





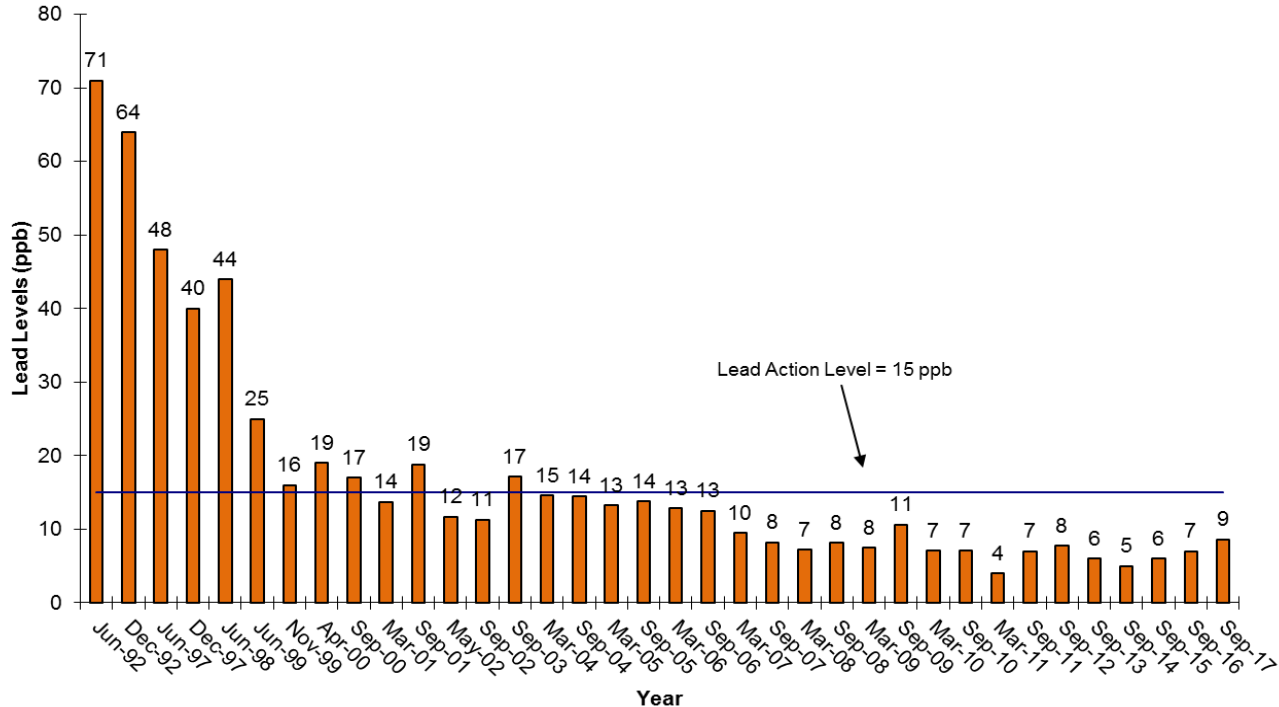
Update on Lead and Copper

March 21, 2018



System-Wide, MWRA Continues to Be Below the Lead Action Level

90% Lead Levels in MWRA Fully Served Communities
1992 - 2017





Lead Loan Program

- \$100 Million for community projects
- 10 year interest-free loans
- Projects must replace **ALL** lead pipe within a service line
- Both public and private portions
- If any portion of service is lead or brass, entire service is eligible for replacement under MWRA Loan Program





Lead Loan Program

- 6 communities funded:
 - Quincy \$1.5 million
 - Winchester \$500,000
 - Newton \$4.0 million
 - Marlborough \$1.0 million
 - Revere \$195,000
 - Winthrop \$284,000

TOTAL \$7.5 million

In development:

- Needham
- Somerville





What Should Be Replaced

- Lead Service Pipe
- Lead-Lined Service Pipe
- Lead Goosenecks
- Galvanized Pipe
Connected with Lead
Gooseneck
- Any Brass Pipe or Fitting





Lead and Lead-Lined Service Pipes





Lead Service Line Replacements





Lead Service Line Replacements





Lead Service Line Replacements





Lead Service Line Replacements





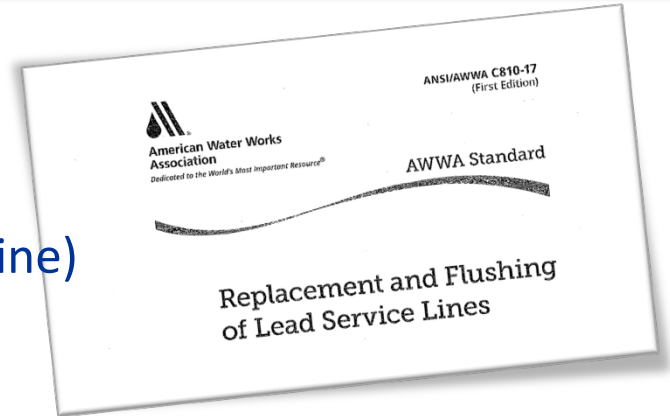
Lead Service Line Replacements





Post Construction Flushing

Flushing of interior plumbing after service line replacement
(or after ANY service disruption in lead service line)





Lead Loan Program Potential Need

- **7** communities with greater than 1,000 lead services
- **9** communities with 100-600 lead services
- **12** communities with fewer lead services and more than 100 lead goosenecks
- **6** communities with few lead services and low number of lead goosenecks
- **11** communities with no lead services and no lead goosenecks
- Total of **18,000** lead services and **30,000~** lead goosenecks



Other Activities

- School Testing Program
- MassDPH testing
- Review of MWRA corrosion control
- EPA request for feedback on future revisions to Lead and Copper Rule





SEH Redundancy Pipeline Section 111

***Dedham/Westwood Water District
Memorandum of Agreement***

March 21, 2018



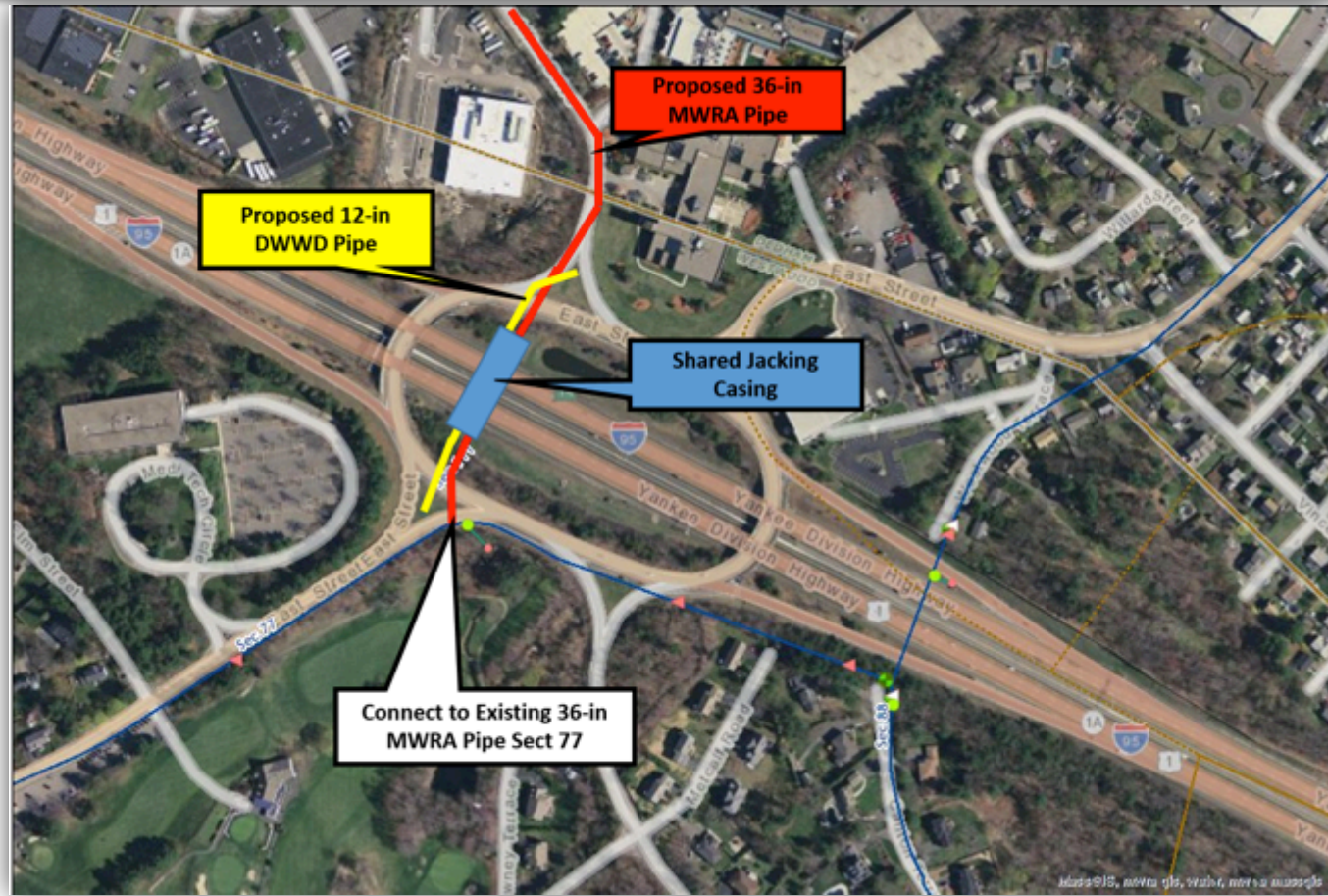
SEH Section 111 Redundancy Pipeline



- CONTRACT 6454 (Boston)**
\$11,770,000
11,000 linear feet of 36-inch pipeline
NTP: June 2016
Substantial Completion: September 2018
- CONTRACT 7504 (Dedham North)**
\$17,226,350
10,000 linear feet of 36-inch pipeline
NTP: August 2017
Substantial Completion: November 2019
- CONTRACT 7505 (Dedham South)**
\$18,970,000 Engineer's Estimate
6,800 linear feet of 36-inch pipeline
NTP: July 2018
Substantial Completion: July 2020

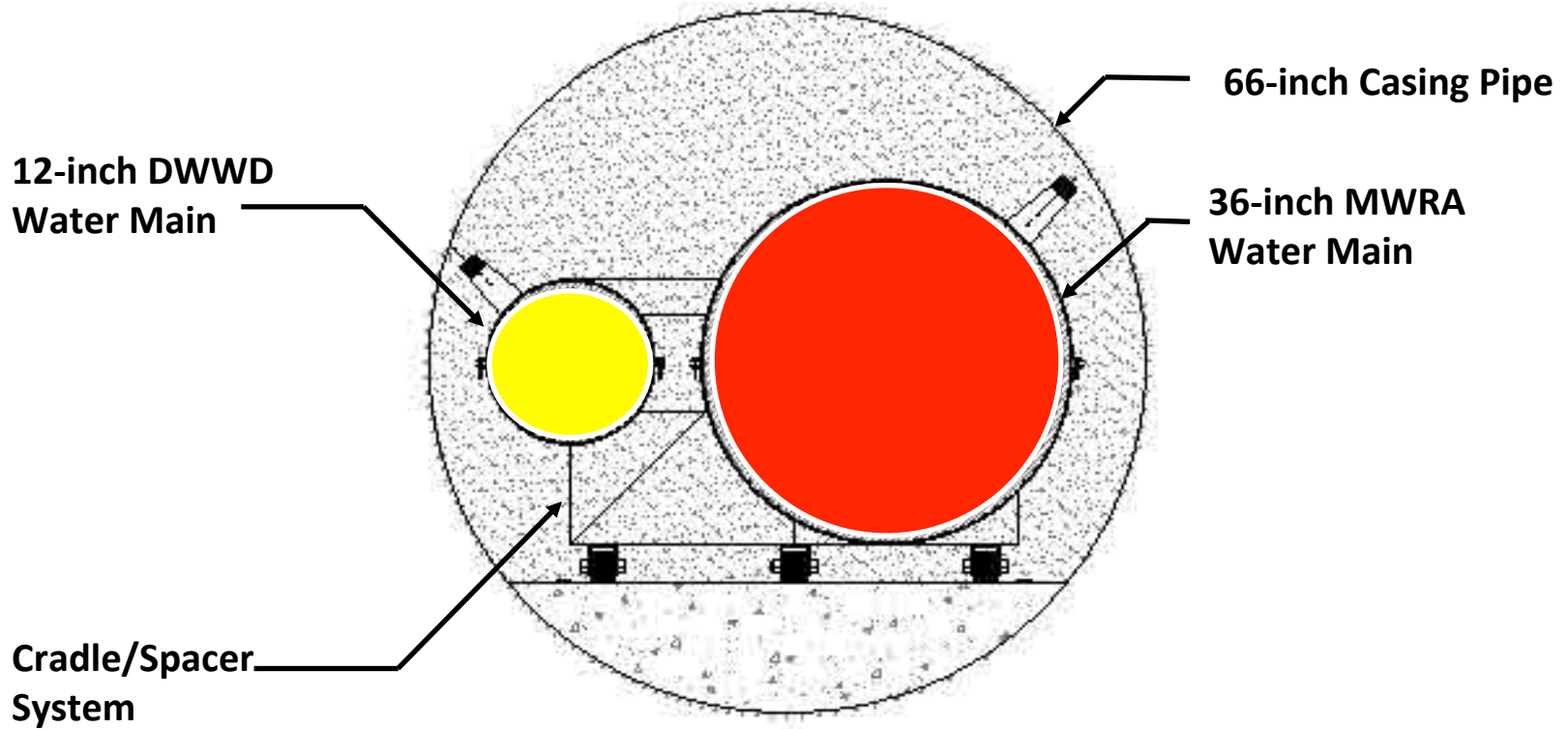


Route 95 East Street Rotary Crossing - Westwood





Route 95 Pipe Jacking





Memorandum of Agreement Key Points

- DWWD is responsible for added construction cost estimated at \$540,000
 - 17.7% of jacking beneath Route 95 (180 feet)
 - 100% of 12-inch water main at Route 95 (380 feet)
- DWWD responsible for design, construction administration, and resident inspection costs of its work
- DWWD named as additional insured and obligee of Performance, Labor and Material bonds provided by Contractor
- DWWD responsible for its share of any potential construction change orders
- No added project cost to MWRA





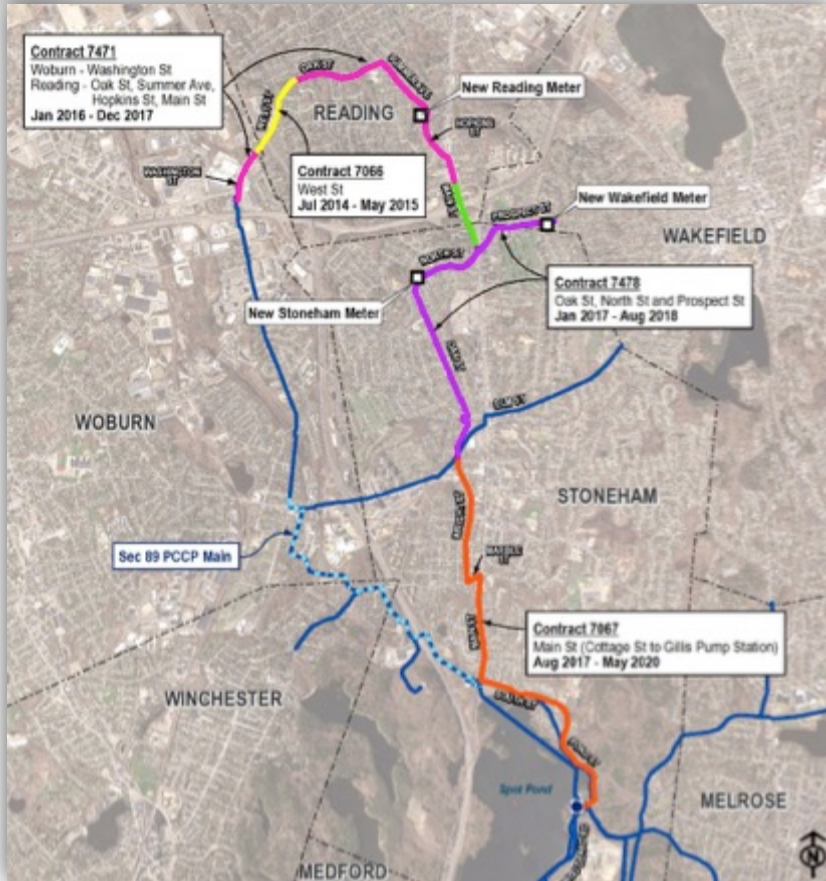
***Northern Intermediate High
Section 89 Replacement***

Contract 7116

March 21, 2018



NIH Section 89 Replacement – Current Progress



- **Contract 7066: (\$1,921,952)**
 - 2,400 linear feet of 36-inch pipeline
 - Completed May 2015.
- **Contract 7471: (\$11,071,797)**
 - 8,800 linear feet of 36-inch pipeline
 - NTP January 2016
 - Substantial Completion December 2017
- **Contract 7478: (\$17,817,999)**
 - 7,800 linear feet of 48-inch pipeline
 - 2,600 linear feet of 16 and 12-inch pipeline
 - Substantial Completion September 2018
- **Contract 7067: (22,737,300)**
 - 14,000 linear feet of 48-inch pipeline
 - Substantial Completion May 2020



NIH Section 89 Replacement



Contract 7116: Design and ESDC

- 10,500 linear feet of 48-inch pipeline
- Abandonment of Section 29 (6,000 Linear feet of 24-inch diameter pipe)
- Replacement of Three Line Valves
- Replacement of Six Blow-off Valves
- Replacement of Six Air Valve Assemblies



NIH Section 89 Replacement – Contract 7116

PROPOSER	FINAL RANKING	TOTAL POINTS	PROPOSED CONTRACT COST
Stantec Consulting Services, Inc.	1	389	\$3,948,625
Green International Affiliates, Inc.	2	379	\$4,115,911
Parsons Transportation Group	3	324	\$3,922,621
Hazen and Sawyer, P.C.	4	290.2	\$4,835,462
Arcadis U.S., Inc.	5	291.4	\$3,406,922
Kleinfelder Northeast, Inc.	6	278	\$4,681,127
AI Engineers, Inc.	7	243.5	5,238,546*
Engineers Estimate	-	-	\$3,705,444



Contract 7116 - Section 89 Replacement: Schedule

ITEM	START	DURATION	END
Contract NTP	April 2018	57 Months	January 2023
Design	April 2018	24 Months	April 2020
Construction	May 2020	21 Months	January 2022
Warranty	January 2022	12 Months	January 2023





Electronic Document Management System

March 21, 2018



MWRA Long-Term Content Management Plan



MWRA Content Management

Document and Records Management, Image Processing, Workflow/Business Process Management, Electronic Signature







MWRA Fleet Update

March 21, 2018



Fleet Make-up

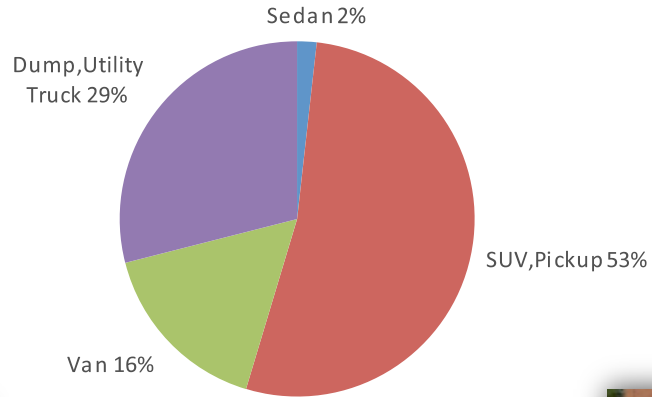
- MWRA's fleet includes 520 plated vehicles and pieces of equipment
- The average age of the fleet is 6.3 years
- The replacement value of the fleet is approximately \$30,000,000
- There are currently 41 hybrid vehicles and 8 solar powered arrow boards



Types of Vehicles

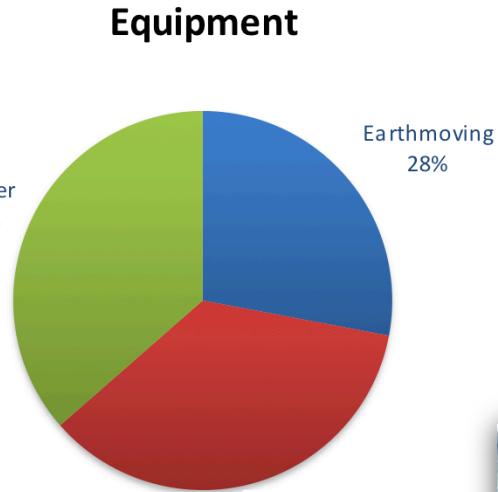


Passenger Vehicles





Types of Equipment





Examples of Vehicles and Equipment in Use





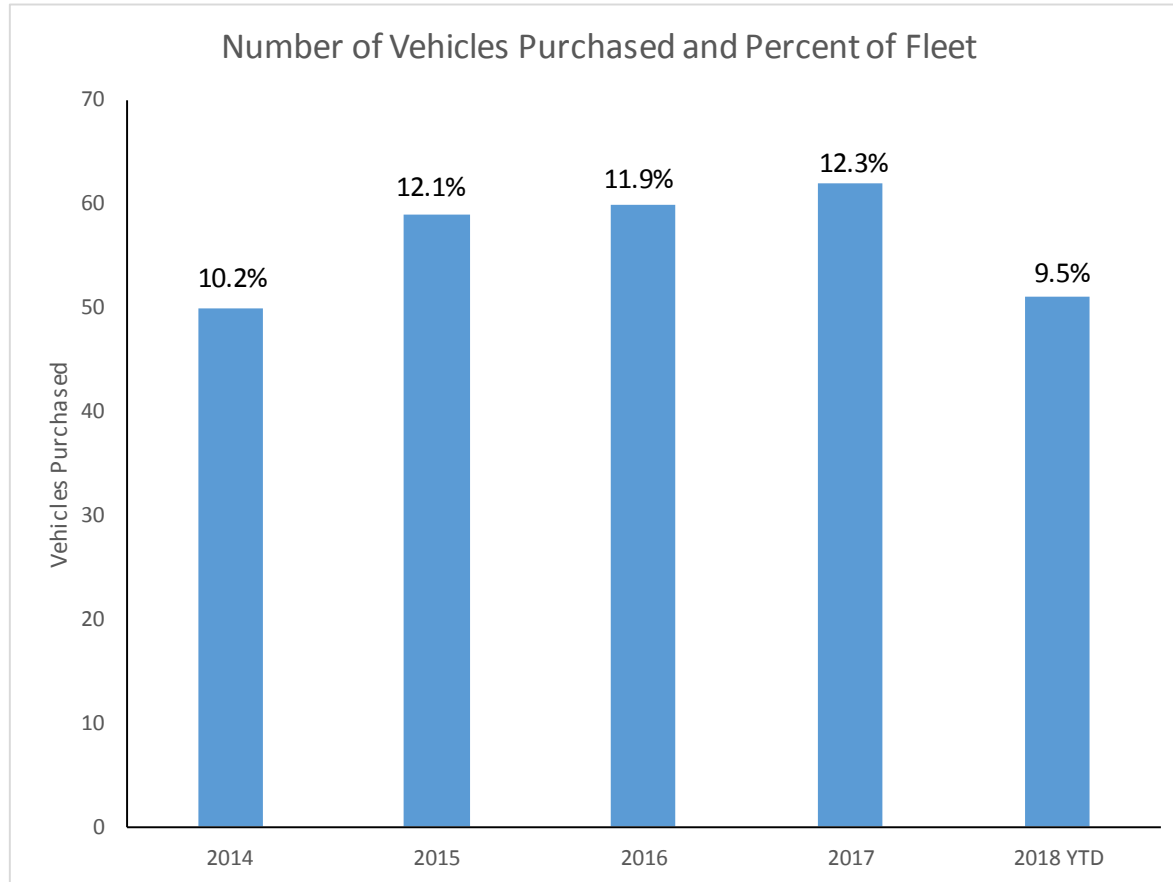
Purchase/Replacement Process

Type	Description	Age (Years)	Mileage	Other
Vehicles	Class 1-3: sedan, pickup, 4x4, van	8	125,000	Condition warrants replacement
	Class 4-5: bus, med-heavy duty truck	8	75,000	Condition warrants replacement
Equipment	Class 6-8: tractor, tag-a-long trailer	10		Condition warrants replacement

- A vehicle committee consisting of staff From Operations, Procurement, Budget and Fleet Services meets regularly to review the status of the fleet, to review vehicle replacement requests and to make recommendations to the committee co-chairs (the COO and Director of Administration) as to which vehicles to replace with new purchases
- A competitive procurement is undertaken to purchase new vehicles

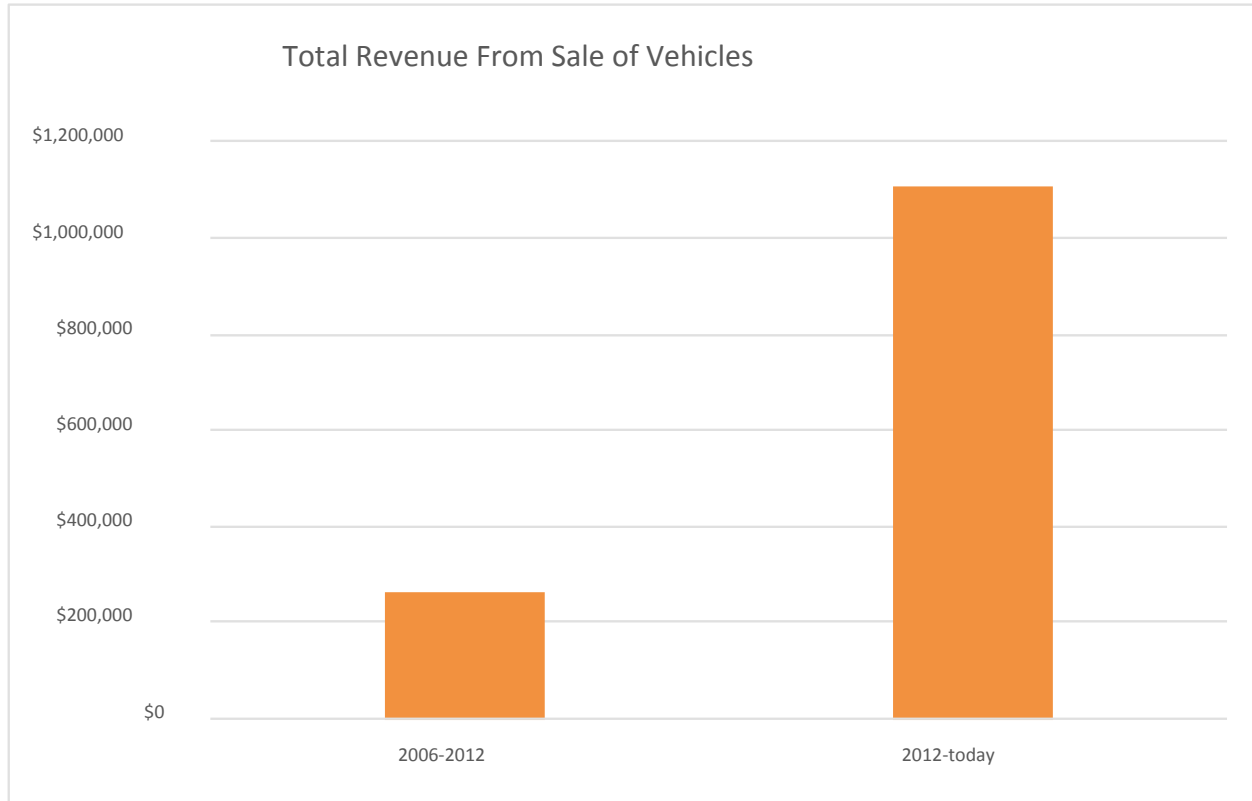


5-Year Purchase History





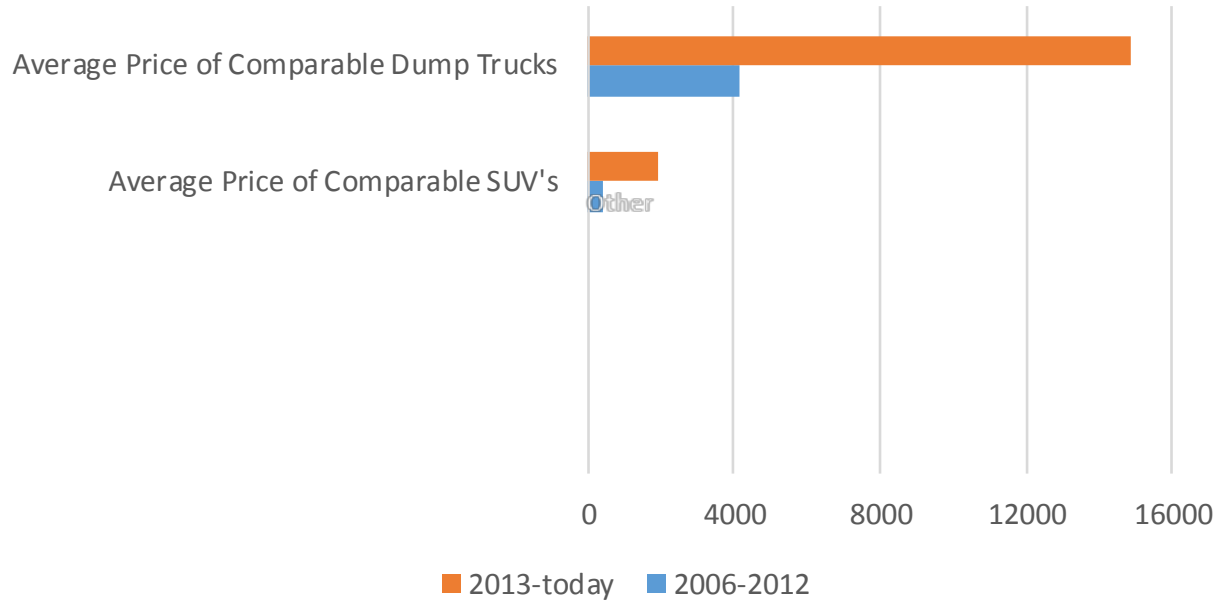
Sale of Surplus Vehicles/Equipment





Sale of Surplus Vehicles/Equipment

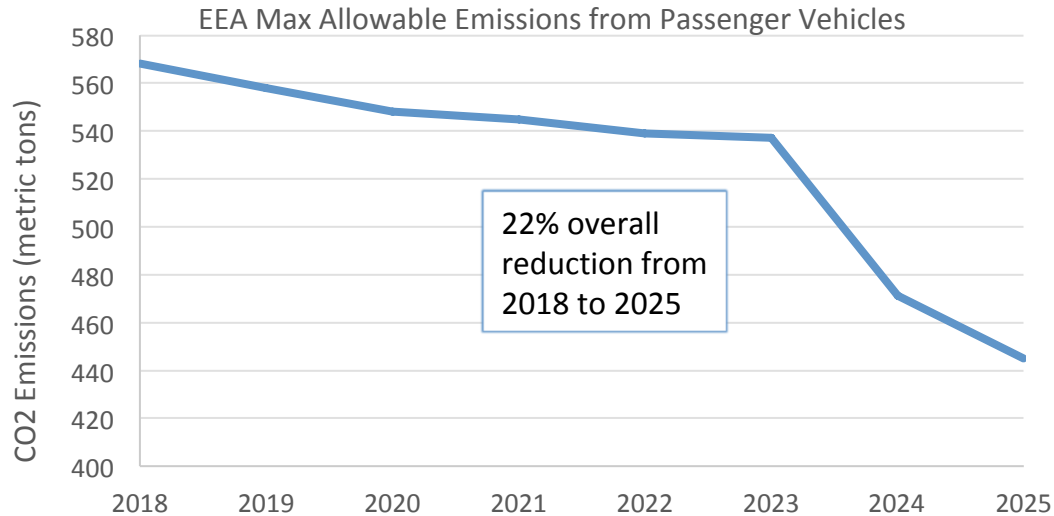
Average Sale Prices of Comparable Vehicles





Emission Regulations on Passenger Fleet Vehicles

- MassDEP new regulation to set limits on carbon emissions from state fleet passenger vehicles beginning in 2018



- MWRA currently has 112 passenger vehicles including sedans and SUVs
- MWRA represents about 66% of EEA passenger vehicle target
- Current requirement on heavy duty (non-passenger) vehicles is to report annual mileage and fuel usage – no current emission limits





***Deer Island Power Outage
March 14, 2018***

March 21, 2018



March 14, 2018: Deer Island Power Outage

- **8:37 am: Eversource regional outage**
 - Fault at South Boston, Andrew Square
 - Affected all water and wastewater facilities in the area
 - Deer Island only facility to trip off line
- **9:00 am: First pumps on-line**
 - Flow ramped up over next hour
 - Close coordination with Chelsea OCC required
- **No SSOs, CSOs or any raw sewage releases as a result**





Complications from Outage

- **9:34 am - PICS communications failure**
 - Central Monitoring not available
 - Staff deployed to remote facilities to monitor/control locally

- **10:35 am – PICS restored to normal operation**



Consequences of Outage

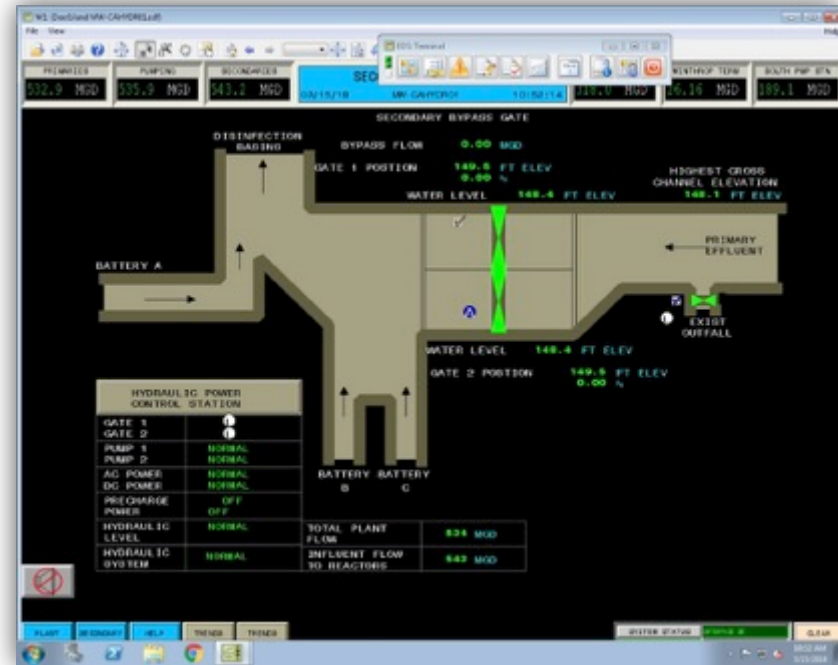
- **11:07 am – Flow control gate opens**
 - Resulting in a blending event
 - Reportable to regulatory agencies
- **11:38 am – All blending ceases**
- **2:52 pm – Free flow at all headworks in the North**
- **7:00 pm – Deer Island fully reconnected to utility power**



Reportable Event

Reportable event due to Blending / Bypass occurring at less than 700 MGD

- 9.74 Mgal out of 551 Mgal for Day
- Less than 2% of Total Plant Flow Blended or Bypassed
- All NPDES permit numerical standards met



Flow Control Gate (controls blended flow quantities)



Flow Control Gate

- HMI graphic revised
- Changed Authorization – only Shift Managers or Higher have authorization to adjust set points effective immediately
- Added alarms whenever gates are not in upright closed position
- Tool Box Talks conducted for all Operations Staff:
 - Importance of Gate
 - Impact to NPDES permit

PICS

- Revisit PICS battery replacement cycle

Plant

- Conduct more drills on manual operation of Plant





***Update on Infiltration/Inflow
Local Financial Assistance Program***

March 21, 2018



MWRA I/I Local Financial Assistance Program



Infiltration
(Groundwater via physical defects)



Inflow
(Stormwater via direct connections)

Goal – Rehabilitation of local sewer systems and long-term reduction of I/I and ensure that dry weather flow to Deer Island is below NPDES permit limits



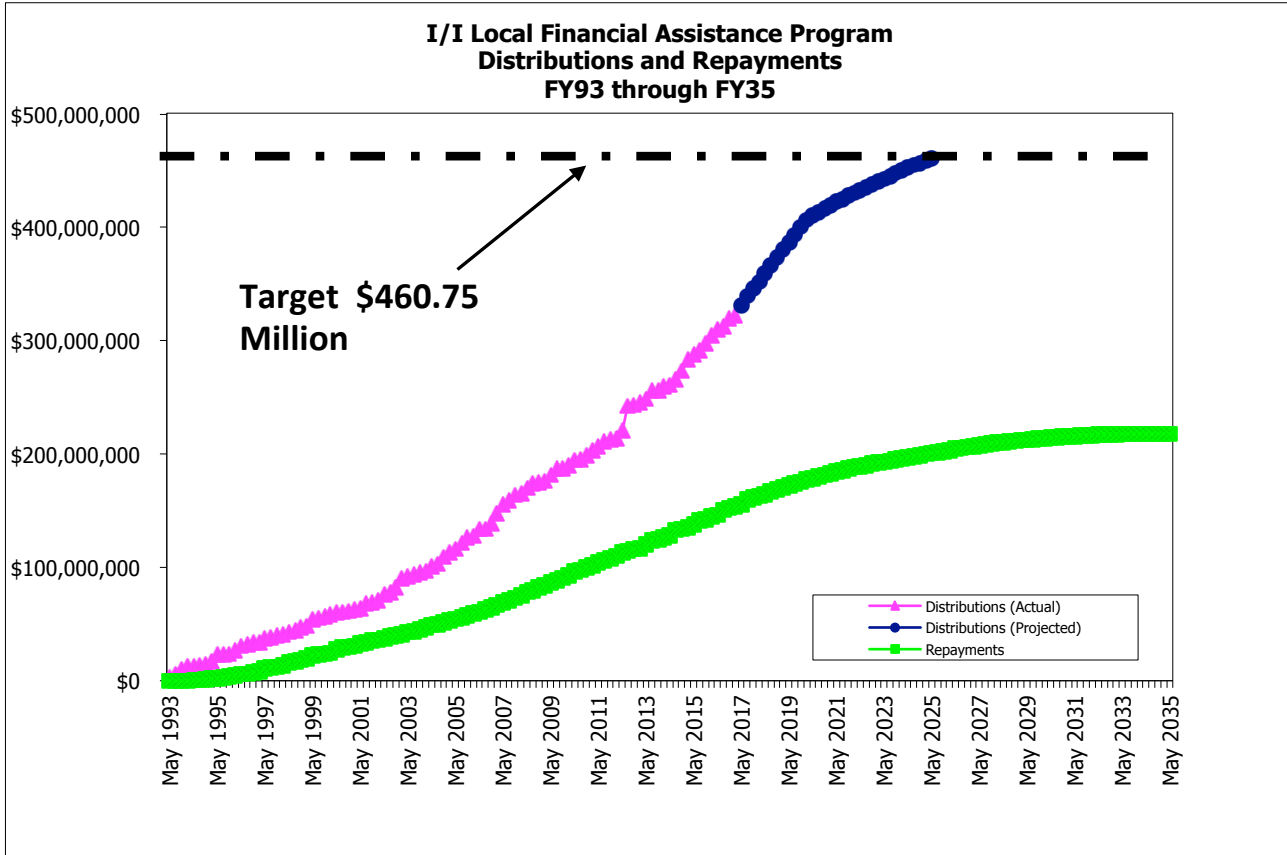
MWRA I/I Local Financial Assistance Program

- **\$460.75** million approved for distribution (10 Phases)
- **\$352** million distributed (FY93 – February 2018) 76% of Total
- **\$162** million loans repaid to MWRA
- **541** local projects funded
- All **43** member sewer communities participating
- Community allocation based on % share sewer charge

- **\$160** million approved in FY15 with enhanced funding terms
 - Prior terms 45% grant / 55% 5-year interest-free loan
 - New terms 75% grant / 25% 10-year interest-free loan



Distributions and Repayments





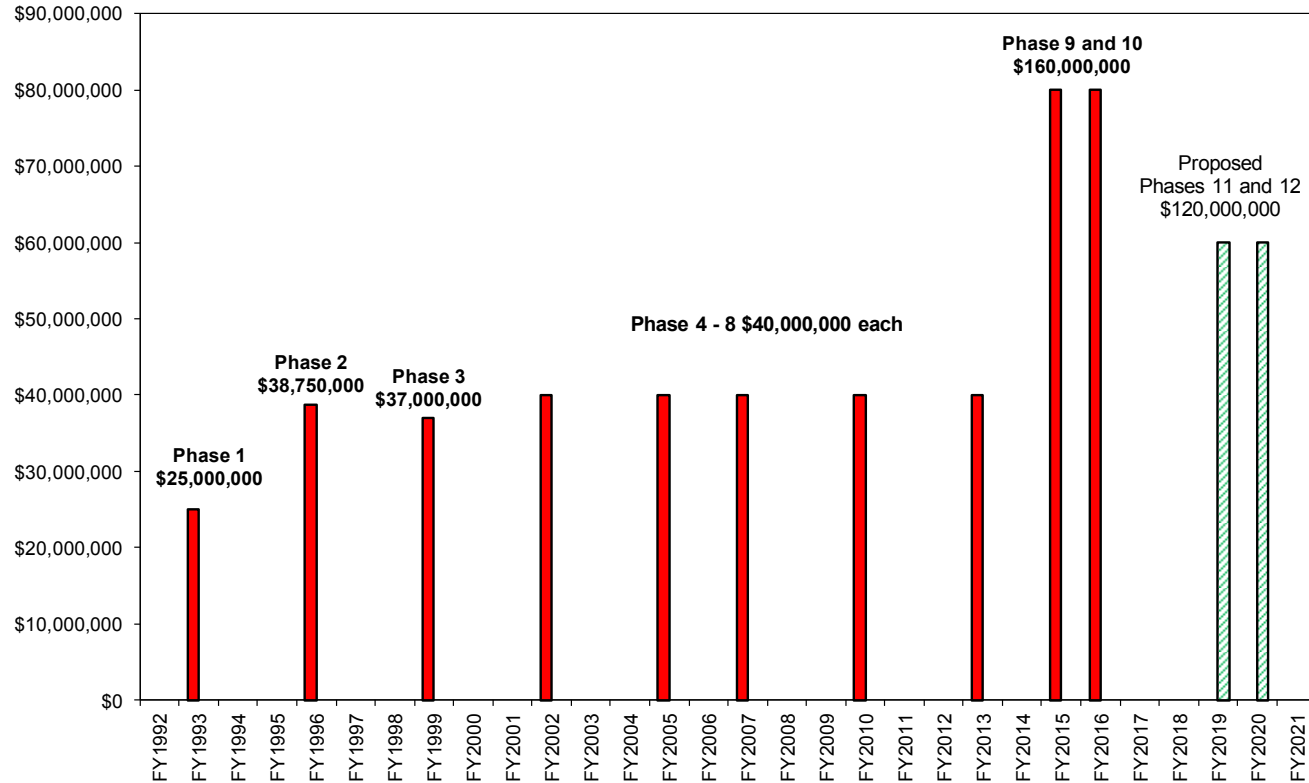
I/I Local Financial Assistance Program

- Community funding applications/distributions have increased
 - FY94-99 \$9.0 million per year
 - FY00-05 \$10.5 million per year
 - FY06-11 \$17.0 million per year
 - FY12-17 \$21.0 million per year
- MassDEP Regulations Required All Communities to Submit an I/I Control Plan by December 2017
- 13 of 43 sewer communities have received all of their allocation through Phase 10



MWRA's Long-Term Commitment to Fund I/I Reduction

I/I Local Financial Assistance Program
Timing of Phases





I/I Funding Results

TV Inspection of Sewers: 1,957 miles





Examples of Infiltration into Sewer Pipelines





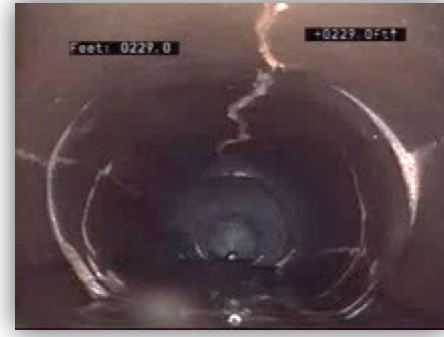
Infiltration at Sewer Pipe Joint





I/I Funding Results

191 miles of sewer Cured-In-Place Pipe (CIPP) liner installed





I/I Funding Results

60 miles of sewer replaced



Quincy sewer repair at Salt Marsh



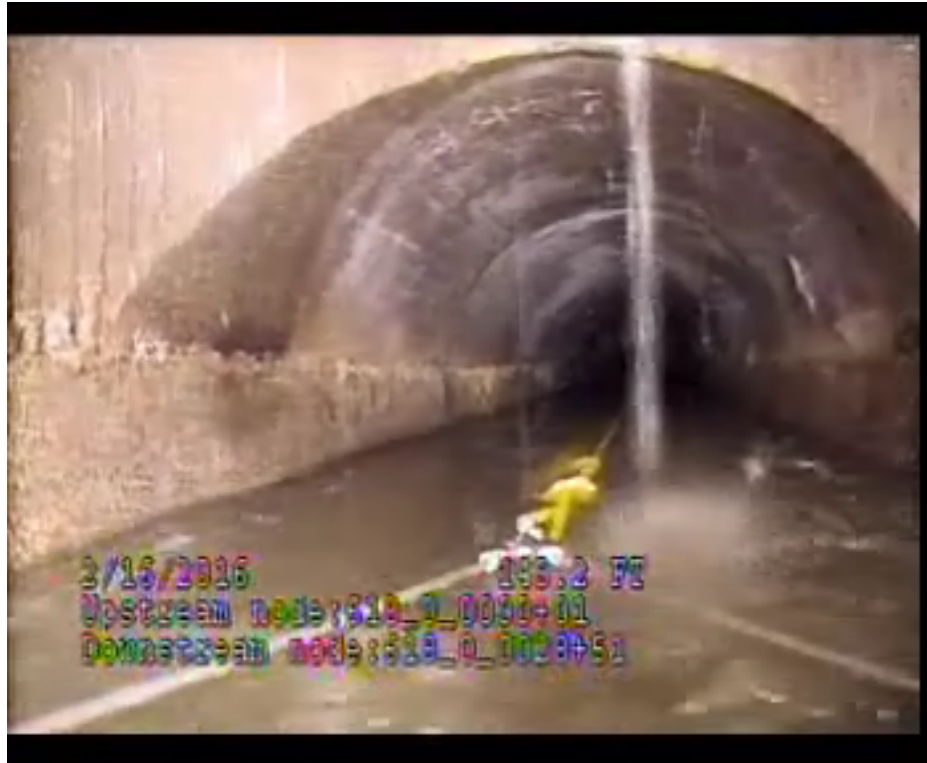
I/I Funding Results

16,804 manholes rehabilitated/sealed





Inflow - Snow Melt into Manhole





I/I Funding Results

1,308 miles of sewer smoke tested

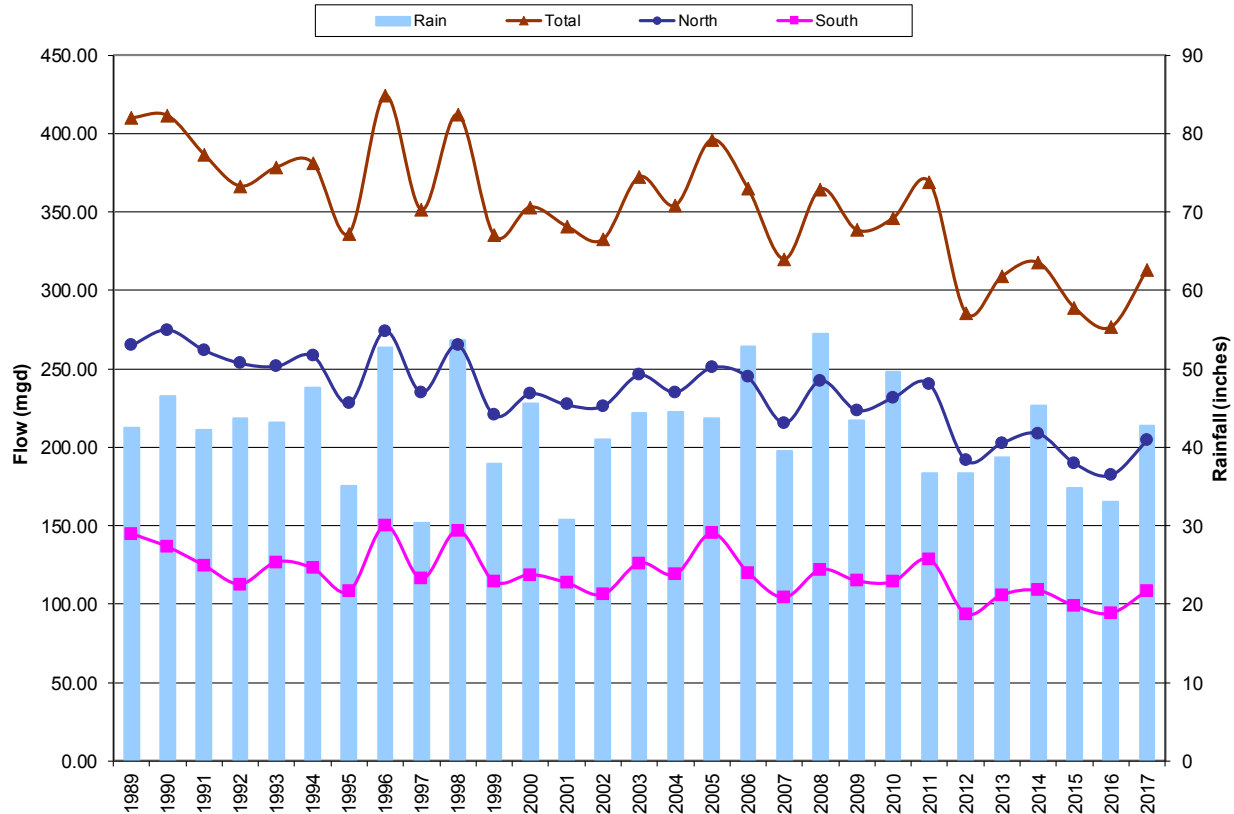
1,060 catch basins disconnected from sewer





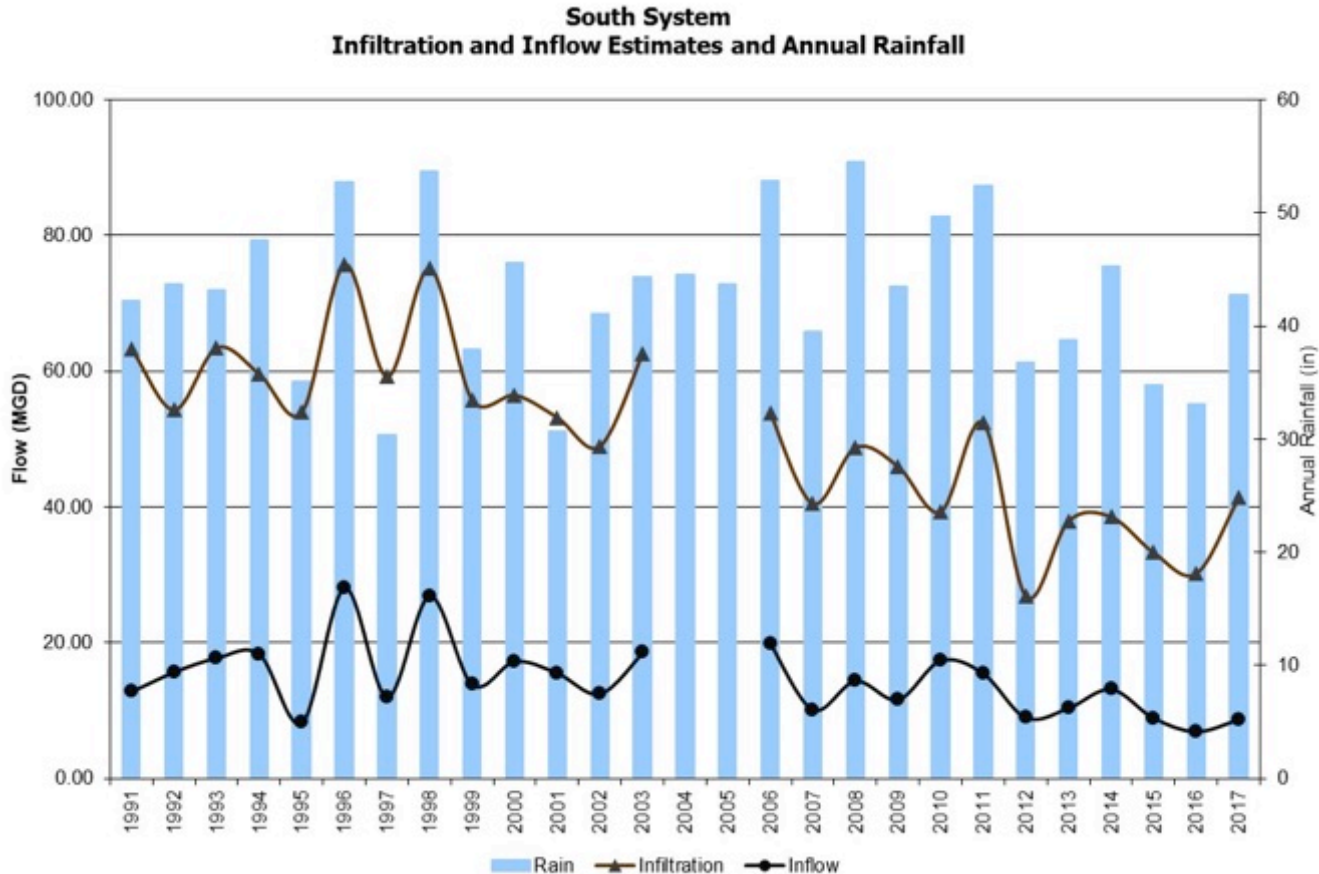
MWRA Long-Term Regional Flow Data

MWRA Long-Term Regional Flow Data
NOAA Annual Rainfall at Logan Airport





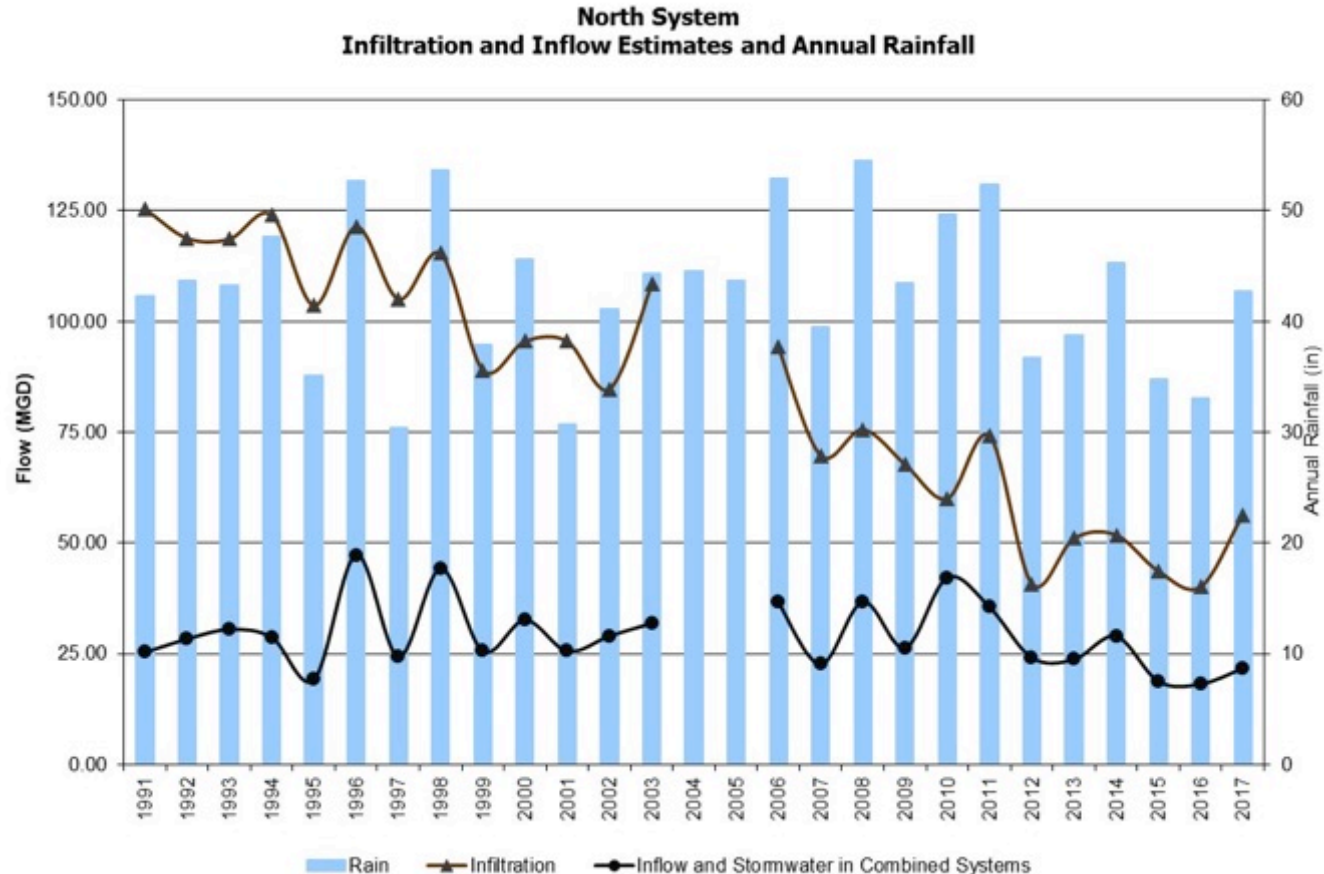
MWRA South System Long-Term Infiltration/Inflow Estimates



*No I/I estimates for 2004-2005 due to wastewater metering system replacement project



MWRA North System Long-Term Infiltration/Inflow Estimates



*No I/I estimates for 2004-2005 due to wastewater metering system replacement project





March Nor'easters: Storm Damage to Boston Harbor Islands

March 20, 2018



MassPort: Storm Preparations



Protecting electrical equipment



MWRA: Storm Preparations



Stop logs installed to keep facilities from flooding

DCR: Nantasket Beach



Nantasket Avenue in front of DCR complex; damage to Hull Shore Drive



DCR: Spectacle Island



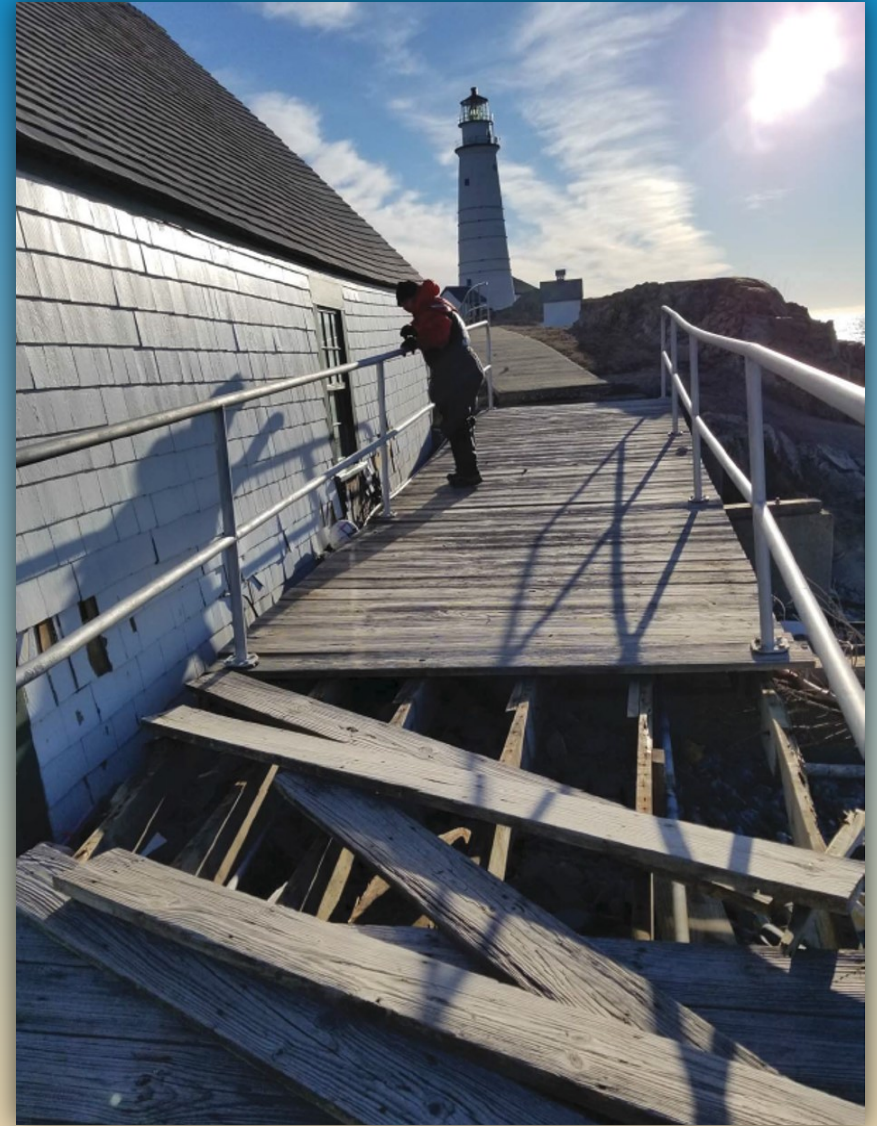
Damage to yurt

DCR: Hingham Commuter Boat Pier

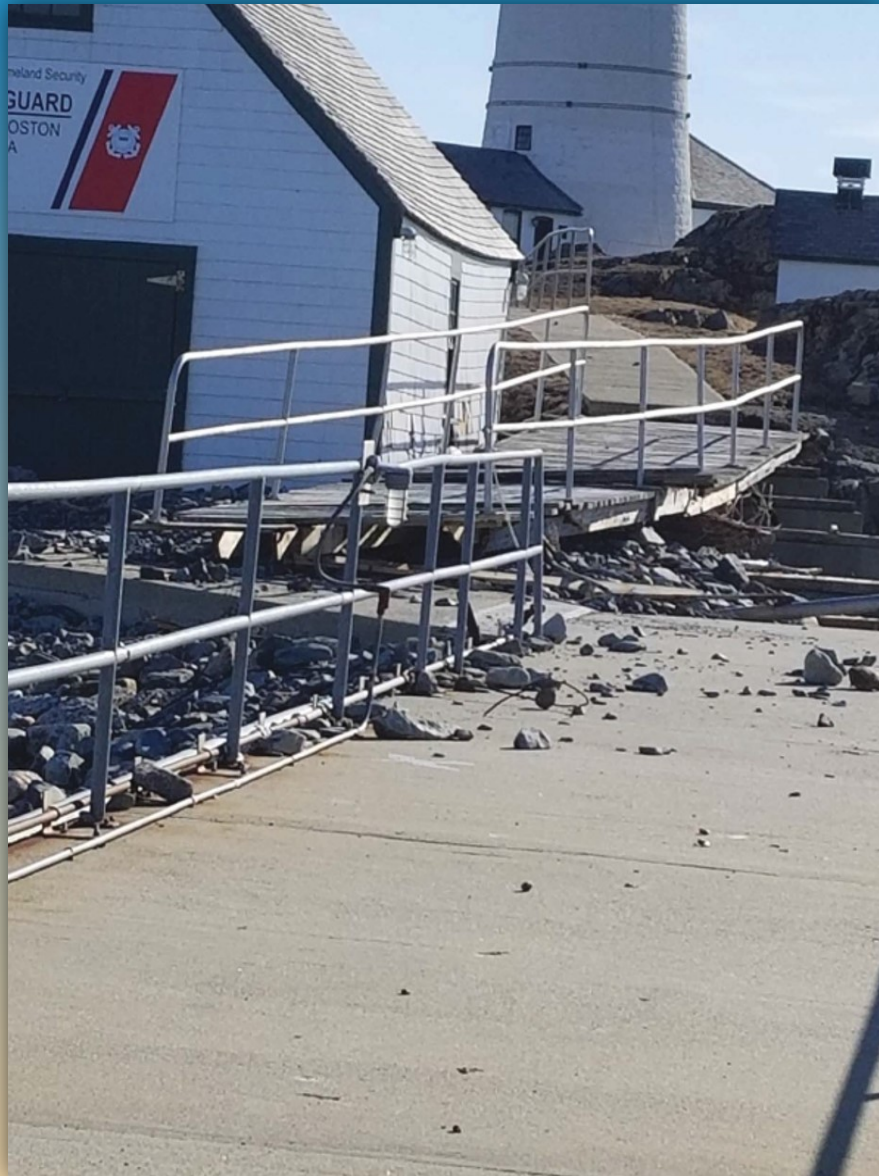


Undermined revetment and walkway

US Coast Guard: Little Brewster and Boston Light



US Coast Guard: Little Brewster and Boston Light



Boston Harbor Islands Partnership



Thompson Island



Once again, the climate-resilient design of the Waterfront Landing paid off. With the main decking placed above the 100 year storm sea level, the storm surge went under, not through, the building. This time without the ice of the Jan. 4 storm.

Thompson Island



This area was all cleaned up after the Jan. 4 storm. Time to clean it up all over again.

Thompson Island



The greatest damage we sustained was to the wave wall. This breach appears to have been created by the sheer force of wind and waves out of the east and northeast.

Calf Island



Looking east, showing massive overwash fan of cobble pushed by storm energy over the top of the salt marsh

Gallops Island



Looking southwest, showing continued damage to historic seawall and erosion of bluff that protects cemetery

Grape Island



Looking east (left image) and looking west (right image), showing overwash fan of shells, cobble, and vegetative debris pushed by storm energy over the coastal trail next to the pier

Georges Island and Lovells Island



Looking south, showing continued damage to historic seawall and outer earthworks of Fort Warren



Looking east, showing perched doorway and tunnel entrance associated with Fort Standish coastal defense installation

World's End



March 2nd high tide



Charlestown Navy Yard



Charlestown Navy Yard



Dry Dock received 15 feet of water from overflow of caisson, overtopping and pump drains



Charlestown Navy Yard



Pier One was flooded from overtopping of seawall

East Boston



Boston Harbor Islands Partnership



State Street, Boston



AP/CityLab

Boston Harbor Islands Partnership



MWRA: Deer Island



The seawall protects the island from storm surges

MWRA: Deer Island



Fallen tree in front of historic pump station; granite blocks along public access were moved by waves



Short Beach, Revere



Shirley Street, Winthrop



MWRA: Nut Island



Access to Nut Island was cut off by roadway flooding



Eastern Avenue, Chelsea



Summing It All Up...



Secretary Matt Beaton

Boston Harbor Islands Partnership



