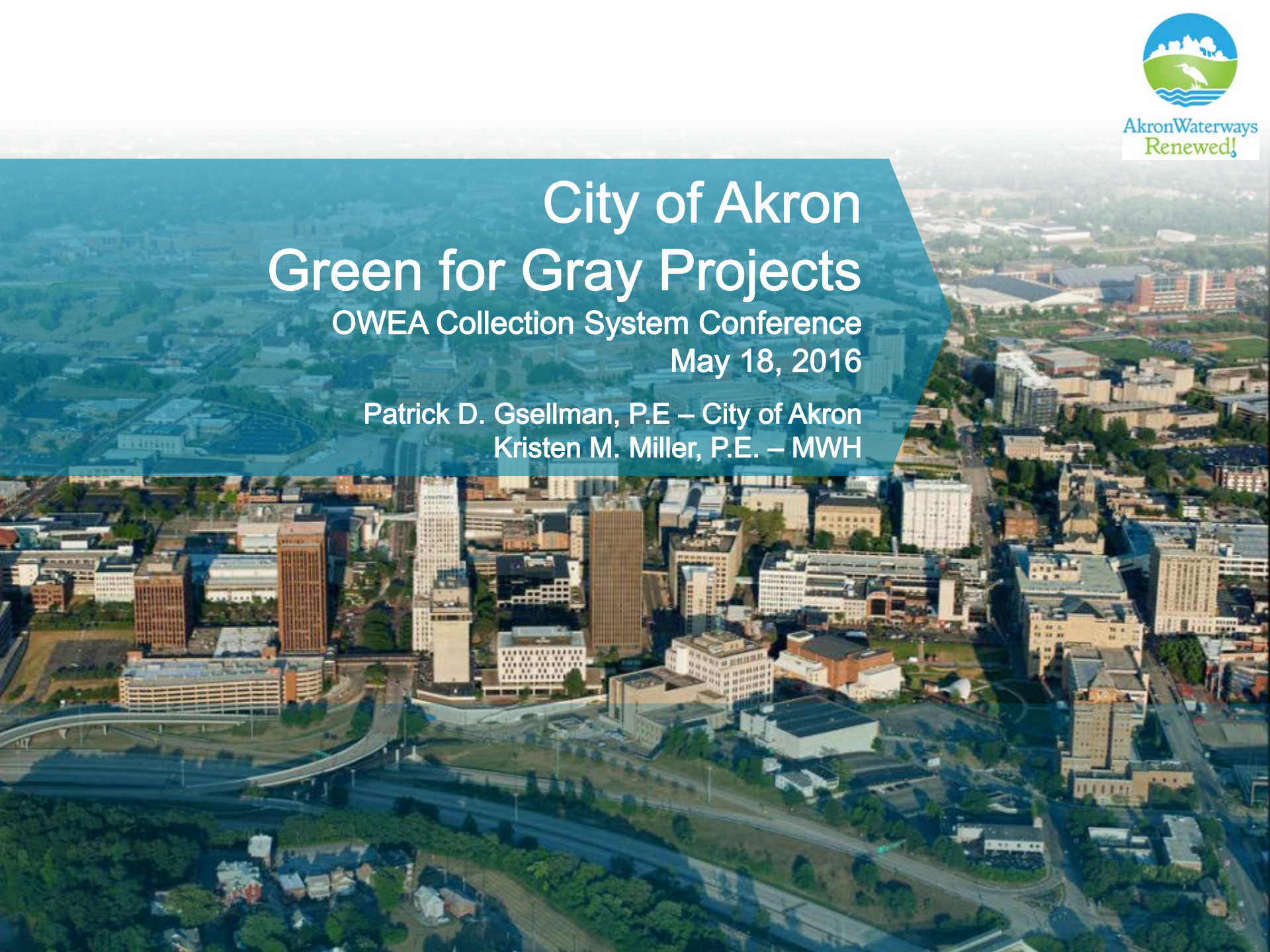


City of Akron
Green for Gray Projects

OWEA Collection System Conference
May 18, 2016

Patrick D. Gsellman, P.E – City of Akron
Kristen M. Miller, P.E. – MWH

AkronWaterways Renewed!

Akron’s Approach to Green for Gray

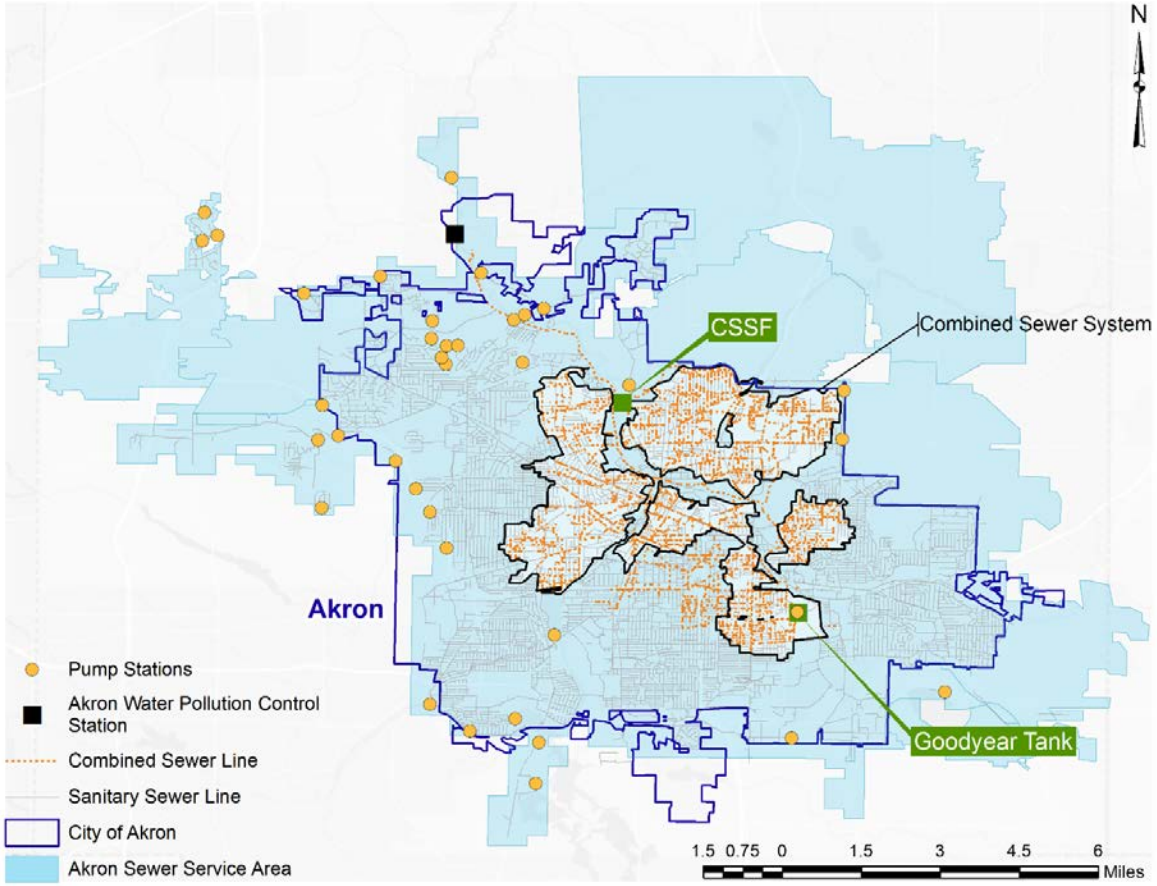
- Key Drivers and Objectives
- Technical Approach
- Overview of Akron’s Three Green for Gray Projects

AkronWaterways Renewed!

Key Drivers and Objectives

Akron's Collection System

- ~183 sq. mi service area
- 356,000 people served
- 1360 miles of sewer
  - 490 storm
  - 700 sanitary
  - 170 combined
- WRF – 130 mgd secondary capacity
- 35 CSO Racks (not all active)



AkronWaterways Renewed!

Current Consent Decree

- Consent Decree: 0 Overflows in a Typical Year
- Current LTCP:
  - $800M 2010 LTCP
  - $1.1B 2014 Update
  - All projects by 2027
- Financial/Demographic Drivers
  - Declining population
  - Poverty rate > Nat'l Avg
  - MHI < Ohio and Nat'l Avg.
  - Residential Indicator = 2.64% MHI; (2.9% Akron alone)

AkronWaterways Renewed!

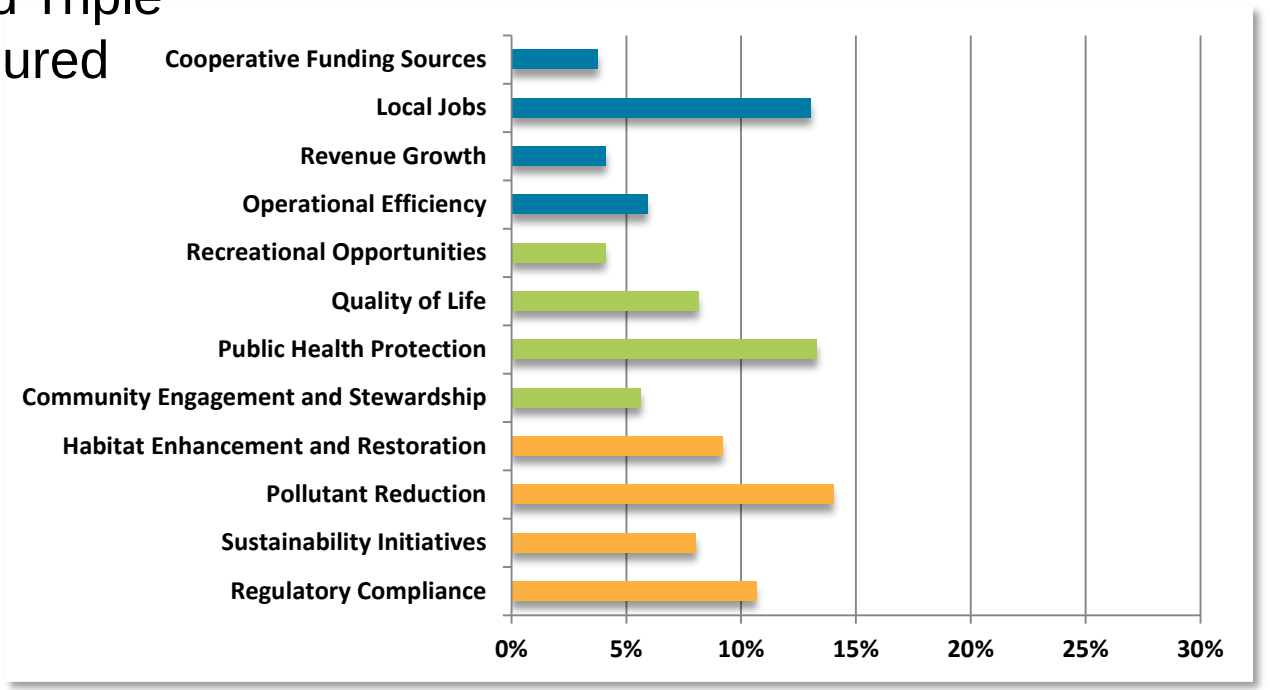
Financial Affordability is Key Driver in re-evaluating LTCP Projects

- Akron invested $335M on sewer infrastructure through 2014
- Sewer rates have been raised over 269% in the past 10 years
- Current 2027 schedule is not affordable

AkronWaterways Renewed!

Akron Used Integrated Plan Approach to Review Consent Decree

- 2014 - City began development of an Integrated Plan:
  - Improve financial affordability
  - Develop enhanced Triple Bottom Line measured benefits
  - Achieve equal or better environmental benefit
- Engaged stakeholders



AkronWaterways Renewed!

Akron Identified Major Objectives of the Integrated Plan

- Evaluate priority and schedule to meet regulatory requirements
- Optimize and refine system utilizing new technologies and green sustainable alternatives
- Identify cost reduction options
- Expand public health investments (stormwater and asset management)
- Engage stakeholders

Akron, Ohio will be recognized as a community that has used the Integrated Planning approach in rebuilding its infrastructure to meet all of its needs ***with more affordable benefits that are achieved earlier***

AkronWaterways Renewed!

AkronWaterways Renewed!

Akron's LTCP Provides Options for Minor Modification

- Exhibit 3 – "Green for Gray Option"
  - Three early action projects identified
  - Reduce effective storage volume
    - Reduction directly compensated for by GI Control Measures located within the drainage area
  - Provide same or greater level of control
  - Identify control measures to meet Performance Criteria and Critical Milestones
  - Alternative proposal must be submitted 6 months before CD Bid Date
  - Administrative review and approval by EPA

Agreement on Approach Set Stage for Technical Discussions

- U.S. EPA and City have mutual understanding that:

1. The model that was used to develop Akron's LTCP Update was fit for preliminary engineering to initially size the controls;
2. Akron, like other cities, will refine its hydraulic model as it moves through detailed design;
3. In some cases Akron will need to upsize controls to meet performance criteria. Other cities have asked to reduce the size of controls based upon a refined model;
4. Modeling is the driver and it is used to size controls to meet the performance criteria.

Technical Approach

Refining the LTCP Begins with the Model

Top 3 Justifications for Increased Data Collection, Investment in Model

#1 Increase confidence in flow and volume predictions on which to base plan refinements

#2 Scrutiny of a Consent Decree renegotiation requires defensible, accurate model

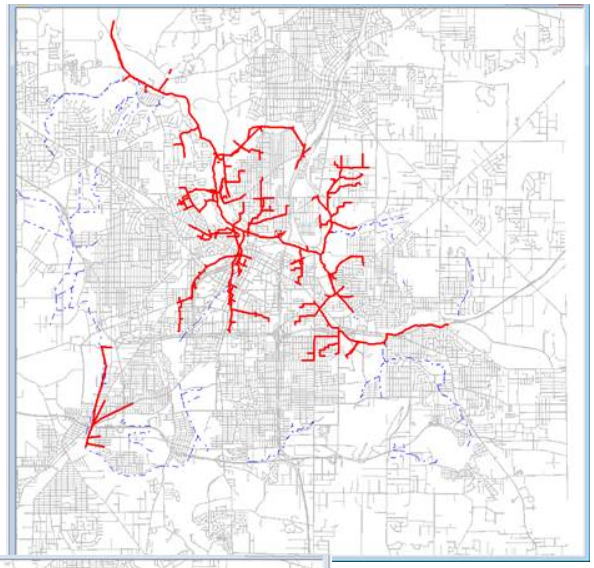
#3 Enables evaluation of non “end of pipe” solutions (Green Infrastructure, source control, etc.)

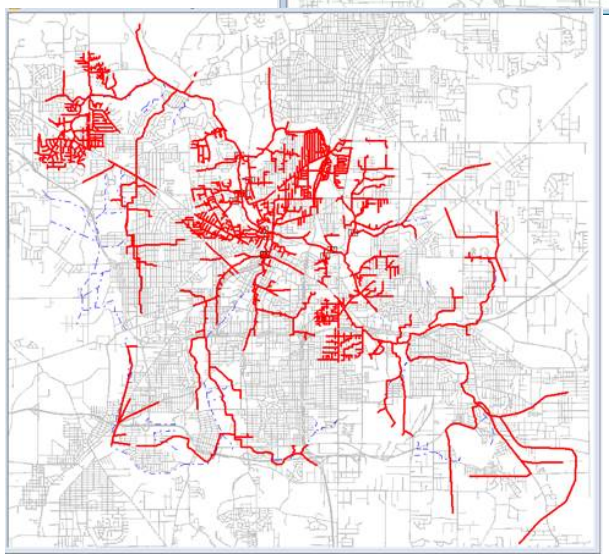
Being Used to Develop Over $1B in CSO Control Improvements

AkronWaterways Renewed!

Akron's Updated Collection System Model Provided Basis for Discussions

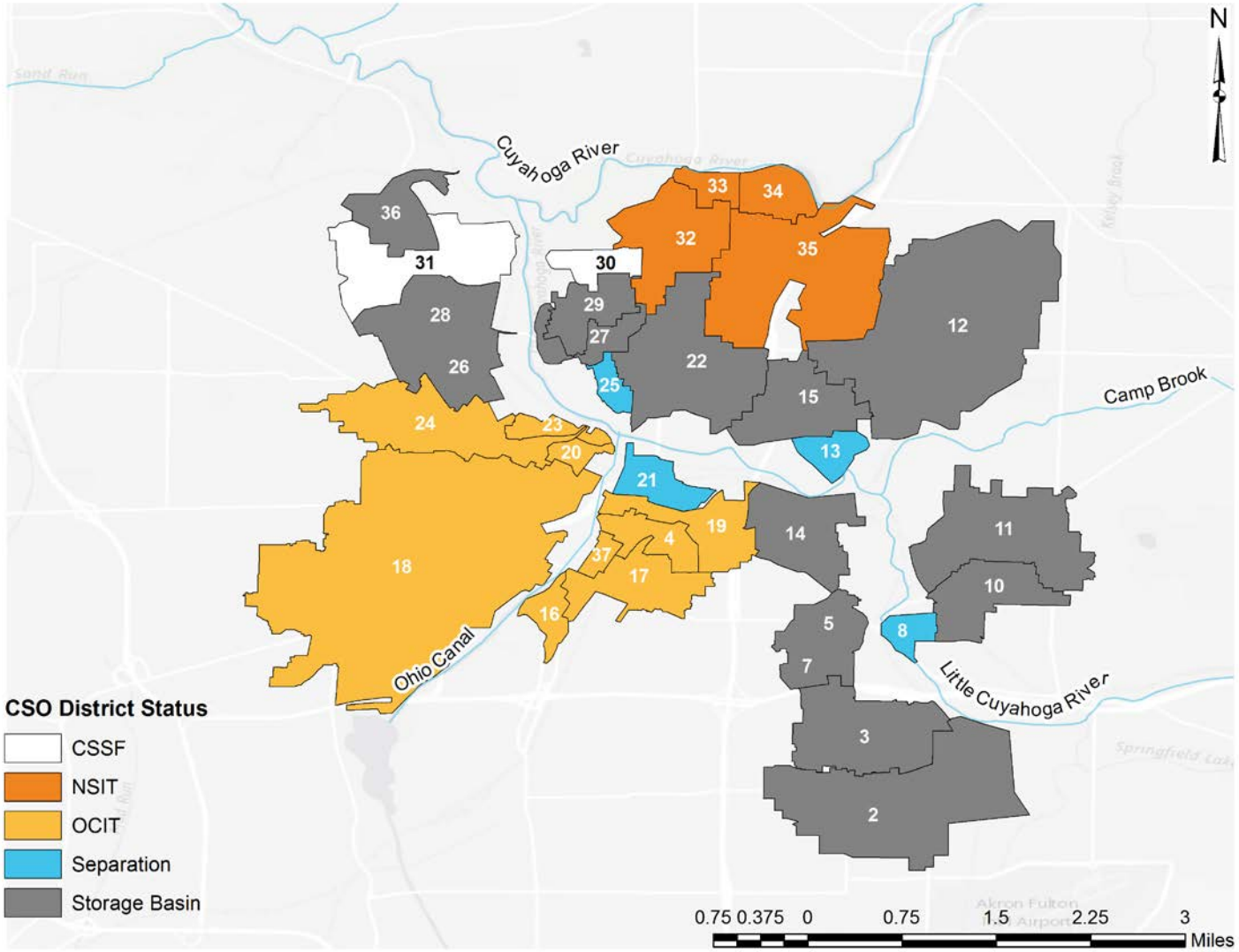
- Existing model developed over ~20 yrs
- Changed between numerous platforms
- Akron invested $3M on flow monitoring and model update efforts
- Collection system as a whole has been refined and recalibrated with the updated information





AkronWaterways Renewed!

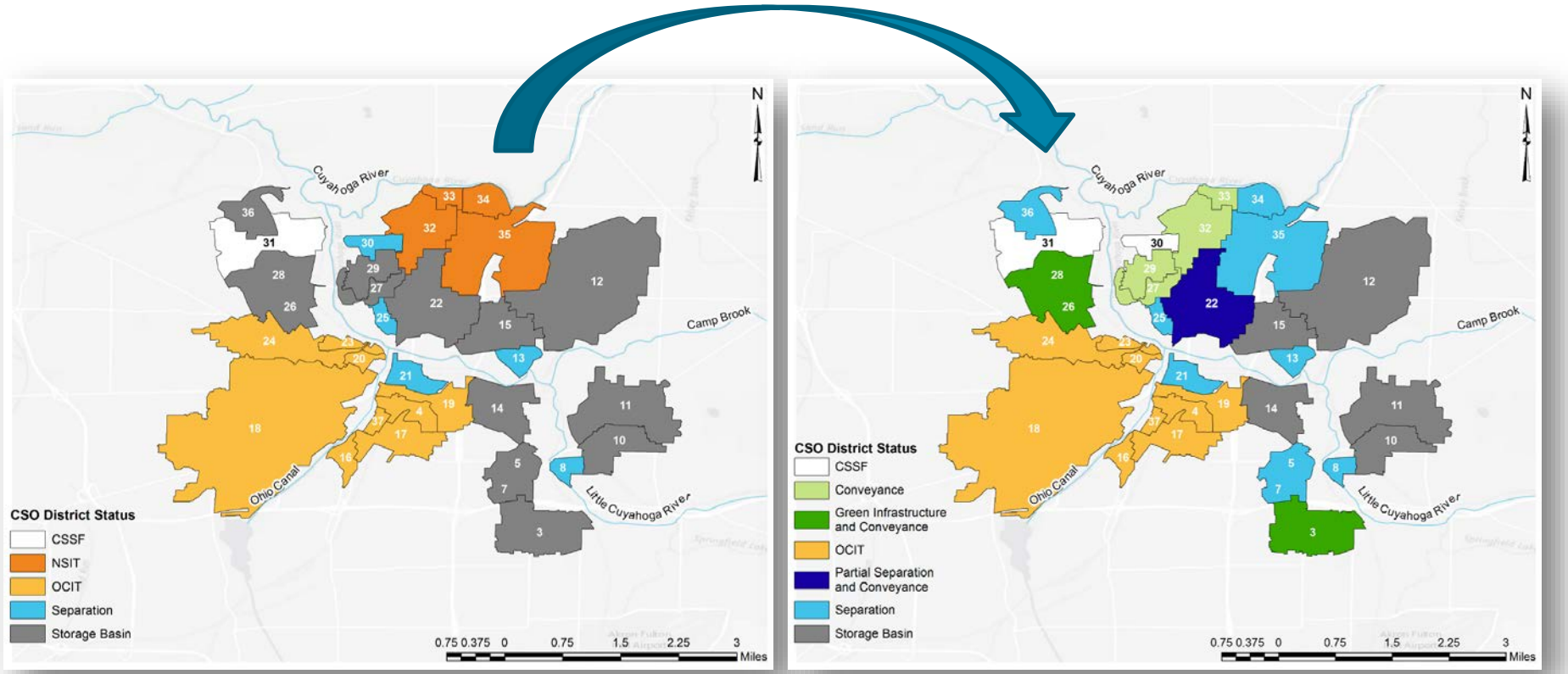
Projects Proposed under Akron's Current LTCP are Primarily Gray



AkronWaterways Renewed!

Green Infrastructure Opportunities were Evaluated in Every Rack

- Cost benefit analysis done to determine if implementing green upstream can eliminate gray or significantly reduce



AkronWaterways Renewed!

Akron Followed a Systematic GI Evaluation Process

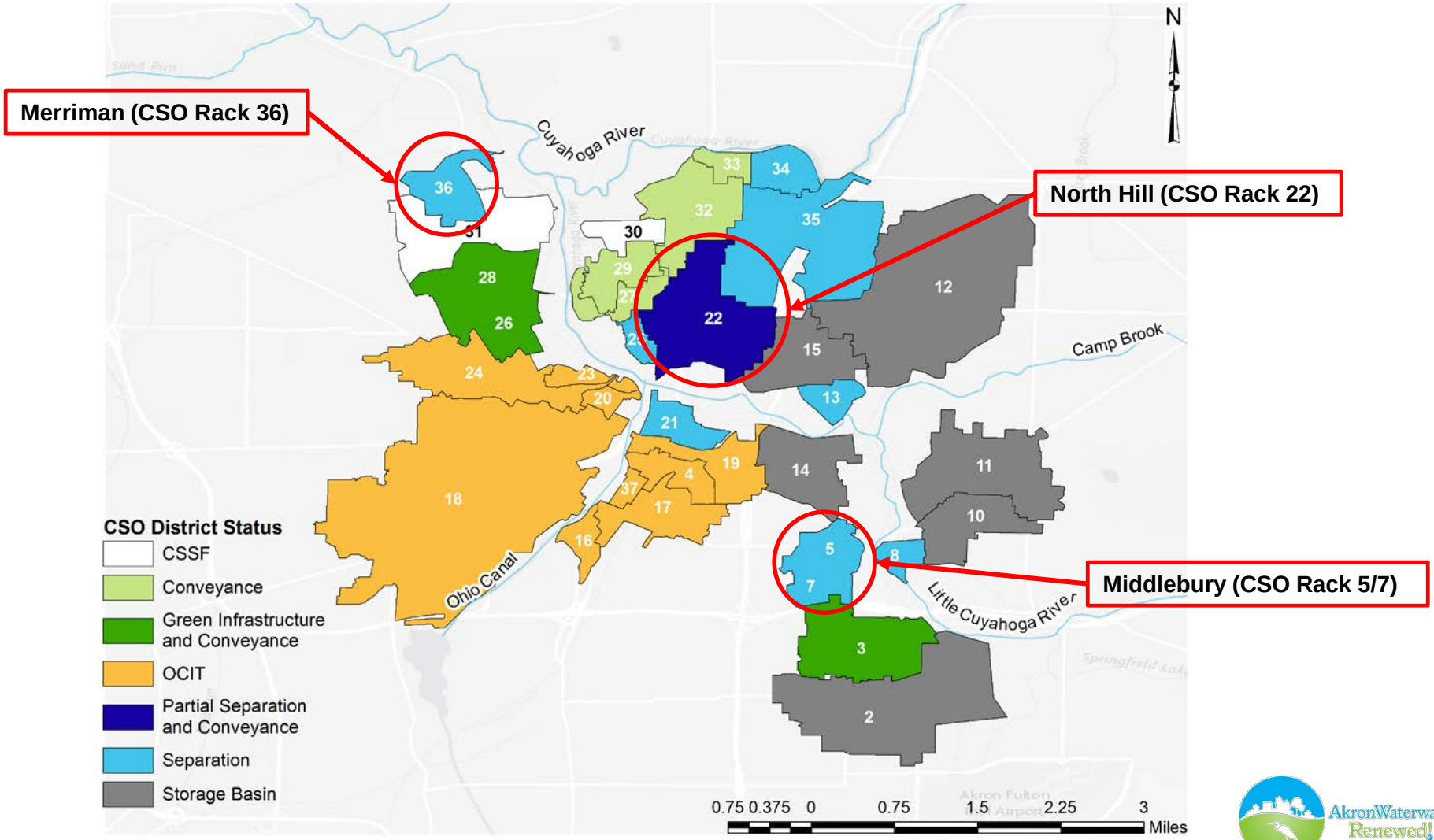
- Use information from collection system model to identify potential critical areas within the drainage area
- Coordinate between program team, various city departments and other stakeholders to identify potential GI opportunity areas
- Model collection system response and evaluate cost implications for various green/gray scenarios
- Develop preliminary cost estimates for GI implementation

Recessed Landscape Island

AkronWaterways Renewed!

Project Description

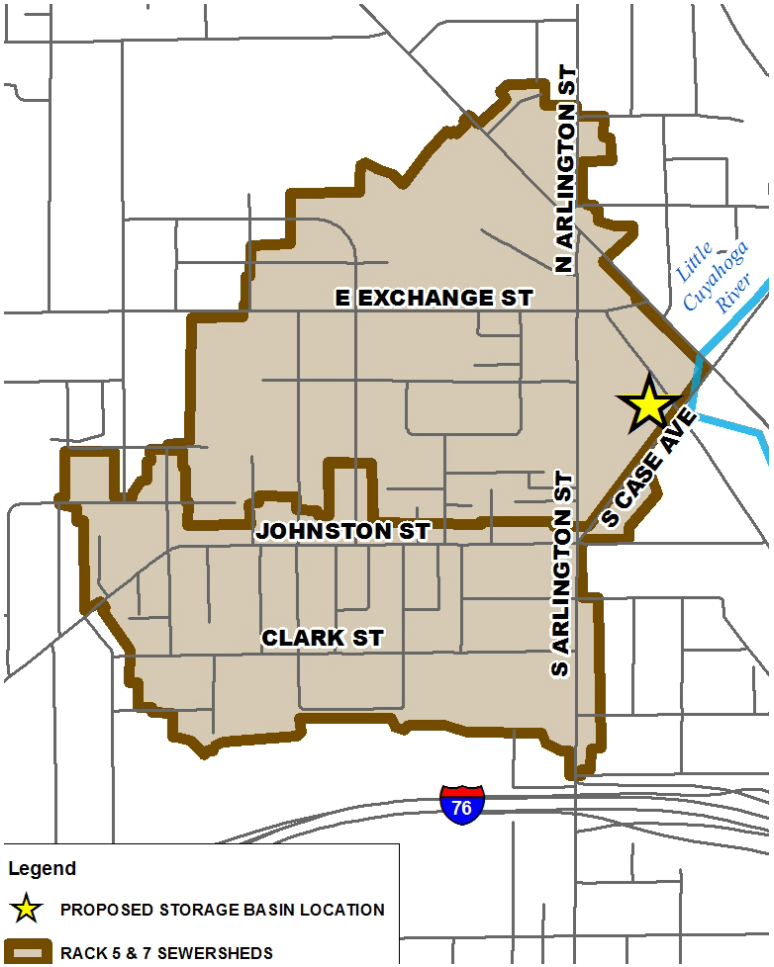
Akron's Use of Exhibit 3 Allowed for Three Green for Gray Projects



AkronWaterways Renewed!

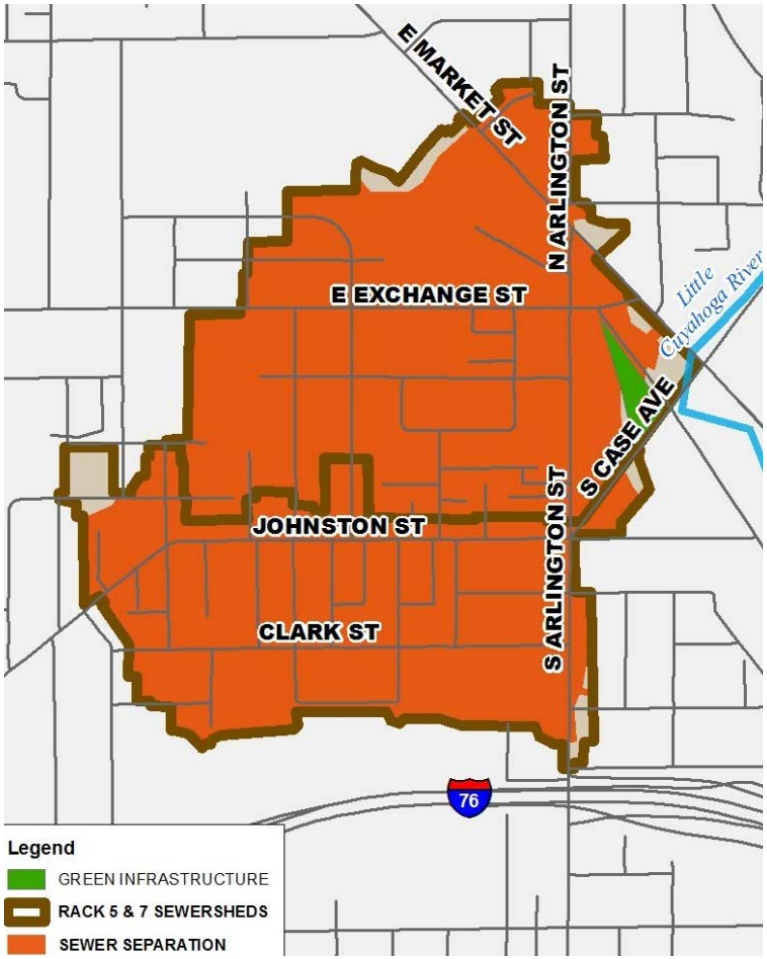
Middlebury Separation-Green Project CSO Racks 5/7 LTCP Optimization

- LTCP Update requires 1.1 million gallon storage basin to achieve zero overflows within the typical year
- Recalibrated model = 1.2 MG basin
- Above ground storage basin with odor control
- High O&M costs



Middlebury Separation – Green Project (CSO Rack 5/7)

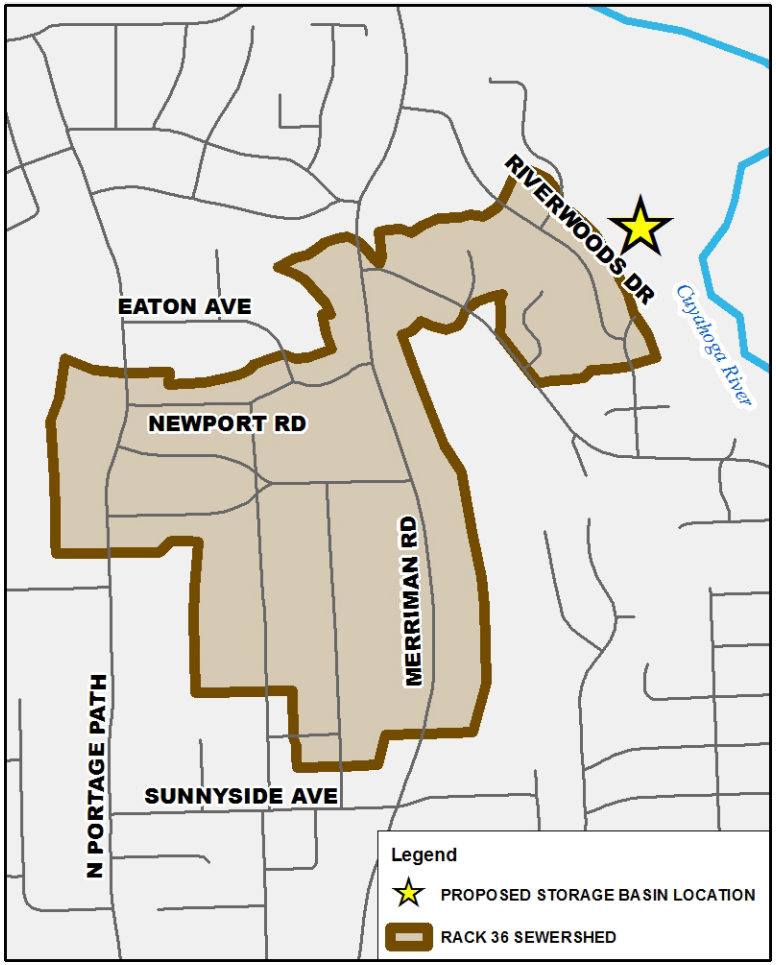
- Full Sewer Separation
  - Use existing combined sewer as new sanitary sewer
  - Install new parallel storm sewer
  - Eliminate overflows with added benefit of improved roads
- Constructed stormwater wetland
- 190 acres of contributing drainage area
- Formal approval received October 30, 2015



AkronWaterways Renewed!

Merriman Separation – Green Project
CSO Rack 36 LTCP Optimization

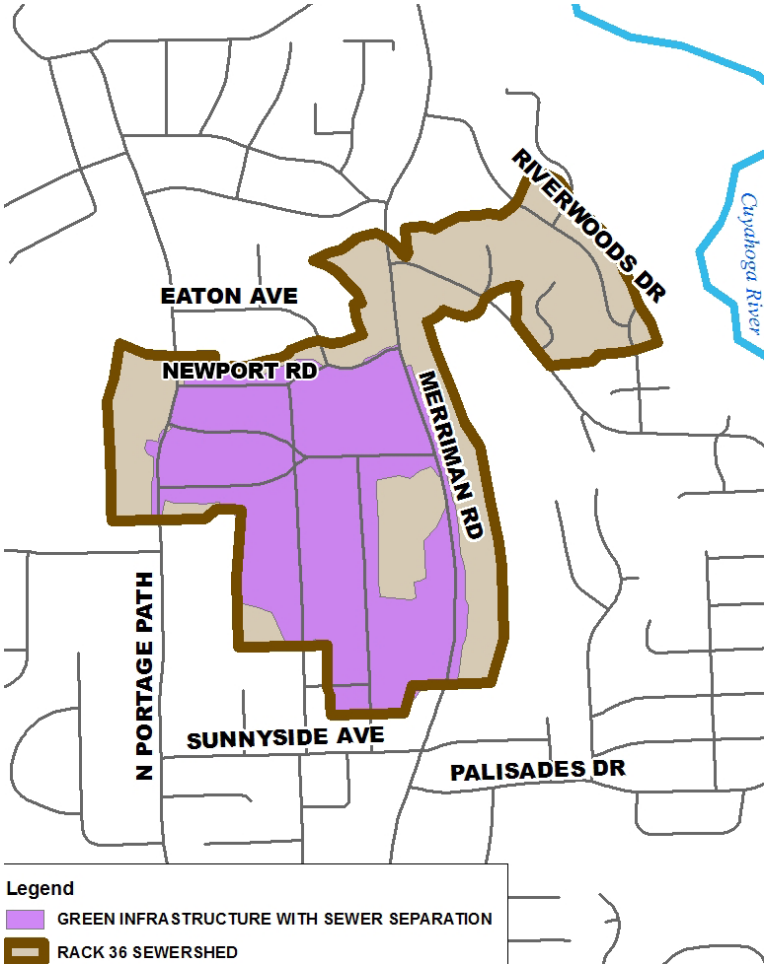
- LTCP Update requires minimum of 1.13 MG storage basin to achieve zero overflows within the typical year
- Recalibrated model = 1.15 MG
- Cost and constructability issues warranted investigation into other alternatives
- Identifying location for basin problematic



AkronWaterways Renewed!

Merriman Separation – Green Project (CSO Rack 36)

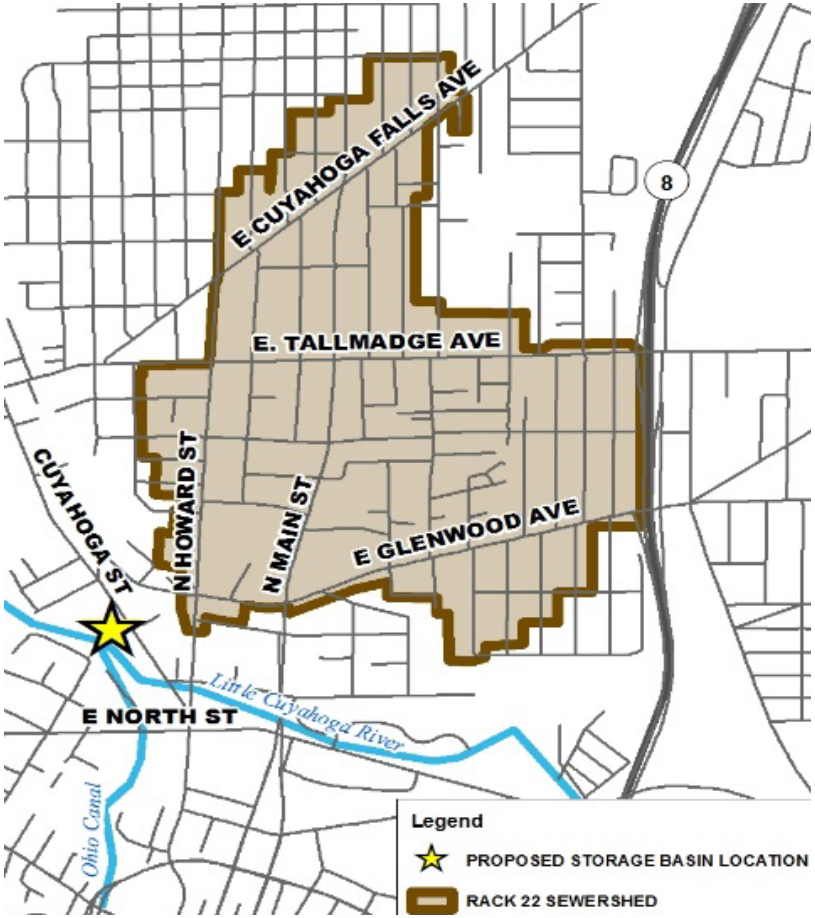
- Full sewer separation
  - Use existing combined sewer as new separated storm sewer
  - Install new parallel sanitary sewer and reconnect laterals
  - Eliminate overflows with added benefit of improved roads
- Centralized vs. distributed green infrastructure
- Constructed stormwater wetland
- 88 acres of contributing drainage area
- Formal approval received October 30, 2015



AkronWaterways Renewed!

North Hill Separation-Green Project
CSO Rack 22 LTCP Optimization

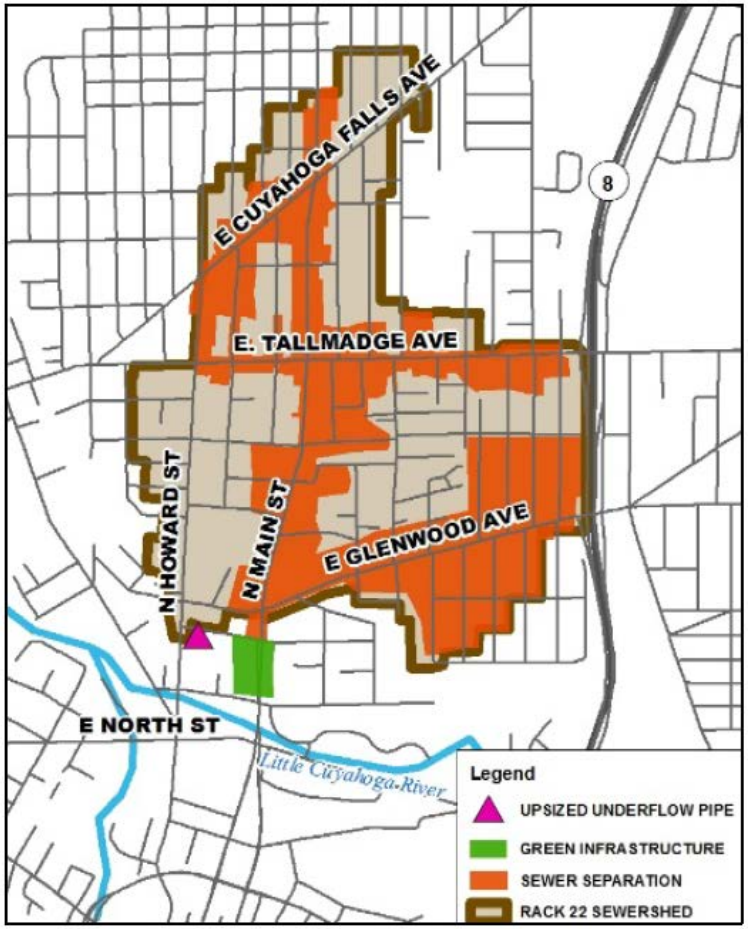
- LTCP Update requires minimum of 2.4 MG storage basin to achieve zero overflows within the typical year
- Recalibrated model = 1.95 MG



AkronWaterways Renewed!

North Hill Separation – Green Project (CSO Rack 22)

- Partial sewer separation (46% of rack)
- Off-loading green infrastructure
  - Constructed stormwater wetland
- 196 acres of drainage area captured
- Remaining CSO volume will be controlled by using existing interceptor capacity
- Formal approval received December 7, 2015



AkronWaterways Renewed!

Key Findings from Exhibit 3 Negotiations

- Updated flow data and system-wide hydraulic model enhancements established platform for discussions
- Routine technical discussions provided transparent and cooperative negotiation environment
- Mutual understanding of model led to confidence in ability to meet performance criteria with revised projects
- Administrative order did not require court approval

Resulted in three successful green for gray modifications

AkronWaterways Renewed!