



CSO AFFORDABILITY WHAT IS THE RIGHT ANSWER?

OWEA ANNUAL CONFERENCE
JUNE 24, 2015



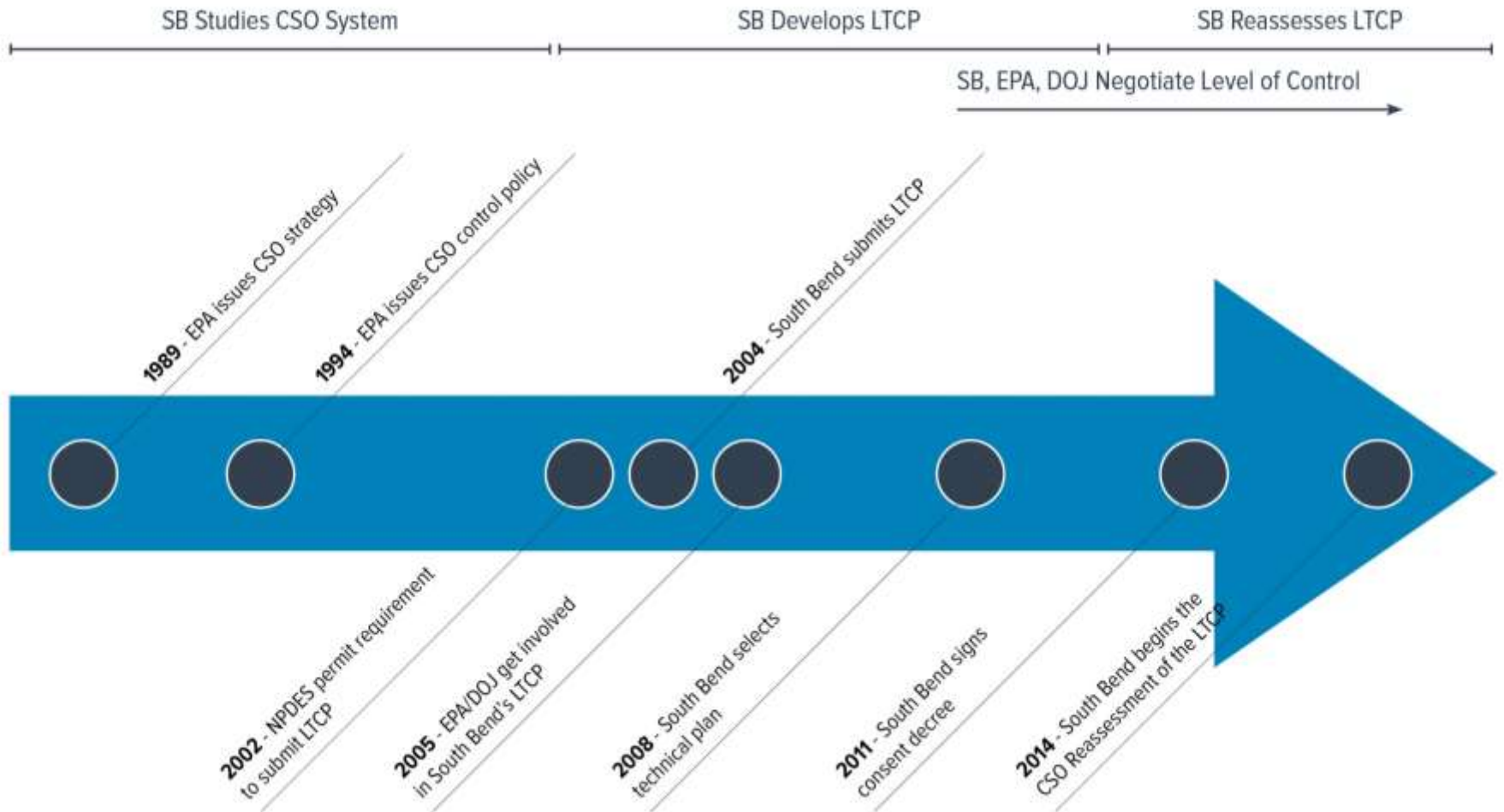
AMERICAN
STRUCTUREPOINT
INC.

1. CSO Regulation and Design History
2. South Bend CSO Program
3. South Bend Optimization Opportunities
4. Affordability Approach
5. Conclusion

A large stack of grey pipes, likely for sewer or stormwater collection, is shown on a gravel surface. The pipes are arranged in a dense, overlapping stack that recedes into the background. The text 'CSO REGULATION AND DESIGN HISTORY' is overlaid in white, bold, sans-serif font in the center-right of the image.

CSO REGULATION AND DESIGN HISTORY

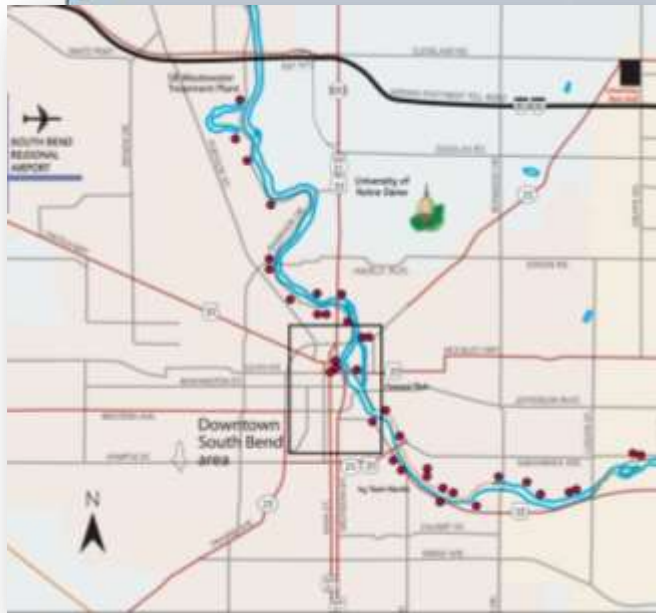
CSO REGULATION



CSO COMMUNITIES

United States

- 772 cities
- 46 million people
- 850 billion gallons
- \$50+ billion

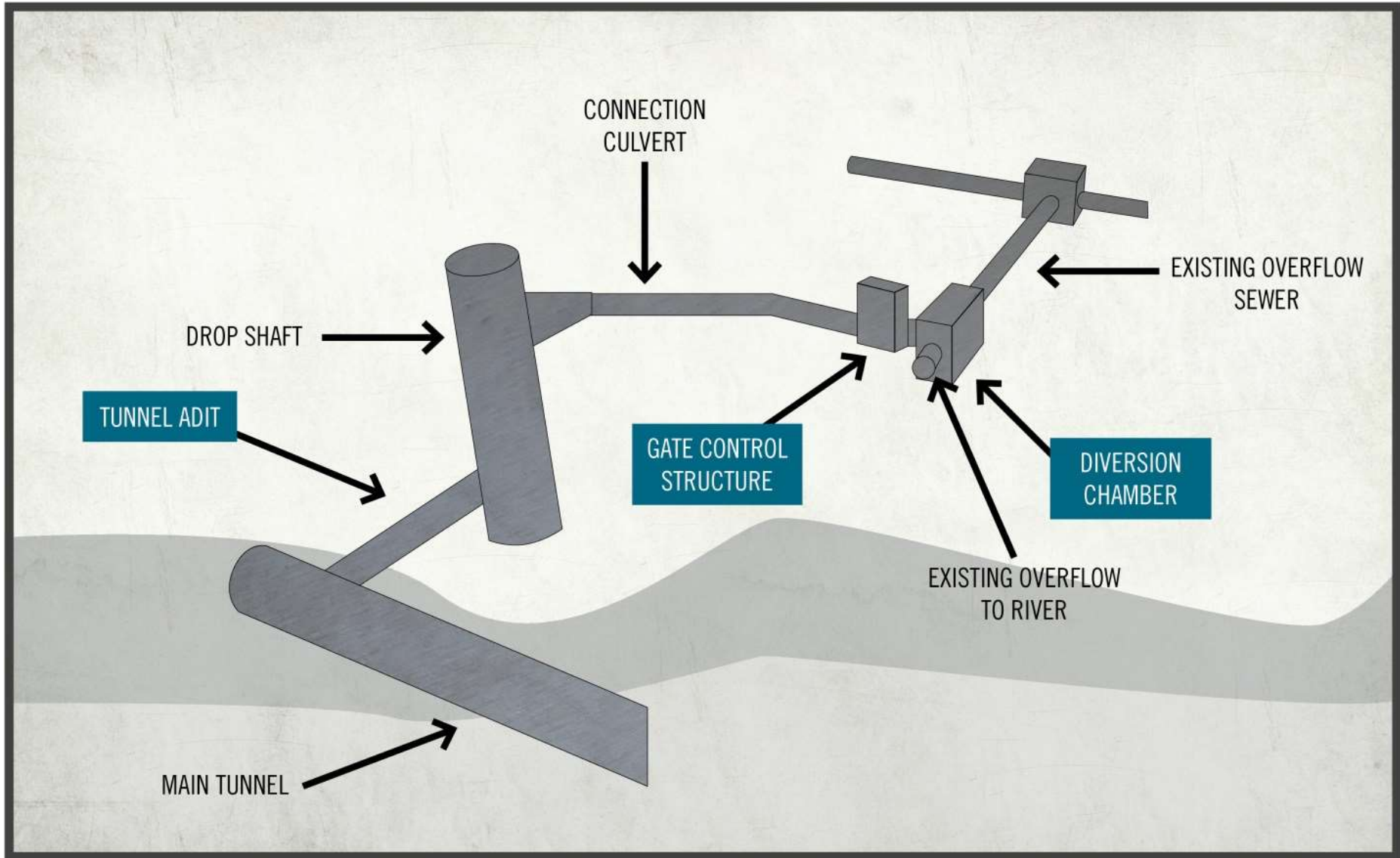


South Bend

- 40 mi²
- 20 mi² combined
- >1 BG/year
- 77 MGD WTPP
- \$600M+ LTCP

- Tunnels
- Retention Treatment Basins
- Sewer Separation

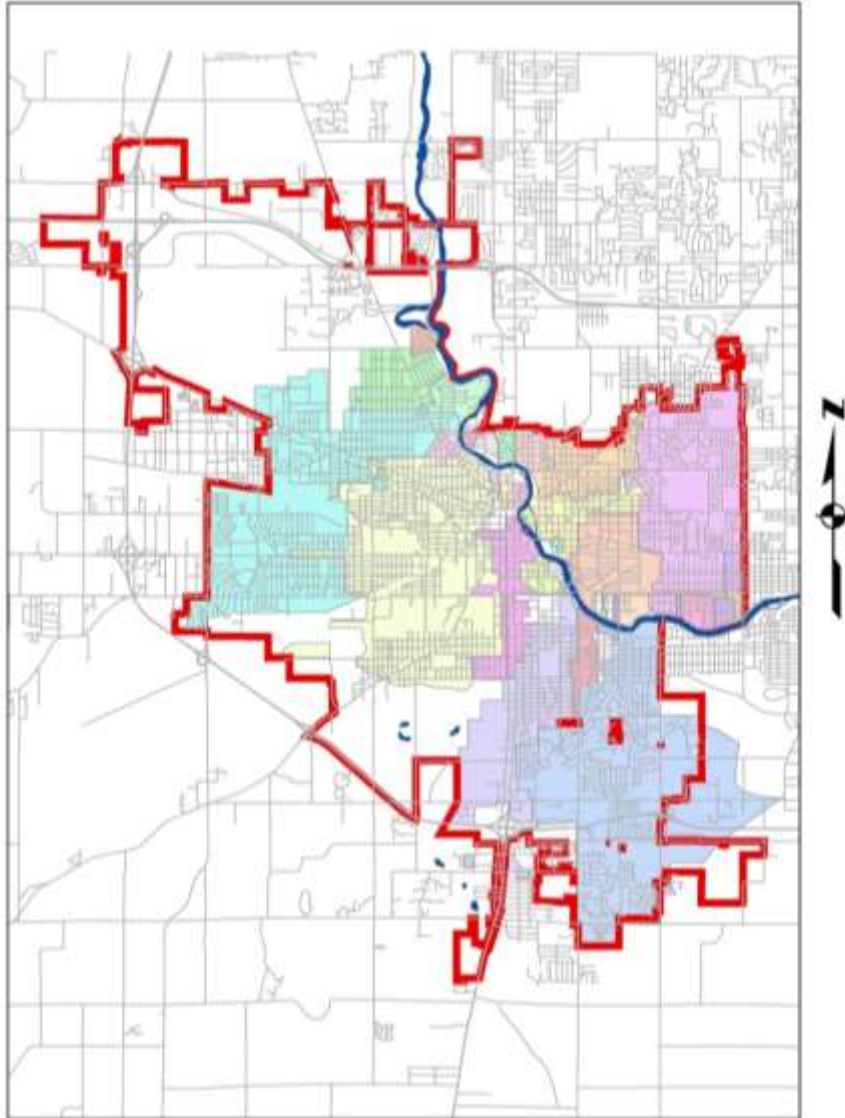
TUNNEL SYSTEM



A large stack of grey pipes, likely for a sewer or stormwater system, is the central focus of the image. The pipes are stacked in a somewhat haphazard but dense manner, with many open ends visible. The background shows a construction site with gravel and more pipes lying on the ground. The entire image has a dark, semi-transparent overlay, making the text stand out.

SOUTH BEND CSO PROGRAM

SOUTH BEND CSO DISTRICT

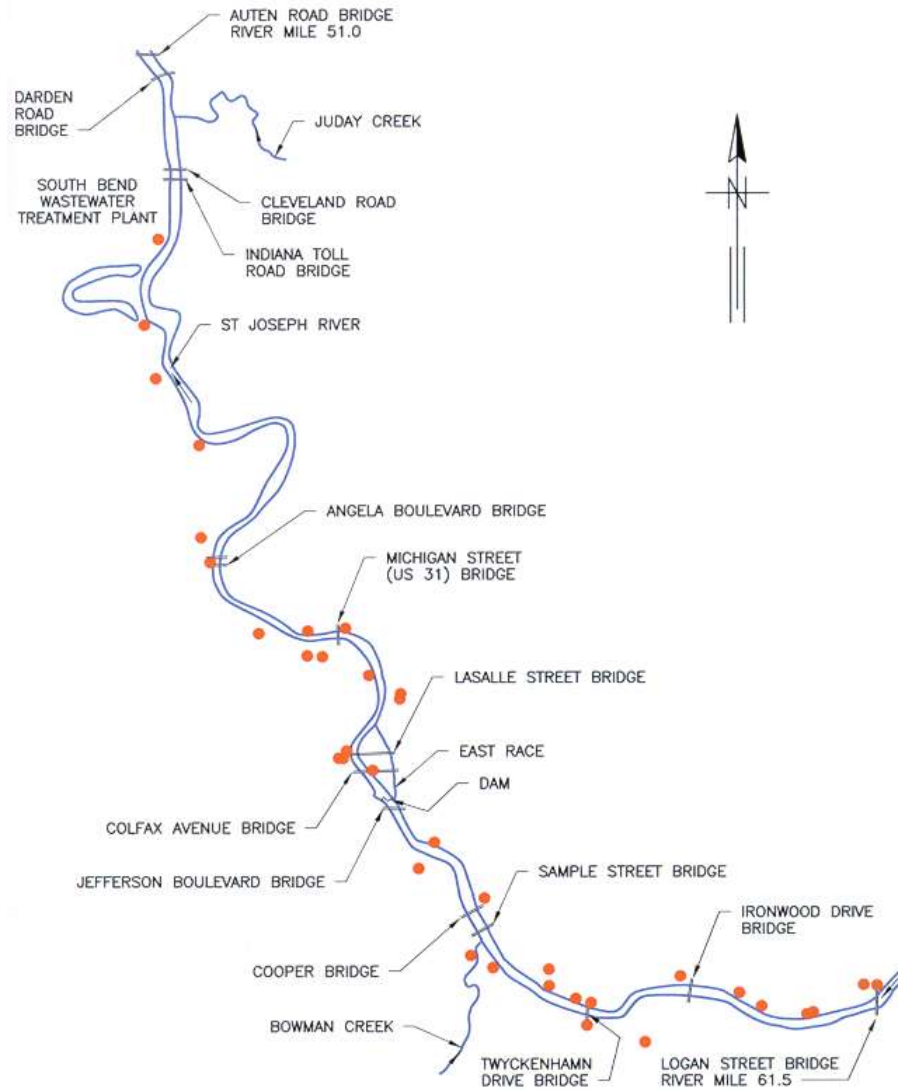


South Bend CSO Service Area:

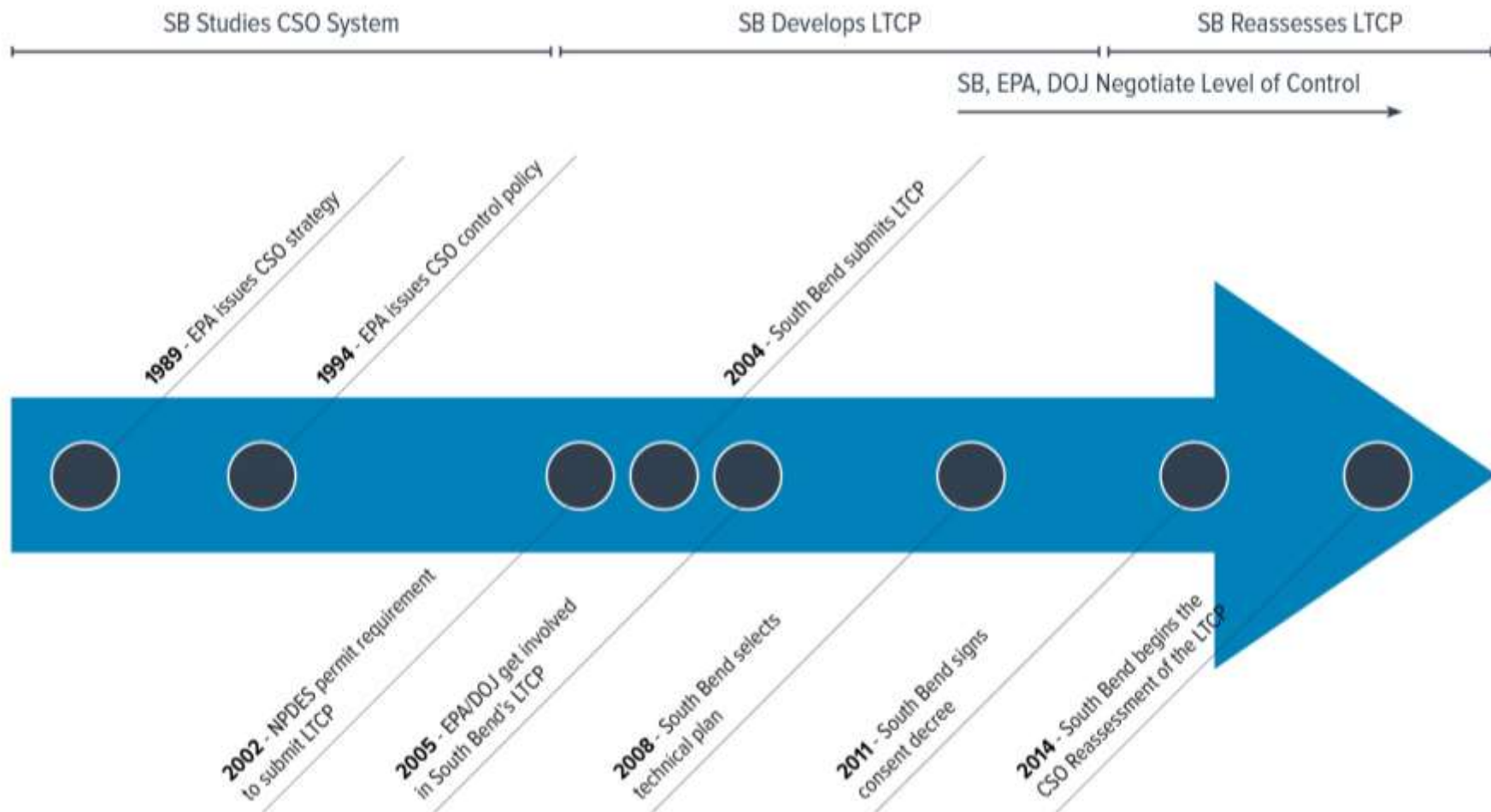
20 square miles

(13,069 acres)

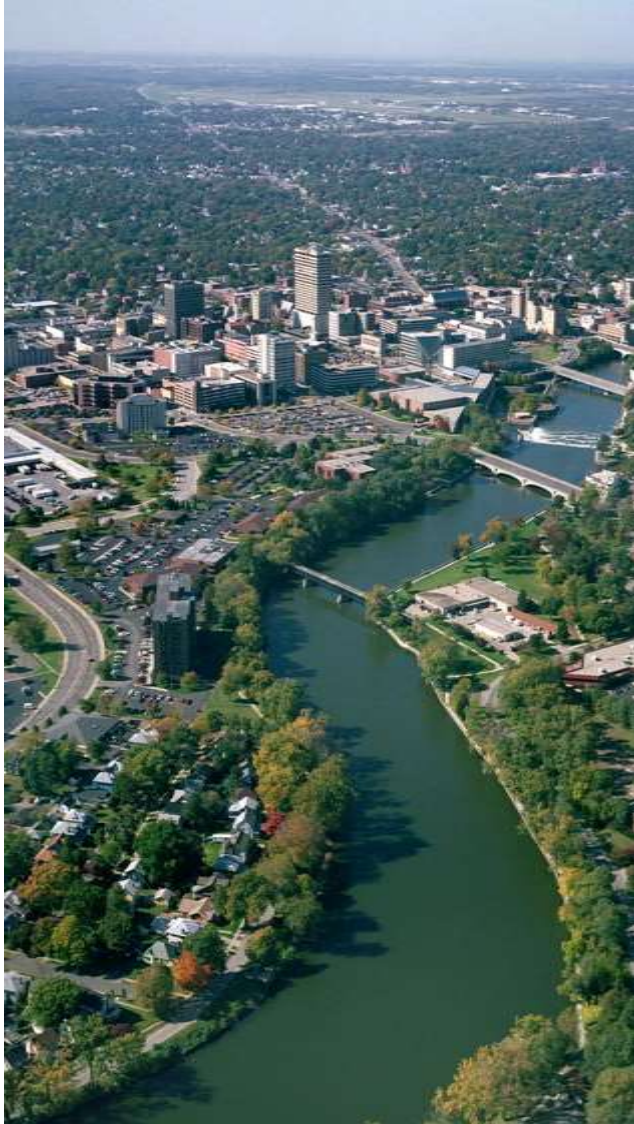
SOUTH BEND CSO OUTFALLS



SOUTH BEND LTCP DEVELOPMENT



CITY'S CSO LTCP GOALS



- Eliminate DWOs
- Prevent Basement Backups
- Minimize CSOs to River
- Maximize Flow to WWTP
- Utilize Existing Infrastructure

CONSENT DECREE REOPENERS

Option	Potential Change	Approval Authority	Constraints
1	Schedule (Extend up to 5 years)	EPA DOJ IDEM	<ul style="list-style-type: none">• Post 5/2/2017• \$98,915,750 (2007 Dollars)• Residential Indicator increase by 0.2% (2.41% currently)
2	Technical Plan: Size and/or Configuration	EPA DOJ IDEM	<ul style="list-style-type: none">• Two opportunities before 12/31/2020• Implement green infrastructure or CSOnet and prove flows have been reduced• Max reduction of 40% in storage volume
3	Other: i.e., Cost Reductions due to Model Recalibration	EPA DOJ IDEM	<ul style="list-style-type: none">• Prove better plan for the environment• Show good faith in implementation of existing plan

A large stack of grey pipes in a construction site, with the text 'CITY OF SOUTH BEND CSO LTCP REASSESSMENT' overlaid in white.

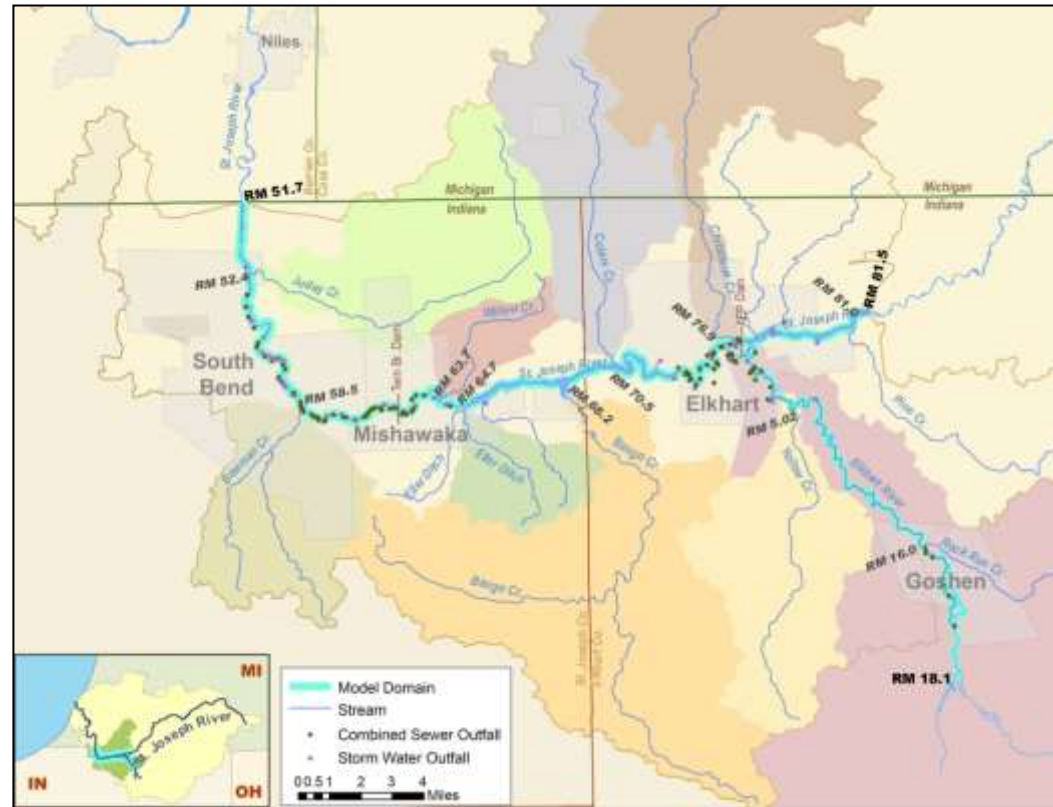
CITY OF SOUTH BEND CSO LTCP REASSESSMENT

- City hired consultant team in 2015
- Goal is to achieve affordability
- Keep or improve Water Quality Benefits

- Use Optimization and Technology to Reduce Capital Requirements
- Define Affordability
- Include Other Methods for Control including Green Infrastructure

Role of Water Quality

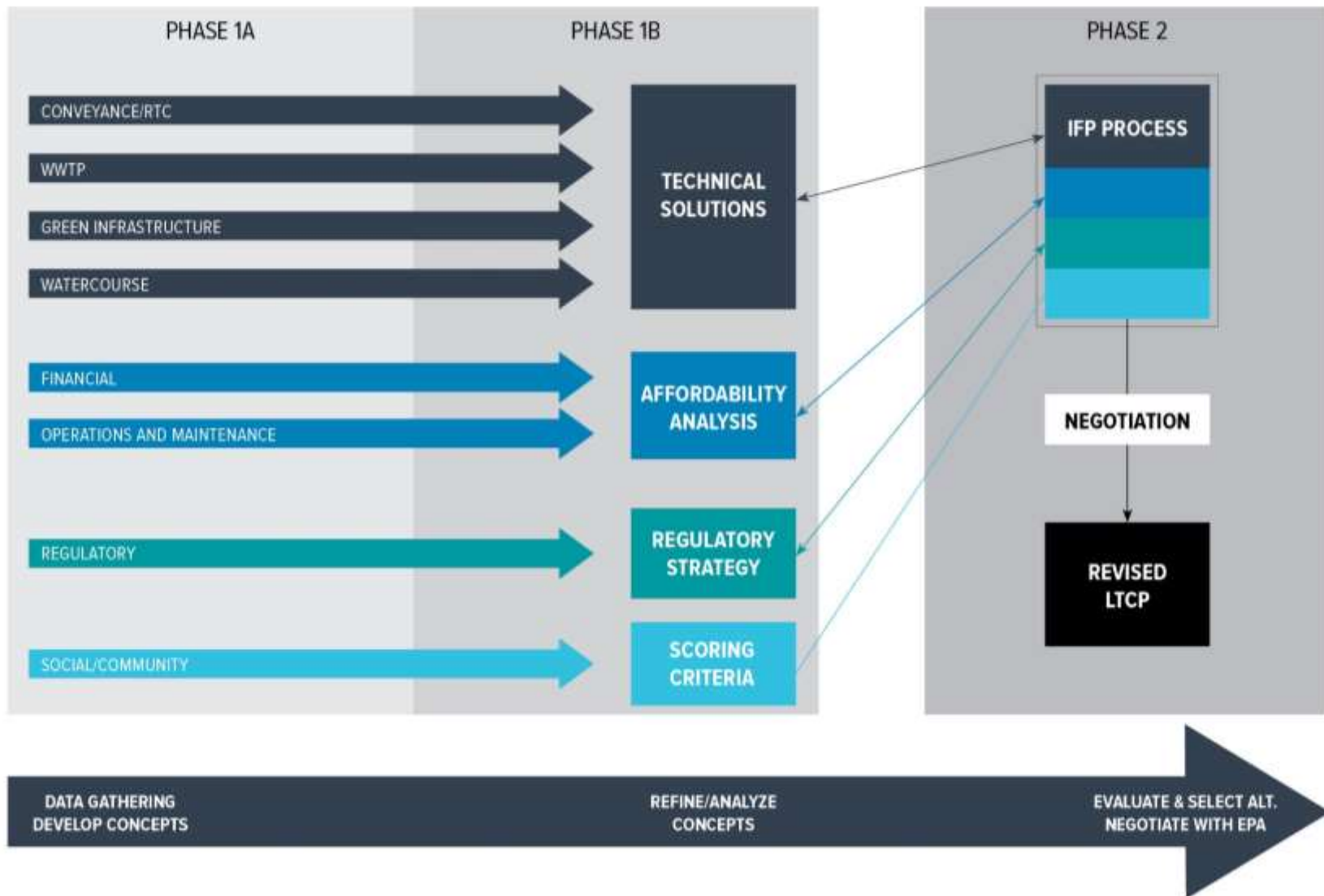
- Evaluate localized impacts and effects
- Perform alternatives analysis
- Optimize water quality benefits of integrated planning
- Support reopeners in CD



KEYS TO INTEGRATED PLANNING DEVELOPMENT

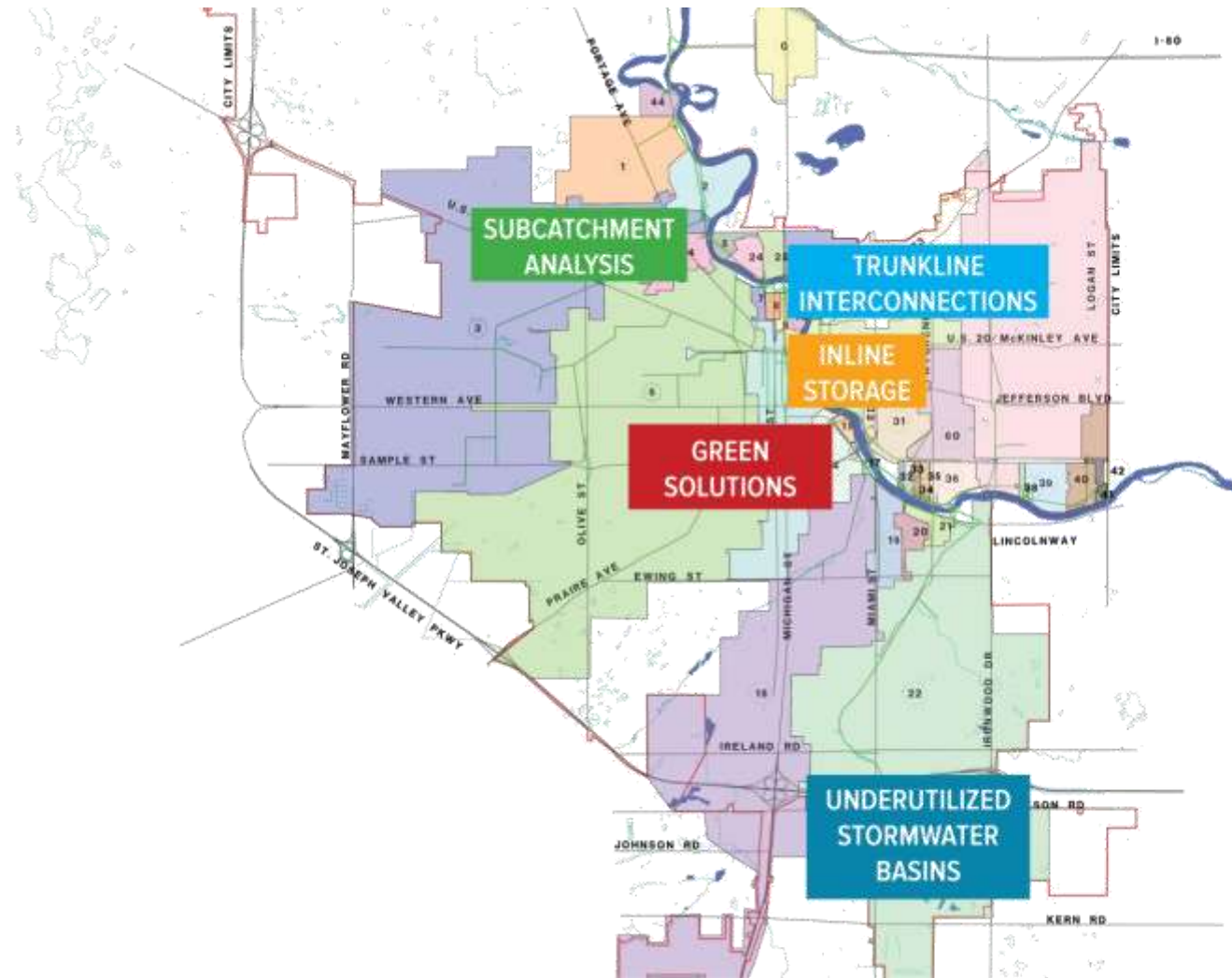


ENVIRONMENTAL PLAN AT AN AFFORDABLE COST



- In-line Storage
- Interconnections
- Alternate Storage
- Green Solutions

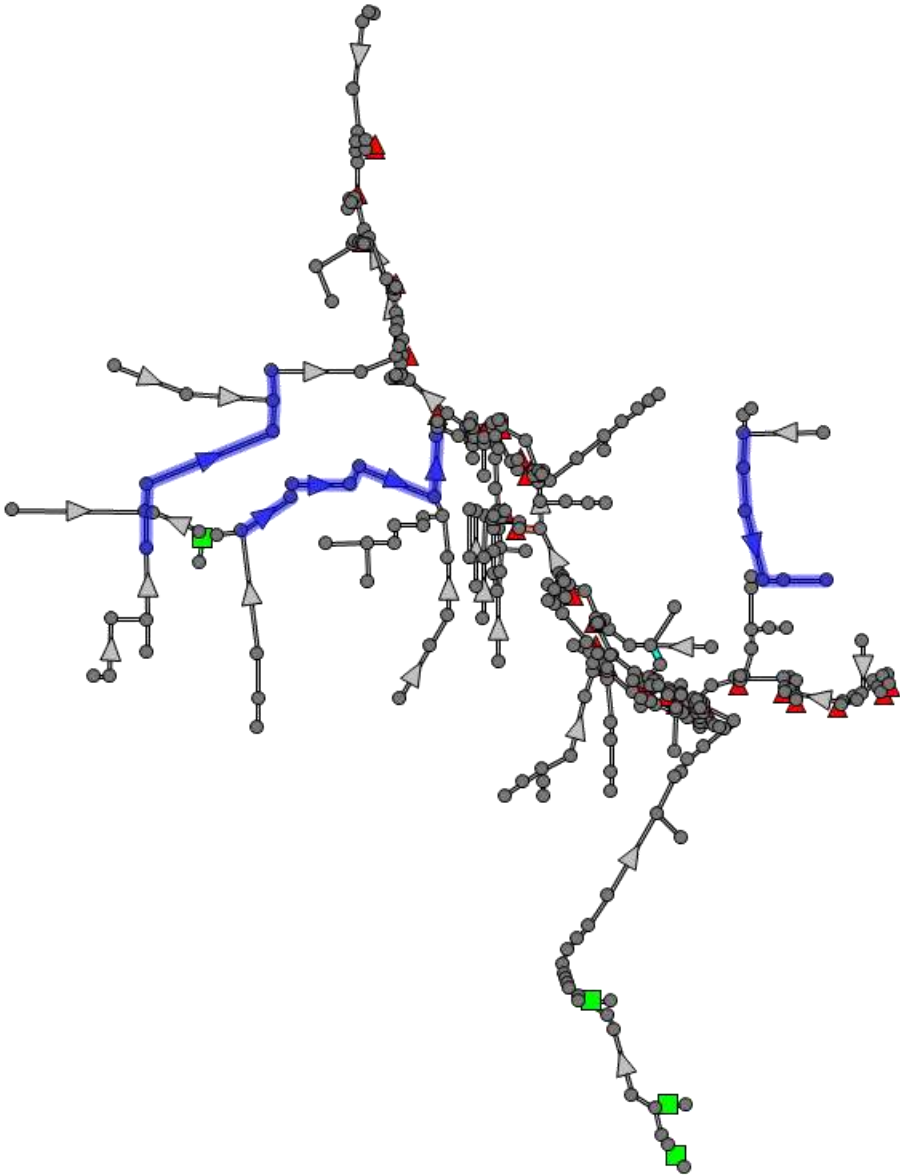
POTENTIAL PROJECTS IN SOUTH BEND



A large stack of grey pipes, likely for construction or industrial use, is shown in an outdoor storage area. The pipes are stacked in a way that shows their circular ends, creating a dense pattern of circles. The background is a light, overcast sky, and the ground is covered with gravel or crushed stone. The overall image has a muted, greyish-blue color palette.

INLINE STORAGE AREAS

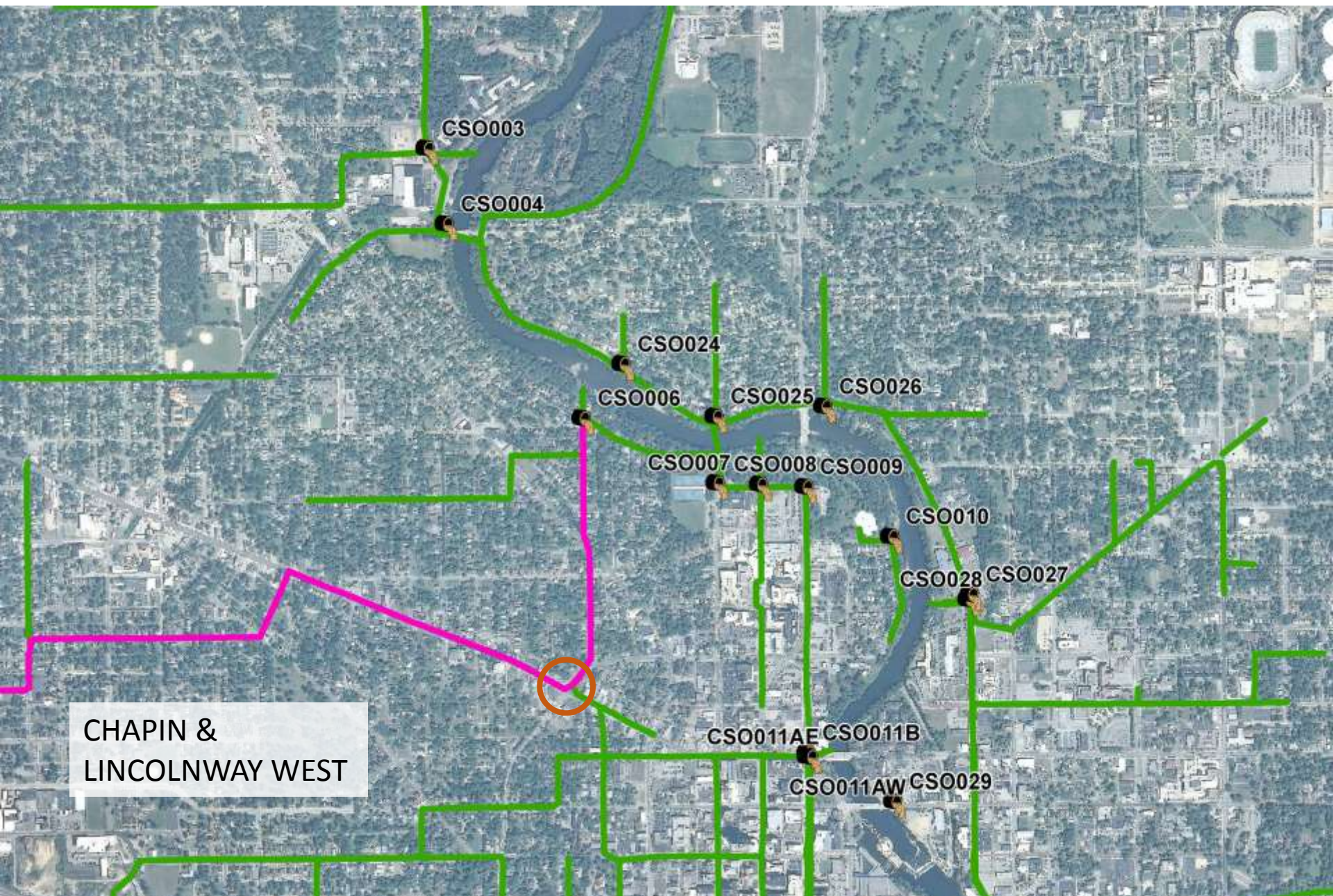
POTENTIAL INLINE STORAGE LOCATIONS




Legend

- In-Line Storage Candidate
- Sewer line

INLINE STORAGE ALONG CSO 6 TRUNKLINE

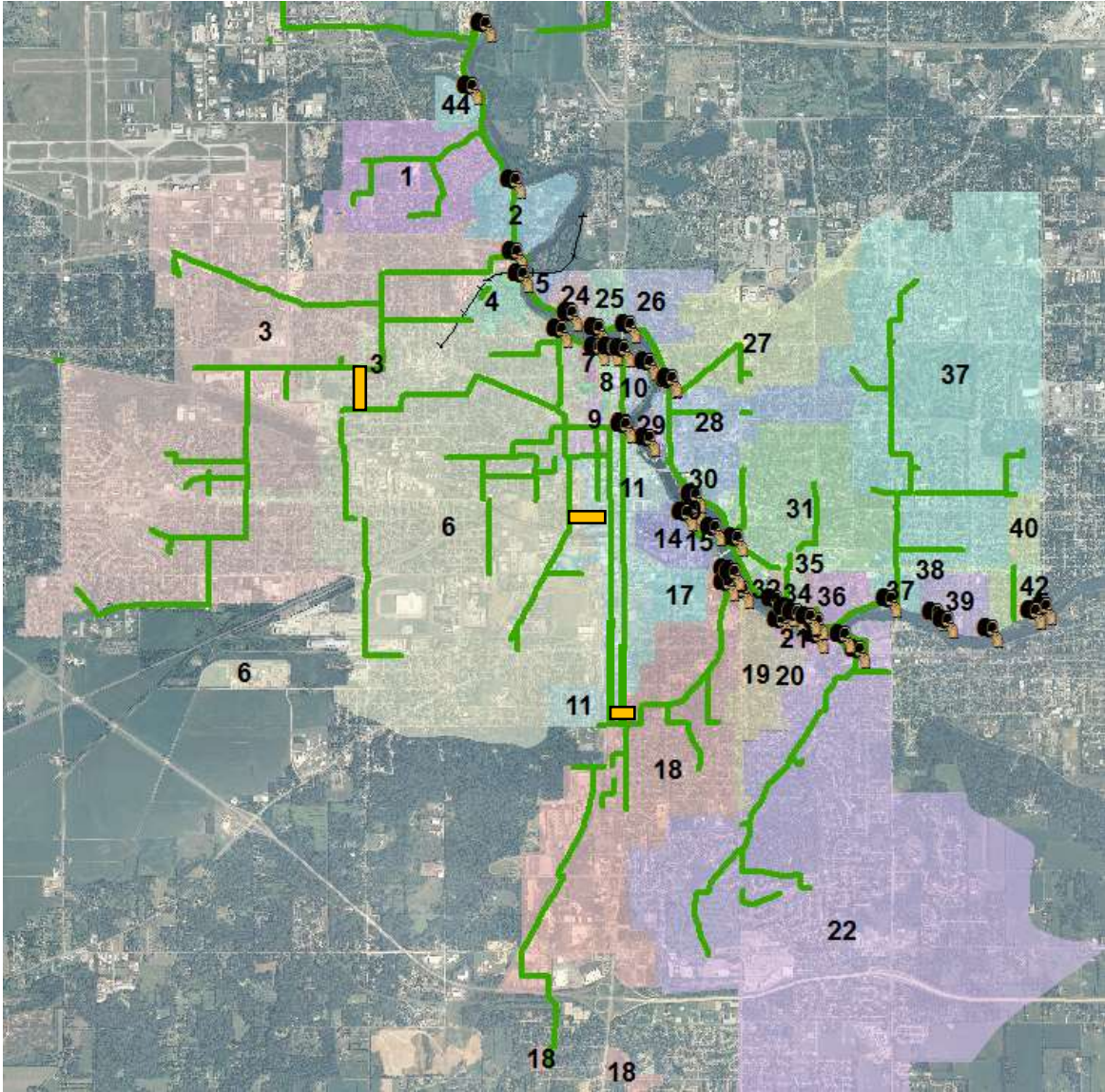


CHAPIN &
LINCOLNWAY WEST





TRUNKLINE INTERCONNECTIONS

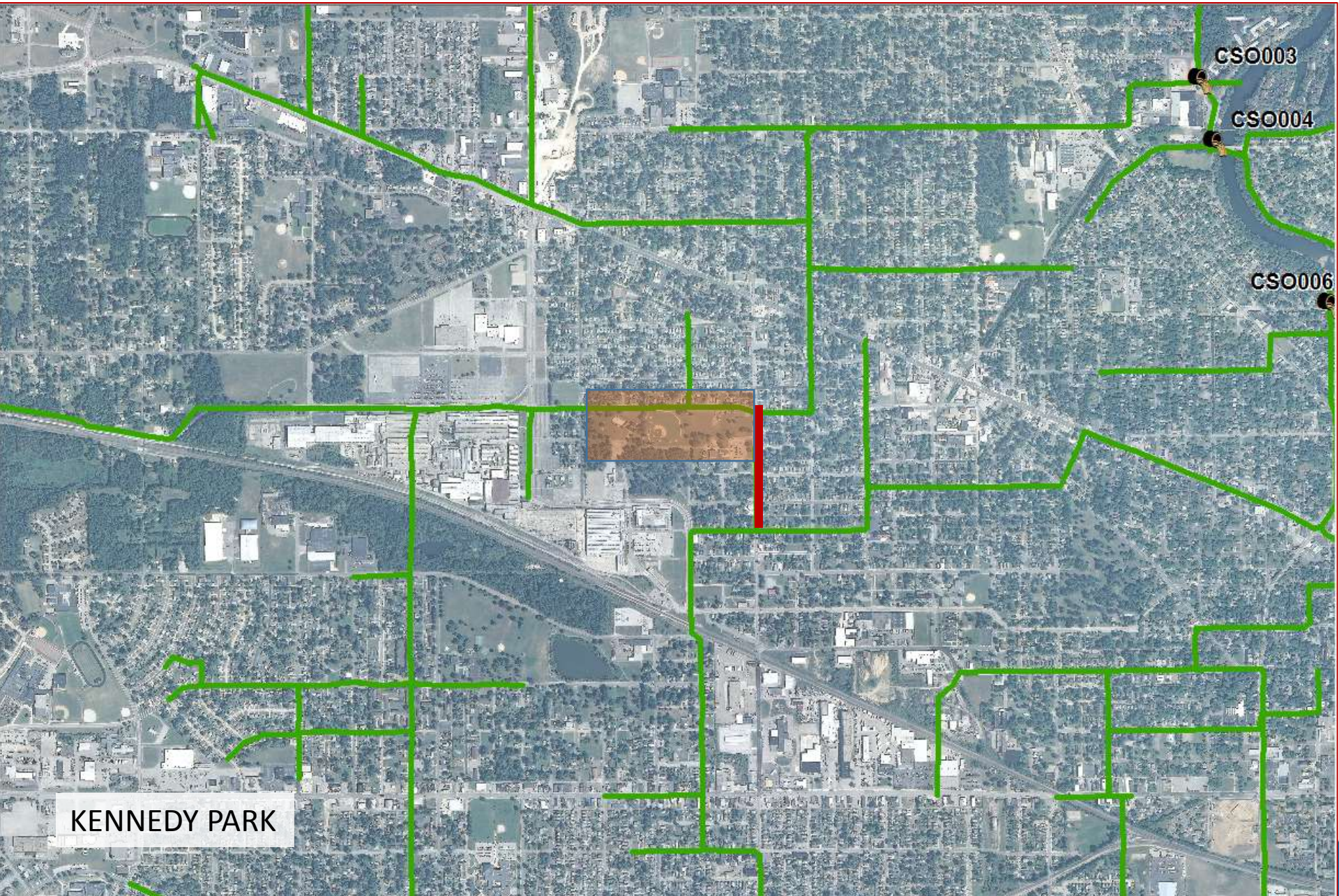
POTENTIAL TRUNKLINE INTERCONNECTION LOCATIONS



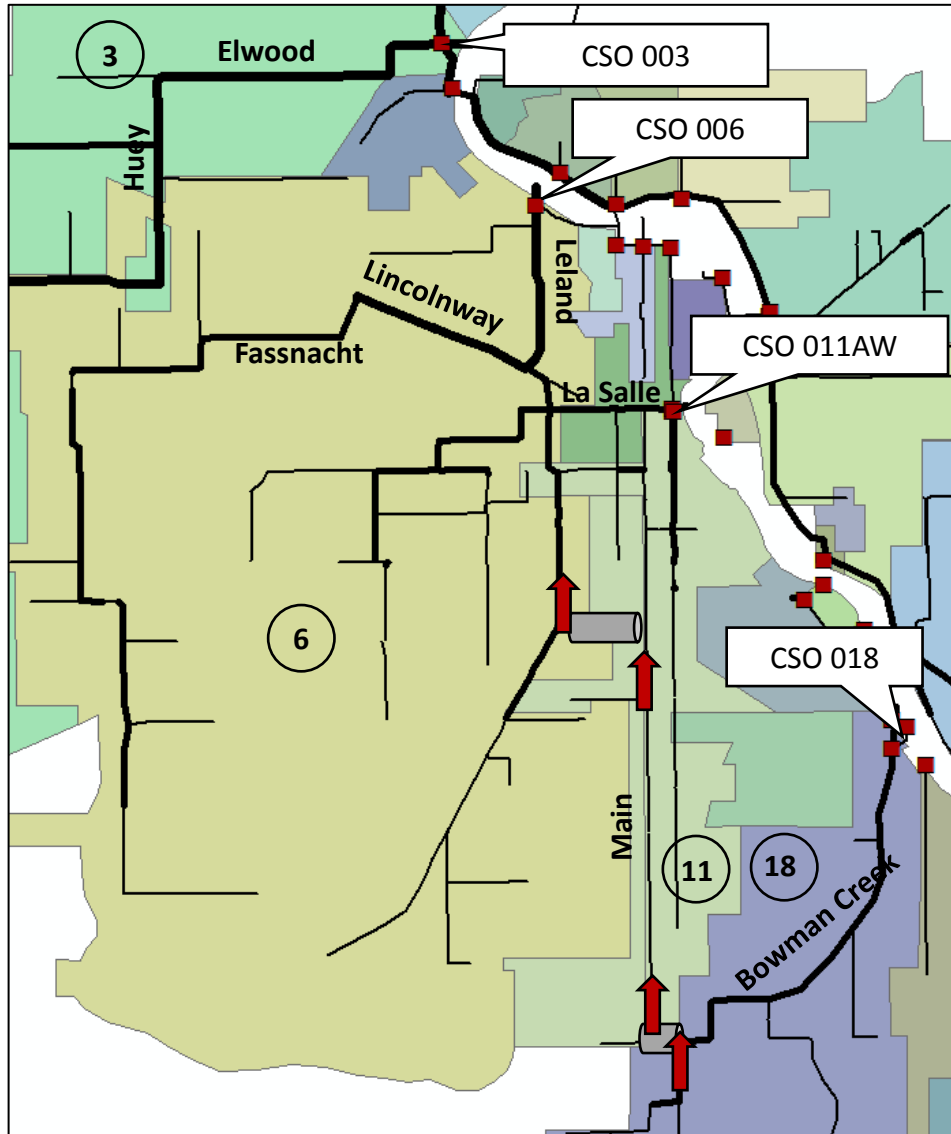
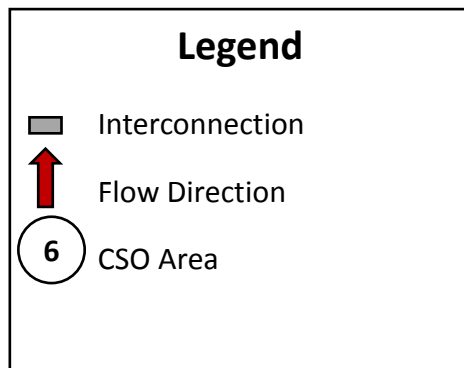
Legend

-  Potential Interconnection
-  Trunkline
- 1** CSO Service Area Number

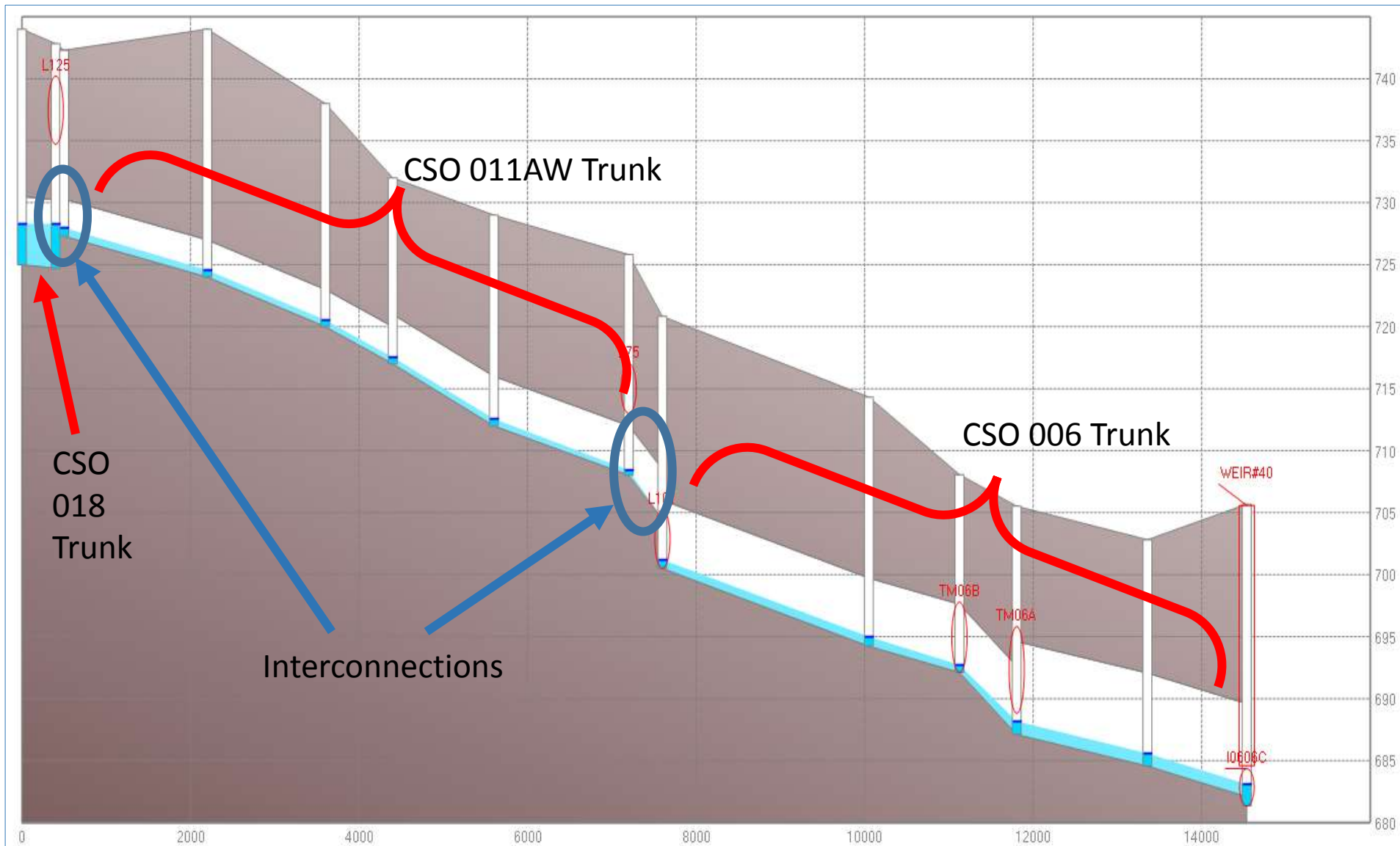
CONNECTION LINE BALANCES FLOWS BETWEEN CSO 3 AND 6



INTERCONNECTIONS OF TWO SYSTEMS RESULTS SAVINGS



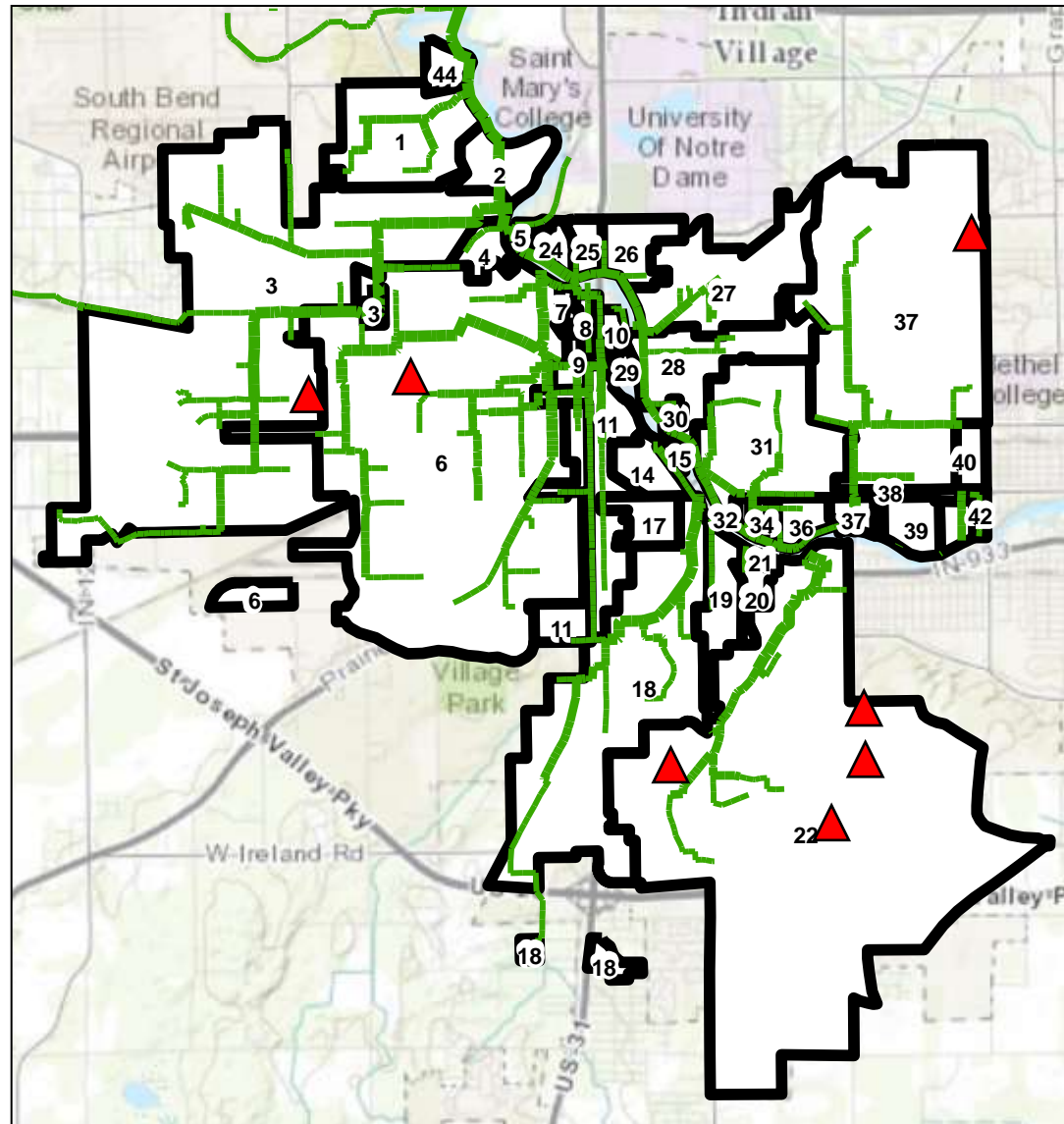
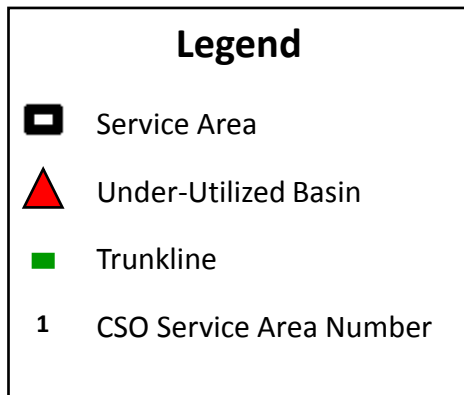
TRUNKLINE INTERCONNECTIONS



A large stack of grey pipes, likely for construction or industrial use, is shown in an outdoor storage yard. The pipes are stacked in a way that creates a sense of depth and volume. The background shows more pipes and a gravel surface, suggesting a storage or distribution area. The overall image has a dark, muted color palette.

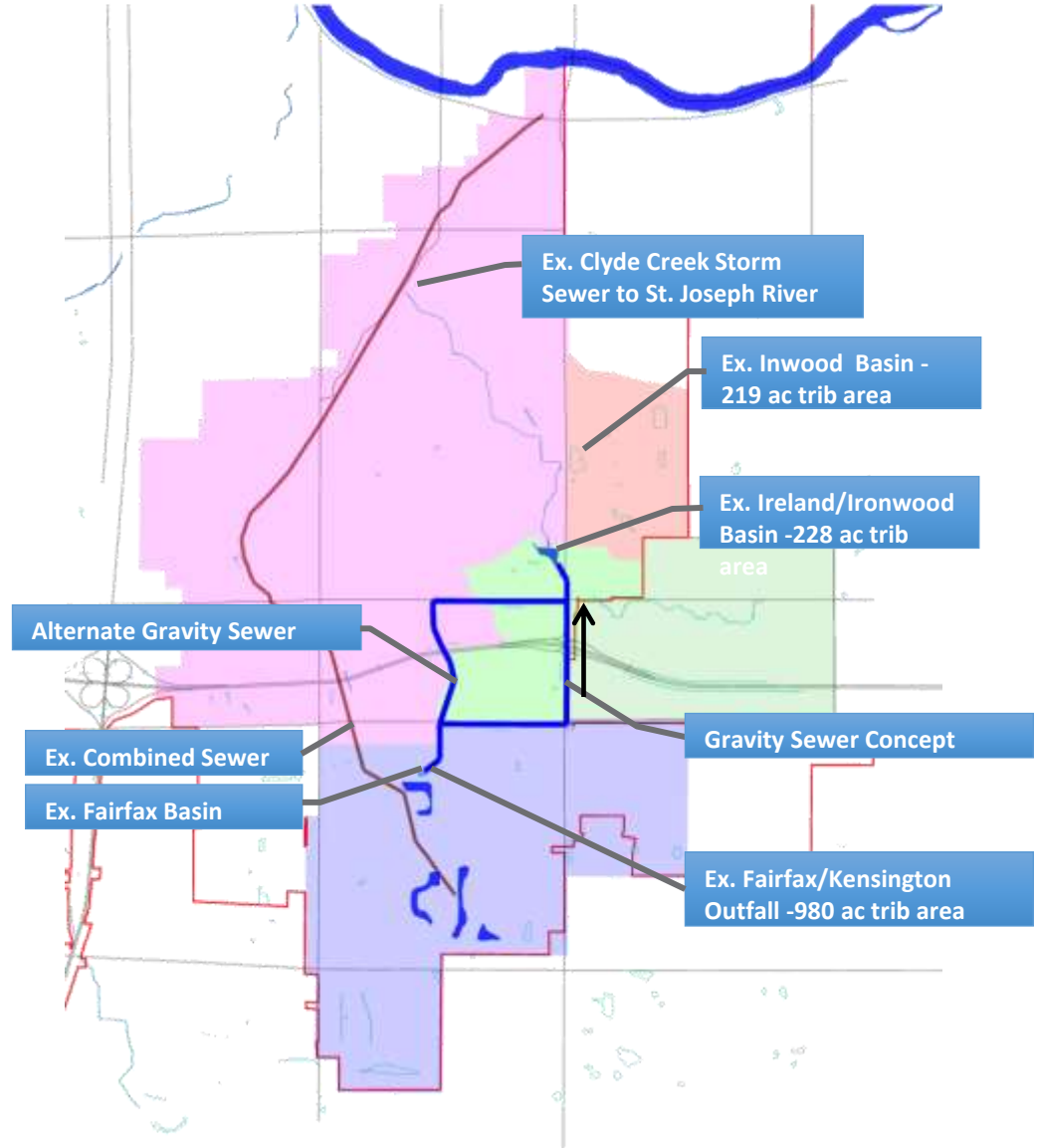
ALTERNATE STORAGE SOLUTIONS

UNDER UTILIZED STORAGE BASINS



DIVERT MORE STORMWATER FROM CSO 22

- 49 MG/yr. removed
- Farthest upstream basin
- Uses existing storm basins
- Reduces WWTP flows



A large stack of grey pipes, likely made of a sustainable material like recycled plastic or concrete, is piled up in a construction site. The pipes are arranged in a dense, somewhat chaotic stack, with many open ends visible. The background shows a gravelly ground and more pipes in the distance, suggesting a construction or industrial setting. The overall image has a muted, greyish-blue color palette.

GREEN SOLUTIONS

SOLUTIONS AVAILABLE TO THE COMMUNITY



ECOROOF



CONSTRUCTED WETLANDS



DETENTION BASIN



BIOSWALE



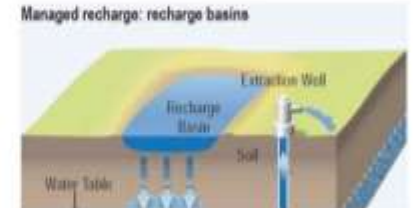
CISTERN



PERMEABLE PAVEMENT



INFILTRATION TRENCH



GROUNDWATER RECHARGE



ROOFTOP DISCONNECTION



BIORETENTION



STREAM DAYLIGHTING



INFILTRATION

KENNEDY PARK INFILTRATION BASINS



UNDERGROUND
INFILTRATION BASIN

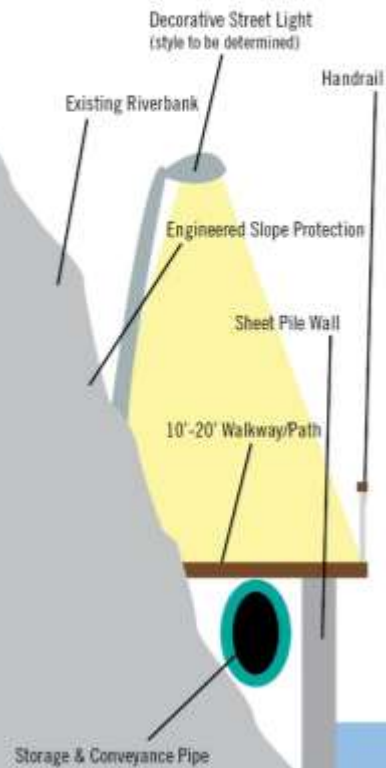


TECHNICAL ALTERNATES
Sub-catchment Analysis

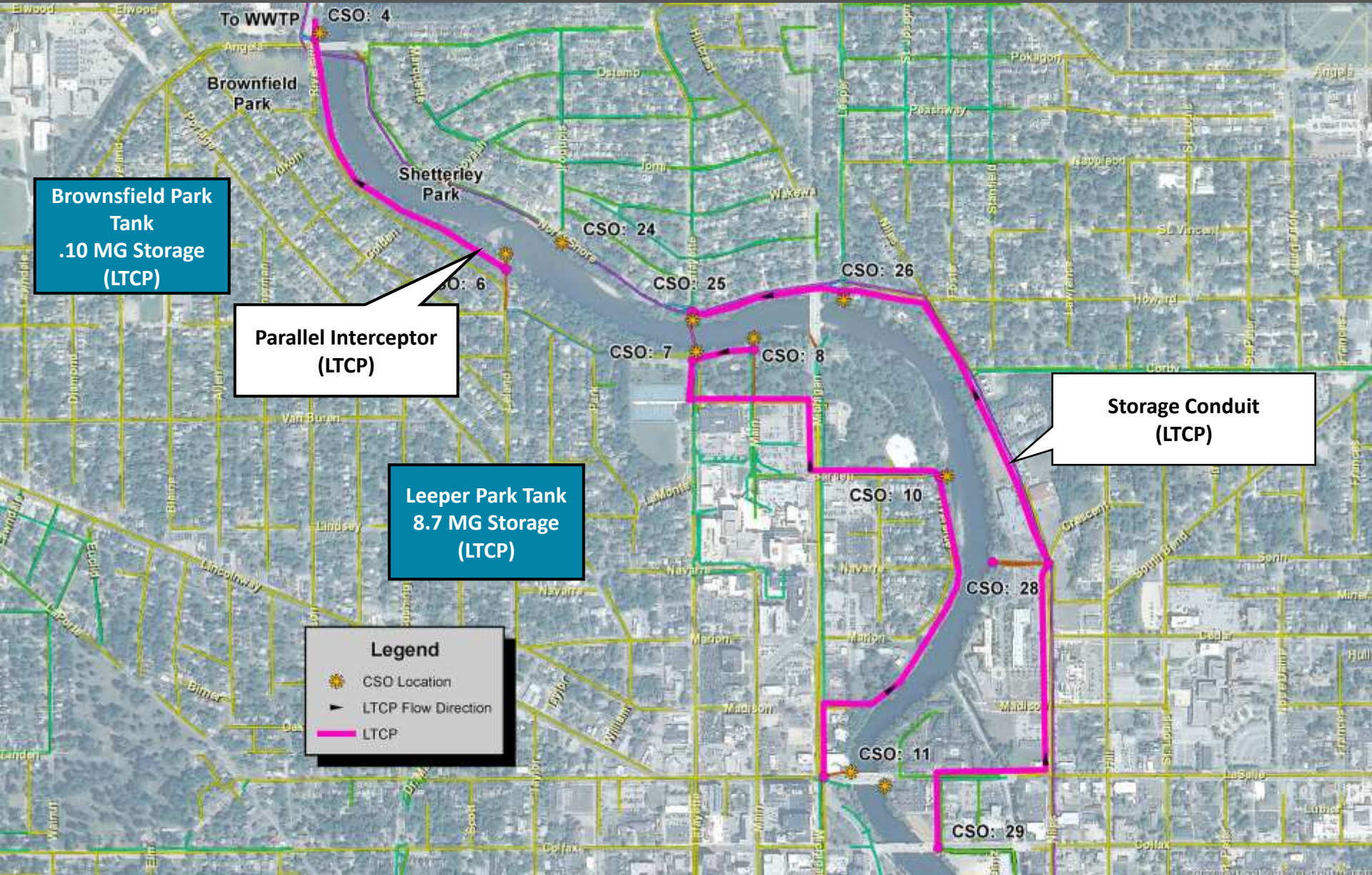
2012 RIVERBANK STABILIZATION PROJECT

Combine Three Projects

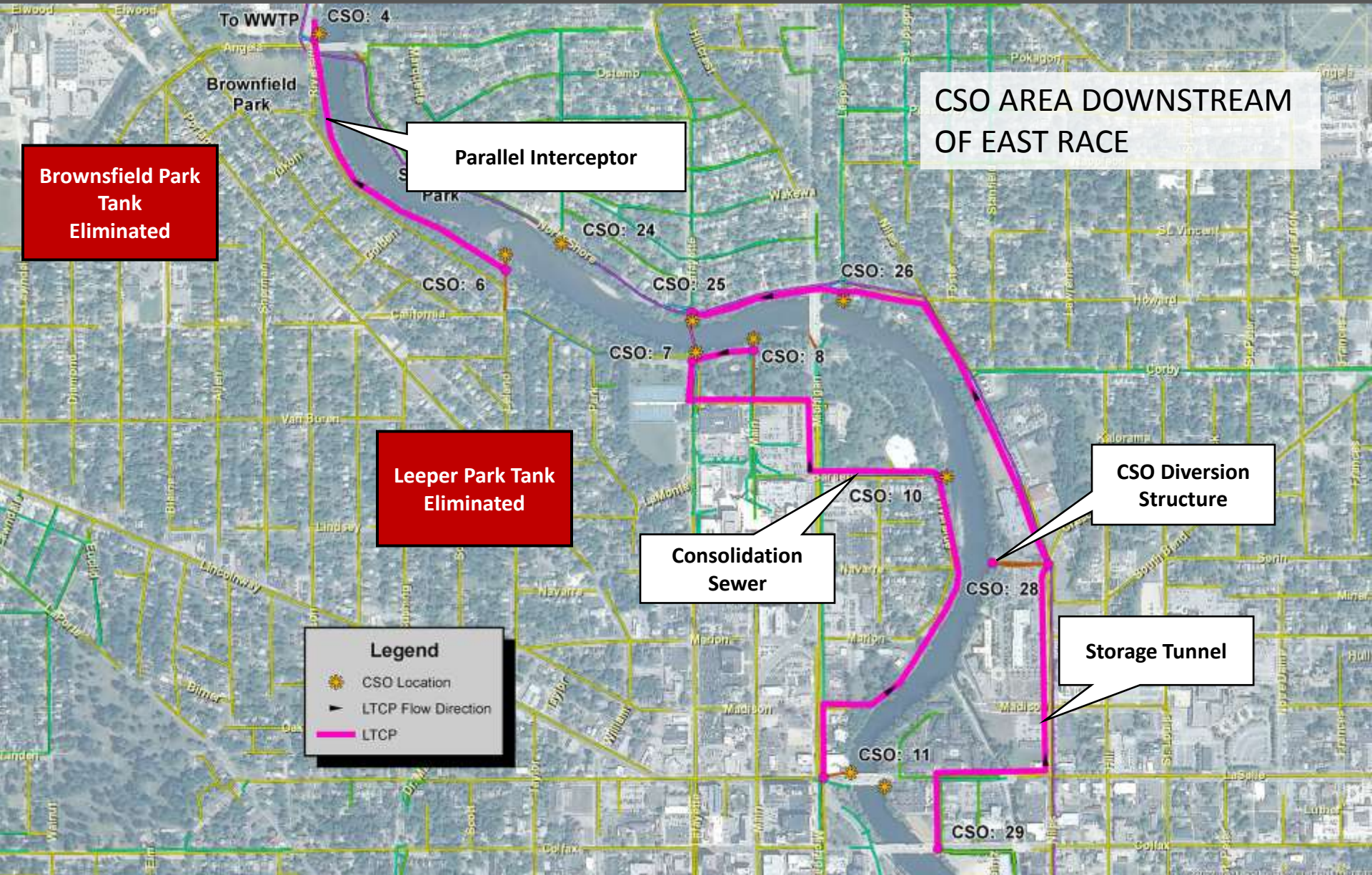
- Walkway Path
- Bank Stabilization
- CSO Project



EXISTING LTCP DOWNSTREAM OF EAST RACE



CONCEPTUAL ALTERNATE OPTIONS TO SAVE \$



**Brownsfield Park
Tank
Eliminated**

**Leeper Park Tank
Eliminated**

Parallel Interceptor




**Consolidation
Sewer**

**CSO AREA DOWNSTREAM
OF EAST RACE**

**CSO Diversion
Structure**

Storage Tunnel

Legend

-  CSO Location
-  LTCP Flow Direction
-  LTCP

A large stack of grey pipes is shown in an industrial setting, with the text "AFFORDABILITY ANALYSIS" overlaid in white. The pipes are stacked in a way that creates a sense of depth and volume, filling most of the frame. The background is a blurred industrial area with more pipes and a gravelly ground.

AFFORDABILITY ANALYSIS

FINANCIAL BURDEN IS HIGH

Projected LTCP cost is 2.4% of median income

HIGH BURDEN

DETAILS MATTER

Income Distribution	Households	% of Households	Midpoint of Income Dist	RI by Income Dist
Less than \$10,000	4,438	11.3%	\$5,000	17.52%
\$10,000 to \$14,999	3,526	9.0%	\$12,500	7.01%
\$15,000 to \$24,999	6,526	16.7%	\$20,000	4.38%
\$25,000 to \$34,999	5,865	15.0%	\$30,000	2.92%
\$35,000 to \$49,999	6,449	16.5%	\$42,500	2.06%
\$50,000 to \$74,999	6,027	15.4%	\$62,500	1.40%
\$75,000 to \$99,999	2,962	7.6%	\$87,500	1.00%
\$100,000 to \$149,999	2,274	5.8%	\$125,000	0.70%
\$150,000 to \$199,999	482	1.2%	\$175,000	0.50%
\$200,000 or more	618	1.6%	\$200,000	0.44%

68% of all households are above 2% of MHI

END PRODUCT FROM REASSESSMENT OF LTCP

- Solutions that will save CSO LTCP \$\$ - New LTCP
- Better-defined cost of existing LTCP and whether it is affordable by EPA standards
- Computer models to assess environmental improvements and affordability of alternative solutions
- LTCP implementation schedule and budget
- Tools to track progress, performance
- Engagement of our stakeholder and greater community understanding

The image shows a large stack of grey pipes in the foreground, with more pipes visible in the background on a gravel surface. The pipes are arranged in a way that creates a sense of depth and repetition. The overall scene is dimly lit, with a greyish-blue tint.

QUESTIONS