

Implementing an Acoustic Pipe Inspection Program Using the Sewer Line Rapid Assessment Tool A Case Study on the City of Augusta

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Agenda

- ▶ Situation Overview
- ▶ Acoustic Inspection Technology
- ▶ Implementation Case Study
- ▶ Summary

Augusta Utilities Overview

- Founded 1822
- Combined operations with Richmond County in 1996
- Population Served 190,000

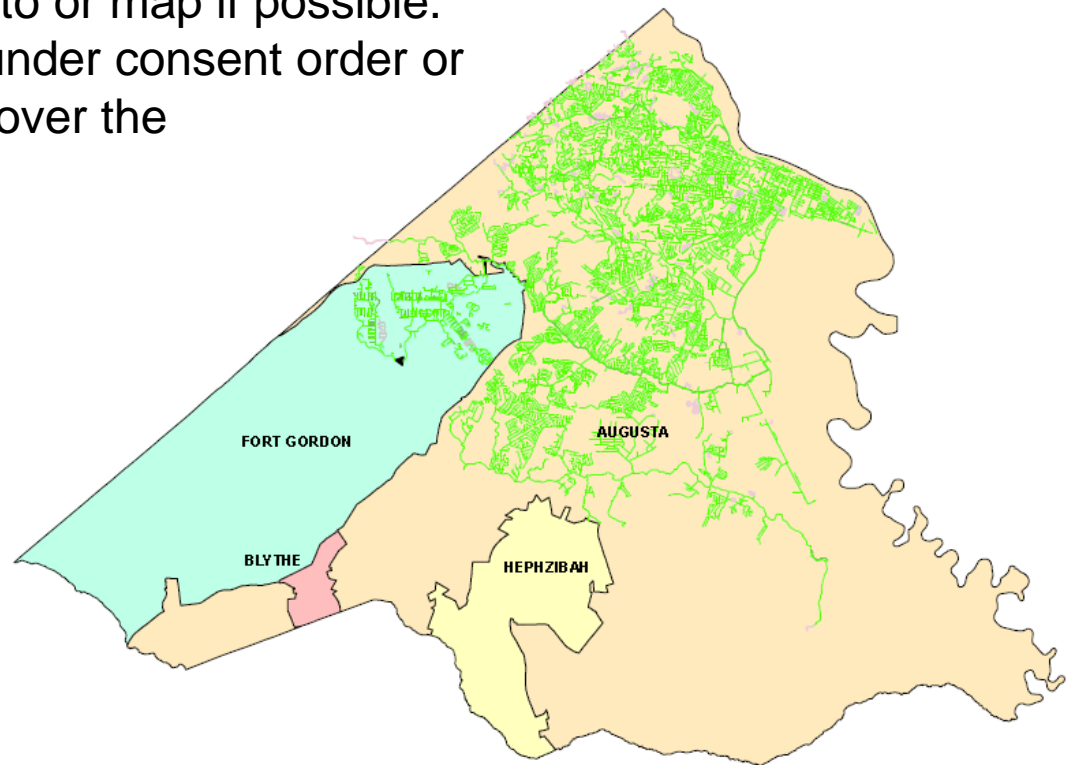


- 1,040 miles of sewer pipe
- Covers 280 square miles
- Under GA EPD Consent Order

Reason for selecting the SL-RAT

► TBD...

Would like to set out the objectives the SL-RAT was desired to help achieve – here when first purchased and include a photo or map if possible. Possibly showing the areas under consent order or where SSO's have occurred over the



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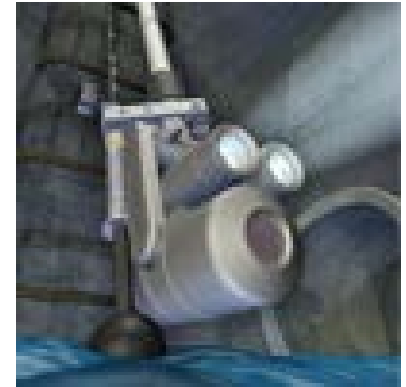
Sewer Line Inspection Methods



▶ Manhole Inspection



▶ *Acoustic*



▶ Zoom Camera



▶ Push Camera



- ▶ CCTV/Robotic Camera
- ▶ Pipe Wall Defect Scanners
- ▶ Pipe Profiling / Robotic Multi-Sensor

Active Acoustic Pipe Inspection Background

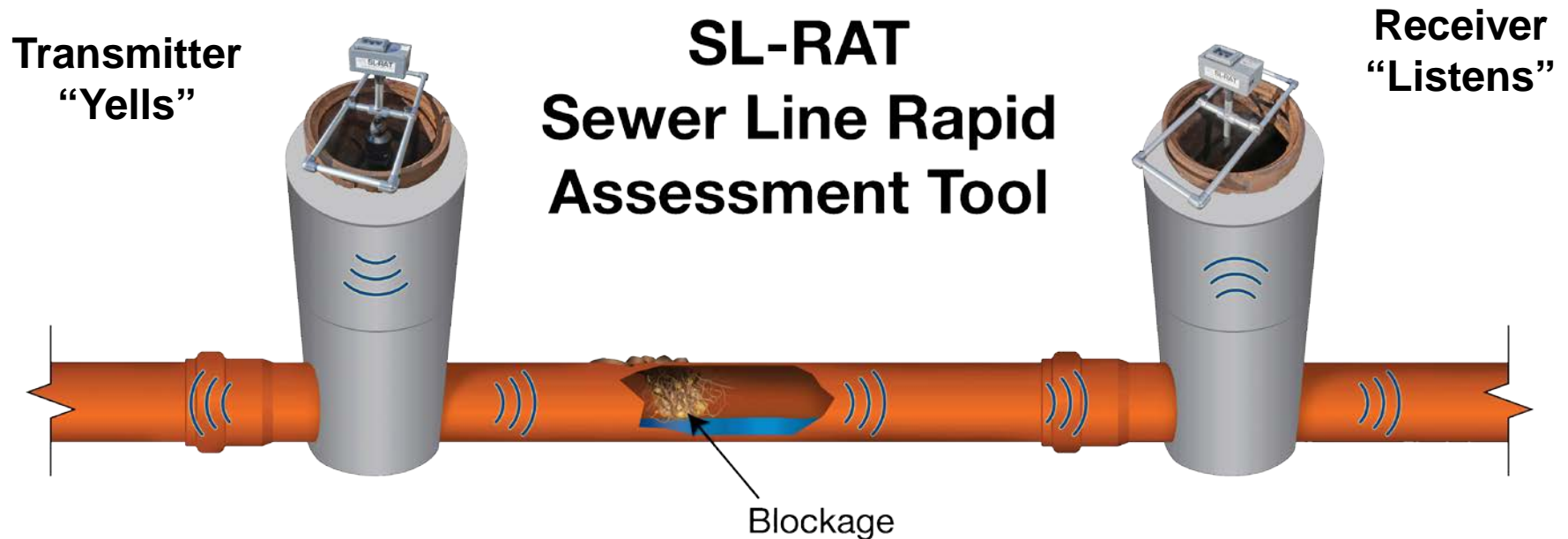
- ▶ Patented technology
- ▶ Gravity-fed sewer focus
- ▶ Winner 2012 WEF Innovative Technology Award



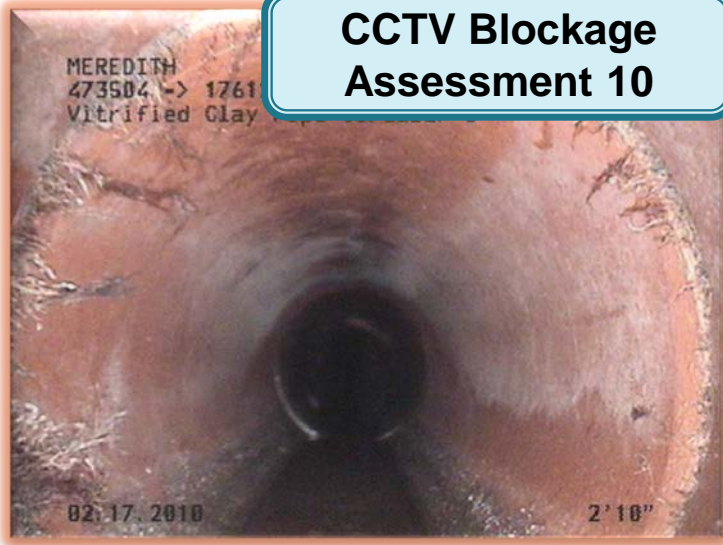
- ▶ Over 3.0M feet inspected
- ▶ Rapid assessment helps better focus cleaning and CCTV resources

Acoustic Inspection Technology

► How Does it Work?



Visual Comparison

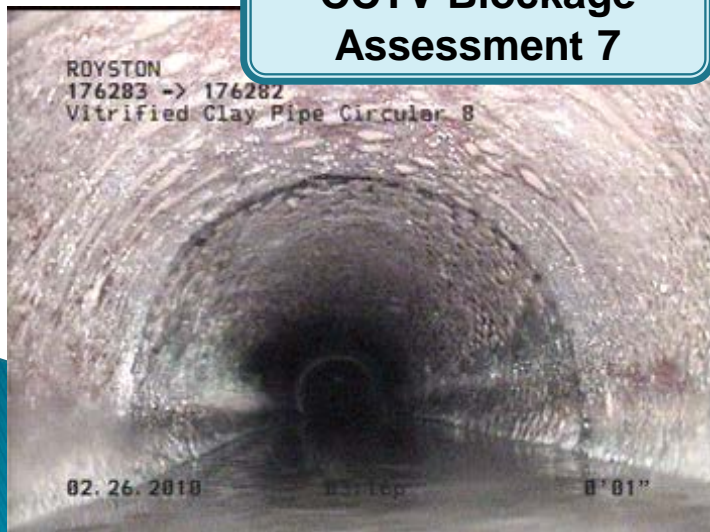


**CCTV Blockage
Assessment 10**

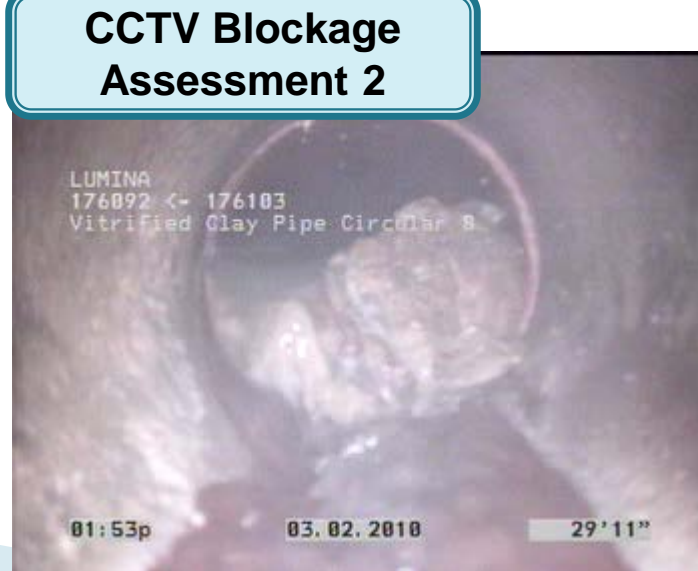


**CCTV Blockage
Assessment 5**

**CCTV Robot was Able to
Pass Through Root Fibers**



**CCTV Blockage
Assessment 7**



**CCTV Blockage
Assessment 2**

**CCTV Robot was
Not Able to Pass
Through Obstruction**

Acoustic Inspection Technology

▶ Demonstration Video

Will include a video – just
cannot get it sent via
email...too big

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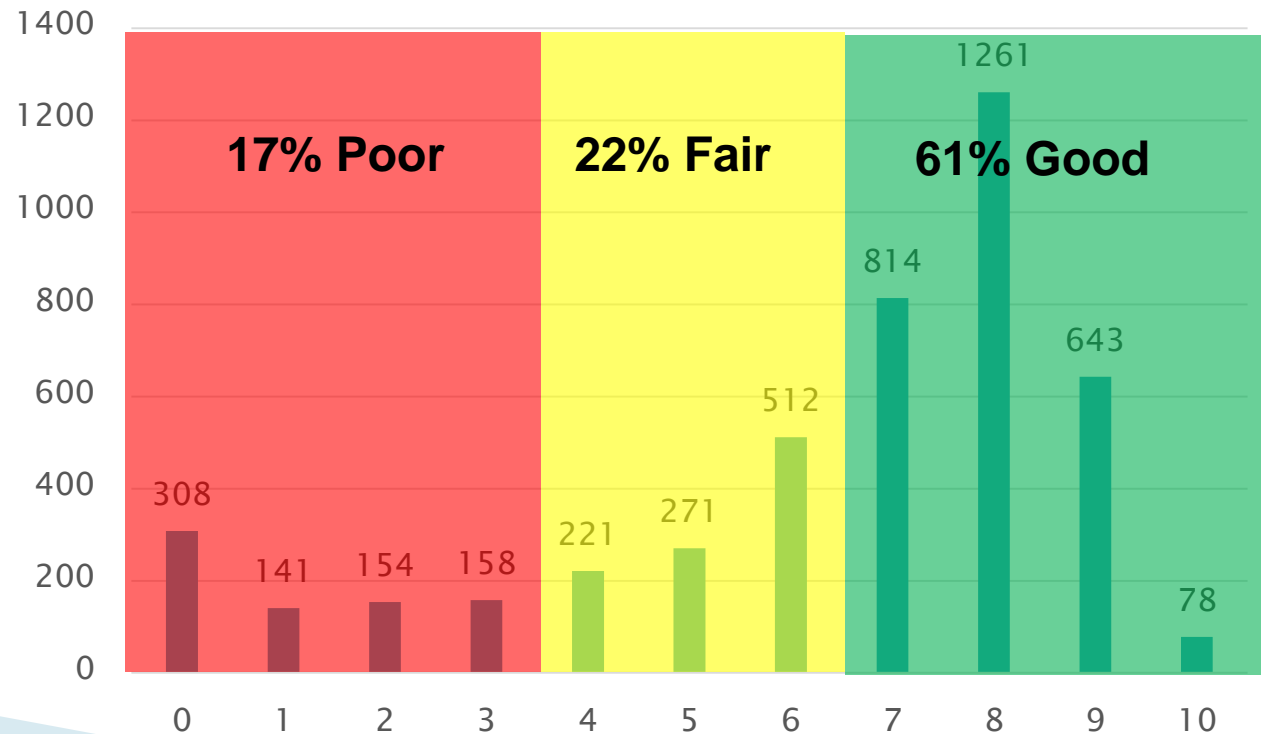
How it was operationalized

- ▶ 2 SL-RAT's
- ▶ Managed by Asset Management
- ▶ Run with 2 person crews per SL-RAT
- ▶ Averaging ~7500 feet/8 hour day per crew
- ▶ Plan out inspection areas based on tax-maps
- ▶ Combining with manhole inspection program

Results So Far...

- ▶ >4,500 segments inspected in ~9 months of work
- ▶ >9,000 manholes located and inspected
- ▶ >1 MILLION Feet (197 miles)

Histogram of Acoustic Scores



Conduct Inspections



- Street Name
- Parcel Address
- Line Sizes

Download SL-RAT

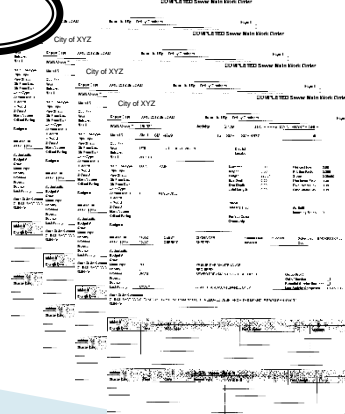
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Create Base Report

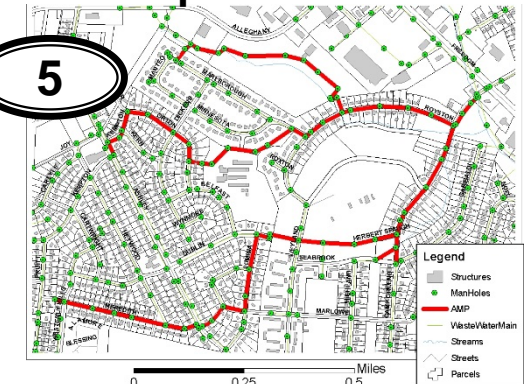
4

	Accession Number	Accession Number	Test Duration	Pipe Length	Exit Pipe Length	Mean Status	Assessment	Pipe Status
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2	020001-SC-00002	020001-SC-00002	30	220	220	valve	6	valve
3	020001-SC-00003	020001-SC-00003	30	220	220	valve	6	valve
4	020001-SC-00004	020001-SC-00004	30	220	220	valve	6	valve
5	020001-SC-00005	020001-SC-00005	30	220	220	valve	6	valve
6	020001-SC-00006	020001-SC-00006	30	220	220	valve	6	valve
7	020001-SC-00007	020001-SC-00007	30	220	220	valve	6	valve
8	020001-SC-00008	020001-SC-00008	30	220	220	valve	6	valve
9	020001-SC-00009	020001-SC-00009	30	220	220	valve	6	valve
10	020001-SC-00010	020001-SC-00010	30	220	220	valve	6	valve
11	020001-SC-00011	020001-SC-00011	30	220	220	valve	6	valve
12	020001-SC-00012	020001-SC-00012	30	220	220	valve	6	valve
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Generate Cleaning Crew Work Orders



Map Out in GIS



Close Out

- QA Cleaning
- Fix GIS Issues
- Update Records
- Schedule Next Inspection

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Key Learnings

1. The SL-RAT is simple, reliable, and easy to use
2. Keep up with the data – DAILY! Backlogs can get overwhelming
3. Forces discipline in visiting every manhole – identify issues, update GIS records, etc
4. Has focused efforts on the 39% of segments that are Poor or Fair
5. Requires teamwork to achieve full potential – cleaning crews, GIS, inspection crews – must all work together
6. Future plans include conducting post-cleaning QA

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Additional Information

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