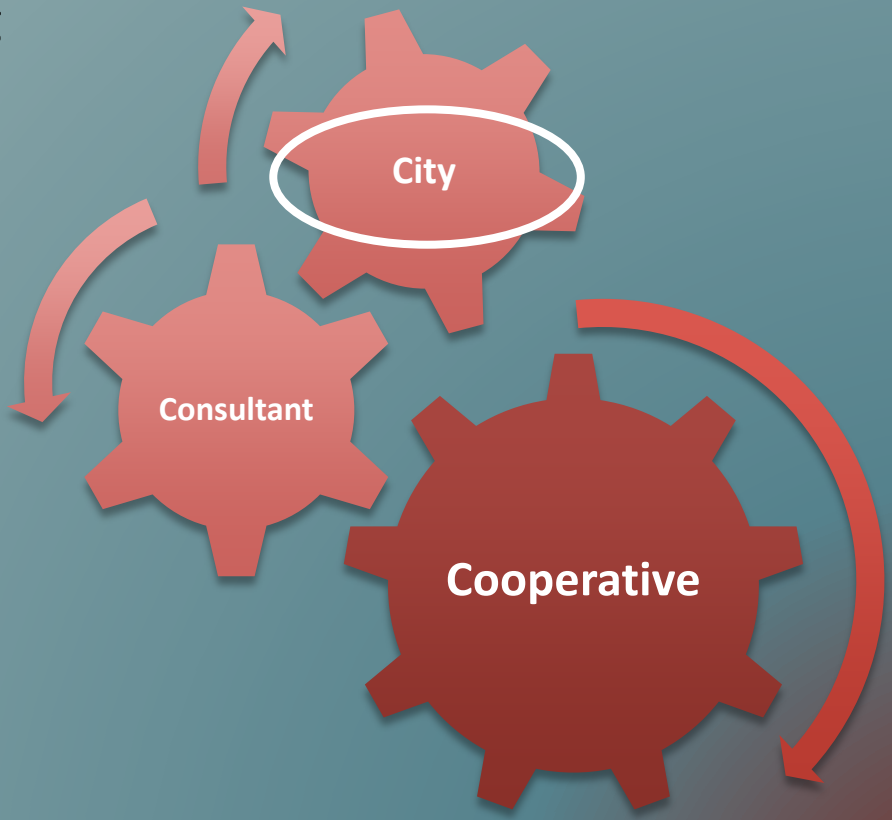
COOPERATIVE TASKS – CONSULTANT AND CITY

- IDDE Training & BMP Inspections
  - Consultant develop, City implement
- Ordinances & Regulations
  - Consultant review existing
  - Provide recommendations
- Annual Report
  - Consultant first year, then City
  - City to perform all documentation



IN-HOUSE TASKS – FALL RIVER

- Field Work
  - Mapping & catchment delineation
  - Dry & wet weather screening
  - Catchment investigations
- Maintenance
  - Street sweeping
  - Catch basin cleaning
  - System maintenance
  - SWPPP implementation

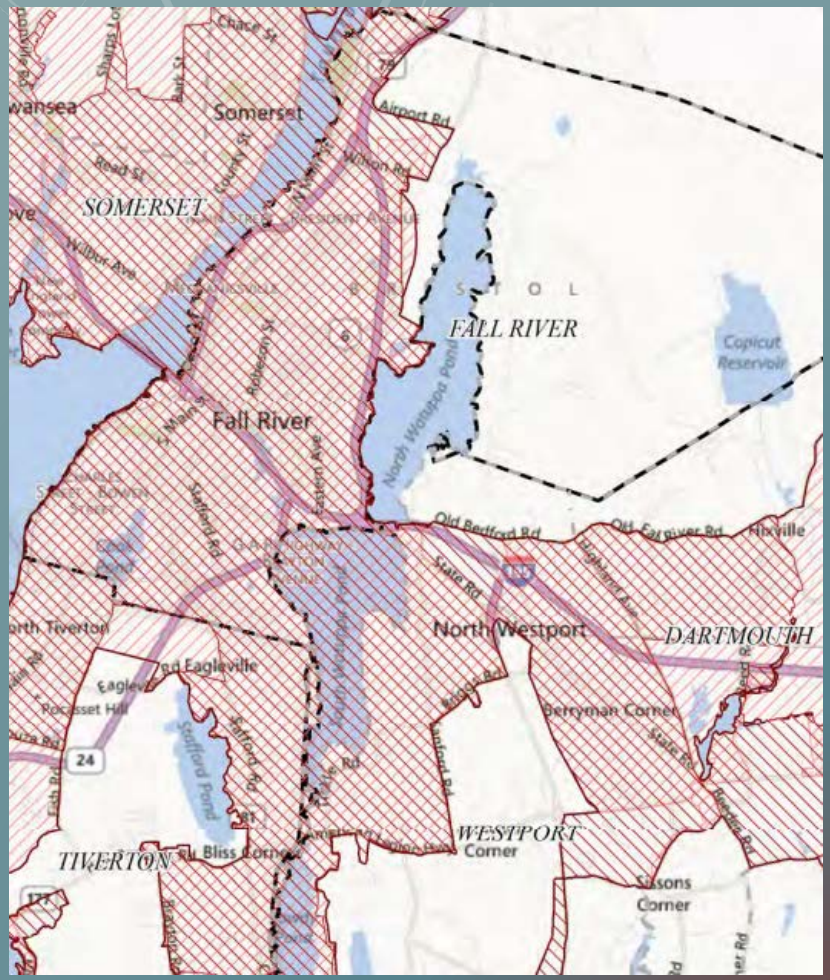


FUNDING – HOW WILL WE PAY FOR IT?

- Stormwater Utility, 2008
  - Help fund $185-million CSO Program
  - $160/year for residents ($40/quarter)
  - $160/year per 2,800 s.f. of impervious area
- Credits and Discounts
  - Up to 25% credit for nonresidential properties for reduced runoff volume
  - Exemption where no direct or indirect discharges
- Generated $4.7-million revenue in FY-2015
- Appeals: Close to 1,000!

LESSONS LEARNED (SO FAR)

- Fieldwork is Time Consuming
  - And weather doesn't cooperate
- Stormwater Utilities are Difficult to Implement
- Bylaws/Ordinances Take Time
- Managing Rain is Expensive!
- Managing Sewage is REALLY Expensive!



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QUESTIONS?