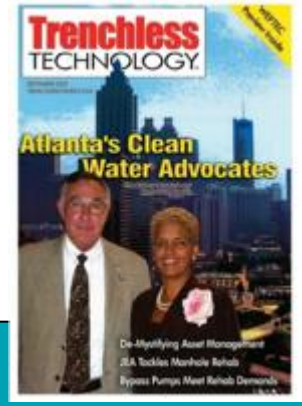
Challenges of Developing Asset Management Plans (AMPs) for Small Utilities

A Collaborative Initiative by BAMI-I, AIRW, and Purdue UIT

By Tom Iseley, Wei Liao, Adam Hershberger



BAMI-I HISTORY

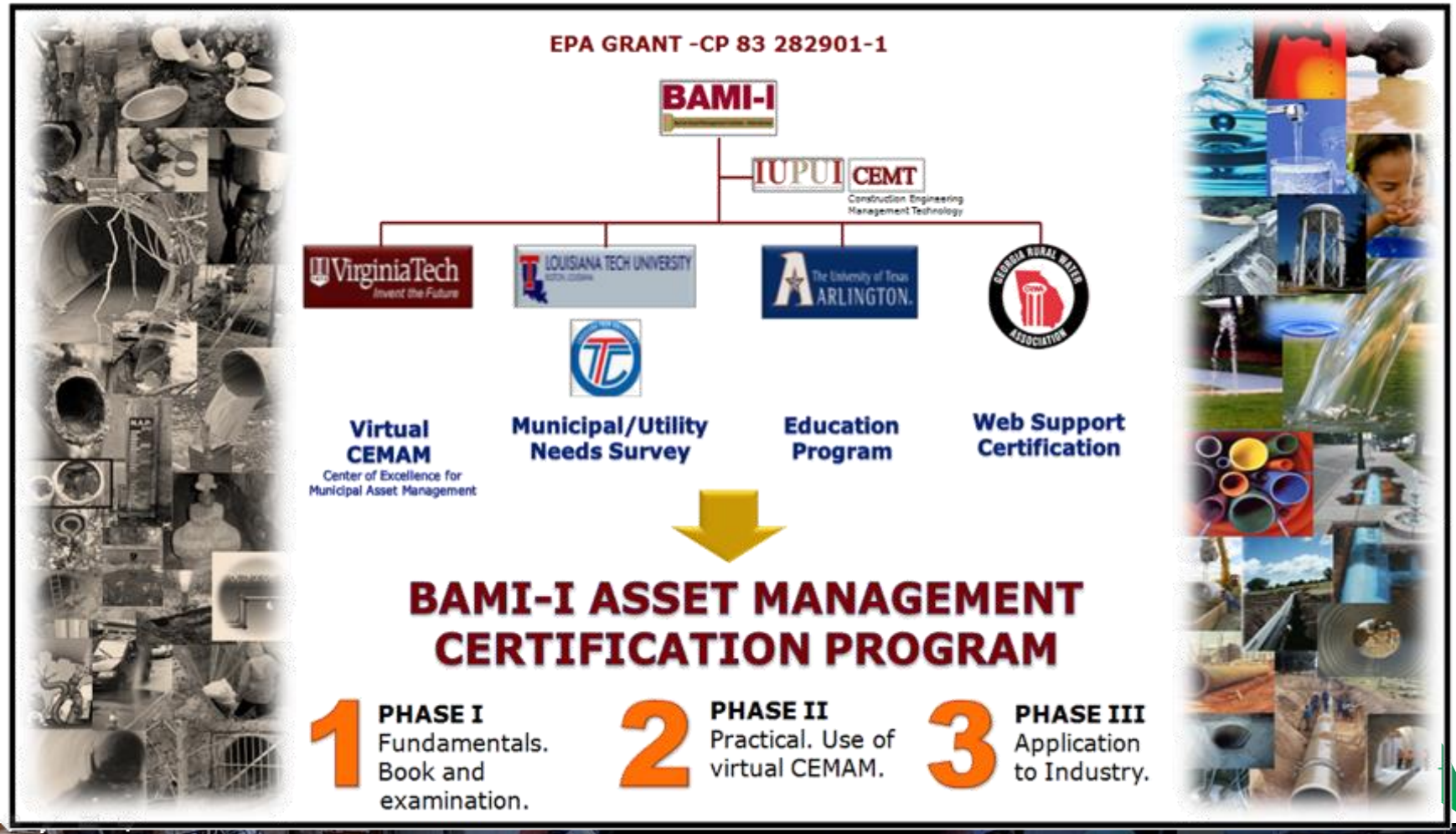
SEPTEMBER 28 - 30, CHICAGO IL
TINLEY PARK
CONVENTION CENTER
GLOBAL BURIED ASSET MANAGEMENT
CONGRESS
BAMH
www.bami-i.com

2003	2004	2006	2010-2021	2022	2023
Start	**Progress**	**Progress**	**Progress**	**Progress**	**Today**
BAMI-I was formed in Atlanta's Department of Watershed Management	**BAMI-I was formed as a non-profit organization**	U.S. EPA Cooperative Agreement	BAMI-I launched CTAM100-400) And UIS program	• 7 committees • International ambassador group • BAMI-I journal	**First global Buried Asset Management Congress**

2025

GBAMC
The 3rd Global Buried Asset Management Congress

ESTABLISHING A PATHWAY FOR ACHIEVING WATER UTILITY INFRASTRUCTURE MANAGEMENT EXCELLENCE



What is CTAM?

- Certification of Training in Asset Management

100
Overview of Asset Management

200
Developing an Asset Management Program

CTAM

300
Managing an Asset Management Program

400
Financing an Asset Management Program

Levels of Certification

- **Certificate of Completion.**
  - Issued for any CTAM course upon completion.
- **Associate Water Asset Manager (AWAM). Required:**
  - Completion of CTAM 100-400
  - Apply to BAMI-I Asset Mgt. Certification Board
- **Professional Water Asset Manager (PWAM). Required:**
  - Completion of CTAM 100-400
  - Four years of relevant asset mgt. experience
  - Apply to BAMI-I Asset Mgt. Certification Board

BAMI-I Journal

CONTENT:

This journal is dedicated to providing cutting-edge research and practical case studies, announcements and updates on the latest developments in the field covers various aspects of the industry, including:

- Asset Management
- Location & Mapping
- Pipeline Condition Assessment
- New Installation
- Rehabilitation
- Trenchless Technologies
- Financial Management
- Research and Education
- Regulation and Compliance

GBAMC- Global Buried Asset Management Congress

WATER AND WASTEWATER UTILITIES IN THE US

54,000 Water Utilities

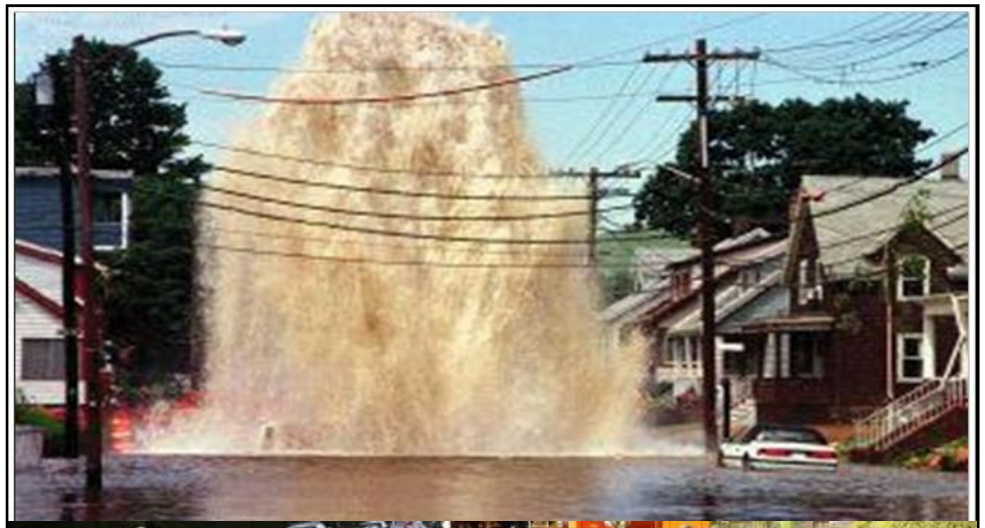
2.2 million miles of underground water pipes

800,000 miles of public sewers
500,000 miles of private lateral sewers

16,000 Wastewater Utilities

Indiana: 2,000 Water and Wastewater Utilities

CHALLENGES ORGANIZATIONS FACE IN MANAGING BURIED PIPELINES



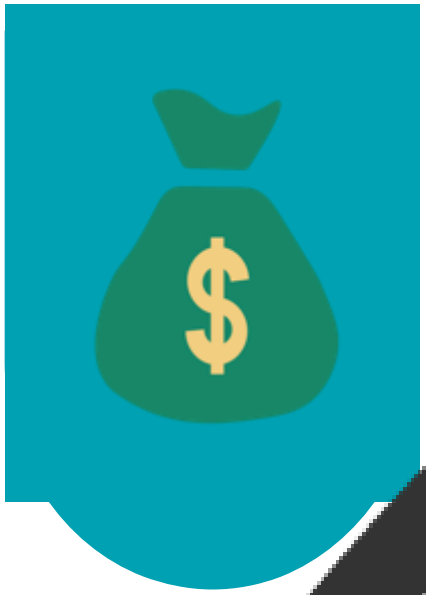
STRATEGIC ASSET MANAGEMENT

Asset Management:

Maintaining a desired level of service for what you want your assets to provide at the lowest life cycle cost. Lowest Life cycle cost refers to the best appropriate cost for rehabilitating, repairing or replacing an asset.

Resource: EPA Asset Management Best Practices

WHY IS AM IMPORTANT?



AM is about being proactive instead of reactive and ensuring your money is spent in the right place at the right time.

Core Components of AM

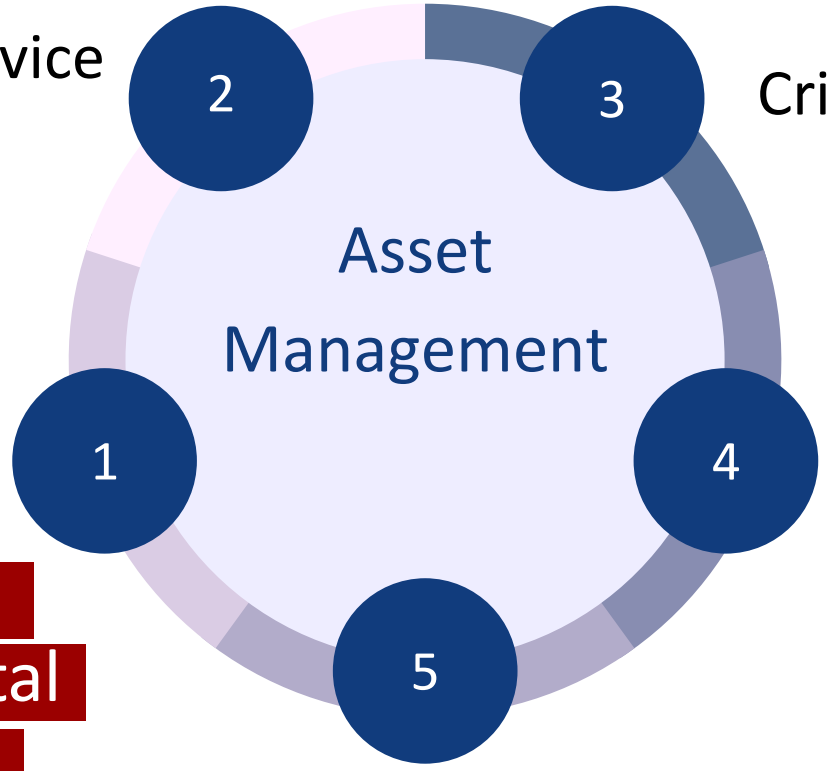
EPA

Level of Service

Critical Assets

Current State of Assets

Minimum Life Cycle Cost



Technical

Managemental

Financial

Long-ter
Funding Plan

THE ORIGIN OF THE SWITZ CITY ASSET MANAGEMENT PLAN (AMP) PROJECT

- **Indiana Senate Bill 272 (2022)**
- **Challenges Faced by Small Utilities**
- **The Need for Improved Asset Management Strategies**
- **How the Idea for the Project Emerged**
  - Recognition of the gap in effective asset management for small utilities
  - Collaborative effort between BAMI-I, AIRW, IFA, and local communities to fill this gap

COLLABORATIVE EFFORT WITH PARTNERS

Stakeholders Involved:

- BAMI-I
- Indiana Finance Authority (IFA)
- Alliance of Indiana Rural Water (AIRW)
- Purdue UIT: support BAMI-I
- Bynum Fanyo Utilities (BFU)

- George Kurz Independent I&I Consultant
- Ziptility
- Utility Inspection Services
- Smart-View, LLC
- InfoSense
- 4M Analytics
- ADS
- ACE Pipe Cleaning
- Water Finance Assistance, Llc
- Kurt Wright

SWITZ CITY, INDIANA
ASSET MANAGEMENT PLAN

- Small town (population less than 300)
- Complete water system and sewage system
- No budget for developing asset management plan

INTERIM ASSET MANAGEMENT PLAN

INTERIM ASSET MANAGEMENT PLAN

FOR

The Town of Switz City
220 Charlotte Ave.
Switz City, IN 47465

Presented to The Town of Switz City's Leadership
Glenda Headley - Town Council Board President
Tammy Woodall – Town Council Board Member
Levi Lundy - Town Council Board Member
Carla Porter - Clerk Treasurer

Developed and Prepared By:

Buried Asset Management Institute-International (BAMI-I)
Ziptility, Inc.
Bynum Fanyo Utilities (BFU)

Date: February 5, 2024

SECURING GRANT FROM THE INDIANA FINANCE AUTHORITY (IFA) AND IMPLEMENTATION STEPS AND TIMELINE

- PHASE 1: DEVELOPMENT OF COMPREHENSIVE AMP FOR SWITZ CITY AND MODEL CREATION (1 year)

➡️ **$250K + $400K**

- PHASE 2: EXPERIMENTAL PROMOTION AND CONTINUOUS IMPROVEMENT (1-2 YEARS）

- PHASE 3: EXTENSIVE IMPLEMENTATION OF MODEL, ESTABLISHMENT OF STATE-WIDE ASSET MANAGEMENT DATABASE AND LIVING LAB (LONG TERM)

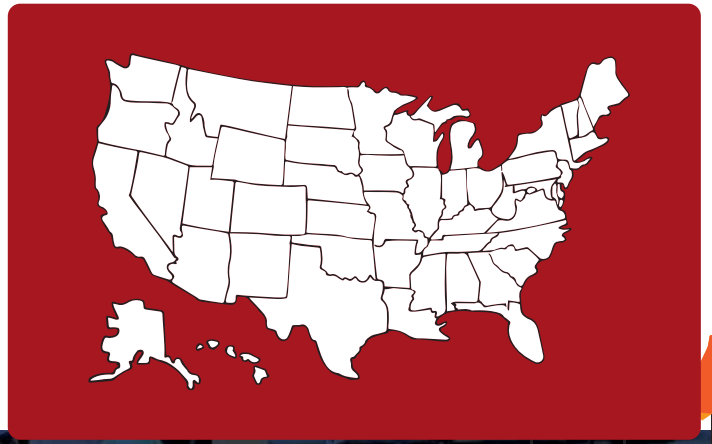
REPLICATION POTENTIAL ACROSS THE USA

1 NOT JUST A PLAN

- Manual of Practice
- Training
- Living Lab
- New Product Validation

2 NATIONAL IMPACT

- 70,000 utilities
- 93% of them are small utilities

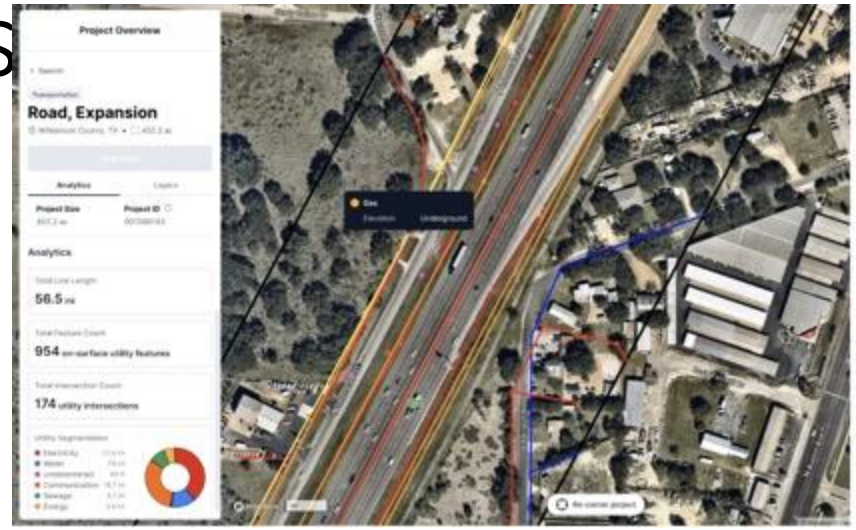


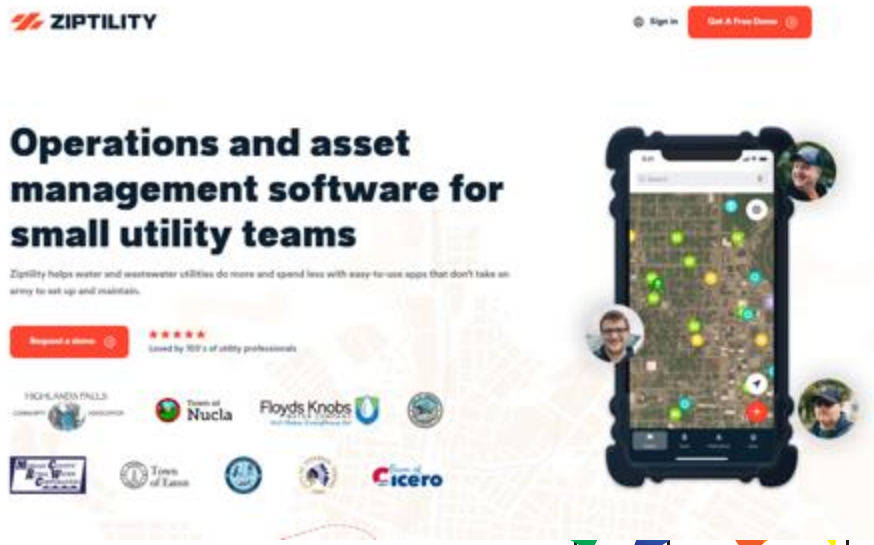
AMP Project Components

- Inventory Collection and Updates
- Pole Camera Inspections
- Sewer Line Rapid Assessment (SL-RAT)
- Sewer cleaning, inspection and smoke testing
- Inflow and Infiltration Study
- Wastewater Treatment Plant Study
- Water Distribution System Analysis
- Financial Review and Analysis
- Cybersecurity Assessment and Best Practices

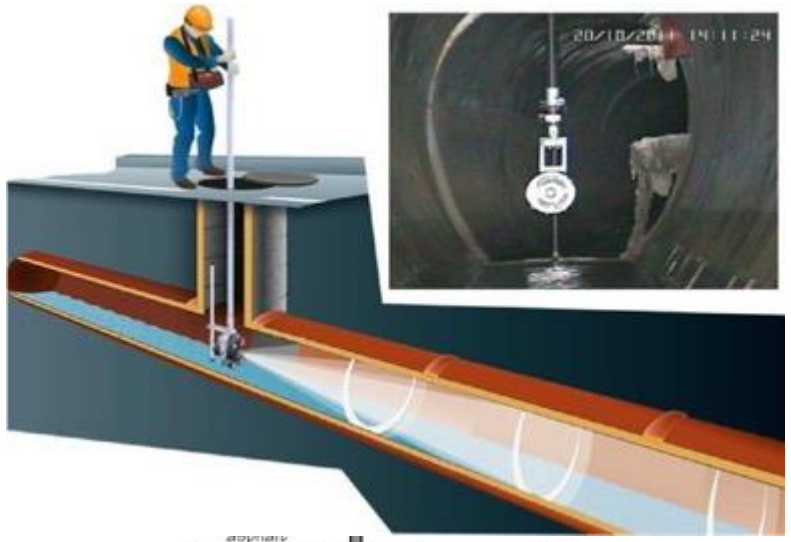
Inventory collection and updates

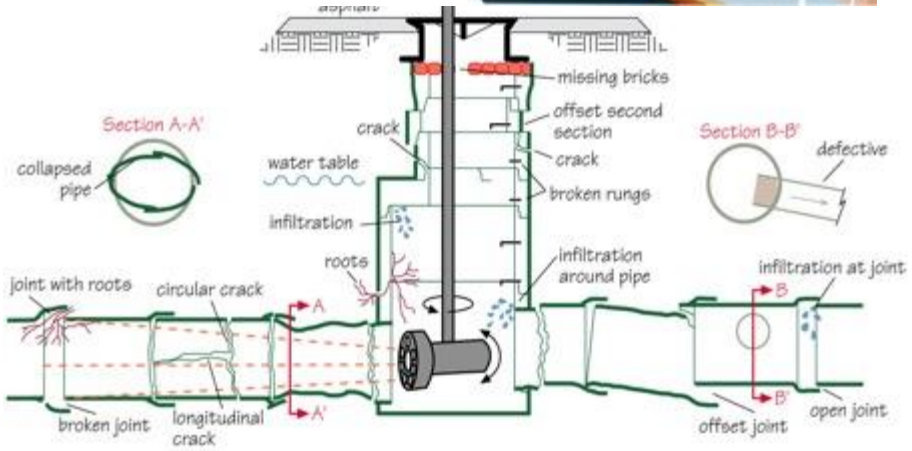
- The town contracts with Ziptility GIS to host its water and sewer utility inventory
  - The town started with incomplete paper maps of both utilities
    - Historical records review (As-builts, paper maps, etc)
    - Operator institutional knowledge
- 4M Analytics – Digital mapping aid
  - Utility records queries
  - AI using aerial imagery
  - Identifies utility networks including gas, electric, water, sewage, communications, etc.





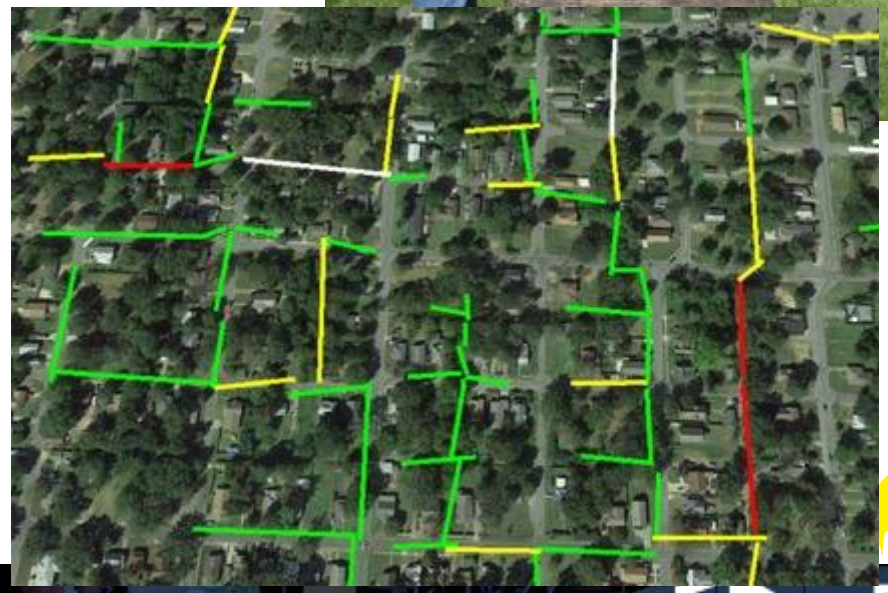
Zoom Camera Inspection



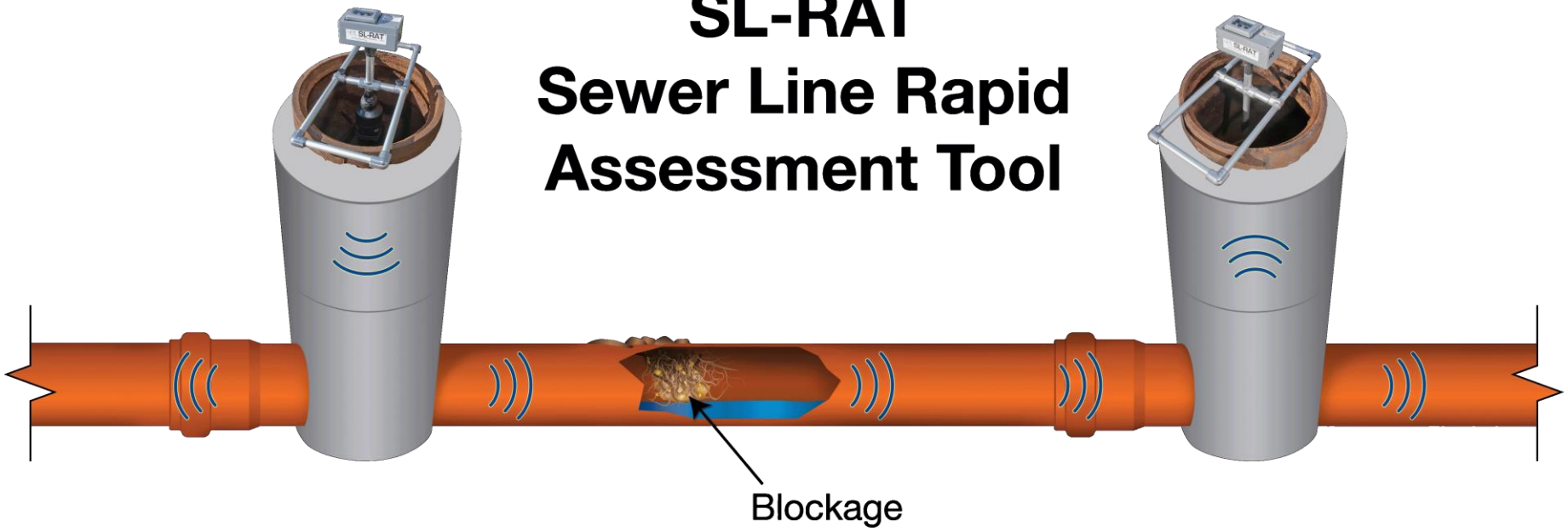


Sewer line rapid assessment (SL-RAT)

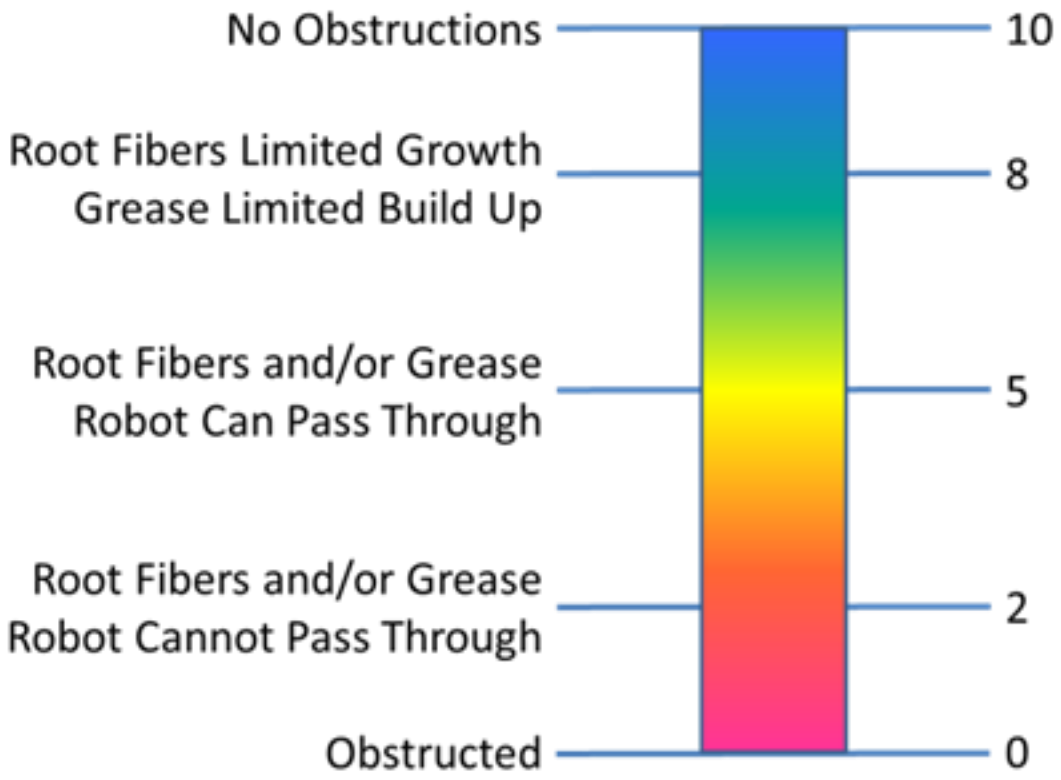
- Level 1 sewer line inspection method
- Affordable, quick method for gaining initial information
- Completed 90% of town's collection system in 8 hours
- Patented acoustic technology to determine levels of blockage in a line between 2 manholes
- GPS locations of manholes and preliminary inspections completed
- Also helped identify previously unmapped manholes
- Deliverable included color-coded digital map



SL-RAT
Sewer Line Rapid Assessment Tool



SL-RAT Assessment Scale



Sewer cleaning, inspection and smoke testing

- Performed by Ace Pipe Cleaning
- Cleaned and televised entire collection system (approx. 3 days)
- QA/QC by Smart Views
  - Goal: ensure quality control and determine prioritization of needed repairs and rehabilitation
    - Combination of trenchless and traditional excavation repairs

Underground Infrastructure Conference

Construction. Rehabilitation. Asset Management.

March 4-6, 2025 | Houston, TX

CELEBRATING 30 YEARS 1995 - 2025

Inflow and Infiltration Study

- Study performed by George Kurz PE
  - Phase I – Mr. Kurz utilized treatment plant flow data, rainfall data and BOD test results to draw preliminary conclusions about the extent of rain dependent Inflow and Infiltration (I&I) impacting collection system and treatment plant

    - Determined approximately $10,000 additional annual costs due to I&I
  - Phase 2 – ADS Environmental Services installed flow monitors and logged data for three-month period. This data was combined with additional treatment plant data by Mr. Kurz to further analyze I&I.
  - Finalized analysis and reporting are currently underway, but preliminary results identify one sewer basin, approximately 26 manholes, as the area with the most significant rain-dependent I&I within the collection system

Inflow and Infiltration Study

Wastewater Treatment Plant Study

- Completed by SDG Engineering (Kurt Wright PE)
- Thorough analysis of treatment plant condition and performance
- Utilized town's current National Pollution Discharge Elimination System (NPDES) permit to evaluate performance and compliance
- Evaluated plant peak flows, Five-day Biochemical Oxygen Demand, Total Suspended Solids and ammonia levels over a three-year period as part of analysis
- Evaluated condition of all major treatment structures including concrete oxidation ditch, clarifier, sludge digester, sludge drying beds, and disinfection unit
- Provided approximate costing details for plant repairs/rehab versus new replacement
  - Evaluating possibility of regionalization with nearby Worthington, Indiana

Water Distribution System Analysis

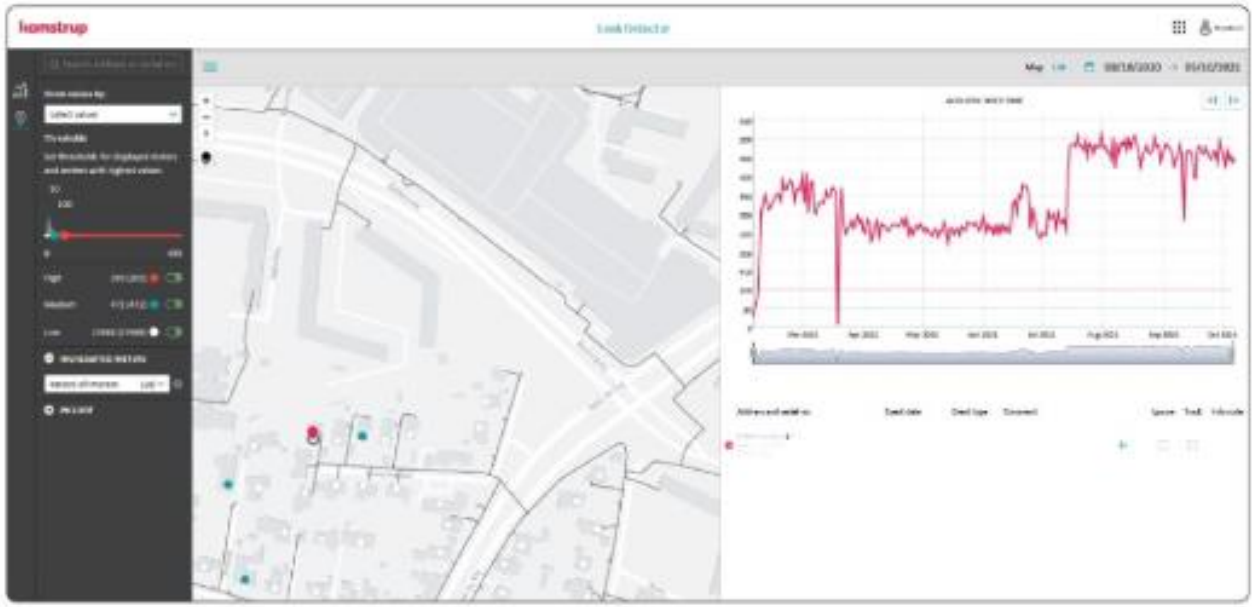
- The town loses ~40-50% of the water they purchase every month (Water Loss or Non-revenue water)
- Water Loss= Real Losses and Apparent Losses
  - Real Losses = Actual leaks in the system
  - Apparent Losses = Data entry errors, incorrect rate multiplier on an account(s), etc.
  - Cannot accurately determine where problems exist without accurate water metering
- New water meters purchased (Kamstrup smart meters)
  - Ultrasonic style meters with no moving parts (last longer and no accuracy degradation)
  - Very high accuracy of flow capture even at low flow volume
  - 20-year warranty
  - Integrated acoustic leak listening in every meter
    - Detects abnormalities at each customer building and in the distribution system

Leak Detector

Leak detection is often a time-consuming, inefficient and expensive task based on a combination of trial and error, theoretical models or gut feelings. But it does not have to be.

Leak Detector enables you to locate leaks in service connections and distribution mains based on acoustic noise levels registered by flowIQ® 2200 water meters. With the systems advanced algorithm and map-based overview, you can easily identify high-risk installations where elevated noise levels indicate possible leaks or bursts.

With a faster and more efficient leak detection, you reduce your cost per identified leak and can find the low-hanging fruits for reducing your non-revenue water. Detailed knowledge about high-risk installations with possible leaks and the overall condition of your network will also enable you to prioritize your daily efforts to when and where they will have the biggest impact.



Financial Review and Analysis

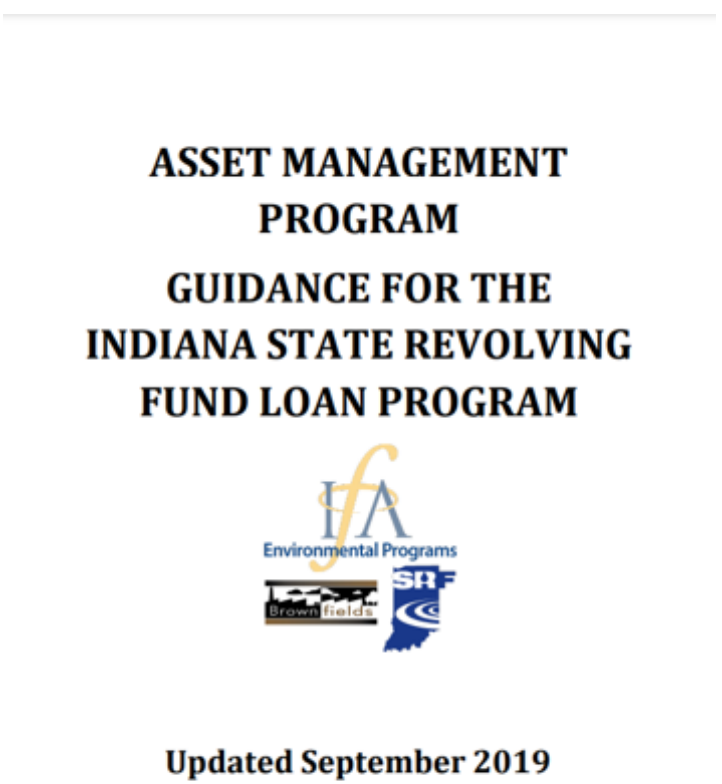
- Being completed by Water Finance Assistance (Glenn Barnes)
- Completing a comprehensive rate study for the town's water and sewer utilities
- Evaluating 3 years of water usage data for all customers
- Goal is to determine if rate adjustments will be necessary to fund the improvements and repairs the AMP outlines over the next 20 years

Cybersecurity Analysis and Best Practices

- In collaboration with AlphaGuardian and Alvaka
- Indiana Finance Authority (funding source) has expressed interest in including cybersecurity assessment and implementation into this pilot.
- We mostly focus on physical assets, but digital Assets require management too!
- Cybersecurity intrusions are increasing in number and severity in the U.S.
- Helping small utilities with minimal staffing and technical expertise is a challenge. We are exploring a simplified, best-practice IT and OT solution

What's Next…

- Combine all of these separate components into a single Asset Management Plan formatted to meet the requirements of Indiana Finance Authority:
  - Executive Summary
  - Technical Section
  - Managerial Section
  - Financial Section
  - Appendix to include all supporting reports and documentation



Questions?

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