

Council Planning Session

December 10, 2018

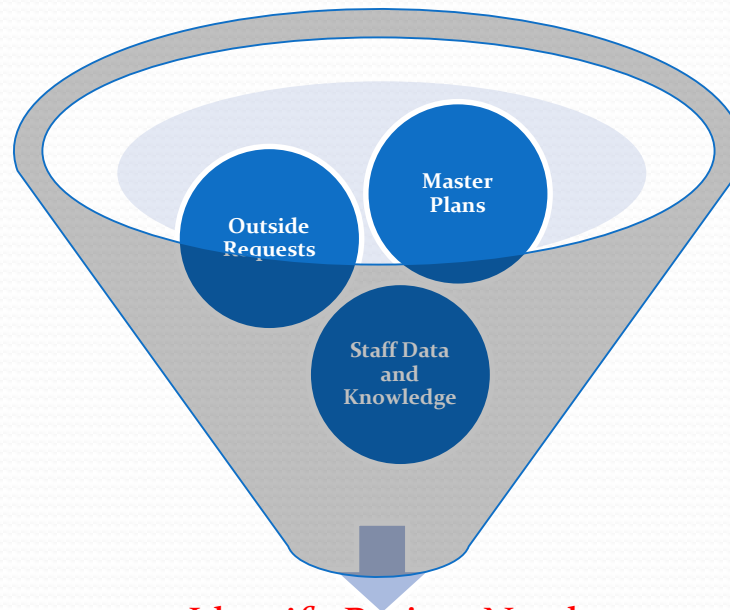


Presentation Agenda

- CIP Program Management
- Ann Arbor Water Supply
- Ensuring Water Treatment Plant Reliability
 - 1938 Plant facilities replacement (Plant 1)
 - Regulatory compliance and future treatment alternatives
- Cost and Schedule
- Sanitary Sewer System Asset Management

CIP Program Management

*Step 1: **P**roject Needs*



Identify Project Needs
and Enter in CIP
Database

CIP Program Management

*Step 2: **P**rioritize Projects*

Prioritize Needs
Using Prioritization
Model

Rating Categories:

Sustainability Framework

Safety/Compliance/Emergency Preparedness
Funding

Coordination with Other Projects or Agencies

Master Plan Objectives

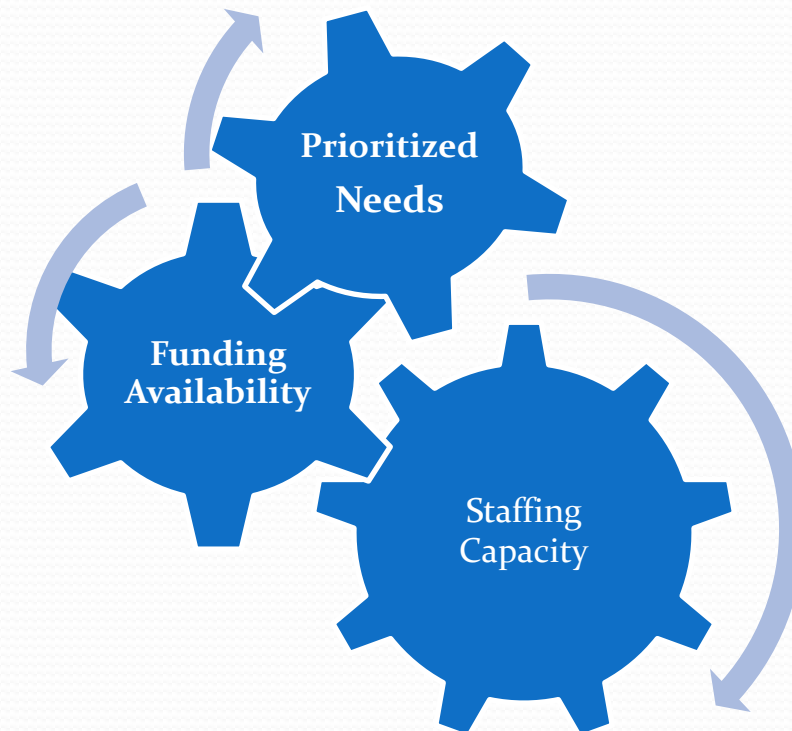
User Experience (Level of Service

System Influence/Capacity

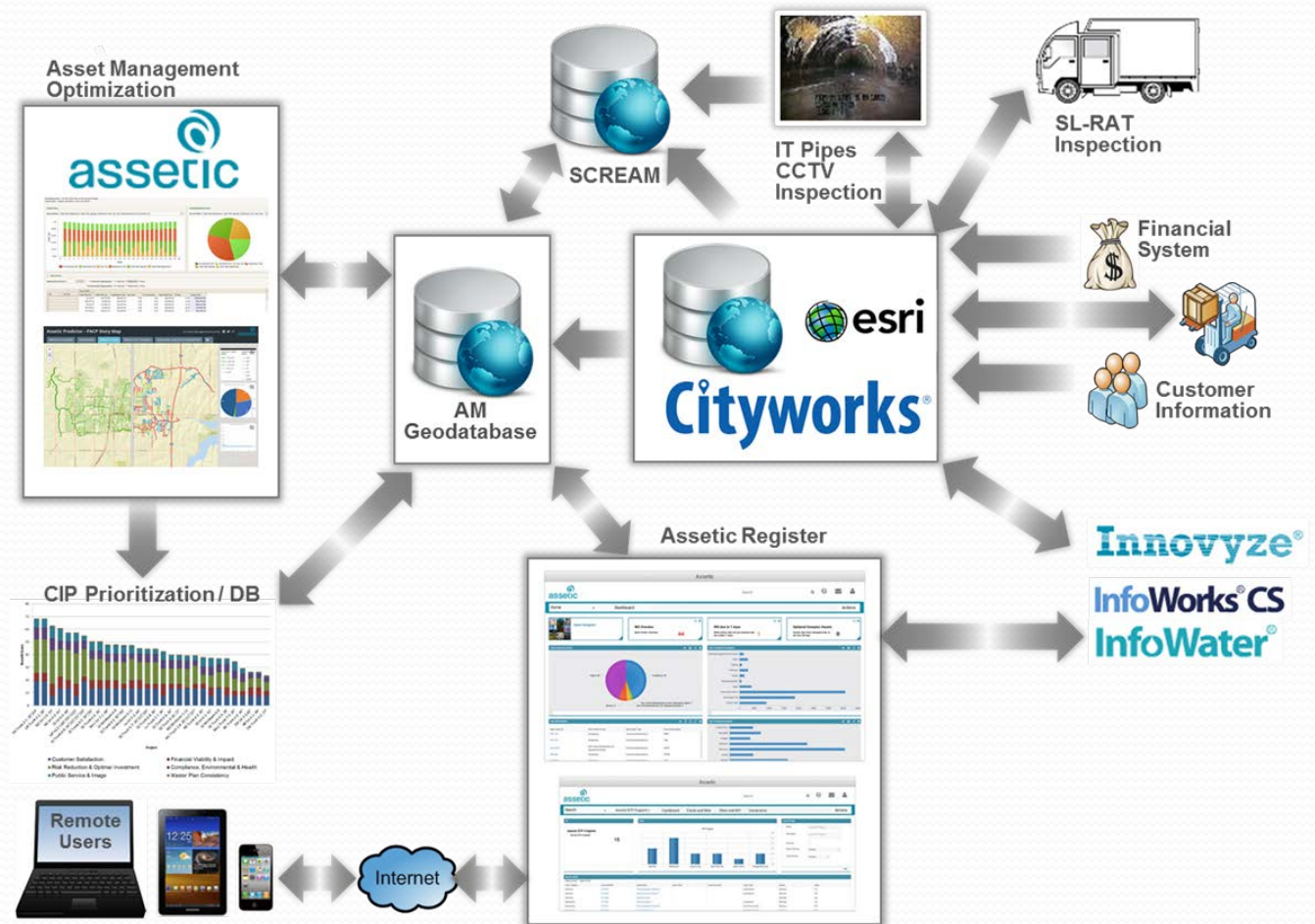
Operations & Maintenance

CIP Program Management

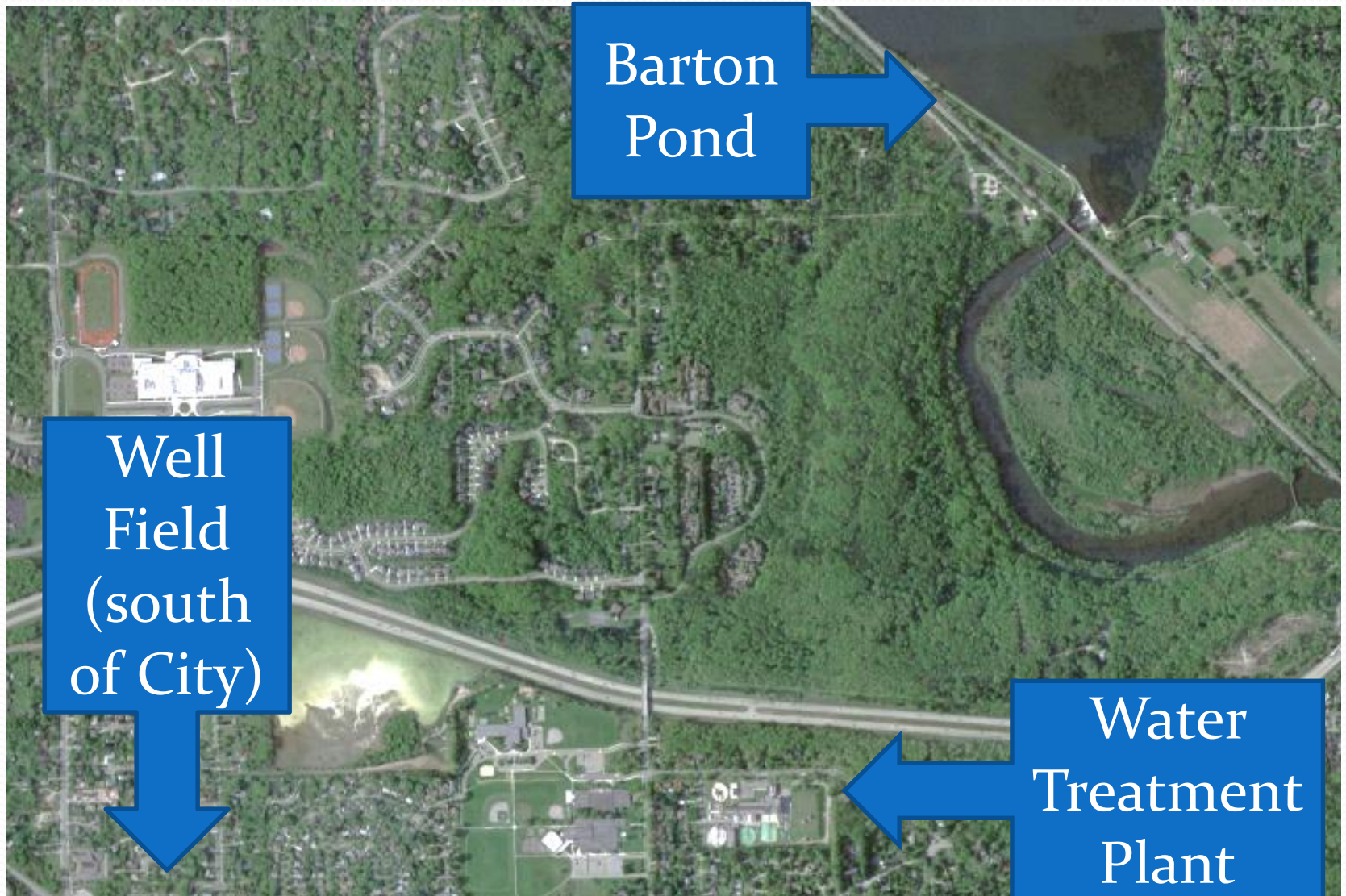
*Step 3: **P**rogramming*



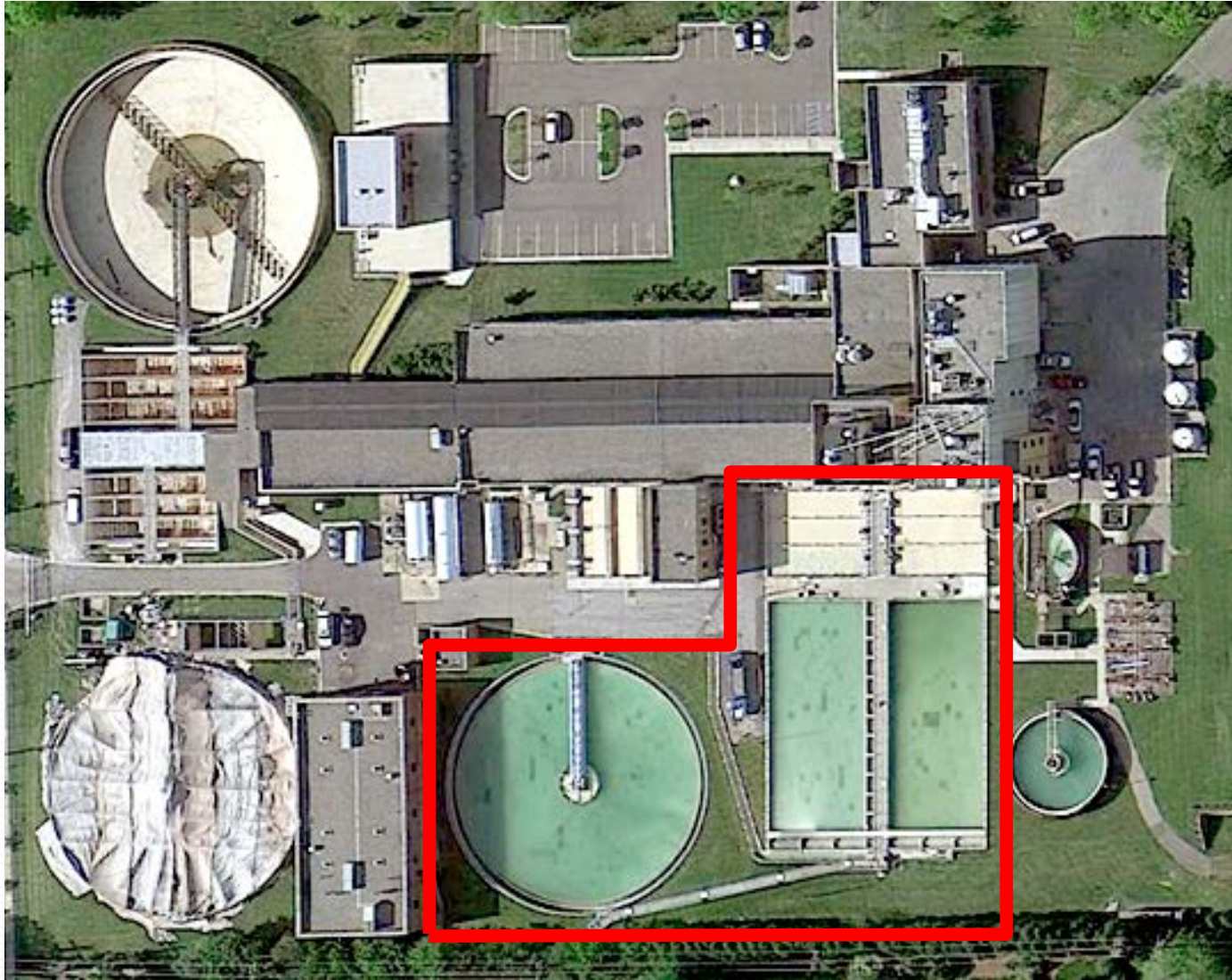
Managing the Data & Data Systems



Ann Arbor Water Supply



Water Treatment Plant



Project Drivers

- Age and condition of 1938 and 1949 infrastructure
- Source water impacts from drought and/or potential contamination
- DEQ Sanitary Survey concerns (uncovered basins; settled water turbidity; 10 States Standards)
- Future regulatory requirements and compliance



Project Goals

- Ensure a safe and reliable water supply for the future
 - Establish water quality goals and customer service requirements
 - Analyze source of supply alternatives
 - Develop source of supply plan with facility alternatives
- Maintain focus on:
 - Regulatory compliance
 - City Sustainability Framework
 - Customer Satisfaction

Long-term Water Supply Options Evaluation

Water Supply Alternatives



Source of Supply Findings

- Non-economic evaluation rankings:

Alternative	Ranked High	Ranked Low
Existing sources with WTP improvements	Distribution water quality Existing facilities utilization Autonomy/IGA's Sustainability	Raw water quality challenges
New groundwater supply (22 MGD)	Distribution water quality Existing facilities utilization Autonomy	Raw water quality challenges
Purchased water supply	Water quality vulnerability System operations	Distribution water quality Sustainability

- Overall, Existing Sources w/ WTP Improvements ranked highest

Source of Supply Findings (cont.)

- Economic evaluation:

Alternative	Capital Cost
Existing sources with WTP improvements	\$80M to \$90M
New groundwater supply	\$100M to \$130M
Purchased water supply	\$250M to \$300M

- Costs represent a similar level of redundancy and capacity amongst alternatives
- Combined with non-economic rankings, Existing Sources w/ **WTP Improvements is the recommended** long-term supply plan

Source of Supply Findings (cont.)

- Economic evaluation:

Alternative	NPV (30 years)
Existing sources with WTP improvements	\$390M
New groundwater supply	\$500M
Purchased water supply	\$490M

- Costs represent a similar level of redundancy and capacity amongst alternatives
- Combined with non-economic rankings, Existing Sources w/ **WTP Improvements is the recommended** long-term supply plan

Water Rate Impacts

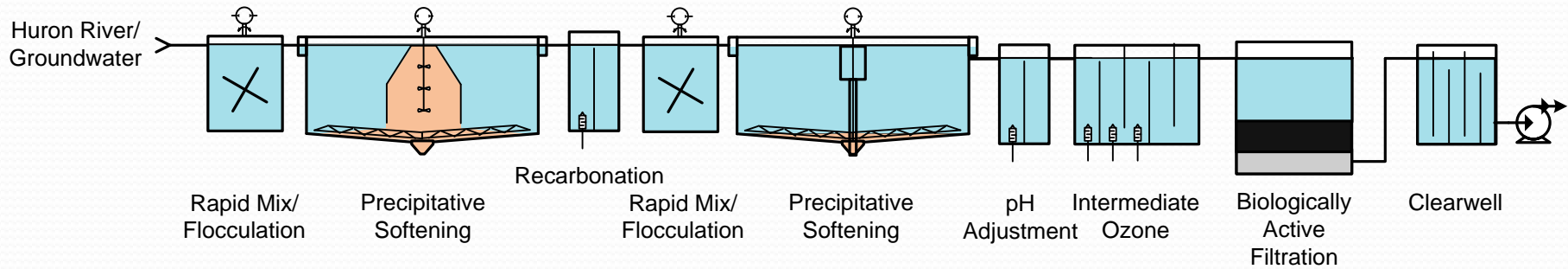
- Proposed revenue requirement increase in January 2019 and subsequent years
 - 6%
 - Meet financial metrics for future capital needs
 - Plant 1 Replacement Project
 - Distribution system water main renewal
 - Goal – 1% per year

Future Treatment Considerations and Regulatory Compliance

Regulatory Horizon

- 10 States Standards
- Contaminants under consideration for regulation
 - Microbial Pathogens – Contaminant Candidate List 4, LT₂ESWTR
 - DBPs and precursors – nitrosamines, chlorate
 - Trace inorganic contaminants – strontium, perchlorate, fluoride, hexavalent chromium
 - Trace organic contaminants – VOCs, algal toxins, PFAS

Current Contaminant Barriers



Turbidity		✓		✓			✓	
Pathogens		✓		✓		✓ ^{4,5}	✓ ⁴	✓ ⁴
DBP Precursors and DBPs		✓				✓	✓	
Inorganic Macro-Pollutants		✓ ¹		✓ ³				
Inorganic Micro-Pollutants		✓ ²				✓	✓ ²	
Organic Micro-Pollutants						✓	✓	
Taste & Odor Compounds						✓	✓	

Legend:

Robust Barrier
 Partial Barrier

¹Ca and Mg

²Fe and Mn

³Ca

⁴Bacteria, viruses, and Giardia

⁵Cryptosporidium, warm water

Recommendations



- 1938/1949 Pretreatment Facilities Replacement (Plant 1):
 - New solids contact clarifiers
 - UV Disinfection
- Recommended improvements position City for future needs

Issues for Council

- UV Disinfection - Construction Contract (Early 2019)
- Lime Solids Residuals Removal (Early 2019)
- Plant 1 Replacement Project
 - Progressive Design Build Contract (FY20)
 - Design (FY21 – 23)
 - Financing Application (FY24)
 - Construction (FY25 – 29)

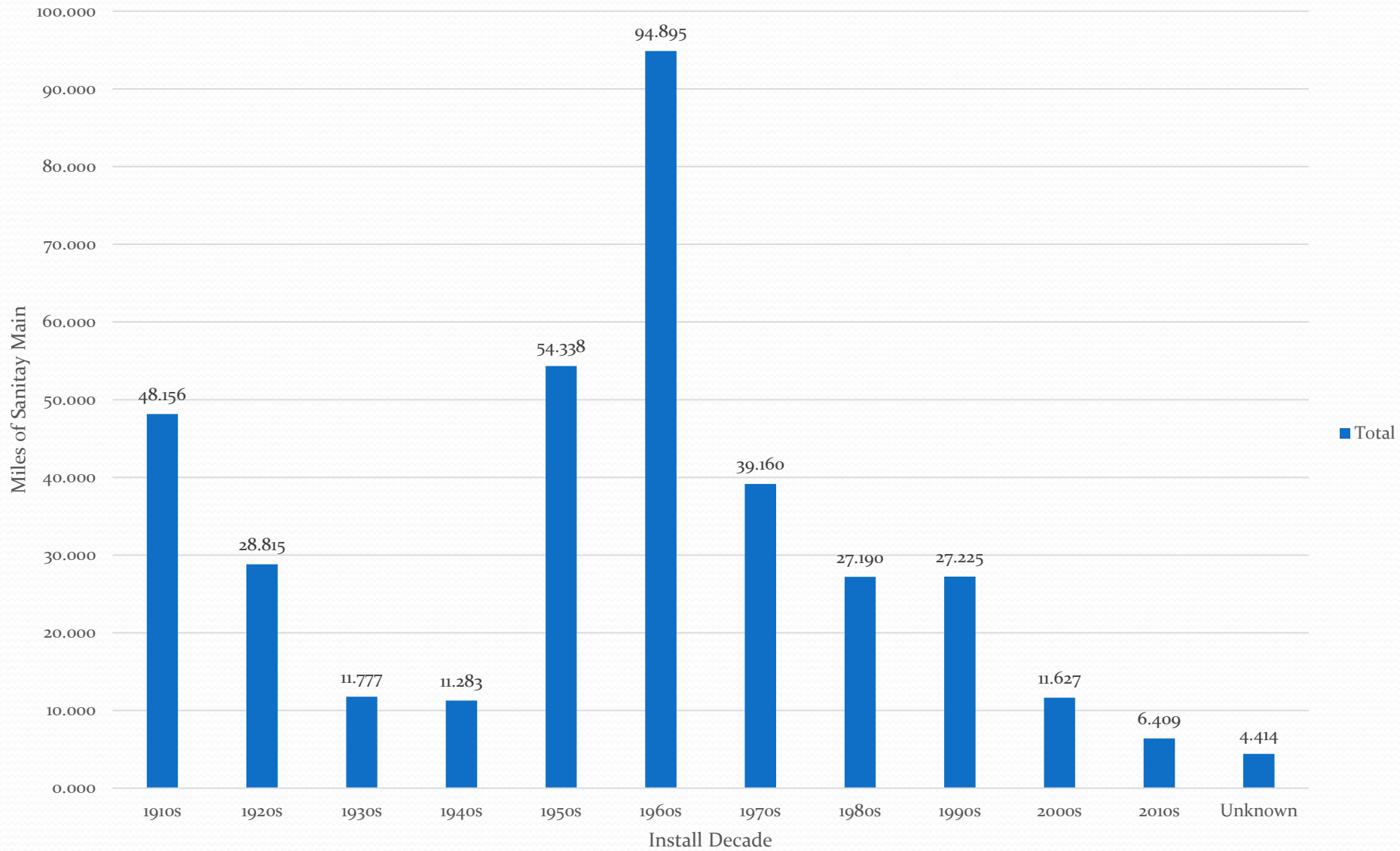
Potential Future Barriers

- Potential advanced treatment processes
 - Advanced oxidation – organic contaminants, pathogens
 - Ozone/Peroxide Treatment (\$15M to \$20M)
 - Upgrade current ozone equipment
 - New Peroxide equipment

Sanitary Sewer Collection System

- 365 Miles of Sanitary Main
 - Size range 8"-72"
- 10,230 Manholes
- 27,000 connections
- 9 Public Works Technicians (maintenance and repair)
- Annual Operating Budget \$2,675,394.00

Miles of Sanitary Mains by Installation Decade



Old Maintenance Program

- Followed a schedule of cleaning by identified “Districts”...
 - Jetting
 - Rodding
 - Televising



...which Led to Problems:

- Old Technology
- Ineffective and Inefficient methods
- Schedules often based on 1-time occurrence
- Unmanageable lists
- Lack of maintenance in all pipes

In Response, City launched Asset Management Project

Asset Management Plan

- Sanitary and Stormwater Project
- \$1,170,537 Total; Sanitary: \$701,917
- Models aids in determining
 - Optimal Maintenance Schedule
 - Capital Repair and Replacement Priority
- Long Term Funding

Departmental Changes

- New Televising Truck and Software
- Root Cutting Nozzles
- Acoustic Pipe Inspection Equipment
- New Vactor to replace rodding truck(delivery June 2019)
- Asset Management Software
- Computerized Work Order Management System
- Staff Training
- On Call Spot Lining Contracts

Truck Inspection View

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Media Playback Audio Video Subtitle Tools View Help



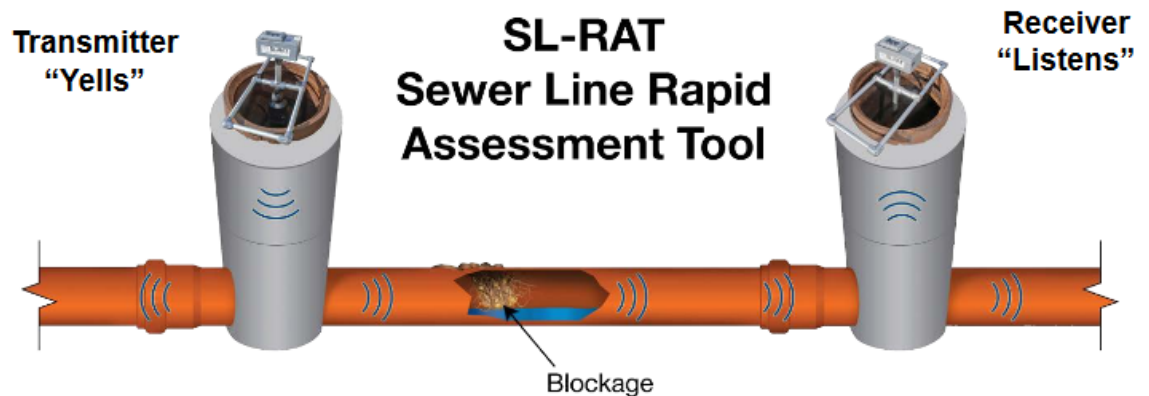
Acoustic Inspections

Identifies potential blockages

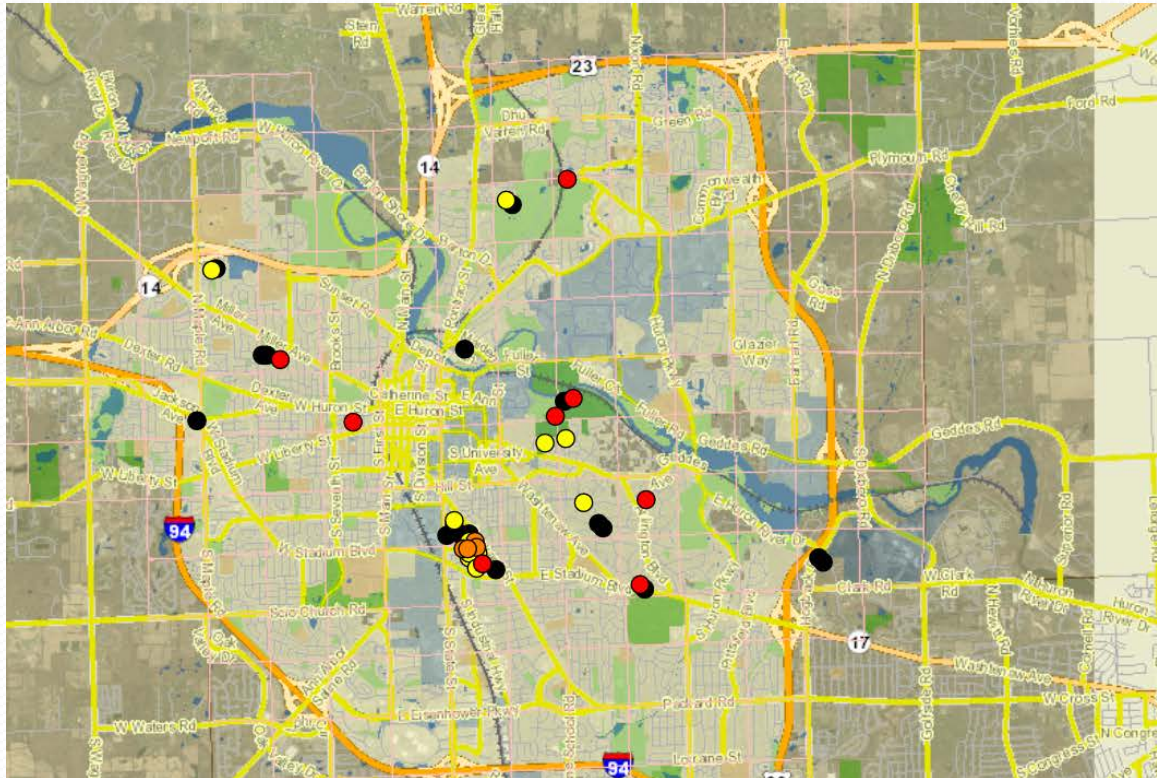
Screening Tool used for:

- Cross Lot* Sewers
- High Risk or Known Problem Spots
- Pre Maintenance

*Sewers located in grassy/wooded areas



Map View of Acoustic Inspections



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Legend

- Out of Service Hyd ☐
- Progress ☐
- Fiscal 16 Hydrant F ☐
- Quality Complaints ☐
- Fiscal 17 Hydrant F ☐
- Quality Complaints ☐
- Fiscal 17 Non Hydr ☐
- Flushing Quality Complaints ☐
- ▼ SL Rat Score = 1 ☐
- ▼ SL Rat Score = 2 ☐
- ▼ SL Rat Score = 3 ☐
- ▼ SL Rat Score = 0 ☐

Red dot

Orange dot

Yellow dot

Black dot

Where are we now?

- 26% of pipes televised and rated
- FY19: New vactor to replace rodding truck
- In process of renting vactor to use until new vactor delivered (\$75K)
- Goal – 50% of cross lots inspected with acoustic equipment

Challenges:

Evolving Maintenance Schedules cause need for parallel maintenance

Addressing backlog

Data Management and Analysis

Recent and Upcoming Maintenance Activities

- FY17: \$3.8M Lining and Televising
- FY18: \$469K Lining and Televising
- FY19: 1.5M Lining
- FY19: New Vactor \$449K

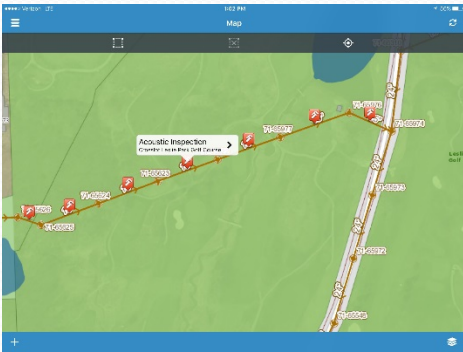
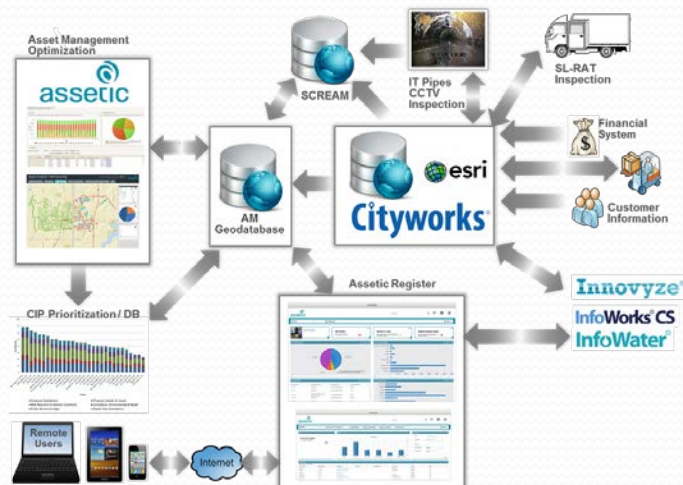
Planned FY20-FY21

- \$1.5M Lining/year
- \$400K/year Spot Repair and Lining
- Replacement Vactor with Recycled Water Feature
- Education and Outreach



Future Needs

- FY20: Replacement Vector Upgrades \$126K
- FY20-22: Finish televising the system \$2.7M
- Ongoing: Additional Staff support
 - Engineer (shared with other Public Works Areas)
 - Data Analyst (shared with other Public Works Areas)





Questions