



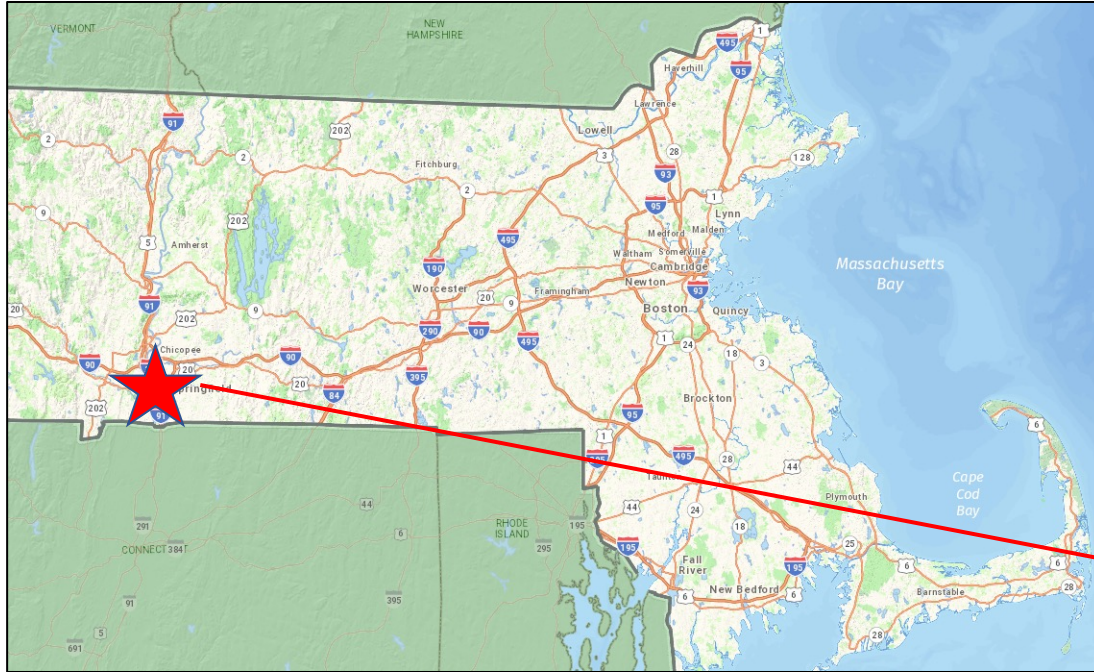
Springfield Water and Sewer Commission Building System Resiliency – Overcoming the Challenges of the Locust Transfer Construction

John Rahill, P.E. - Kleinfelder

**2024 NEWWEA Annual Conference & Exhibit
January 22, 2024
Boston, MA**

Background

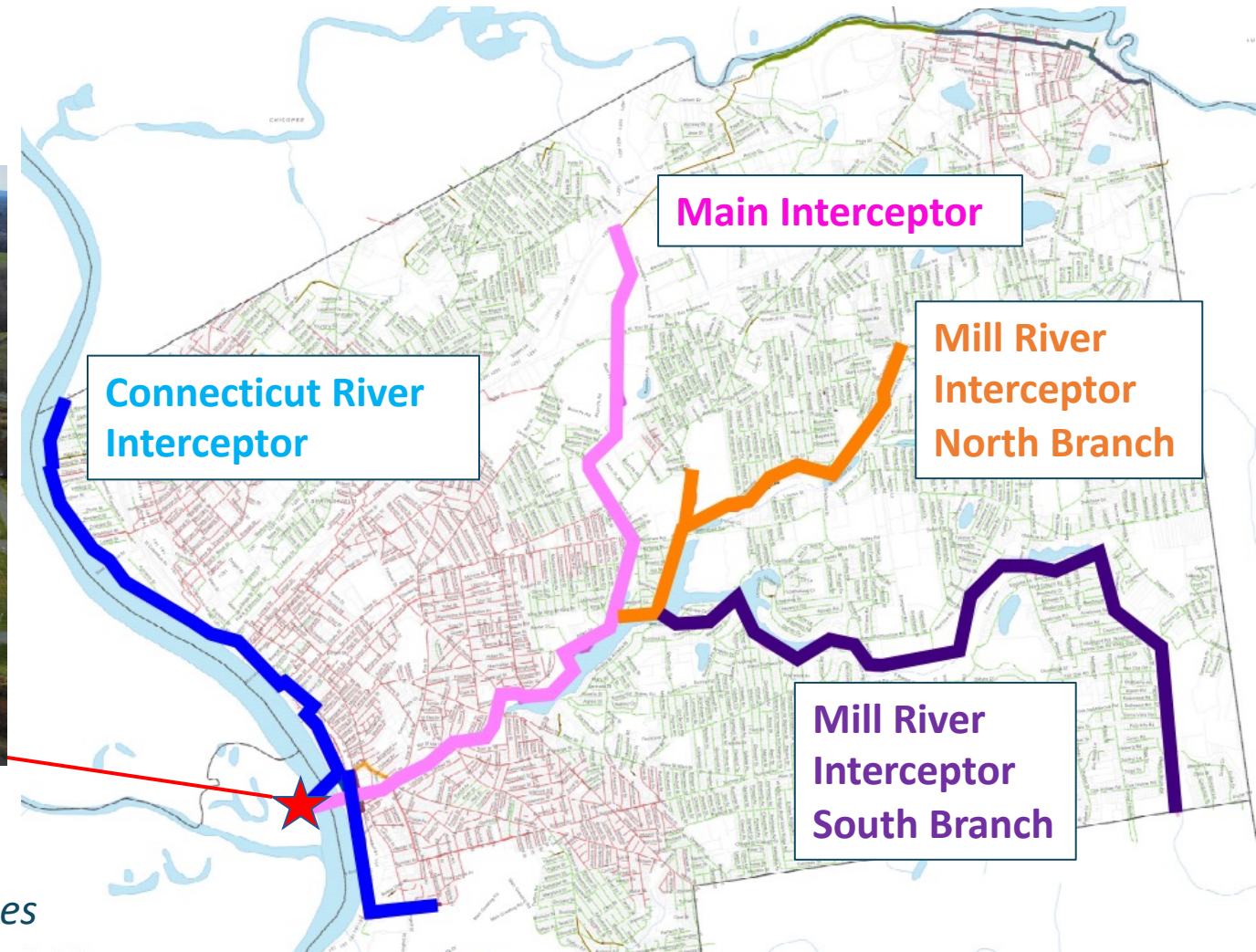
Springfield and SWSC



- ❖ *SWSC Provides Wastewater Treatment Services for 7 Communities at the SRWTF*
- ❖ *SWSC Maintains the Wastewater Collection System in Springfield that Serves Over 36,000 Homes*

Background

SRWTF and Sewer Interceptors



- ❖ *SRWTF Average Monthly Flow up to 67 MGD*
 - ❖ *Full Secondary Treatment up to 134 MGD*
- ❖ *SWSC Maintains Over 470 Miles of Wastewater Pipes in the City of Springfield*

Background

SWSC Integrated Wastewater Plan

Integrated Wastewater Plan (IWP) Published in 2014

Primary Goals:

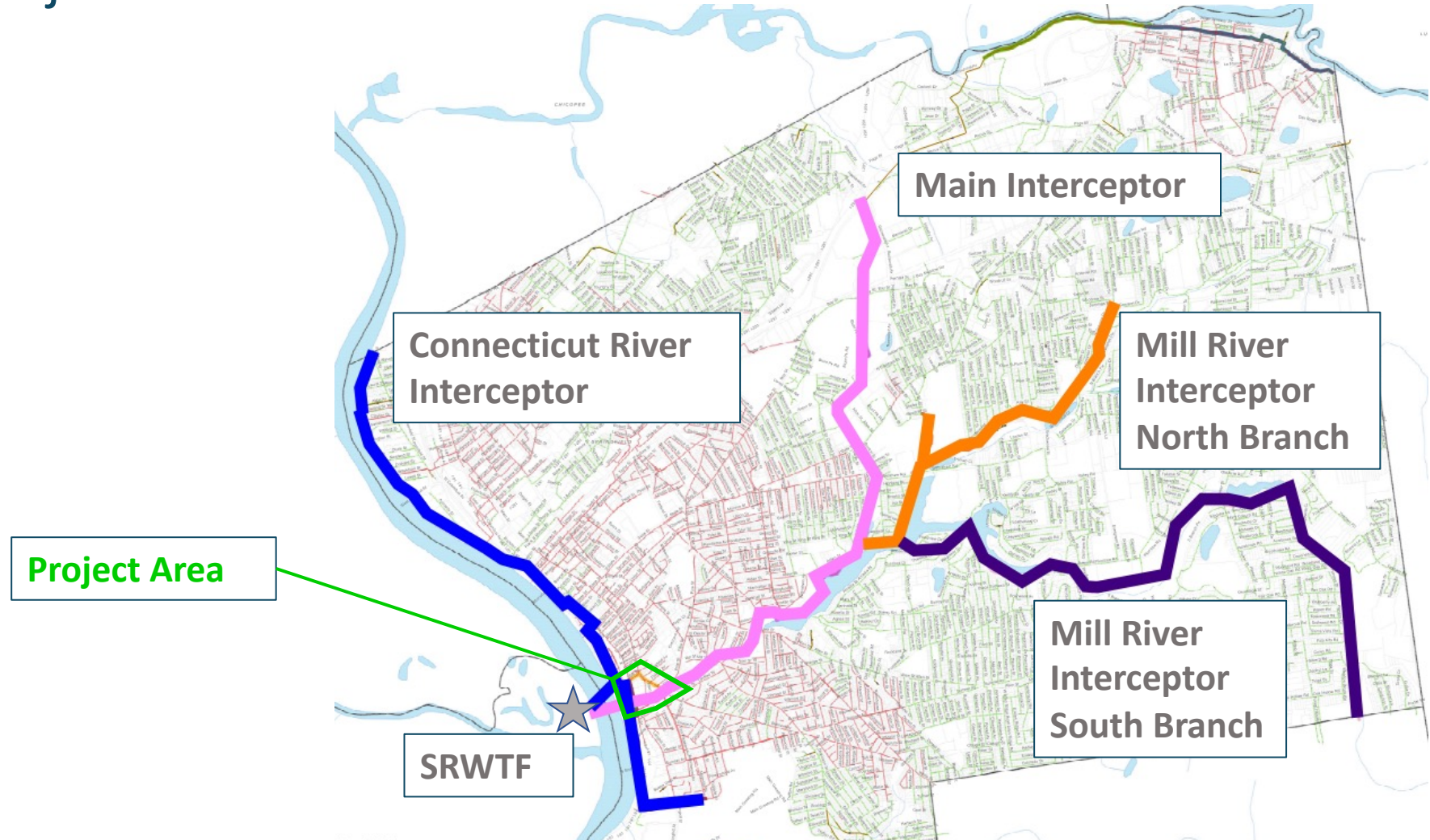
- ❖ Implement CSO Reduction Projects*
- ❖ Reduce Risk for Primary Wastewater Infrastructure*

Project Phase	Years	Cumulative Reduction in Typical Year CSO Volume	Actual Construction Cost
Phase 1 – Washburn CSO <i>(System Optimization, Sewer Separation, Inflow Removal)</i>	2012-2014	9%	\$23,424,000
Phase 2 – York St Pump Station and River Crossing <i>(Increased Capacity and Redundancy)</i>	2015-2023	48%	\$137,585,000
Phase 3 – Locust Transfer and Flow Optimization <i>(Redundancy and Risk Mitigation)</i>	2022-2024	49%	\$24,950,000*

**Bid Cost -- Phase 3 in Progress*

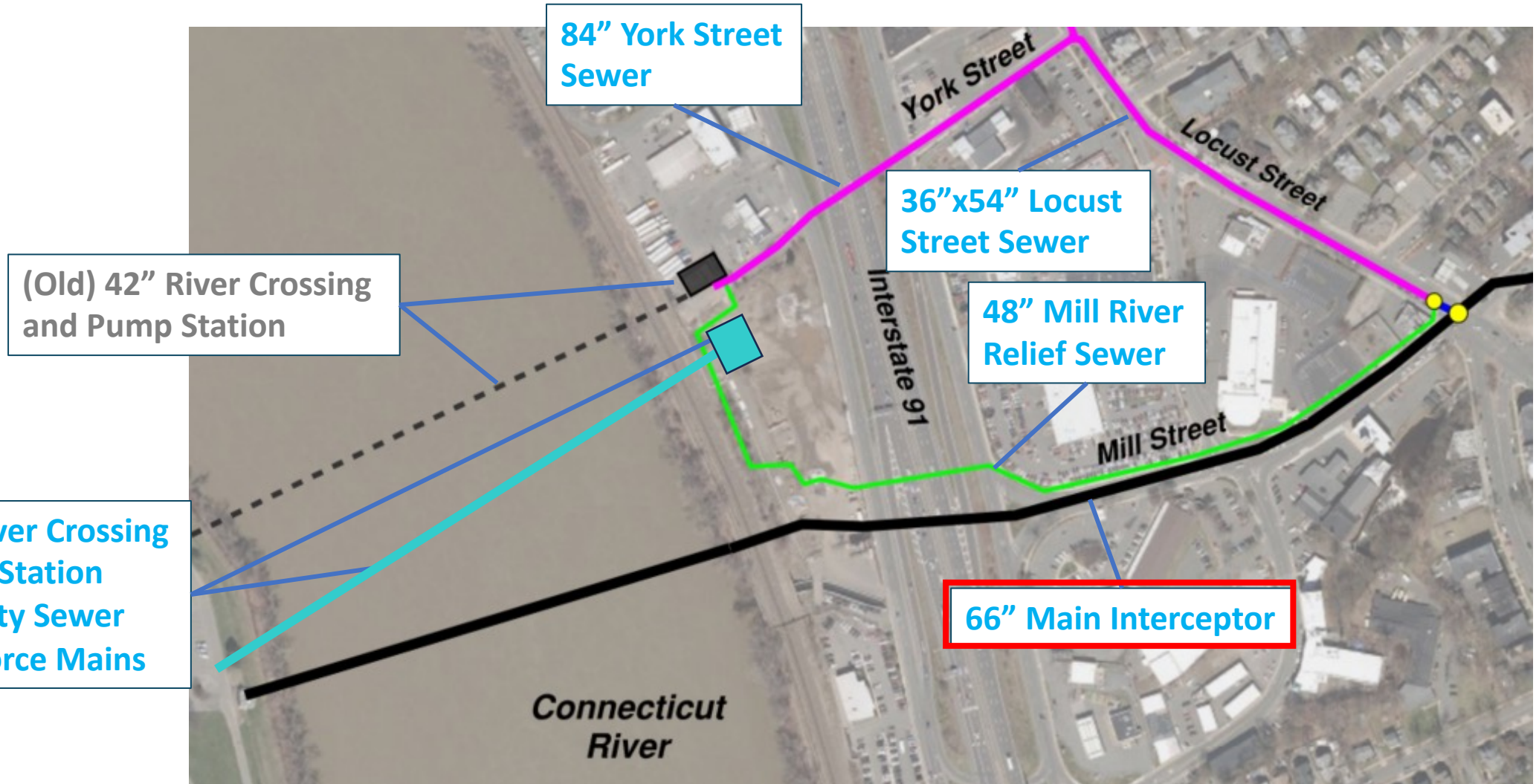
Background

Phase 3 Project Area



Background

Existing Conditions



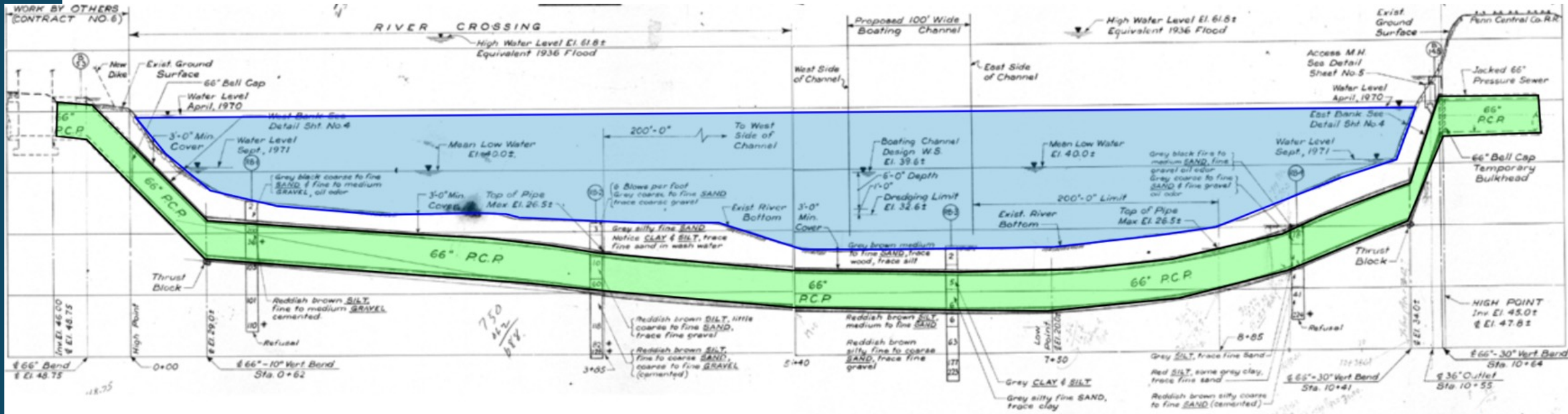
Background

Main Intercepting Sewer

SRWTF

Connecticut River

Springfield, MA
Collection System



Main Interceptor

1972 Record Drawing

- ❖ Avg. Dry Weather Flow -- 25 MGD (1-Year Peak – 150 MGD)
- ❖ 2,875 Linear Feet of 66-Inch PCCP Pressure Sewer Not Inspected Internally or Rehabilitated Since Construction

Design

Preliminary Design and Alternative Concept Analysis

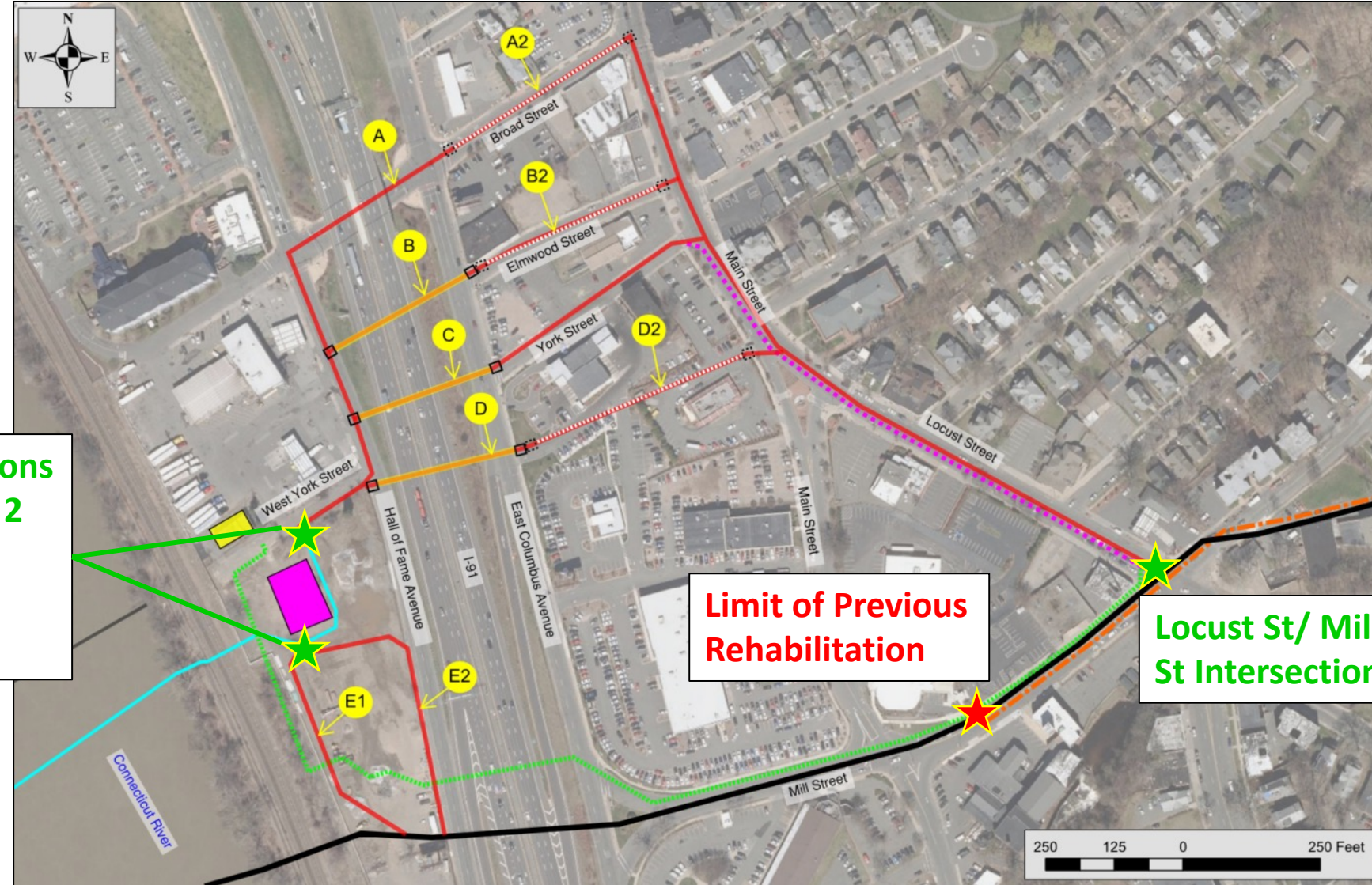
6 Alternative Alignments Evaluated

- ❖ Estimated Cost
- ❖ Constructability/Risk
- ❖ Public Impact During Construction
- ❖ Permits and Easements
- ❖ Operations and Maintenance

Connections to Phase 2 River Crossing Pipeline

Limit of Previous Rehabilitation

Locust St/ Mill St Intersection

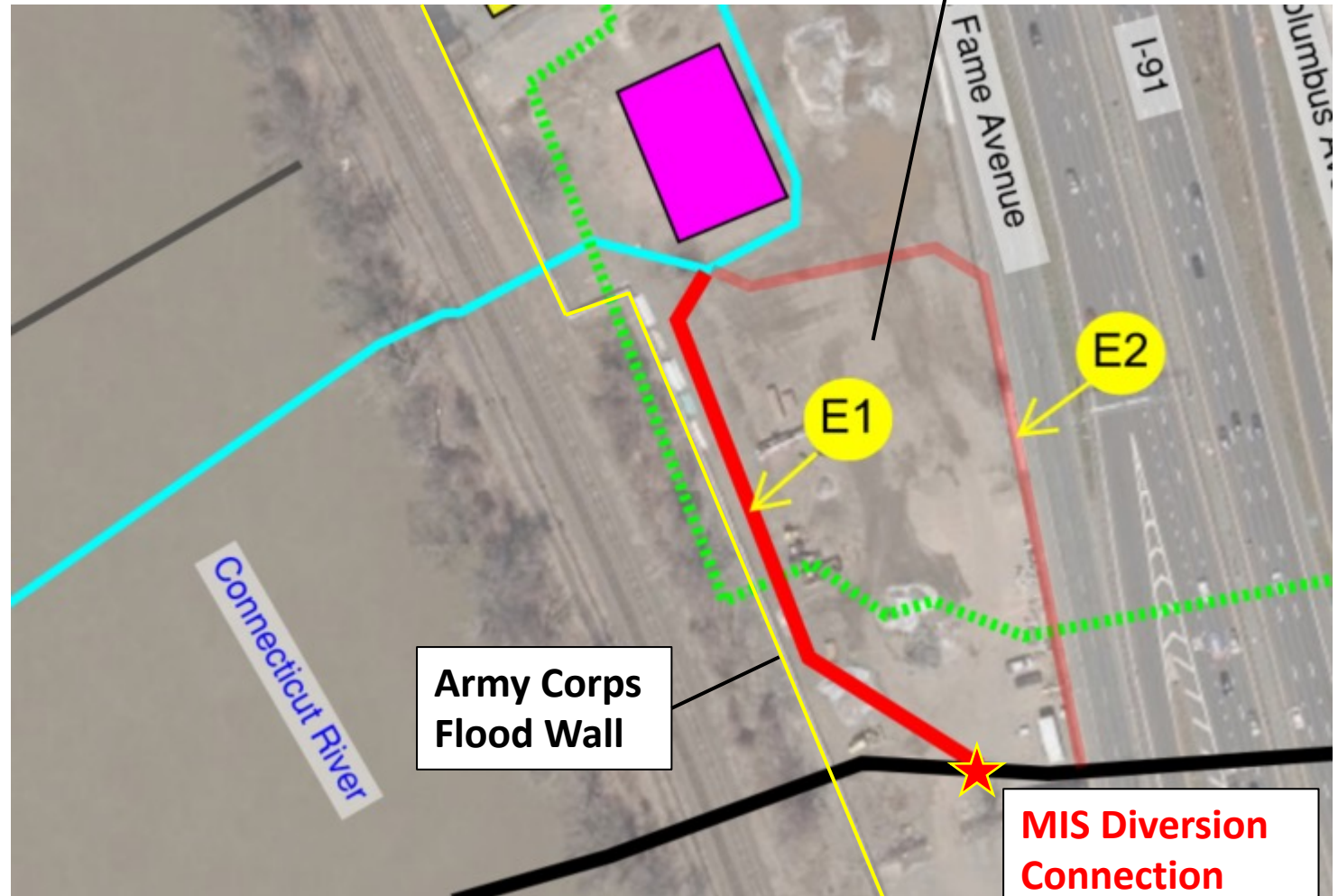


Design

Selected Alternative Details

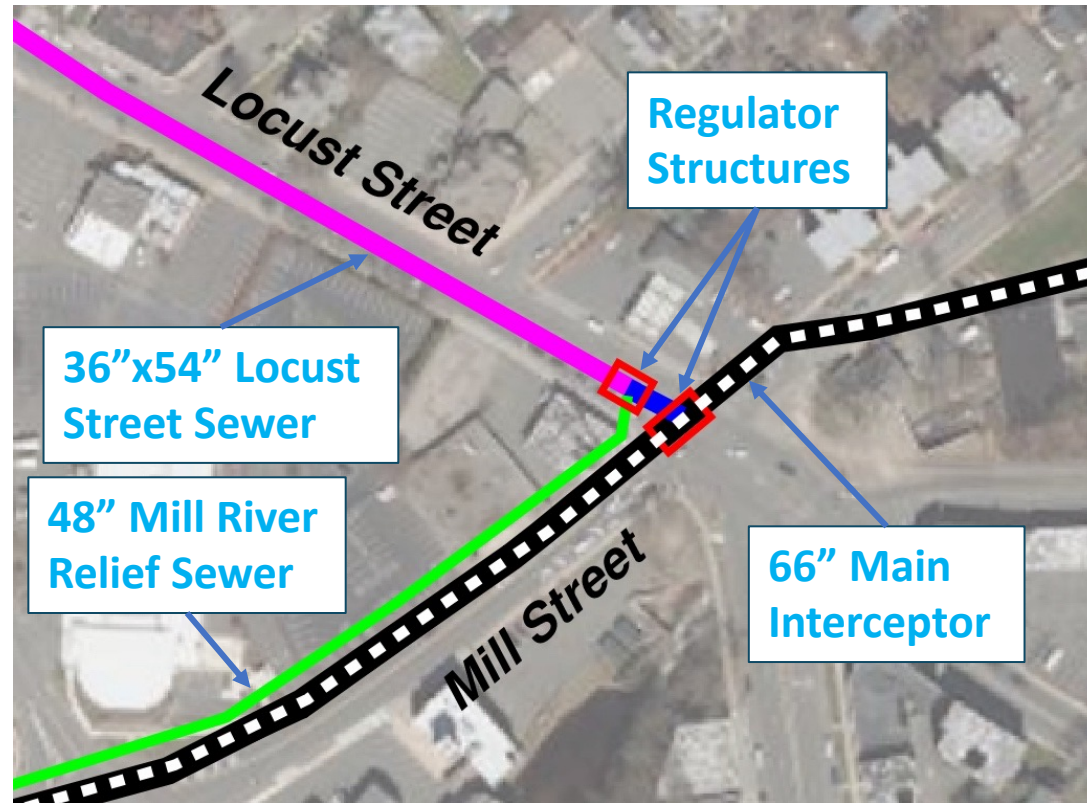
Alternative E1 Selected

- ❖ *Shortest Alignment (Approx. 430 Linear Feet)*
- ❖ *Lowest Estimated Cost*
- ❖ *Lowest Public Impact*
- ❖ *No New Easements Required*
- ❖ *No MassDOT Permits Required (No I-91 Crossing)*
- ❖ *Requires Significant Improvements on Other Pipelines*
- ❖ *Requires Complex Flow Bypass and Dewatering*
- ❖ *Excavation in Close Proximity to Army Corps Flood Wall – Requires Army Corps Permit*
- ❖ *Requires Difficult Connection to Existing MIS*

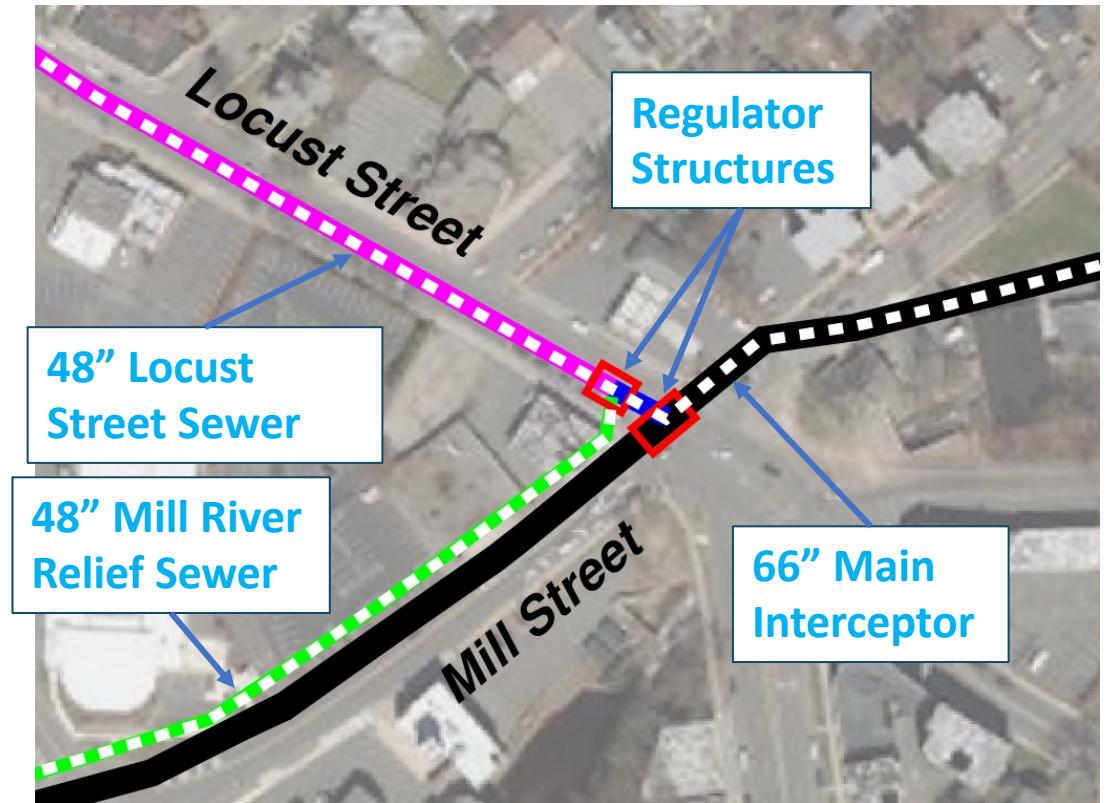


Design

Temporary Flow Bypass Plan



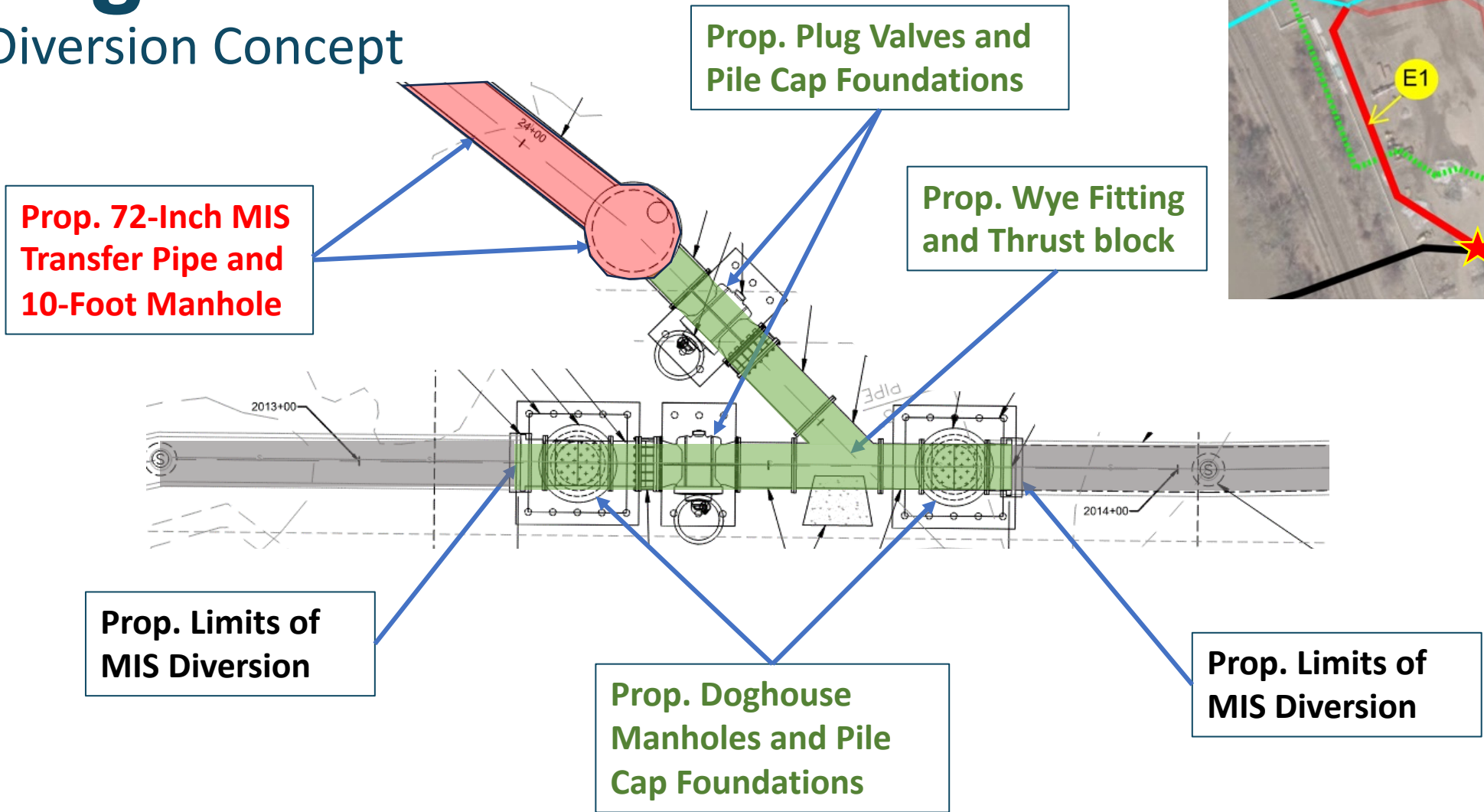
Existing Conditions – Flow in Main Interceptor
Wet Weather Overflow to Locust Street Sewer and Mill River Relief Sewer



Temporary Flow Bypass Plan – All Flows in Locust Street Sewer and Mill River Relief Sewer (Dry Weather Only)

Design

MIS Diversion Concept



MIS Diversion Connection

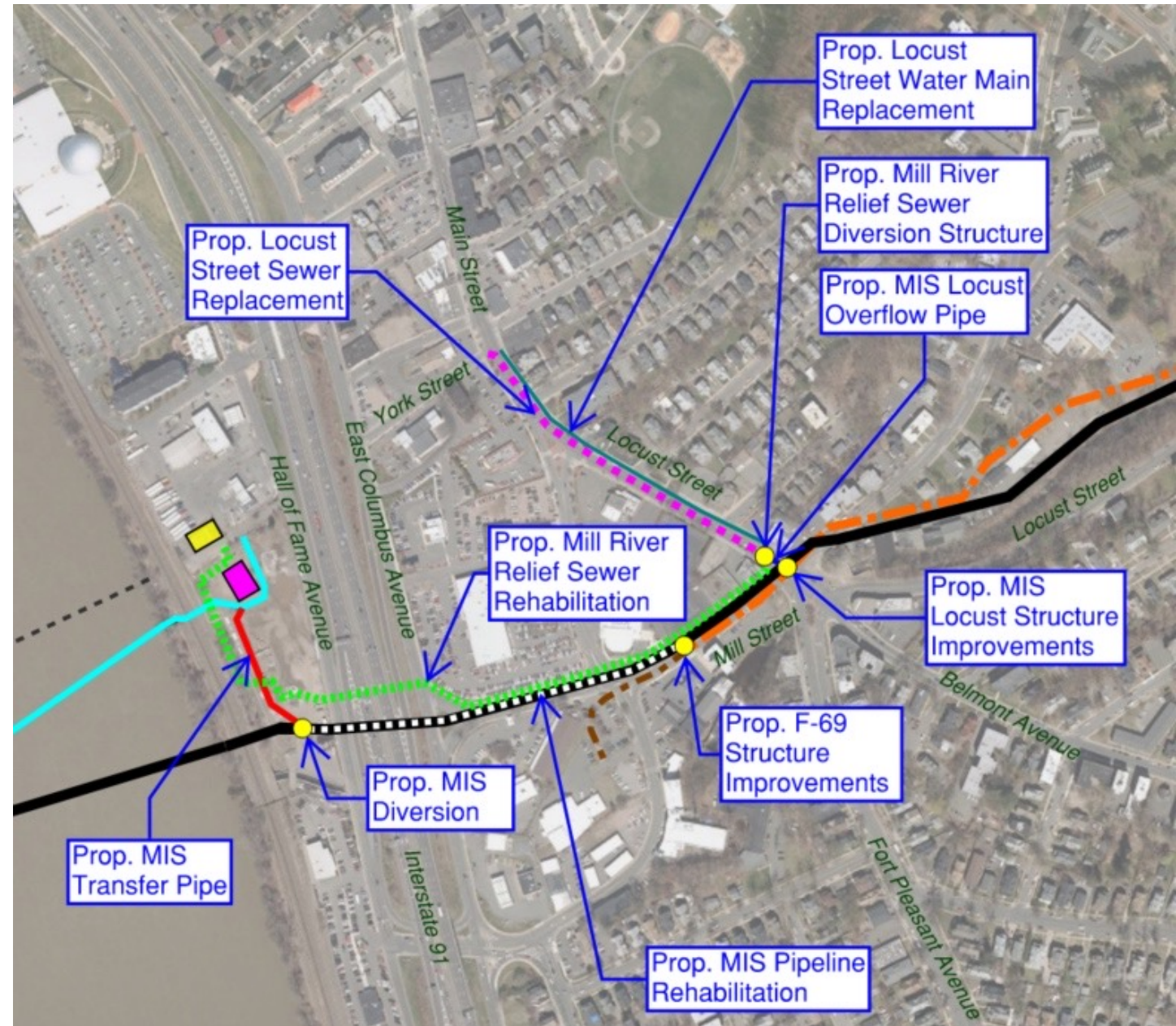
Exist. 66-Inch MIS to Prop. 72-Inch MIS Transfer

Design

Project Scope Overview

Final Project Scope

- ❖ MIS Transfer Pipeline (430 LF)
- ❖ MIS Diversion Connection
- ❖ Locust St and Main St Sewer Replacement (1,000 LF)
- ❖ Locust St and Main St Water Main Replacement (1,200 LF)
- ❖ Mill River Relief Sewer Manhole Frame and Cover Replacements (13)
- ❖ Regulator Structure Improvements (3)
- ❖ MIS Pipeline Rehabilitation (1,100 Linear Feet) (Bid Alternate)



Bidding and Award

Bid Opening and SRF Loan Allocation

Allocation	Estimate	Low Bidder
Base Bid	\$17,831,462	\$24,950,000
Bid Alternate	\$1,595,000	\$2,640,000
Bid Total	\$19,426,462	\$27,590,000

SRF Loan Distribution	Approved Cost
Construction	\$24,700,000
Contingency (10%)	\$2,470,000
Utility Relocation	\$200,000
Police Details	\$250,000
ESDC	\$2,625,375
Project Total	\$30,245,375

Construction

Utility Conflicts and Relocations

Locust Street and Main Street Work

❖ *Existing Utilities*

● ❖ *(2) Gas Mains (Cast Iron)*

● ❖ *CATV Duct*

● ❖ *Telecom Duct*

● ❖ *Electric Duct*

● ❖ *Street Railway*

● ❖ *Gas Main Replacement (by Others)*

● ❖ *Water Main Replacement (1,200 LF)*

● ❖ *Sewer Main Replacement (1,000 LF)*



Construction

Utility Relocations Performed by Others



***CATV Duct Bank Relocation to Sidewalk
Locust Street***



***8-Inch Gas Main Replacement – Ledge and Rail Ties
Locust Street***

Construction

Sewer Flow Handling



*Temporary Sewer Bypass Piping
Locust Street and Main Street*



*Temporary Flow Conveyance with ADS
Pipe for Wet Weather Contingency
Main Street*

Construction

US Army Corps Flood Wall Monitoring



*Army Corps Flood Wall – View from North to South
SRA Property*



*Required Careful Pre-Construction Survey and
Monitoring During Construction
SRA Property*

Construction

MIS Transfer Pipe Installation



***MIS Transfer Pipeline Installation – 72-Inch Pipeline
and 10-Foot Manhole
SRA Property***



***Work Required Supporting the 48-
Inch Mill River Relief Sewer in Place
SRA Property***

Construction

Drilled Micropile Installation



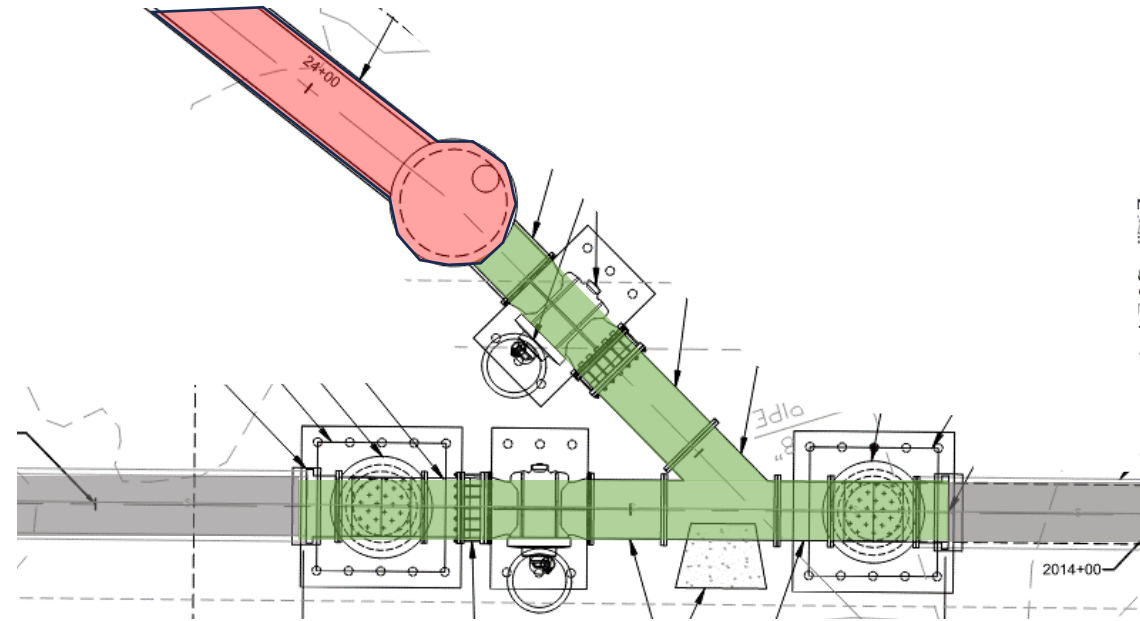
*Drilled Micropile Installation for MIS
Diversion Foundations
SRA Property*

Construction

MIS Diversion Planning and Risk Mitigation

Measures for Upcoming MIS Diversion:

- ❖ *MIS Bypass only to Occur During Dry Weather*
- ❖ *Contractor Crews to Work 24 hours Per Day*
- ❖ *Drilled Micropiles for Foundations Installed Prior to Excavation*
- ❖ *Rebar Cages for Foundations Assembled Prior to Excavation*
- ❖ *High Early Strength Concrete for Pile Cap Foundations*
- ❖ *Pre-Assembly of Fittings and Valves at Grade*
- ❖ *Dry-Run and Testing of Flow Bypass Before MIS Diversion*
- ❖ *Dry-Run of Flow Isolation from SRWTF Before MIS Diversion*
- ❖ *Careful Planning, Coordination, and Communication Regarding Risks and Contingency Measure Prior to Commencing Work*



Construction

Project Status Update

Project Progress and Upcoming Work:

- ❖ *Utility Relocations*
- ❖ *Water Main Replacement*
- ❖ *Sewer Main Replacement*
- ❖ *MIS Transfer Pipe Installation*
- ❖ *Mill River Relief Sewer Frame and Cover Replacements*
- ❖ *Regulator Structure Improvements*
- ❖ *MIS Diversion Installation*

Substantial Completion Target: July 2024



MIS Transfer Pipe Installation – View from York Street Pump Station

Acknowledgements



Springfield Water and Sewer Commission

- ❖ *Josh Schimmel, Executive Director*
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- ❖ *Cy Ryding, Project Engineer*



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- ❖ *Jen Nechamen, Project Engineer*



Stantec:

- ❖ *Matthew Travers, Program Manager*
- ❖ *Garrett Frueh, Project Manager*
- ❖ *Bill Ruoff, Resident Engineer*

An aerial photograph of a city, likely Knoxville, Tennessee, showing a multi-lane highway (I-75) curving through the center. The city is densely packed with buildings, parking lots, and green spaces. In the foreground, there is a construction site with various materials and equipment. The sky is blue with scattered white clouds.

Questions?

Thank You!

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