



East Isthmus and Yahara River Watershed Study Solutions

City of Madison Engineering Division
Board of Park Commissioners Meeting
April 15, 2026

[Link to Final Report](#)

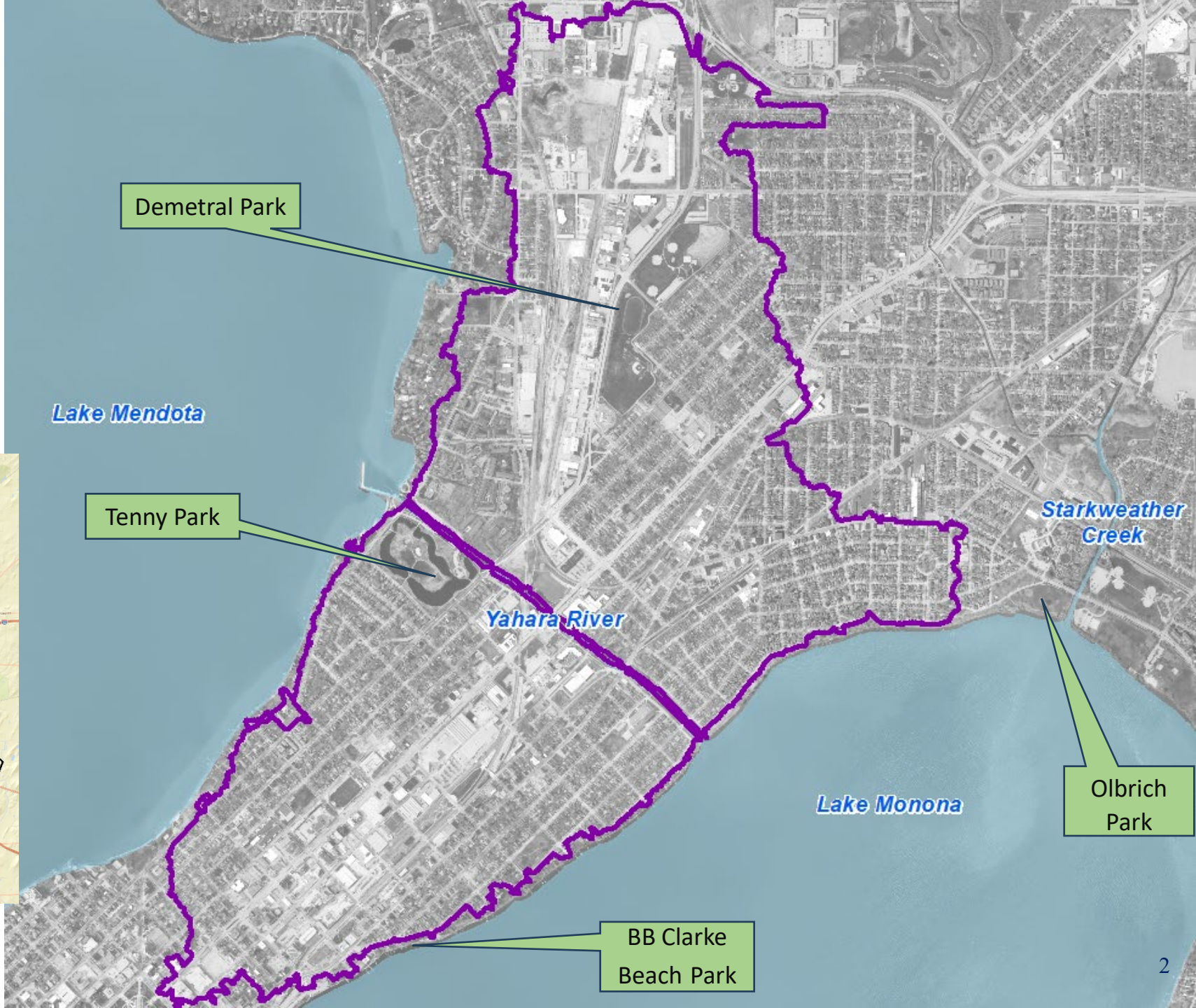
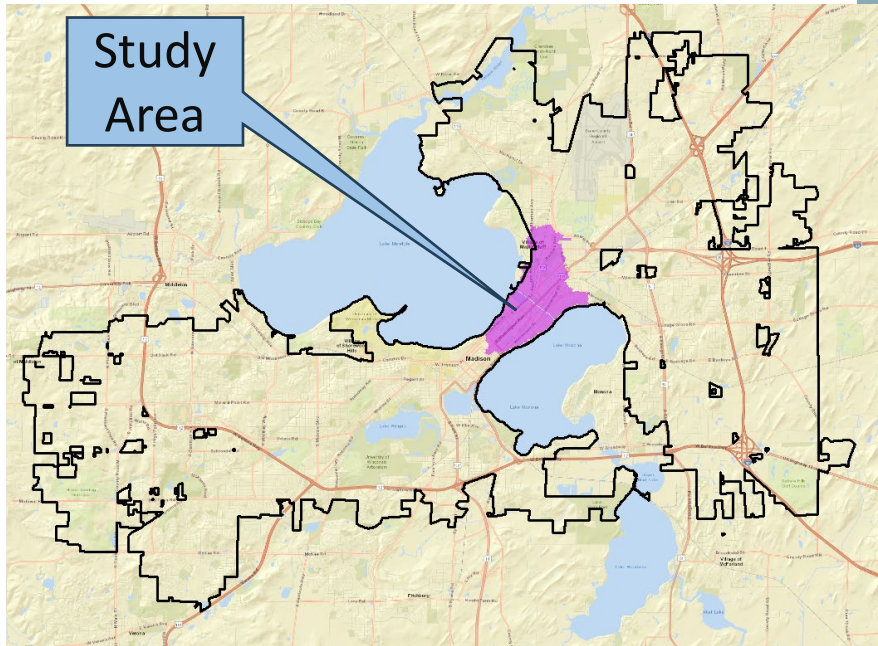
(Or can be found on the project page:

www.cityofmadison.com/IsthmusYaharaWatershed)

CITY OF MADISON



East Isthmus and Yahara Watershed Study



Watershed Study Process

Model Existing Conditions & Predict Future Flood Risk

Analyze Solutions on Watershed Scale, Rank & Budget

**Create
Watershed
Model**

**Identify
Flooding
Impacts**

**Develop
Engineering
Solutions**

**Prioritize
& Budget**

Flood Mitigation Targets

10% Chance Event

- No surcharging of storm sewer onto roadway (storm sewer pipes are sized to carry storm)

4% Chance Event

- 0.2' at Centerline of Road (roads passable for emergency vehicles)

1% Chance Event

- No structure (home/building) flooding
- No greenway crossing overflow (stormwater does not come out of greenway and flow over the road)

0.2% Chance Event

- Safe conveyance of overflow

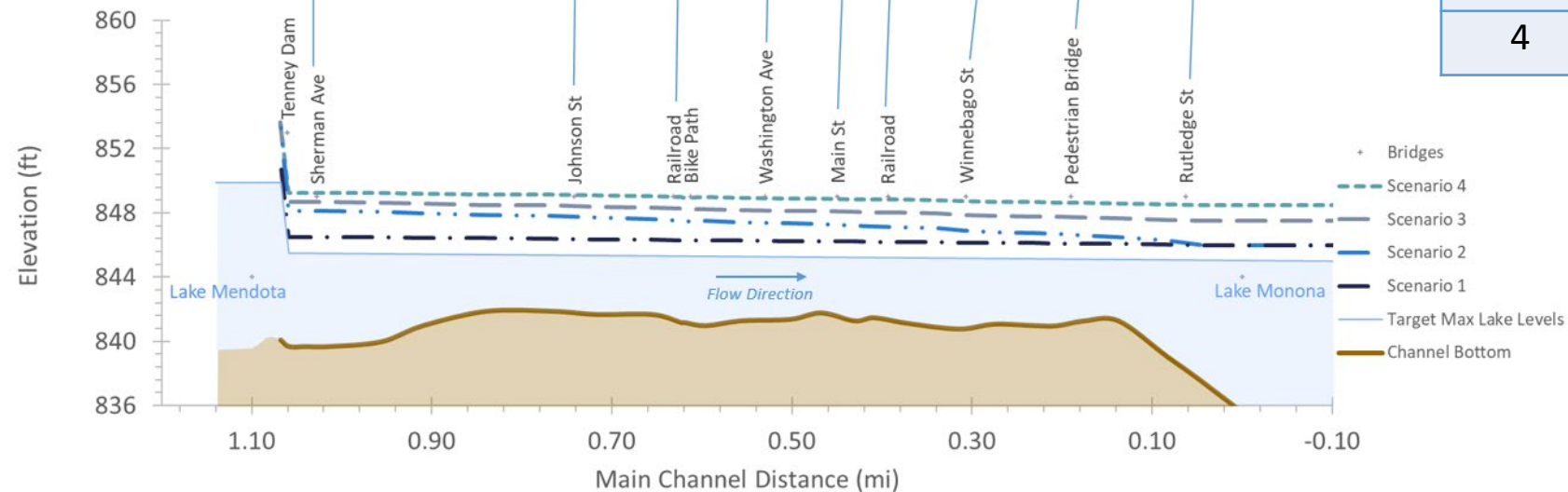
% Annual Chance	24-hr rainfall depth
10%	4.09 in
4%	4.98 in
1%	6.66 in
0.2%	8.94 in

Variety of Lake Levels Considered in Study



Scenario	Yahara River Discharge (cfs)	Lake Monona Elevation (ft)
1	250	846.0
2	700	846.0
3	700	847.5
4	700	848.5

Less likely to occur, more conservative



Local Storm Sewer Improvements

- ~56,500 feet of local storm sewer improvements
- Coordinated with future street reconstruction projects
- Recently rebuilt streets likely won't see upgrades for many years

For Park lands:

- Replacing existing storm sewers and outfalls with larger pipes.

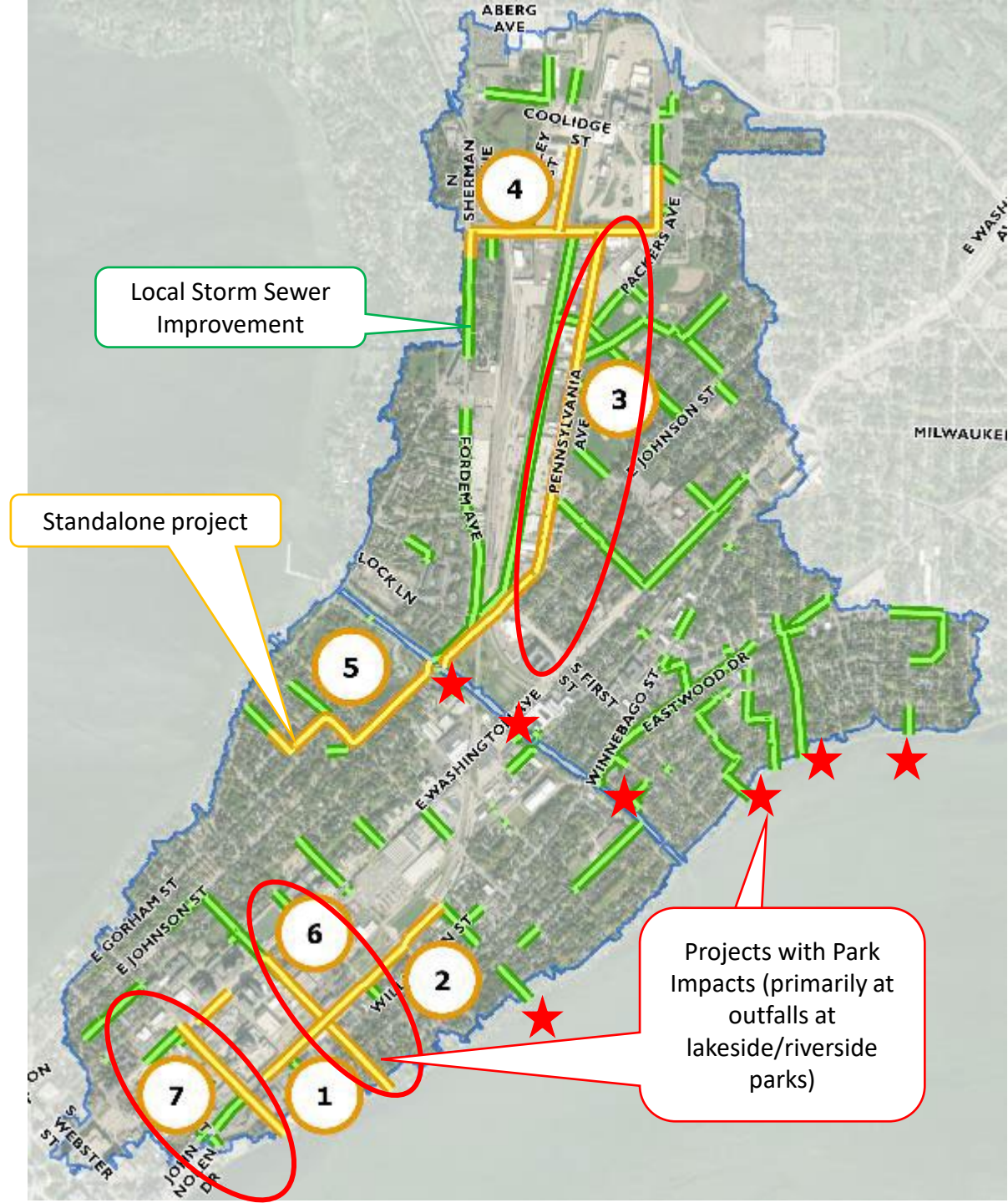


All Storm Sewer Improvements

- Local storm sewer improvements (green) +

Standalone Projects (yellow)

1. Capital City Trail (Brearly St to Livingston St)
2. Wilson St (Few St to Brearly St)
3. Pennsylvania Ave
4. Commercial Ave
5. E Johnson St
6. Paterson Relief
7. Blount St



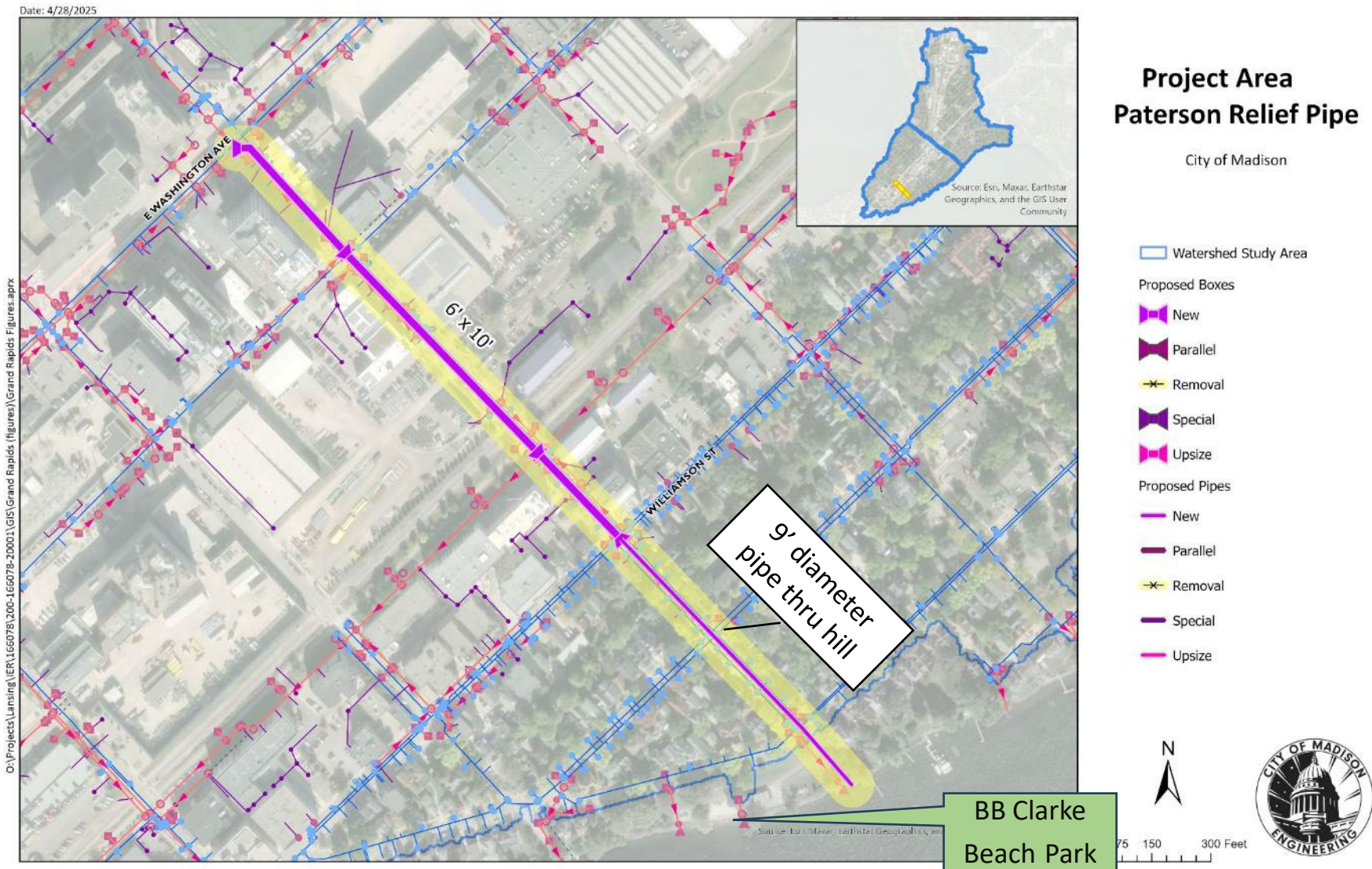
3. Pennsylvania Avenue (Commercial Ave to Yahara River)

- Increase conveyance along Pennsylvania Ave to Yahara River.
- Dual 5' by 12' box culverts.
- Relieves flooding on Johnson and Third St.
- Est. Cost \$33.2M



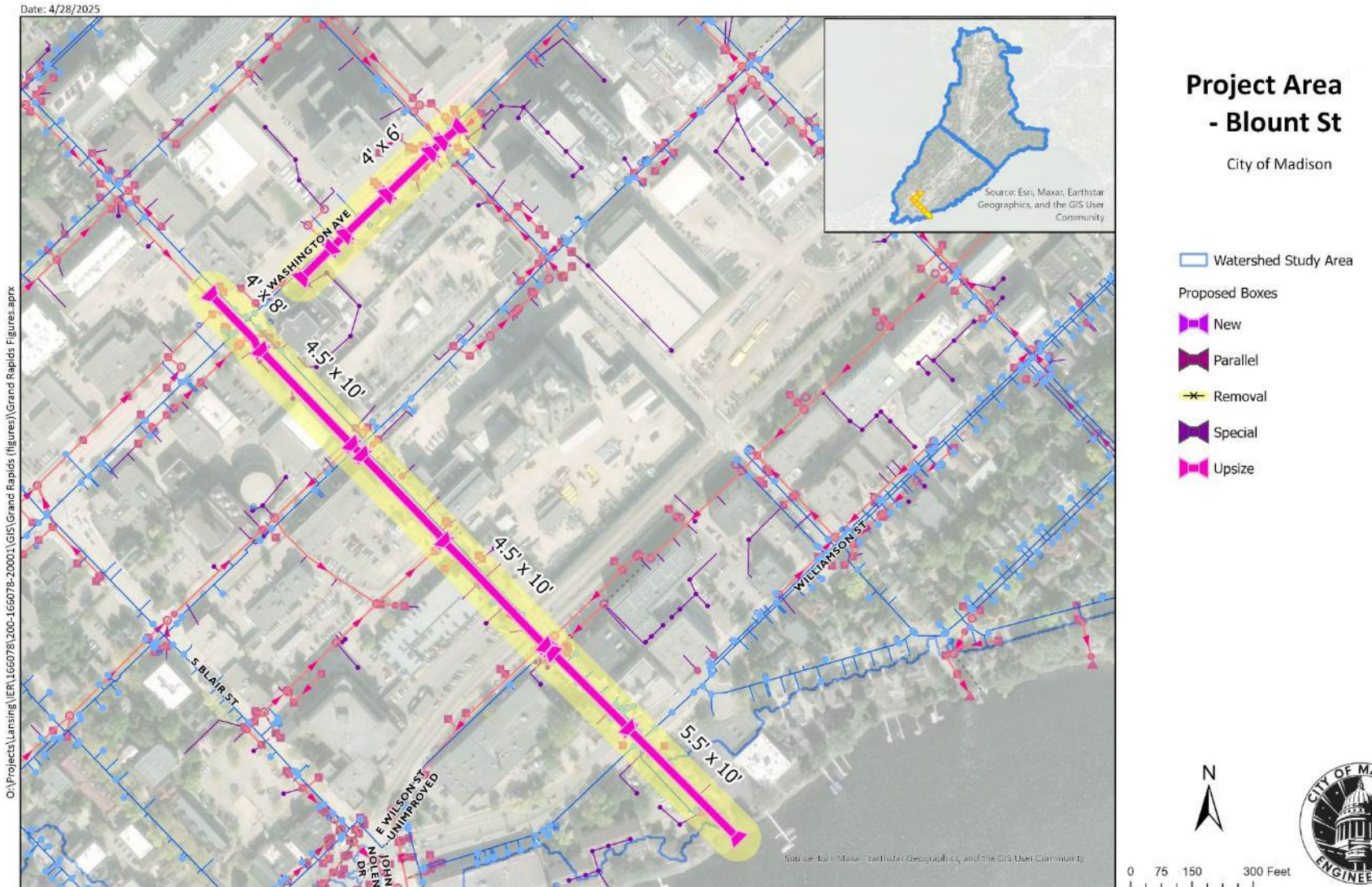
6. Paterson Relief Pipe (E Washington Ave to Lake Monona)

- Primary relief pipe for flooding on E Washington
 - Relieves flooding at Mifflin and Livingston as well
- Existing outfall at this location
- 9' diameter pipe - depths require tunneling
- Est. Cost \$8.8 M



7. Blount Street (E Washington Ave to Lake Monona)

- Increase conveyance to Lake Monona to help drain low areas.
- Est. Cost \$6M



Local Sewers Outfalls

Tenny Park

63"x98" HECP (1969)

→ 4'x10' Box

36" RCP (1961)

→ 98"x68" HECP



Local Sewers Outfalls

Hudson Park

Miller Ave

36" RCP (1999) → 42" RCP



Local Sewer Outfalls

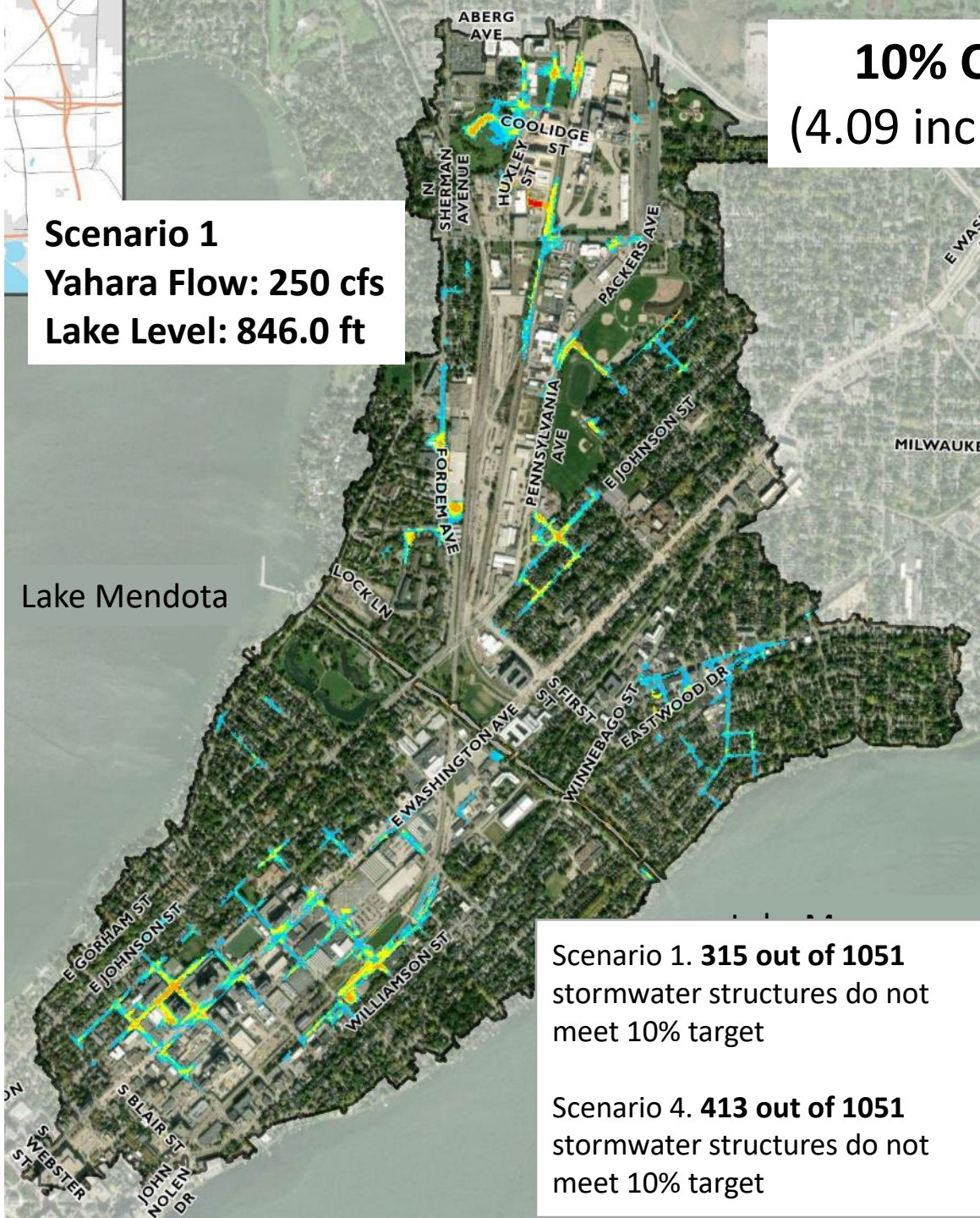
Street Ends

- Few St

24" RCP (2009) → 30" RCP



Existing Conditions Inundation Mapping

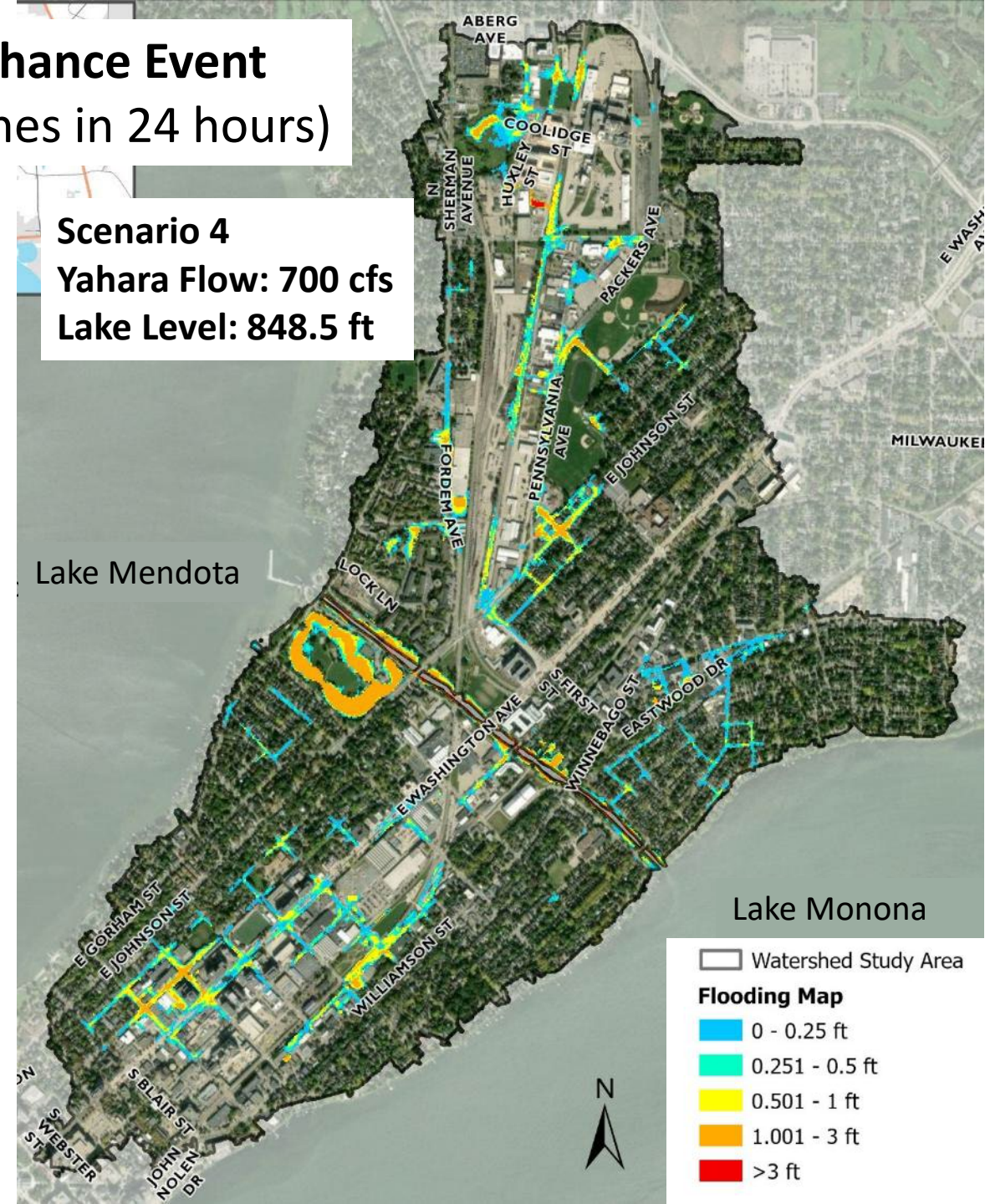


10% Chance Event
(4.09 inches in 24 hours)

Scenario 1
Yahara Flow: 250 cfs
Lake Level: 846.0 ft

Scenario 1. 315 out of 1051
stormwater structures do not
meet 10% target

Scenario 4. 413 out of 1051
stormwater structures do not
meet 10% target



10% Chance Event
(4.09 inches in 24 hours)

Scenario 4
Yahara Flow: 700 cfs
Lake Level: 848.5 ft

Scenario 4. 413 out of 1051
stormwater structures do not
meet 10% target

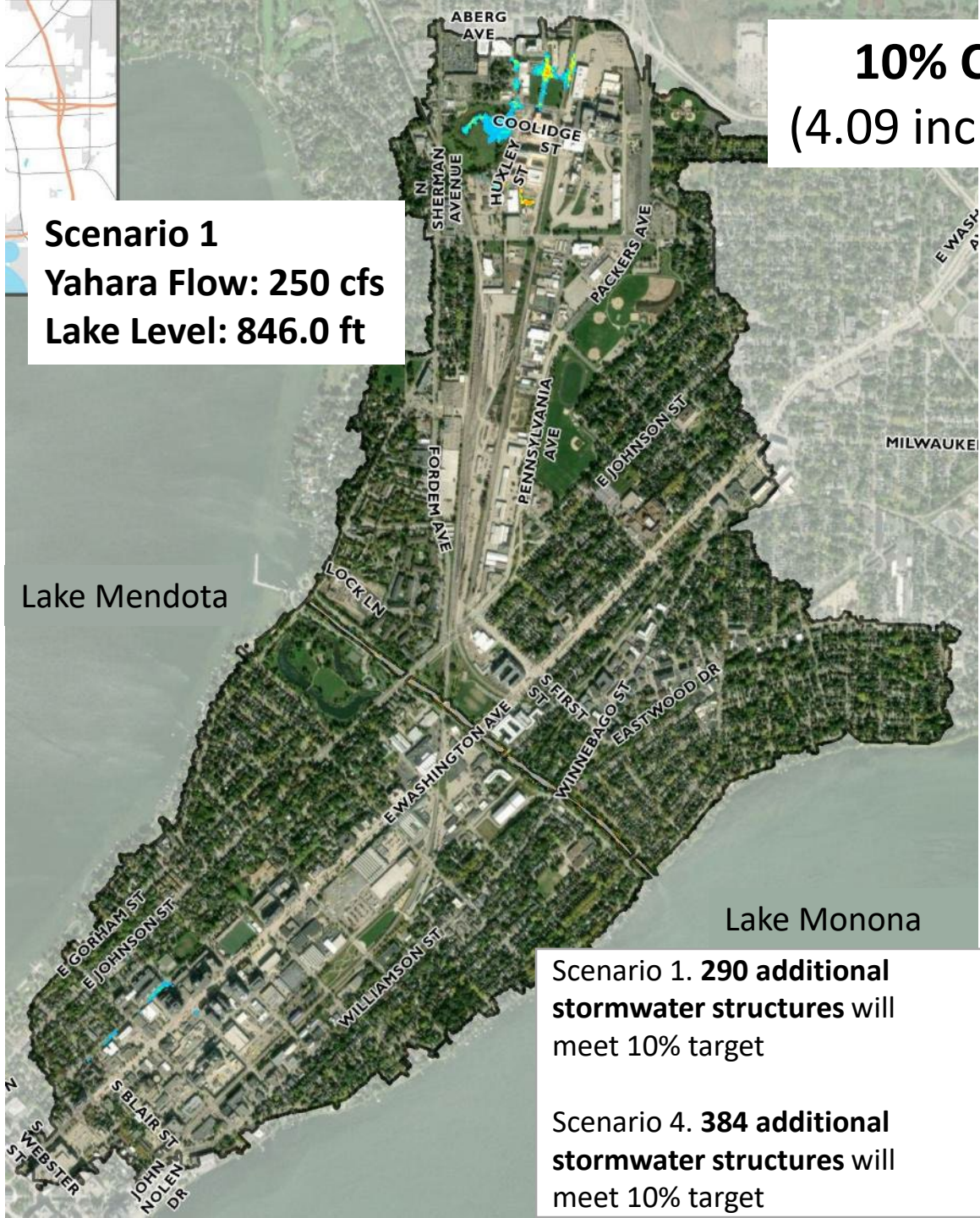
Lake Monona

Watershed Study Area

Flooding Map

- 0 - 0.25 ft
- 0.251 - 0.5 ft
- 0.501 - 1 ft
- 1.001 - 3 ft
- >3 ft

Proposed Conditions Inundation Mapping

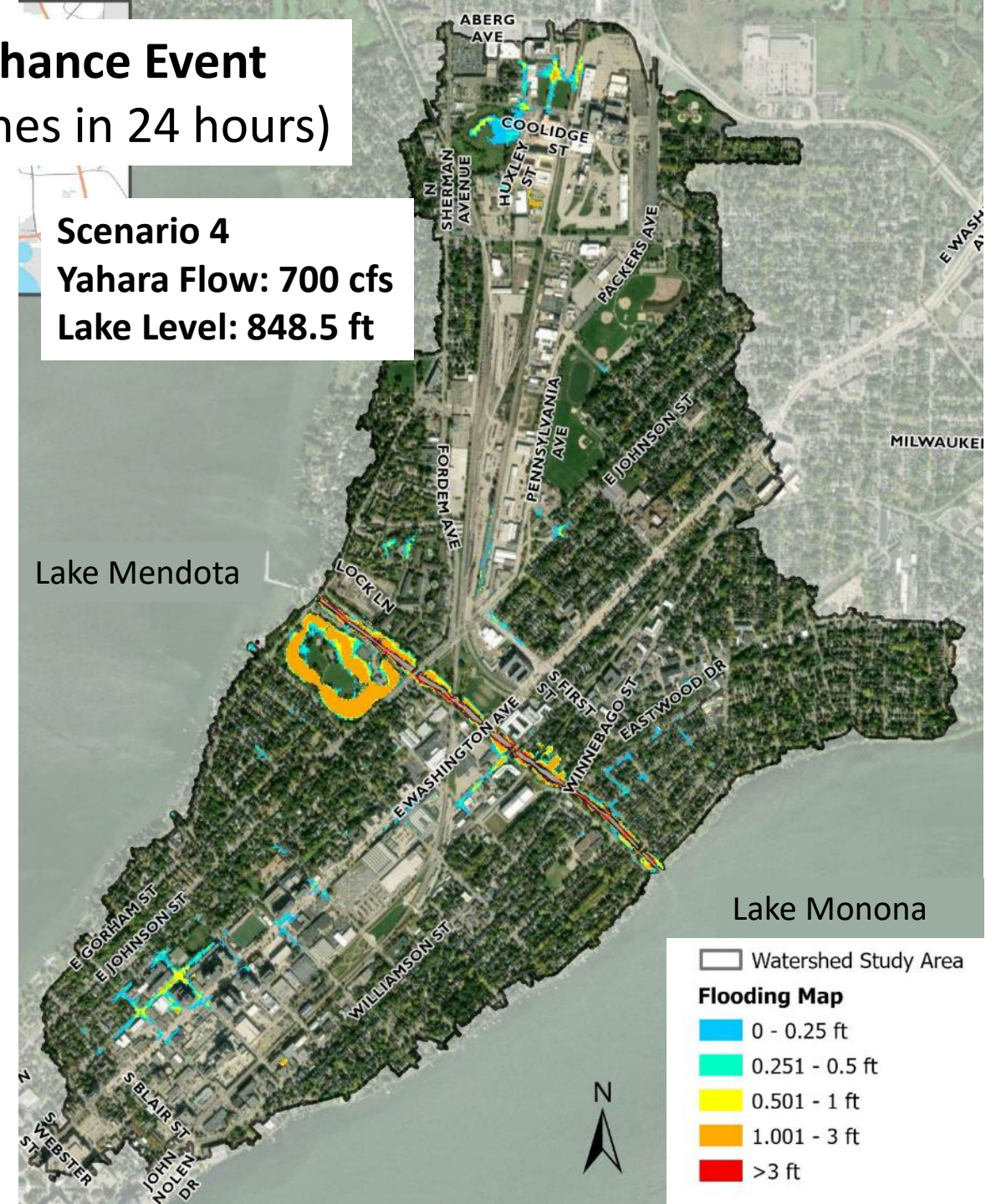


10% Chance Event
(4.09 inches in 24 hours)

Scenario 1
Yahara Flow: 250 cfs
Lake Level: 846.0 ft

Scenario 1. 290 additional stormwater structures will meet 10% target

Scenario 4. 384 additional stormwater structures will meet 10% target



10% Chance Event
(4.09 inches in 24 hours)

Scenario 4
Yahara Flow: 700 cfs
Lake Level: 848.5 ft

Watershed Study Area

Flooding Map

- 0 - 0.25 ft
- 0.251 - 0.5 ft
- 0.501 - 1 ft
- 1.001 - 3 ft
- >3 ft

Existing Conditions Inundation Mapping

1% Chance Event
(6.66 inches in 24 hours)

Scenario 1
Yahara Flow: 250 cfs
Lake Level: 846.0 ft

Scenario 4
Yahara Flow: 700 cfs
Lake Level: 848.5 ft

Scenario 1. 100 out of 7,421
buildings do not meet 1%
target

Scenario 4. 135 out of 7,421
buildings do not meet 1%
target

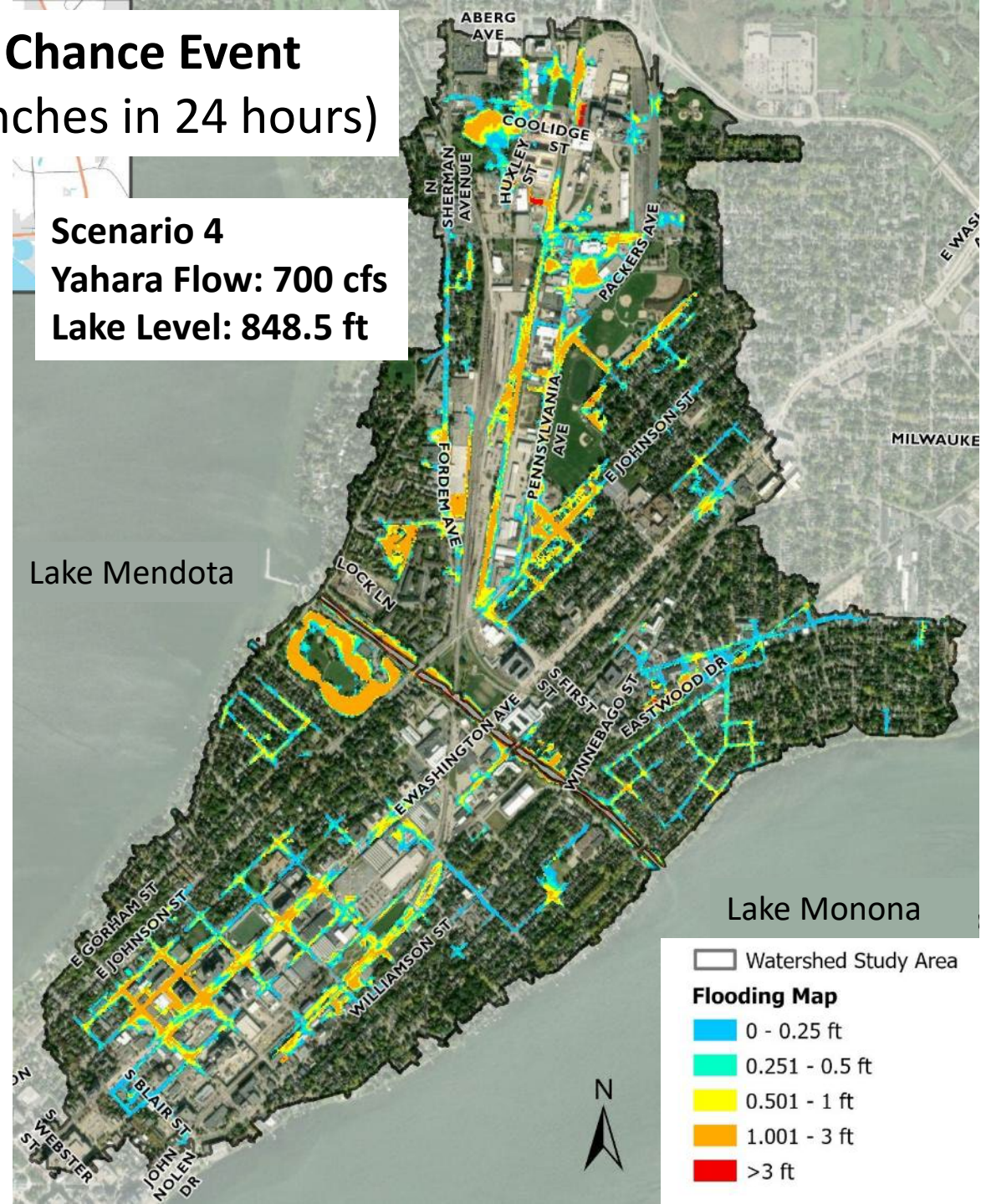
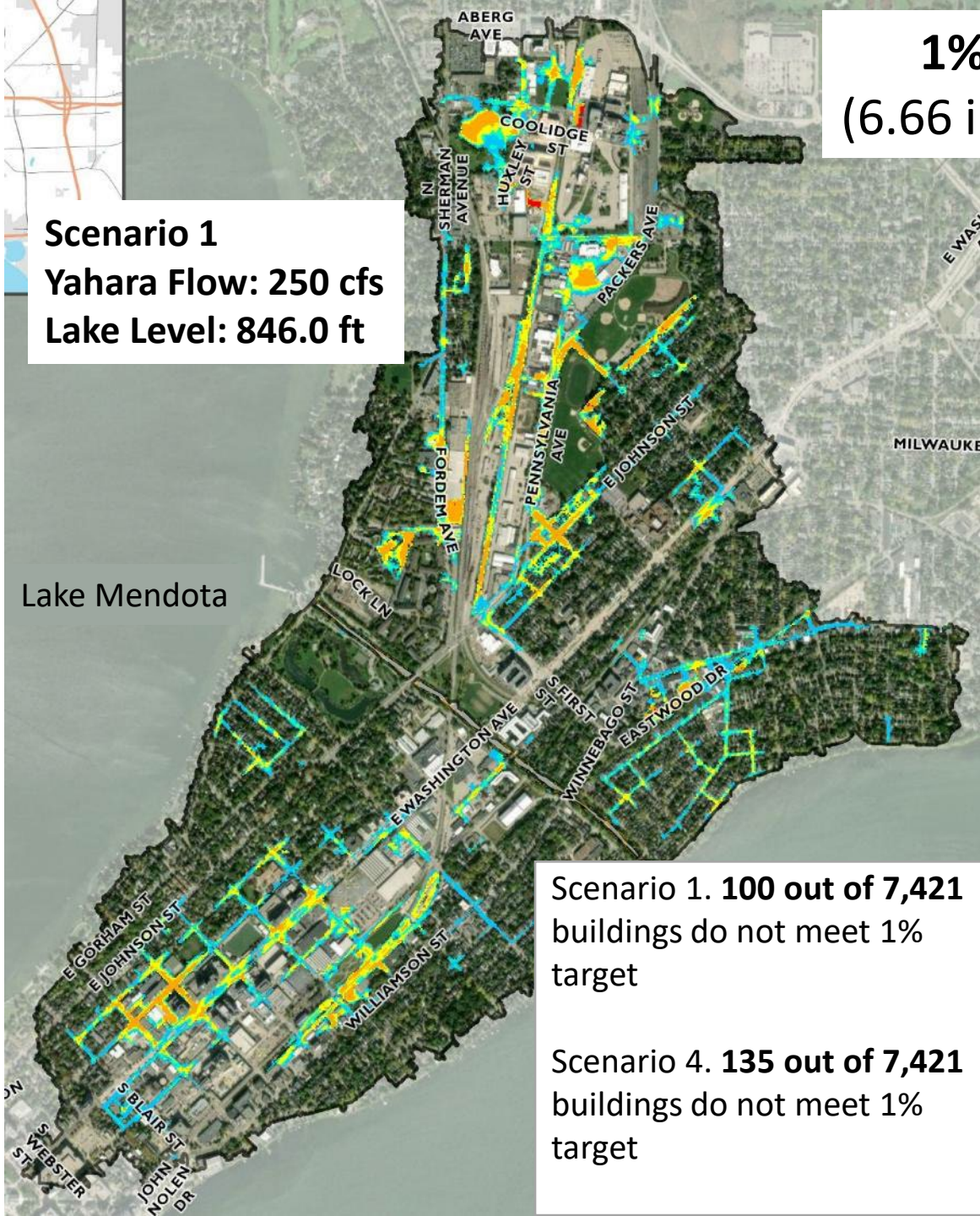
Lake Mendota

Lake Monona

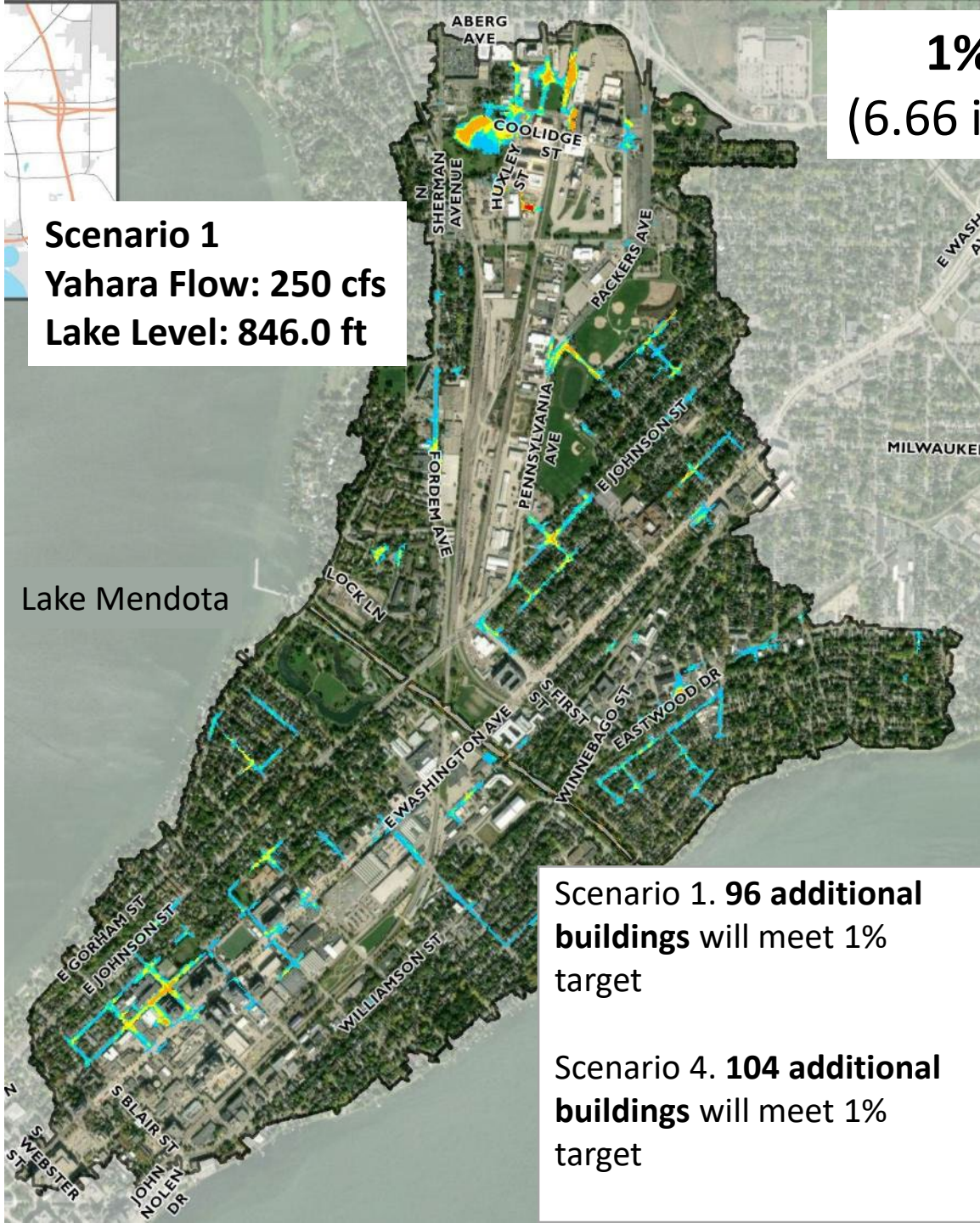
Watershed Study Area

Flooding Map

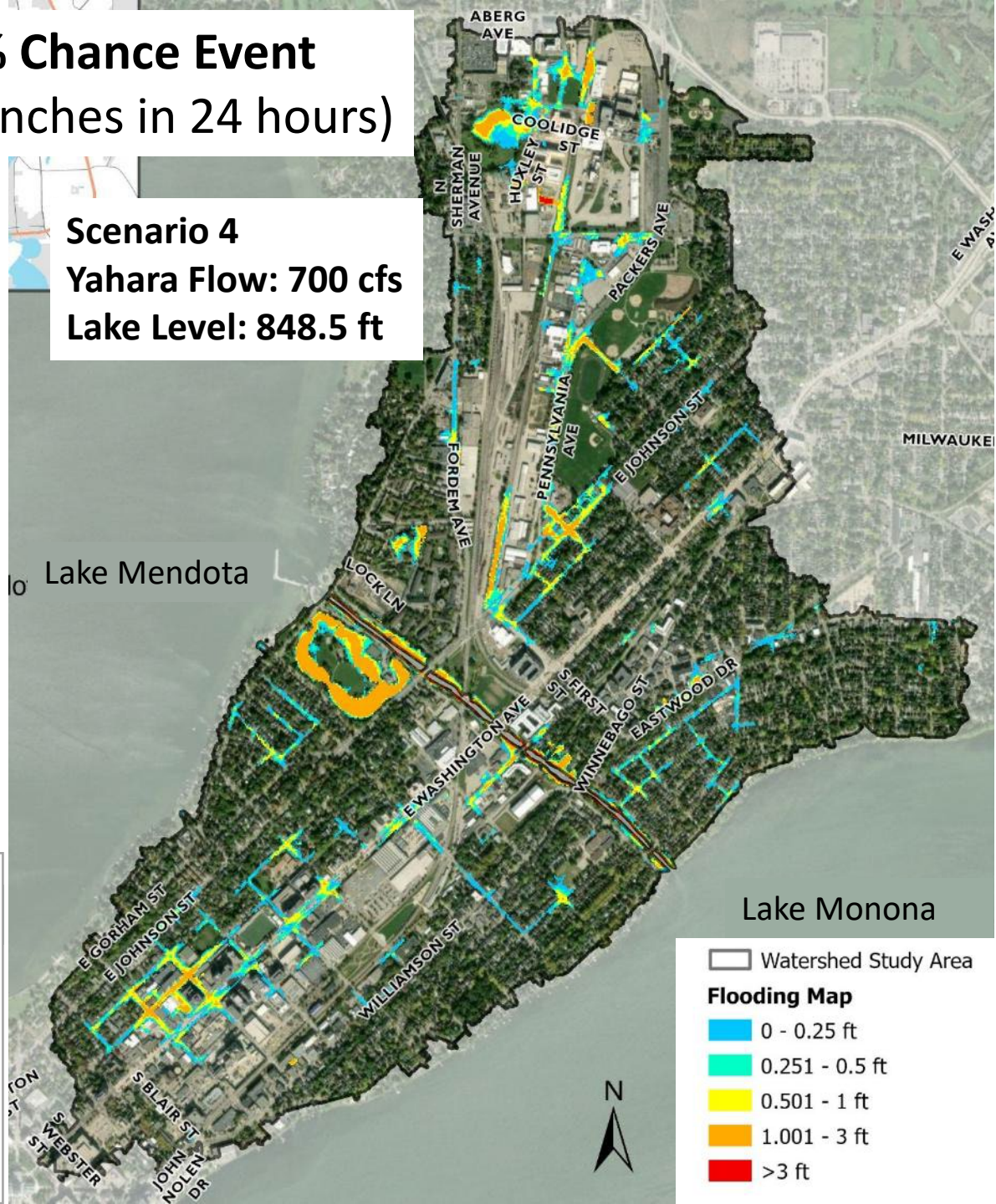
- 0 - 0.25 ft
- 0.251 - 0.5 ft
- 0.501 - 1 ft
- 1.001 - 3 ft
- >3 ft



Proposed Conditions Inundation Mapping



1% Chance Event
(6.66 inches in 24 hours)



Scenario 1. 96 additional buildings will meet 1% target

Scenario 4. 104 additional buildings will meet 1% target

Lake Monona

□ Watershed Study Area

Flooding Map

- 0 - 0.25 ft
- 0.251 - 0.5 ft
- 0.501 - 1 ft
- 1.001 - 3 ft
- >3 ft

Solutions not recommended

- Dredging the Yahara River between Lake Mendota and Lake Monona
 - Reduced flooding in small storms only
 - Extremely difficult and expensive
- Flood storage – limited storage was expensive, would impact open spaces, and was less effective than pipe conveyance
- Widespread Green Infrastructure to meet flood targets –
 - Would require 30% of all pervious area with >\$500 million in capital costs (+annual maintenance)



Questions/Discussion

