### **NEWEA** Collection Systems Conference

# Benefits and Limitations of Sonar and Multi-Sensor Inspection of Sewer Siphons in Chicopee, MA

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# Outline

- Role of Sonar and Multi-Sensor Inspection (MSI) in Chicopee's Integrated Management Plan
- Benefits and Limitations of the Technology
- Post-Inspection Siphon Cleaning
- Coordination Tips



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#### **Integrated Management Plan (IMP)**

- Comprehensive and adaptive plan to address capital needs and regulatory requirements
- Includes re-evaluation of the Long-Term CSO Control Plan
- Sewer system model update

#### City Limitations

 City-owned CCTV equipment not capable of inspecting large-diameter pipes, submerged pipes, or siphons



### **MSI Capabilities**



#### **Two goals for MSI:**

- Identify/estimate condition of interceptors and siphons largely unknown
- Identify opportunities to regain capacity through cleaning or rehabilitation
- Potentially reduce CSO activations



MH #8 on Chicopee Interceptor



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#### Information Needed: Pipe Condition and Quantity of Debris Present

- Connecticut River interceptor –
  5 miles
- Chicopee River Interceptor 4 miles
- 13 siphons 15,000 feet

Too long to inspect everything!





#### City chose a variety of pipes for inspection

- A variety of instruments were used for inspection







# Inspect a sampling of sections of interceptor and siphons

- Deady Bridge double-barrel siphon 14" and 24"
- Uniroyal double-barrel siphon 18" and 24"
- Chicopee River Interceptor 30" to 42," including two siphon segments
- Connecticut River Interceptor 24" to 36"
- Approximately 9,000 feet total to inspect



# **Inspection Set-up**





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Parachute pulling probe through

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# Segment 1: Chicopee River Interceptor MH 11 to WPCF



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## Segment 1: Chicopee River Interceptor MH 11 to WPCF



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#### **Observation Report**

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# Segment 1: Chicopee River Interceptor MH 11 to WPCF



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#### **Observation Report**



#### Segment 2: Connecticut River Interceptor 2,300 feet of 24" and 36" Gravity Pipe



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#### Segment 2: Connecticut River Interceptor 2,300 feet of 24" and 36" Gravity Pipe





#### **Observation Report**



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ø36.0"

#### Segment 3: Deady Bridge Siphon 520 LF, 14" and 24" Double-Barrel



#### Segment 3: Deady Bridge Siphon 520 LF, 14" and 24" Double-Barrel



#### **Observation Report**



150.1ft General Observation - Debris to 6.7"

165.7ft Maximum Debris - To 7.5"

201.2ft General Observation - Debris to 2.3"

#### Segment 3: Deady Bridge Siphon 520 LF, 14" and 24" Double-Barrel



#### Segment 4: Uniroyal Siphon 400 feet, 18" and 24" Double-Barrel



### Segment 4: Uniroyal Siphon 400 feet, 18" and 24" Double-Barrel



#### **Observation Report**



ø18.0"

## Segment 4: Uniroyal Siphon 400 feet, 18" and 24" double-barrel



#### **Extra Inspection**

- With two siphons dry/plugged, had additional budget remaining
- Inspected 875 additional feet of Chicopee River Interceptor





### Segment 5: Chicopee Interceptor at Main 875 feet, 30"



### Segment 5: Chicopee Interceptor at Main 875 feet, 30"



#### **Observation Report**



99.9ft General Observation - Debris to 5.6"

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99.9ft Maximum Debris - To 5.6"

149.9ft General Observation

#### **Inspection Findings**

- Siphons in generally better condition than anticipated
- Gravity flow sections in excellent condition
- Need for regular siphon cleaning identified





### Post-Inspection Project: Deady Bridge Siphon Cleaning





## Post-Inspection Project: Deady Bridge Siphon Cleaning



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# Post-Inspection Project: Deady Bridge Siphon Cleaning





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#### Coordination

#### Inspect sites for accessibility ahead of the inspection date

- Manhole accessibility
- Traffic / Police Details





#### Coordination

#### Inspect sites for accessibility ahead of the inspection date

- Manhole accessibility
- Traffic / Police Details
- Site accessibility!





### Coordination

#### Pipe Geometry

- Pipe diameter
- Length between manholes
- Bend radius

#### Have a Back-up Plan

Identify additional pipe runs





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