Spring Harbor Watershed Study

7/16/25

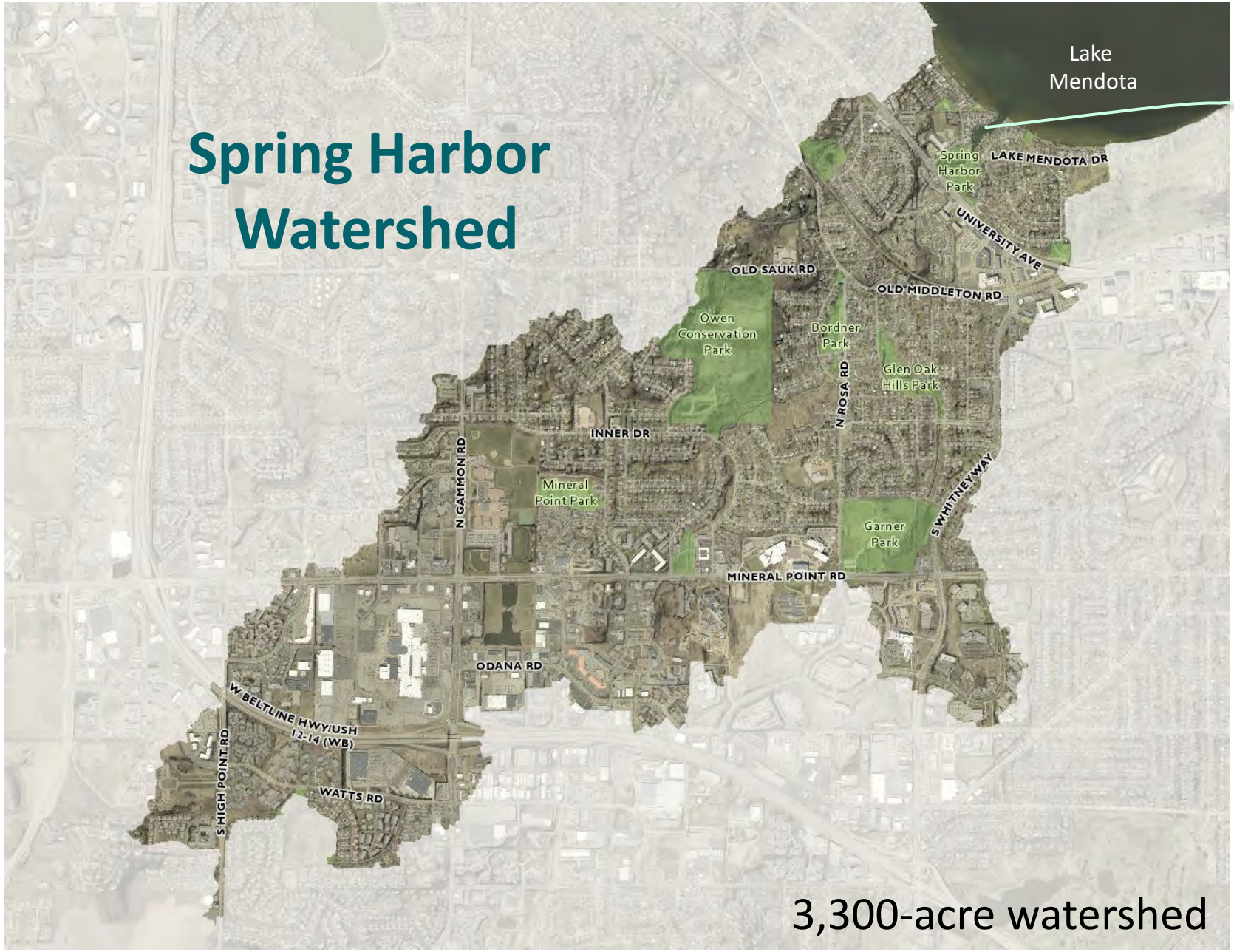
BPW

Presented by Alaina Baker

Agenda

- Background - Original Watershed Study
  - Watershed Challenges
  - Original Study Milestones
  - Public Feedback
- Recent City Modeling Work
  - Long-Term Proposed Solutions (All Solutions)
  - Near-Term Proposed Solutions
  - Recent Milestones

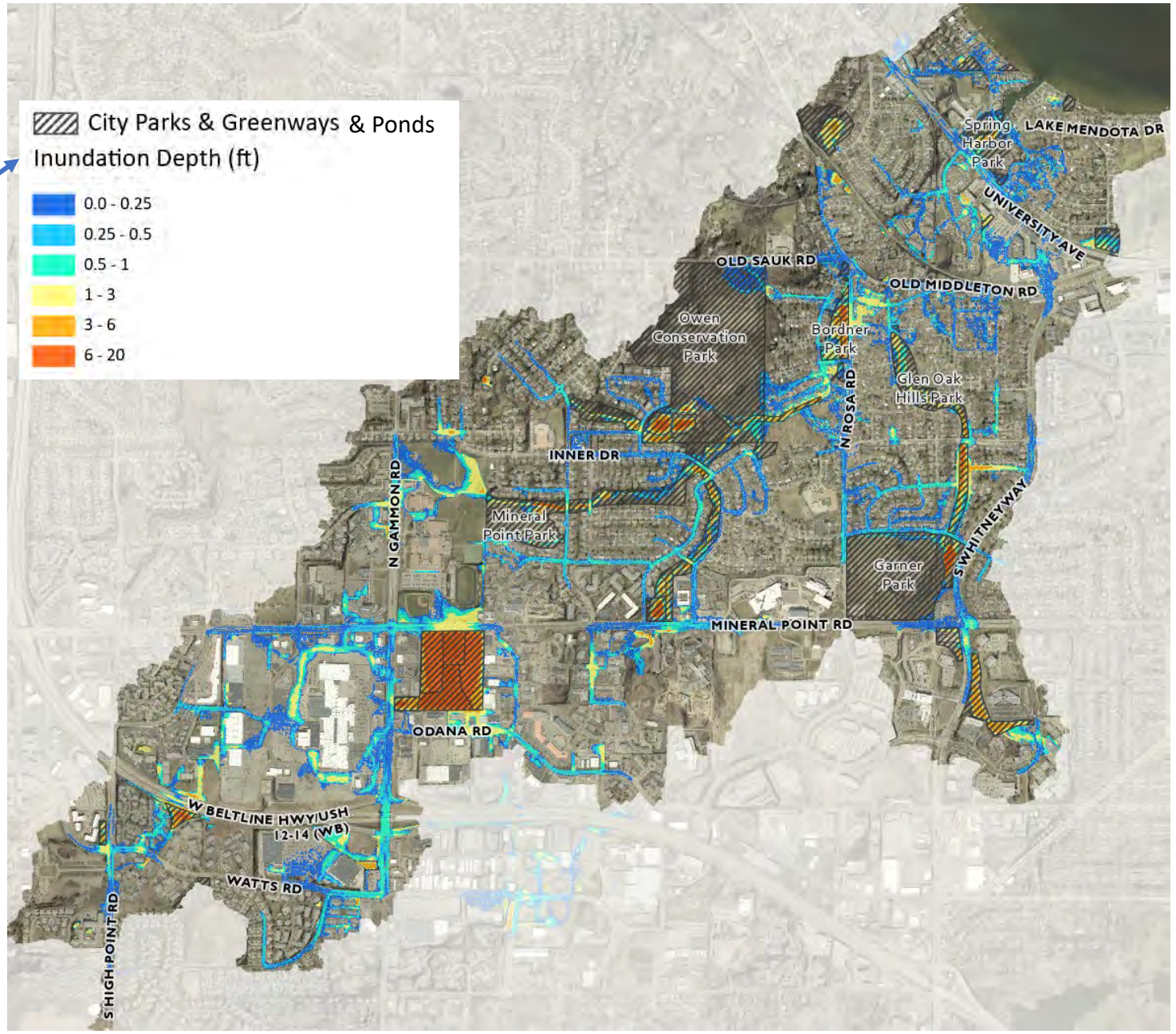
Spring Harbor Watershed



Background

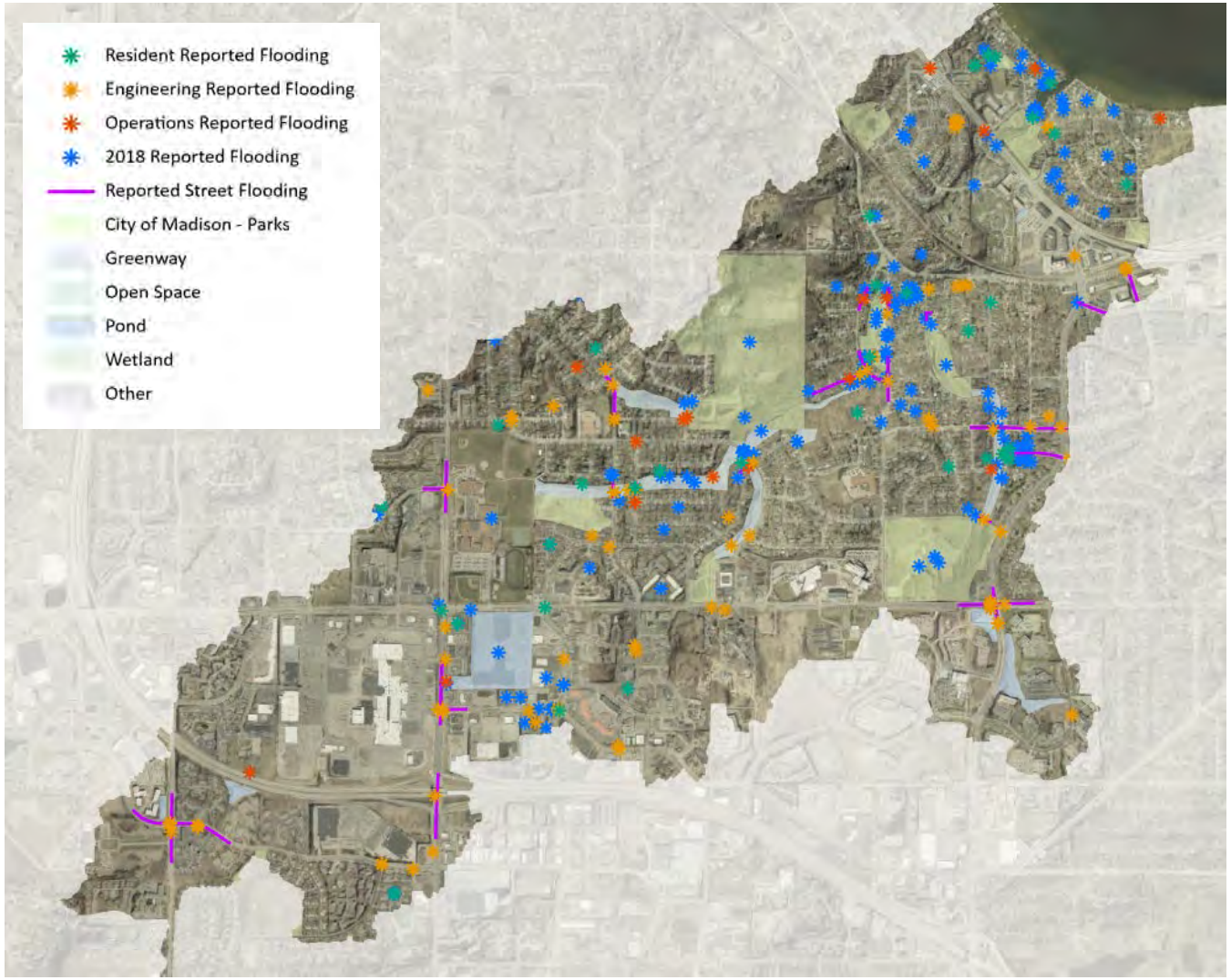
- Flood Inundation Map
1% Chance Storm

Inundation as projected from our model that would result during a storm that has a 1% chance of occurring during any given year, which is 6.66 inches of rain in 24 hours



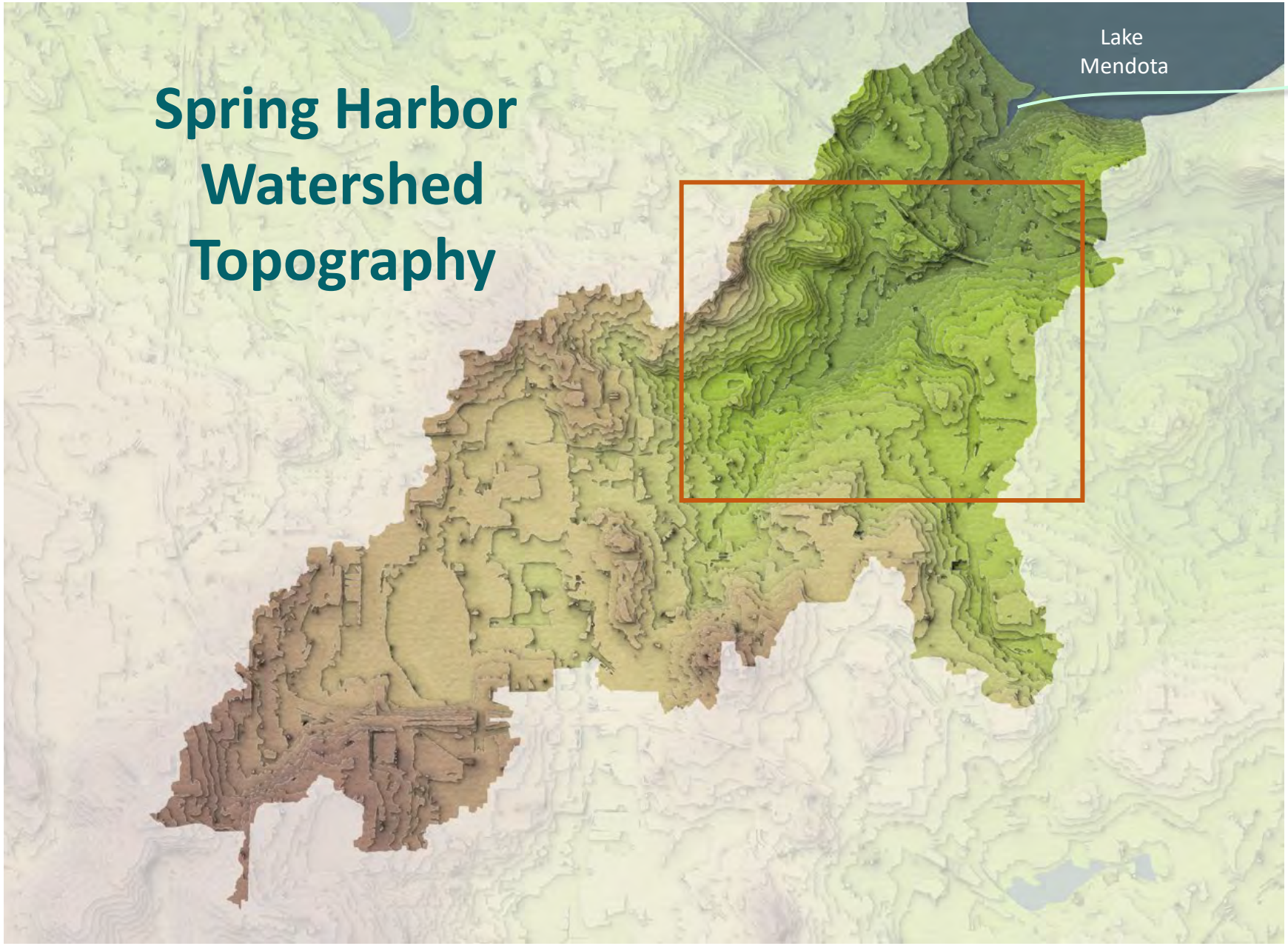
Background

-Past Watershed Flooding



- The Spring Harbor watershed was developed in the **1950's and 1960's** – developed with the knowledge that stormwater designers had at the time
- Original system was not sized for current and future rainfall events

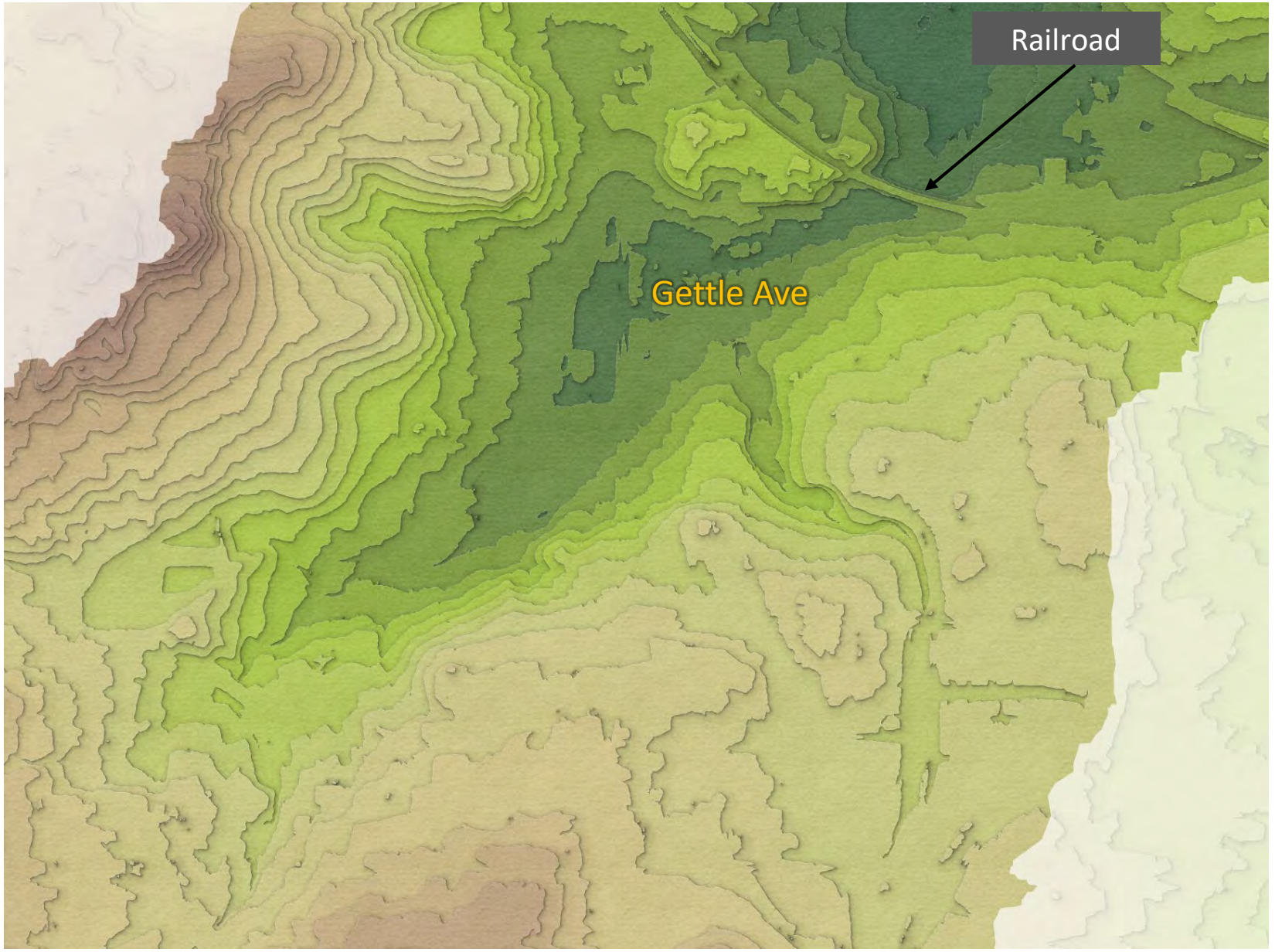
Spring Harbor Watershed Topography



Background
- Unique Watershed Challenges

Gettle Ave

- Major low-point
- Enclosed depression (no way for water to leave over land)
- Runoff can only leave through the Spring Harbor Box



Background
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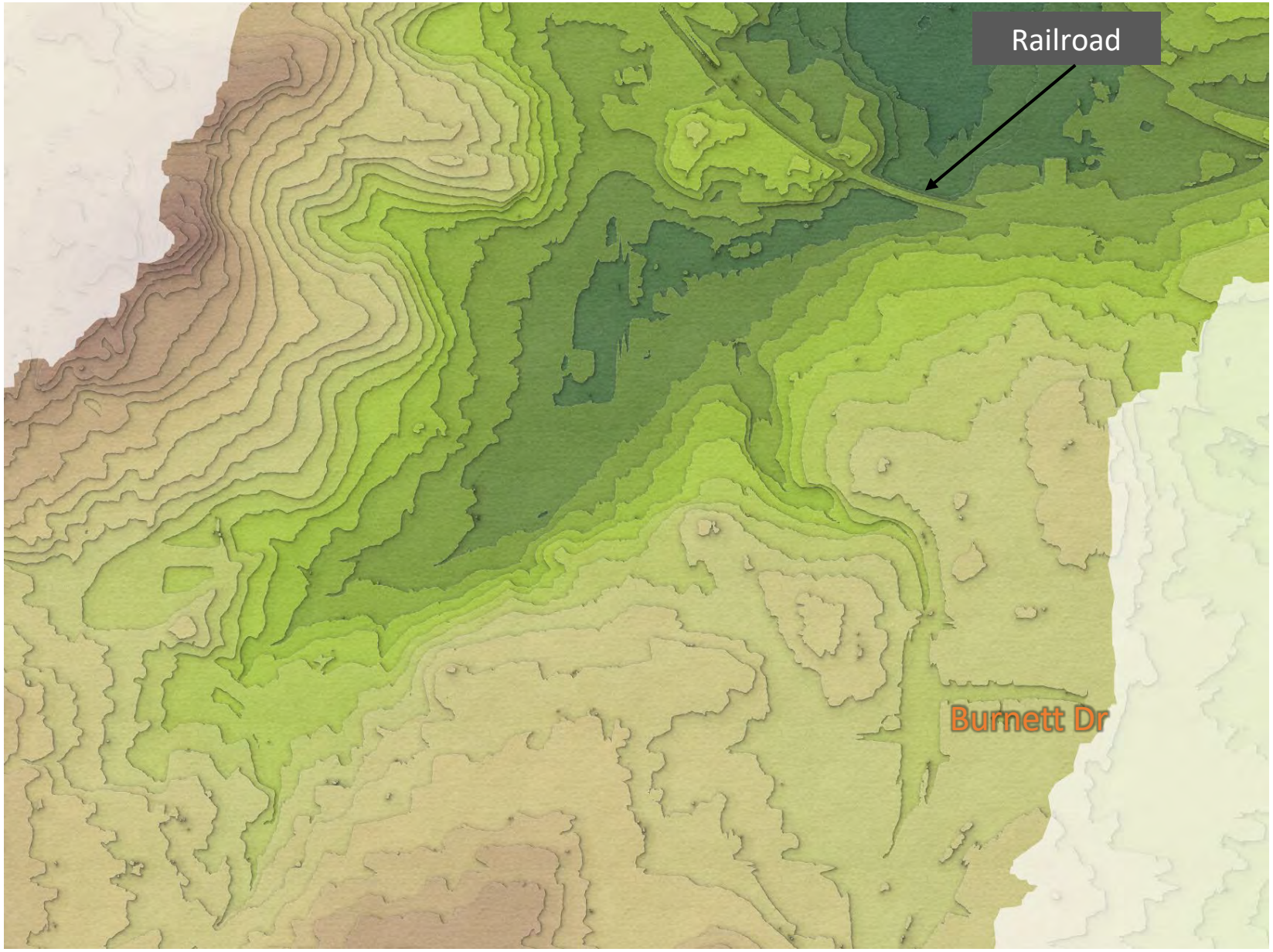
Background
- Unique Watershed Challenges

Burnett Dr

- Street elevation is similar to the greenway
- The City will not mitigate flooding in one location if it results in worse flooding somewhere else (cannot just send more water downstream)



Background
- Unique Watershed Challenges

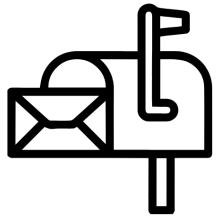
Burnett Dr

- Street elevation is similar to the greenway
- The City will not mitigate flooding in one location if it results in worse flooding somewhere else (cannot just send more water downstream)

Background

-Original Spring Harbor Watershed Study Milestones

- Began January 2019
  - AE2S - firm hired to complete study
  - In first round of studies contracted
- PIM 1 – April 2019
  - Focus Groups (In Person) – Summer/Fall 2019
- PIM 2 – February 2020
  - Focus Groups – Breakout rooms following PIM
- PIM 3 – June 2021
  - Focus Groups – Breakout rooms following PIM
- Original Study Completed – June 2022



~ 25,000 postcards sent

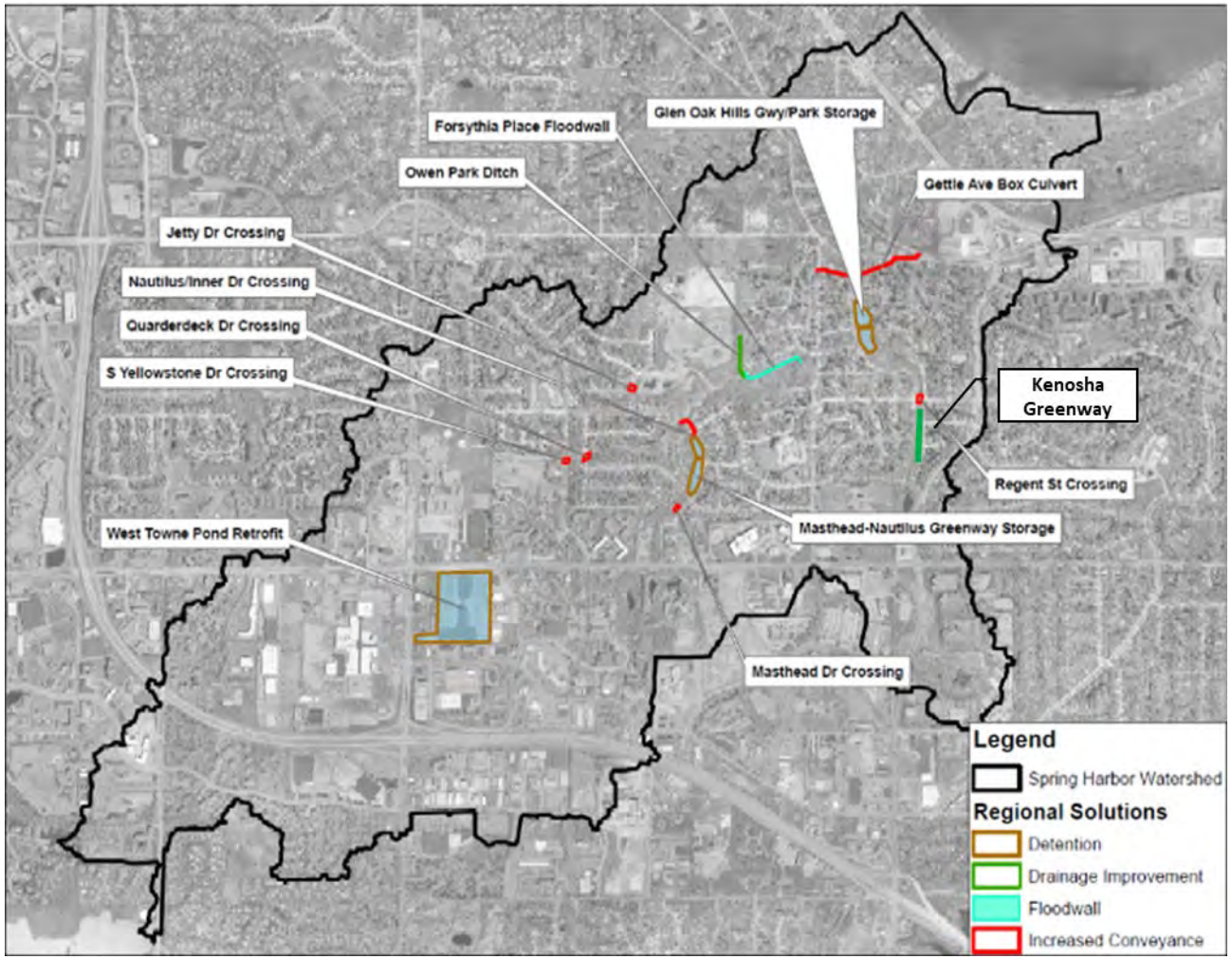
~200 Total Attendees at PIMs (Public Information Meetings)

8 Focus Groups with 132 Total Attendees
2 Additional Rounds of Breakout Rooms

Background

-Original Spring Harbor Watershed Study Solutions

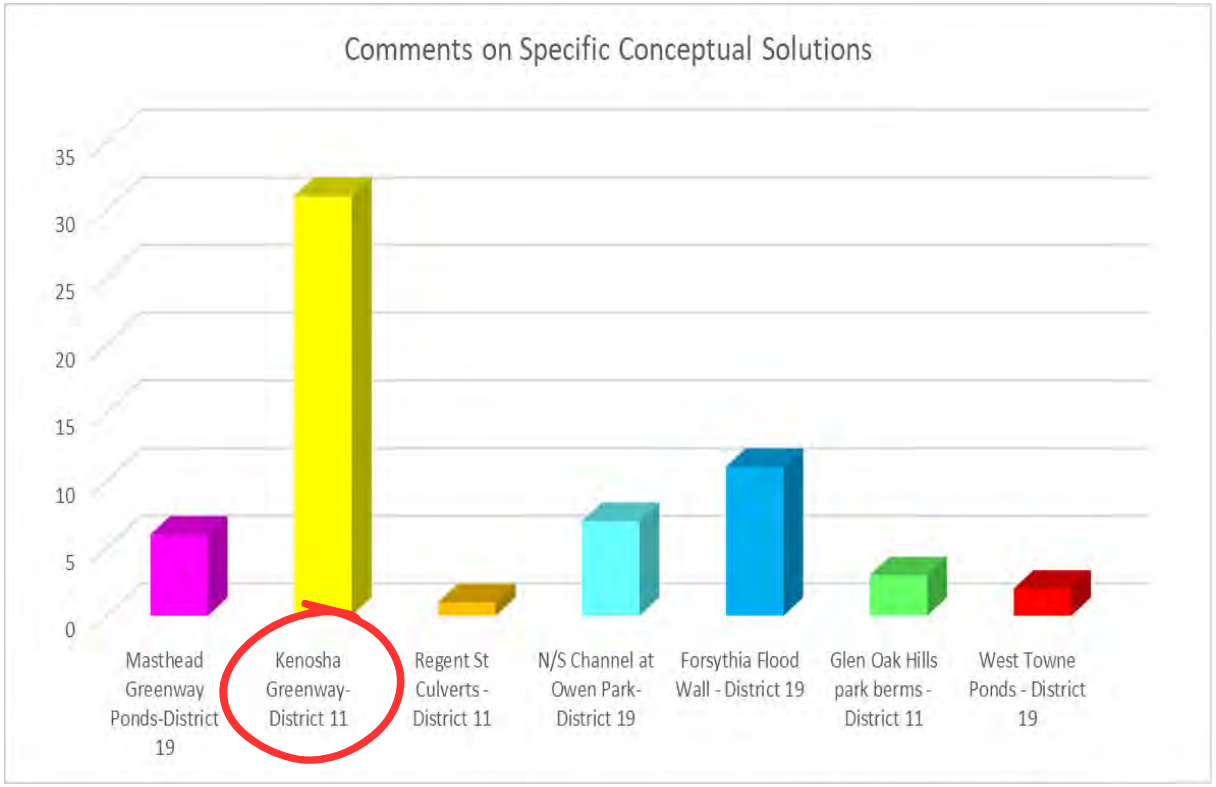
- Solutions Recommended:
  - 3 detention area improvements
  - 2 channel conveyance improvements
  - 7 greenway crossing improvements
  - 1 Flood wall (10.5' tall at highest point)
  - Spring Harbor Upper Box upgrades
  - Significant local sewer upgrades (not shown)

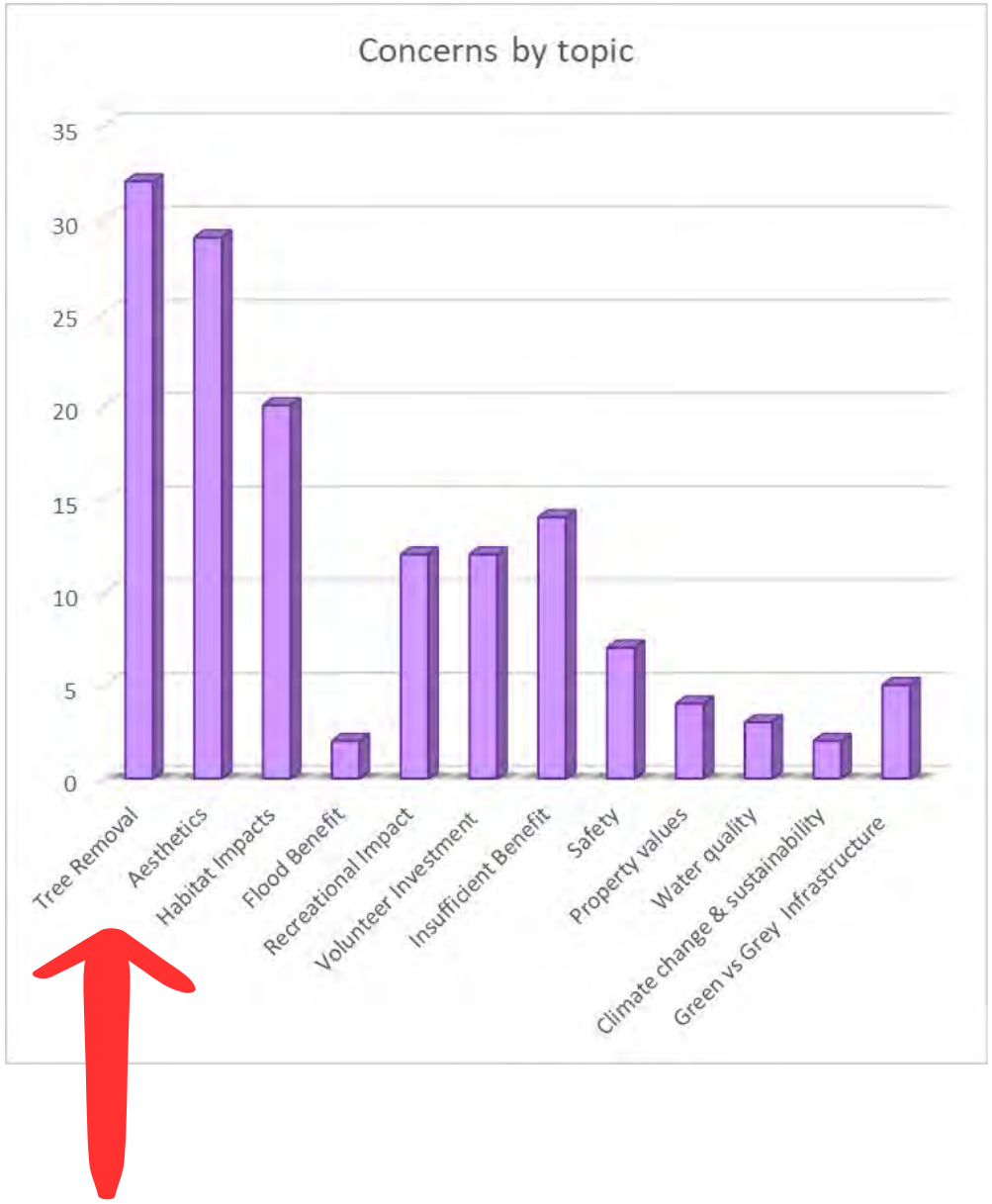


Background

-Public Feedback on Draft Final Report

- Public Comment Period: 01/28/22 – 03/04/22
- **58 comments** & more than **100 individual questions received**





Public Feedback → Additional Modeling

- Model viability of alternative solutions recommended by the public, and brainstormed internally
- Model impact of not implementing solutions with public concerns
- Develop near-term plan for Spring Harbor flood mitigation projects

Long-Term Proposed Solutions Development

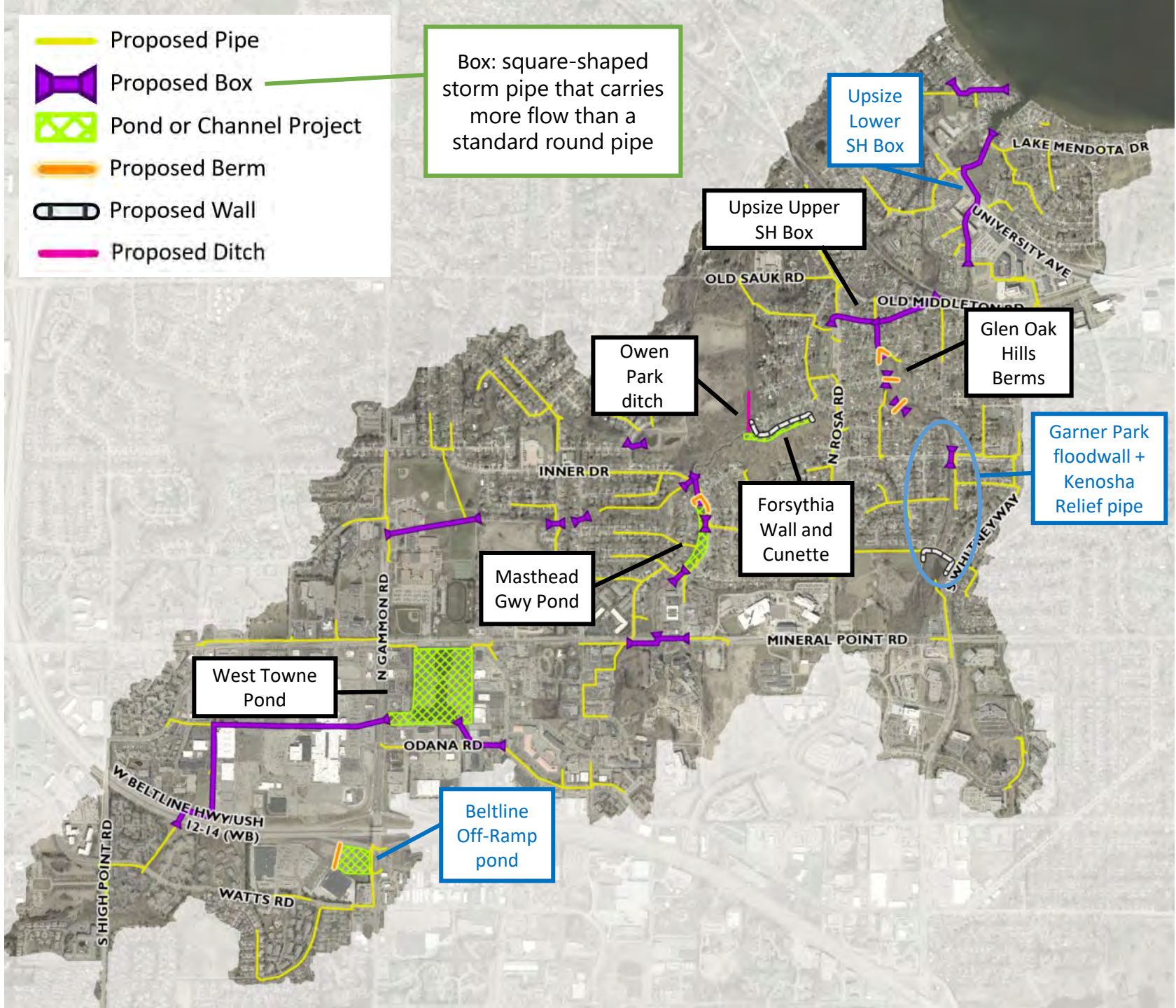
- Developed suite of solutions to meet flood targets
  - 10% Chance Event - No surcharging of storm sewer onto roadway
  - 4% Chance Event - Roads passable for emergency vehicles
  - 1% Chance Event - No structure (home/building) flooding & no greenway crossing overflow

- Tweaks to standardize model led to slightly increased flows in enclosed depression – made solutions more challenging

City Modeling

All Solutions (0-50 yrs)

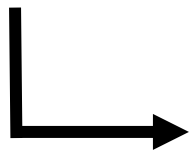
- **Meets flood targets**
- Solutions from original study:
  - Upsize Upper SH (Spring Harbor) Box
  - West Towne Pond (Currently Programmed in 2025-2026)
  - Masthead Gwy Pond
  - Forsythia Wall (3.5' shorter at tallest point—7' max) + cunette modifications
  - Glen Oak Hills berms
  - Owen Park ditch (half the size of original)
  - Local Sewer across watershed
- New regional solutions:
  - Beltline Off-Ramp pond
  - Garner Park flood wall (4' high) + Kenosha relief pipe
  - Upsize Lower SH (Spring Harbor) Box
- Excludes from original study:
  - Kenosha greenway



Drawbacks of the Long-Term Proposed Solutions

To meet the City's Flood Mitigation Targets:

- Unpopular solutions would need to be constructed, some in the near-term
- The lower portion of the Spring Harbor Box would need to be upsized to avoid negative impacts in other parts of the watershed. The lower portion of the Spring Harbor Box is in good condition and does not need to be reconstructed for several decades.



Does not offer a reasonable near-term plan

City Modeling

-From Long-Term to Near-Term Modeling

Develop a set of **Near-Term Solutions for the next ~25 years**:

- Exclude Lower Spring Harbor Box Upsize Project
- Exclude solutions that are unpopular to residents

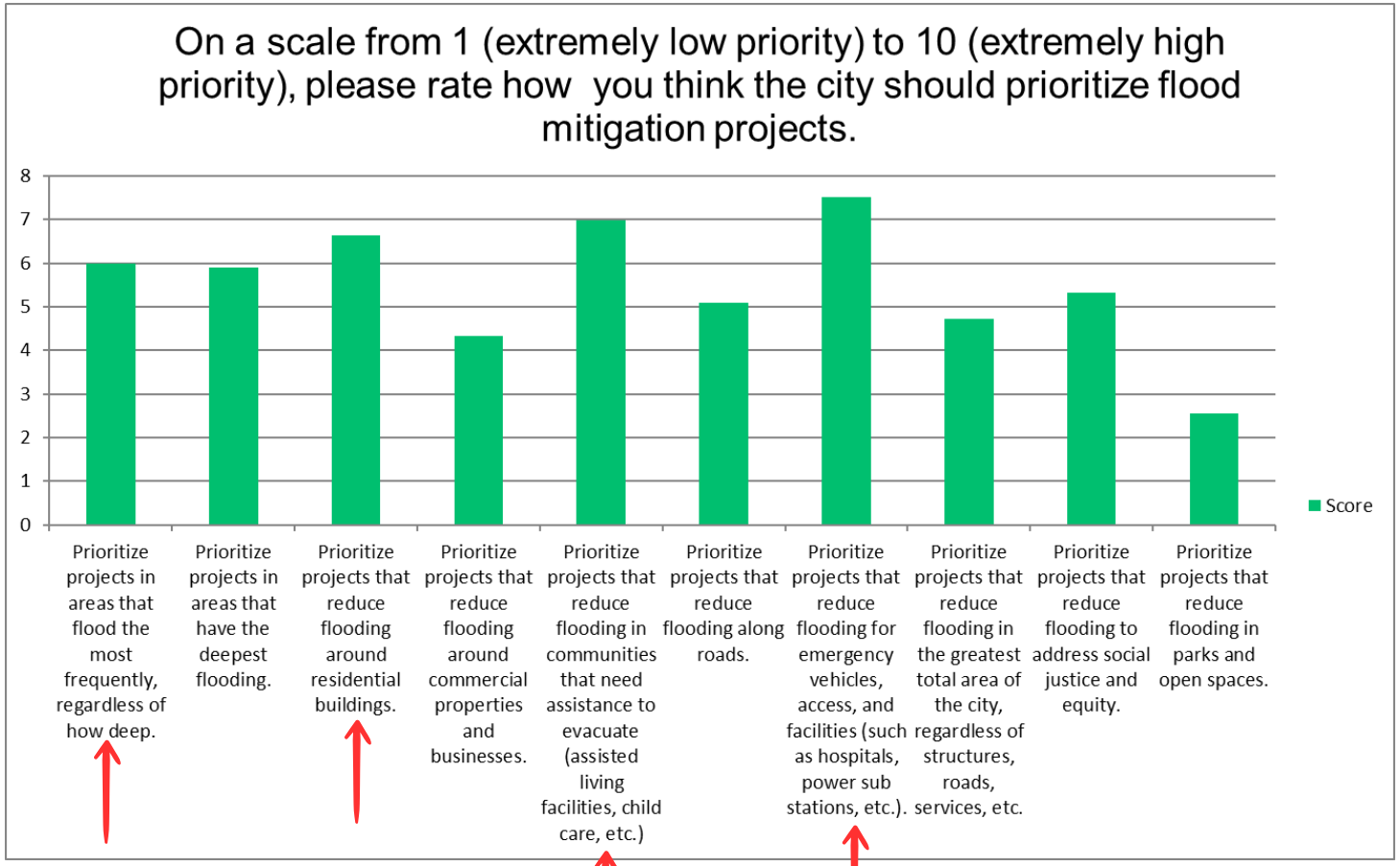
Retain record of "**All Solutions" for ~25-50 years from now**:

- Show what type and size of solutions would be needed to meet all the City's Flood Mitigation Targets across the watershed, which will provide valuable insights for future modeling efforts
- Document the recommended size for the Lower Spring Harbor Box when reconstructed

City Modeling

-How to Prioritize Near-Term Flood mitigation solutions

- Flood Mitigation targets **can't** be met watershed wide
- Residents prefer to prioritize projects that:
  - Provide access for **Emergency Vehicles**
  - Reduce risk of flooding for **residential homes**
  - Reduce risk of flooding for residential homes that **flood most frequently**
  - Reduce risk of flooding for **communities that need evacuation assistance**



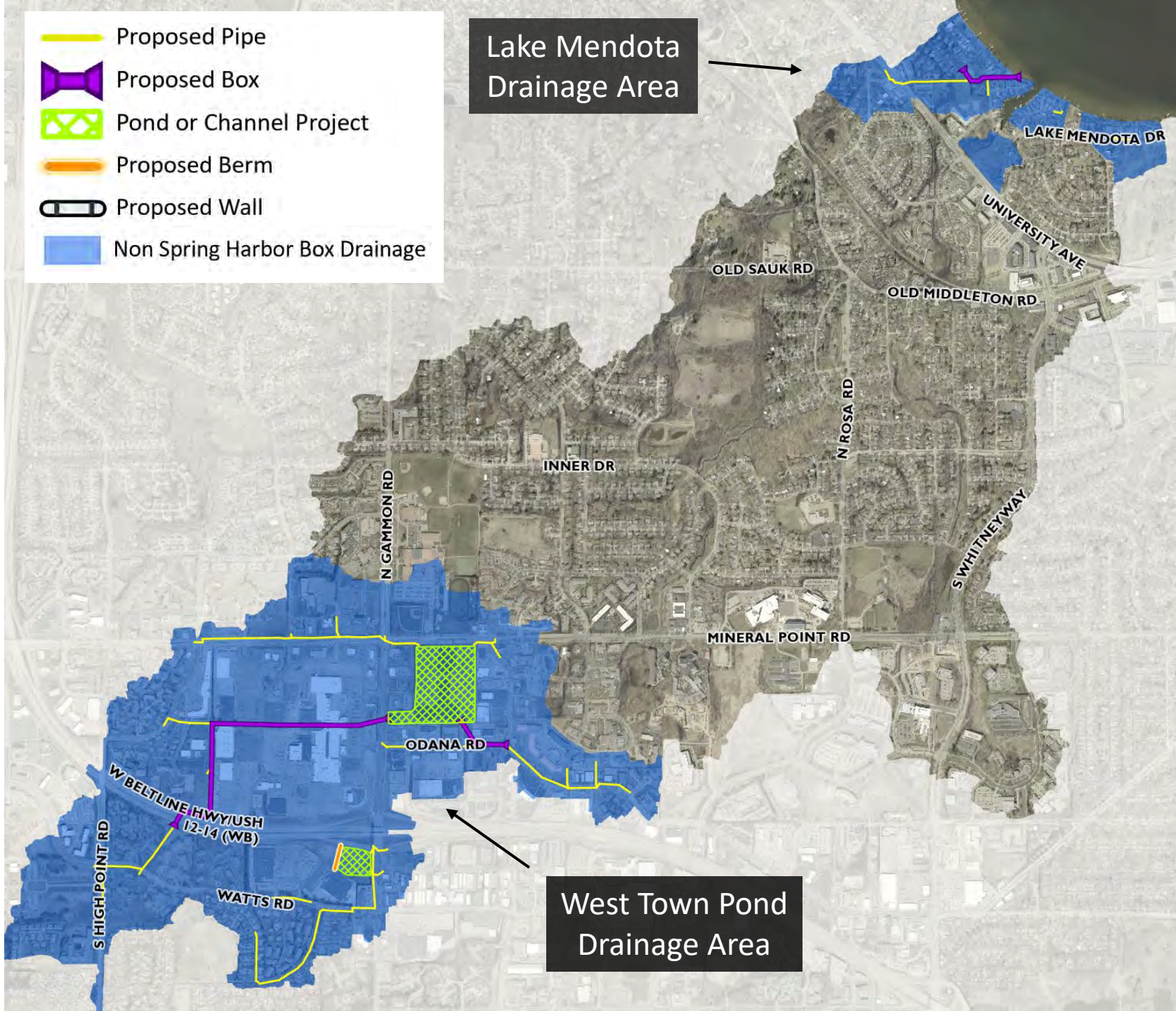
Feedback from Resident Survey

https://www.cityofmadison.com/news/2021-05-11/survey-open-city-engineering-works-to-prioritize-flood-projects

Near-Term Recommend Solutions
- Splitting up the Watershed

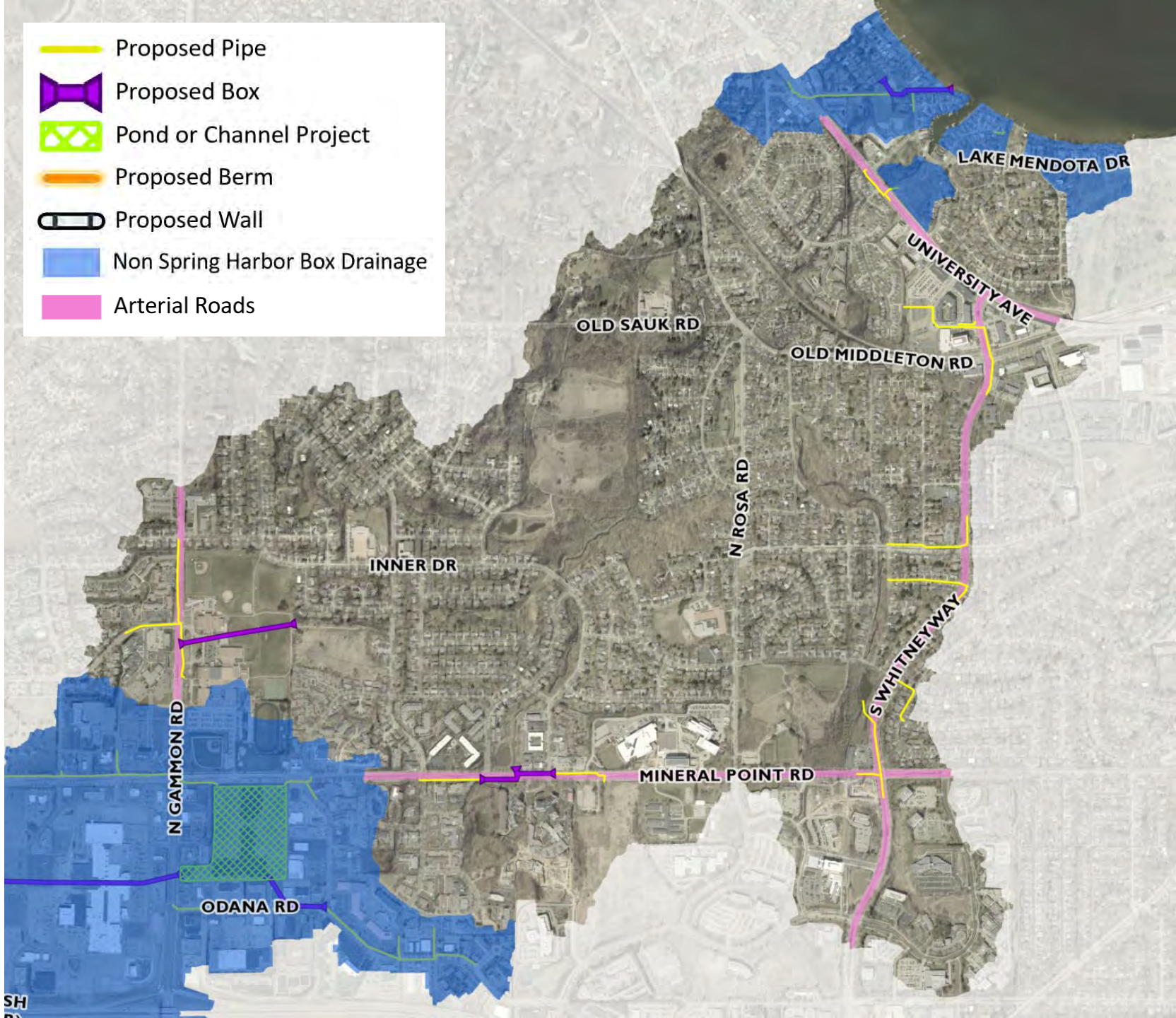
Areas that **did not drain to the Spring Harbor Box** would have the **same solutions** as what was recommended in the Suite of **All Solutions**

- Used local sewers and regional solutions (West Towne Pond and Beltline Off-Ramp Pond) to meet flood targets



Near-Term Recommend Solutions
- 10-Year and 25-Year Target for Arterial Roads

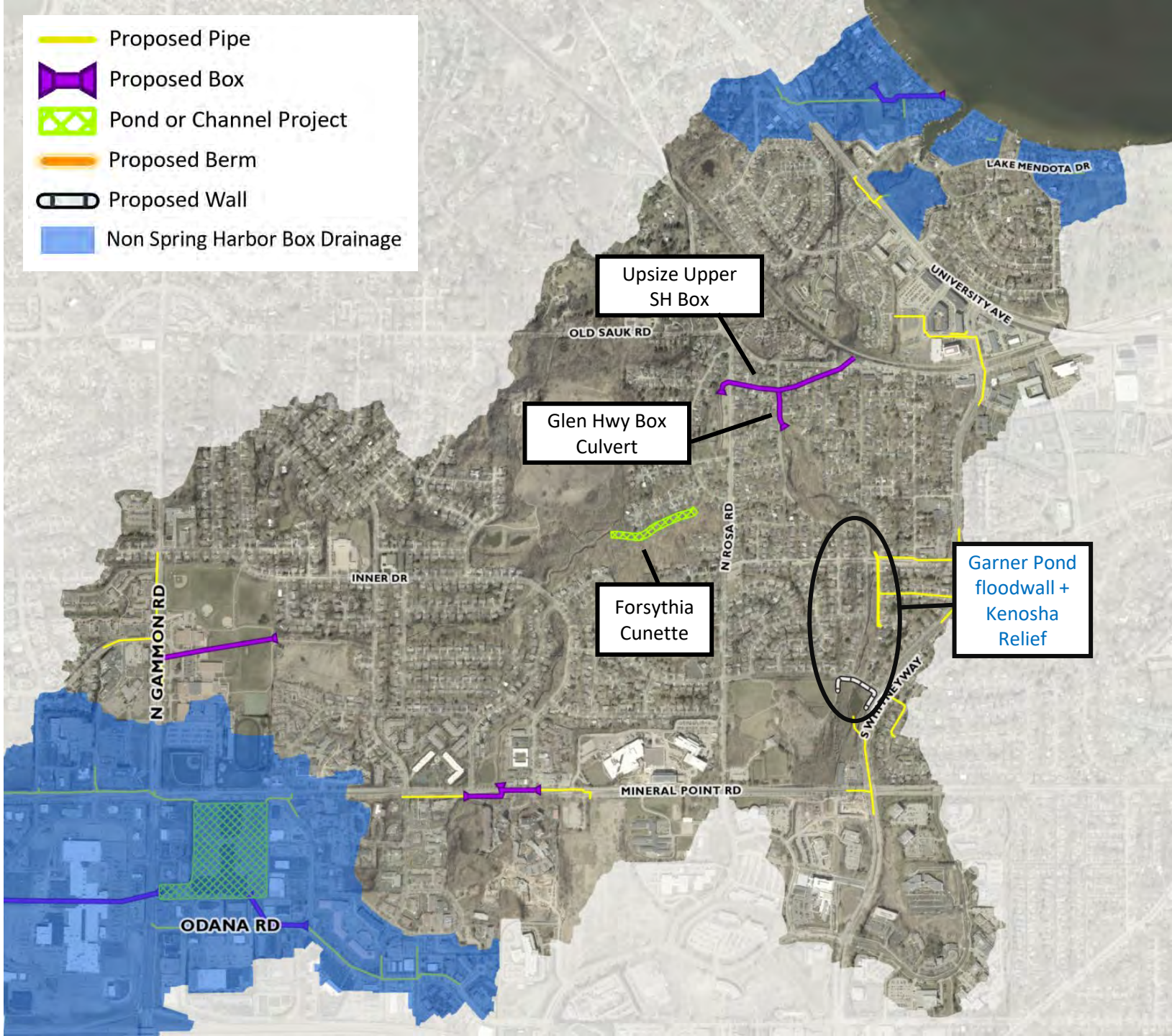
- Local storm sewer were upsized to meet 10 and 25-year targets on **arterial roads**
- Overlaps **BRT** and **Emergency Vehicle** routes
- Roads included:
  - University Ave
  - Whitney Way
  - Mineral Point Rd
  - Gammon Rd



Near-Term Recommend Solutions
- Feasible Regional Solutions

Feasible Regional Solutions:

- Upsize Upper Spring Harbor Box
- Glen Hwy Box Culvert
- Forsythia Cunette Deepened & Lowered
- Garner Pond Floodwall + Kenosha Relief Pipe

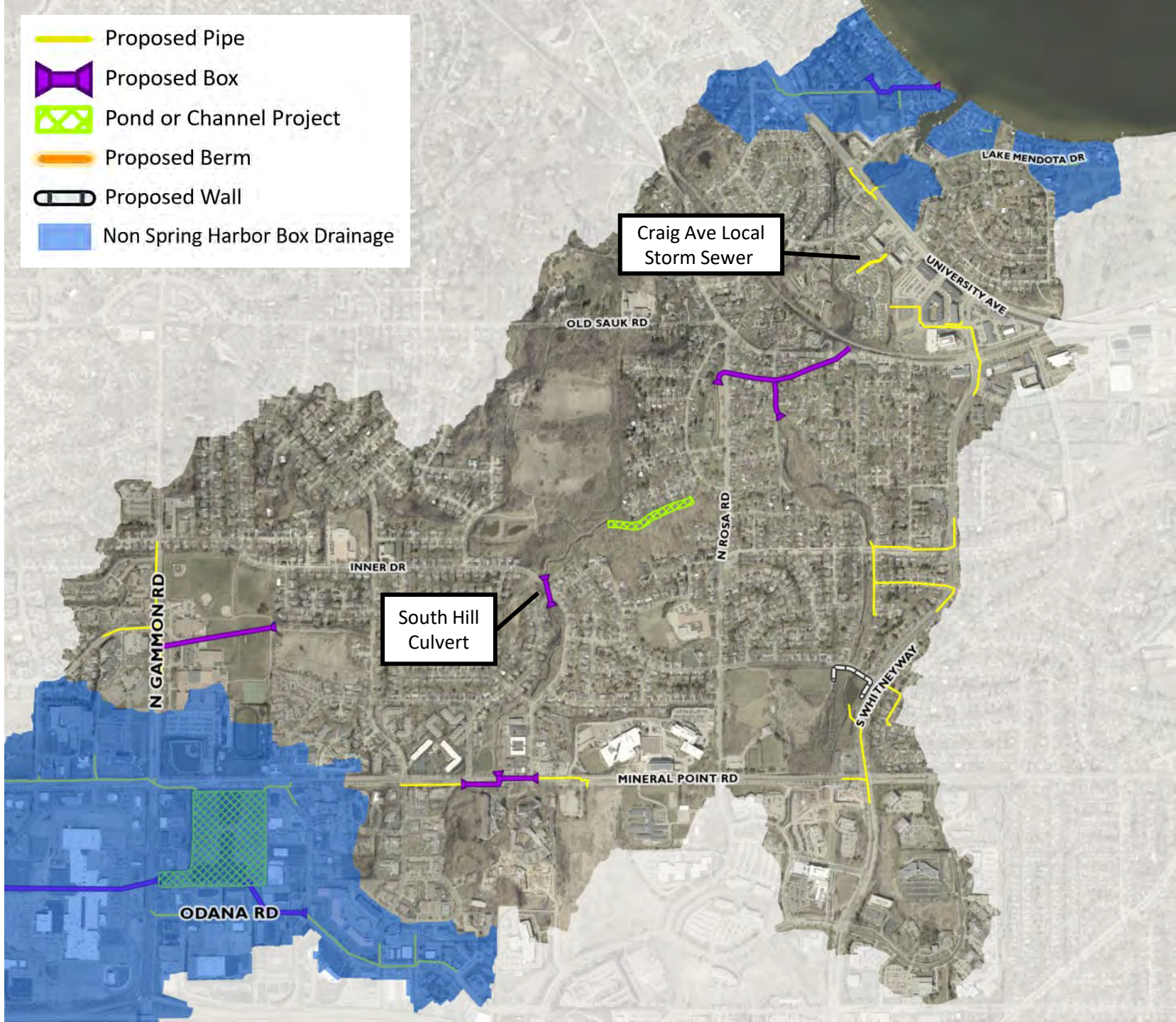


Near-Term Recommend Solutions

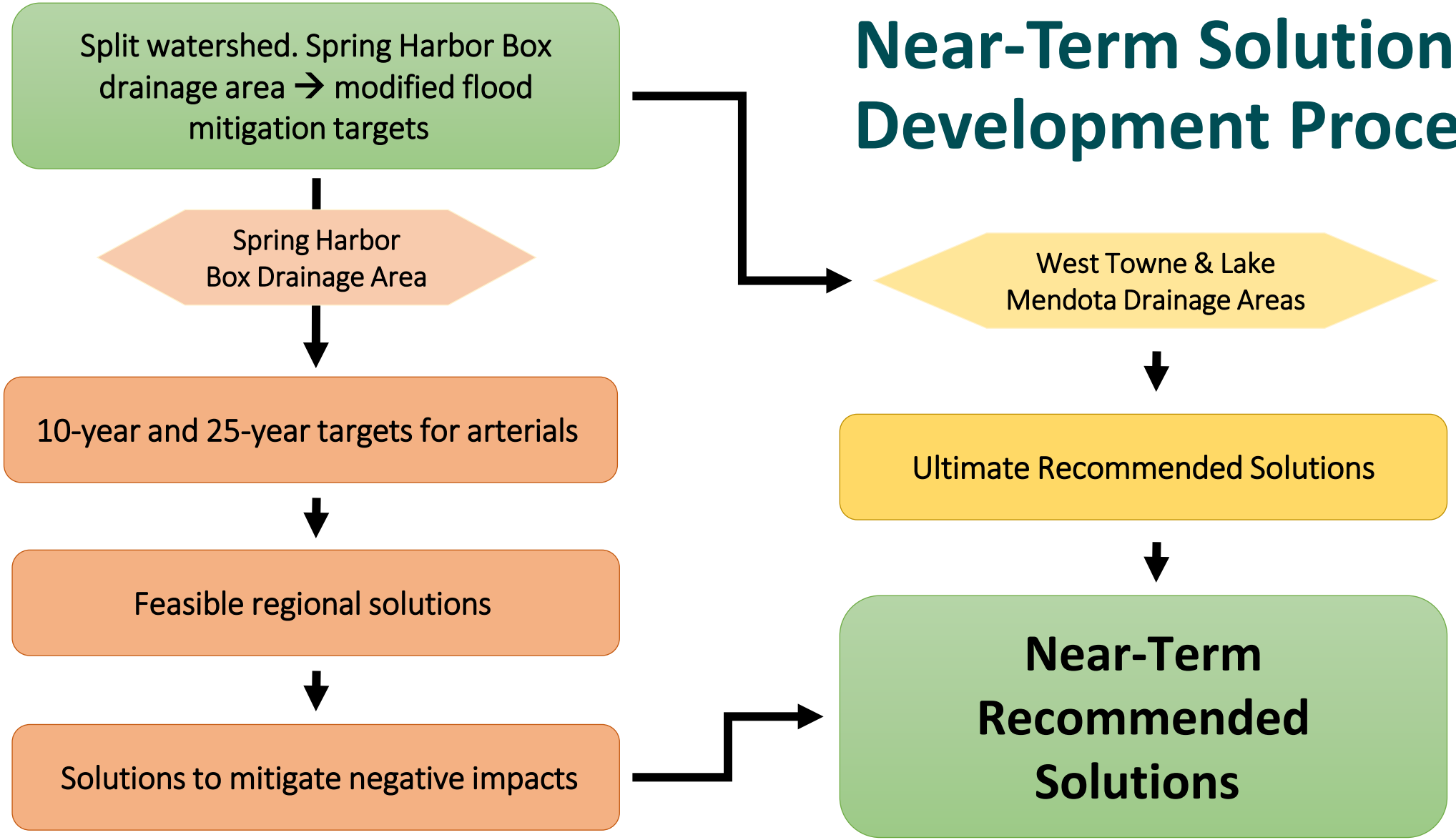
- Solutions To Mitigate Negative Impacts

Mitigate Negative Impacts:

- Craig Ave Local Storm Sewer Upsize
- South Hill Culvert



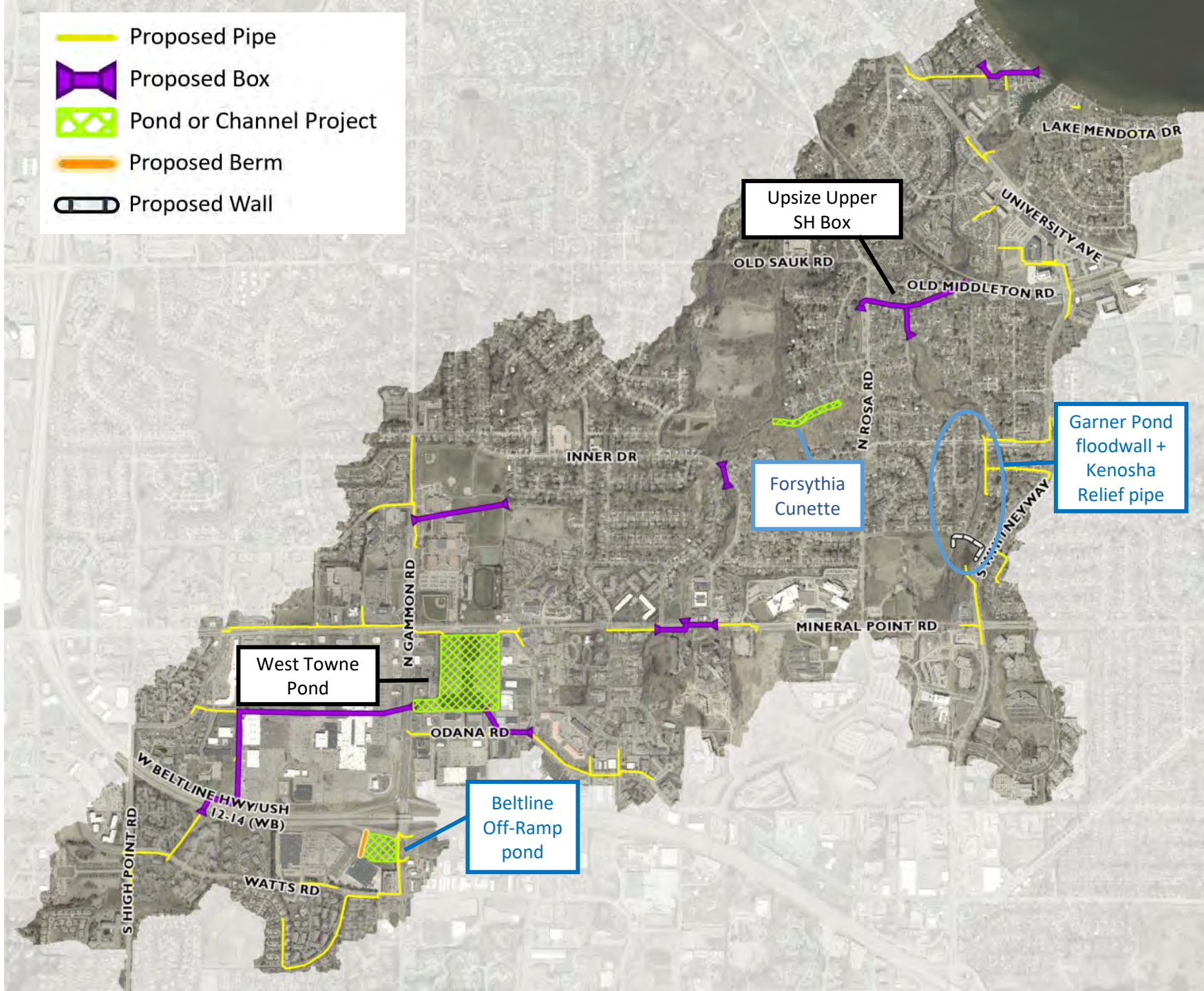
Near-Term Solutions Development Process



Near-Term Recommend Solutions

0-25 years

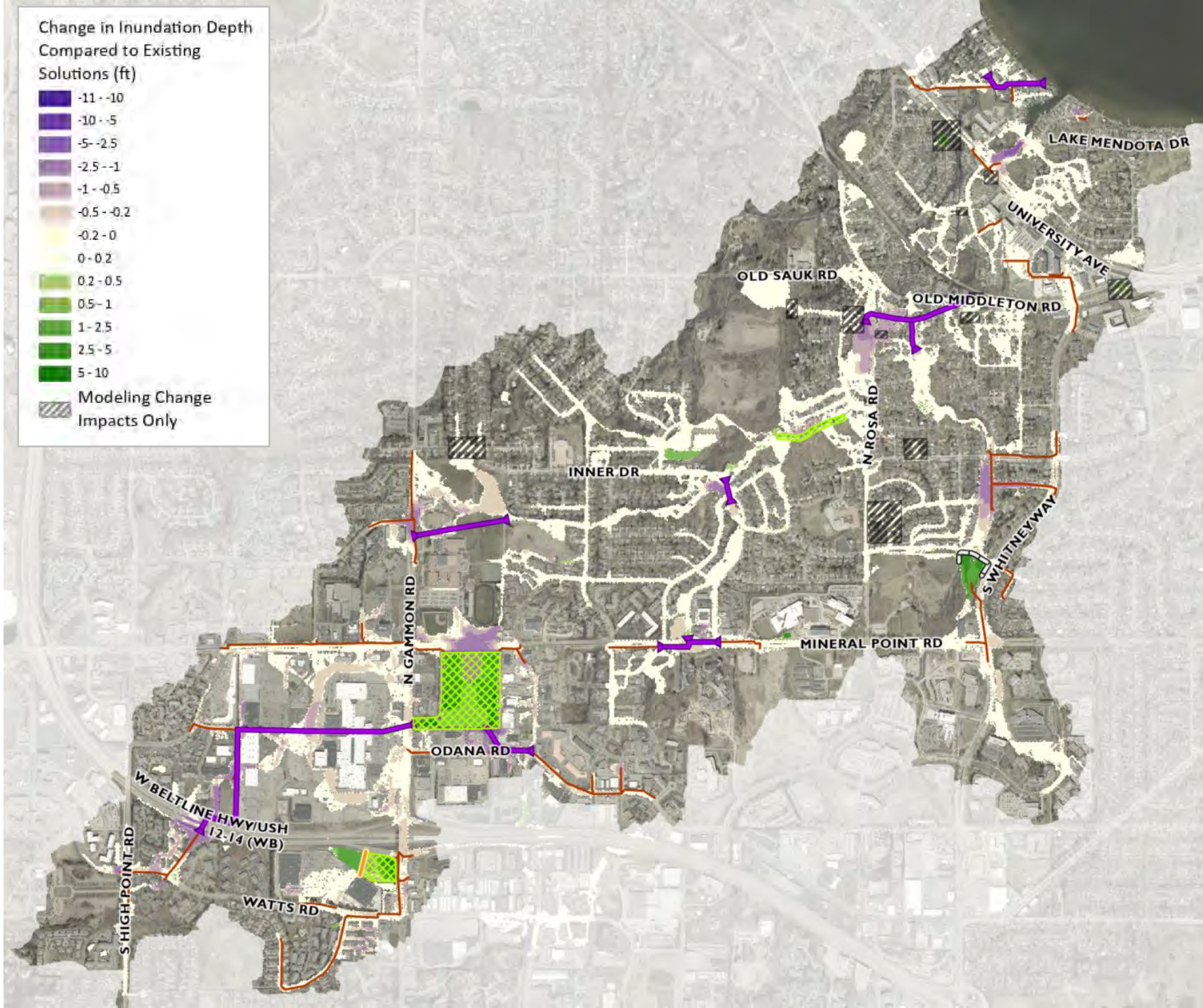
- **Only meets flood targets on arterials and in discrete drainage areas**
- Solutions from original study:
  - Upsize Upper Spring Harbor Box
  - West Towne Pond (Currently Programmed in 2025-2026)
  - Local Sewer upgrades on arterials
- New regional solutions:
  - Beltline Off-Ramp pond
  - Garner Park flood wall (4' high) + Kenosha relief pipe
  - Forsythia cunette (concrete channel) modifications
- Excludes:
  - Kenosha greenway
  - Masthead Gwy Pond
  - Forsythia Wall
  - Glen Oak Hills berms
  - Owen Park ditch
  - Upsize Lower Spring Harbor Box



Near-Term Recommend Solutions

- Solutions Mitigation Impacts

- Change in inundation from existing conditions shown on map
  - **Purple = Decrease in flood depth**
  - **Green = Increase in flood depth**
- Solutions don't meet all flood targets but **reduce flood risk**:
  - Arterial roads (BRT routes)
  - West Towne area
  - Gettle Ave
  - Kenosha/Burnette
  - No new negative impacts to streets or structures



Solutions Timeline

West Towne Pond Expansion
(Currently programmed in 2025-2026)

Budgeted Projects

2025-2030

Present

2030-2050

Near-Term Solutions

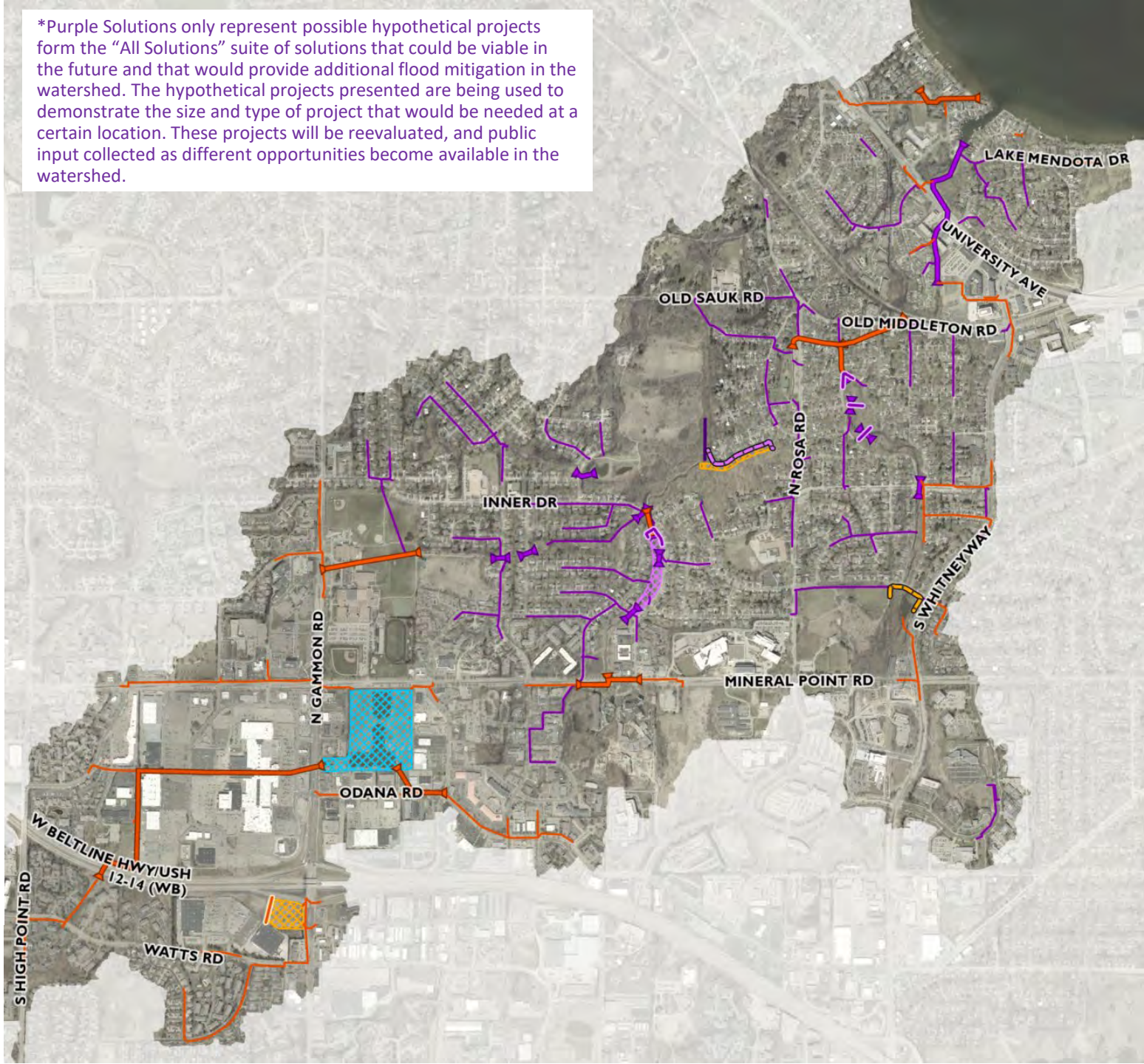
Beltline Off-Ramp Pond
Gettle Avenue Box (Upper Spring Harbor Box)
Glen Hwy Box
Kenosha Relief Pipe
Garner Park Flood Wall
Forsythia Cunette Modifications
South Hill Culvert
Local Sewer Upgrade on Craig Ave
Local Sewer Upgrades on Arterials
Local Sewer Upgrades for West Towne Pond and Direct Lake Mendota Drainage Areas

Lower Spring Harbor Box
Glen Oak Hills Park Greenway Berms
Masthead Greenway Ponds
Modified Forsythia Wall
Modified Owen Park Ditch
Local Sewer Upgrades Throughout Watershed
Greenway Crossings Upgrades Throughout Watershed

Hypothectical Future Solutions*

2050-2075

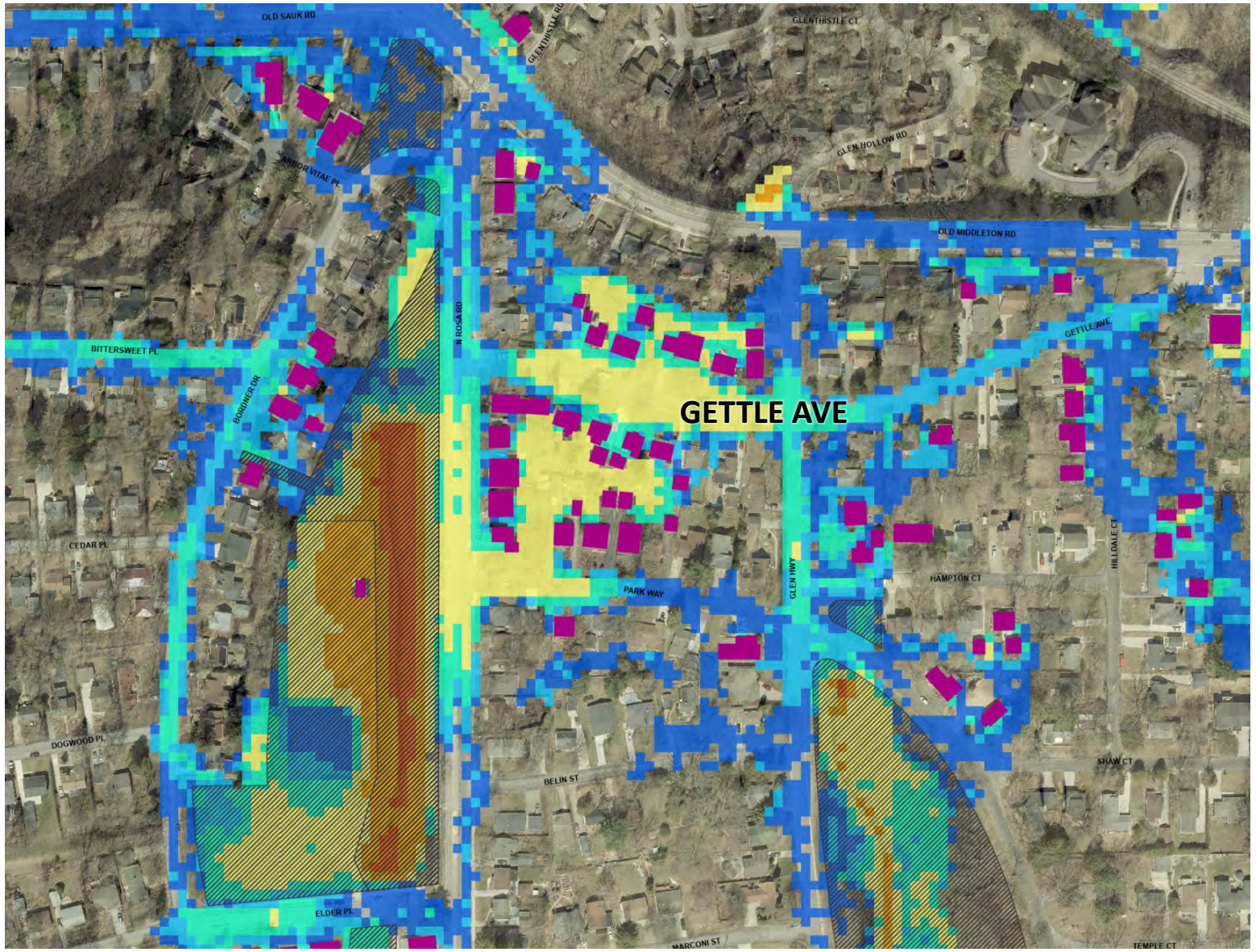
*Purple Solutions only represent possible hypothetical projects form the "All Solutions" suite of solutions that could be viable in the future and that would provide additional flood mitigation in the watershed. The hypothetical projects presented are being used to demonstrate the size and type of project that would be needed at a certain location. These projects will be reevaluated, and public input collected as different opportunities become available in the watershed.



Recommended Solutions Project Details

1% Chance Flooding
-Gettle Ave

- Overland flow from Bordner Park and Glen Oak Hills Park
- Significant home and road flooding



Flooded Structures

City Parks & Greenways

1% Chance Storm Inundation Depth (ft)

- 0.0 - 0.25
- 0.25 - 0.5
- 0.5 - 1
- 1 - 3
- 3 - 6
- 6 - 20

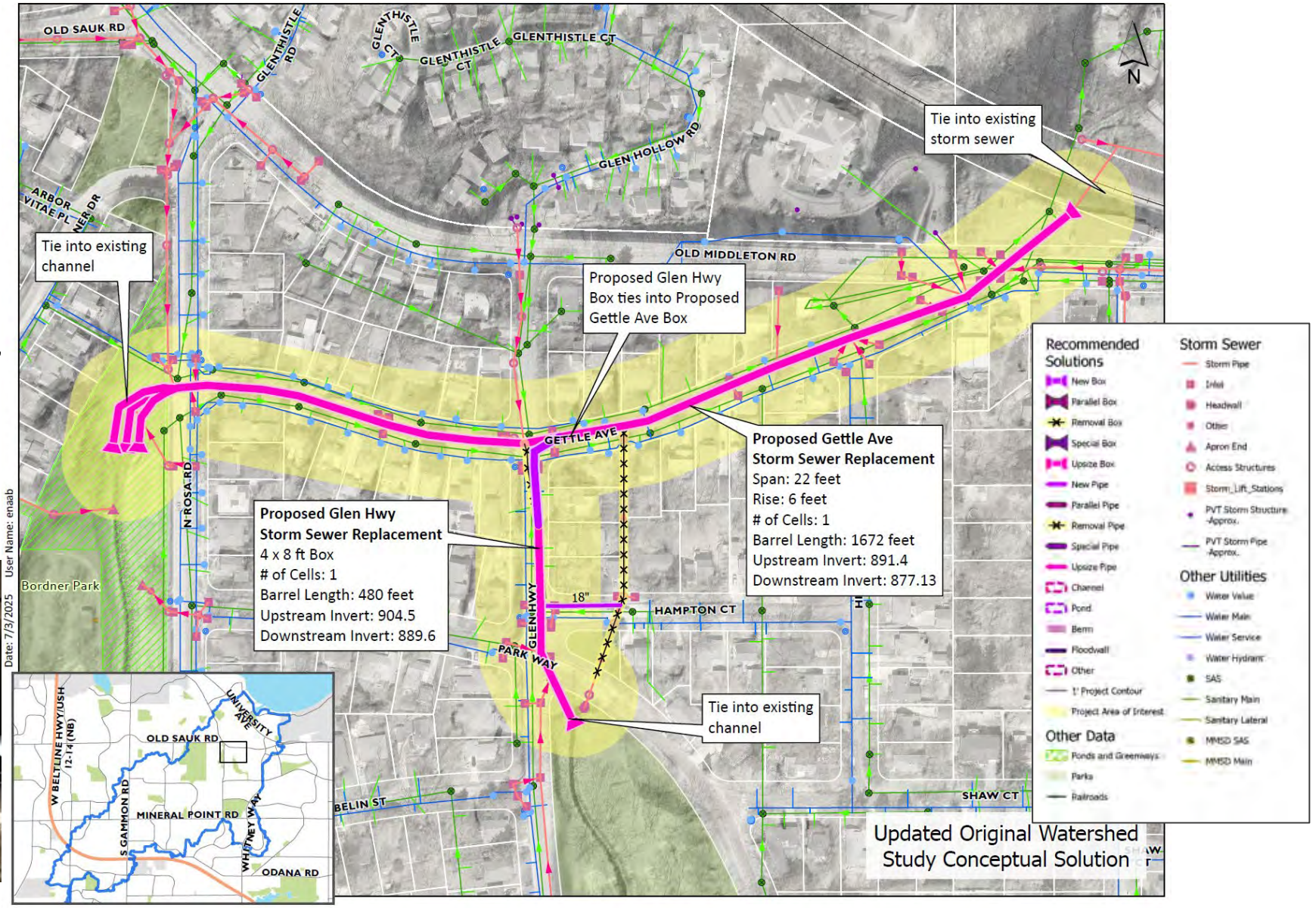
Recommend Solutions

-Upsized Upper Spring Harbor Box

NEAR TERM SOLUTION

Proposed Improvements

- Updated Conceptual Solution
- Upsize Gettle Ave box to 22’x6’ box (current box is 14’x6’ to 17’x6’ box)
- New 4’x8’ box down Glen Hwy



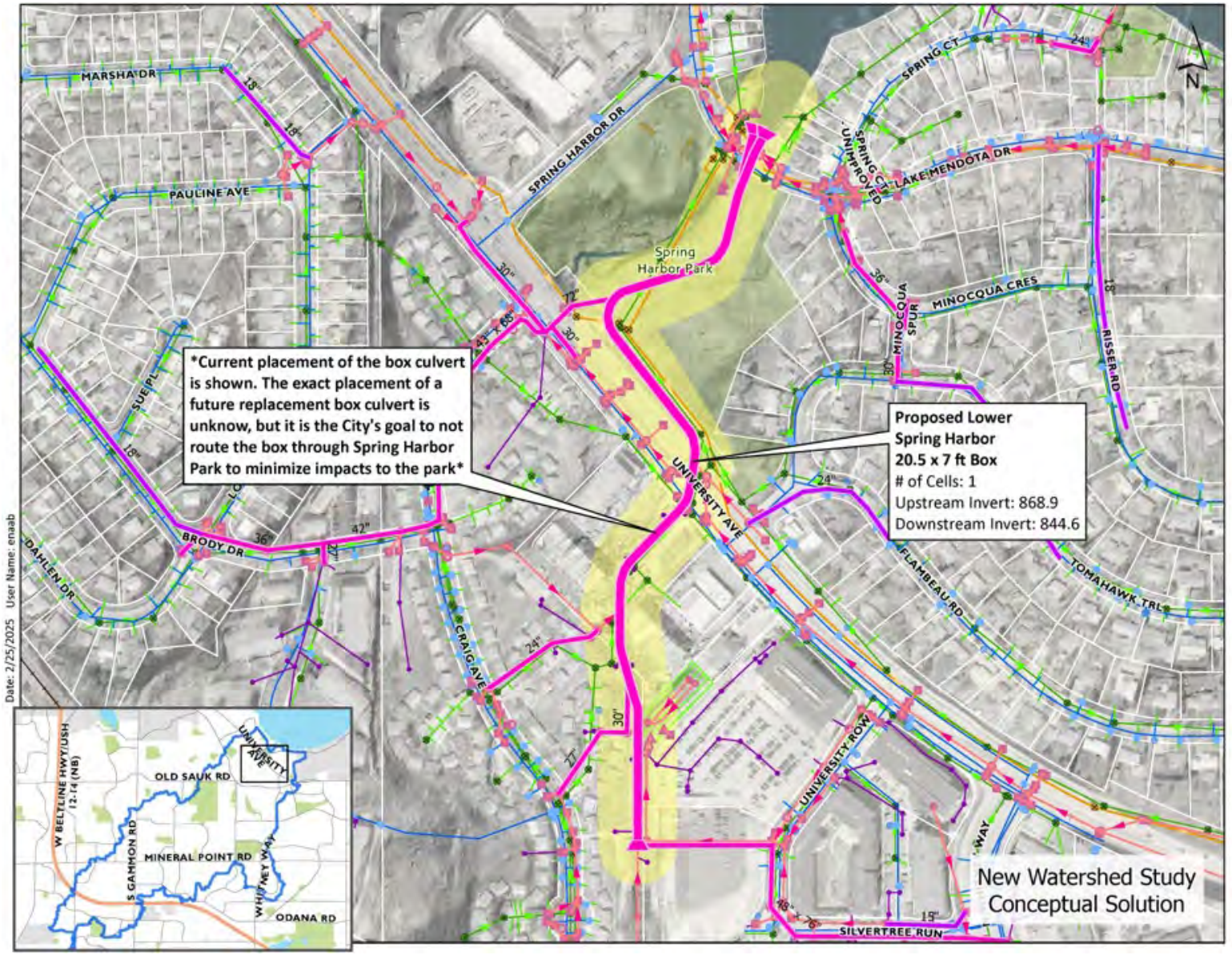
Recommend Solutions

-Upsized Lower Spring Harbor Box

HYPOTHETICAL FUTURE SOLUTION

Proposed Improvements:

- New conceptual solution
- Upsized box to 20.5'x7’ (current box is 19.5'x6’)
- Alternative to additional storage solutions in the upper portions of the watershed



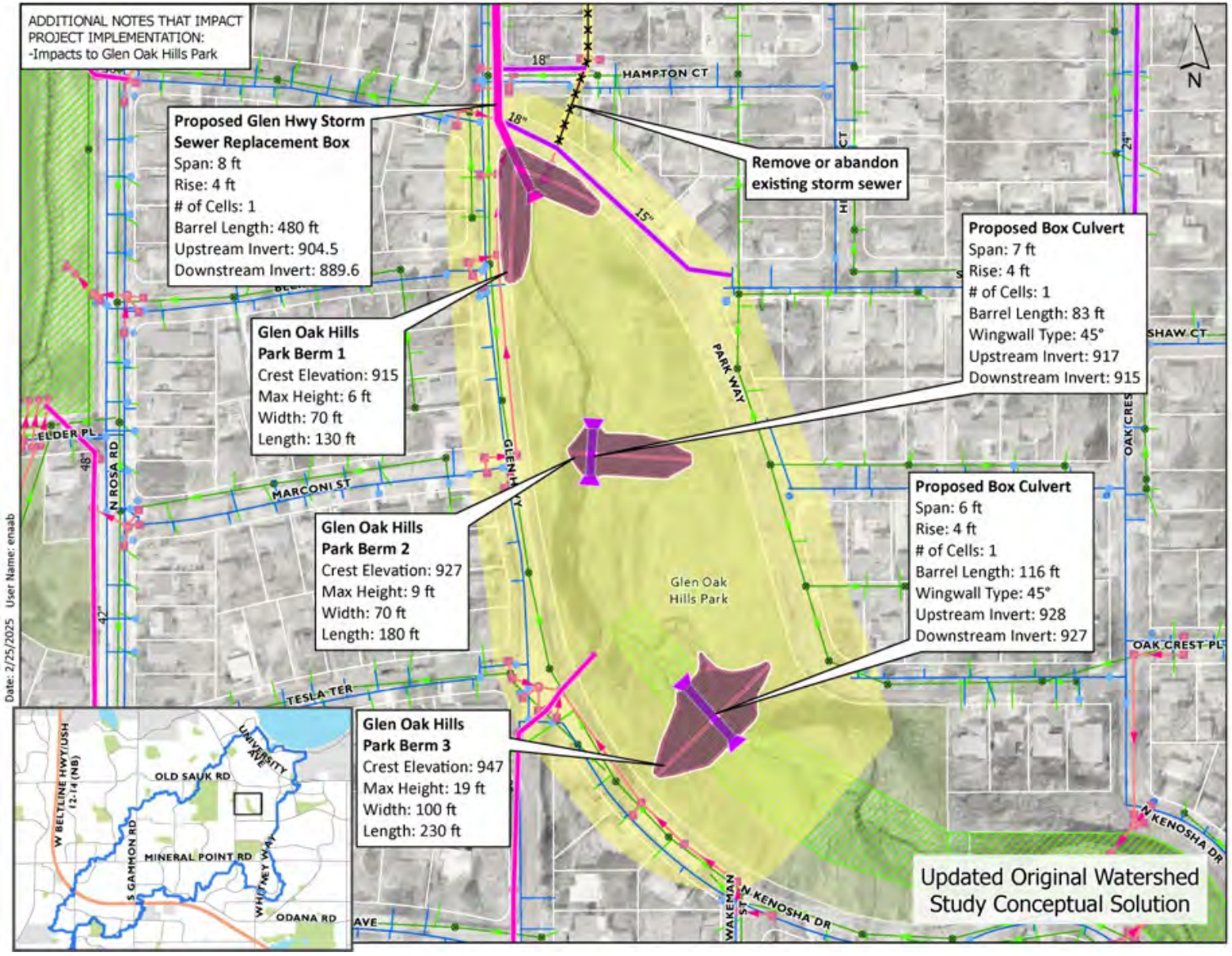
Recommend Solutions

-Glen Oak Hills Berms – Original Conceptual Solution

HYPOTHETICAL FUTURE SOLUTION

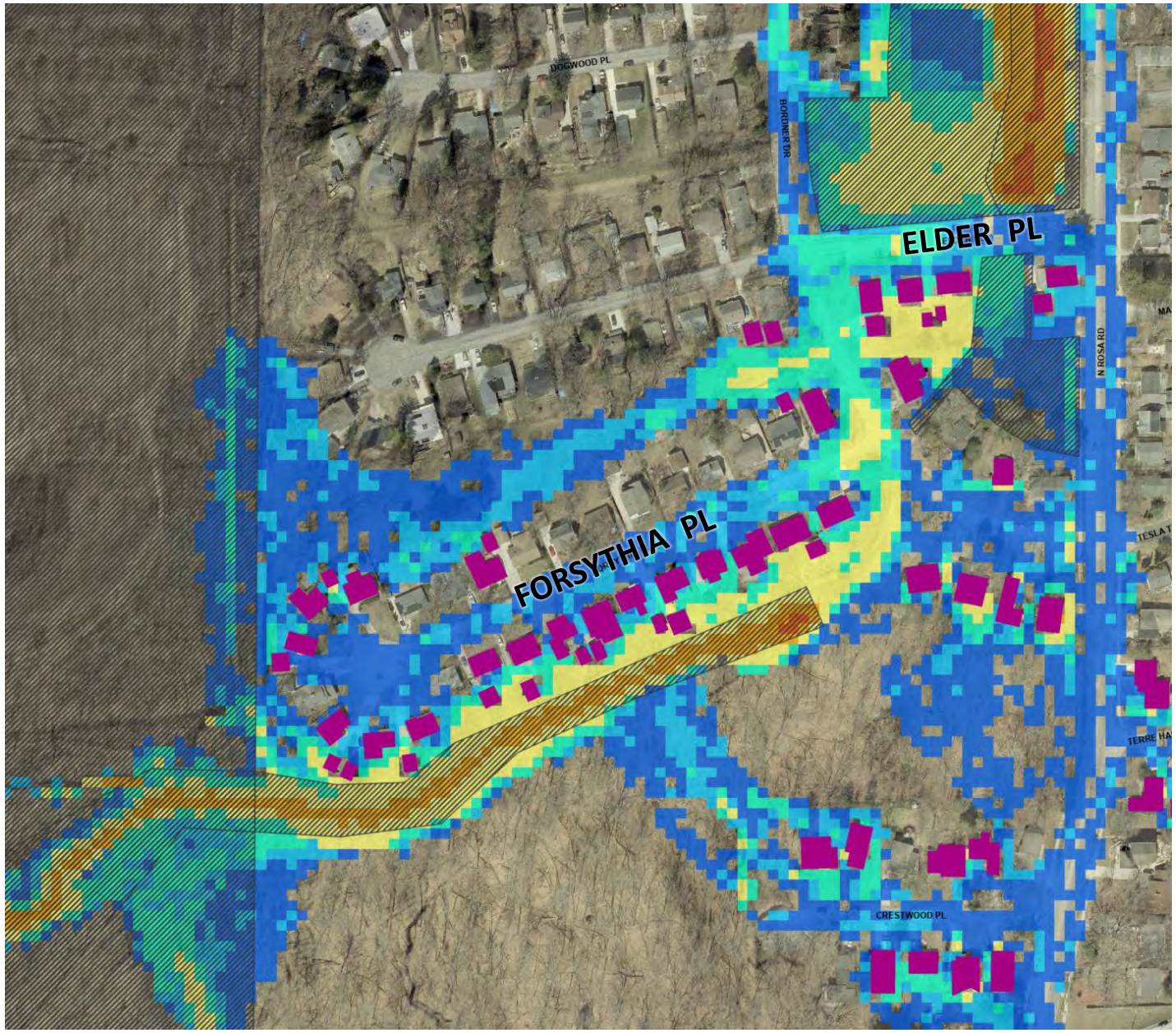
Proposed Improvements

- Updated Conceptual Solution
- Three berms ranging from 6 ft to 19 ft in height
- New box storm sewers
- Berms create additional storage and hold water in greenway instead of allowing it to flow down Glen Hwy and create flooding at Gettle Ave



1% Chance Flooding
-Forsythia Pl and Elder Pl

- Cunette overtopping
- Significant home and road flooding



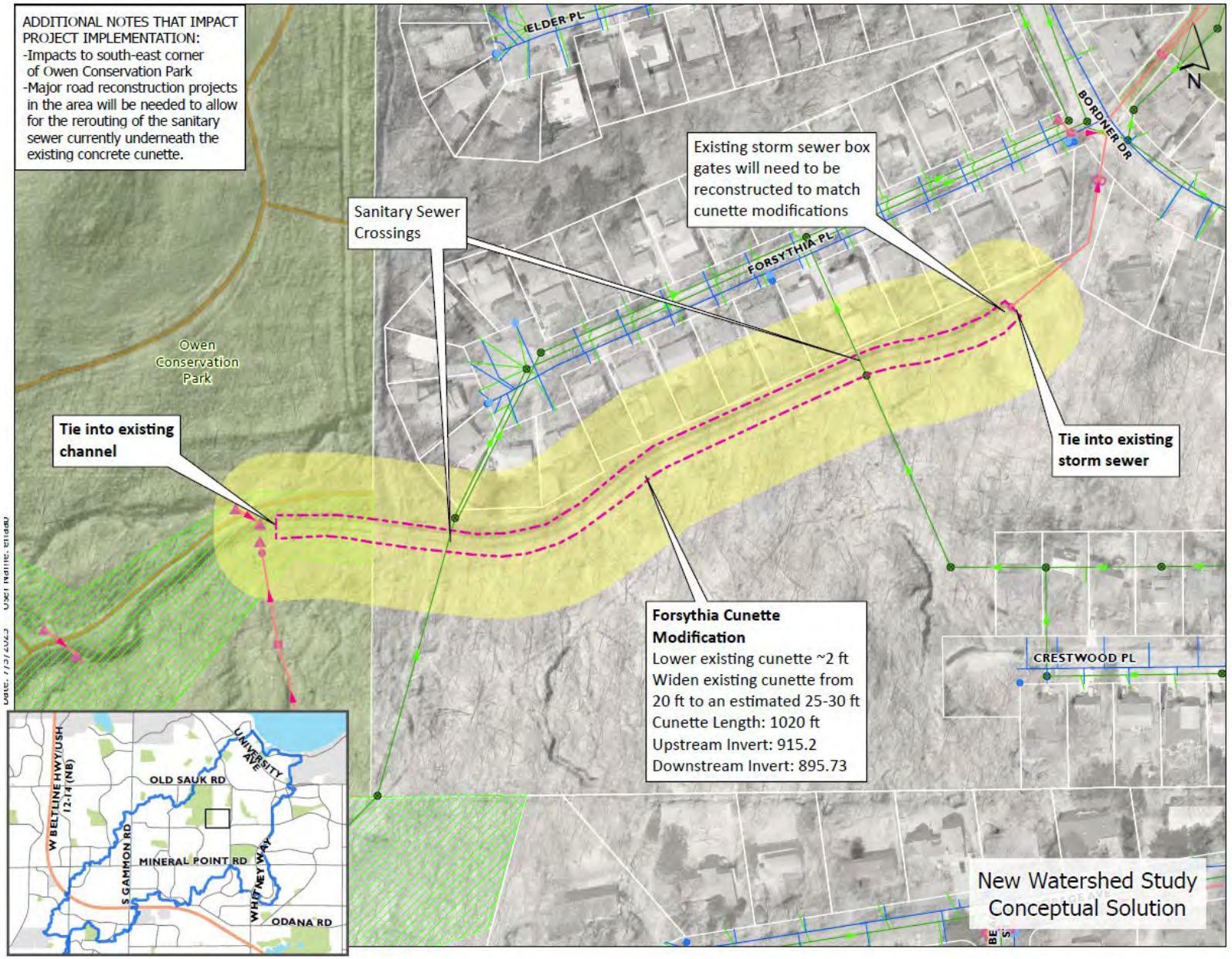
Recommend Solutions

-Forsythia Cunette Modifications

NEAR TERM SOLUTION

Proposed Improvements

- New conceptual solution
- Widen and lower existing concrete cunette
- **To complete the project, major road reconstruction projects would need to be completed to allow for the rerouting of the sanitary sewer currently underneath the existing concrete cunette**



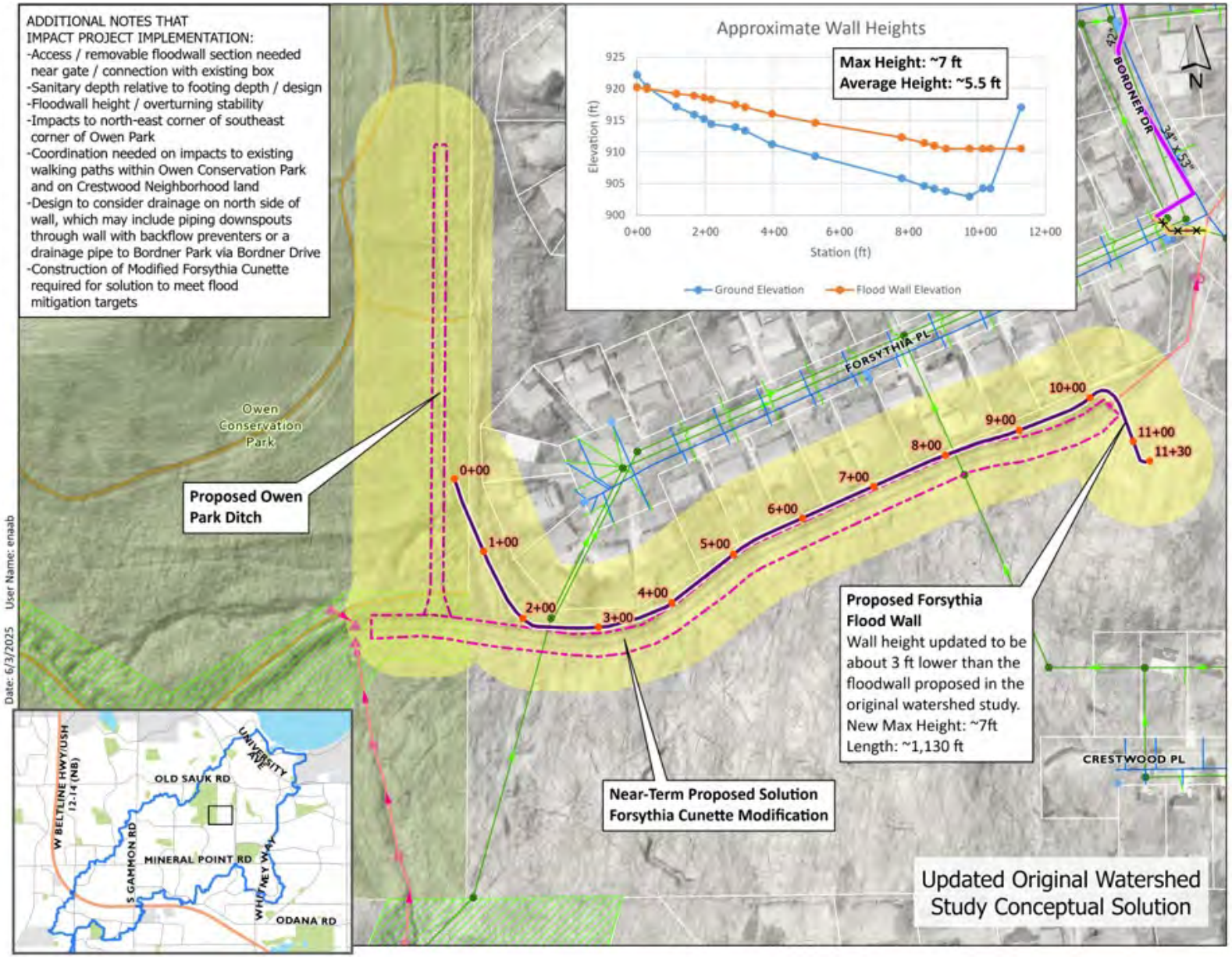
Recommend Solutions

-Forsythia Wall & Owen Park Ditch

HYPOTHETICAL FUTURE SOLUTION

Proposed Improvements

- Updated Conceptual Solution
- North-South Channel
  - ~2’ deep trapezoidal channel
  - 16’ wide **(compared to original 40’ proposed width)**
- Flood Wall - Up to 7.5’ tall **(~3' less than original wall proposed height)**



Recommend Solutions

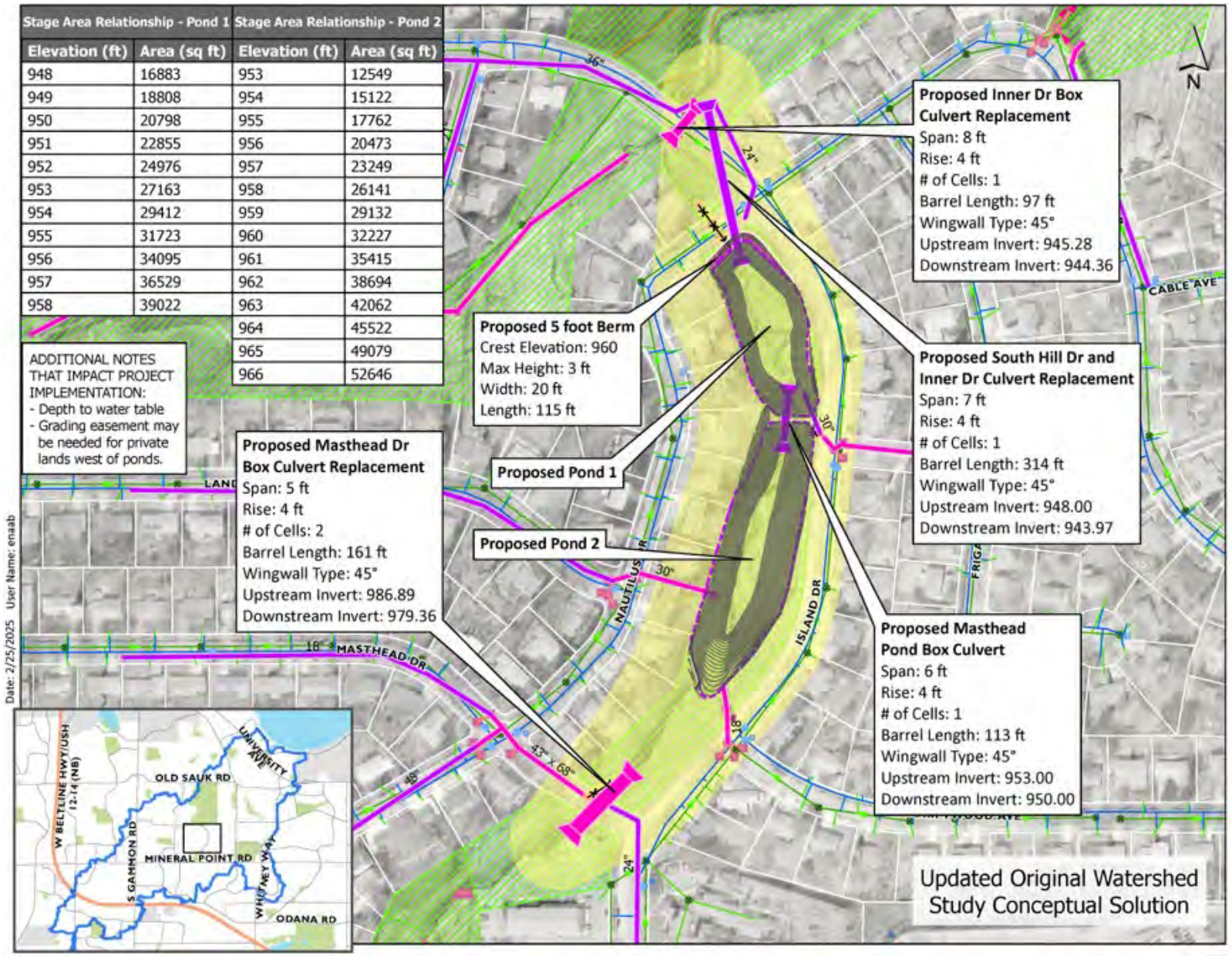
-Masthead Gwy Pond

HYPOTHETICAL FUTURE SOLUTION

Proposed Improvements:

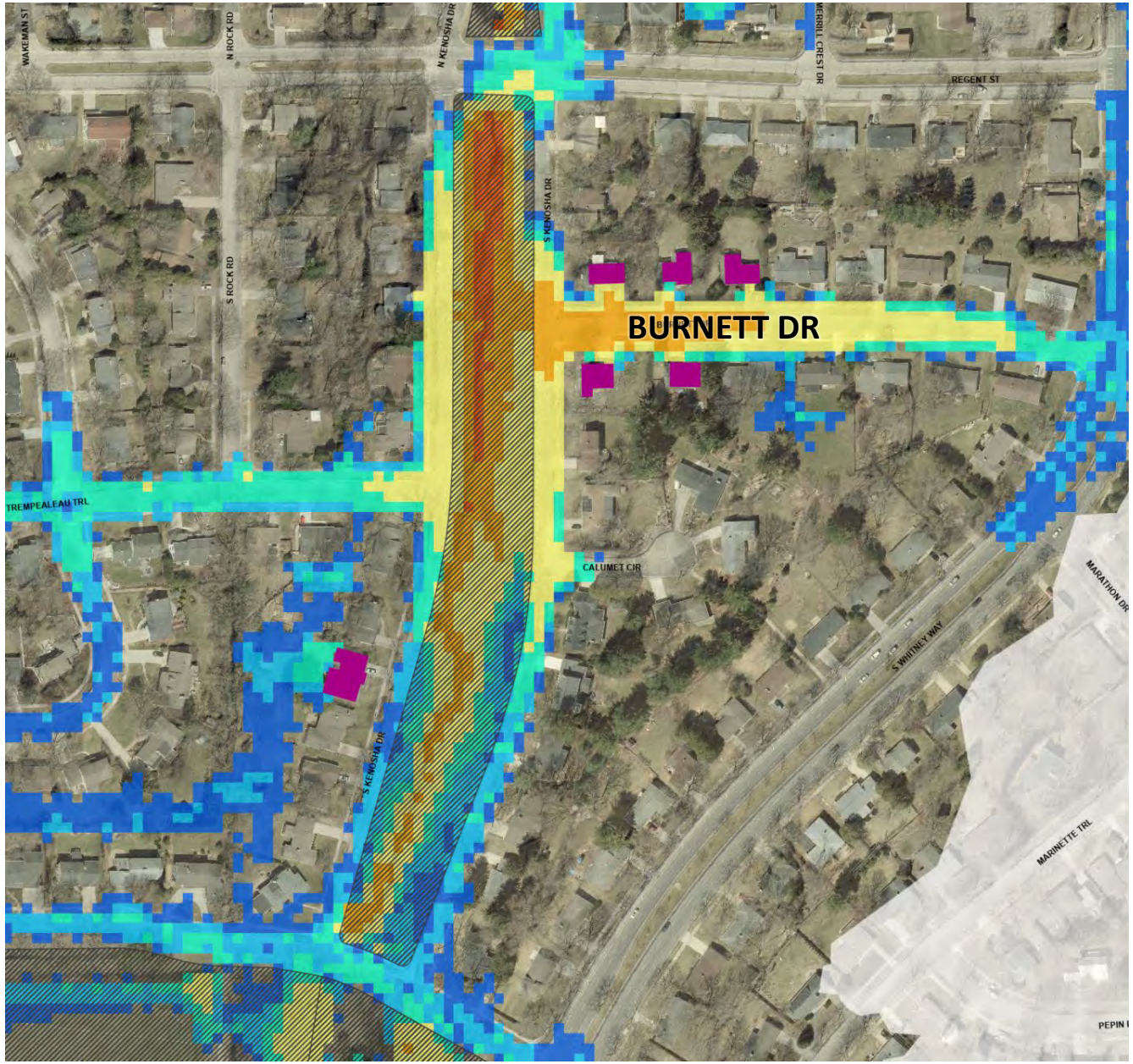
- Updated Conceptual Solution
- Two regional detention ponds (northern pond depth ~10ft and southern pond depth ~13ft)
- New box storm sewers

Stage Area Relationship - Pond 1		Stage Area Relationship - Pond 2	
Elevation (ft)	Area (sq ft)	Elevation (ft)	Area (sq ft)
948	16883	953	12549
949	18808	954	15122
950	20798	955	17762
951	22855	956	20473
952	24976	957	23249
953	27163	958	26141
954	29412	959	29132
955	31723	960	32227
956	34095	961	35415
957	36529	962	38694
958	39022	963	42062
		964	45522
		965	49079
		966	52646



1% Chance Flooding
-Kenosha Greenway

- Greenway overtops at Regent St and Burnett Dr
- Significant home and road flooding



Flooded Structures
City Parks & Greenways
1% Chance Storm Inundation Depth (ft)
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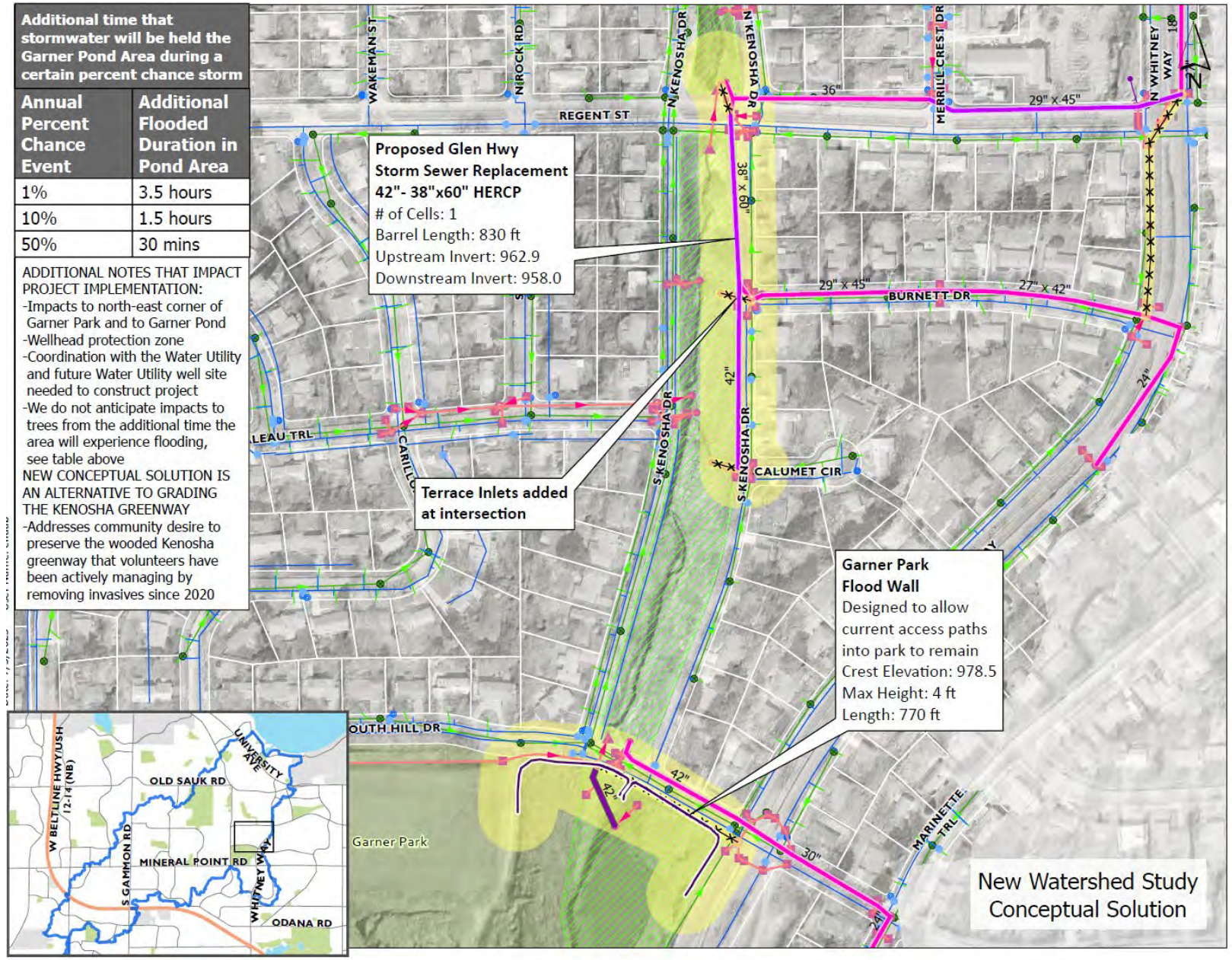
Recommend Solutions

-Garner Park Flood Wall + Kenosha Relief Pipe

NEAR TERM SOLUTION

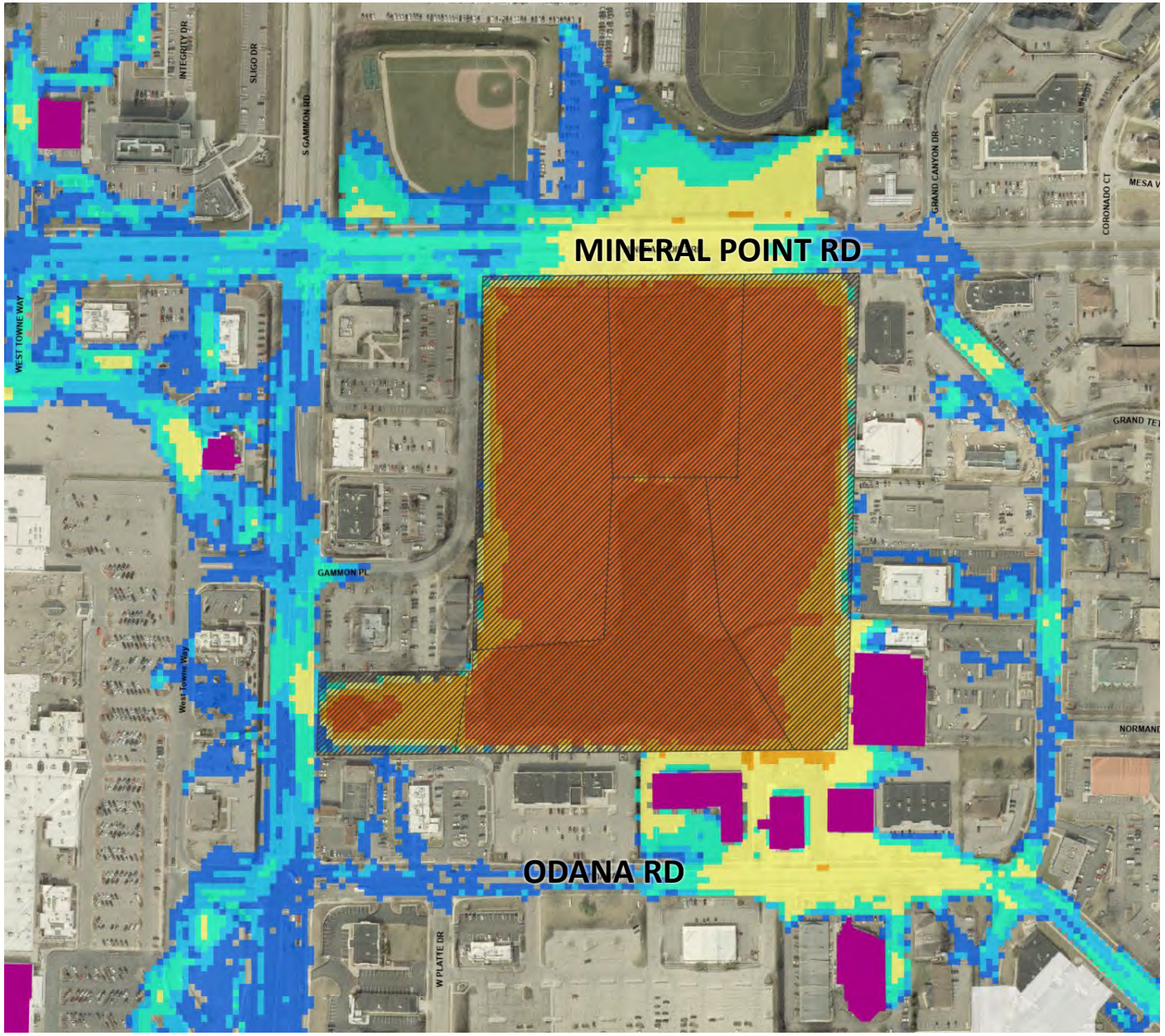
Proposed Improvements:

- New conceptual solution, ALTERNATIVE to grading the Kenosha greenway
- Addresses community desire to preserve the wooded greenway that volunteers have been actively managing
- 4' tall wall to hold water in Garner Park Pond during large events
- 42" relief pipe to on S. Kenosha Drive
- Coordination with future Water Utility well site



1% Chance Flooding
- West Town Pond

- Flooding of multiple arterial roads
- Significant business flooding



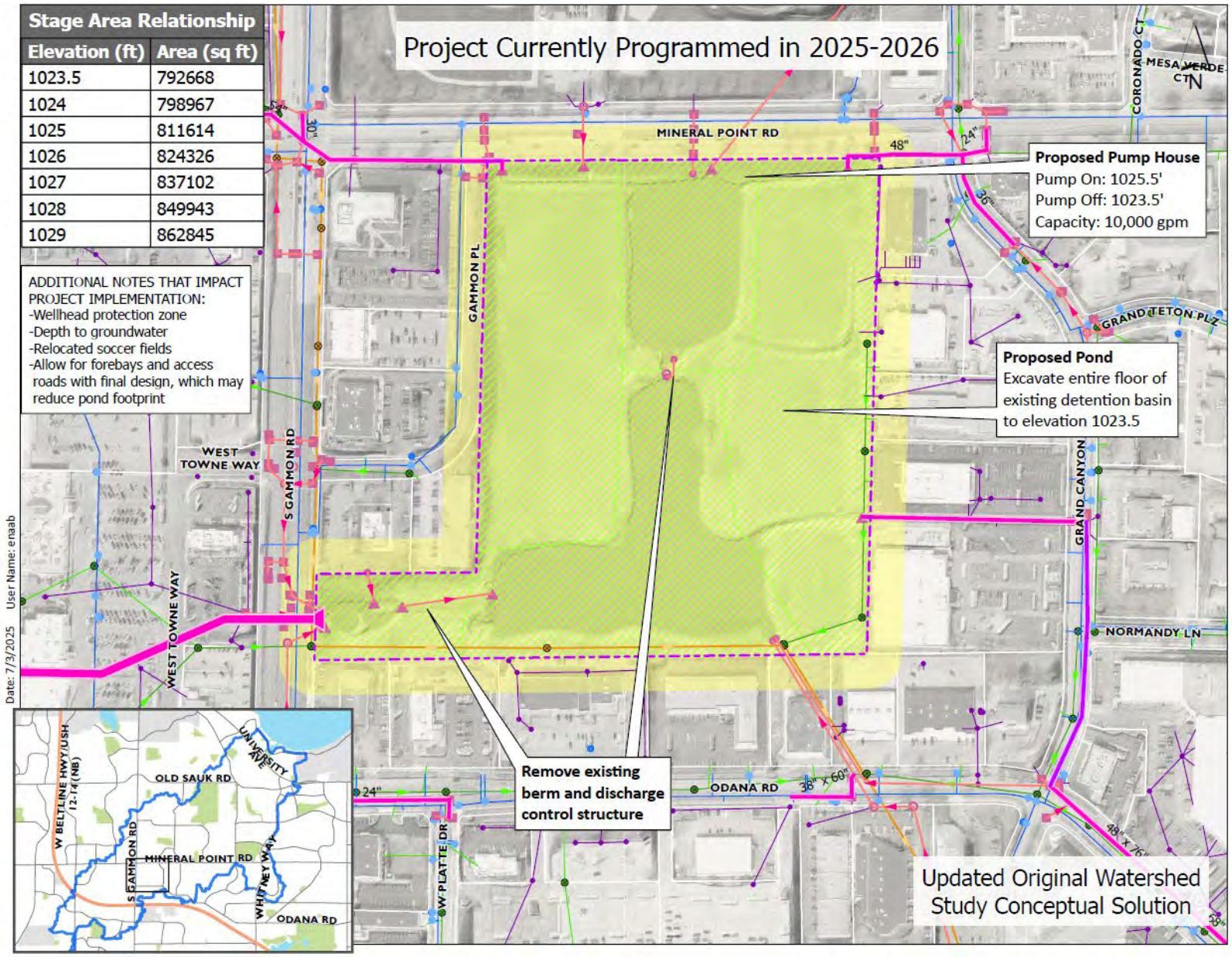
Recommend Solutions

-West Towne Pond

SOLUTION CURRENTLY PROGRAMMED IN 2025-2026

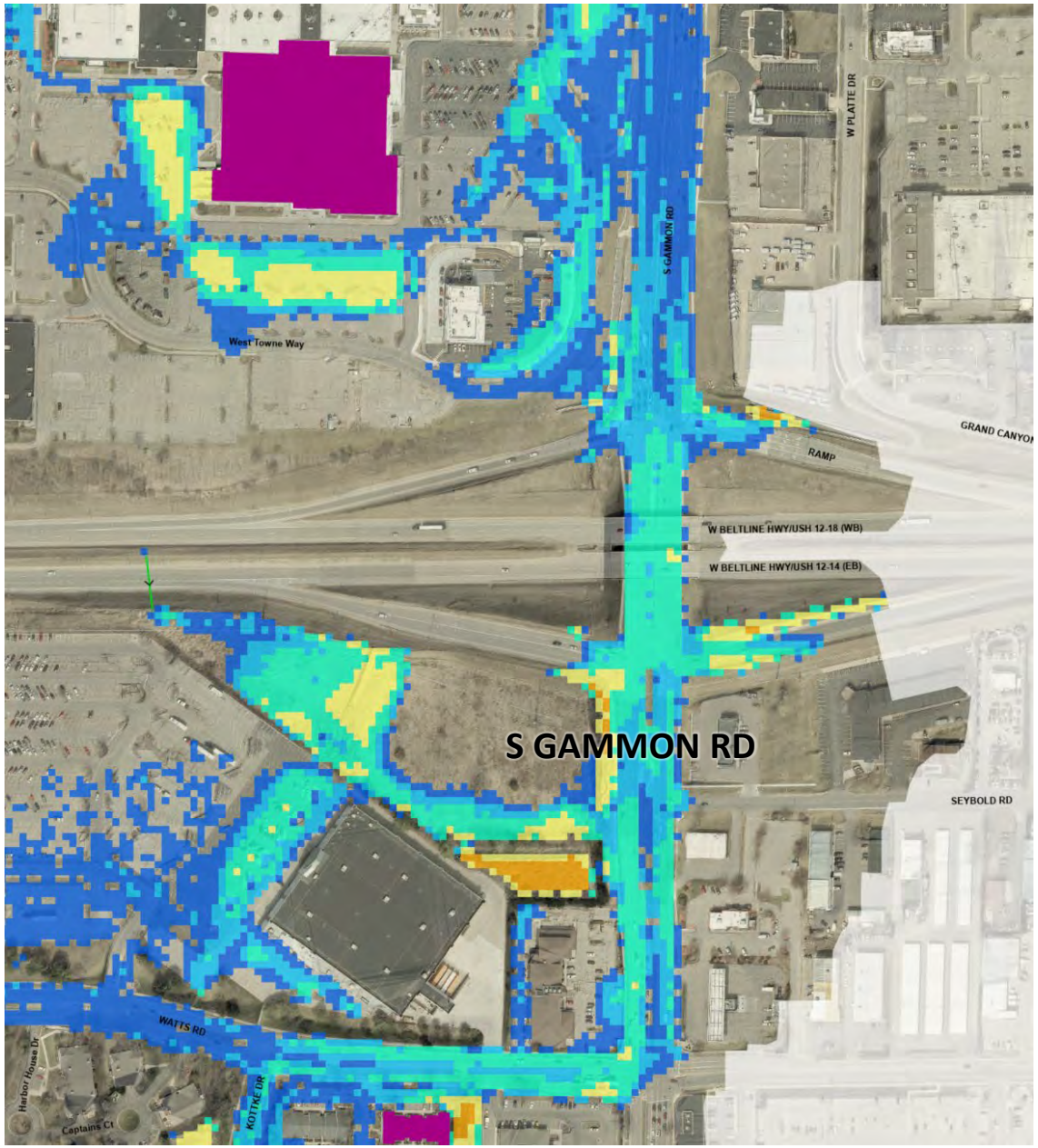
Proposed Improvements

- Updated Conceptual Solution
- Excavate existing soccer field area down ~7’
- Combine current three “ponds” into a single large pond
- New small pump house to lower normal pool 2.0’
- **Improvements do not add to downstream flooding issues**



1% Chance Flooding
- S Gammon Rd

- Significant flooding of an arterial road



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1% Chance Storm Inundation Depth (ft)

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- 6 - 20

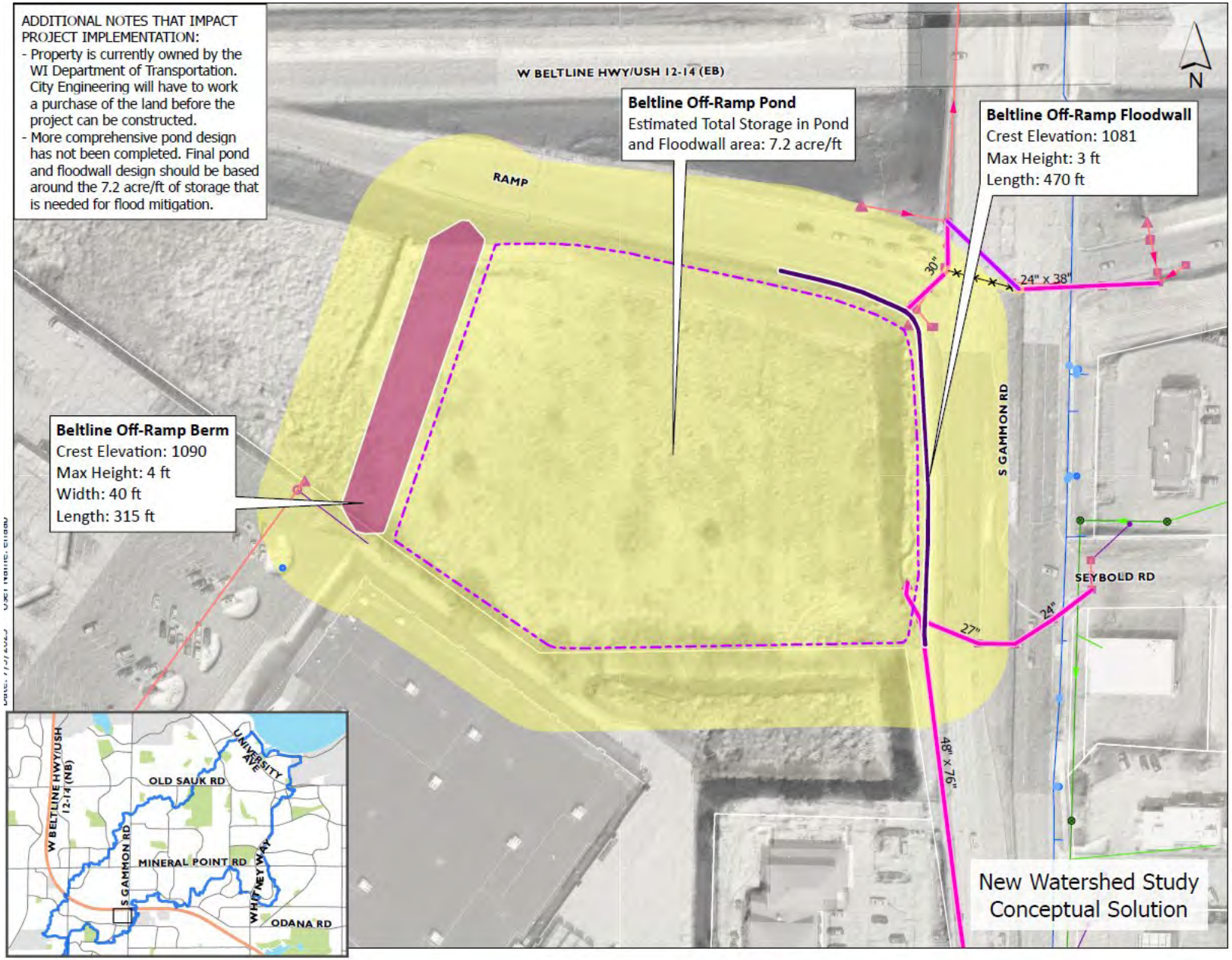
Recommend Solutions

-Beltline Off-Ramp Pond and Berm

NEAR TERM SOLUTION

Proposed Improvements:

- New conceptual solution
- Regrading around 3.37 acres to create new pond
- 4.5ft berm along the edge of new pond



Recommendations Solutions Costs

- 2024 Dollars

Near-Term Solutions (0-25yrs)

- Upsized Upper Spring Harbor box - $9M
- New regional solutions
  - Beltline Off-Ramp pond - $1.5M
  - Garner Park flood wall & Kenosha relief sewer - $2.7 M
- Regional solutions
  - West Towne Pond - $4.5M (Currently programmed in 2025-2026)
  - Forsythia Cunette modifications - $5 M
- South Hill Culvert - $0.7M
- Local Sewer

- **Total without local sewer: $23.4M**

All Solutions (0-50yrs)

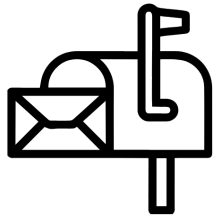
- Upsized Upper & Lower Spring Harbor box - $9M (upper) + $12M (lower)
- New regional solutions
  - Beltline Off-Ramp pond - $1.5M
  - Garner Park flood wall & Kenosha relief sewer - $2.7M
- Regional solutions
  - West Towne Pond - $4.5M (Currently programmed in 2025-2026)
  - Masthead Greenway Pond - $2.6M
  - Forsythia Wall (shorter) + Cunette modifications - $7.1M
  - Glen Oak Hills berms – $1.8M
- Greenway Crossings - $4.7M
- Local Sewer

- **Total without local sewer: $46M**

City Modeling

-Recent Milestones

- City modeling started in August 2022
- Meetings with Parks staff, Water Utility staff, and with Alders of impacted Districts – 2024
- PWI – April 2024
- PIM 4 – August 2024
  - PIM to present work completed by the City since the original report
  - Focus Groups – Breakout rooms following PIM
- BPC – November 2024



~ 9,300 postcards sent for PIM 4

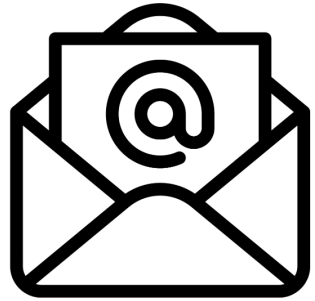
~80 Registrants for PIM 4

Breakout Rooms following PIM 4

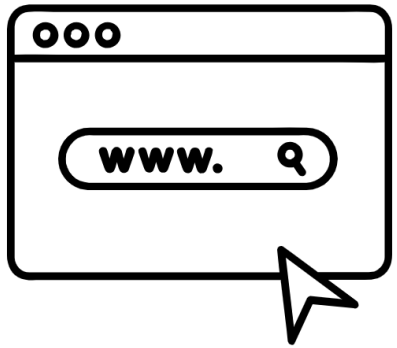
City Modeling

-Recent Milestones

- Watershed Study Report Amendment posted – 02/28/25
  - Details work completed by the City since the original report
  - Details the new sets of proposed solutions
- Public Comment Period on Study Amendment – 02/28/25 – 3/30/25
  - Comments & questions from 5 residents
  - Remaining concern mostly involves Future Hypothetical Conceptual Solution Forsythia Wall
  - City staff responded and provided additional information to concerned residents
- BPW – 7/16/25
  - Final Spring Harbor Watershed Study Report with report Amendment and public comments & questions



162 Project Email Subscribers



~720 Watershed Study Webpage Views since July 2023

Recommendations and Next Steps

- Recommendations:
  - Begin implementing Near-Term Solutions (5-25 years)
  - Future hypothetical solutions can be considered once the lower box needs to be replaced and is upsized
  - City continues building Green Infrastructure watershed-wide and continues encouraging residents to install Green Infrastructure

Discussion and Questions