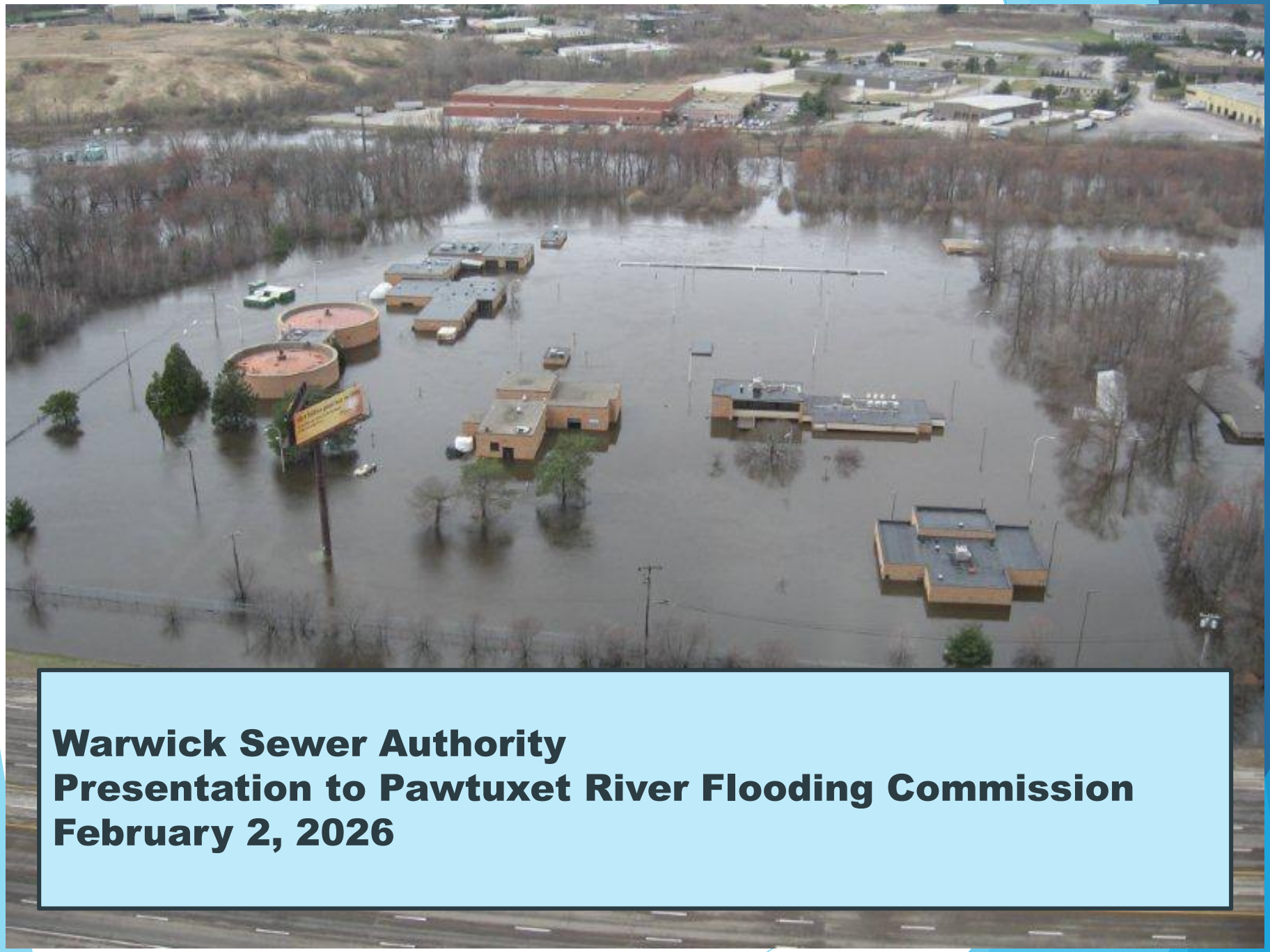


Warwick Sewer Authority
Presentation to Pawtuxet River Flooding Commission
February 2, 2026

Warwick Sewer Authority Representatives

BettyAnne Rogers, Executive Director

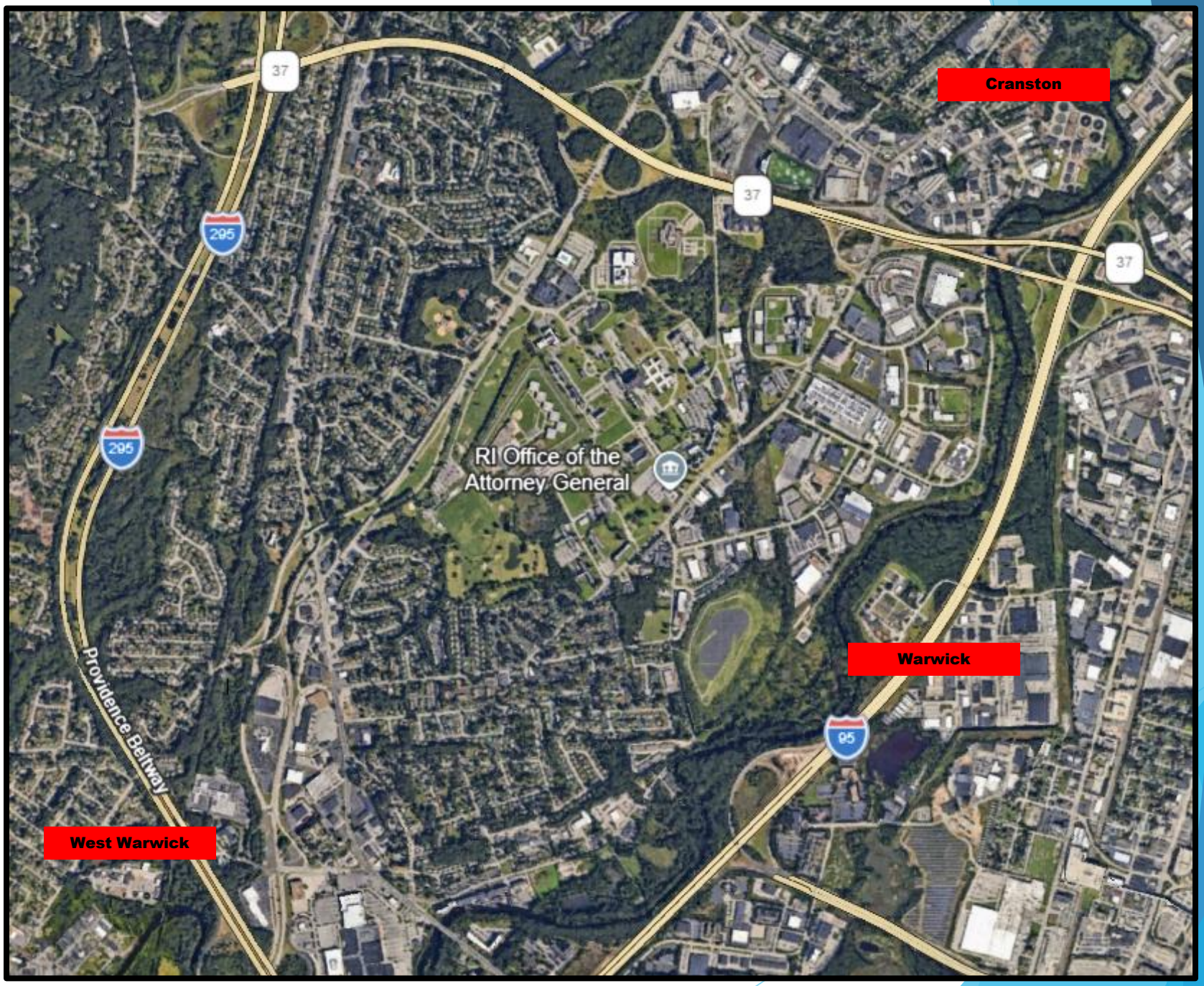
Michael Bedard, Superintendent

Nick Thompson, Assistant Superintendent

RI Wastewater Treatment Facilities (WWTFs)

- 19 Major WWTFs in RI
- Treat ≈120 MGD Wastewater
- WWTFs and Pump Station – Low Elevations
- Riverine or Coastal Flood Plain

- 3 Major WWTFs Discharge to Pawtuxet River
  - Cranston
  - Warwick
  - West Warwick


Cranston
37
37
37
295
295
RI Office of the
Attorney General
Providence Beltway
Warwick
95
West Warwick


Sharpe Dr
Ross Simons Dr
Arthur W Devine Blvd
Service Ave
Illinois Av
Vermont Ave
Bay State Ave
Ohio Ave
Access Rd
Plan Way
Jefferson Blvd
Three Ponds
Graystone St
Blackburn St
Quimby St
Cottage St
95
13
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RI Wastewater Treatment Facilities (WWTFs)

WWTF	CONSTRUCTED	RECENT UPGRADES	DESIGN FLOW (MGD)	AVERAGE DAILY FLOW (MGD)
Cranston	1942	2006 2016	20.2	10.2
Warwick	1965	2004 2016	7.7	4.9
West Warwick	1942	2005 2016	11	5.2

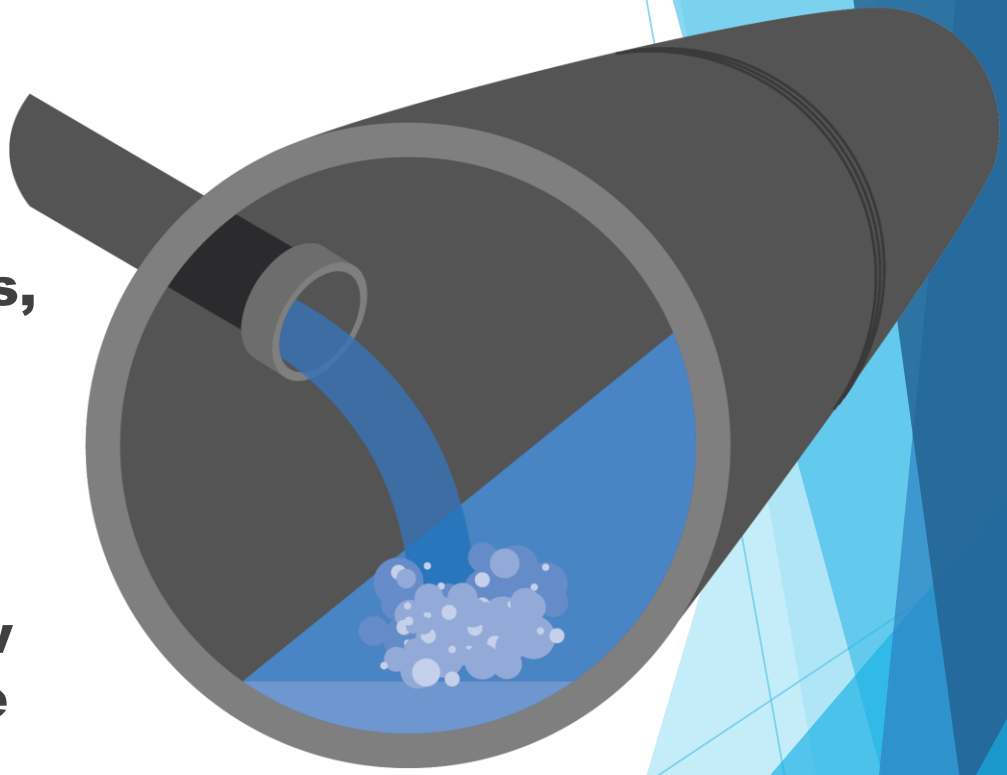
All three (3) municipalities, Cranston, Warwick and West Warwick, have separate wastewater and stormwater systems.

Inflow & Infiltration

What is Inflow?

- **Improper connections of stormwater control systems to the sanitary sewer system, i.e., gutters, downspouts, French drains, sump pumps**

- **Open clean-outs, faulty manhole covers that allow surface water to enter the sewer system**



Inflow

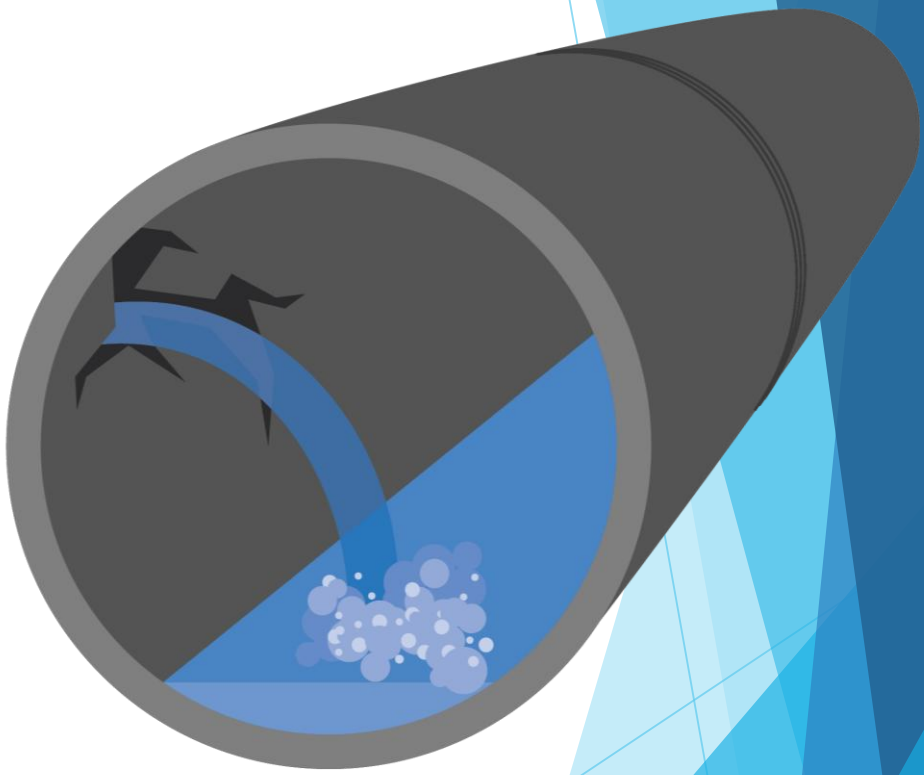
www.madsewer.org

Inflow & Infiltration

What is Infiltration?

- Where groundwater seeps into sanitary sewer pipes and manholes via cracks, leaky joints and deterioration

- Typically occurs gradually and can be exacerbated by aging infrastructure and/or heavy rainfall



Infiltration

www.madsewer.org

Inflow & Infiltration Report 2024 - 2025

	Year	
Determination of Inflow	**2024**	**2025**
Average Wet Weather Flow (MGD)	7.41	6.27
Average Dry Weather Flow (MGD)	5.70	4.93
Inflow (MGD)	**1.71**	**1.34**
Connected Population	57,122	57,826
Inflow Per Capita (GPCD)	29.9	23.2
Average Wet Weather Flow Per Capita (GPCD)	129.7	108.4

Inflow calculated to be 1.71 MGD for 2024 and 1.34 MGD, for 2025.
Average wet weather flow per capita determined to be 129.7 GPCD for 2024 and 108.4 GPCD for 2025.
These figures are well below the EPA's definition of excessive inflow (275 GPCD).

	Year	
Determination of Infiltration	**2024**	**2025**
Average Dry Weather Flow (MGD)	5.70	4.93
Base Sanitary Flow (MGD)	3.60	3.46
Infiltration (MGD)	**2.10**	**1.47**
Connected Population	57,122	57,826
Infiltration Per Capita (GPCD)	36.8	25.4
Average Dry Weather Flow Per Capita (GPCD)	**99.8**	**85.3**

Infiltration calculated to be 2.10 MGD for 2024 and 1.47 MGD for 2025.
Average dry weather flow per capita determined to be 99.8 GPCD for 2024 and 85.3 GPCD for 2025.
These figures are well below the EPA's definition of excessive infiltration (120 GPCD).

Warwick Sewer Authority (WSA): I&I WWTF During Heavy Precipitation

- 17.7 Peak Flow
- Storm Flow Pumps
- WWTF Generator
- Levee Improvements
- SCADA System

Warwick Sewer Authority (WSA): Levee Performance During Major Storm Events

Levee Flood Hardening

- Elevation increased by 5.5 feet following flood of 2010
- Structural Design & Materials
- 500 Year Flood Plain

WSA Collection System: I&I Pump Stations During Heavy Precipitation

Pump Stations

- **Pump Redundancy – 2 to 3 per station**
- **Flood Hardening**
- **Generator**
- **SCADA System**

Following the 2010 Flood, Pump Stations impacted by flood waters were flood hardened:

Bellows (photo)

Knight Street

East Natick & Natick II

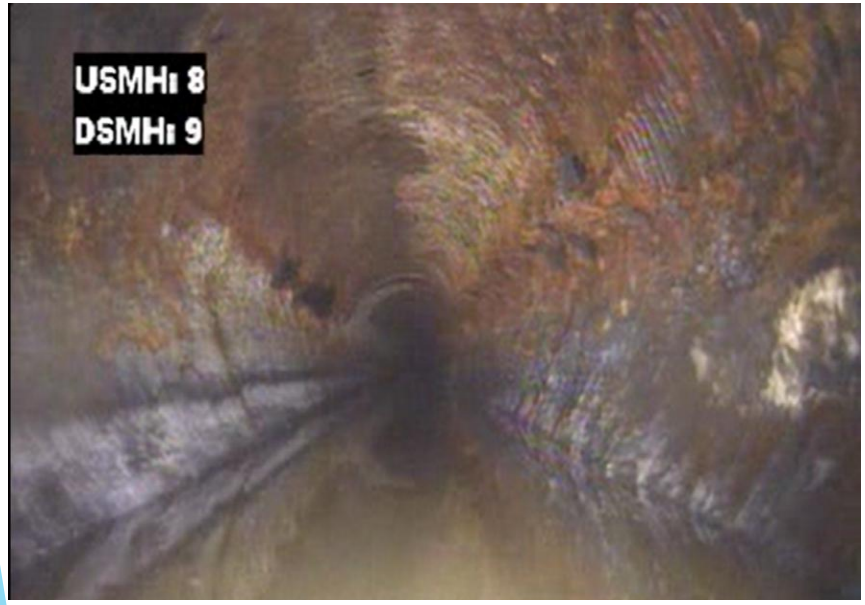
WSA Collection System: Inspection, Maintenance & Rehabilitation

Collection System Infrastructure

- CCTV Inspection of Pipe Condition
- Manhole Frame & Cover Inspection
- Smart Covers
- Vactor Cleaning and Flushing to prevent blockages and impede flow

WSA Collection System:
Capital Improvement Projects – Focus on Rehabilitation

Between 2021 – 2024 the WSA invested $19,617,615.56 for the design and rehabilitation of approximately 23,000 linear feet of critical infrastructure including older, vintage interceptors (Oakland Beach, Airport and Amtrak Interceptors), force main (Cedar Swamp Force Main) and the associated manholes.



Oakland Beach Interceptor Pre- and Post-Rehabilitation

WSA Collection System:
Capital Improvement Projects – Focus on Rehabilitation

- The WSA was awarded a $1.5M CDS Earmark Grant for to upgrade their **SCADA system**. WSA will co-fund this project with a $375K Capital investment. Completion of this project 2026.

- Replacement of three collection system Ejector (Pump) Stations slated to begin early spring 2026. Total cost estimated at $2.3M, co-funded via WSA Capital and CWSRF loan proceeds.

- The WSA was also awarded $1.44M CDS Earmark Grant to rehabilitate the **Oakland Beach Force Main**. This project will be co-funded via CWSRF loan proceeds. Construction will begin in April 2026 and will be completed by year end. Total cost $5.6M.

- The **Oakland Beach Pump Station Replacement** Project is at 95% Design. Estimated total cost of construction is estimated at $8.5M. This project will be co-funded via a CDS Earmark Grant in the amount of $2.94M and CWSRF loan proceeds. This “climate resiliency” project will go to bid summer 2026.

WSA Collection System: Funding our Capital Improvement Projects

- The WSA's Capital Improvement Plan (CIP) includes many rehabilitation and replacement projects slated to be designed by our approved "On-Call" Engineering Services firms.
- Projects will be funded primarily via WSA Capital (design) and CWSRF Loan proceeds (construction).
- WSA's debt service will continue to drop off over the next several years, allowing for additional borrowing moving forward to FY2031 and beyond.
- WSA's CPA is presently working on our Five-Year Rate Study. Completion of the Study will provide direction in updating our FY27 – FY31 Capital Improvement Plan.
- The Study will also provide the WSA with insight as to the future growth of our Renewal & Replacement & Sewer Infrastructure Funds.

WSA Emergency Response Preparedness, Municipal Coordination & RI/NE Network

The City of Warwick and the WSA are well prepared for emergency response activities:

- Warwick Emergency Operations Center (EOC)
- Warwick Emergency Management Agency (EMA) - Code Red, Reverse 911 Notifications
- RI Emergency Management Agency (RIEMA)
- RI Wastewater Agency Response Network (RIWARN)
- RI Department of Environmental Management

RI Clean Water Association (RICWA) is a comprised of a deep-rooted network of wastewater professionals always willing to assist in time of hardship

During the Flood of 2010, WSA Staff also worked with multiple Federal Agencies including FEMA, EPA, NOAA and Army Corps. Of Engineers

WSA Emergency Response Preparedness

The WSA has the ability to mount Emergency Response activities to contain unanticipated compromise of our collection system.

- Emergency Response Trailer
- Emergency Response Vehicles
- Portable emergency generators
- Portable pumps (combined bypass flow approx. 1 MGD)
- Portable lights and sign board for safety purposes
- Vactor truck to collect wastewater and/or break blockages to restore flow
- CCTV Van with Rover to access pipelines and identify compromise
- Staff trained in emergency response activities, confined space entry and pipe/manhole assessment
- Multiple vendor service contracts including emergency bypass, electrical and construction services

Primary Objective of the Pawtuxet River Flooding Commission

Can something be done to mitigate, possibly prevent flooding of the Pawtuxet River?

Answer: Yes!

Integrated Watershed and River Modeling Study of the Pawtuxet River, RI
August 24, 2017

Following the flood of 2010, this study was undertaken to assess the risk of flood and prepare for future events. Study applied a State of the Art (SOA) watershed & river model developed by US Army Corp of Engineers to evaluate flood risks.

Several findings and recommendations came out of this study. *"Scituate Reservoir elevation can be controlled to effectively manage downstream flooding. As an example, 4 ft capacity in the reservoir reduces the peak outflow discharge by about 60% for a 500-year flood event in the North Branch."*

Integrated Watershed and River Modeling Study of the Pawtuxet River, RI
August 24, 2017

"More study is suggested to design a regulating structure which has minimum impact on the dam and upstream areas, and meets the water supply needs for which the reservoir was designed."

"The study also looked at removal of small diversion dams on flooding, with effects being largely local and not having cumulative impact…….the Scituate Reservoir can mitigate flood throughout the river and is more effective for the flood risk management."

"The study showed that the presence of debris significantly increases flooding extent."

Figure 2: The Gainer Dam spillway on a normal day, with only a trickle being added to normal flows that come from the dam's central outlet, which feeds the North Branch of the Pawtuxet River. See Figure 3 for an image of the spillway's raging torrent on March 31st, 2010.
National Weather Service Northeast River Forecast Center (NWS/NERFC)

Figure 3: The Gainer Dam spillway at the Scituate Reservoir at 10:30 a.m., March 31st, 2010. Flow was an unprecedented 2.5 feet over the flashboards at a pool elevation of 287.80 feet. See Figure 2 for the spillway on a normal day, with only a trickle flowing over the flashboards. (David Vallee, National Weather Service Northeast River Forecast Center (NWS/NERFC)

Our Mission is for the Common Good!

Clean Drinking Water
Wastewater Treatment
“The Water Cycle”

Happy 100th Belated Birthday Gainer Dam
November 10th, 1925 - November 10th, 2025