TOWN OF DEDHAM

2014-2015
INFLOW/INFILTRATION
PRIVATE BUILDING INSPECTION PROGRAM

DEFINITIONS:

WASTEWATER: This is used water that can be disposed through your plumbing fixtures, including showers, sinks, dishwashers, washing machines and toilets.

INFLOW: This is stormwater that enters the Town's Sewer System through piping that mistakenly directs stormwater to the sewer system instead of the drainage system.

INFILTRATION: This is clean water from below the ground (known as groundwater) that comes in through broken sewer pipes and manholes.

ILLICIT CONNECTION: An illicit sewer connection is a stormwater connection made to the Town's Sewer System that introduces Inflow into the sewer system. These types of connections are prohibited under the MA Plumbing Code and Town of Dedham Sewer Regulations. Typical illicit sewer connections include:

- *Basement Sump Pumps*
- *Roof Leaders/Downspouts*
- *Foundation/Cellar French Drains*
- *Driveway Drains*

HISTORY:

- The Town's sewer system is over 120 years old with the first sewers being installed in 1902.

- The Town currently has approximately 95 miles of sewer main mostly comprised of vitrified clay and approximately 2,600 sewer manholes mostly constructed of brick.

- In 2007, The Engineering Department began an Infiltration Removal Program that aggressively focused on eliminating infiltration from the Town's sewer system through Trenchless Technologies (Pipe & Manhole Lining). Since 2007, the Engineering Department has been involved with:

    - *The inspection of 1,175,888 linear feet (223 miles) of sewer main.*

    - *The inspection of 3,844 sewer manholes.*

    - *The installation of 90,287 linear feet (17 miles) of manhole to manhole cured-in-place liners.*

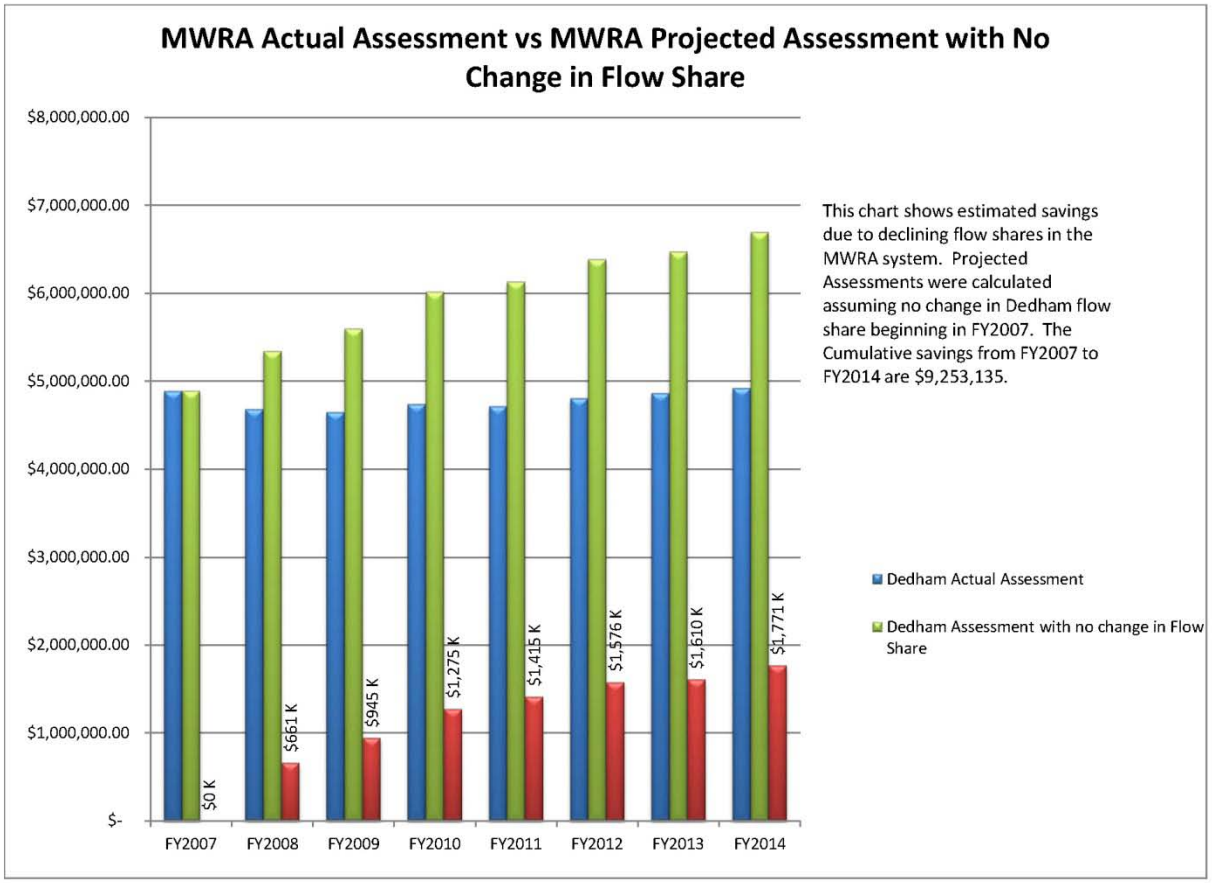
    - *The installation of 2,094 linear feet of cured-in-place short liners.*

    - *The exterior grouting and cementitious lining of 3,834 vertical feet of sewer manhole.*

    - *The removal of approximately 3,400,000 million gallons per day of infiltration.*

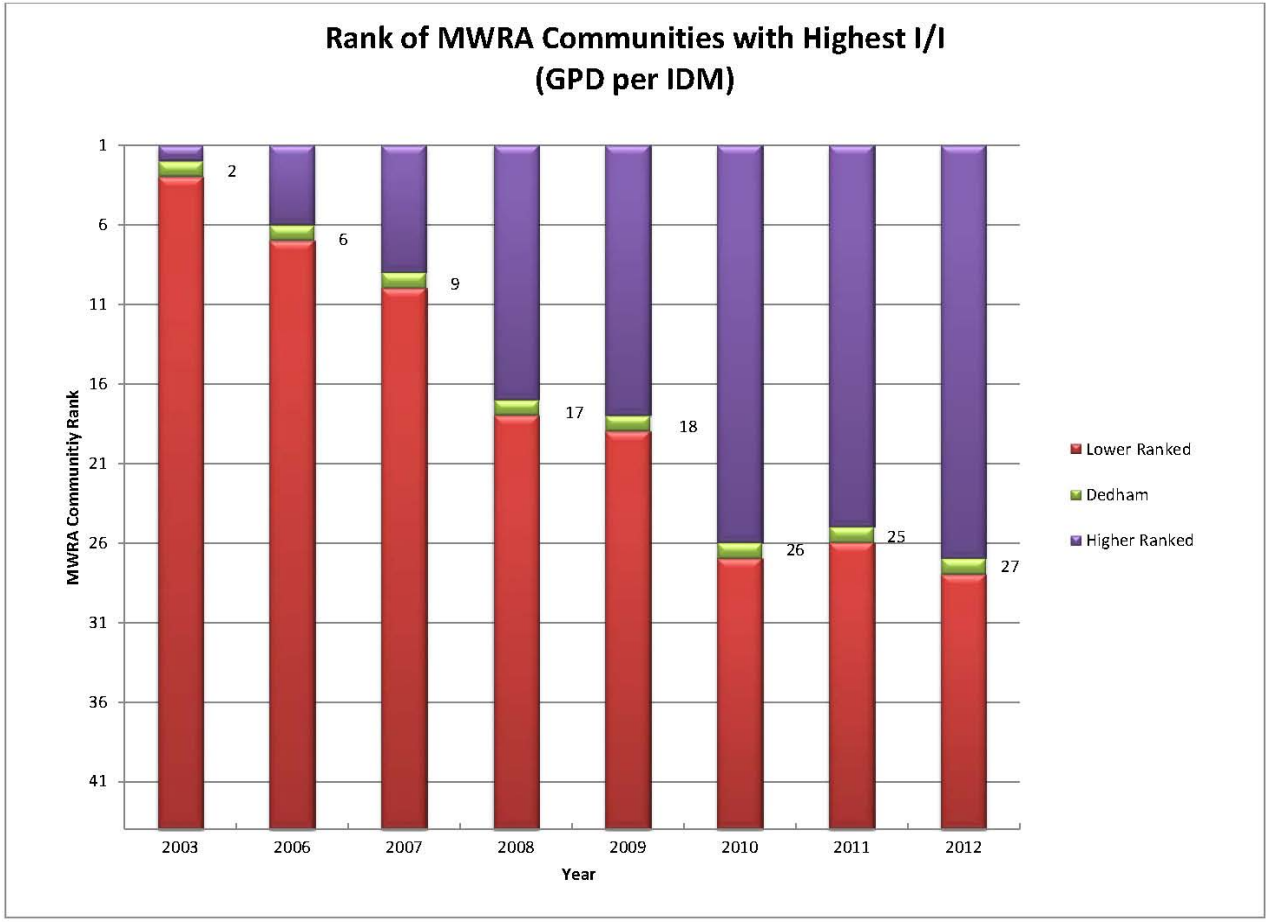
HISTORY (con't):

- The cost of rehabilitating the Town's Sewer System through Trenchless Technologies over the past 7 years has cost approximately $7.7 million. Assuming a no change in flow share scenario, it is estimated that Dedham has cumulatively saved $9.3 million in MWRA assessments since 2007.



HISTORY (con't):

- The most recent MWRA rankings show that Dedham has improved from the 2nd worst in inflow and infiltration in 2003 to the 27th out of the 43 MWRA communities in 2012.



MOST RECENT I/I PROJECTS:

- 2012 Municipal Building Inspections: The Engineering Department along with Weston & Sampson conducted inspections of our 21 municipal buildings (including schools) to identify sources of inflow to the Town's Sewer System. The results indicated that the Town only had 2 sources of inflow generating approximately 1,300 GPD of peak design storm inflow. These 2 sources were removed in the Spring of 2013.

- 2012 Inflow Investigation: The Engineering Department along with Weston & Sampson performed smoke testing on 40% of the Town's Sewer System. Smoke testing consists of pumping a white, non-toxic smoke into the sewer system then observing the surrounding area for smoke escaping from the ground or from drainage structures. A total of 39 sources of inflow were identified as part of this investigation. Of the 39 sources indentified, 5 of them were located in the Town's right-of-way (ROW) accounting for approximately 510,000 GPD of peak design storm inflow. The remaining sources were privately owned. The removal of the inflow sources were handled in-house by the Engineering Department and Department of Public Works in the Summer of 2013.

- 2013 Inflow Investigation: The Engineering Dept. along with Weston & Sampson performed smoke testing on an additional 40% of the Town's Sewer System. A total of 27 sources of inflow were indentified as part of the investigation. Of the 27 sources indentified, 6 of them were located in the Town's ROW accounting for approximately 6,100 GPD of peak design storm inflow. These removal of these sources will be once again handled by the Engineering Dept. and Dept. of Public Works this summer.

UPCOMING I/I PROJECTS:

- 2014 Wet Weather Inspections: Under the Town's On-Call Sewer Rehab Contract awarded to National Water Main Cleaning Co., the cleaning and inspection of approximately 124,000 linear feet (23.5 miles) of sewer main will be completed. This project is currently underway and is anticipated to be completed in May 2014.

- 2014 Sewer Rehabilitation Project (Year 8): Utilizing the data collected during the wet weather inspections, a work order for our On-Call Sewer Rehab contractor consisting of cured-in-place long and short liners and sewer manhole grouting and lining will be generated to continue our ongoing efforts to remove infiltration from the Town's Sewer System.

- 2014 Sewer Inflow Investigations: The Engineering Dept. along with Weston & Sampson will perform smoke testing on the remaining 20% of the Town's Sewer System. This work is anticipated to begin late summer/early fall of 2014.

- 2014 Private Building Inspection Program: The Engineering Dept. along with Weston & Sampson will conduct inspections on approximately 4,200 private buildings (50% of the Town) that are connected to the Town's Sewer System. The intent of this program is to identify prohibited sources of inflow (sump pumps, floor drains, removed sewer cleanout caps, etc.) that may be connected to the Town's Sewer System. This work is anticipated to begin this June. The remaining 4,200 private buildings will be inspected in 2015.

2014 PRIVATE BUILDING INSPECTIONS PROGRAM:

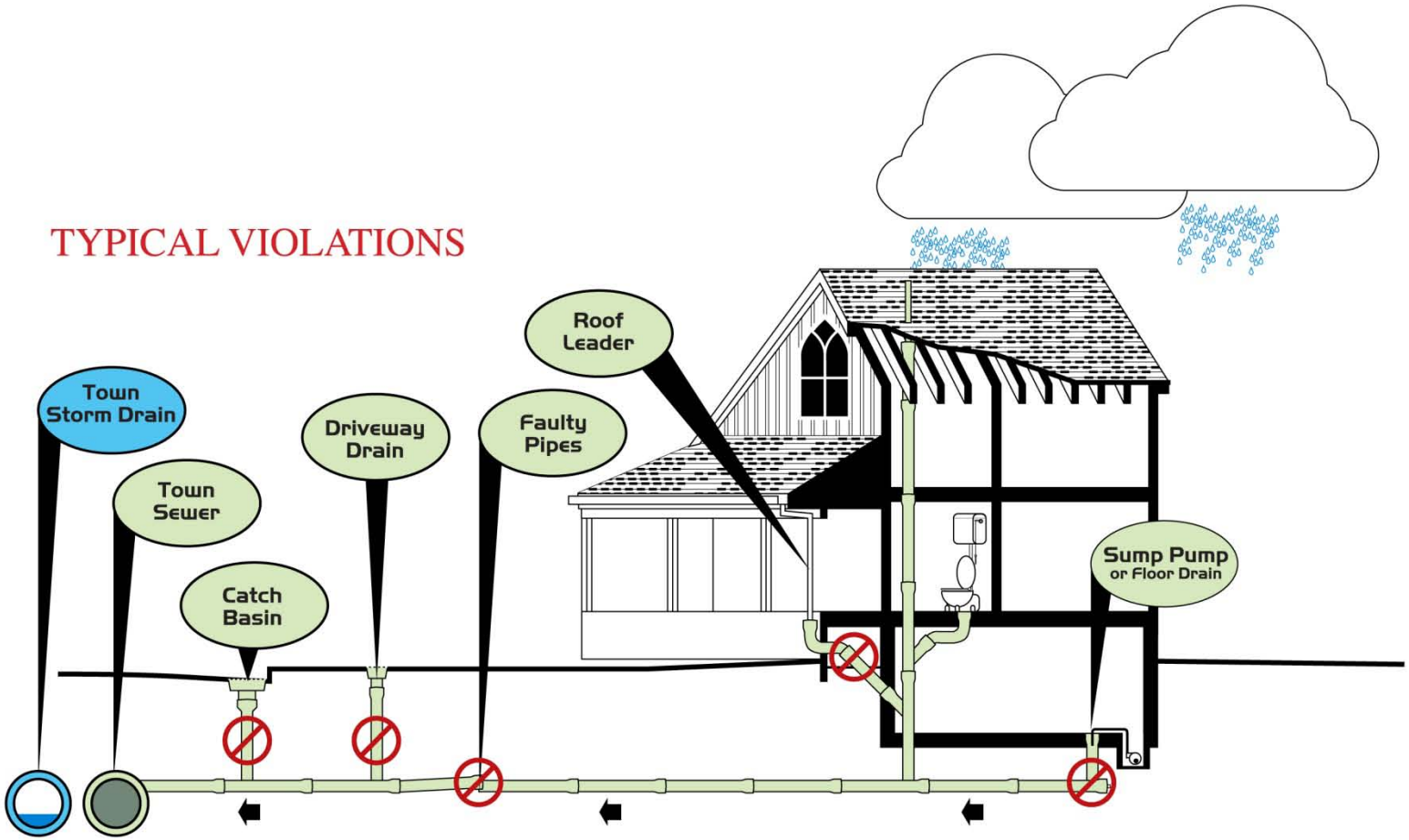
- The Private Building Inspections Program is the next big sewer program to come out of the Engineering Department since our 2007 Sewer Rehabilitation Program which is currently entering its 8th year.

- Through the Engineering Department's Sewer Rehabilitation Program we have removed approximately 3.4 million GPD of infiltration from our system over the past 7 years. Infiltration issues will always arise in a system as old as Dedham's and we will continue to investigate and rehabilitate our sewers every year with the funding the Town has continuously provided through the great support of the BOS, CEC, FIN COM and Town Meeting Members.

- On an average dry weather day the Town generates approximately 4 million GPD of wastewater that is transported and treated by the MWRA. During times of wet weather and storm events, the amount of wastewater can climb up to 16 million GPD as a result of I/I. Of that 12 million GPD increase, approximately 70% comes from Inflow while the remainder comes from Infiltration as determined from our 2011 Town-Wide Flow Monitoring Program.

- This data shows that Inflow has become the major contributor of clean water that enters the Town's Sewer System and is being treated by the MWRA at the expense of resident and commercial owners. The Town has taken responsibility for indentifying and removing sources of inflow from our municipal buildings and ROWs over the past few years and now the focus must turn to the private buildings to indentify and quantify these potential sources of inflow. This will allow us to develop a plan to redirect these sources so the resident and commercial owners do not have to continue to pay for its treatment.

TYPICAL VIOLATIONS



2014 PRIVATE BUILDING INSPECTIONS PROGRAM:

- Since 2007 when the Town began its aggressive I/I removal programs, the sewer rates increased once in 2008 and have remained unchanged since then. A major contributor to that has been the Town's efforts to remove I/I. The Town's flow share to the MWRA has dropped from 1.77% in 2007 to 1.13% in 2014 resulting in stabilized yearly MWRA sewer assessments. That is a 36% decrease in flow share and only a 1% increase in our yearly MWRA sewer assessments over the past 7 years.

- As more MWRA communities begin to address their I/I problems, their flow share will go down resulting in ours going up if we do not continue to move forward in our efforts to remove I/I. This could likely result in higher yearly MWRA assessments which would mean in increase in the sewer rates resulting in higher sewer bills to the residential and commercial owners.

- There are many benefits to removing I/I from the sewer system including reduced sewer backups, overflows, healthier streams and ponds, a cleaner environment and reduced sewer operation and maintenance costs.

- The Town's intent with this program is to work cooperatively with the resident and commercial owners to identify what sources of inflow exist on their properties and to determine an overall amount of inflow entering our sewer system. If it is determined that a significant amount of inflow could be removed by redirecting these sources, then we will work with the resident and commercial owners along with the BOS to develop a program that will be fair and amenable to all parties involved.

IN COMPLIANCE