A map of the Nashville area showing various creeks and rivers. Labels include Marrowbone Creek, Whites Creek, Minor Tribs, Richland, Browns Creek, and Stones River. The map is overlaid with a semi-transparent dark blue rectangle containing the title text.

Beyond the Boom: Tackling Stormwater Challenges in Nashville

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Background and Objectives

Planning

Inventory & Condition Assessment

Model Setup

Analysis

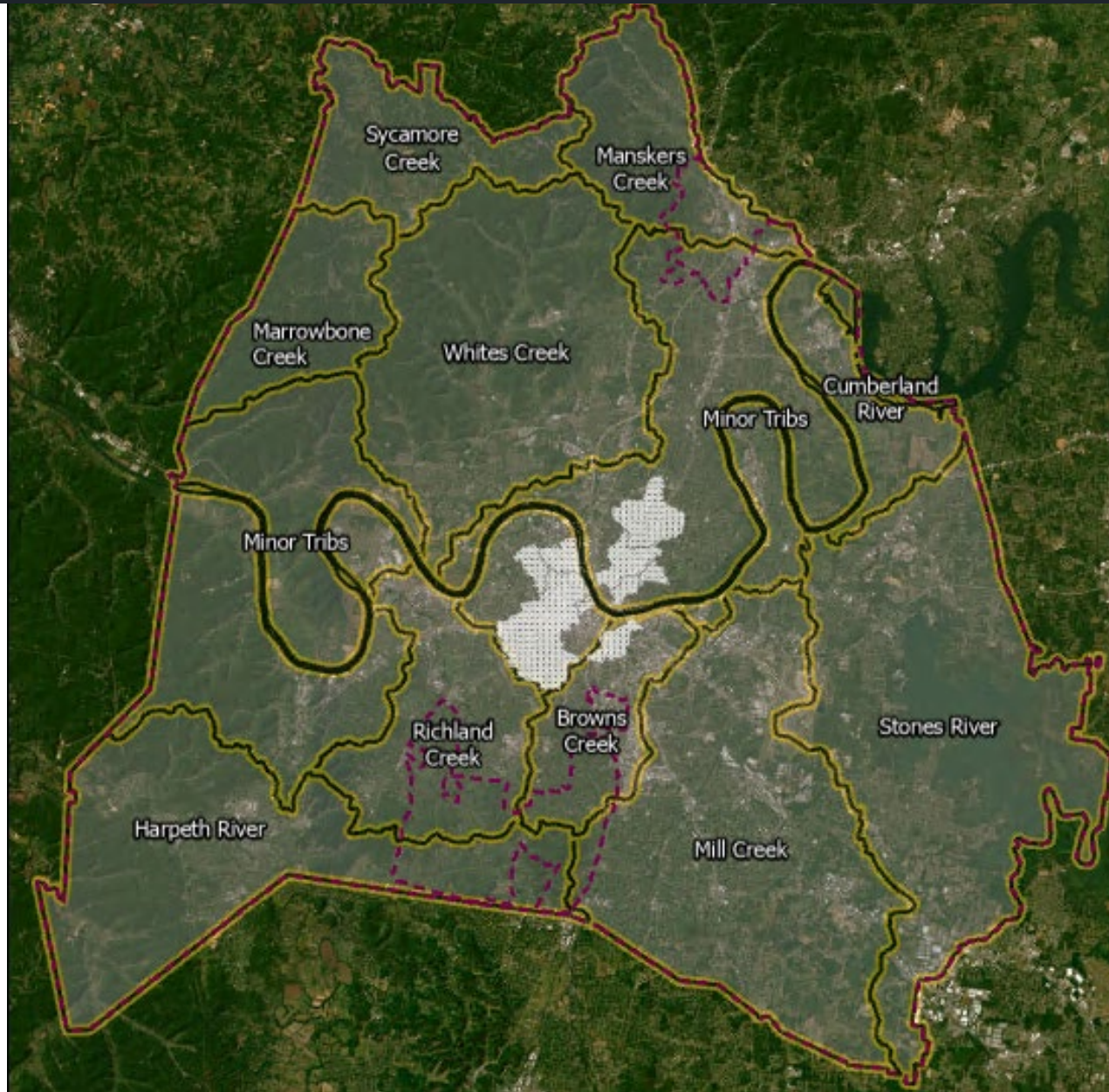
Capital Improvements Plan (CIP)

Project Status

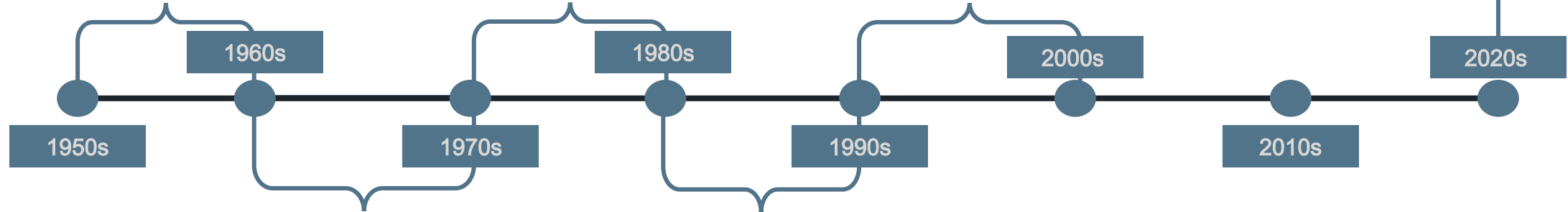
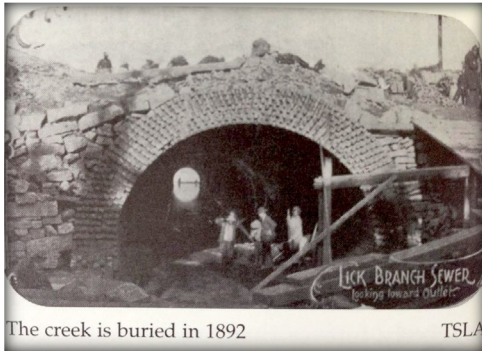
The overall objective of the Stormwater Master Plan is to study existing infrastructure and develop alternatives to reduce or abate flooding throughout the Metro service area.

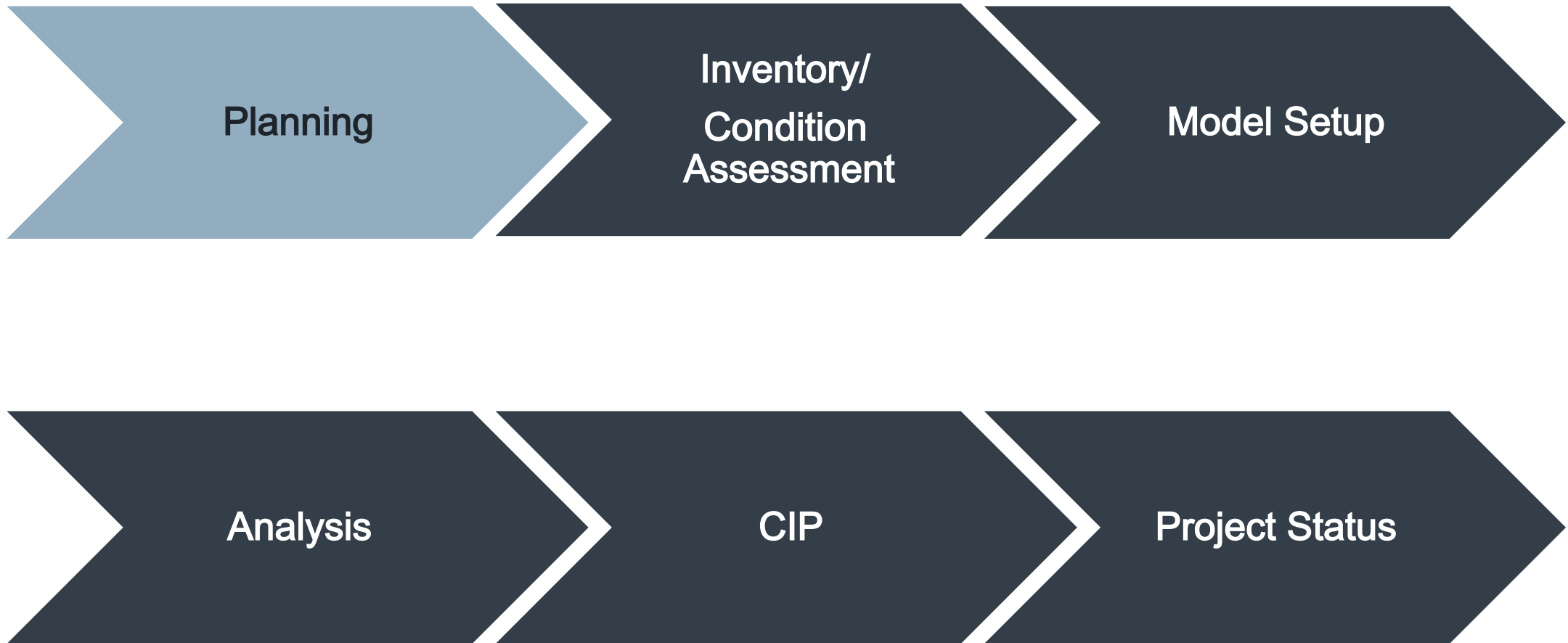


Major Watersheds



Stormwater Program Evolution





24" AND GREATER

~30,000 STRUCTURES

15" AND GREATER

~80,000 STRUCTURES

Development
Density

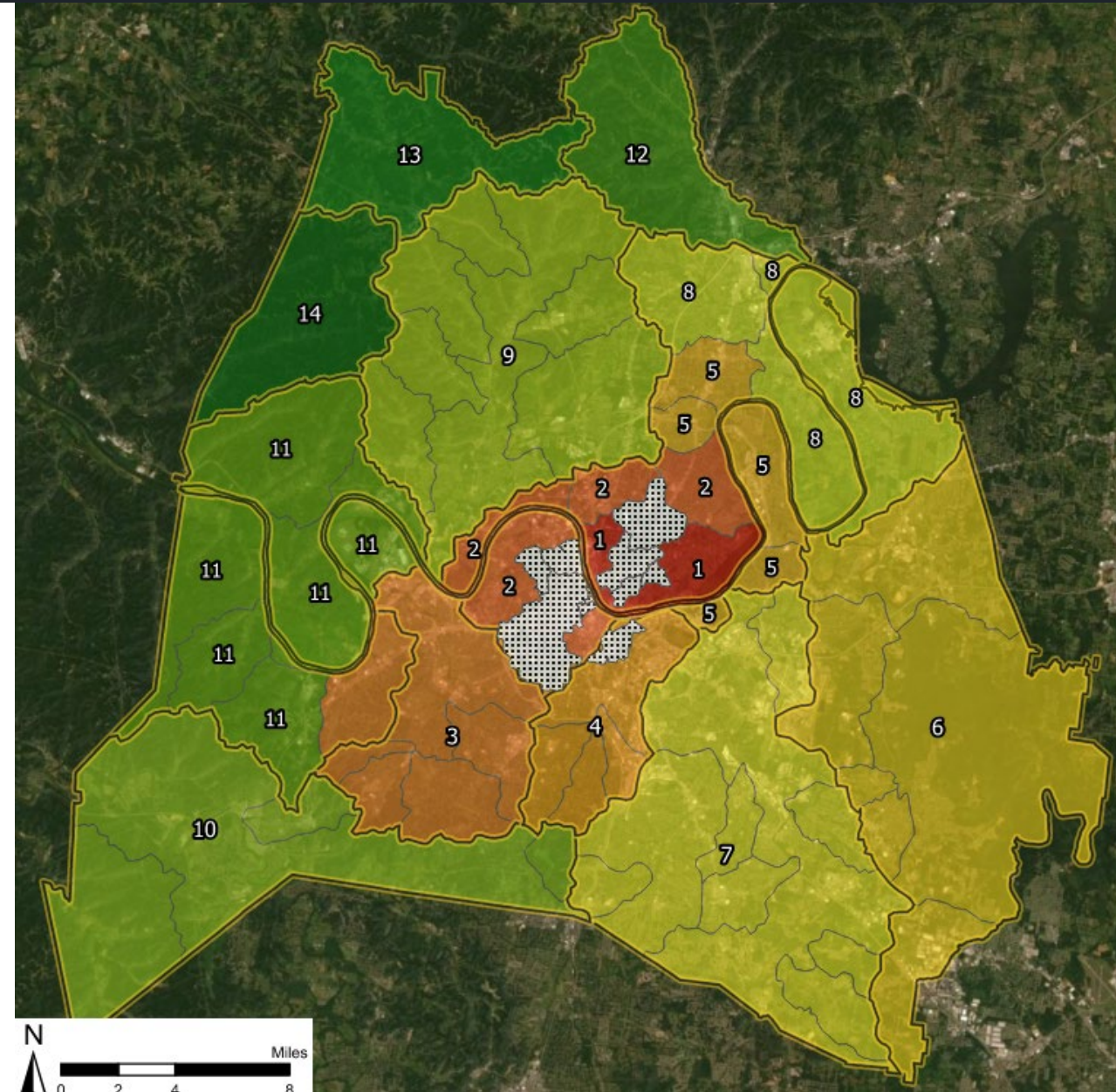
Experiencing
Growth

Existing Issues

Data Quality

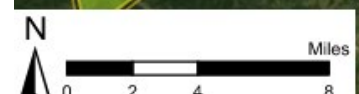
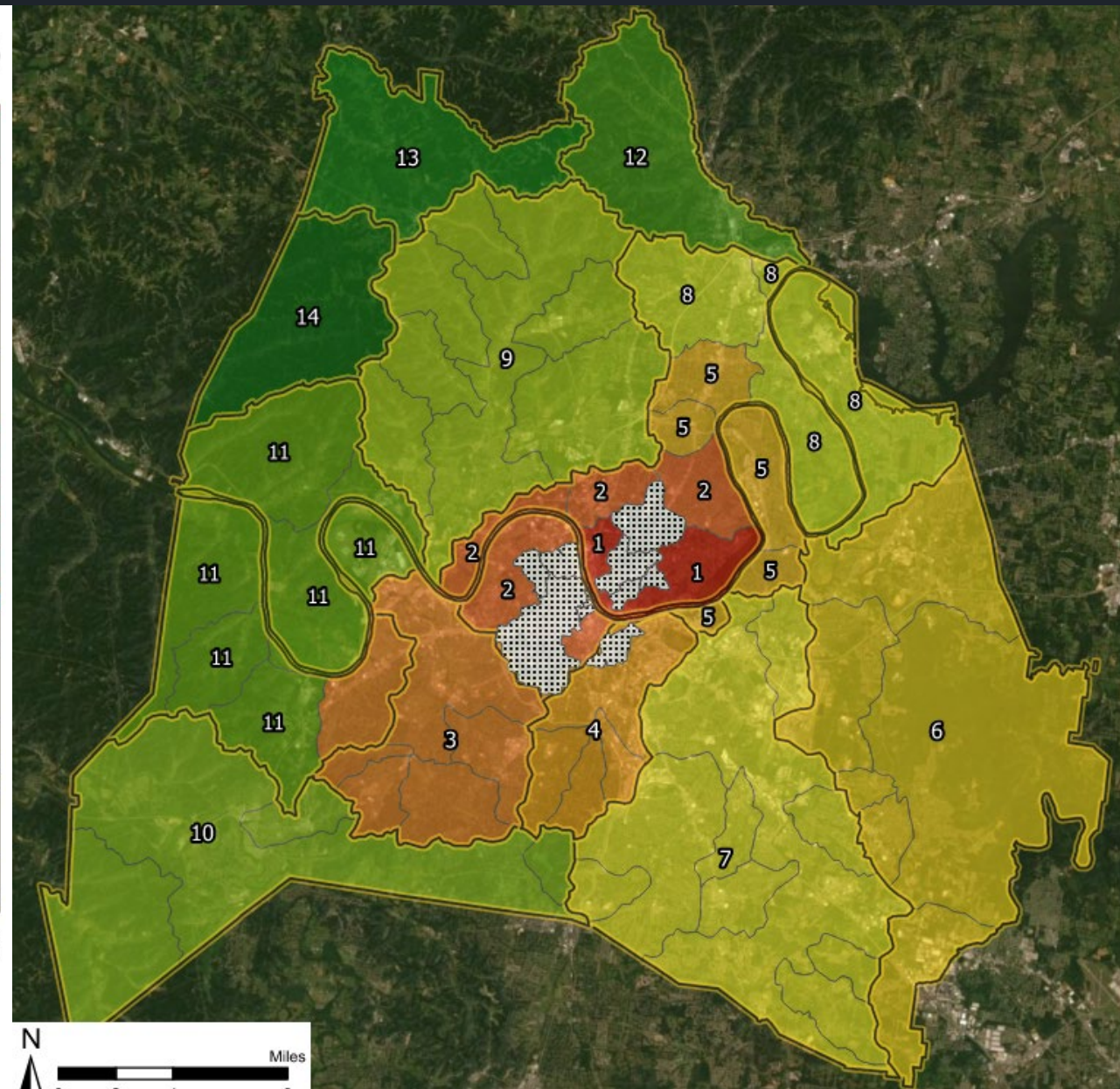
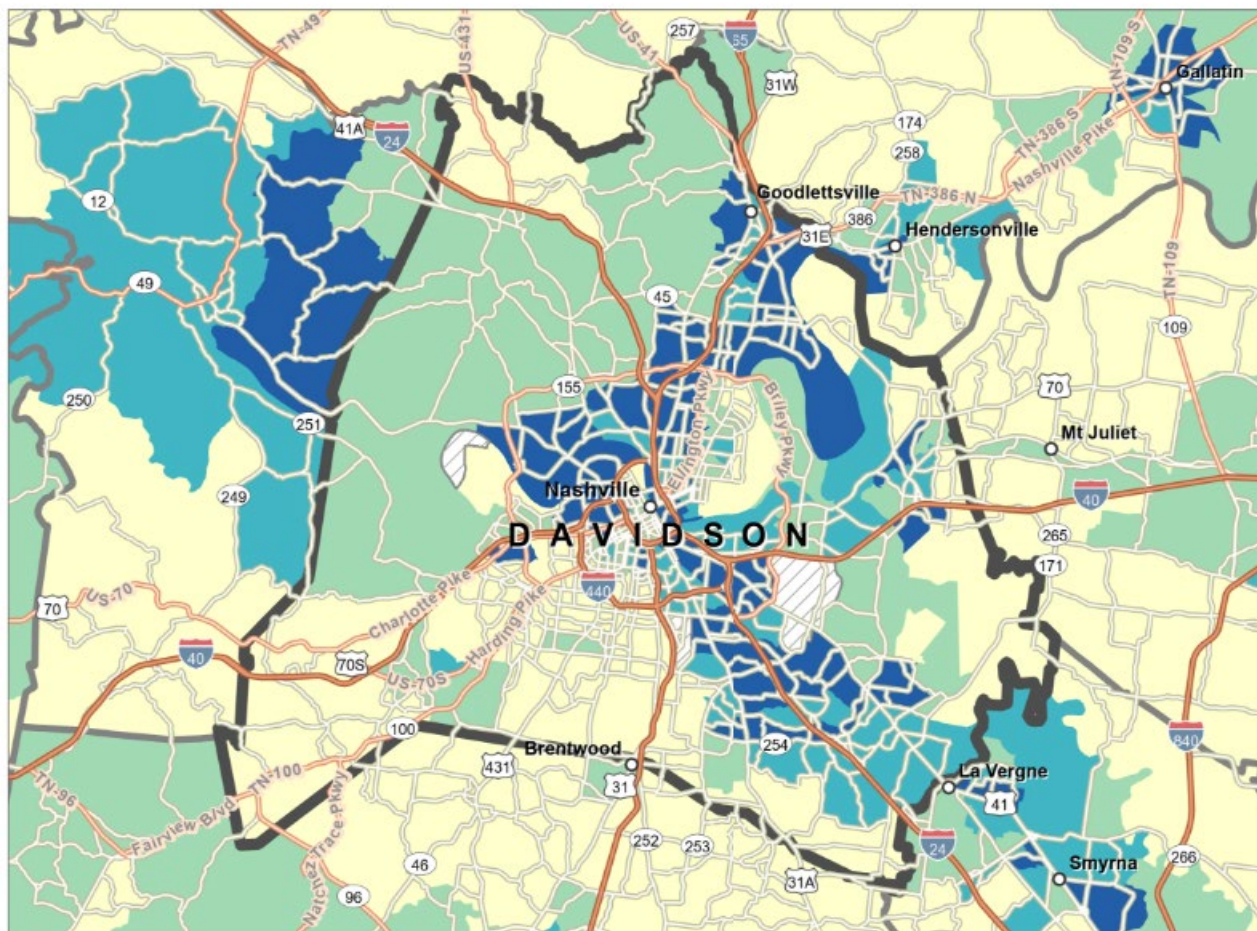
Basin Prioritization

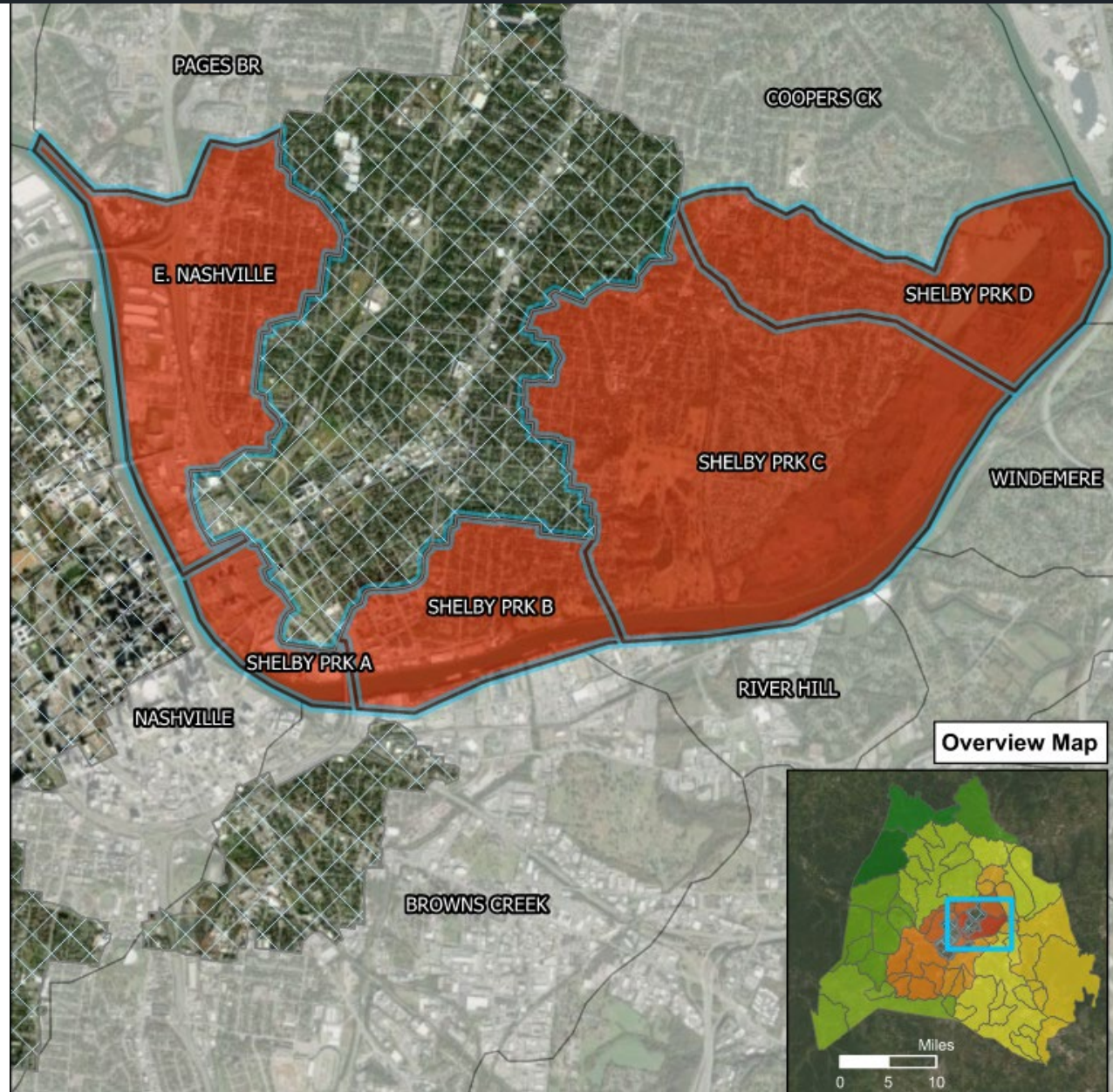
Priority		Watershed	Area (Sq. Mi.)	Weighted Score for Dvlpmnt Density	Weighted Score for Active Dvlpmnt	Weighted Score for Service Requests	Weighted Score for Data Quality	Total Weighted Score
1	Minor Tribes	East Nashville	6	1.14	0.80	1.83	0.61	8.94
		Shelby Park	2	1.48	5.76	2.20	0.65	4.09
2	Minor Tribes	Nashville	7	1.53	3.78	1.33	0.59	6.92
		Unnamed Basin (north of Nashville Basin)	3	0.80	2.45	1.26	0.65	4.94
		Pages Branch	3	1.06	2.70	1.74	0.63	5.86
		Coopers Creek	10	0.61	0.81	0.63	0.64	8.19
3	MT	Richland Creek	16	0.60	0.52	0.99	0.64	6.07
		Cleese Ferry	6	0.84	0.57	0.90	0.65	2.82
4		Browns Creek	4	1.22	0.82	1.95	0.66	4.83
5	Minor Tribes	Gibson Creek	5	1.63	0.97	5.54	0.66	4.38
		Windemere	8	0.29	0.46	0.00	0.64	4.32
		River Hill	2	0.84	0.74	2.36	0.65	4.33
		Pennington Bend	9	0.50	0.24	1.02	0.66	1.48
		Loves Branch	1	0.47	2.65	0.73	0.66	4.00
6		Stones River	1	0.65	1.70	0.39	0.65	3.64
7		Mill Creek	5	0.02	0.11	0.00	0.61	2.99
8	Minor Tribes	Dry Creek	6	0.49	0.09	0.29	0.66	2.57
		Old Hickory	2	0.90	0.46	2.23	0.67	2.60
		Neely's Bend	13	0.02	0.12	0.00	0.66	2.28
		Unnamed Basin (north of Old Hickory Basin)	6	0.03	0.00	0.00	0.64	3.26
9		Whites Creek	11	0.03	0.05	0.07	0.65	2.04
10		Harpeth River	15	0.05	0.04	0.10	0.66	1.43
11	Minor Tribes	Overall Creek	71	0.89	0.69	0.49	0.65	1.36
		Cockrill Bend	78	0.58	0.58	0.47	0.63	0.74
		Bells Bend	63	0.31	0.43	0.30	0.65	0.79
		Indian Creek W.	16	1.08	1.38	0.24	0.62	0.68
		Cub Creek	28	1.20	0.73	2.58	0.64	0.80
		Scottsboro	56	0.36	0.15	0.33	0.64	0.83
12		Mansker Creek	21	0.10	0.17	0.00	0.66	1.11
13		Sycamore Creek	21	0.21	0.07	0.03	0.65	0.96
14		Marrowbone Creek	19	0.07	0.00	0.00	0.66	0.76
		TOTAL	514	20.00	30.00	30.00	20.00	100.00

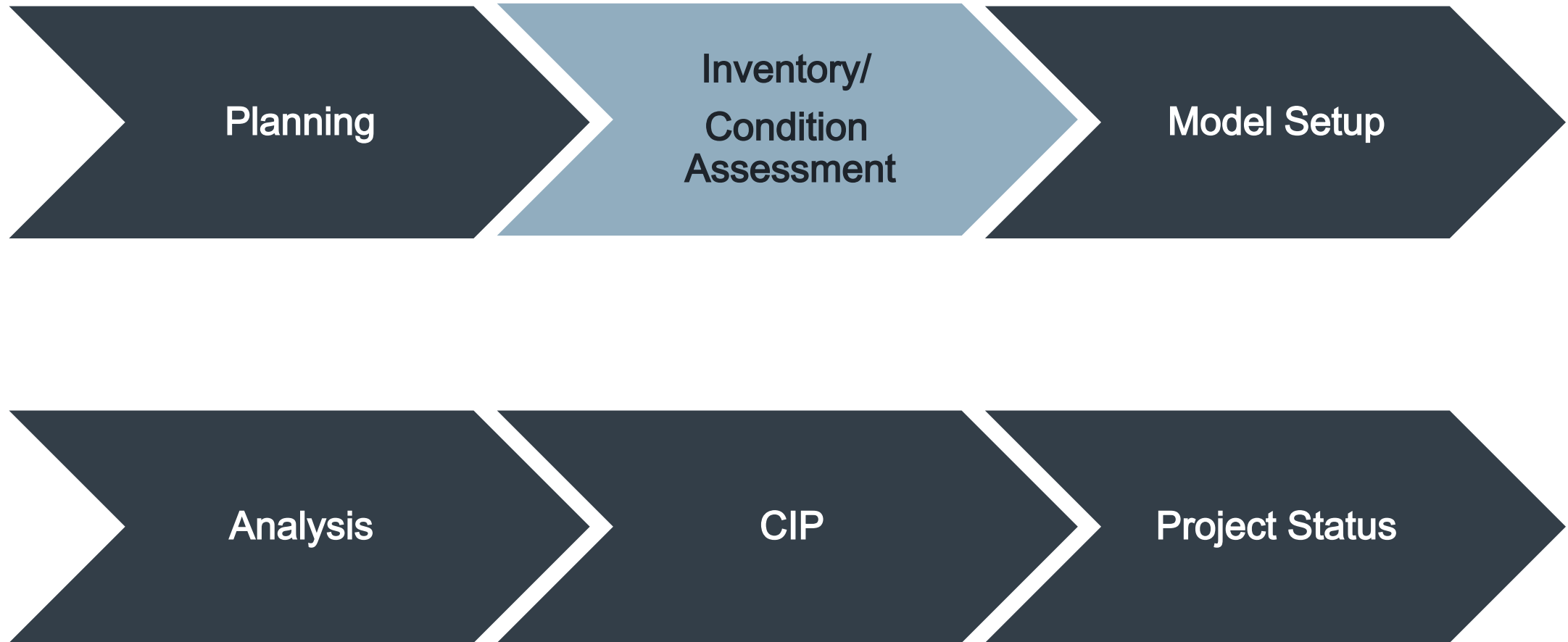


Social Vulnerability Index

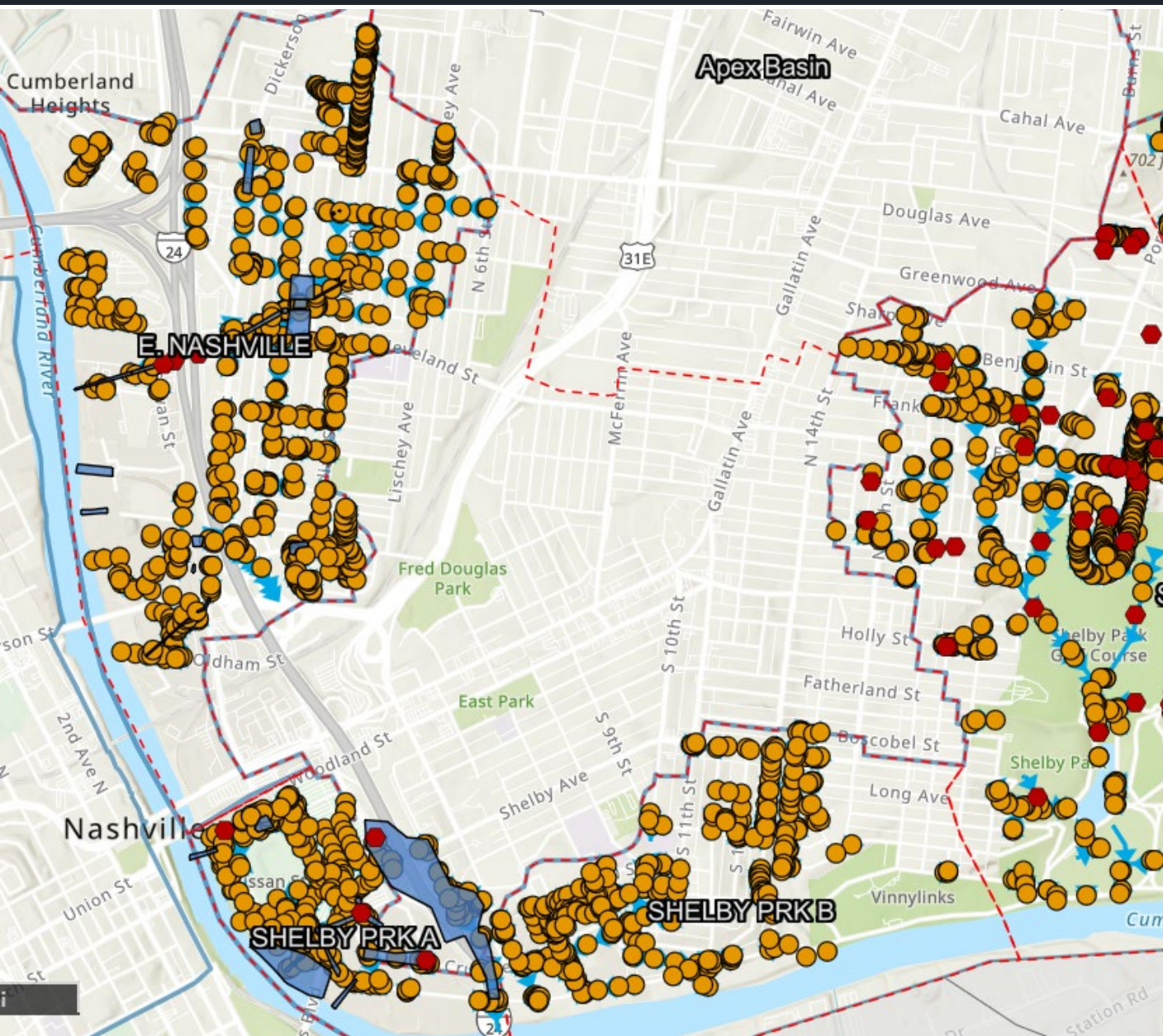
Overall Social Vulnerability¹







Inventory & Condition Assessment



- ✓ Culverts
- ✓ Inlets
- ✓ Manholes
- ✓ Road Crossings
- ✓ Open Channels

Inventory & Condition Assessment

Unique ID

Inverts/Depths

Structure /
Piping Sizes

360 Degree
Video

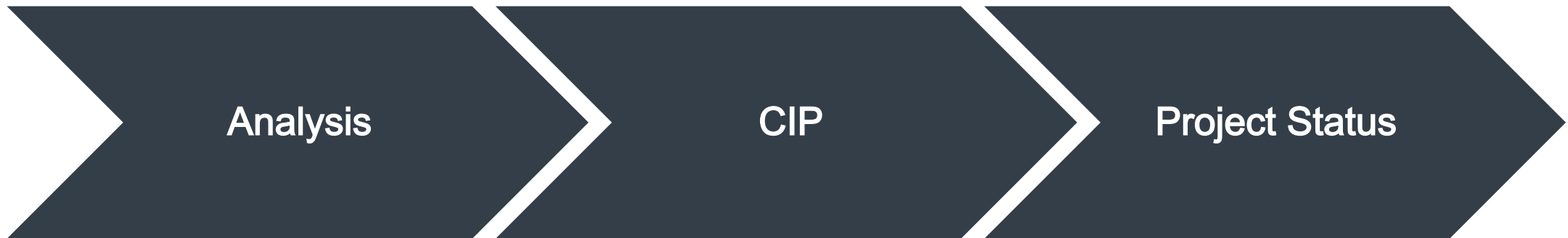
360 Degree Video Demo

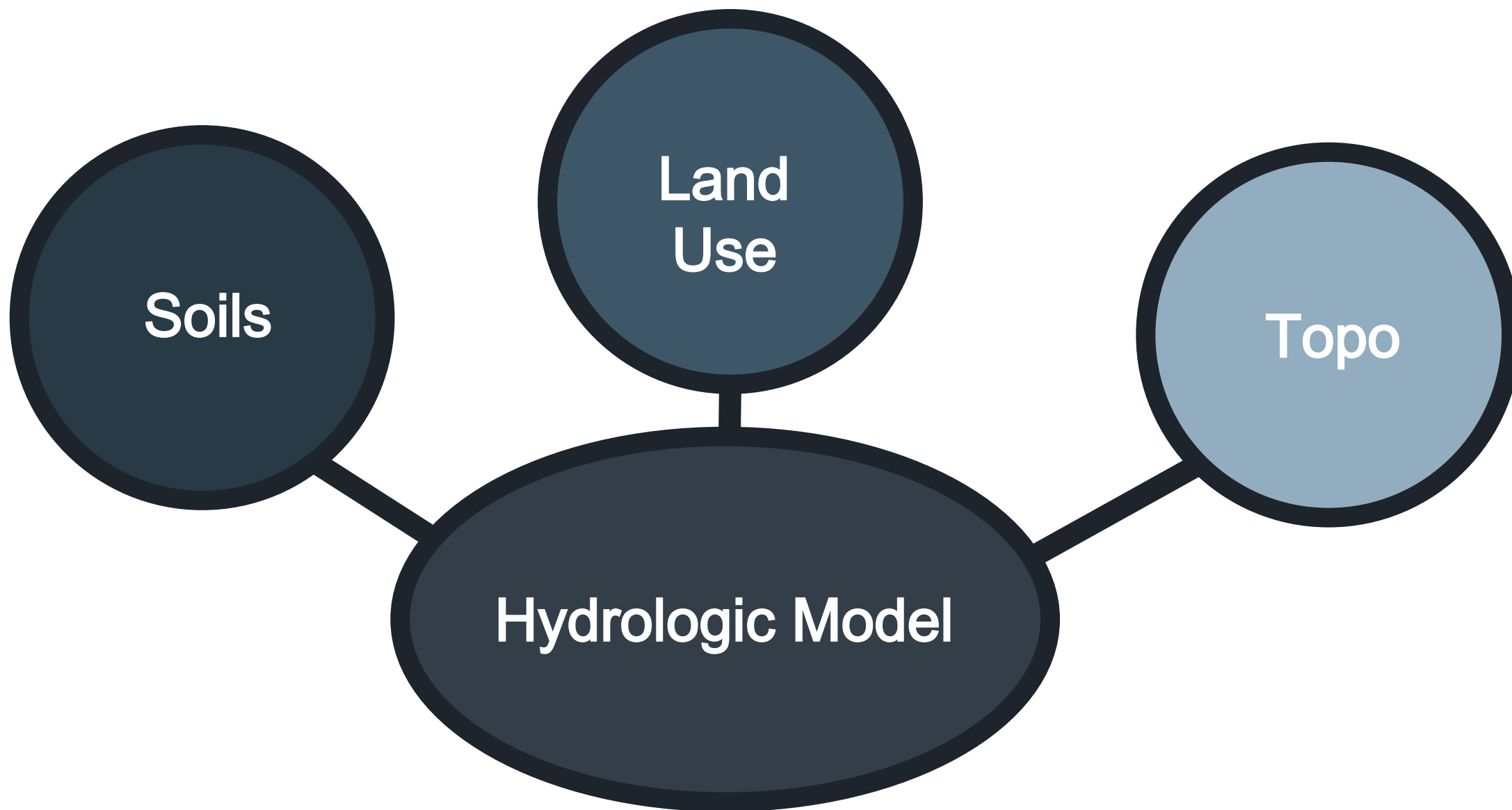


Inventory & Condition Assessment

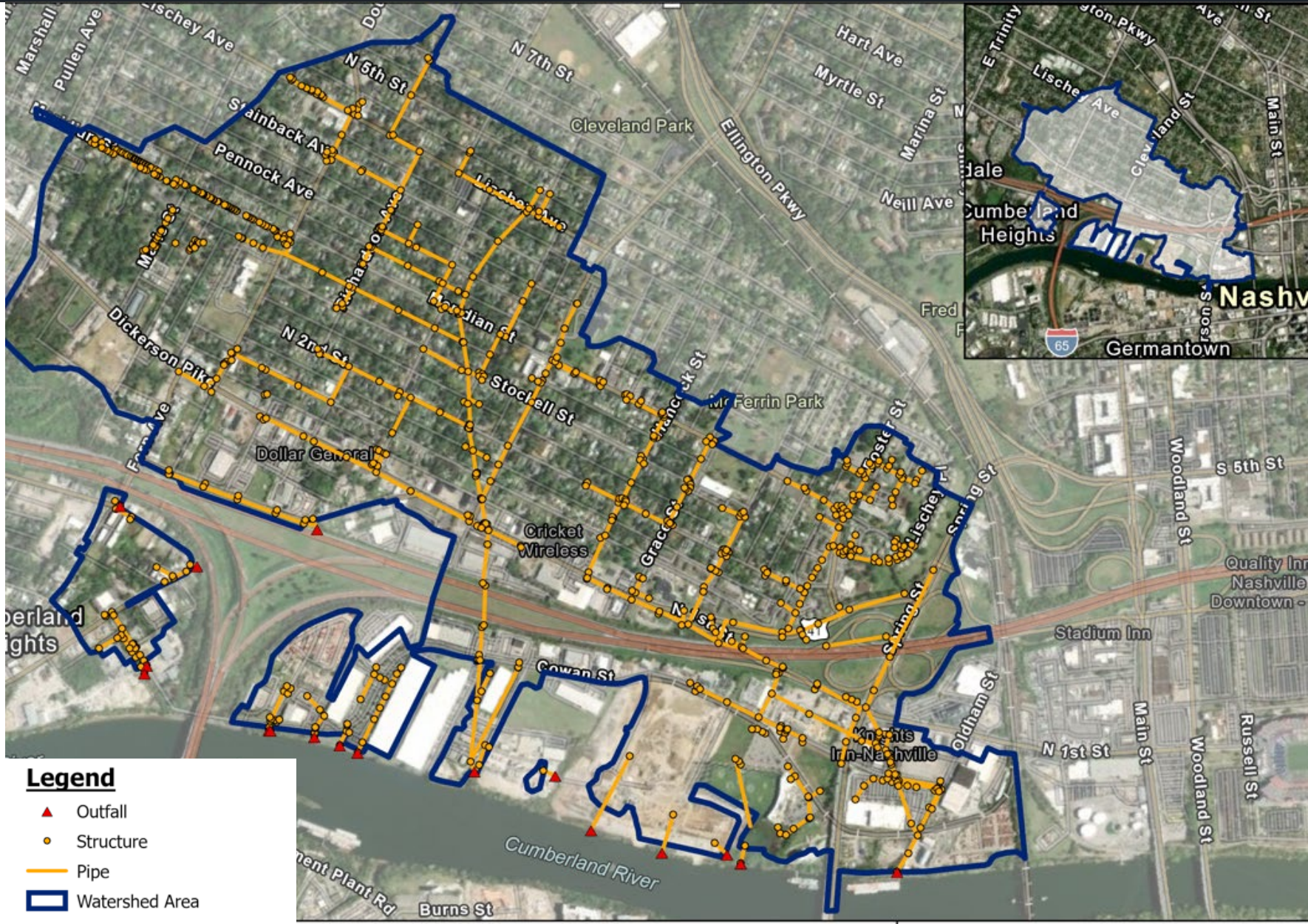
GRADE	COMMON DEFECTS
Other	Roof drains or underdrains
Incomplete	Pipe unable to be evaluated due to inability to access
0	None
1	Poor grouting in joints, Small cracks
2	Poor grouting in joints, Medium cracks, Joint separation, Infiltration, Cracked coating, Aggregate showing
3	Medium cracks, Joint separation, Infiltration, Damaged coating, Aggregate showing, Roots in pipe, Exposed/rusted reinforcement, Surface rusted, Signs of surcharging, Small holes
4	Joint separation, Infiltration leading to sinkholes, Missing coating, Surface rusted, Settled deposits, Medium holes
5	Collapse

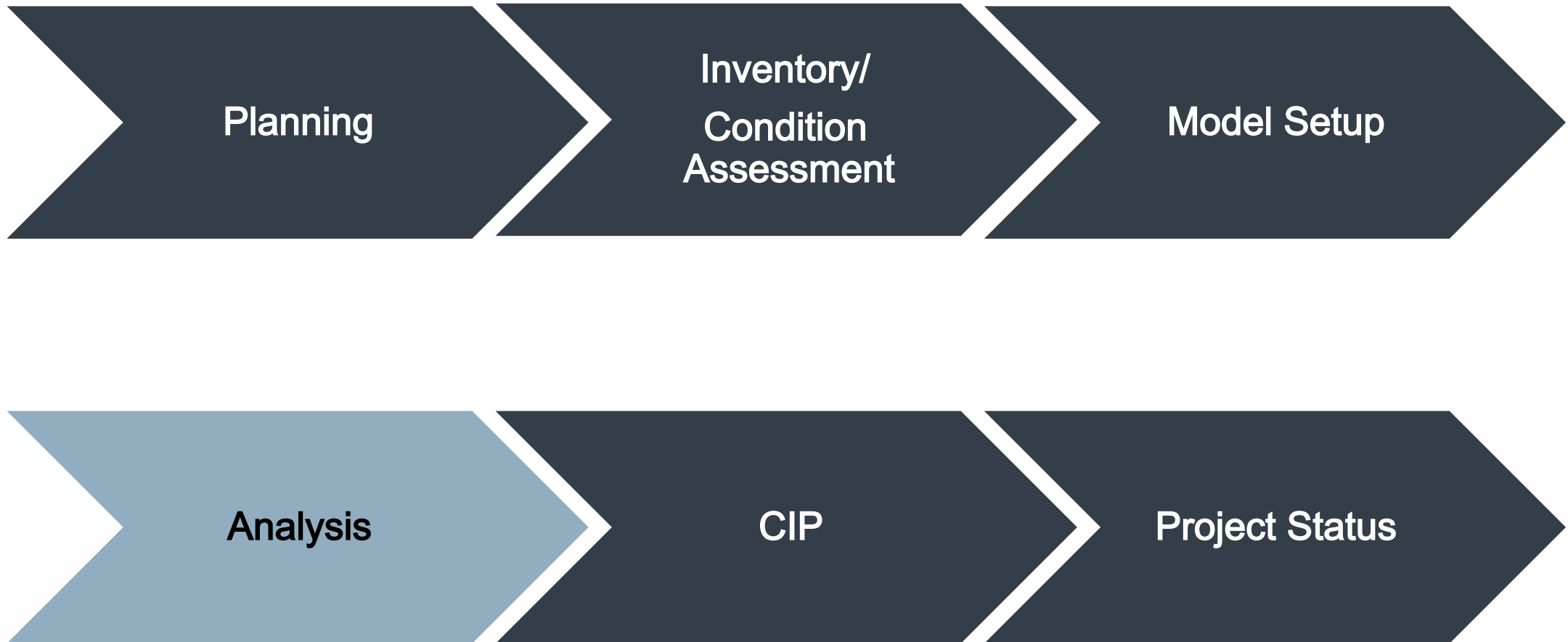






Hydraulic Model Creation





DESIGN STORM EVENT

10-YEAR

LEVEL OF SERVICE

WATER ELEVATION BELOW
RIM

BUILDING FLOODING

100-YEAR

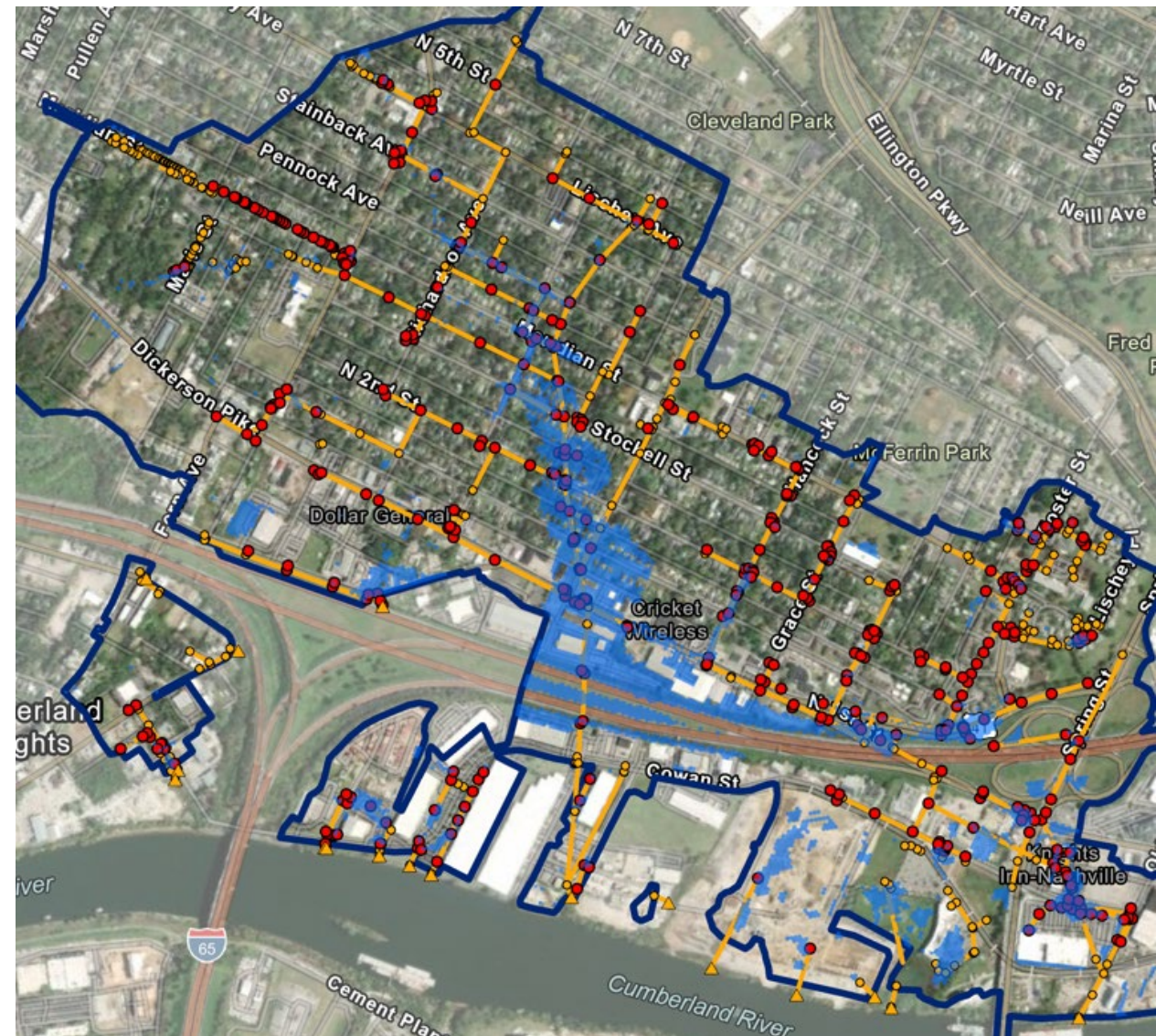
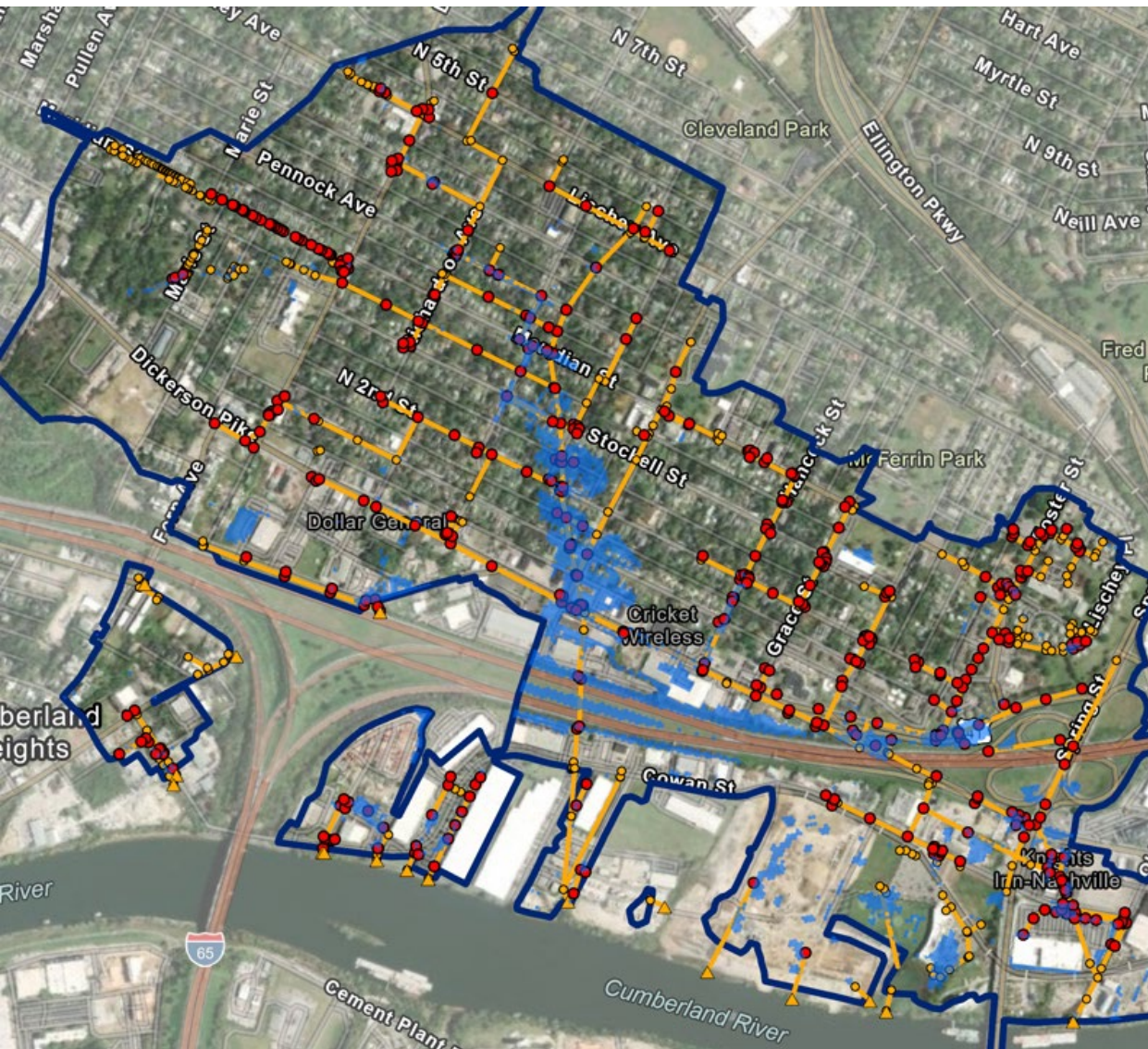
INUNDATION EXTENT

FLOOD DEPTHS

FUTURE CONDITIONS

NASHVILLE NEXT

Existing Condition 10/100 Year Inundation Maps



Alternatives Analysis Project Areas

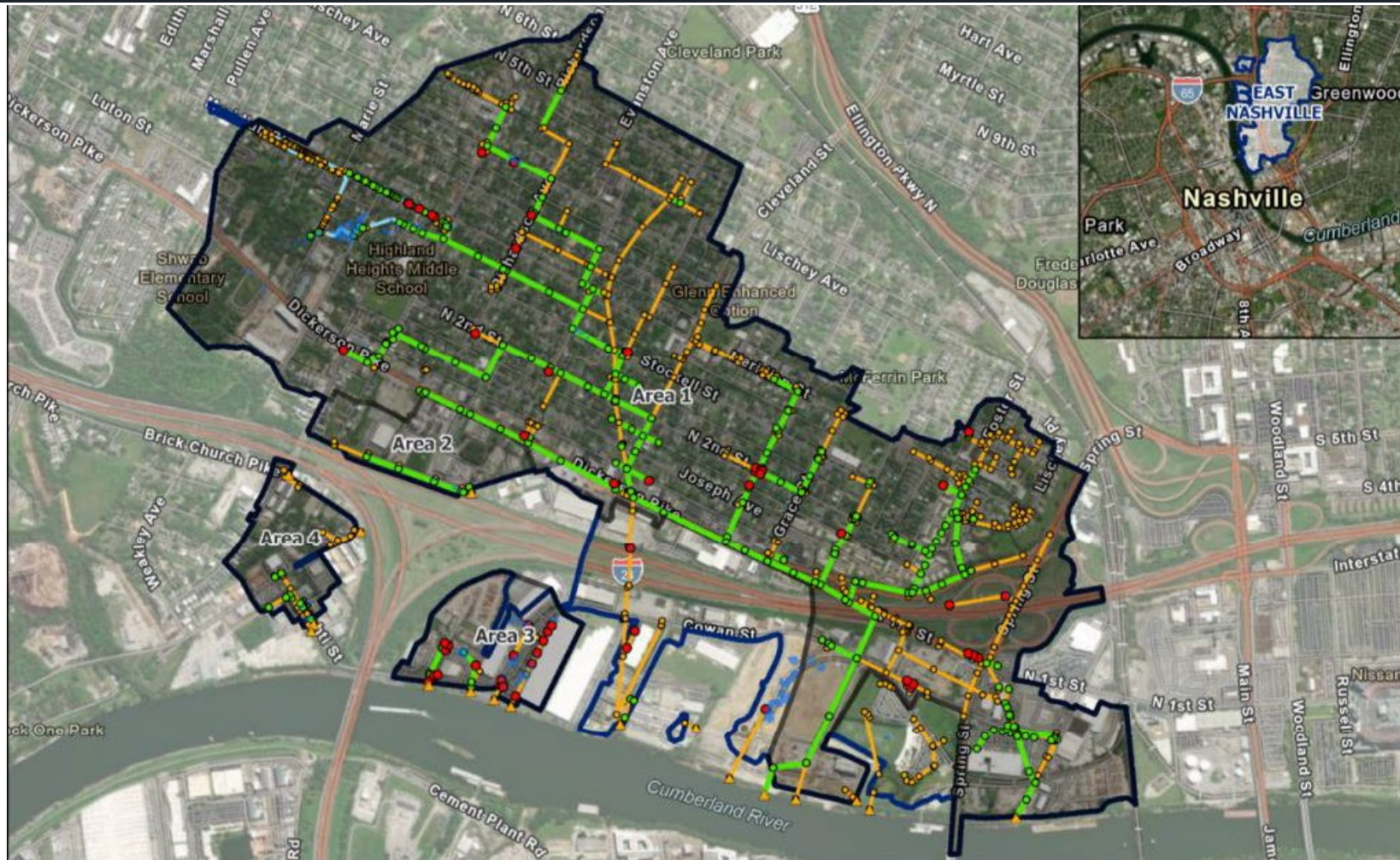
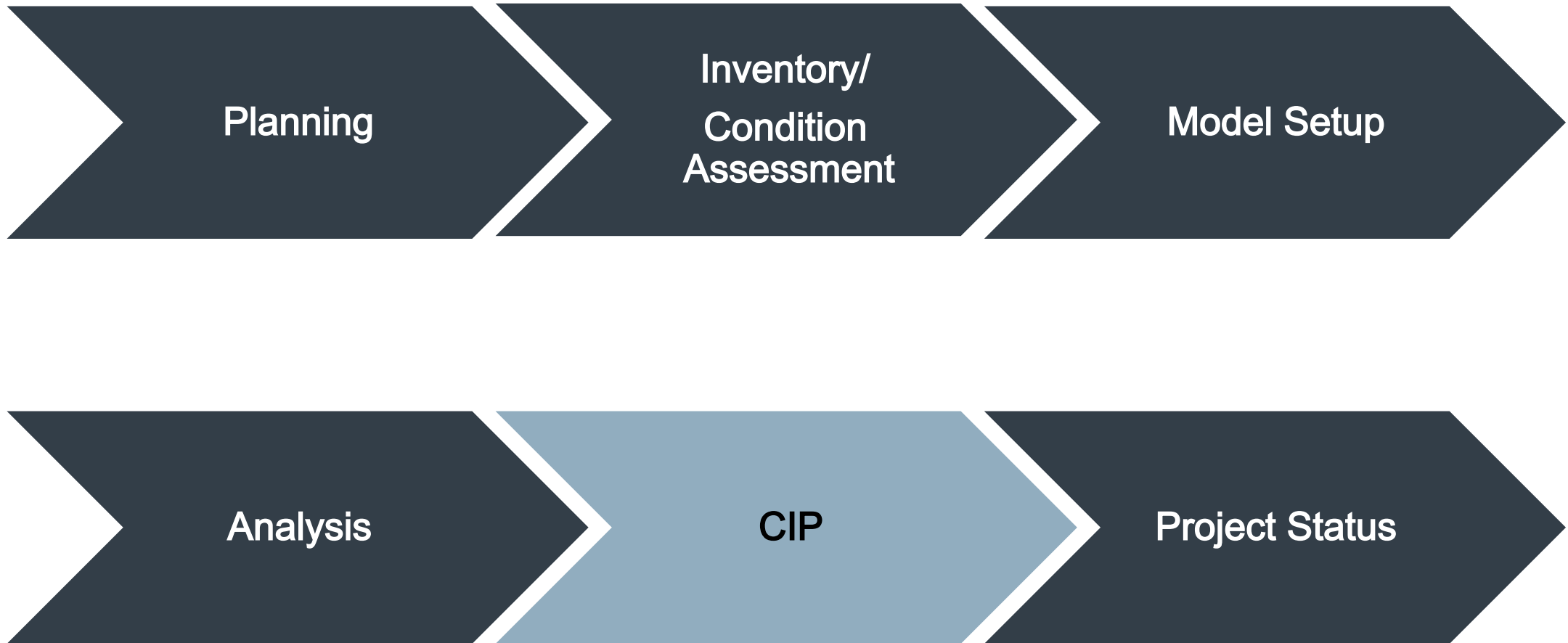


Figure 7
East Nashville
Proposed Inundation
10-year (Upsize)





- CIP developed for all basins studied
- Includes both conveyance and storage options
- Sized for:
 - 10-year for minor systems
 - 100-year for major systems



East Nashville - Area 1.A

Alternative #1 - 10 yr

Upsize 3,670 linear feet (LF) of reinforced concrete pipe (RCP). Install 2,390 LF of new RCBC (Box culvert).

Details:

- 1,500 LF 18" RCP
- 460 LF 24" RCP
- 430 LF 30" RCP
- 540 LF 60" RCP
- 740 LF 72" RCP
- 2,390 LF 12'x10' RCBC
- 31 Structures

Benefits:

- Flood Mitigation
- Improved Safety
 - Road Flooding
 - Parking Lot Flooding
- Highly Visible Issue
 - 1 Service Request
- Improved Resiliency
- Reduced Velocities

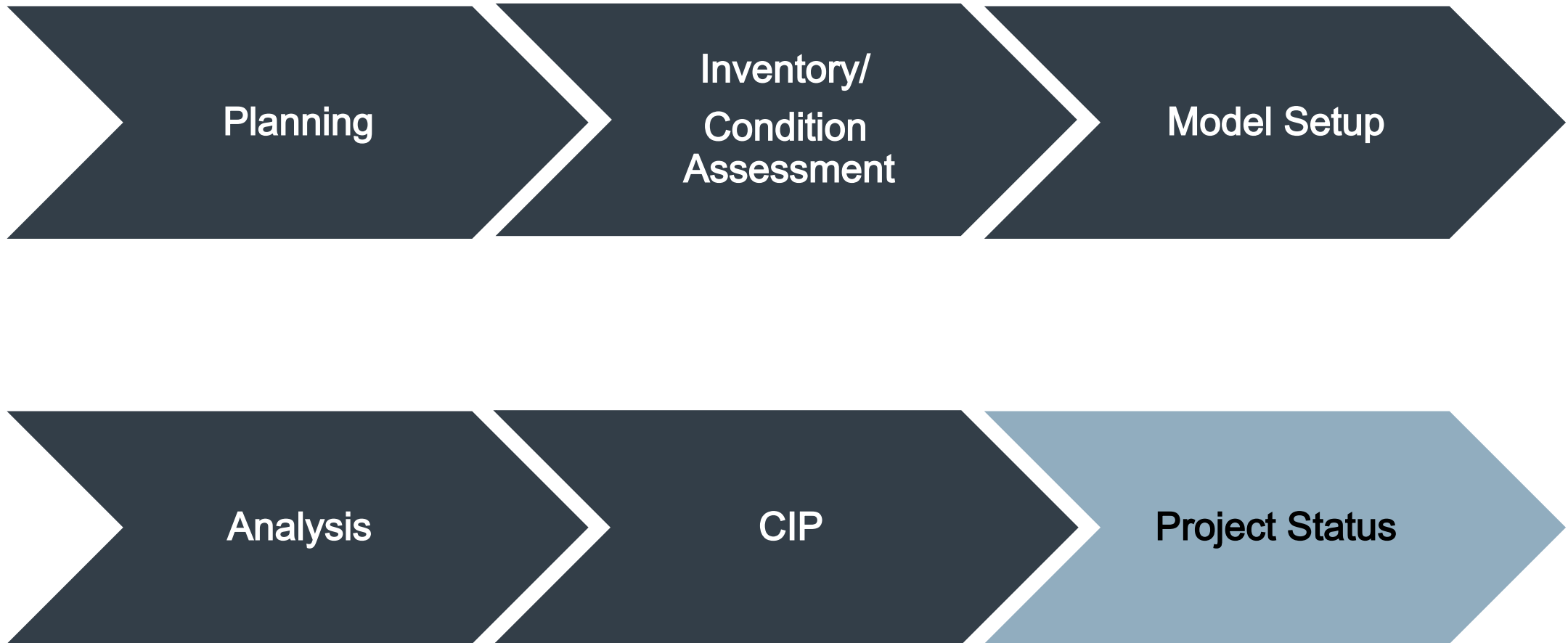
Planning-level Opinion of

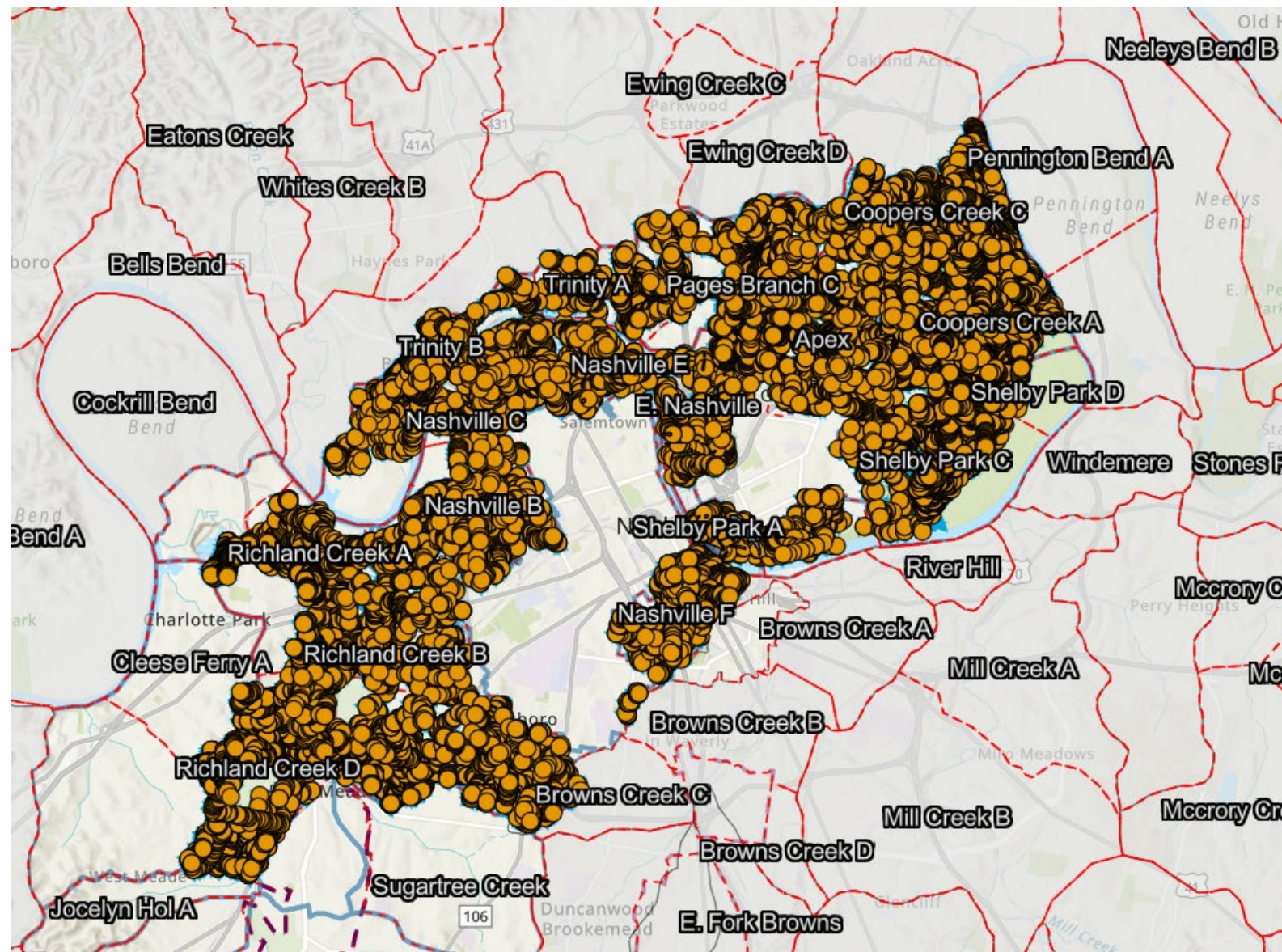
Probable Project Cost:

\$29,500,000

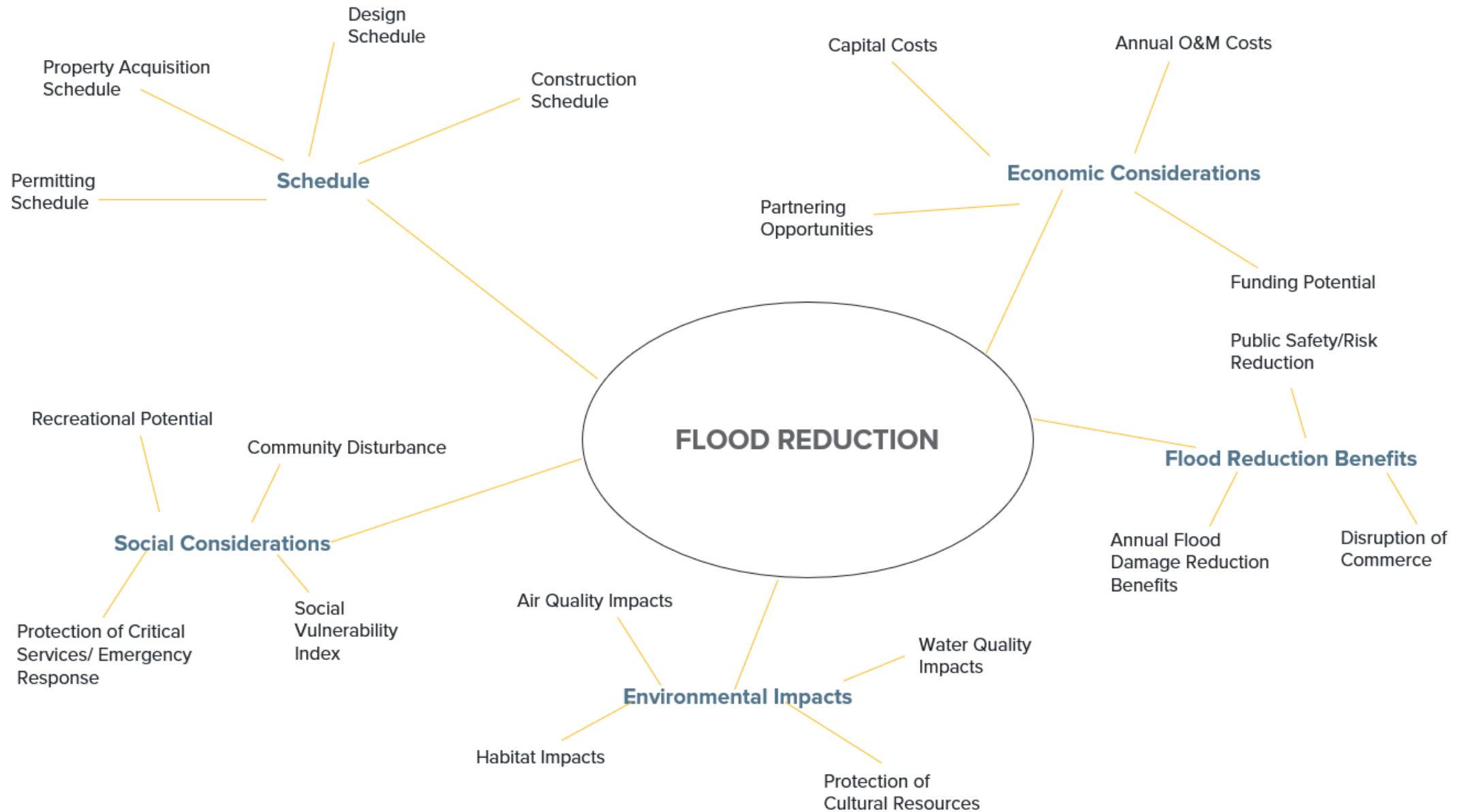
Potential Easements

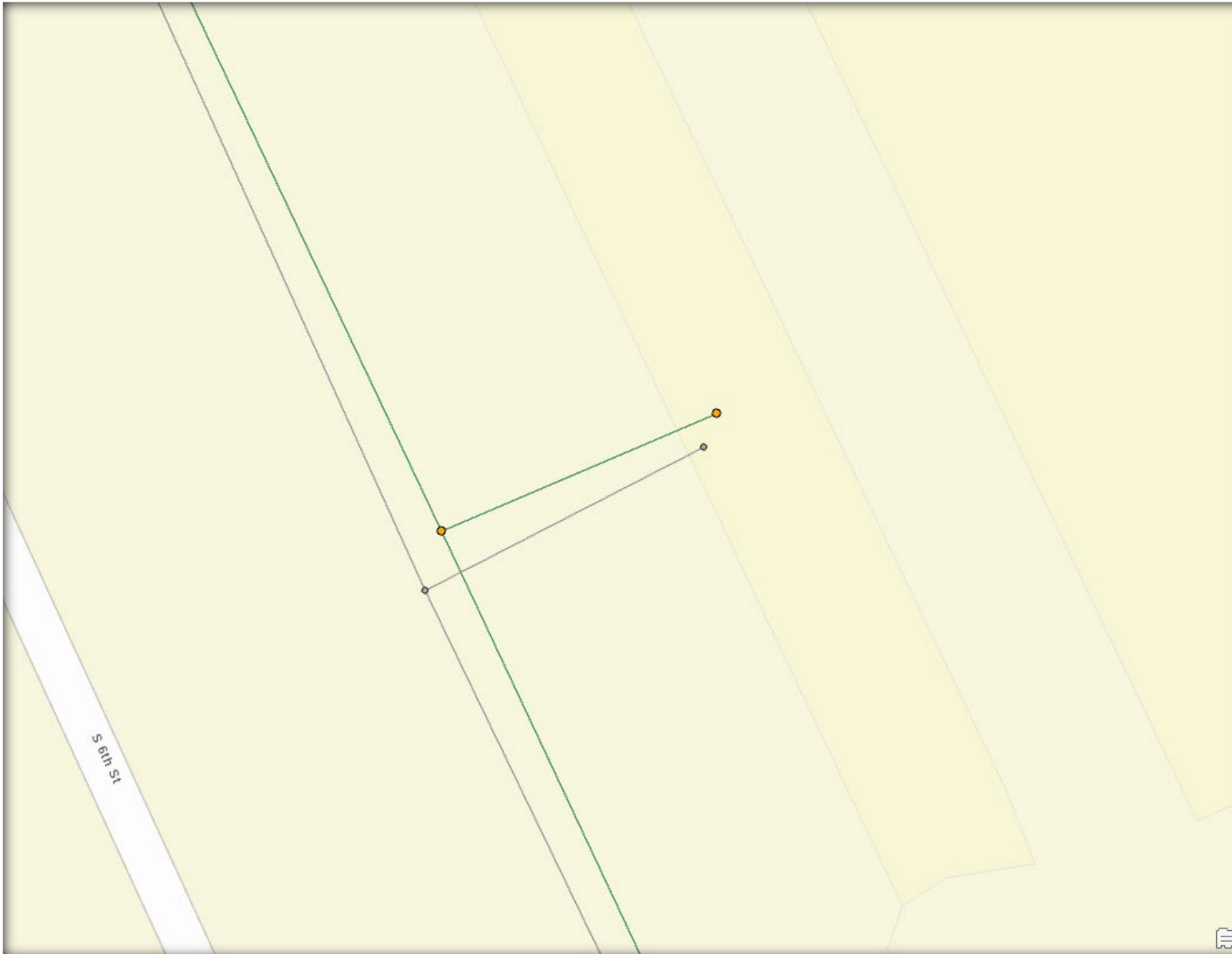
(Council District 19): 8

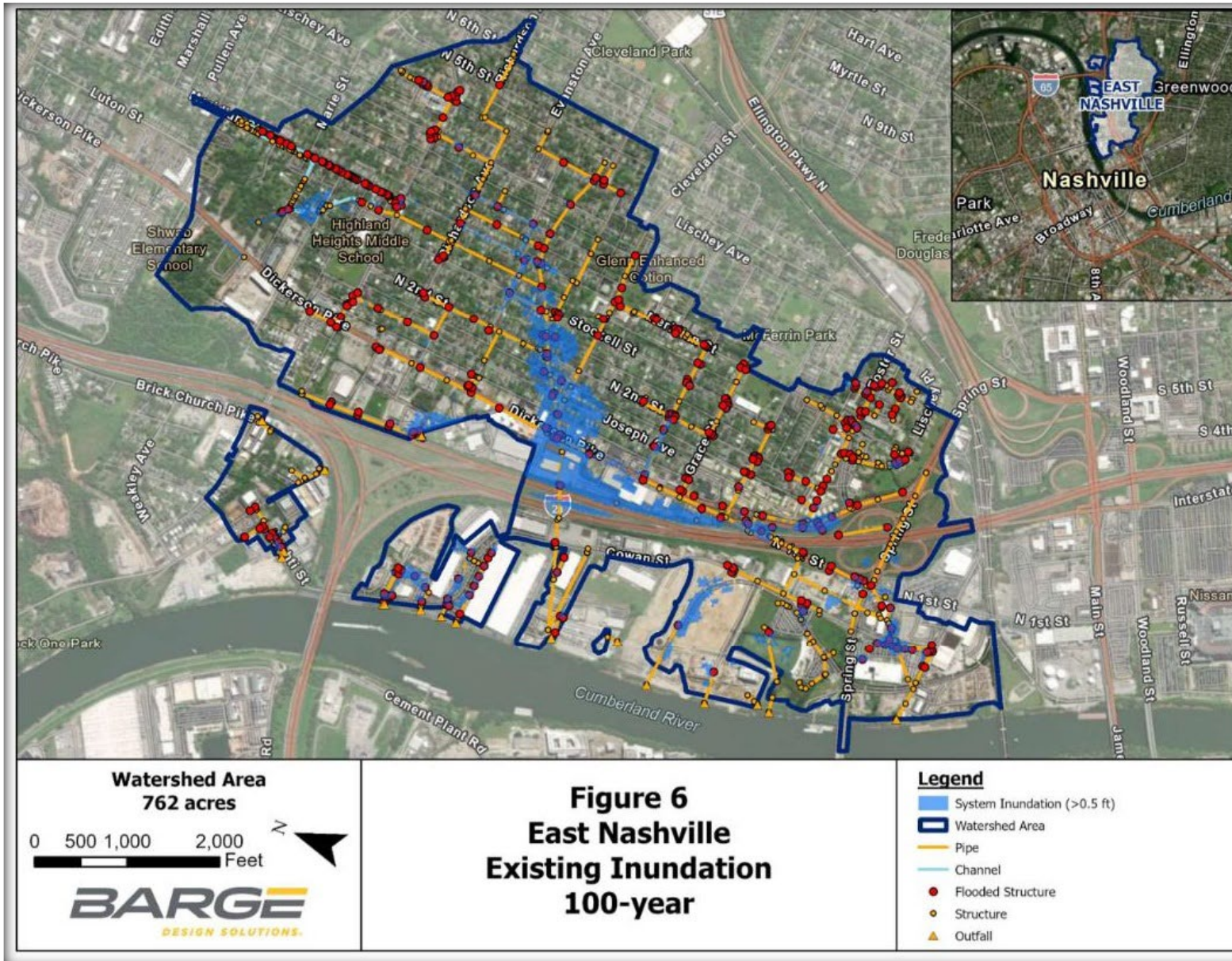


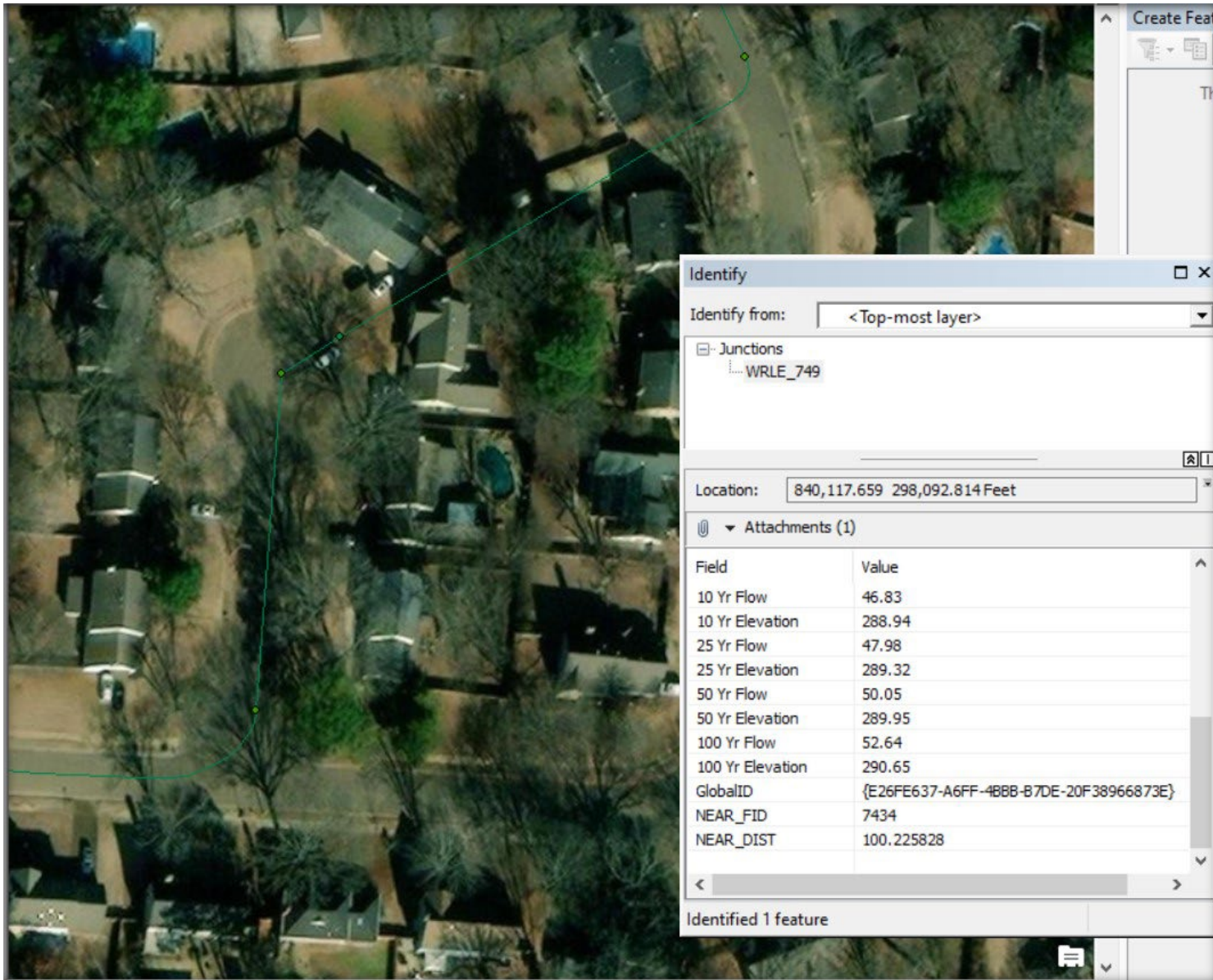


- ✓ Inventory complete 22 subbasins (~30,000 structures)
- ✓ Reports complete for 12 subbasins
- ✓ Providing updated data sets back to Metro











Thank you!

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