Purpose

Provide best possible water quality and utility service

Proactively addressing aging infrastructure now

Reducing the likelihood of future disruptive and costly emergency repairs
About RENEW

Water for the Future

In order to provide customers with the best water quality and utility service, Middlesex Water Company (MWC) is in the process of replacing pipes within its distribution system that are at the end of their useful life.

- Middlesex Water Company has approximately 732 miles of transmission and distribution mains in service area.

- Main driver for the RENEW program is to maintain 100 Year Replacement schedule for all distribution system assets.

- Equates to ±38,000 LF of pipe replacement per year.
The Future of RENEW

Goals of RENEW

“Our RENEW Program helps us to better preserve our water resources by methodically restoring the integrity of our water distribution system within the project scope area, thereby minimizing the potential of future leaks or main breaks in that vicinity”

- Dennis Doll, Chief Executive Officer
  Middlesex Water Company

1. Optimize the Selection of Assets
2. Design Most Practical Solution
3. Efficiently Construct & Implement New Assets
RENEW
Three Year Model

**Year One: Planning**
Year one will focus on identifying the next ideal location for the RENEW Project.

**Year Two: Design**
Year two will focus on designing an appropriate solution.

**Year Three: Implementation**
Year three will focus on the ideal implementation and construction of the RENEW Project.
Year One

PLANNING PHASE
Planning Phase

Year 1

1.1 Identify Potential Areas
1.2 Partner with Peer Utilities
1.3 Condition Assessment
1.4 Selection
Identify Potential Areas

Factors that will contribute to the selection of RENEW replacement assets:

- Pipe Prioritization Model
- Historical Main Break Data
- Customer Complaints
- Valve Inspection Results
- Unlined Cast Iron Pipe
- Age of Pipe
- Input from operations
Pipe Prioritization Model

MWC utilizes a prioritization model as a tool in the selection of assets for replacement. The model ranks various criteria and leverages GIS scripts to determine an asset’s overall risk ranking.

- Probability of Failure
- Consequence of Failure

1.1 Identify Potential Areas
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Probability of Failure

Criteria include:

- Major Roadways
- Rail Crossings
- Past Break History
- Pipe Age/ Vintage
- Pipe Wrapping
- Pipe Class/ Material
- Bury Depth
- Soil Resistivity
- Pressure
- Slide Areas
- Number of Connections
- Lined/ Unlined
- Transients
- Pressure Fluctuations
- Proximity to Saltwater
- Groundwater
- Electrical Transmission Lines
- Known Manufacturing issues
- Joint Types
- Water Temperature Differential
Consequence of Failure

Criteria include:

1.1 Identify Potential Areas
- Damage to Sensitive Areas
- Damage to Critical Roadways
- Damage to Railways
- Damage to Other Utilities
- Service Outage of Priority Customers
- Service Outage - Number of Customers

1.2 Partner with Peer Utilities
- Service Outage - Negative Pressure
- Fire Flow Capacity
- Duration of Outage due to Deep Pipes
- Flooding Potential
- Specialty Crossings
- Hydraulic Criticality
- Tank Feeds
Normalized Risk Results

1.1 Identify Potential Areas
1.2 Partner with Peer Utilities
1.3 Condition Assessment
1.4 Selection
Partnersing with Peer Utilities

Middlesex Water Company will attempt to secure a partner for the project, preferably a peer utility:

- Gas Company
- Telecommunications Utility
- Electric Company
- Sanitary Sewer (Municipal)
- Storm Sewer (Municipal)
Partnering with Peer Utilities

Benefits of Partnering:

- Reduce customer disruption by having utility construction take place once in a particular area.
- Project restoration costs can be split among utility companies.
Performing Condition Assessments will allow the following:

- Tailor RENEW project to better match conditions of the main.
- Estimate likelihood that the main may continue to provide satisfactory service
- Help determine remaining service life of main
- Make better decisions regarding main renewal:
  - Allow some water mains to remain in service longer
  - Prevent some pipeline failures from occurring by intervening sooner
  - Increase confidence in decisions (less chance of error)
Condition Assessment

- Identify loss of integrity
- Identify loss of structural competence or weakening of the pipe (diminished wall thickness)
- Find evidence of liner or coating failure
- Recognize other conditions of concern, e.g., pipe is unacceptably out of round.
Condition Assessment

1.1 Identify Potential Areas
1.2 Partner with Peer Utilities
1.3 Condition Assessment
1.4 Selection

- Material Testing
- Internal NDT
- External NDT
- Survey Level Inspection
- Desktop Study

Increasing Cost → Quality of Assessment
# Condition Assessment

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## 1.1 Identify Potential Areas

## 1.2 Partner with Peer Utilities

## 1.3 Condition Assessment

## 1.4 Selection
1.1 Identify Potential Areas
1.2 Partner with Peer Utilities
1.3 Condition Assessment
1.4 Selection

Condition Assessment
Selection

The Selection Phase of the Planning process will have the following goals:

- Review condition assessment results and prepare recommendation on specific assets to replace
- Coordinate with Peer Utilities on specific locations
- Award Design contract to a Consulting Engineer
DESIGN PHASE

Year Two
Design Phase

Year 2

The Design Phase of the RENEW program will focus on taking the area identified in the planning phase and preparing the project for construction by fully engineering a design, obtaining all external authorizations, and completing all procurement and bidding requirements.
IMPLEMENTATION PHASE

Year Three
Implementation Phase
Year 3

The Implementation Phase of the RENEW Program will focus on the effective construction and implementation of the new assets that were designed in the previous stages of the project lifecycle.

CONSTRUCTION- MWC will handle the Construction Administration and Inspection associated with the RENEW project.

ACCEPTANCE- The acceptance component of the RENEW Project will include completion reports, GIS Data Updates, and updates to the pipe prioritization model.

Tailor RENEW to better match the conditions of the mains
Questions?