CSO AFFORDABILITY
WHAT IS THE RIGHT ANSWER?

OWEA ANNUAL CONFERENCE
JUNE 24, 2015

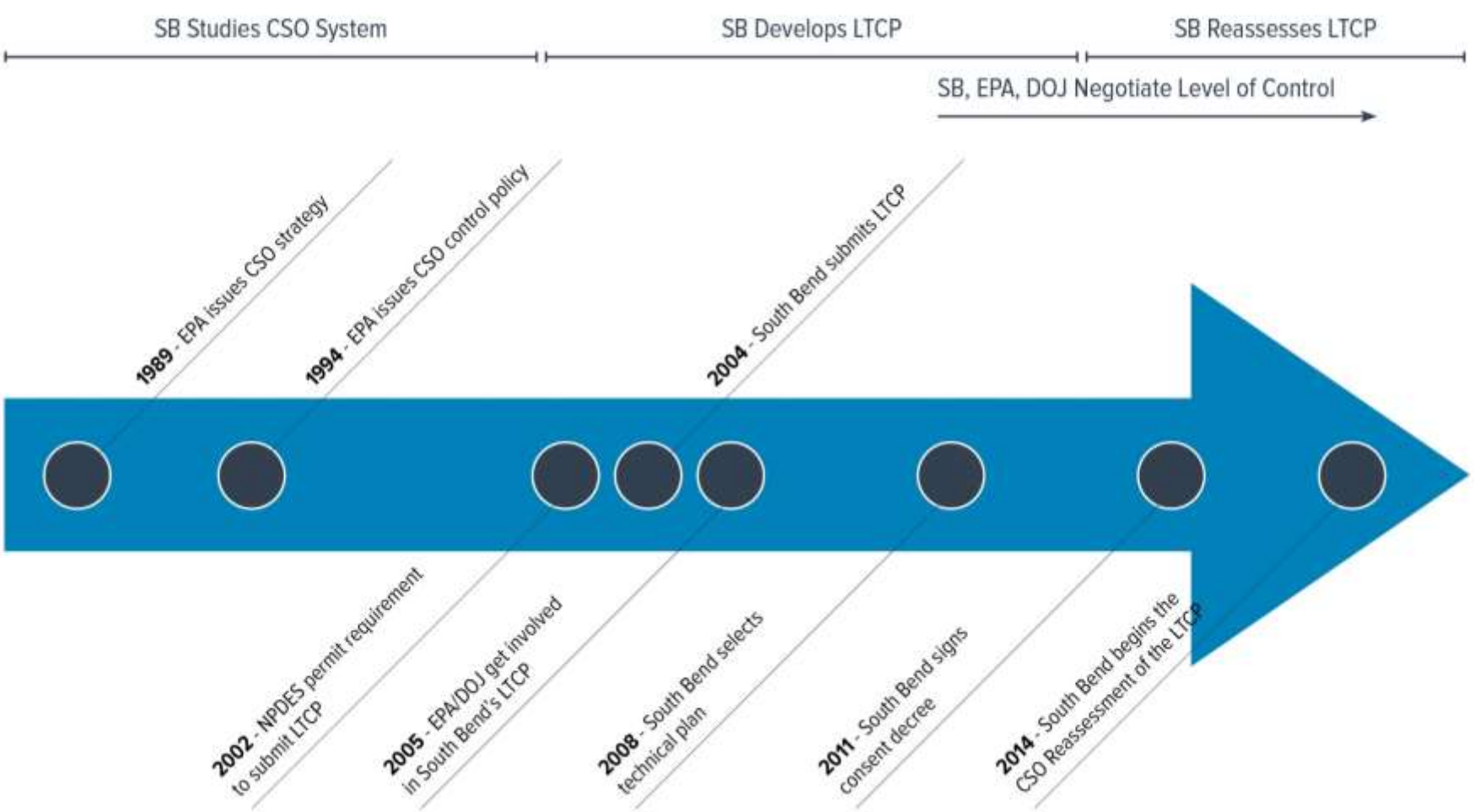
AMERICAN STRUCTUREPOINT INC

AGENDA

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

CSO REGULATION AND DESIGN HISTORY

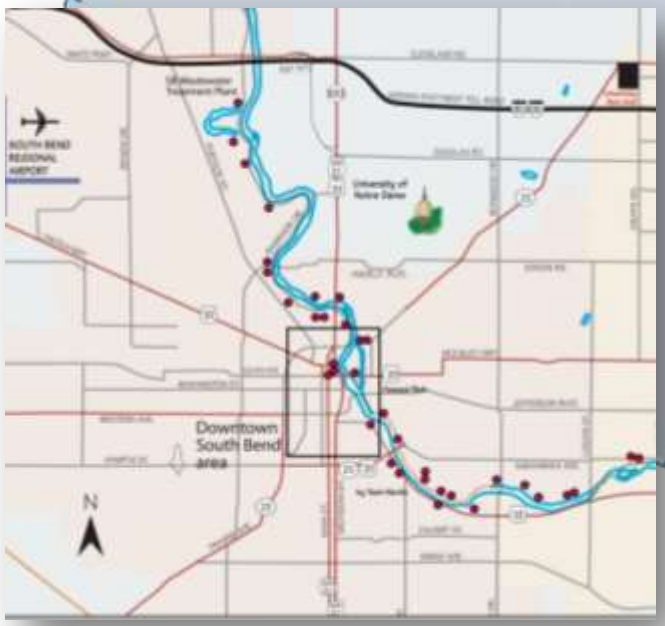
CSO REGULATION



CSO COMMUNITIES

United States

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



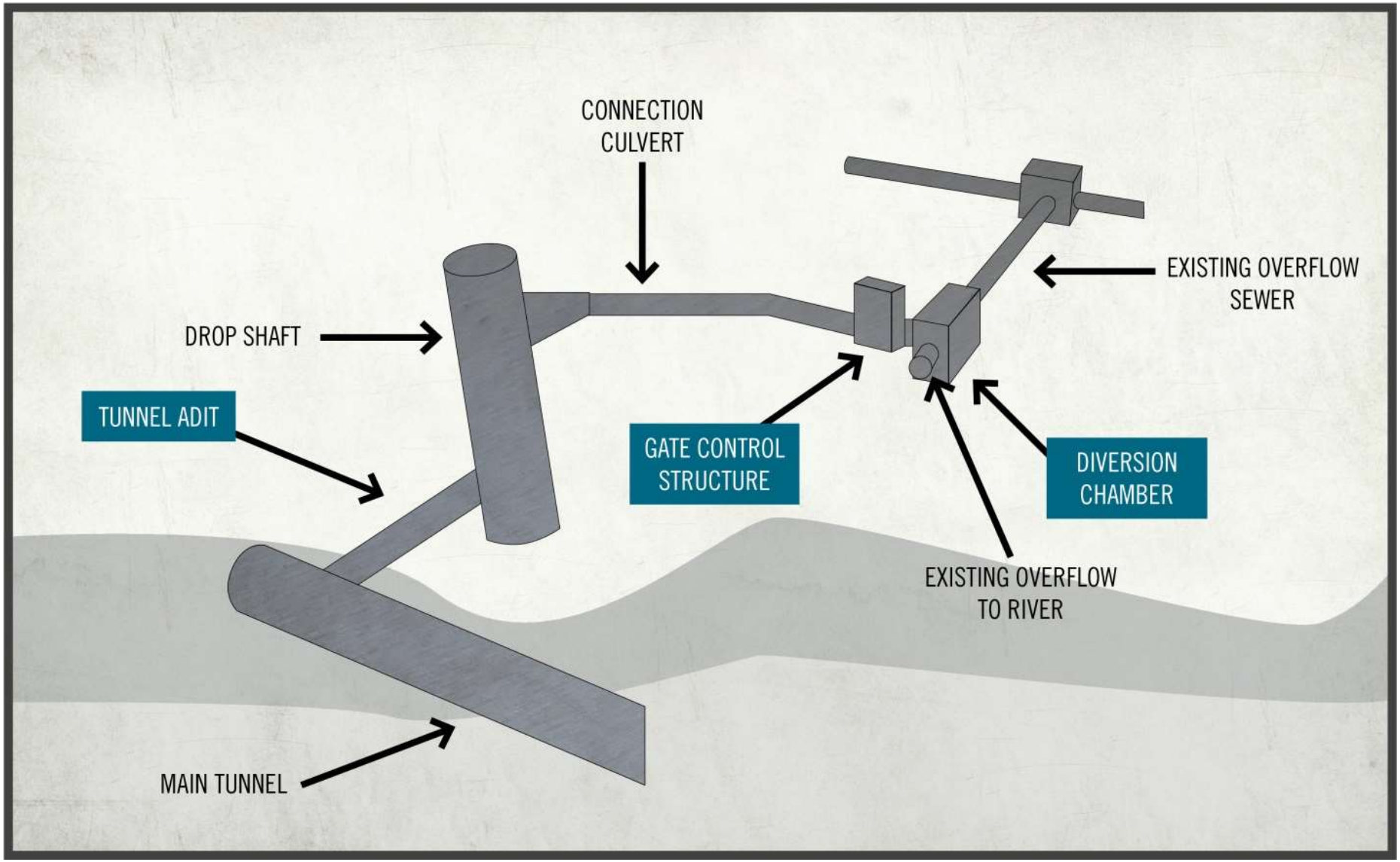
South Bend

- 40 mi^2
- 20 mi^2 combined
- >1 BG/year
- 77 MGD WTTP
- $600M+ LTCP

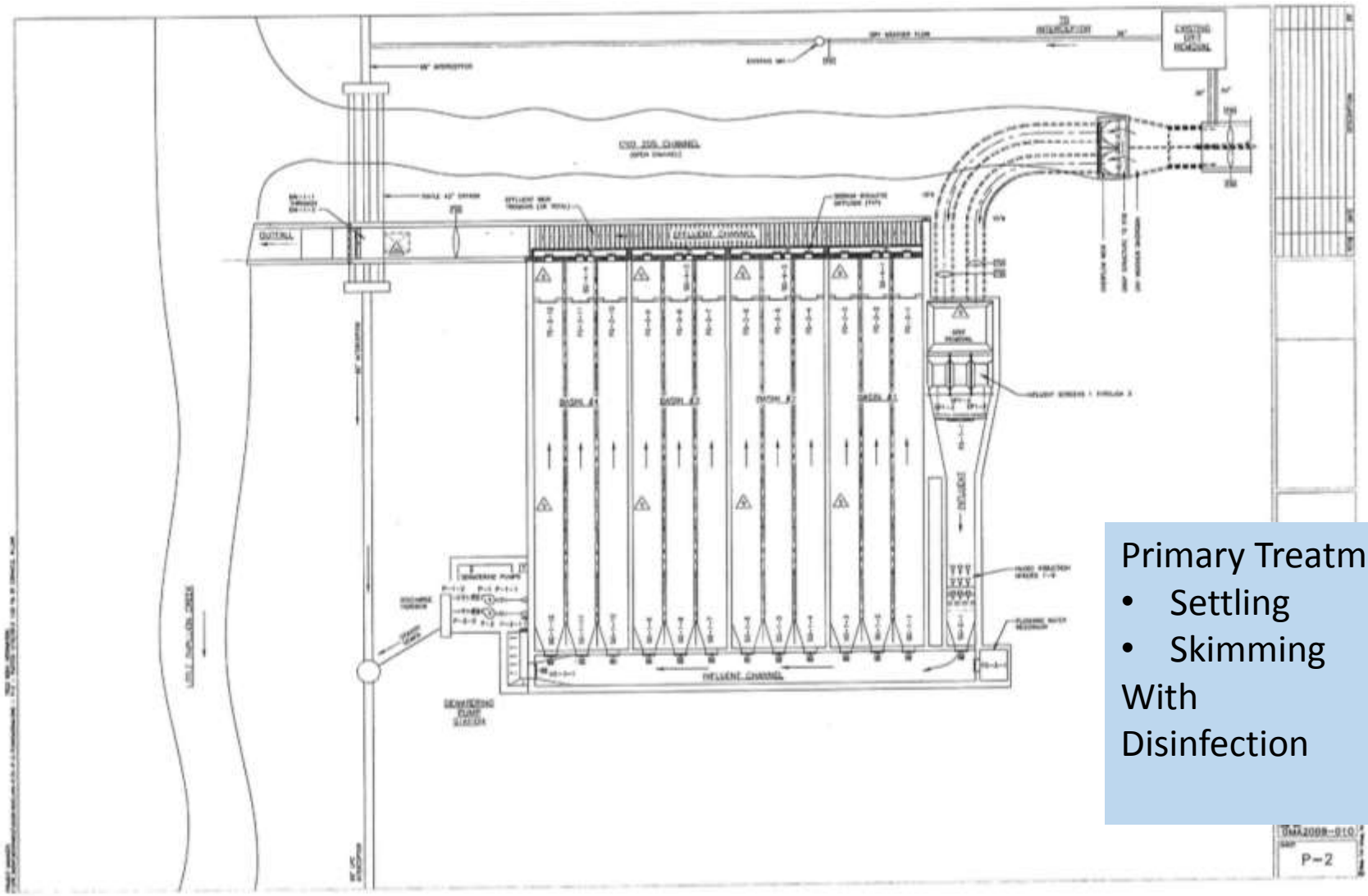
CSO HISTORICAL DESIGN SOLUTIONS

- Tunnels
- Retention Treatment Basins
- Sewer Separation

TUNNEL SYSTEM



RETENTION TREATMENT BASIN

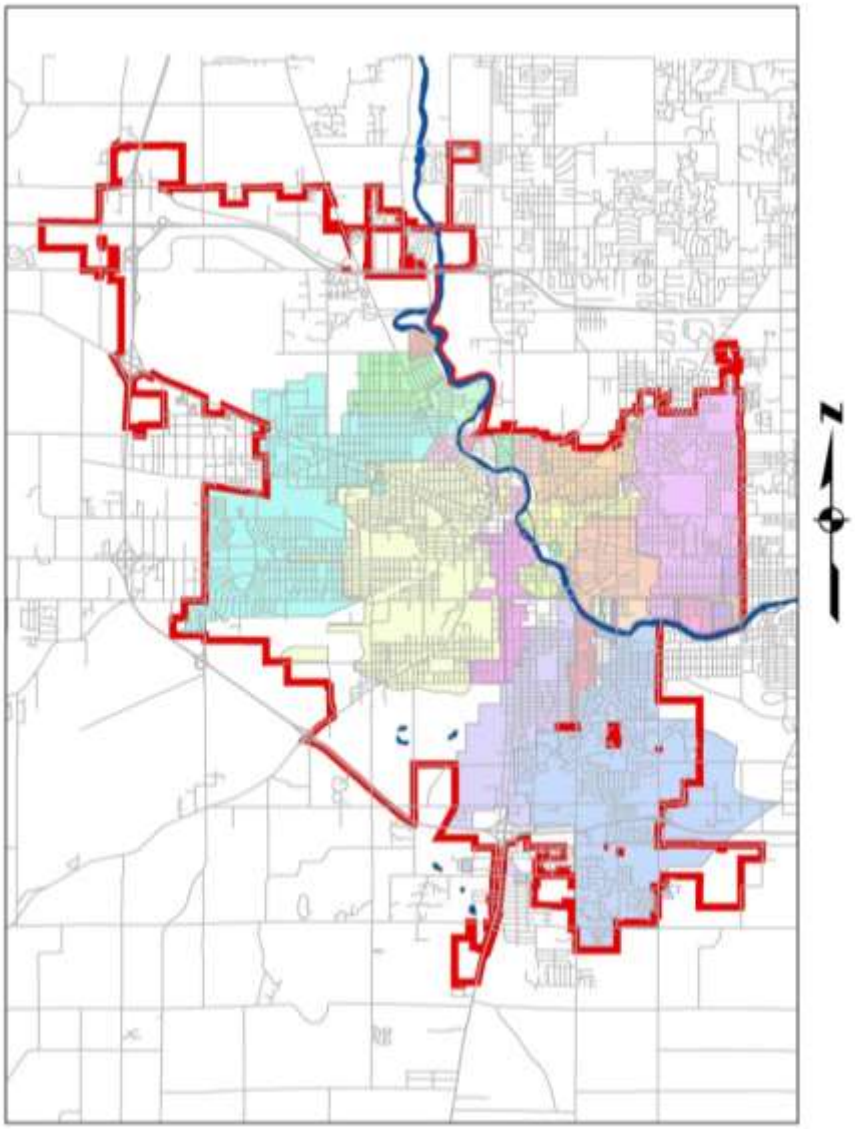


Primary Treatment
- Settling
- Skimming

With Disinfection

SOUTH BEND CSO PROGRAM

SOUTH BEND CSO DISTRICT

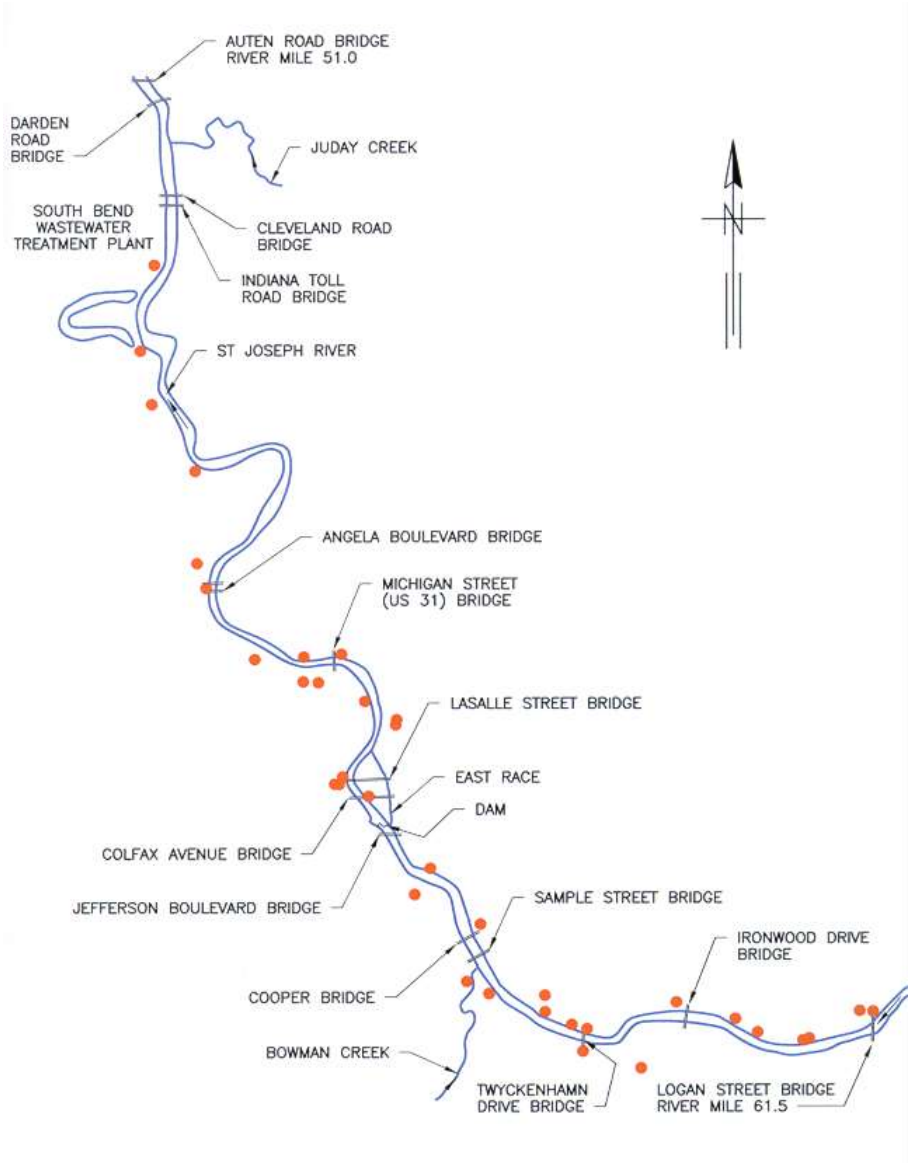


South Bend CSO Service Area:

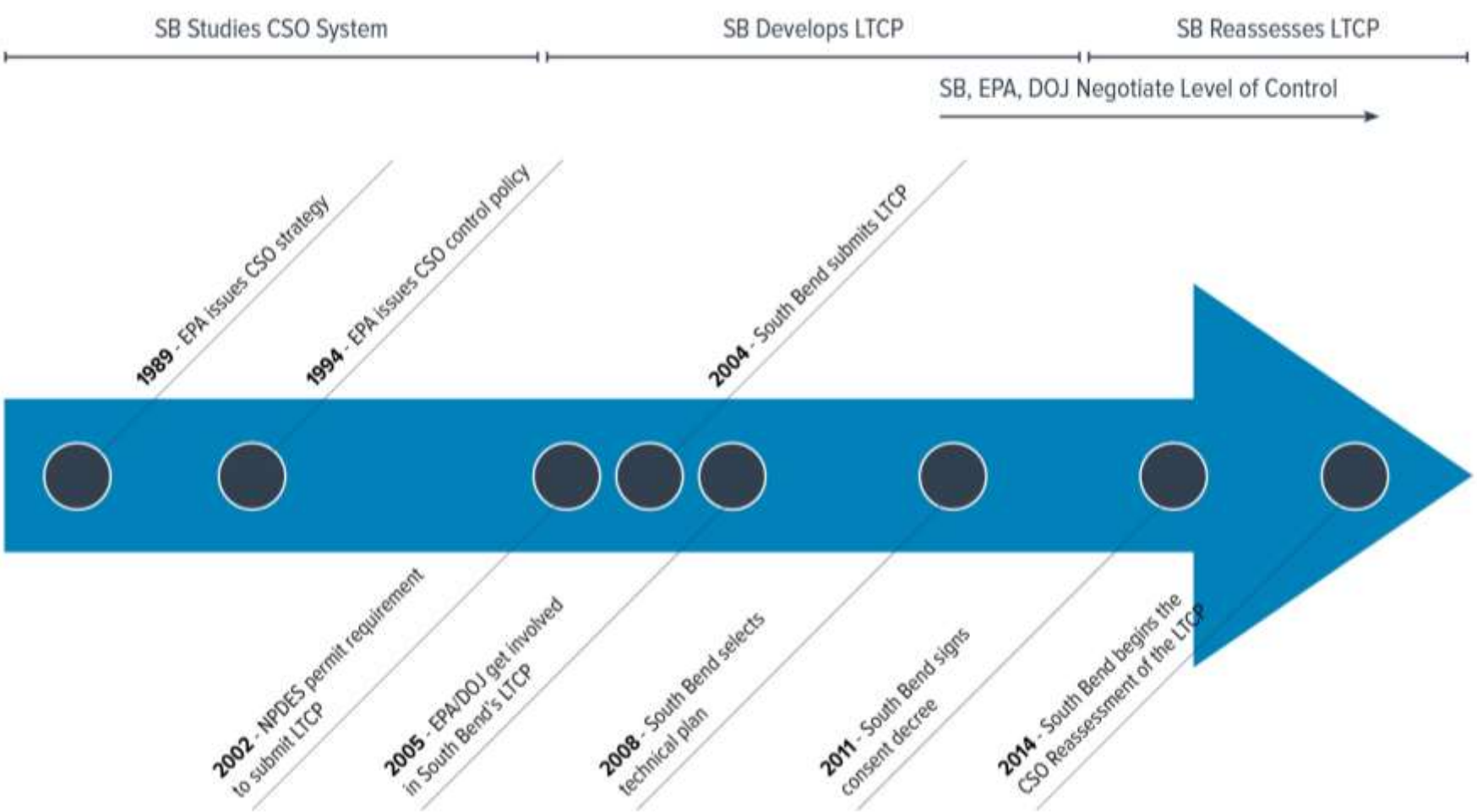
20 square miles

(13,069 acres)

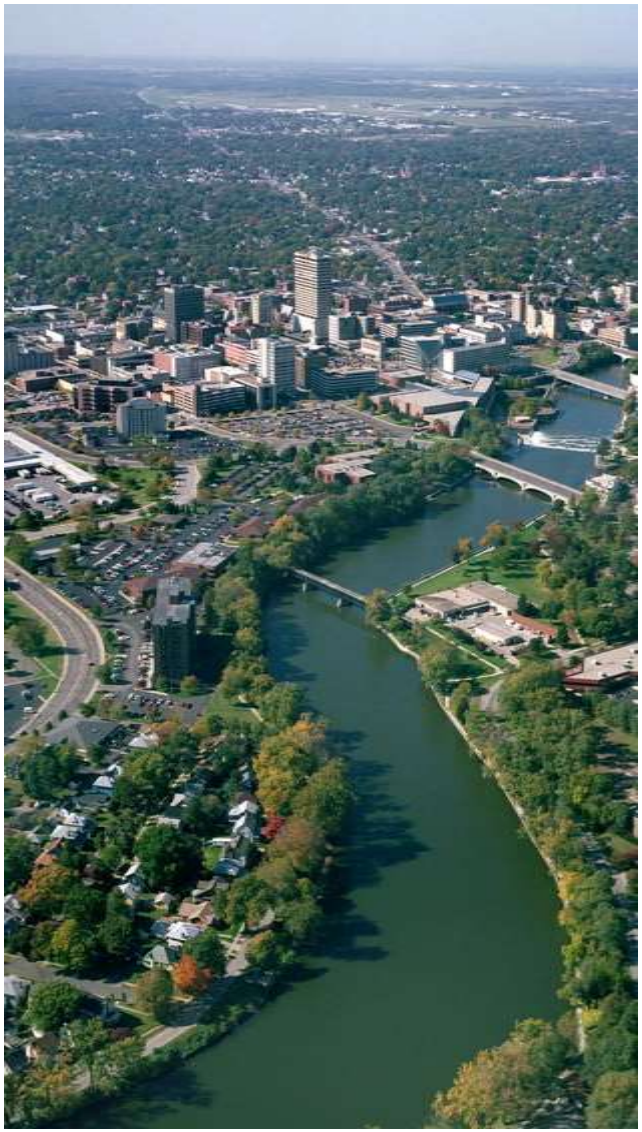
SOUTH BEND CSO OUTFALLS



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	• 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	• 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	• Prove better plan for the environment • Show good faith in implementation of existing plan

CITY OF SOUTH BEND
CSO LTCP REASSESSMENT

SOUTH BEND LTCP REEVALUATION WITH INTEGRATED PLANNING

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

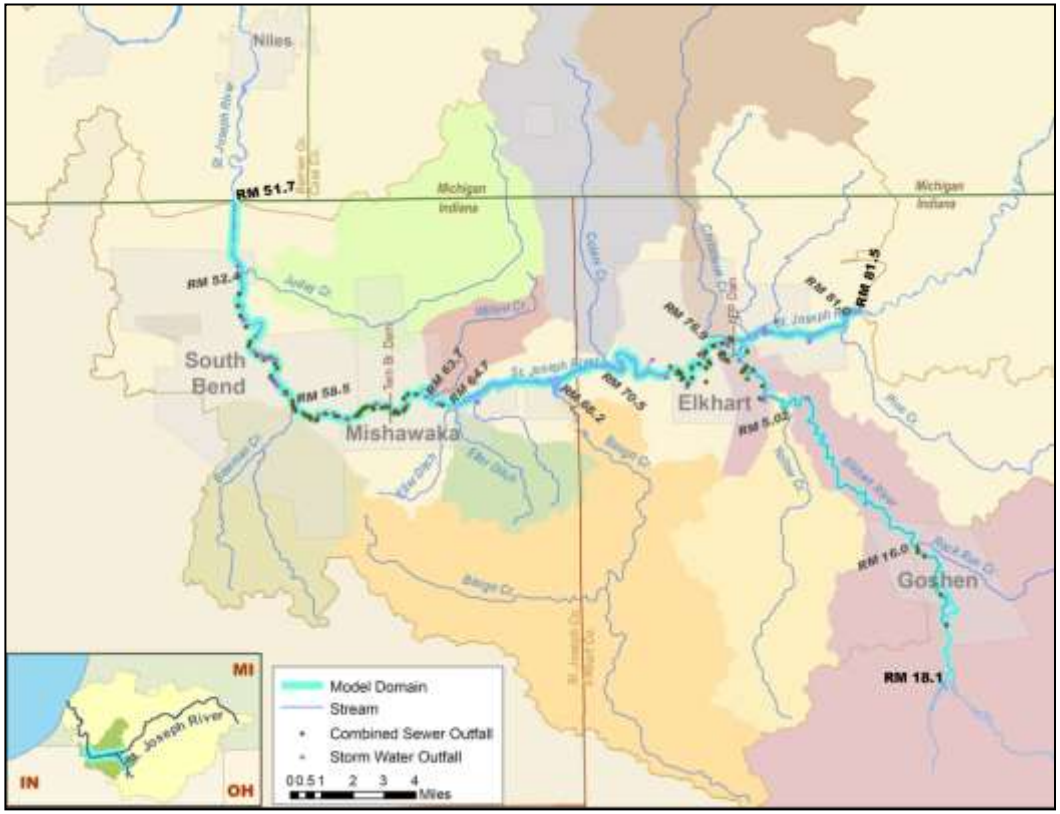
REASSESSMENT OF LTCP

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

WATER QUALITY – KEY TO ACCEPTABLE REVISED PLAN

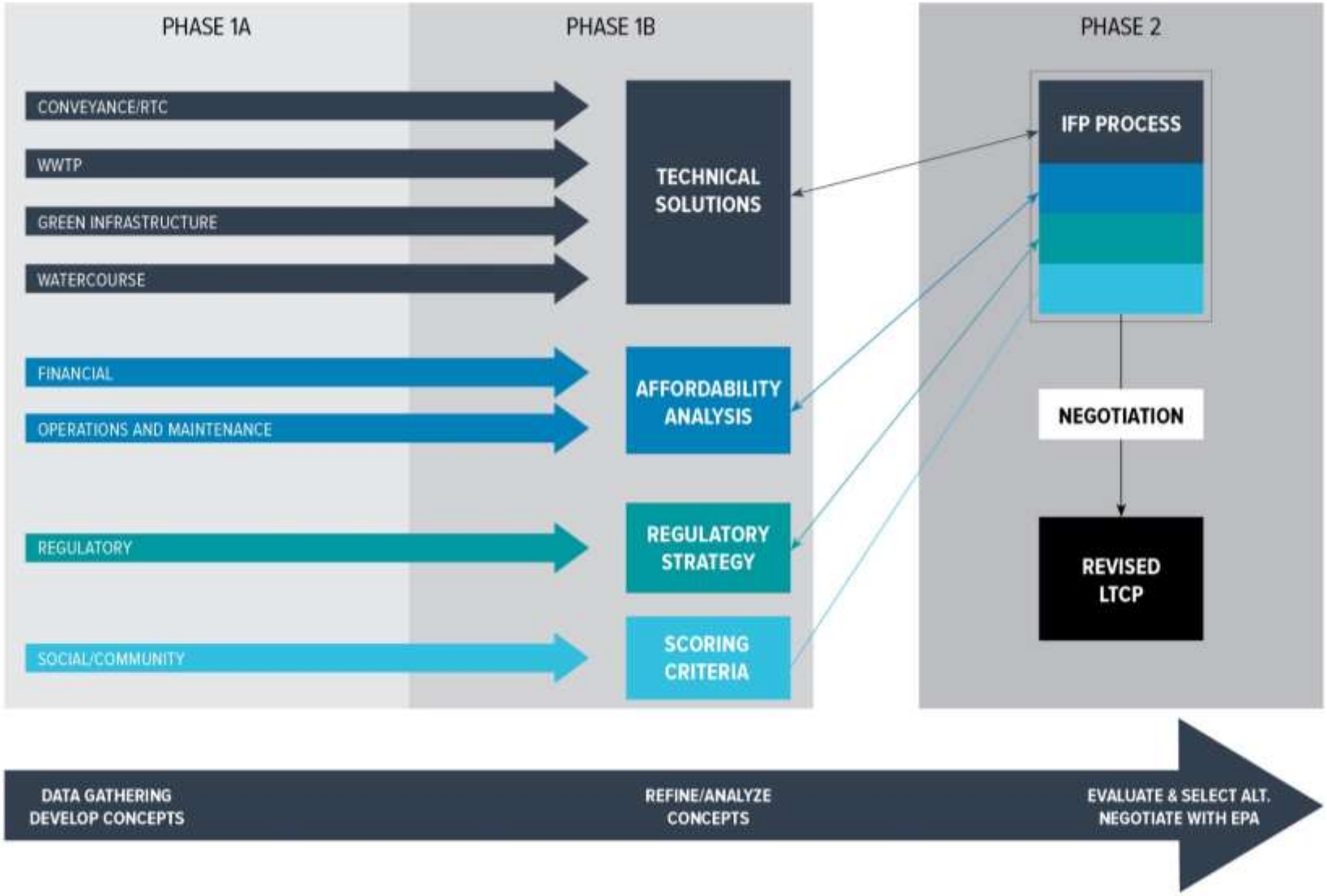
Role of Water Quality

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



KEYS TO INTEGRATED PLANNING DEVELOPMENT

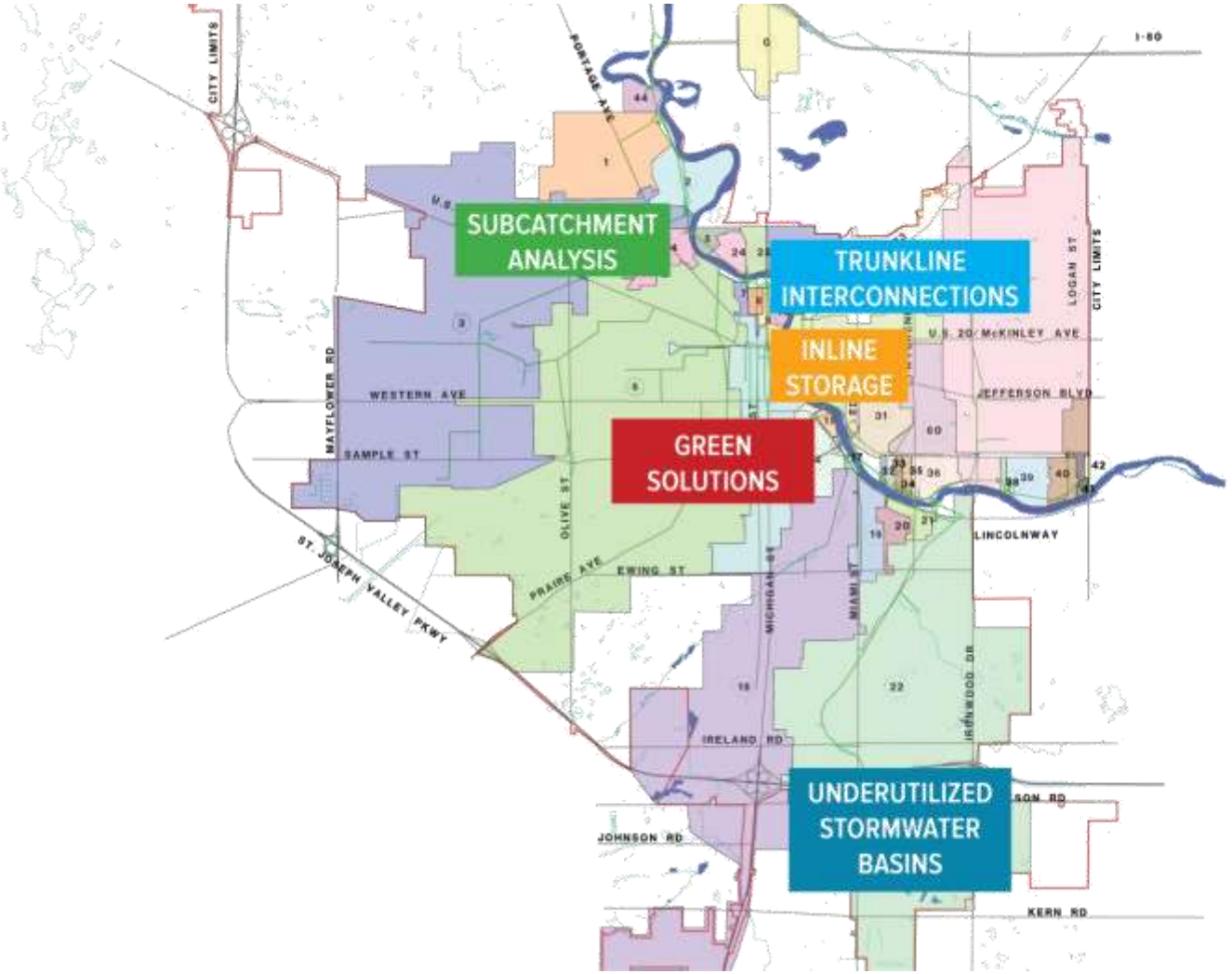
ENVIRONMENTAL PLAN AT AN AFFORDABLE COST



OPTIMIZATION OPPORTUNITIES

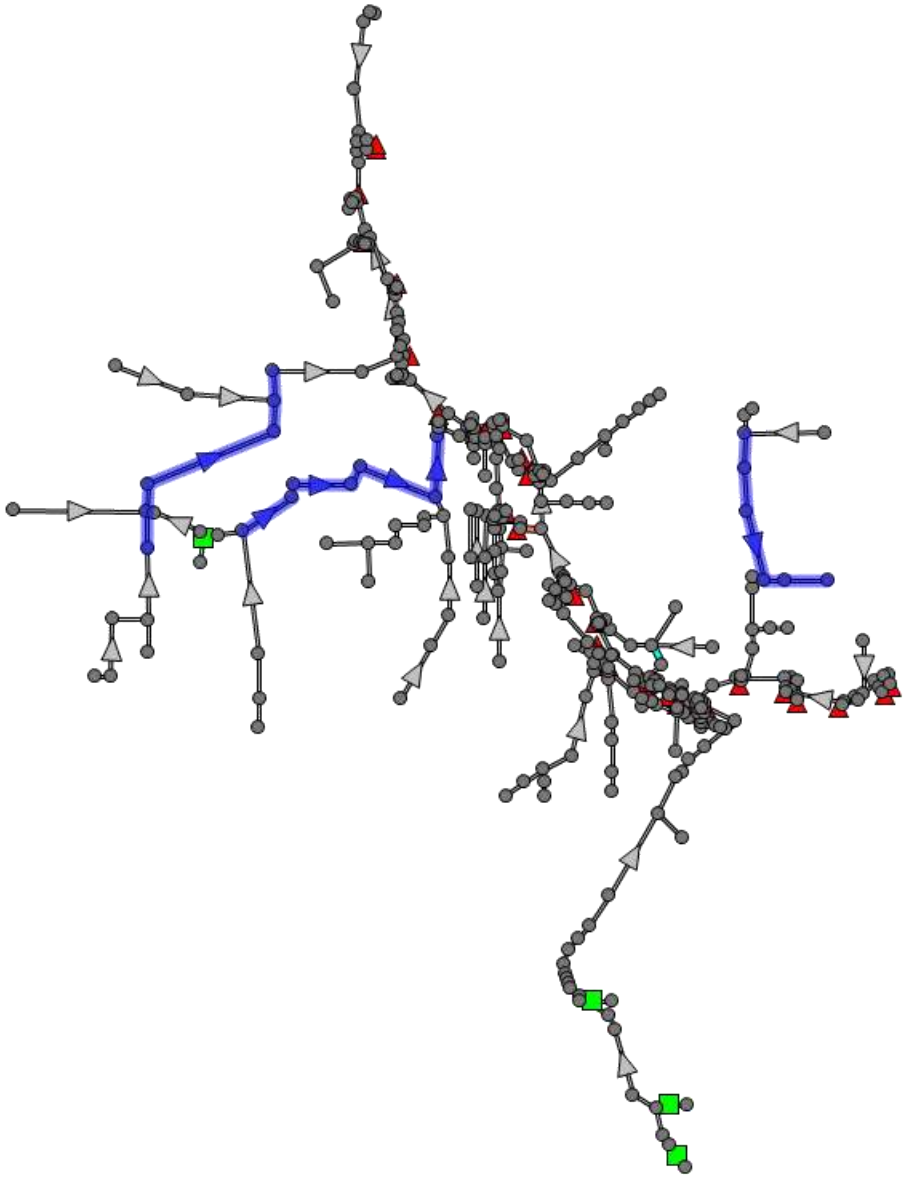
- In-line Storage
- Interconnections
- Alternate Storage
- Green Solutions

POTENTIAL PROJECTS IN SOUTH BEND



INLINE STORAGE AREAS

POTENTIAL INLINE STORAGE LOCATIONS

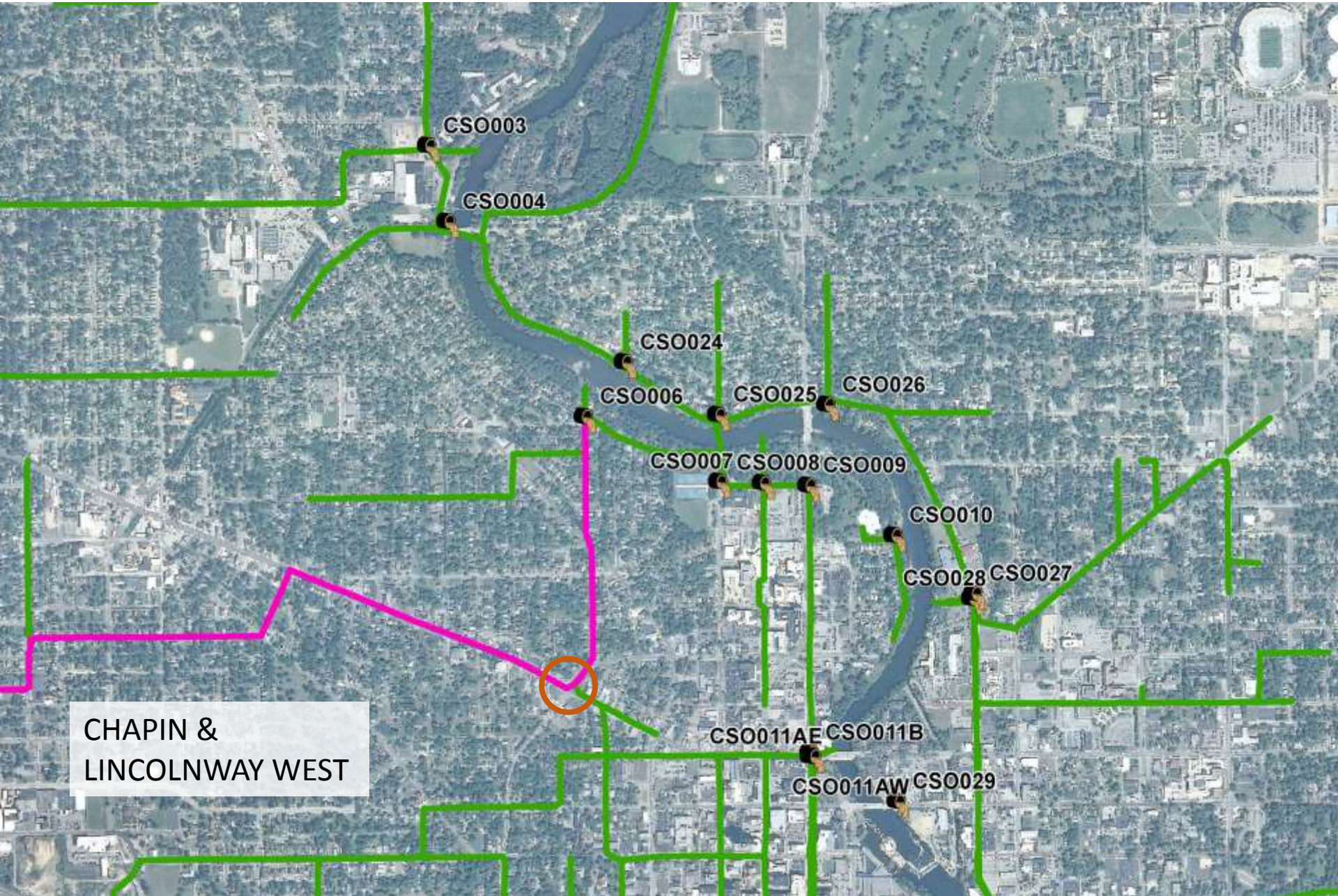


Legend

In-Line Storage Candidate

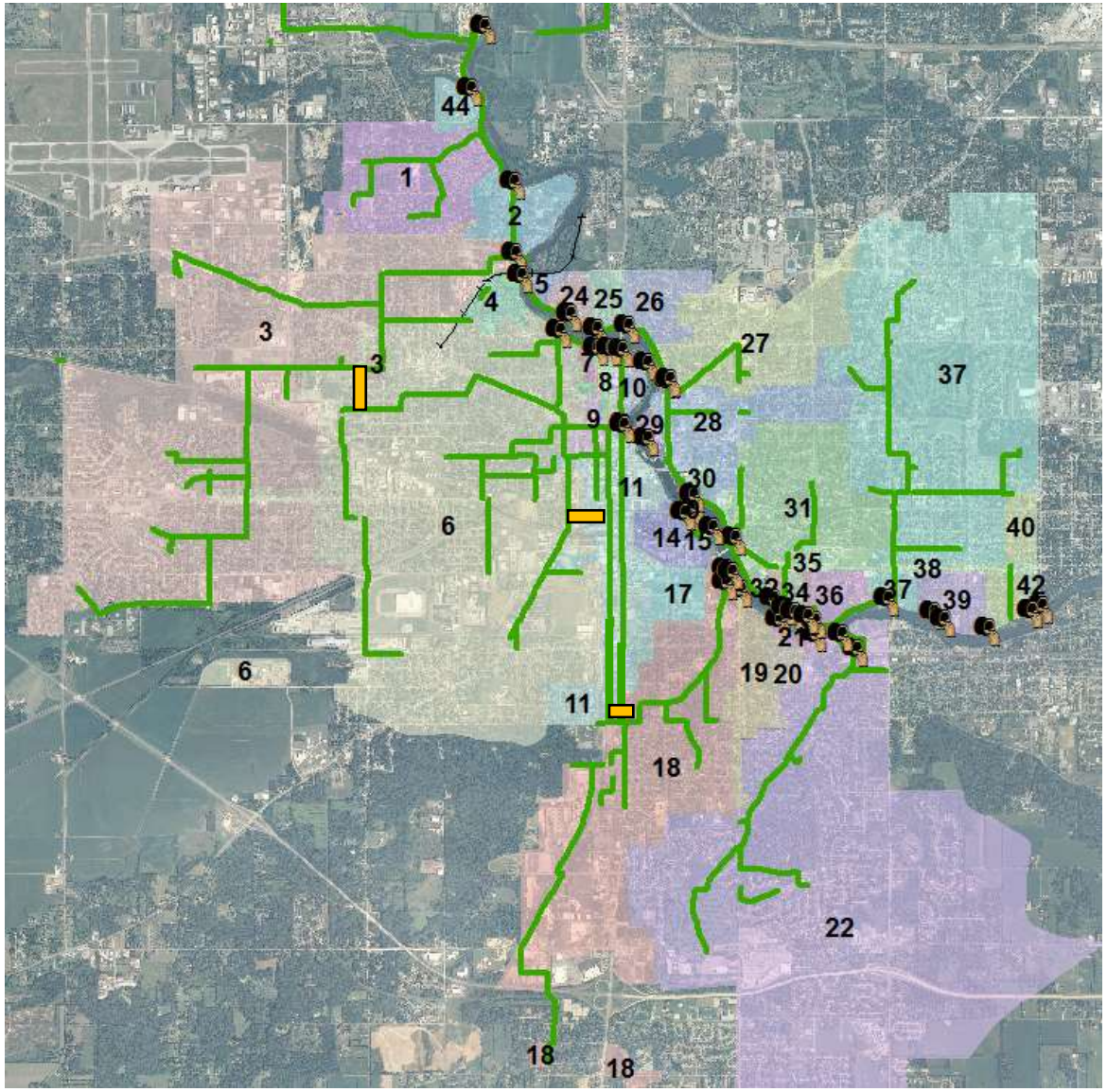
Sewer line

INLINE STORAGE ALONG CSO 6 TRUNKLINE



TRUNKLINE INTERCONNECTIONS

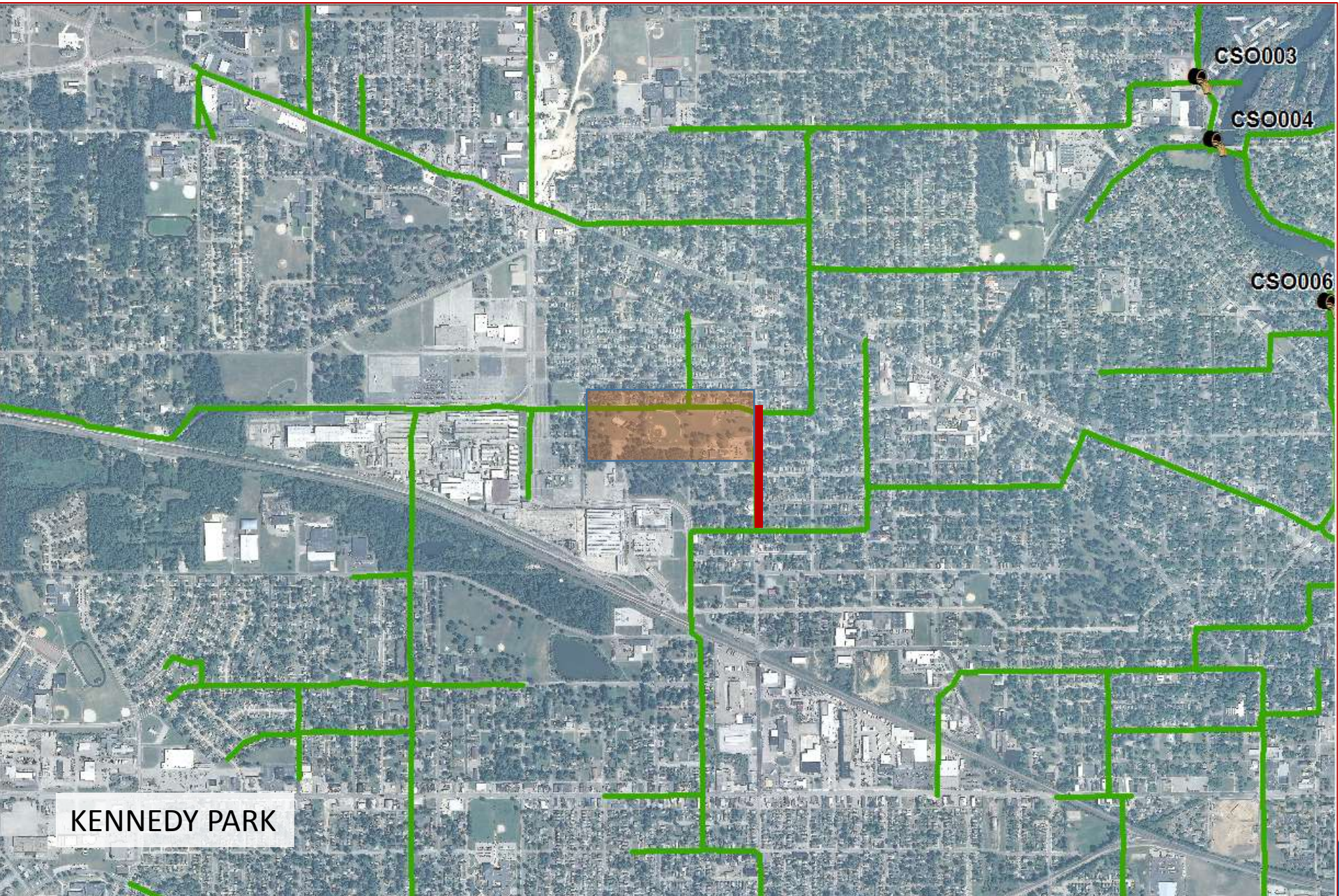
POTENTIAL TRUNKLINE INTERCONNECTION LOCATIONS



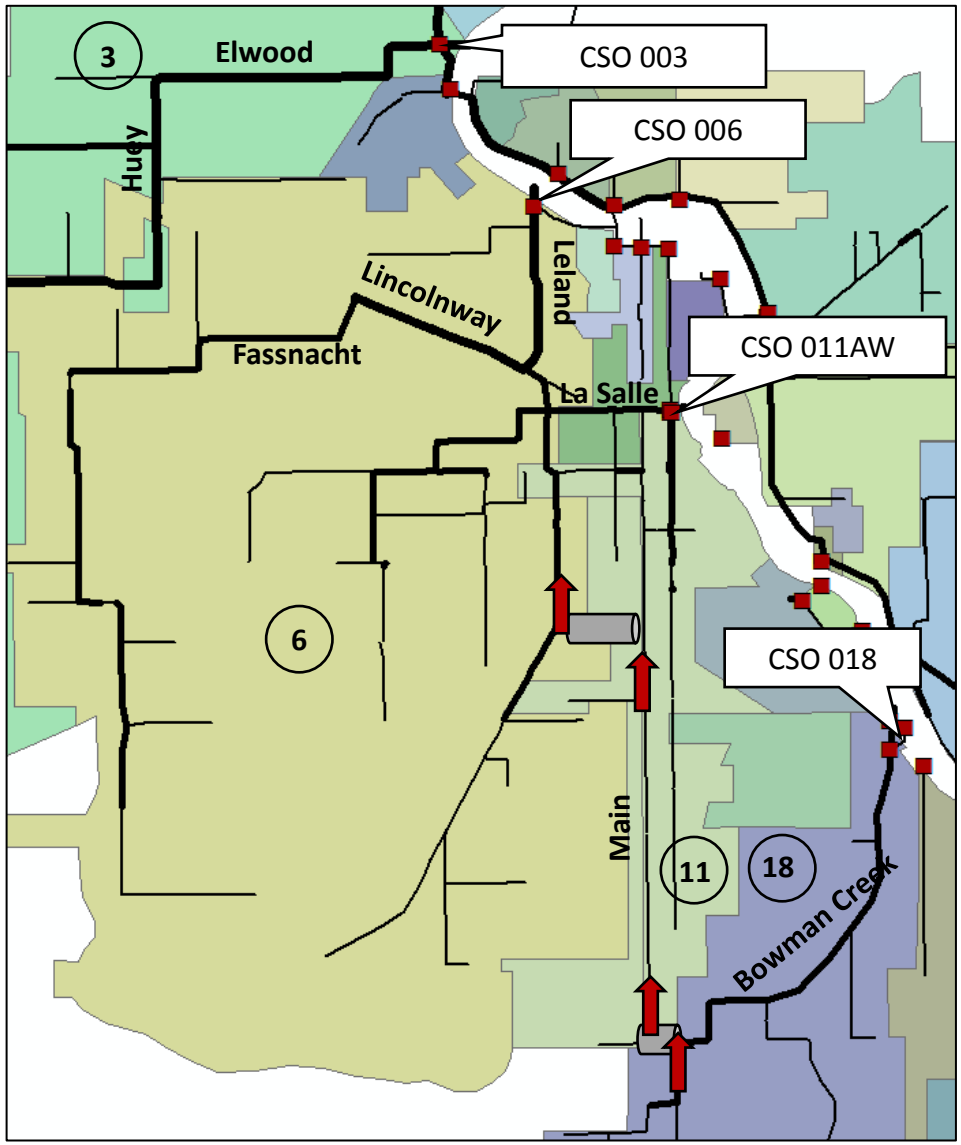
Legend

- Potential Interconnection
- Trunkline
- 1 CSO Service Area Number

CONNECTION LINE BALANCES FLOWS BETWEEN CSO 3 AND 6



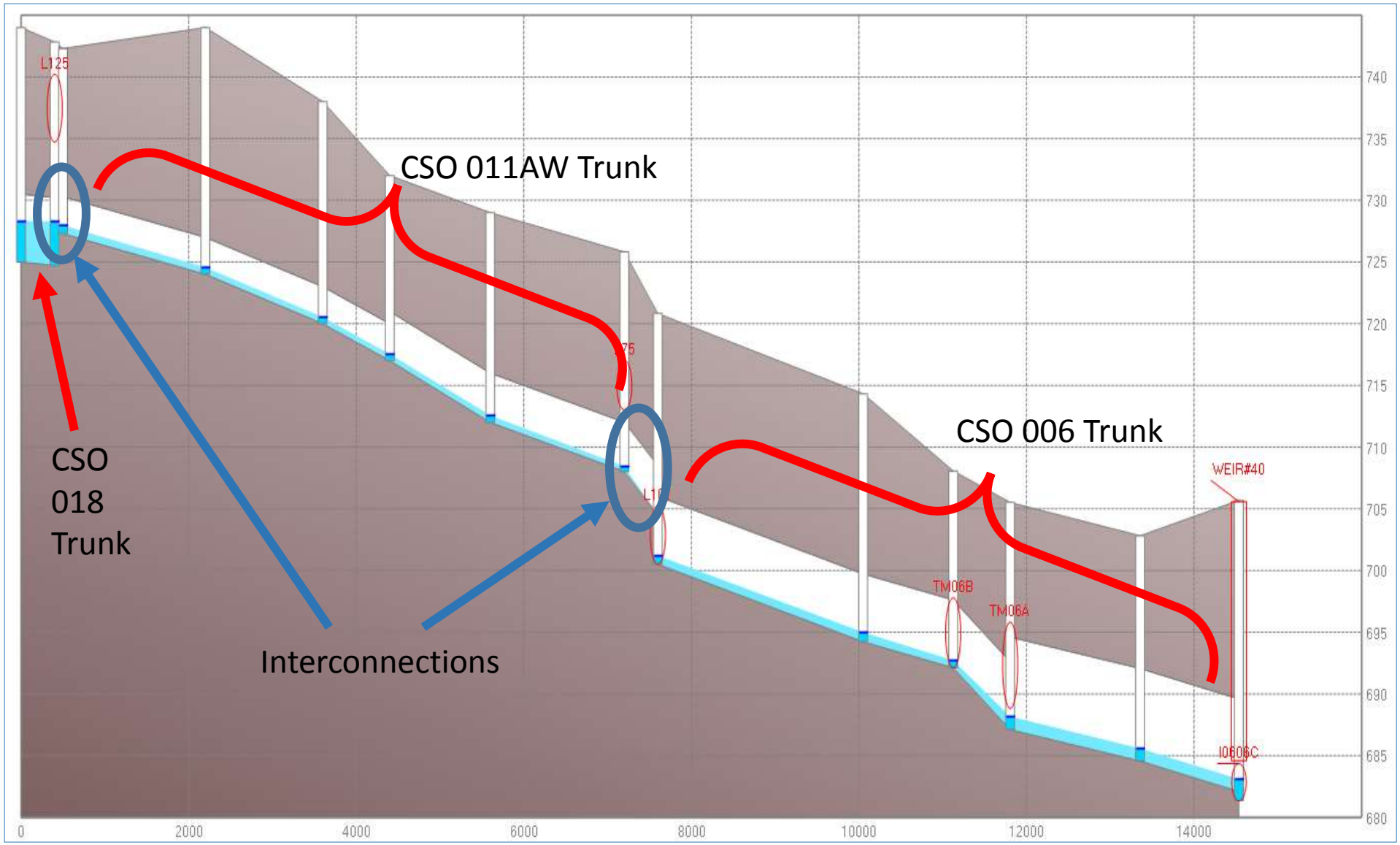
INTERCONNECTIONS OF TWO SYSTEMS RESULTS SAVINGS



Legend

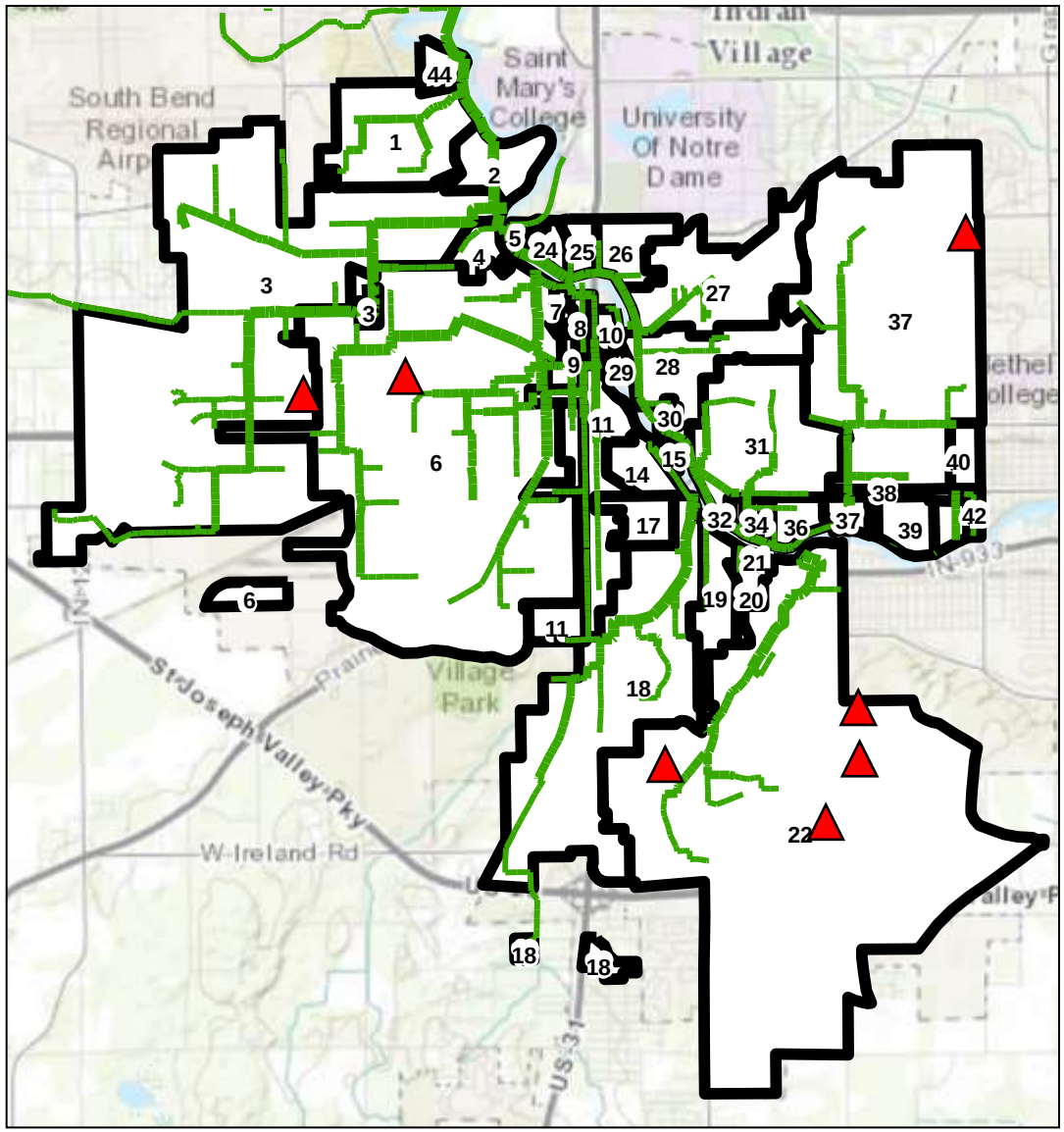
- Interconnection
- Flow Direction
- 6 CSO Area

TRUNKLINE INTERCONNECTIONS



ALTERNATE STORAGE SOLUTIONS

UNDER UTILIZED STORAGE BASINS

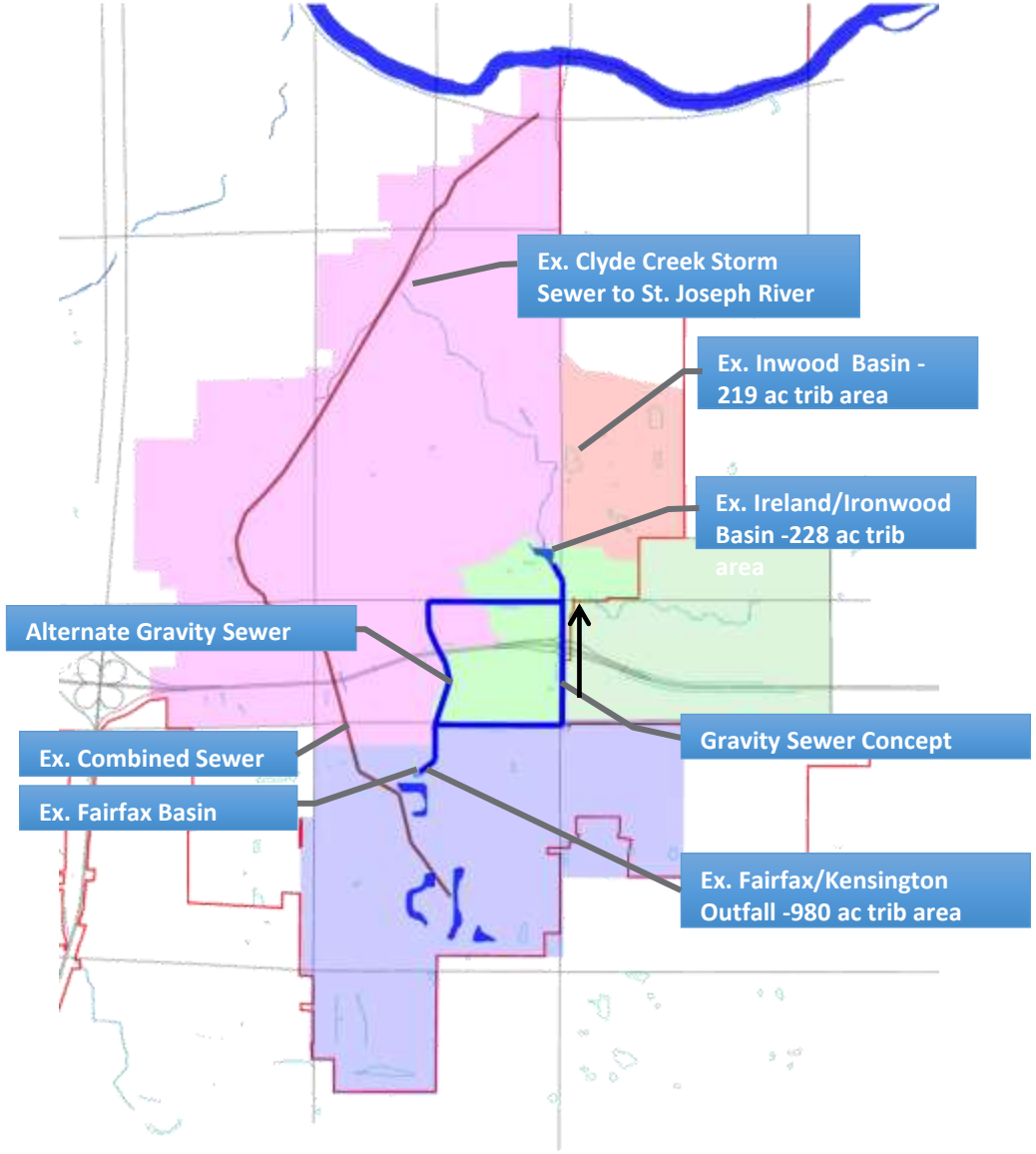


Legend

- Service Area
- Under-Utilized Basin
- Trunkline
- 1 CSO Service Area Number

DIVERT MORE STORMWATER FROM CSO 22

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




GREEN
SOLUTIONS

SOLUTIONS AVAILABLE TO THE COMMUNITY

ECOROOF

CONSTRUCTED WETLANDS

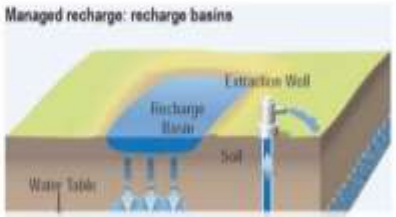
DETENTION BASIN

BIOSWALE

CISTERN

PERMEABLE PAVEMENT

INFILTRATION TRENCH

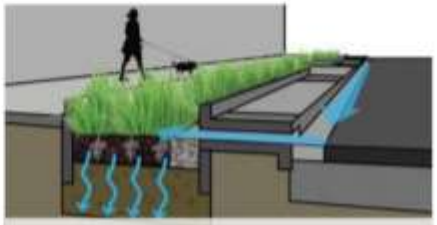


GROUNDWATER RECHARGE

ROOFTOP DISCONNECTION

BIORETENTION

STREAM DAYLIGHTING

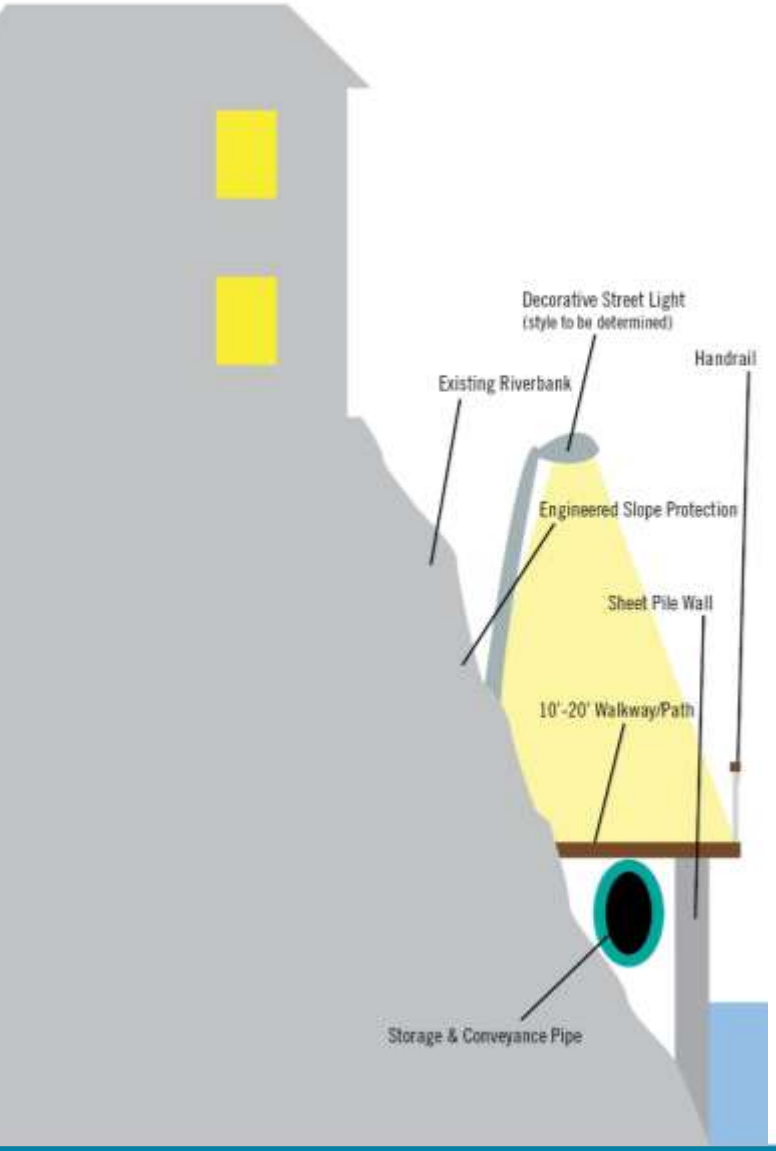


INFILTRATION

KENNEDY PARK INFILTRATION BASINS

TECHNICAL ALTERNATES
Sub-catchment Analysis

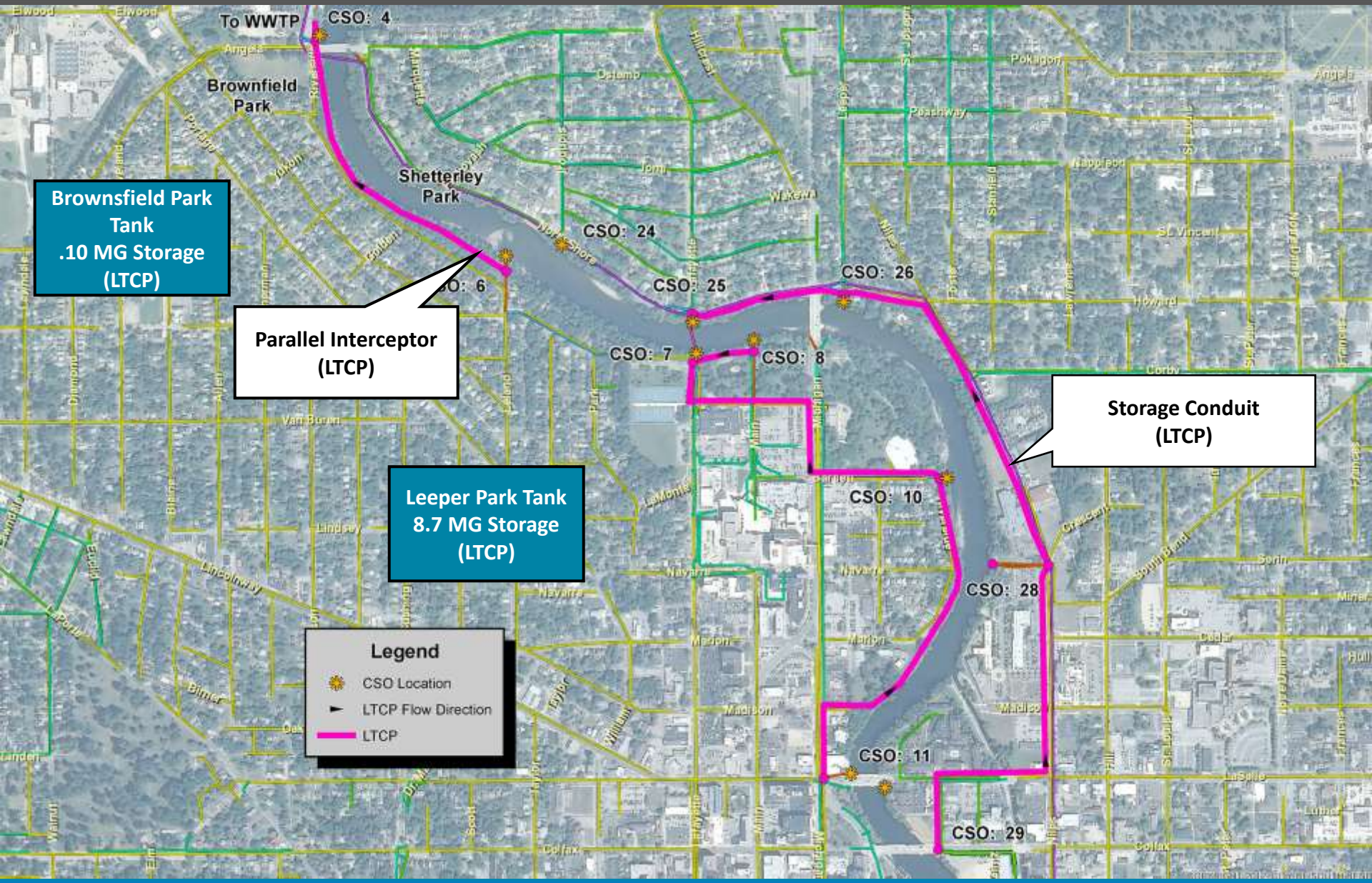
2012 RIVERBANK STABILIZATION PROJECT



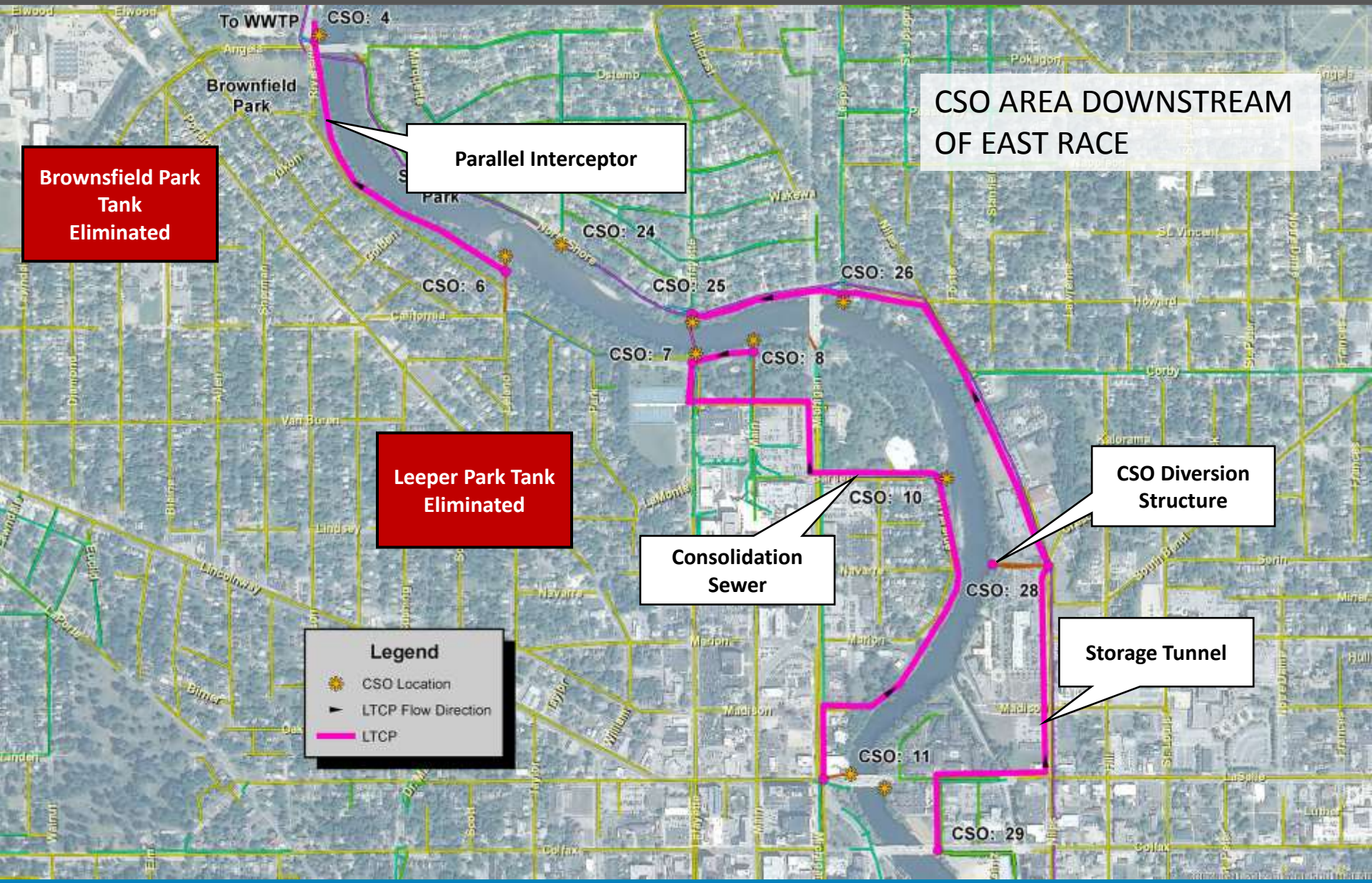
Combine Three Projects

- Walkway Path
- Bank Stabilization
- CSO Project

EXISTING LTCP DOWNSTREAM OF EAST RACE



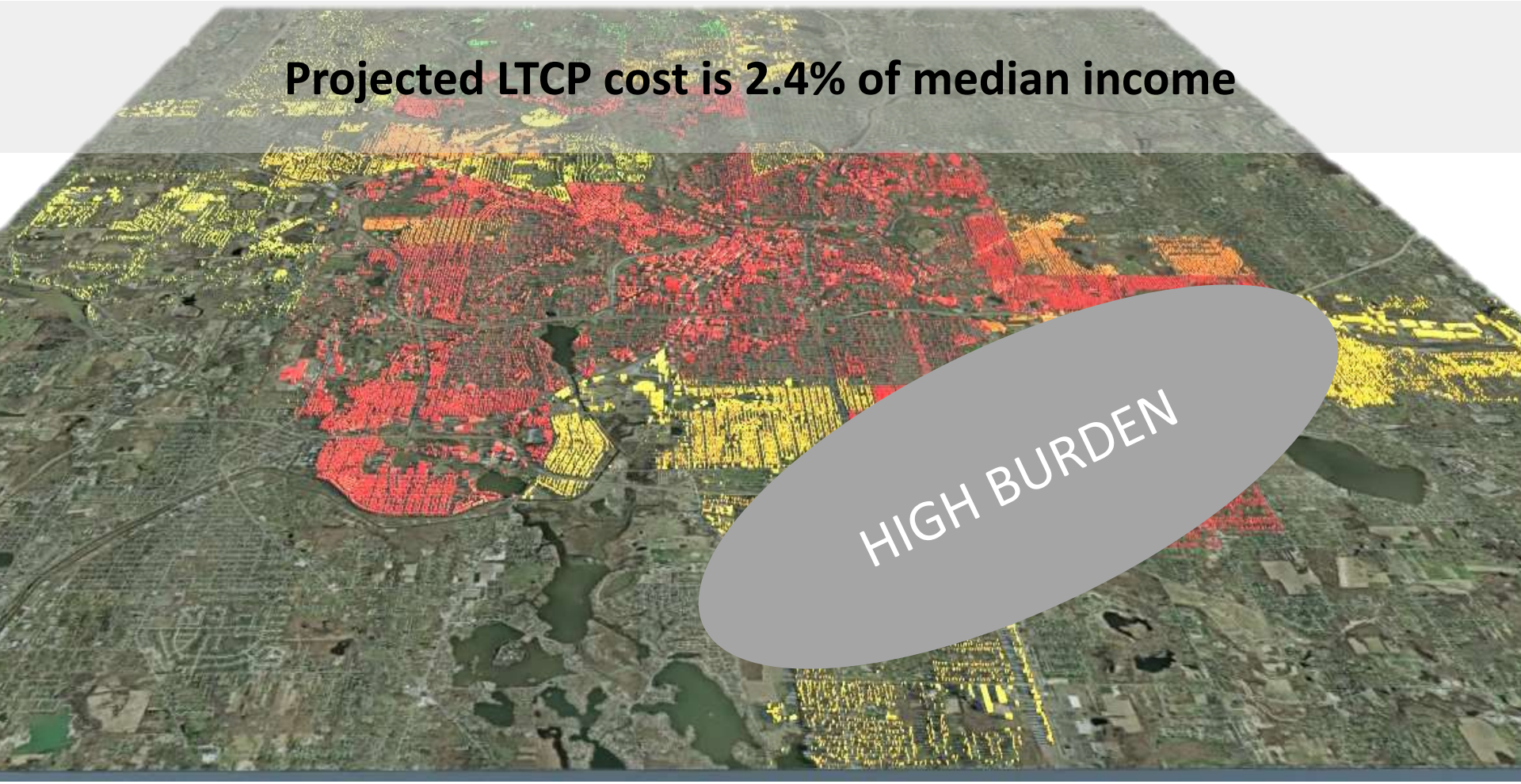
CONCEPTUAL ALTERNATE OPTIONS TO SAVE $



AFFORDABILITY ANALYSIS

FINANCIAL BURDEN IS HIGH

Projected LTCP cost is 2.4% of median income



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%	$125,00	0.70%
$150,000 to $199,999	482	1.2%	$175	0.50%
$200,000 or more	618	1.6%	$ 0	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


QUESTIONS