ASSET MANAGEMENT IN A SMALL COMMUNITY

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Hubbell, Roth & Clark, Inc.

June 20, 2016 | MWEA Annual Conference
AGENDA

1. Project Background
2. Objectives
3. Work Completed to Date
4. Costs to Date
5. Next Steps
6. Questions
CITY OF LINDEN

• Vibrant community that takes pride in its historic charm

• Village established in 1871, grew into city 1988

• Population of about 4,000 residents

• Active downtown with thriving shops, restaurants, and local businesses

• Shiawassee River and Linden Pond important natural resources
In **May 2014** City of Linden awarded MDEQ SAW Grant (Round 1)

- Asset Management Plan Grant ($876,800)
  - Storm Sewer System
  - Sanitary Sewer System
- Sanitary Design ($70,000)
  - East Ralston Road Pump Station Replacement
  - SCADA Upgrades
- Total Grant Amount - $946,800, including 10% City Match - $94,680
- Must complete within **3 years** (May 2017)
AMP GRANT OBJECTIVES

• Develop Asset Management Plan for Sanitary and Storm Sewer Collection Systems:
  • Asset Inventory and Condition Assessment
  • Level of Service
  • Criticality of Assets
  • Operation and Maintenance Strategies
  • Long Term Funding/Capital Improvement Planning
AMP GRANT OBJECTIVES

1. What is the current state of my assets?
   - Develop Asset Registry
   - Assess Condition, Failure Modes
   - Determine Residual Life
   - Determine Life Cycle & Replacement Costs
   - Set Target Levels of Service (LOS)
   - Determine Business Risk ("Criticality")
   - Optimize O&M Investment
   - Optimize Capital Investment
   - Determine Funding Strategy
   - Build AM Plan

2. What is my required level of service?

3. Which assets are critical to sustained performance?

4. What are my best O&M and CIP investment strategies?

5. What is my best long-term funding strategy?

From EPA Fundamentals of Asset Management
SPECTRUM OF ASSET MANAGEMENT TOOLS

Goal to provide useful tools while being simple to use with standard software.
• Asset Management Planning
  • GIS Database Development
  • Level of Service (ongoing)
  • Storm and Sanitary Sewer Televising for Condition Assessment
  • Manhole Inspections for Condition Assessment
  • Pump Station Inventory and Assessment
  • Risk Analysis (ongoing)
• GIS database for sanitary/storm sewer
  • Started with Genesee County sanitary data
  • County attributes were sufficient
  • As-built plans to complete the sanitary GIS and create storm GIS
• All structures field-located/verified using GPS
FIELD INVENTORY

• Manholes and Structures
  • Hand-held Zeno GPS unit
  • Rated accuracy is 2 cm with rover antenna
    • Accuracy depends on signal interference, satellite coverage, antenna location/configuration, etc.
  • Field crews found all structures to be within 1’
• Database updated to actual field location
• Sewer GIS compared to CCTV data
SEWER CONDITION ASSESSMENT

• Cleaned and televised all sanitary & storm sewers constructed prior to 1993 (about 77,000 lft)

• United Resources performed in July & August 2015
  • $165,000 total cost, average unit cost $2.14/lft
  • 85% was 12” diameter or less
  • About 5% sanitary and 15% storm required heavy cleaning

• United Resources provided database as deliverable
  • Unique IDs
  • NASSCO Quick Scores
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Manhole [MH-61-190065]
End of Survey
Approximately 67,700 ft of Sanitary Sewer Inspected

Approximately 9,100 ft of Storm Sewer Inspected
• ArcCollector interface with custom digital form
• Apple iPad tablets
• Attributes were MACP Level I “plus”
• Given general qualitative structural score of 1, 3, 5 (Good, Fair, Poor)
• 1,400 structures assessed in approximately two months (about 22 structures per day)
Location: Lat 42.833121° Long -83.76429°

LindenSanMasterQC: 17D019

Street: 1421 RIPLEY RD

Found: Yes

Routing Status: Surface Inspection

Surface Type: Grass

Grass Type: Dirt

Location Code: Easement/Right of Way

Cover Shape: Circular

Surveyed By: LMH

Certificate Number: 17D019

Date Surveyed: March 4, 2015
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Photo 1

Photo 2

Photo 3

Photo 4
• 512 Sanitary Manholes Inspected
  • 90% in Good Condition
  • 5% in Fair Condition
  • 5% in Poor Condition

• 888 Storm Structures Inspected
  • 90% in Good Condition
  • 7% in Fair Condition
  • 3% in Poor Condition
PUMP STATIONS

• Rolston Road and SCADA system already scheduled to be replaced

• Byrom, Blythe and Ripley assessed with memo of findings and recommendations

• Provide general asset inventory and replacement schedule with prioritization for budgeting
## City of Linden Pump Station Non-Spatial Table

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• Attributes of a utility that describe its performance
  • How much, of what nature, how frequently
  • Driven by customer/users and governing body
  • Communicate and track service levels (manage expectations and measure results)
  • Increased service equals increased cost:
    • Trade-offs: risk versus rate impacts
    • Consumption rate versus investment rate
    • Balance acceptable level of risk with acceptable cost
LEVEL OF SERVICE

• City of Linden wants to maintain current service level
  • Understand where they are first
  • Then define goals and acceptable level of risk

From EPA Fundamentals of Asset Management
• Condition of asset used to estimate Probability of Failure (POF):
  • May include other factors such as age, soil type, material of construction

• Criticality determined with LOS goals to estimate Consequence of Failure (COF):
  • May include location (surface water, railroad), surface type (road/grass), customers/flow

• Business Risk Evaluation (BRE) = POF x COF
  • Adjust for redundancy
COSTS TO DATE

• Pump Station Design
  • SAW Application $70k
  • Spent $68k – Complete

• Wastewater Asset Management Plan
  • SAW Application $529k
  • Spent $250k – Finalizing Risk and Costs

• Stormwater Asset Management Plan
  • SAW Application $347.8k
  • Spent $157k – Finalizing Risk and Costs
NEXT STEPS

Finalize Risk and LOS
- Sensitivity Analysis
- “Gut check”
- Level of Service goals and measures

Recommendations
- O&M costs and priorities
- Capital Improvement Projects

Rate Sufficiency
- Balance Needs and Cost
- Iterative Process
- Develop budget tools

GRANT COMPLETION MAY 2017
AMP BENEFITS TO LINDEN

• Have GIS database, including:
  • Hyperlinks to record drawings that can be viewed in office or on mobile device
  • Risk model

• Have baseline assessment of sewers and structures

• Risk analysis highlights the assets that require more frequent monitoring and/or maintenance

• Have maintenance, rehabilitation and replacement costs for all assets
AMP BENEFITS TO LINDEN

• Know where they stand now
• Plan for the future
• Data available when other needs arise
  • Road, water main, etc. projects can look at condition and risk of sewers and structures
  • Rehabilitate, replace, or leave
• Budgetary tool
QUESTIONS