Welcome!
We will begin shortly…

Virtual Meeting Schedule	
6:30 – 8:00	Welcome & Presentation
8:00 – 8:30	Presentation Q & A (General) & Zoom Breakout Rooms
8:30	Come Back Together/Wrap-Up

CITY OF MADISON

Spring Harbor Watershed Study Public Information Meeting #4

City of Madison Engineering Division
Tuesday, August 27th

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Meeting Technical Housekeeping

- This meeting will be **recorded** and posted to the project page.
- All attendees should be **muted** to keep background noise to a minimum.
- Use the **"Chat"** button for technical issues with meeting to troubleshoot with staff to assist.
- Use the **"Chat"** button to type questions about presentation. Questions will be answered live after the presentation.
- Inappropriate questions may be dismissed.
- Use the **"raise your hand"** button to verbally ask your question. You will be prompted to unmute when it is your turn.

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This meeting is being recorded.

It is a public record subject to disclosure.

By continuing to be in the meeting, you are consenting to being recorded and consenting to this record being released to public record requestors.

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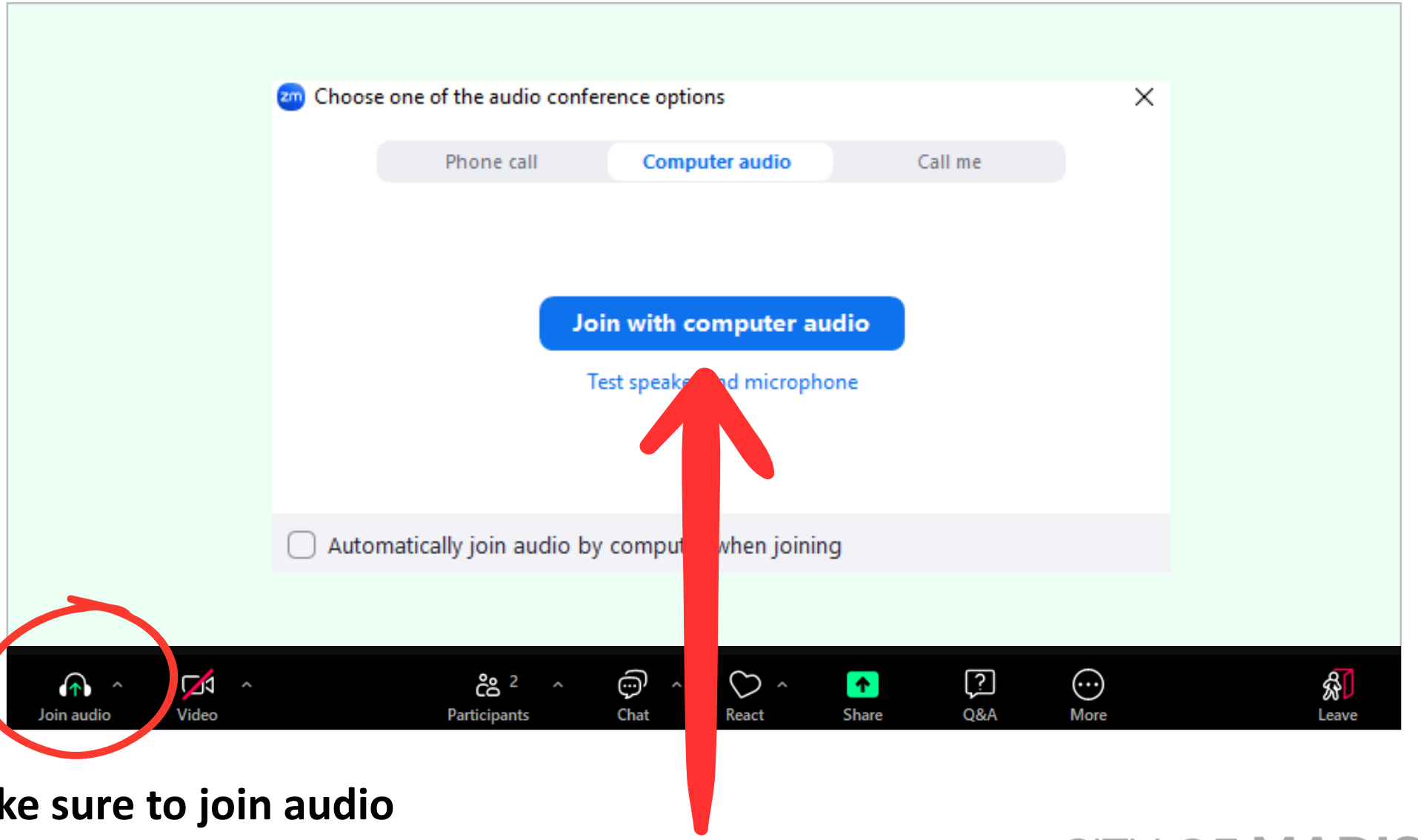
How to Participate



Make sure to join audio

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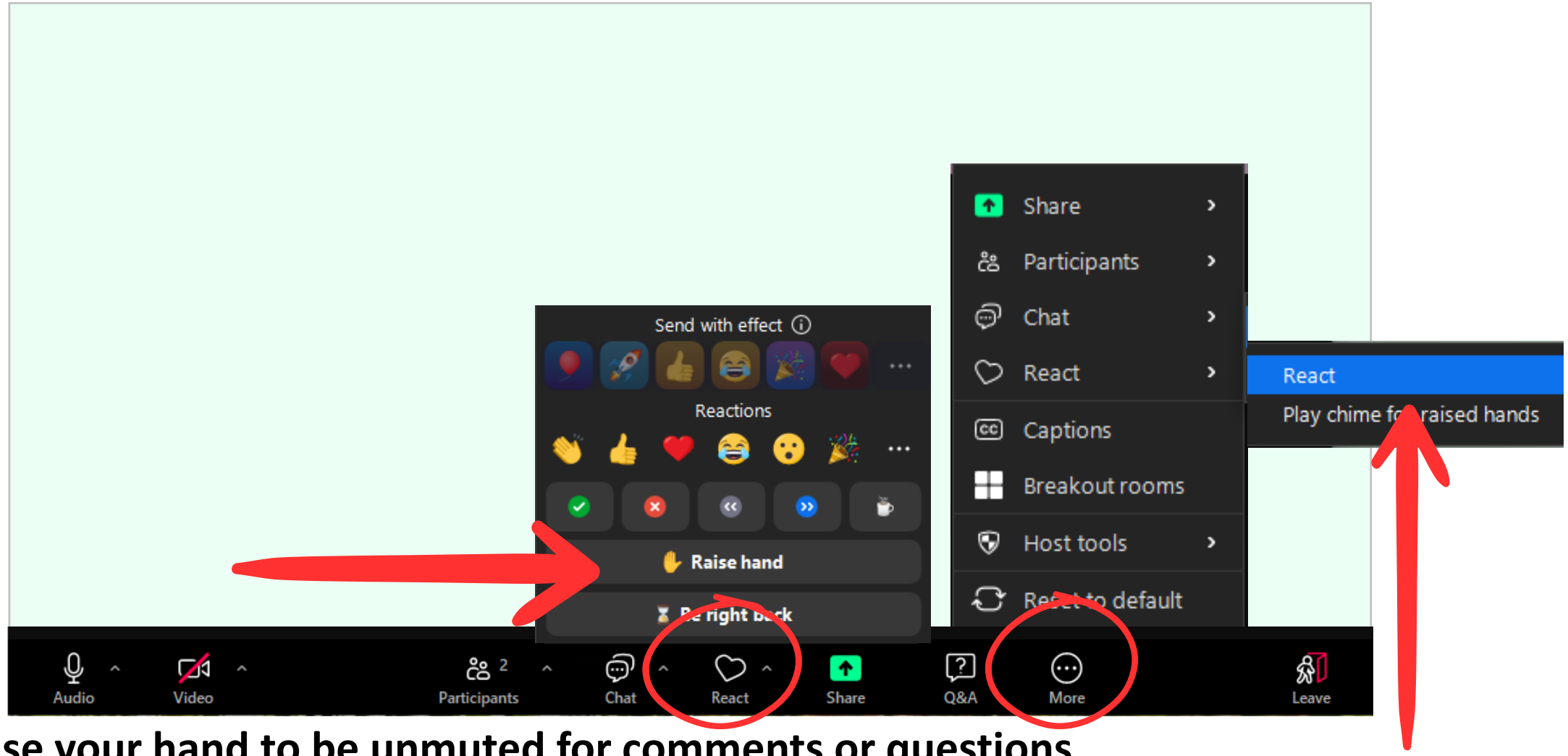
How to Participate



To raise your hand to be unmuted for comments or questions, click “React” and “Raise Hand”. If not shown, first click “More” to open the “React” menu.

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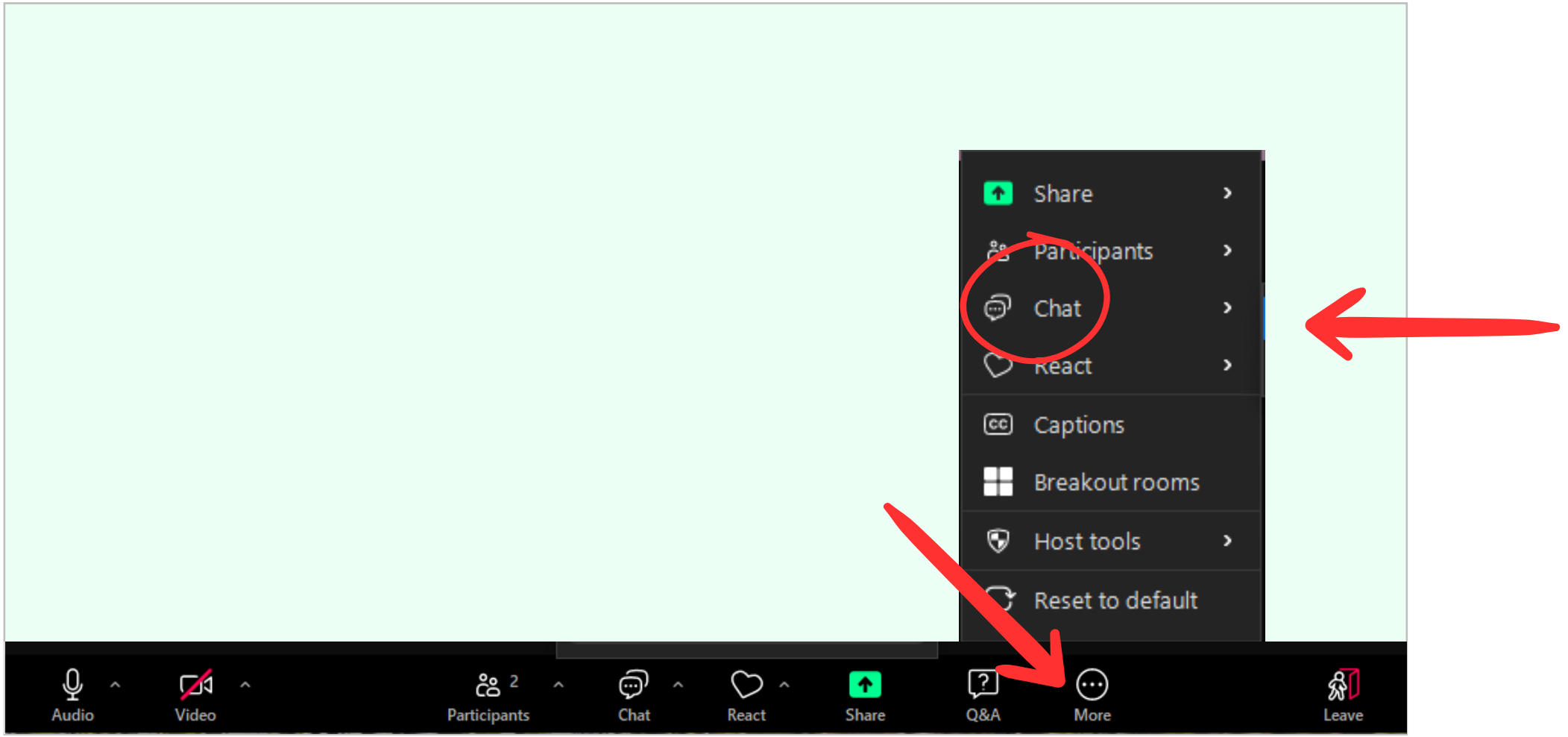
How to Participate



To use the Chat if you have technical issues or a question for the panelists, click “Chat”. If not shown, first click “More” to open “Chat”.

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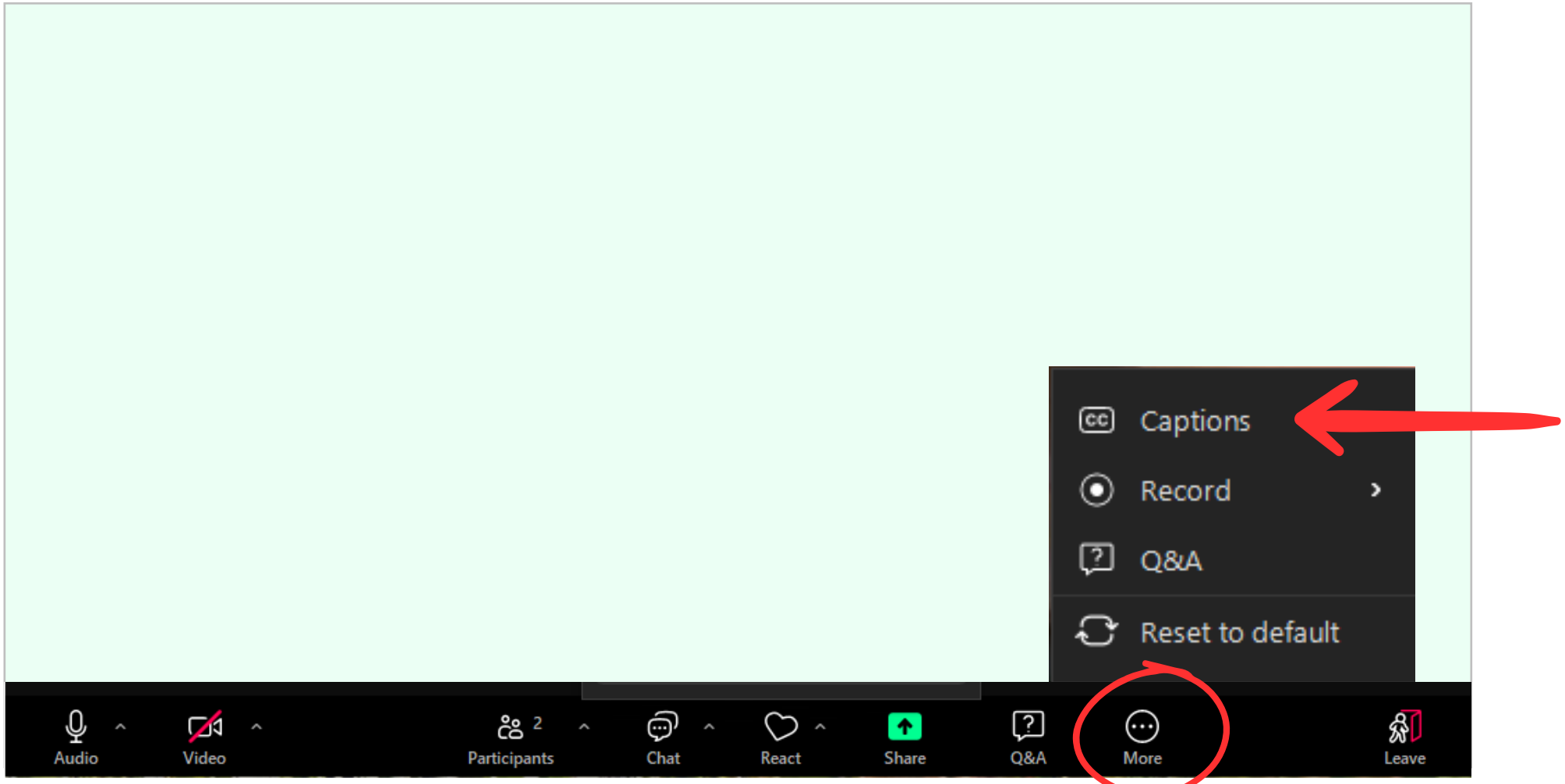

To show zoom automated captions, click “More” and then “Captions”

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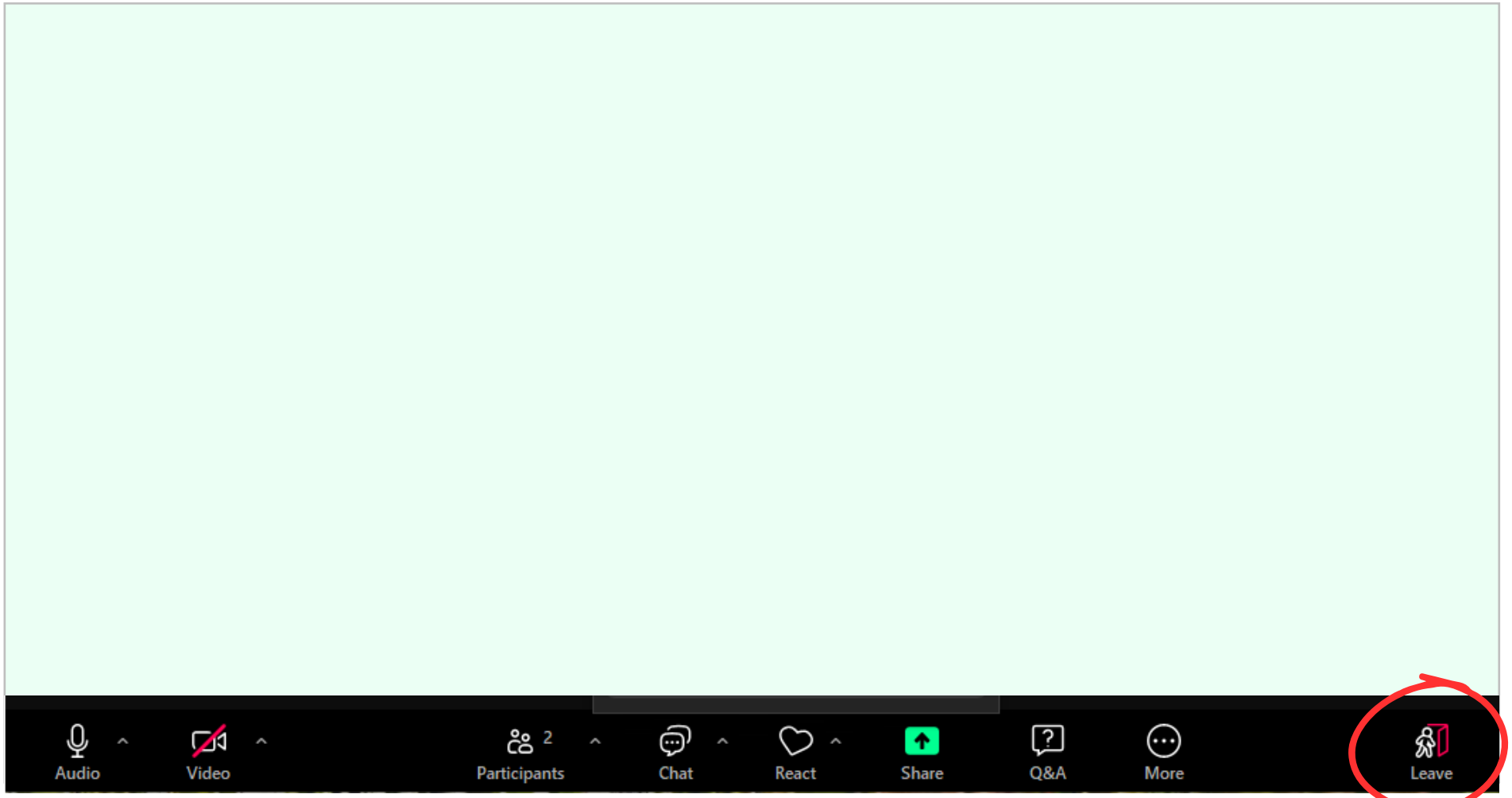
How to Participate



To leave the meeting click “Leave”

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Project Introductions

- City of Madison Engineering Staff
  - Jojo O'Brien – Project Manager
  - Alaina Baker – Water Resource Specialist and Project Modeler
  - Janet Schmidt – Principal Engineer for the City Stormwater section
  - Greg Fries – Deputy City Engineer
- Supporting Staff
  - Caroline Burger – Senior Modeling Expert (Formerly City of Madison Watershed Study Program Manager) – Carollo
- Alder Information
  - Alder John Guequierre – District 19
  - Alder Bill Tishler – District 11
  - Alder Nikki Conklin – District 9

Evening Overview

- Welcome (Hannah Mohelnitzky, City of Madison)
- Presentation (Alaina Baker, City of Madison)
- Q&A (facilitated by Hannah Mohelnitzky, City of Madison)
  - Submit questions through Zoom “Q and A”
  - Questions answered at the end of the Presentation
- Breakout Groups (Project Staff)
  - An option to join breakout groups will appear on your screen
- Wrap Up (Hannah Mohelnitzky, City of Madison)

Spring Habor Watershed Study PIM #4

-Presentation Outline

- Background
- City Modeling Process
- Recommend Solutions – Project Details
- Solutions Timeline
- Other Watershed Opportunities
- Next Steps
- Discussion and Questions

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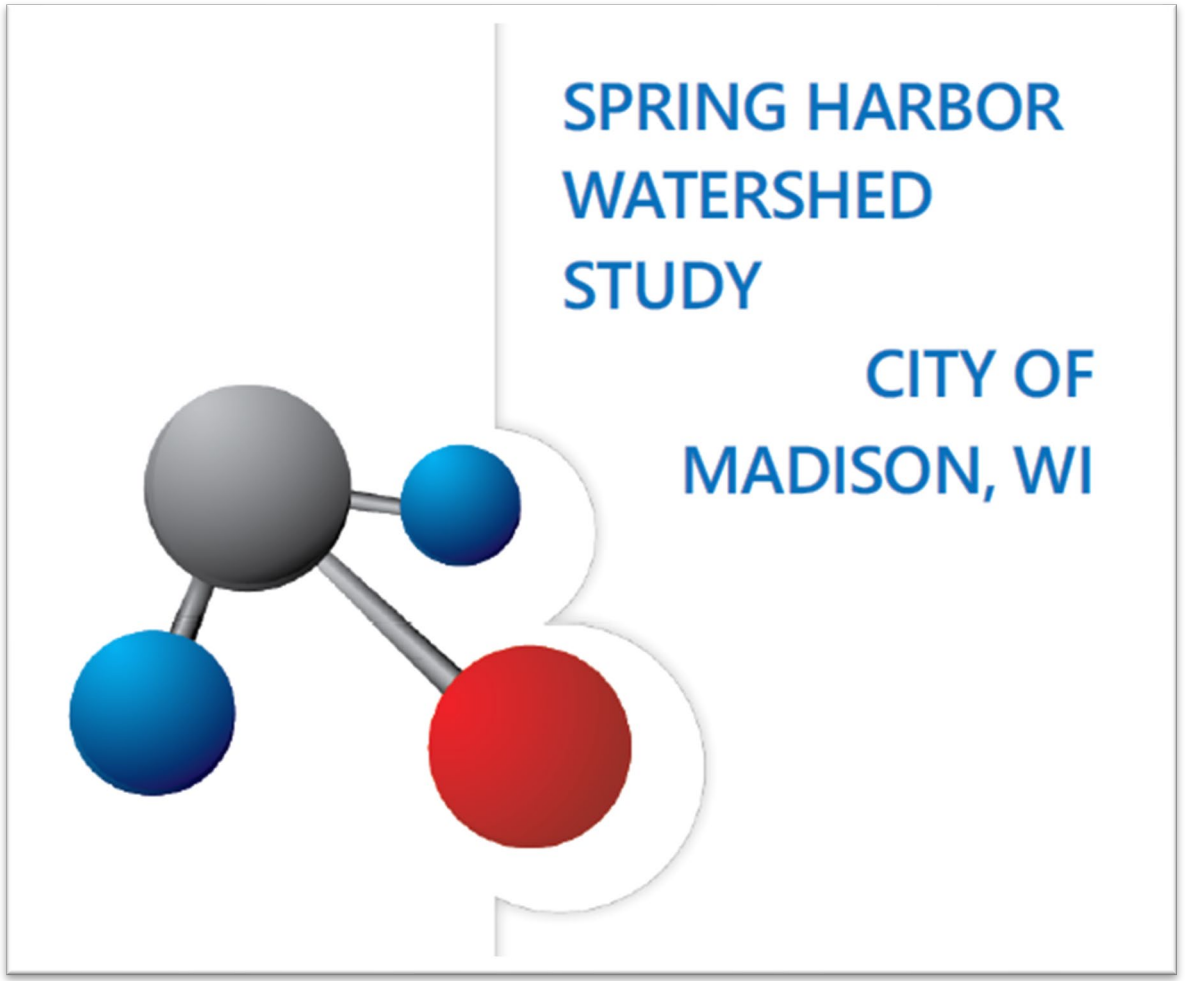
FLOOD MAP DISCLAIMER

The flood maps exist to help you quickly get information about general flood risks. The maps do not identify all areas that may flood or predict future flooding.

Do not use these maps to make official flood risk determinations for insurance, lending, or other purposes. These are not official FEMA federal Flood Insurance Rate Maps or the state or local equivalent.

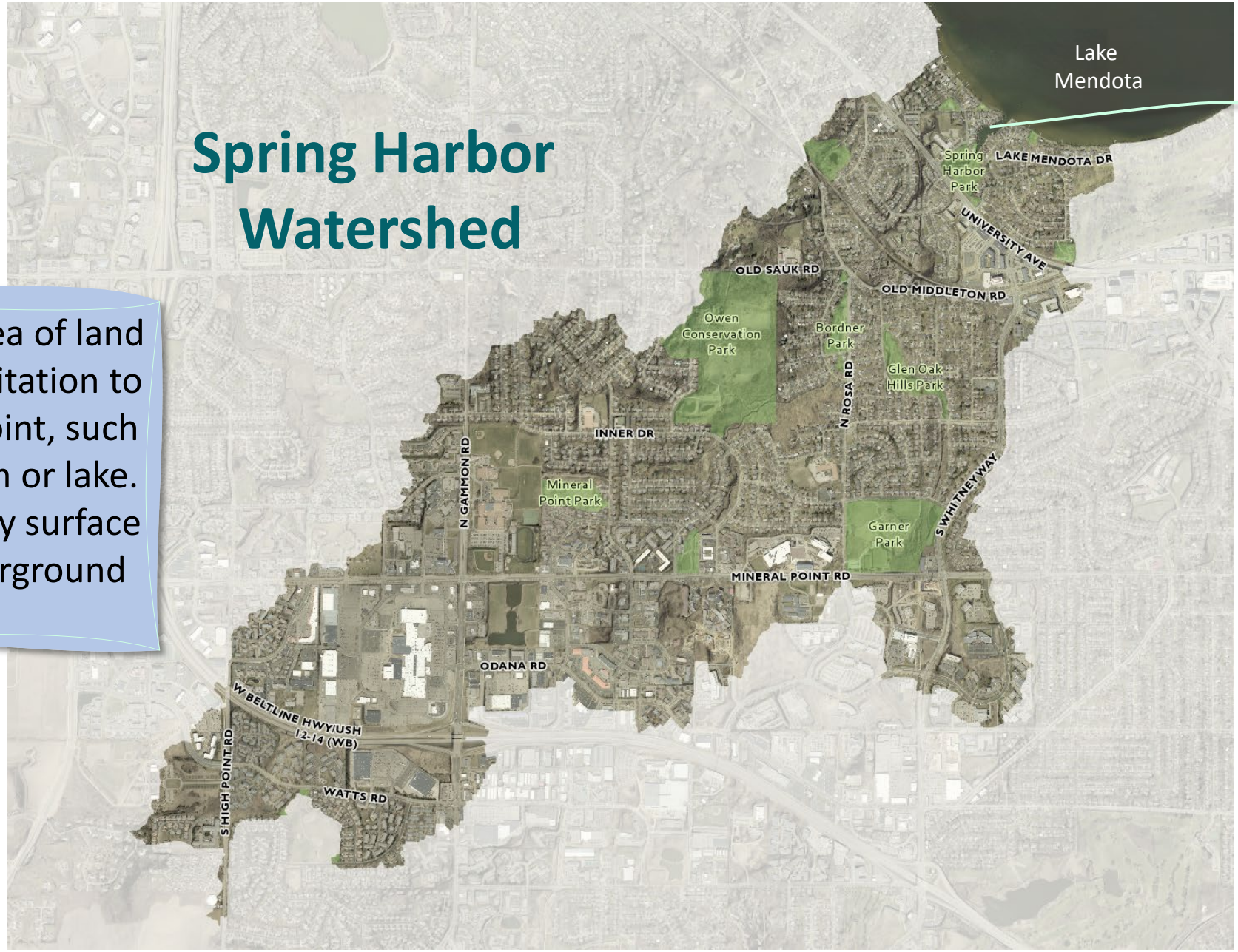
The City of Madison assumes no liability for any errors, omissions, or inaccuracies. The City also assumes no liability for any decisions or actions a user might take based on these maps.

Background



Spring Harbor Watershed

Watershed: an area of land that drains precipitation to a common low point, such as an inlet, stream or lake. It is determined by surface terrain and underground pipes



Primarily drains to Spring Harbor

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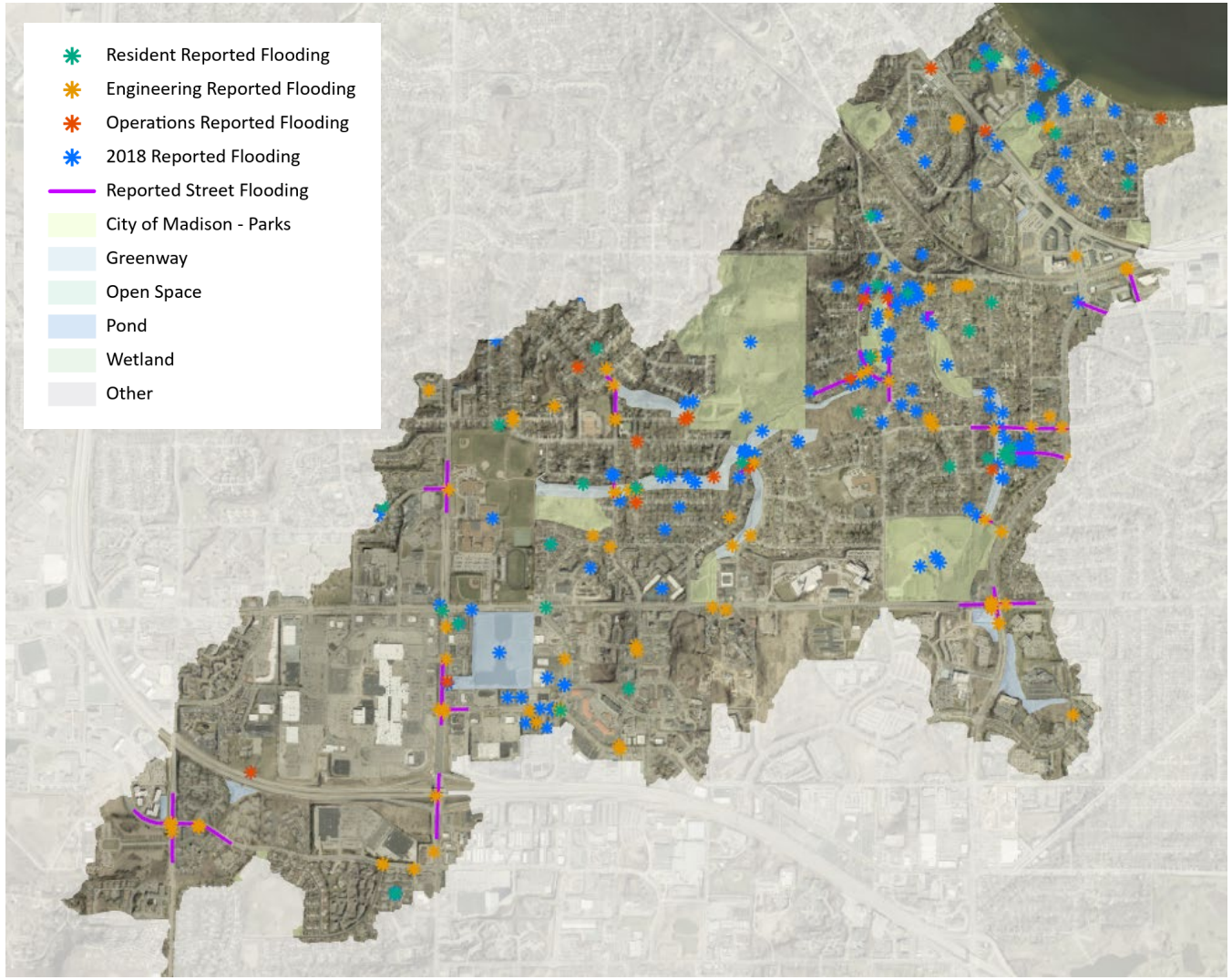
Background

-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

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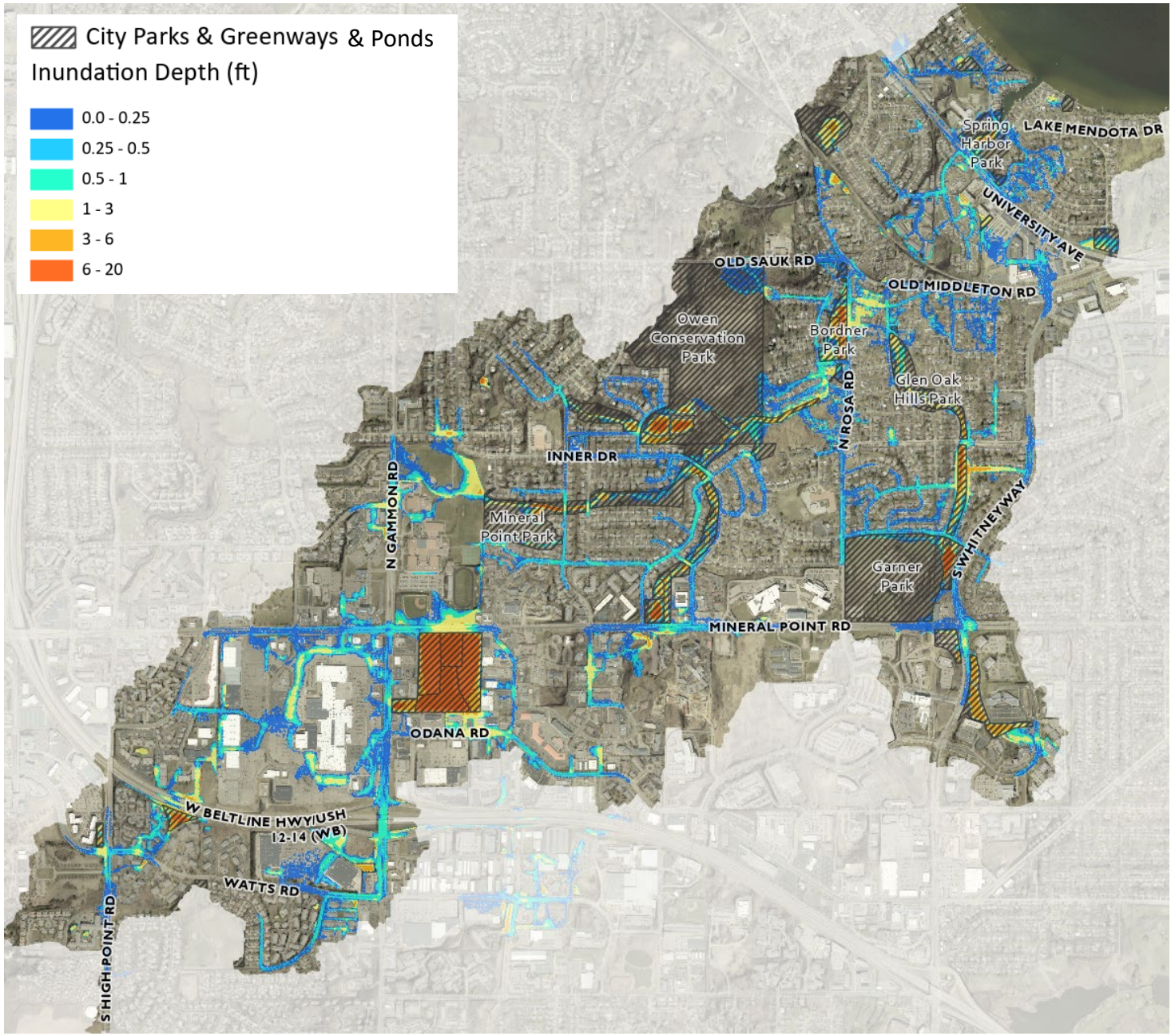
Background

- 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



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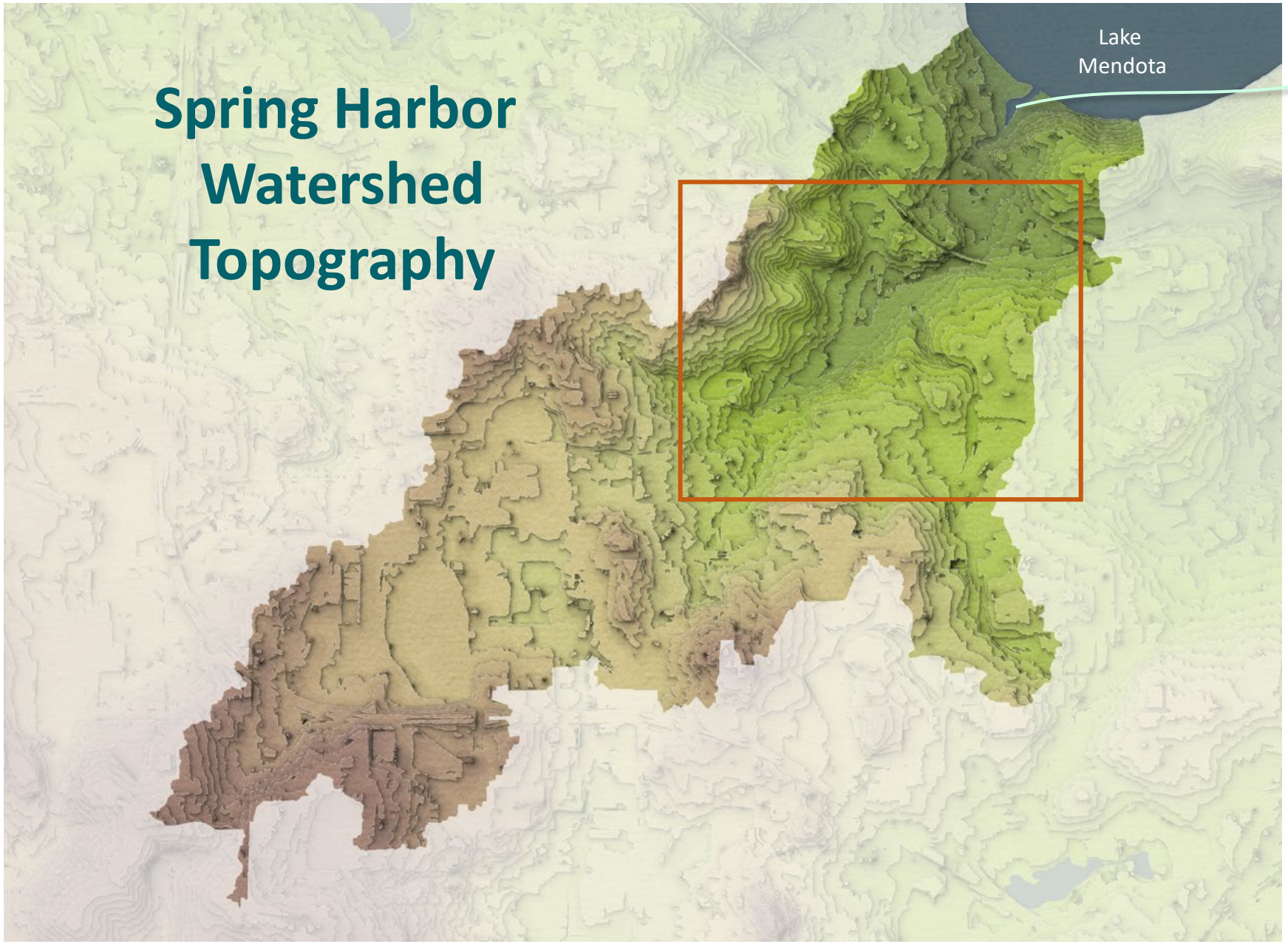
Spring Harbor Watershed Topography



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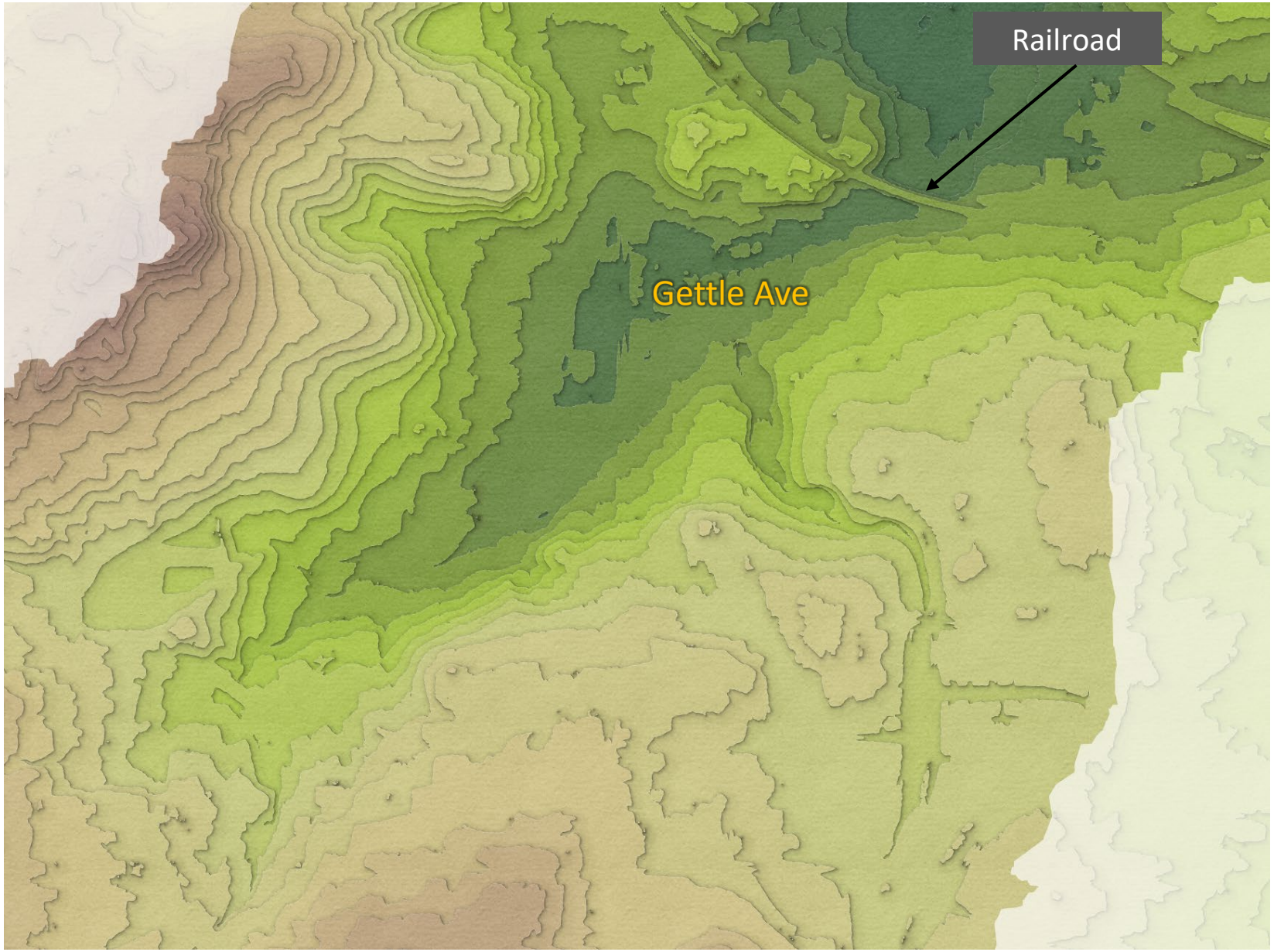
Background
- Unique Watershed Challenges

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



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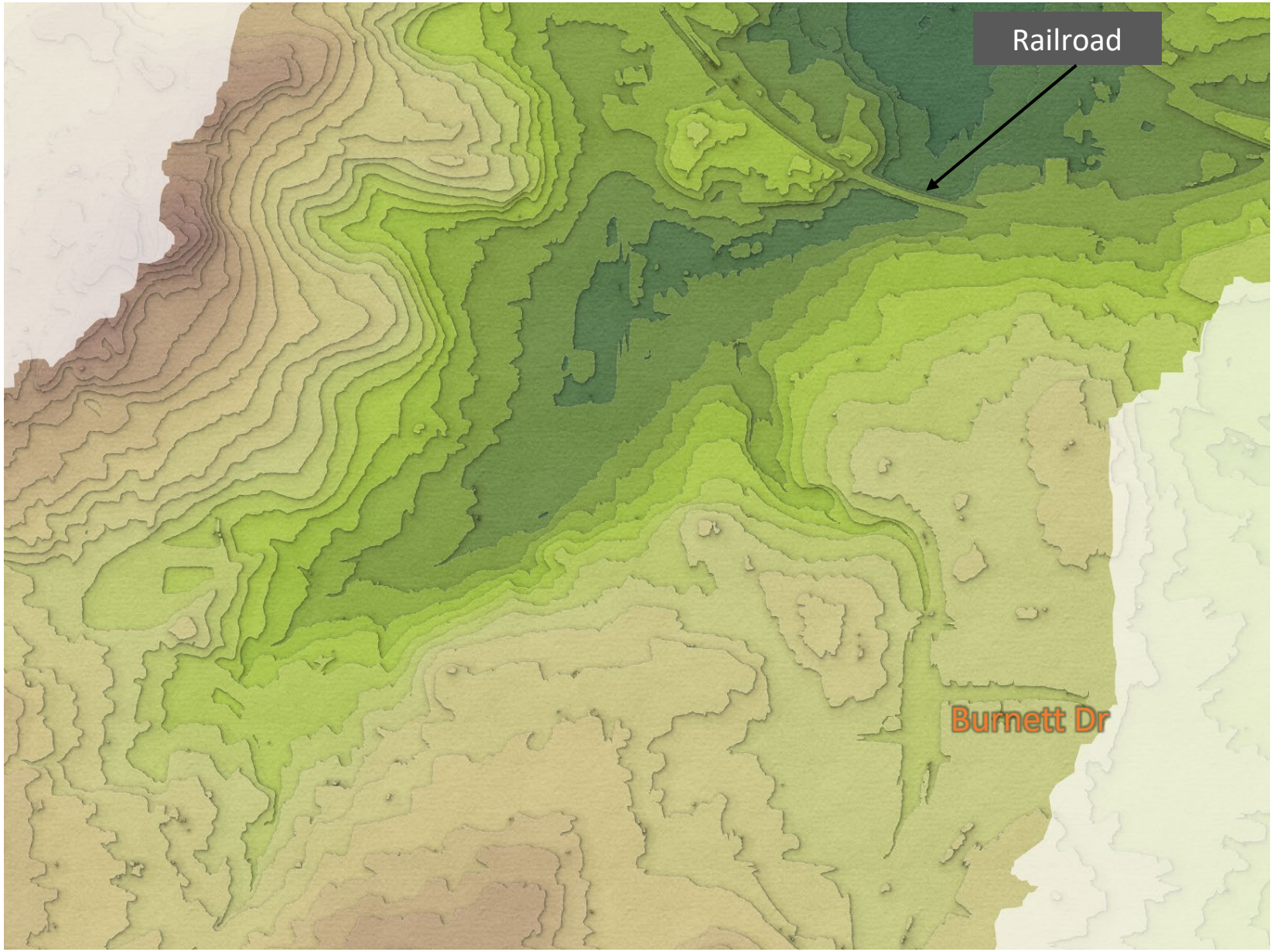
Background
- Unique Watershed Challenges

- 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



Background
- Unique Watershed Challenges

- Burnett Dr
  - Street elevation is similar to the greenway
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Background
-Gettle Ave Flooding

- Photos taken right after July 28, 2023 storm
- 1-4% Chance Storm
- Debris line was higher than the water when the photos were taken, meaning the max water level was higher than in the photos

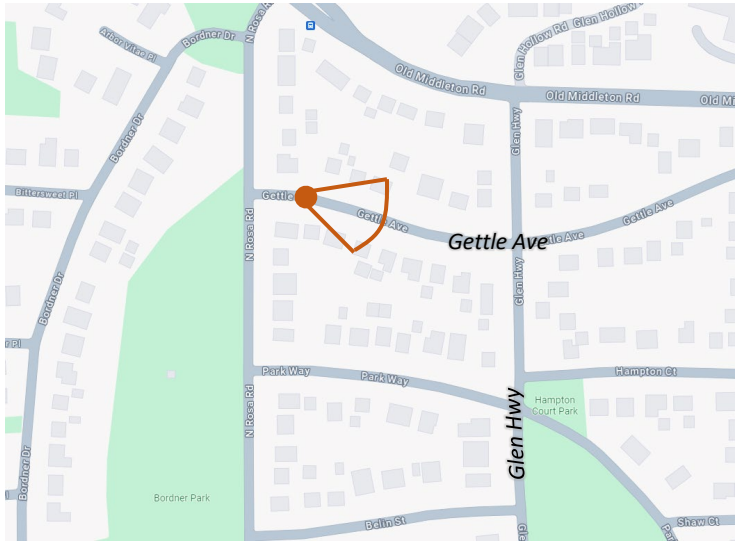


Photo provided by neighborhood resident

CITY OF MADISON

Background
-Glen Oak Hills Park Flooding

- Photos taken right after July 28, 2023 storm
- 1-4% Chance Storm
- Debris line was higher than the water when the photos were taken, meaning the max water level was higher than in the photos

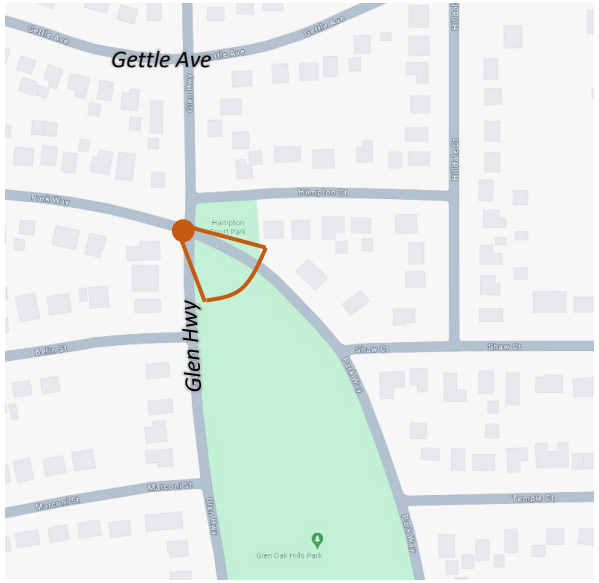

Photo provided by neighborhood resident

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Background

-Historic 2018 Flooding

August 20th, 2018 storm
– 10-12 in of rain in 8 hrs on City's west side

↓

Flash flooding that revealed widespread deficiencies in our stormwater system

↓

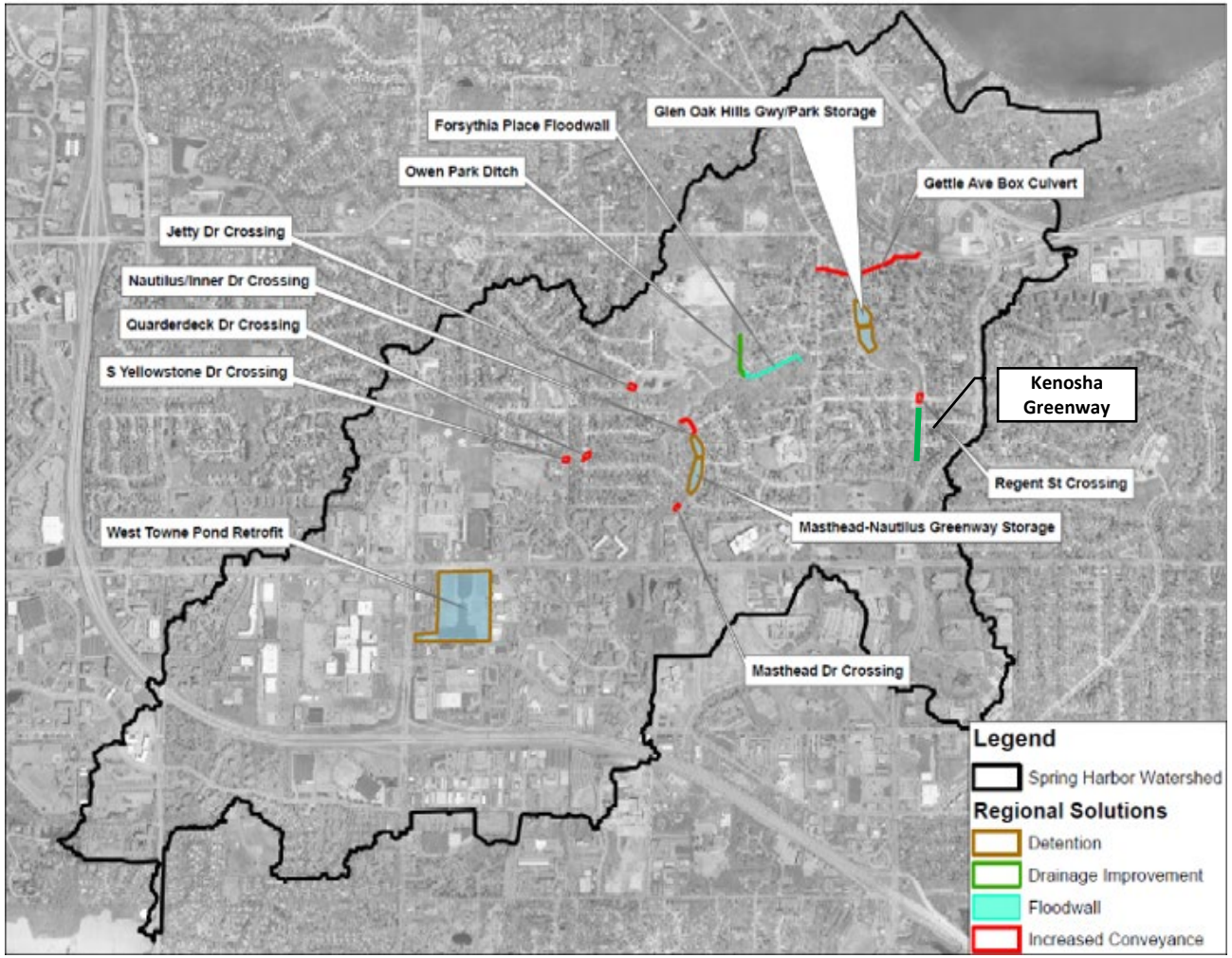
The City's Watershed Study Program
- Identify existing problems, develop solutions, and prioritize improvements citywide

Flooding Near West Towne Pond

Background

-Original Spring Harbor Watershed Study

- Began January 2019
  - AE2S - firm hired to complete study
  - 3,300 acre watershed
  - In first round of watershed study program
- Completed – June 2022
- 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)



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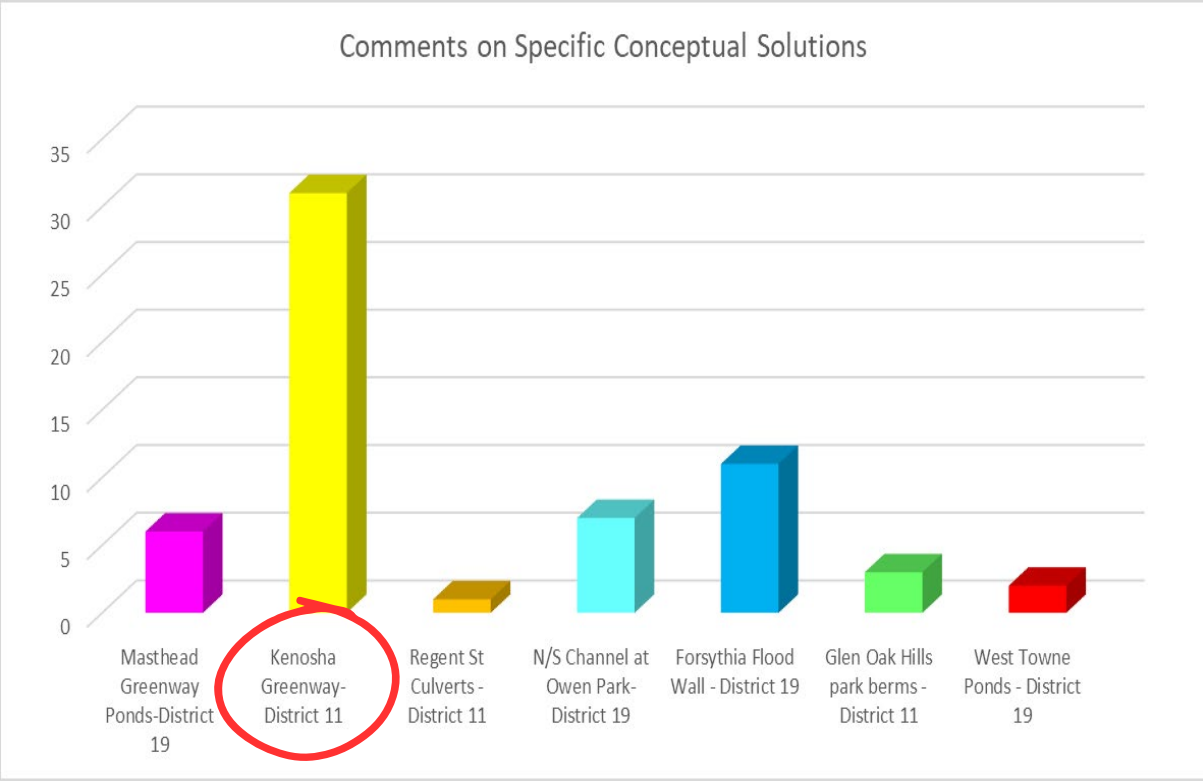
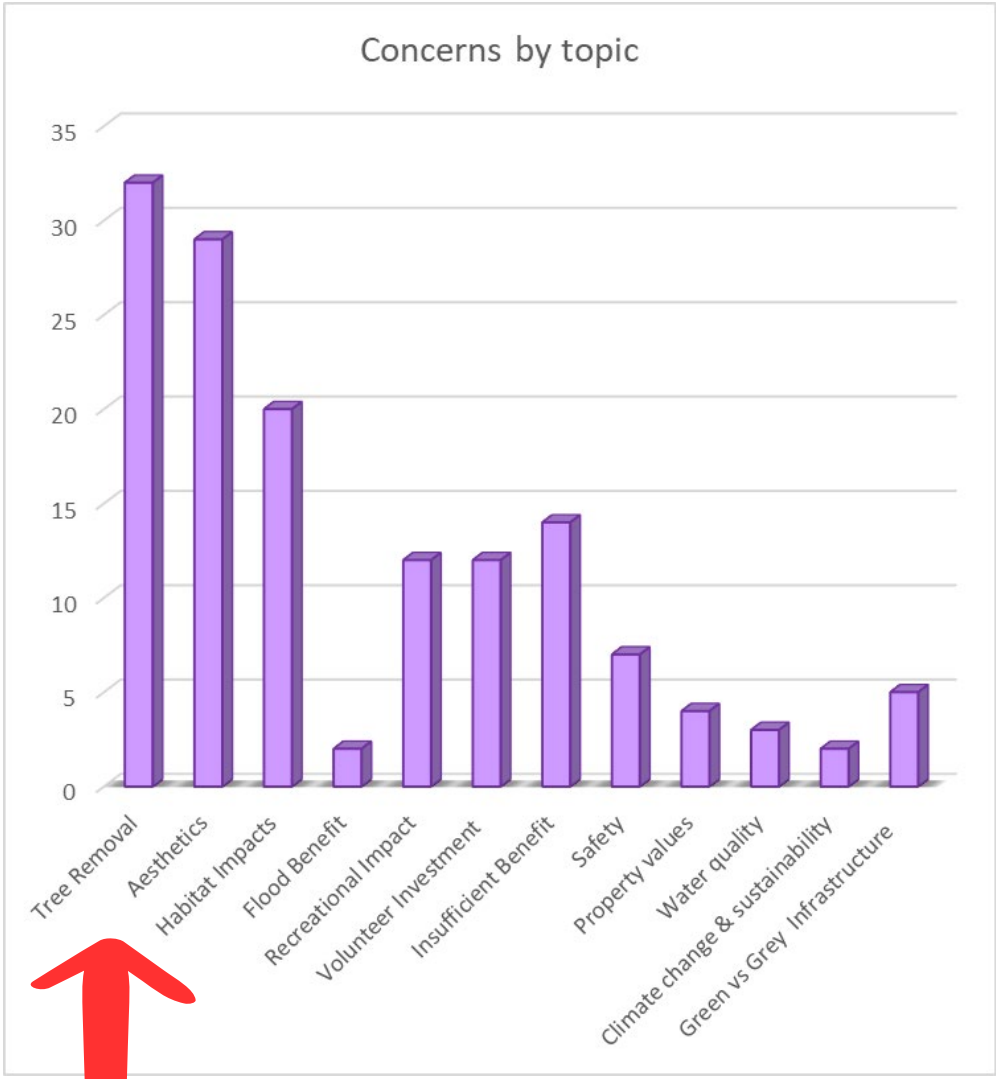
Background

-Public Feedback on Draft Final Report

- 58 comments
- > 100 individual questions





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Background

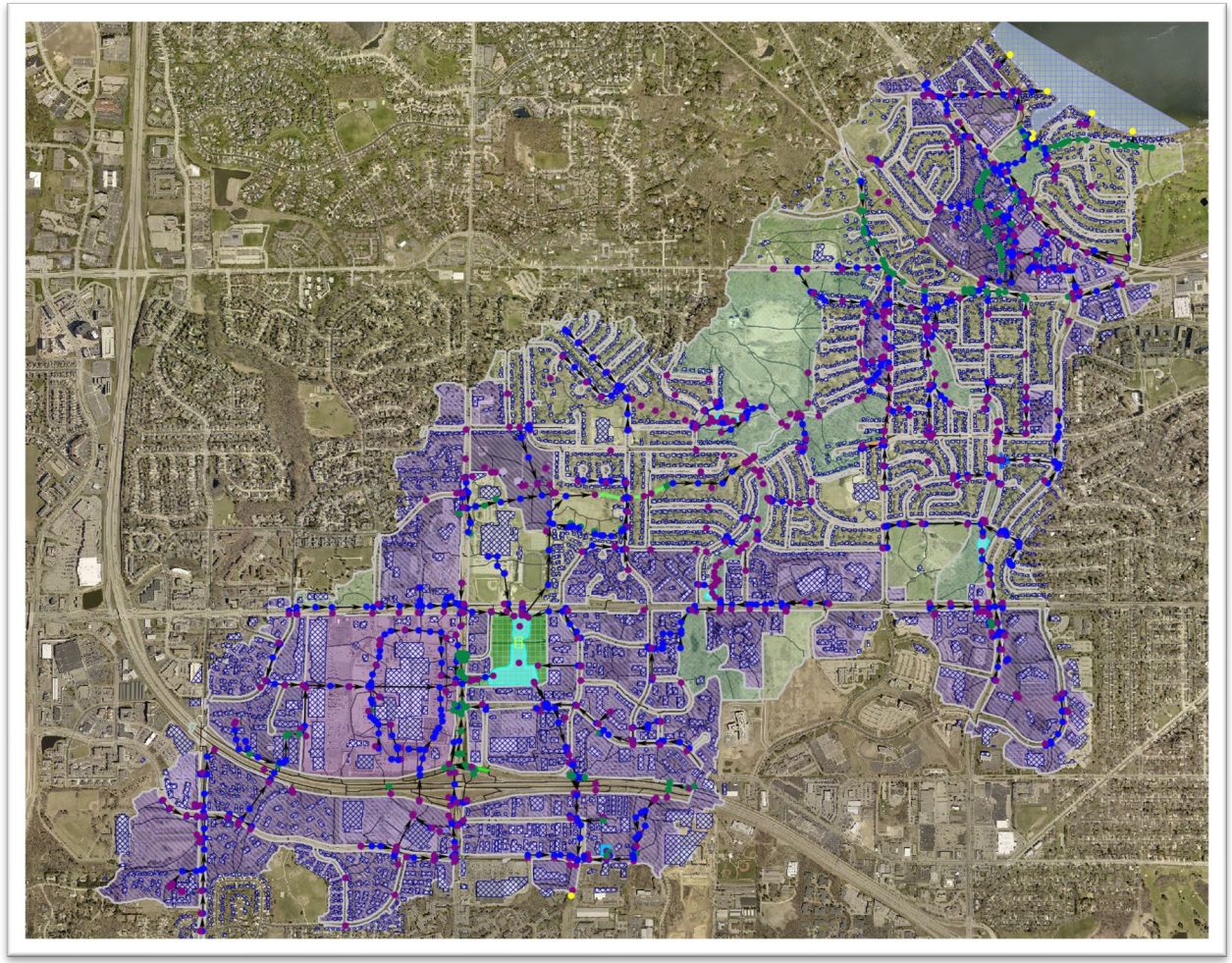
-Additional Modeling Needed

- **Public Feedback**

  → **Additional Modeling** by the City

- Additional modeling goals:
  - Determine the impact of not implementing solutions with public concerns
  - Determine the viability of alternative solutions that were recommended by the public or brainstormed internally
  - Develop near-term plan for flood mitigation projects

City Modeling Overview



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City Modeling Overview

-City Watershed Model Updates

- **Started in summer 2022**
- **Updated the models** provided by the original watershed consultant:
  - Added private development projects and road reconstruction projects completed since the original watershed study
  - Part of the first round of watershed models. Updated with model tweaks to standardize with other watershed study models

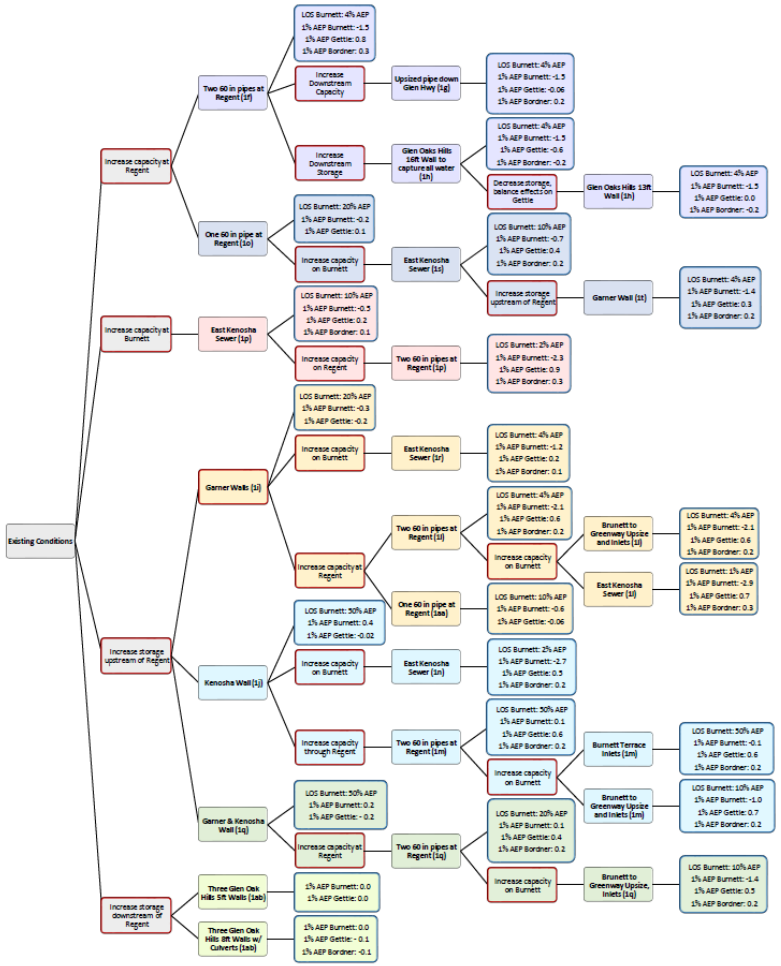
↳ Standardization led to **slightly increased flows** to enclosed depressions and made developing solutions more challenging

City Modeling Overview

-Solutions Development

- Watershed Study **Flood Mitigation 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
- Ran **100's of models** with different combinations of solutions to find an alternative combination that would meet the flood mitigation targets for the watershed

For Example: Kenosha/Burnett Area - Solutions Combination Scenarios



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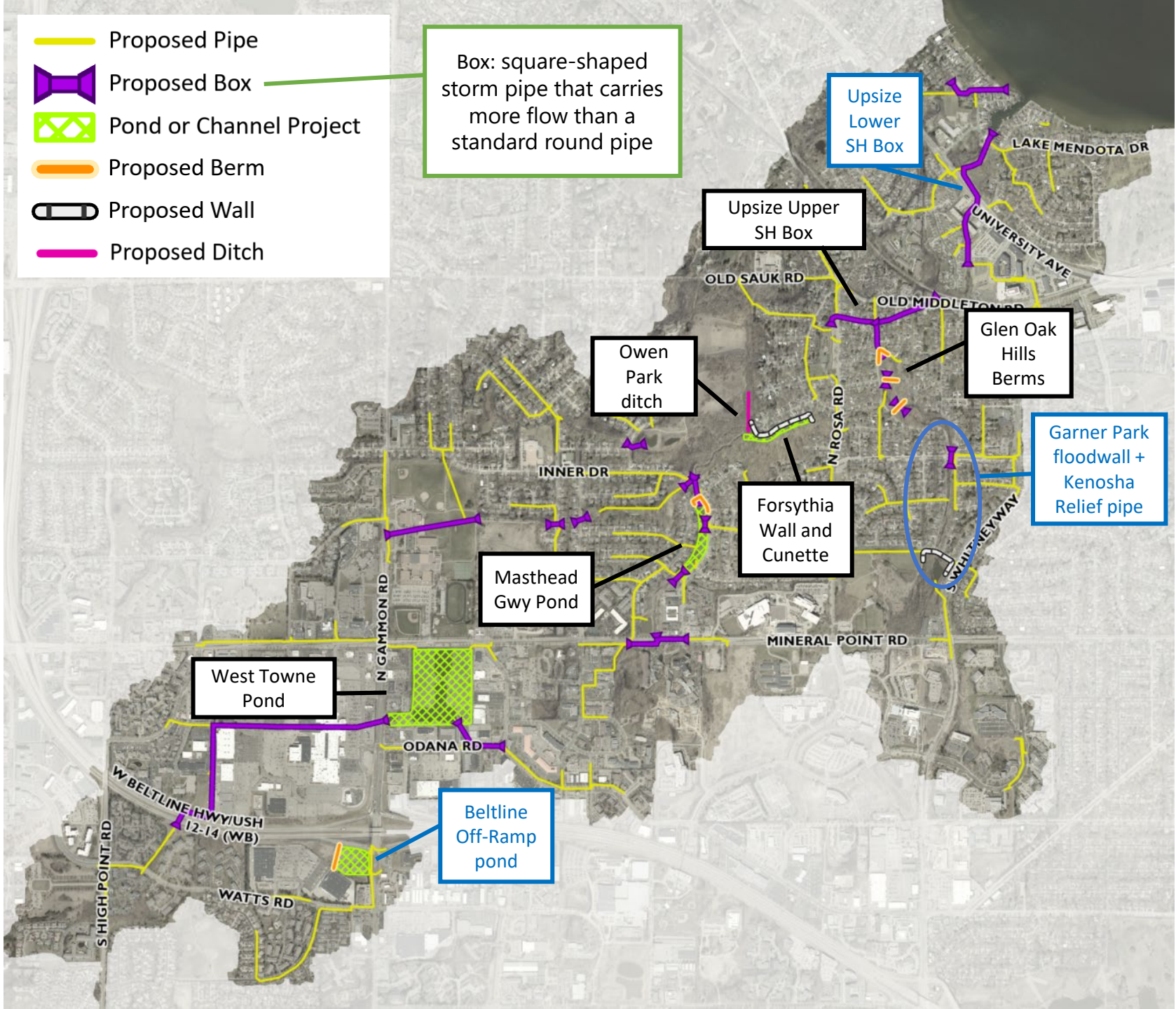
City Modeling

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

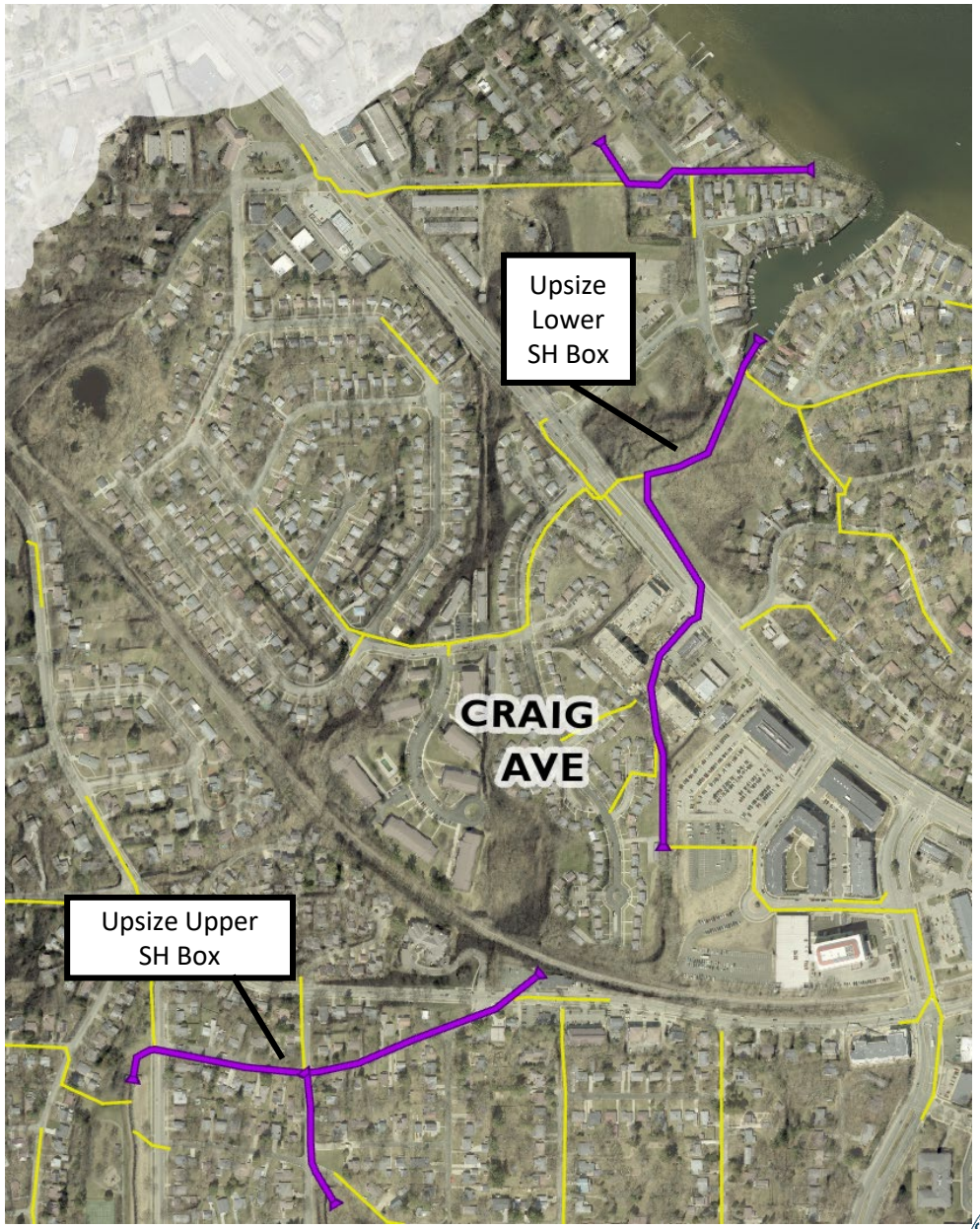


City Modeling

-Drawbacks of the suite of "All Solutions"

- Focuses too much on a **future that we can't predict**
- To meet the City's Flood Mitigation Targets:
  - **Unpopular solutions** would need to be constructed, some in the near-term
  - To the City's knowledge, homes on Craig Ave do not currently flood. The model shows that Craig Ave could flood if more water is sent to the Upsized Upper Spring Harbor Box without also **upsizing the Lower Box**. The lower Spring Harbor Box is in good condition, does not need to be replaced for several decades, and doing so would cost $12 million (2024 dollars)

→ **Does not offer a reasonable near-term plan**



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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

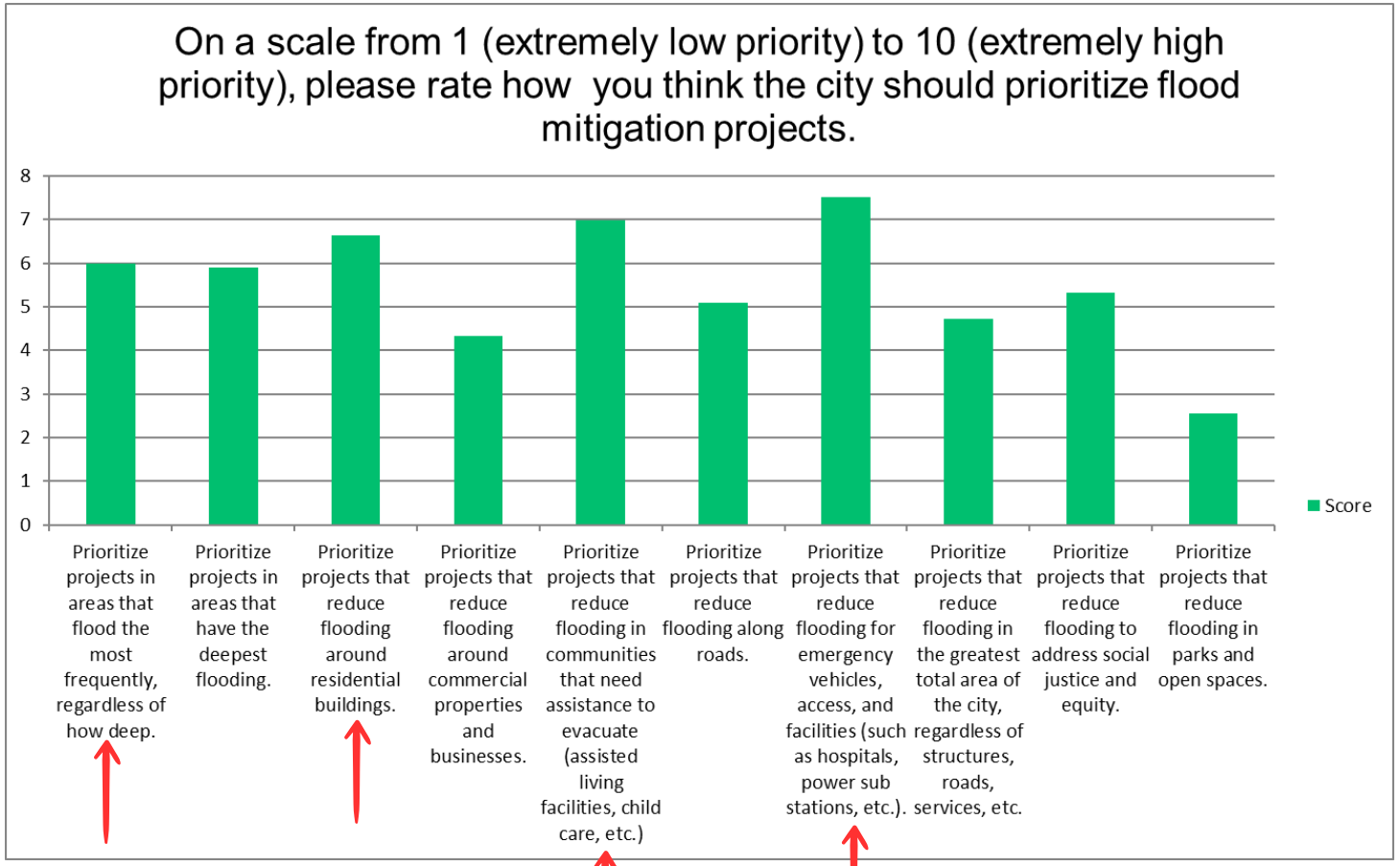
Retain record of "**All Solutions" for ~25-50 years from now**:

- 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 to 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

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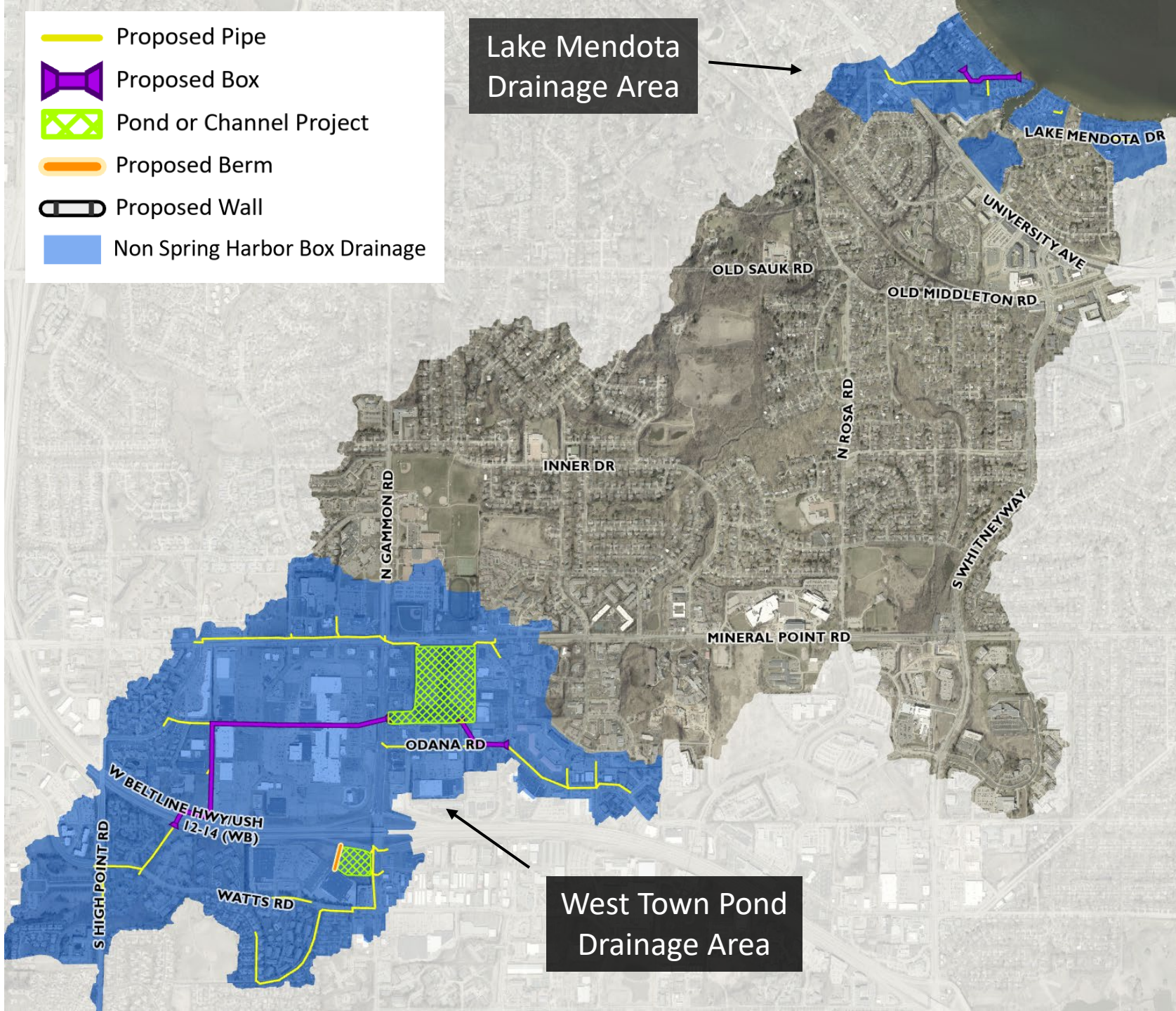
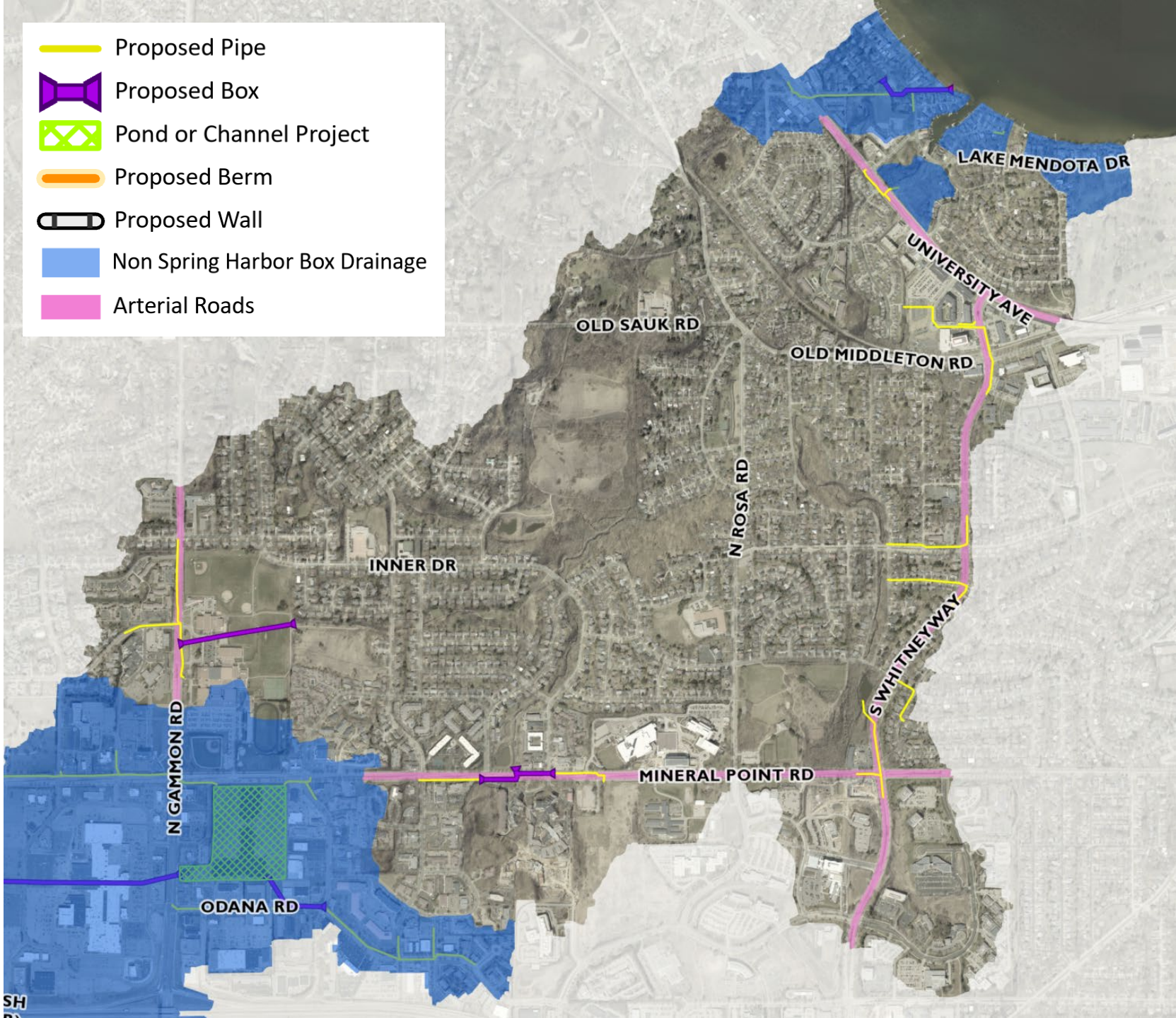
Near-Term Recommend Solutions
- Splitting up the Watershed

- 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



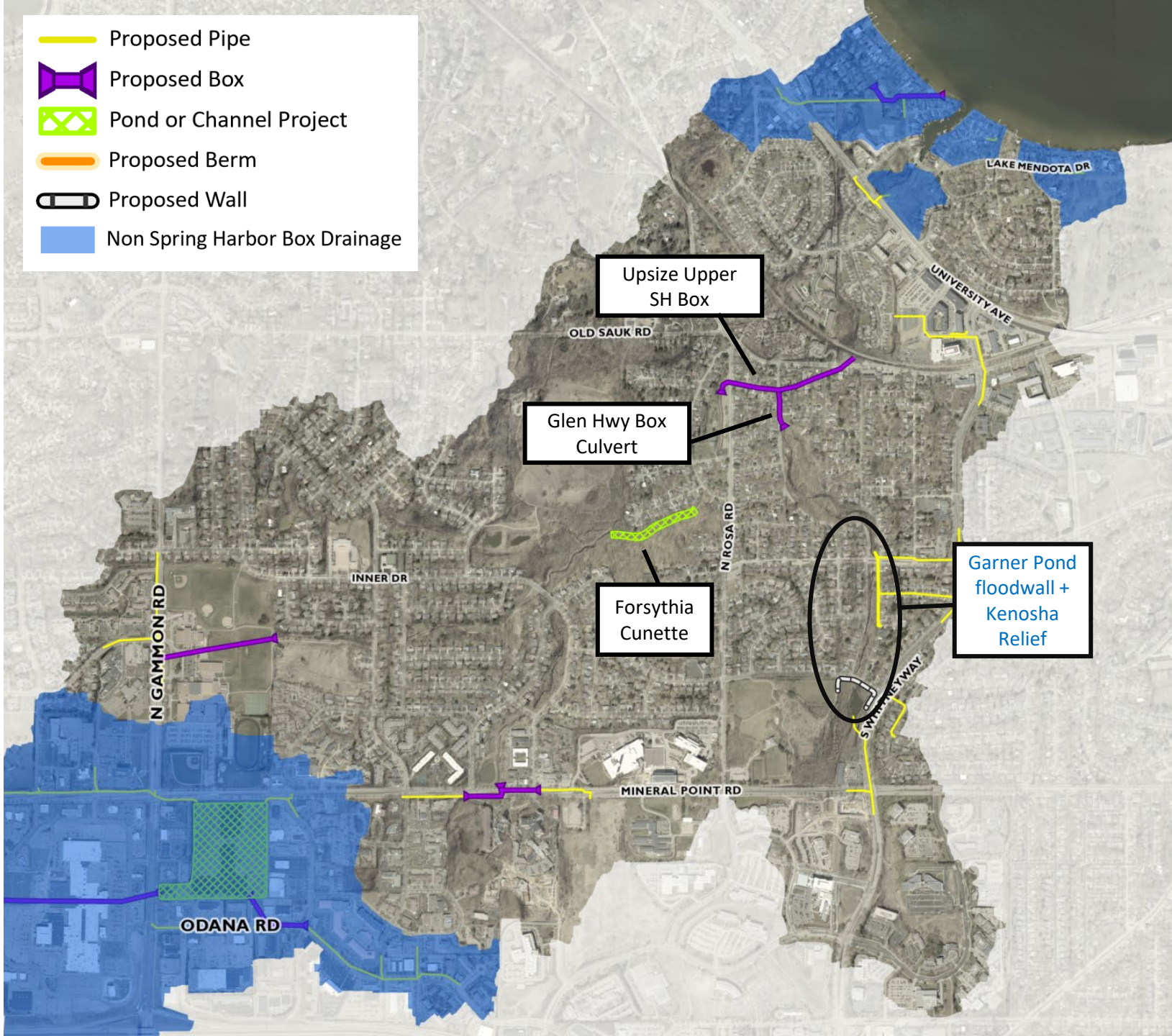
Near-Term Recommend Solutions
- 10-Year and 25-Year Target for Arterial Roads

- 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

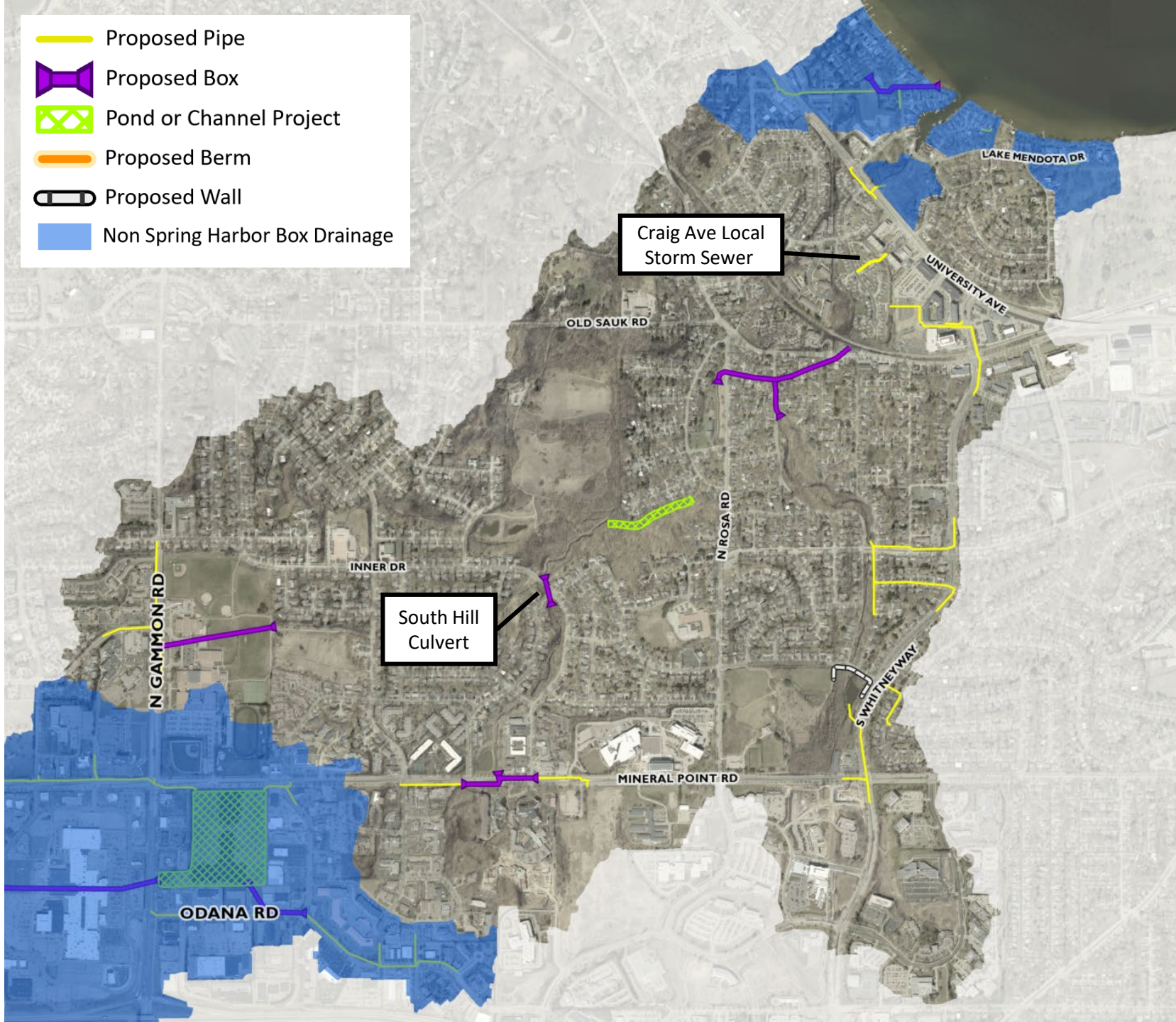


Near-Term Recommend Solutions

- Solutions To Mitigate Negative Impacts

Mitigate Negative Impacts:

- Craig Ave Local Storm Sewer Upsize
- South Hill Culvert



Near-Term Solutions Development Process

Split watershed. Spring Harbor Box drainage area --> different goals.

Spring Harbor Box Drainage Area

10-year and 25-year targets for arterials

Feasible regional solutions

Solutions to mitigate negative impacts

West Towne & Lake Mendota Drainage Areas

Ultimate Recommended Solutions

Near-Term Recommended Solutions

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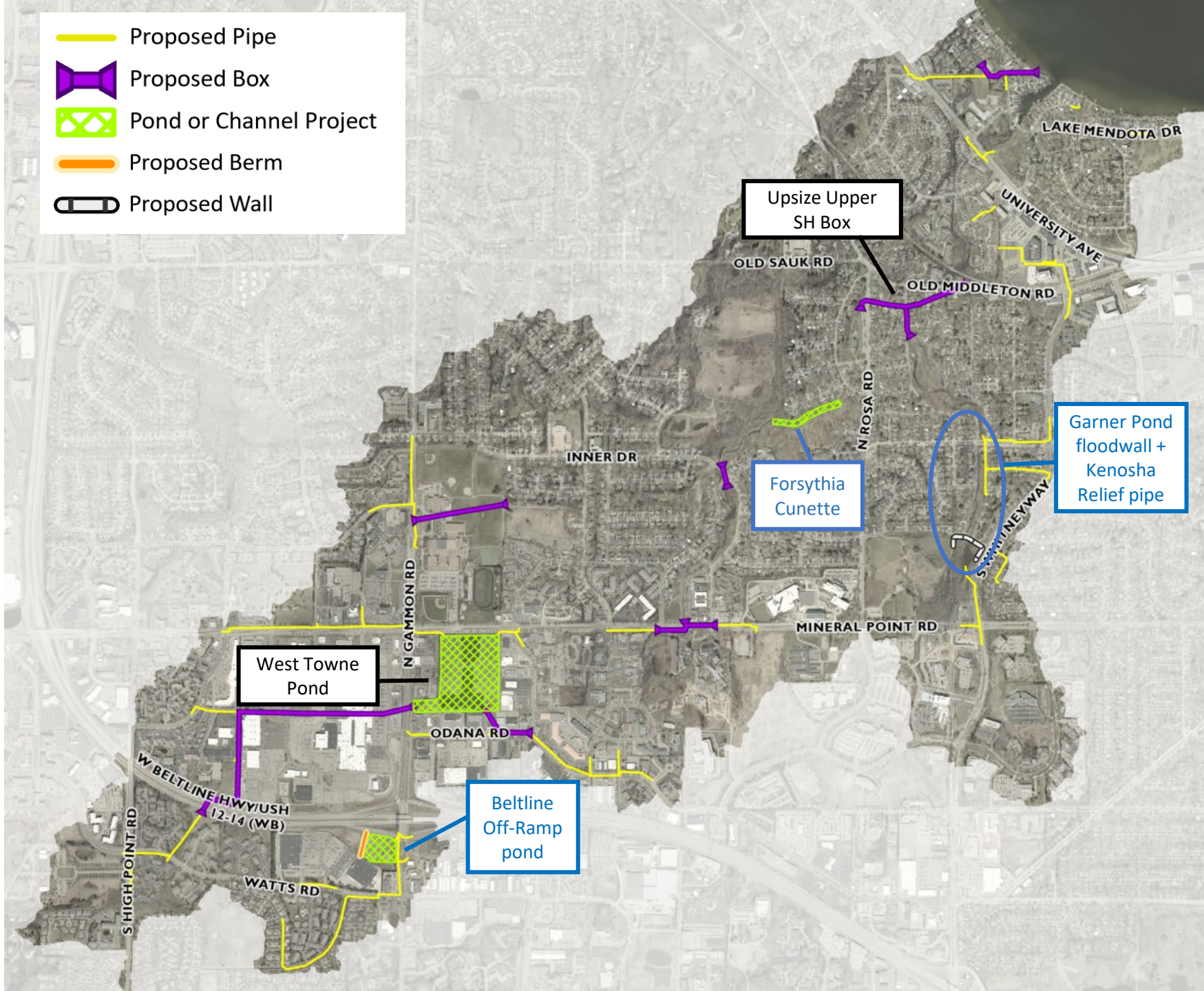
Near-Term Recommend Solutions

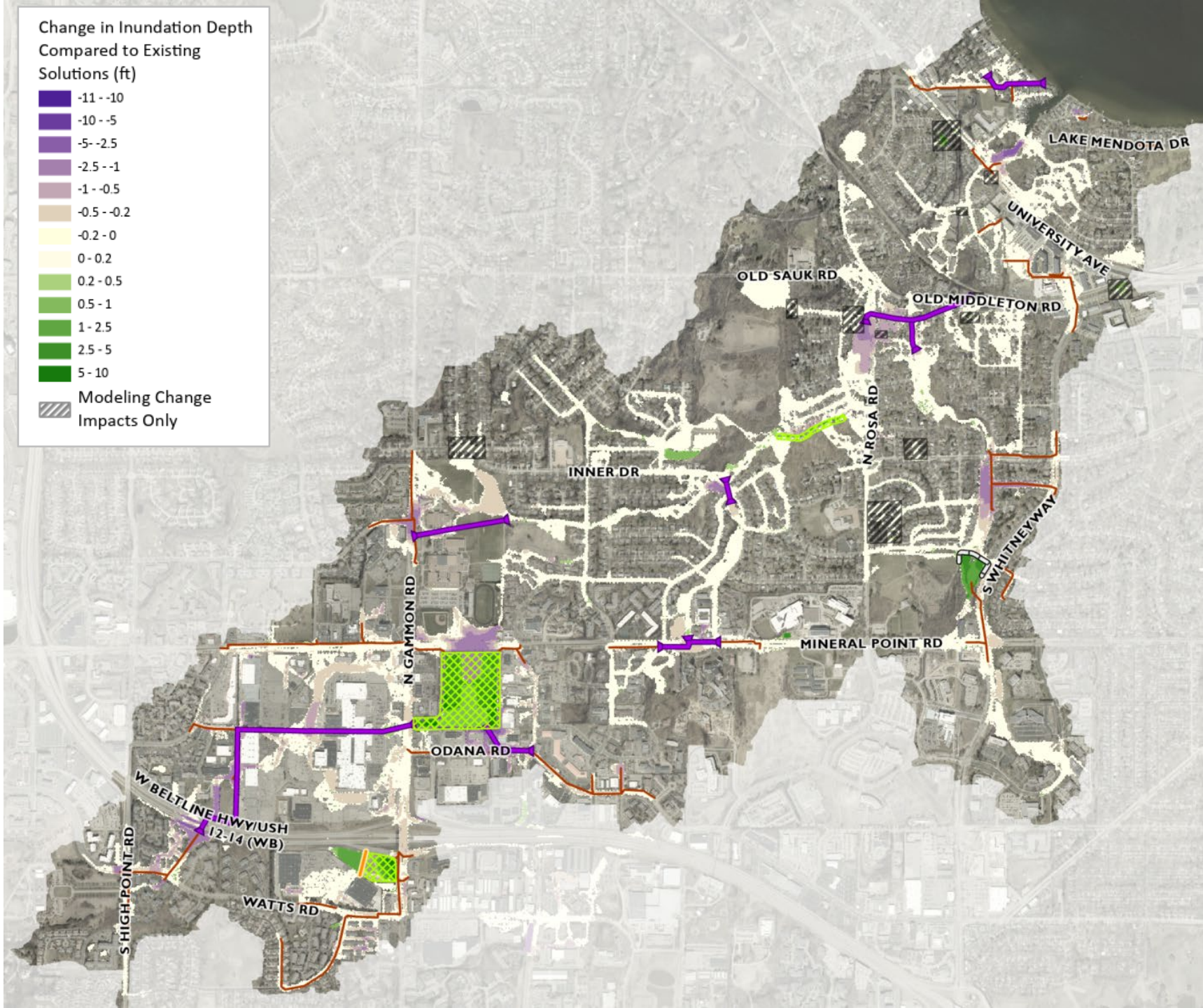
0-25 years

- **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 risk**
  - **Green = Increase in flood risk**
- 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

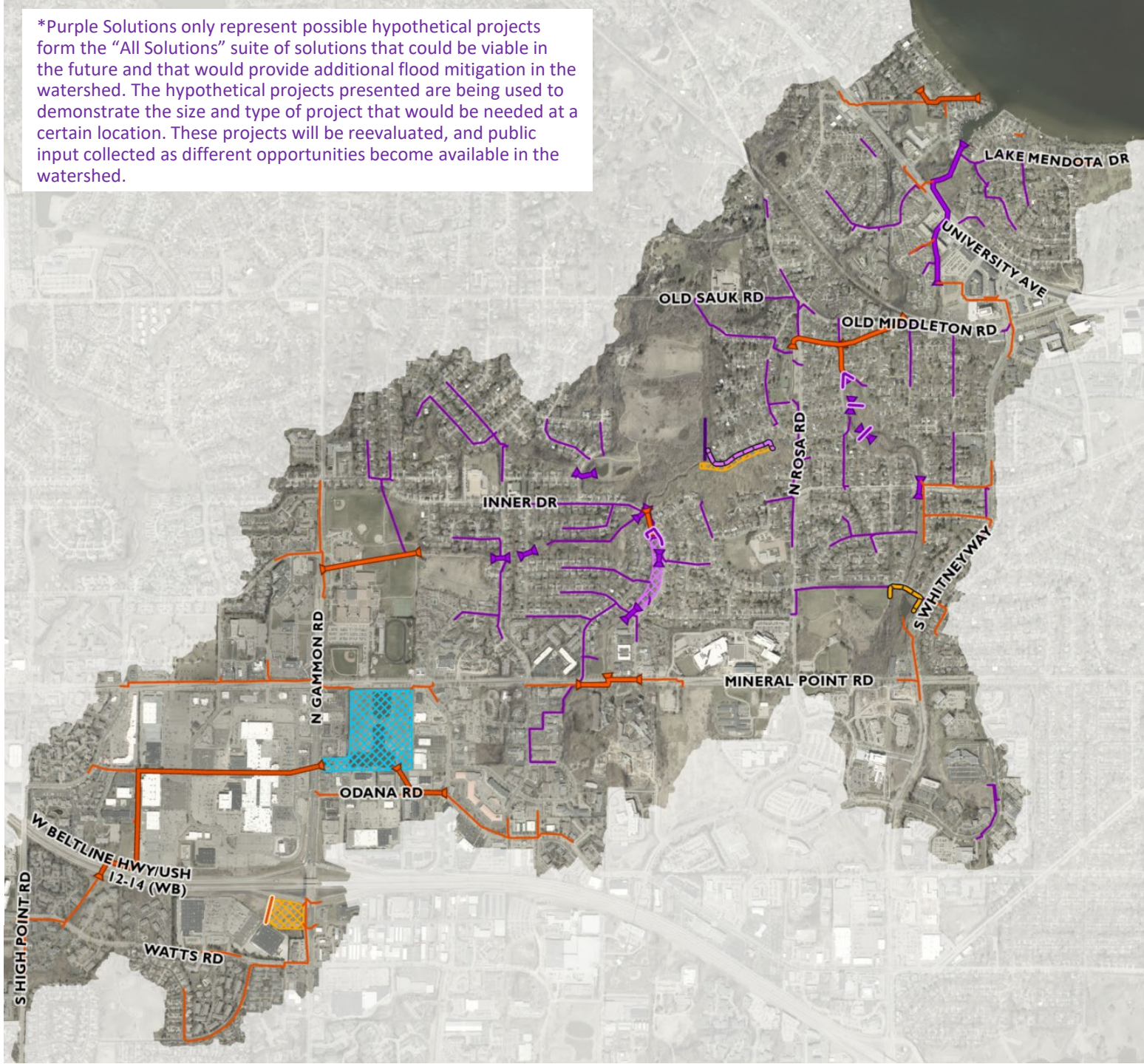
Beltline Off-Ramp Pond
Gettle Avenue Box (Upper Spring Harbor Box)
Glen Hwy Box
Kenosha Relief Pipe
Garner Park Flood Wall
Forsythia Cunette Modifications
South Hill Culvert
Local Sewer Upgrade on Craig Ave
Local Sewer Upgrades on Arterials
Local Sewer Upgrades for West Towne Pond and Direct Lake Mendota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

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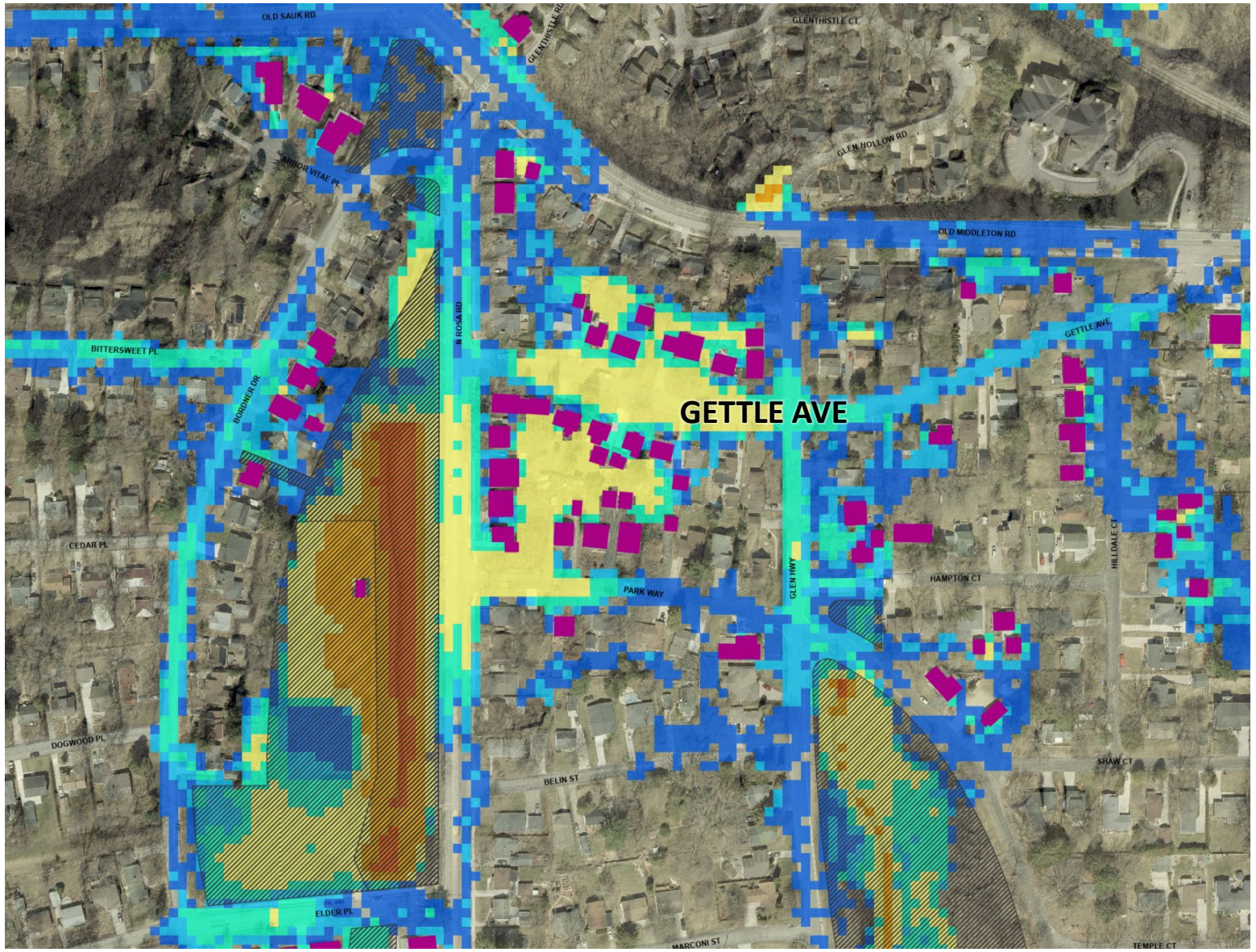
1% Chance Flooding
-Gettle Ave

- 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

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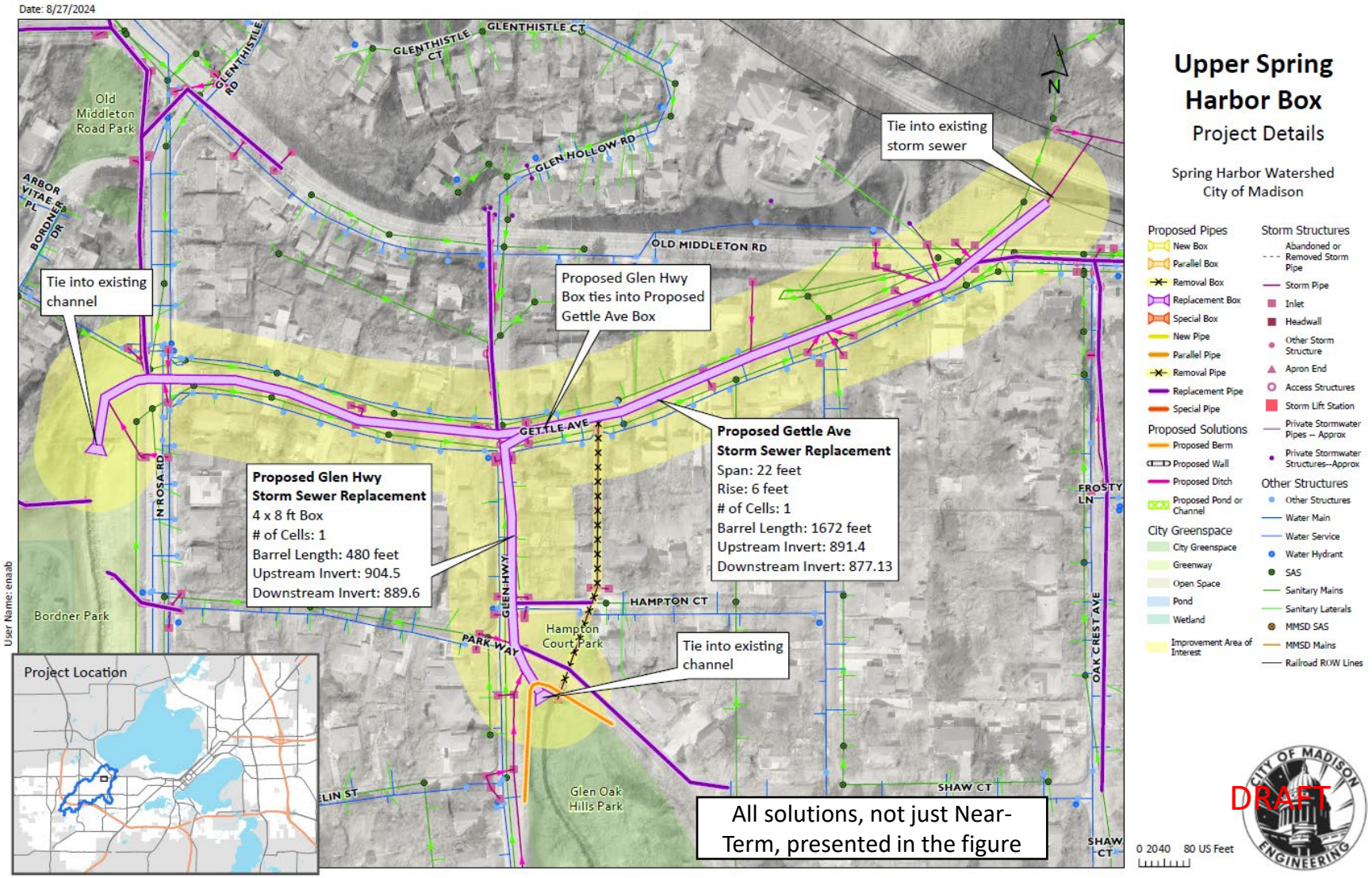
Recommend Solutions

-Upsized Upper SH Box

NEAR TERM SOLUTION

Proposed Improvements

- Same as Original Watershed Study Conceptual Solution
- Increase the box storm sewer size to the equivalent of a 22’x6’ box storm sewer (currently varies from 14’x6’ to 17’x6’)
- Glen Hwy 5'x6' box to move water from Glen Oak Hills Greenway into SH Box



Upper Spring Harbor Box

Project Details

Spring Harbor Watershed
City of Madison

Proposed Pipes
- New Box
- Parallel Box
- Removal Box
- Replacement Box
- Special Box
- New Pipe
- Parallel Pipe
- Removal Pipe
- Replacement Pipe
- Special Pipe

Proposed Solutions
- Proposed Berm
- Proposed Wall
- Proposed Ditch
- Proposed Pond or Channel

City Greenspace
- City Greenspace
- Greenway
- Open Space
- Pond
- Wetland
- Improvement Area of Interest

Storm Structures
- Abandoned or Removed Storm Pipe
- Storm Pipe
- Inlet
- Headwall
- Other Storm Structure
- Apron End
- Access Structures
- Storm Lift Station
- Private Stormwater Pipes -- Approx
- Private Stormwater Structures--Approx

Other Structures
- Other Structures
- Water Main
- Water Service
- Water Hydrant
- SAS
- Sanitary Mains
- Sanitary Laterals
- MMSD SAS
- MMSD Mains
- Railroad ROW Lines

DRAFT

Recommend Solutions

-Upsized Lower Spring Harbor Box

HYPOTHETICAL FUTURE SOLUTION

Proposed Improvements:

- New conceptual solution
- Spring Harbor Box upsized from 19.5'x6' to 20.5'x7' from near Craig Ave to Spring Harbor Outlet
- This is an alternative to having additional storage solutions in the upper portions of the watershed

Current placement of the box culvert is shown. The exact placement of a future replacement box culvert is unknow and will likely not match the current route shown as the City will want to mitigate impacts to Spring Harbor Park

CITY OF MADISON

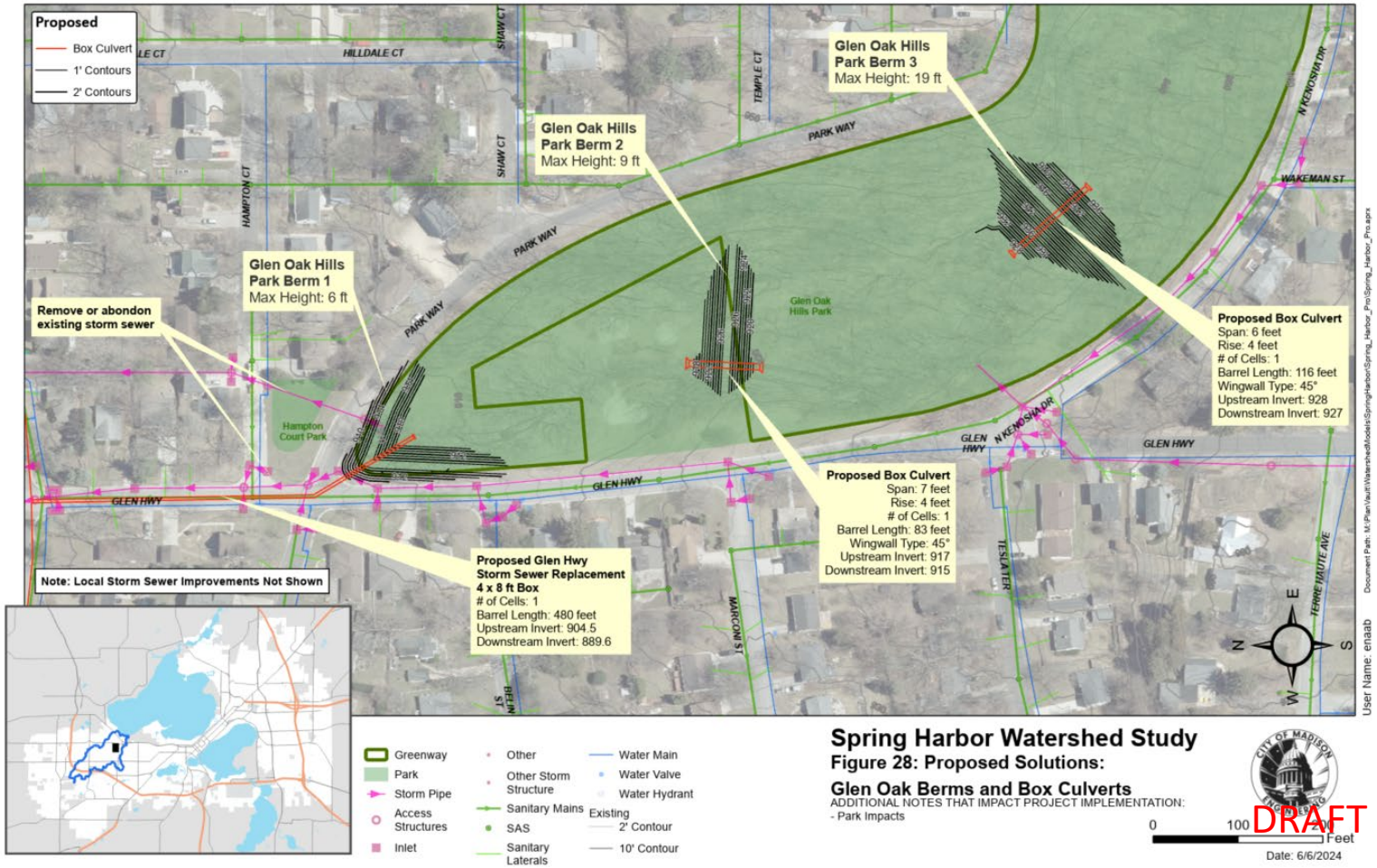
Recommend Solutions

-Glen Oak Hills Berms – Original Conceptual Solution

HYPOTHETICAL FUTURE SOLUTION

Proposed Improvements

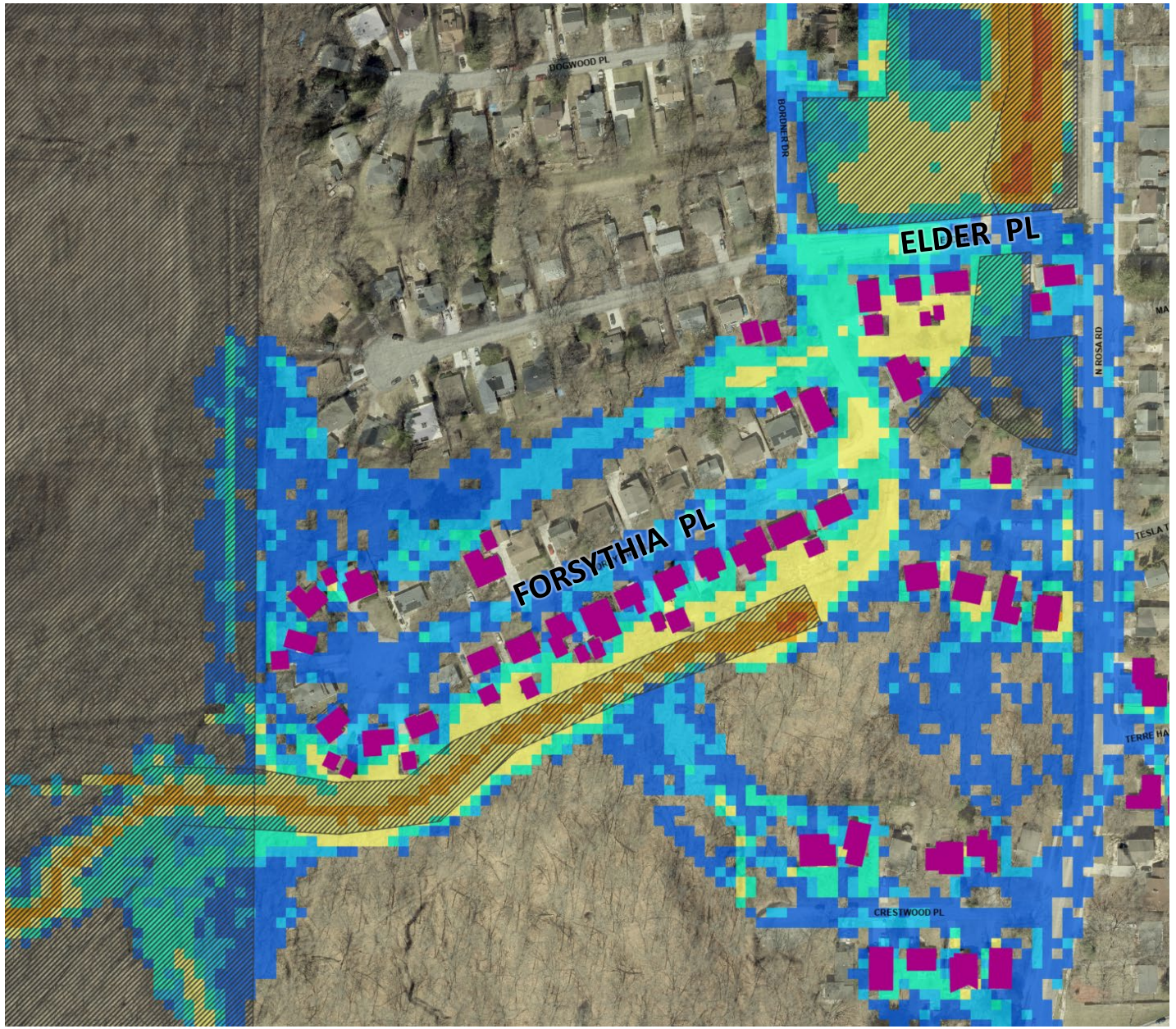
- Same as Original Watershed Study Conceptual Solution
- Three berms across the greenway to create additional storage
  - Holds water in greenway instead of flowing out of the greenway down Glen Hwy and flooding Gettle Ave
- Berms range in height from 6 ft to 19 ft



CITY OF MADISON

1% Chance Flooding
-Forsythia Pl and Elder Pl

- Cunette overtopping
- Significant home and road flooding



CITY OF MADISON

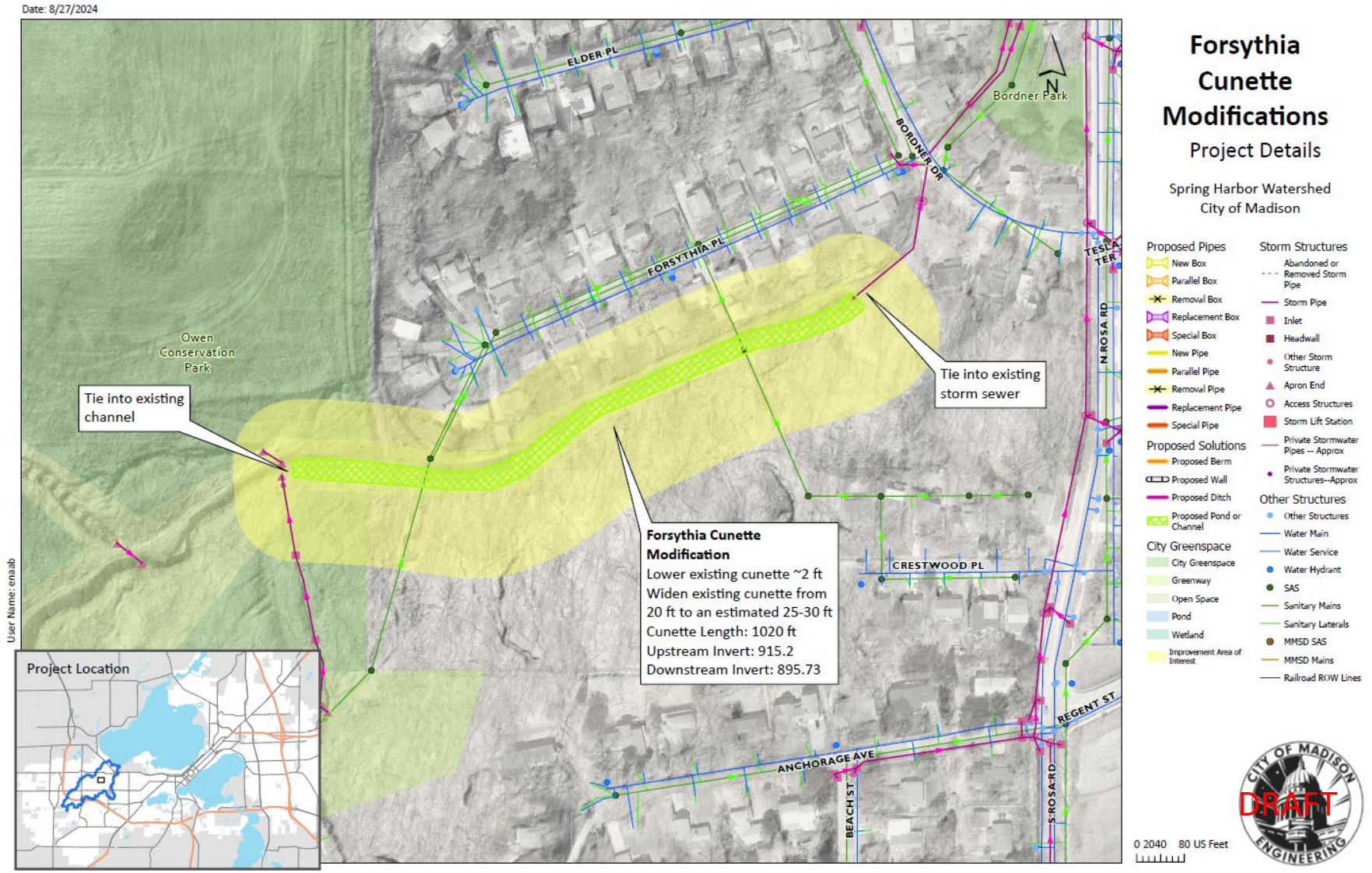
Recommend Solutions

-Forsythia Cunette Modifications

NEAR TERM SOLUTION

Proposed Improvements

- New conceptual solution
- Widen and lower existing cunette
- **In order for the project to be completed, major road reconstruction projects in the area 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

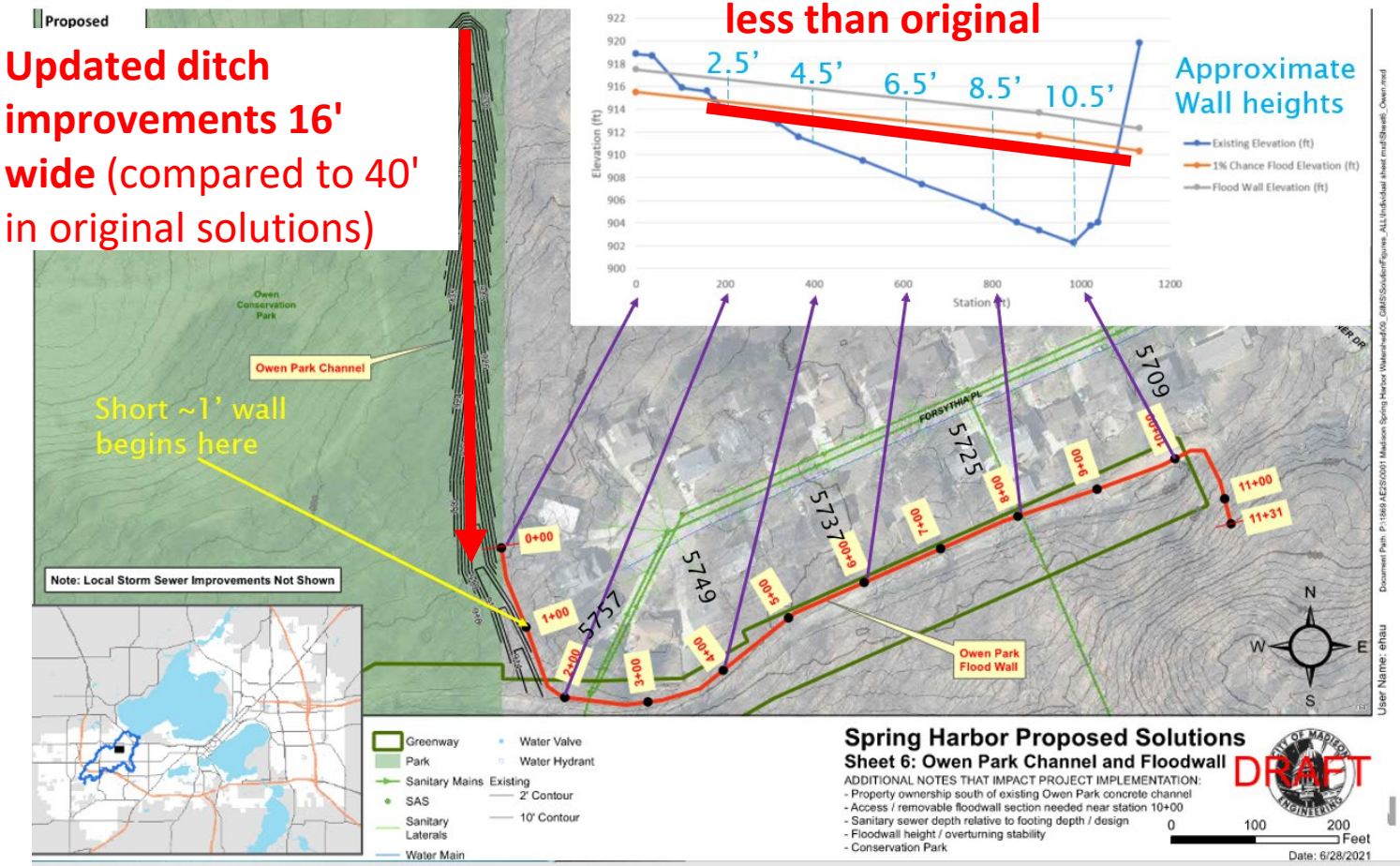
HYPOTHETICAL FUTURE SOLUTION

Proposed Improvements

- Modified from Original Watershed Study Conceptual Solution
- North-South Channel
  - ~2’ deep trapezoidal channel
- Flood Wall - Up to 7.5’ tall

Updated wall height ~3' less than original

Updated ditch improvements 16' wide (compared to 40' in original solutions)



CITY OF MADISON

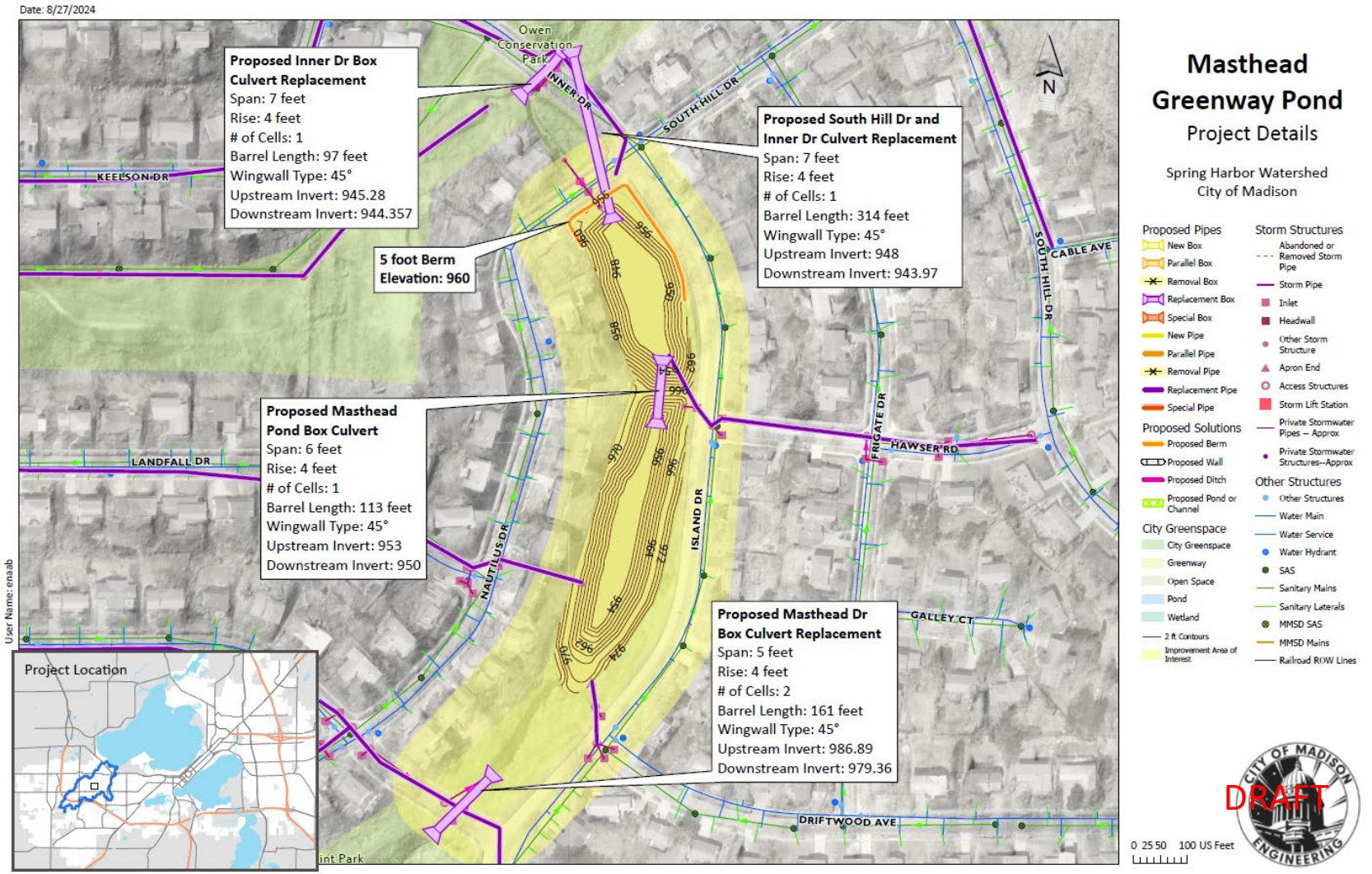
Recommend Solutions

-Masthead Gwy Pond

HYPOTHETICAL FUTURE SOLUTION

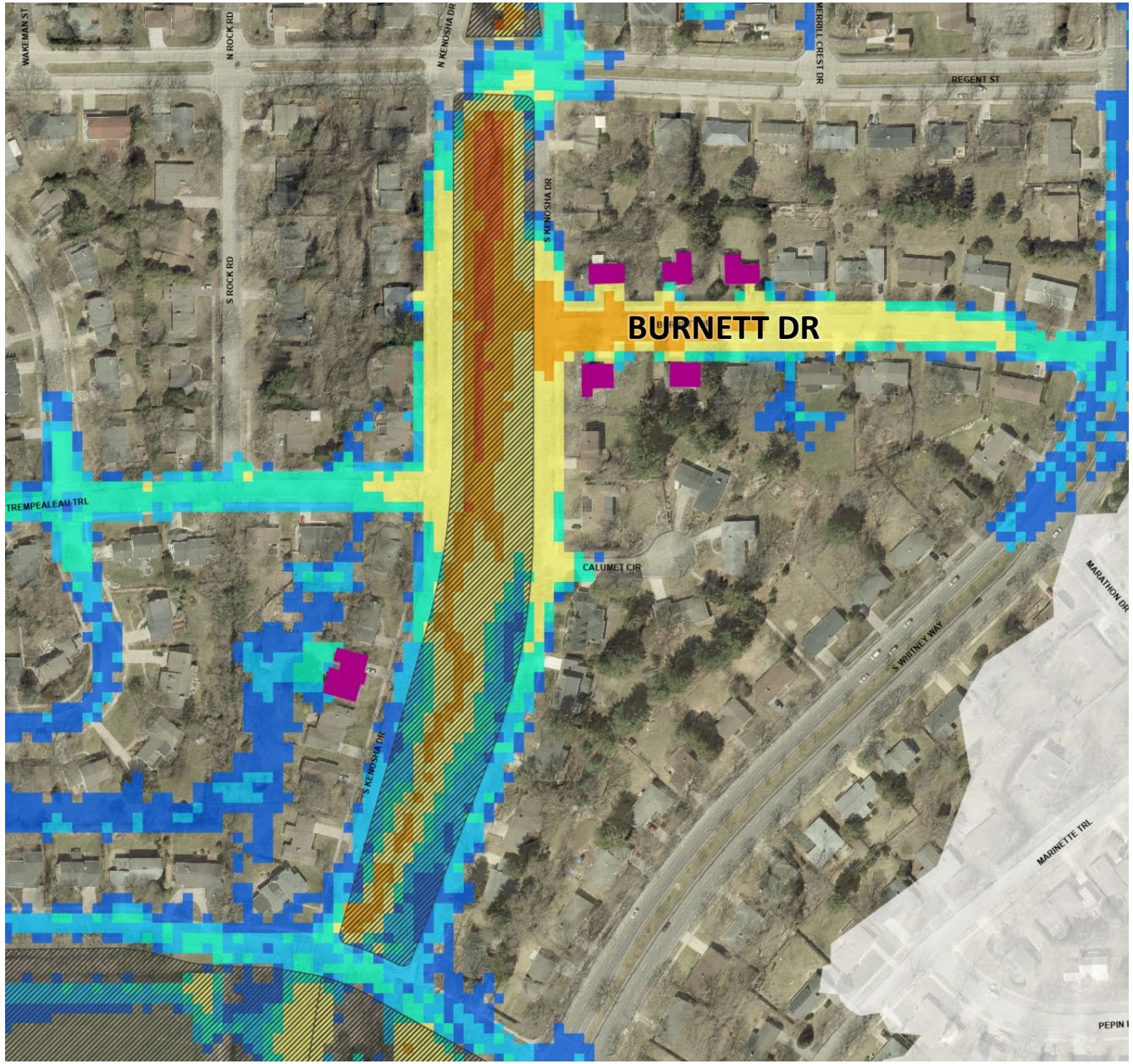
Proposed Improvements:

- Same as Original Watershed Study Conceptual Solution (other than adjustments to Inner Dr. and South Hill Dr. box culvert sizes)
- Two Regional Detention facilities from Masthead to Nautilus (northern pond depth ~10ft and southern pond depth ~13ft)
- Box Storm Sewer From Masthead-Nautilus Greenway



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)

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

CITY OF MADISON

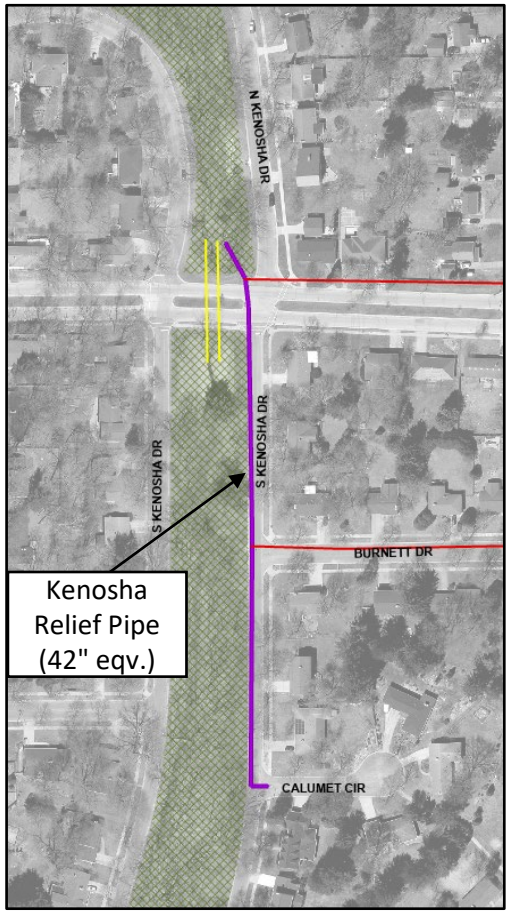
Recommend Solutions

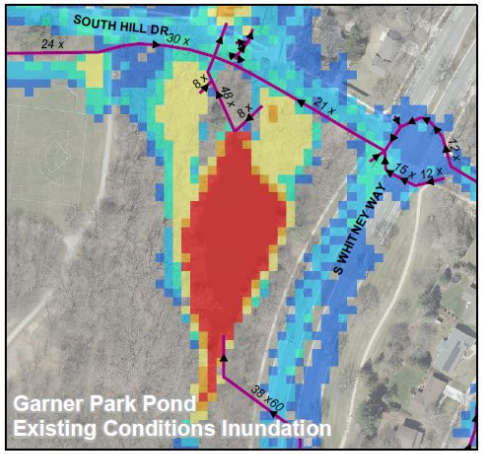
-Garner Park Flood Wall + Kenosha Relief Pipe

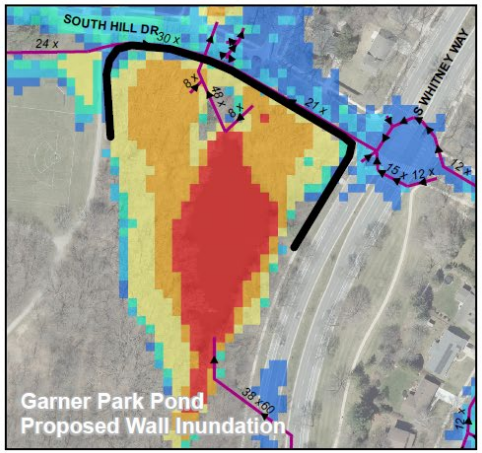
NEAR TERM SOLUTION

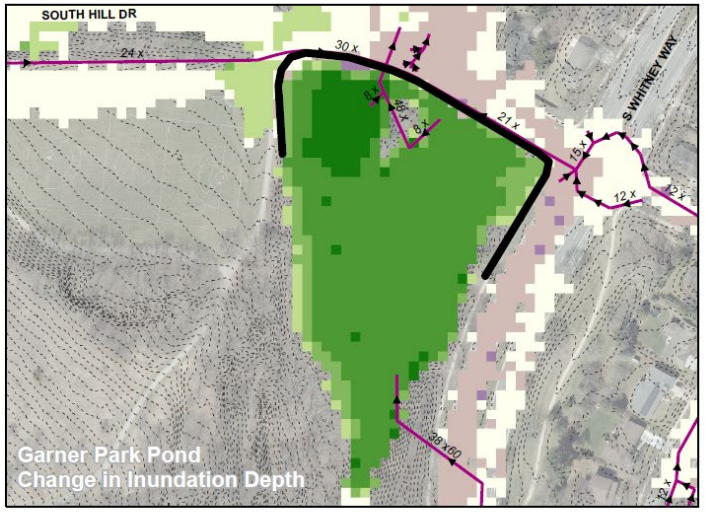
Proposed Improvements:

- New conceptual solution that is an ALTERNATIVE to grading the greenway
- Addresses community desire to preserve the wooded greenway that volunteers have been actively managing by removing invasives since 2020
- 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









Garner Park Pond Proposed Wall 1% Chance Event Inundation

Depth (Feet)
0 - 0.25
0.25 - 0.5
0.5 - 1
1 - 3
3 - 6
> 6

Change in Depth (Feet)
< -3
-3 - -1.5
-1.5 - -0.5
-0.5 - -0.1
-0.1 - 0.1
0.1 - 0.5
0.5 - 1.5
1.5 - 3
> 3

Garner_Wall
Storm Sewer
Contours

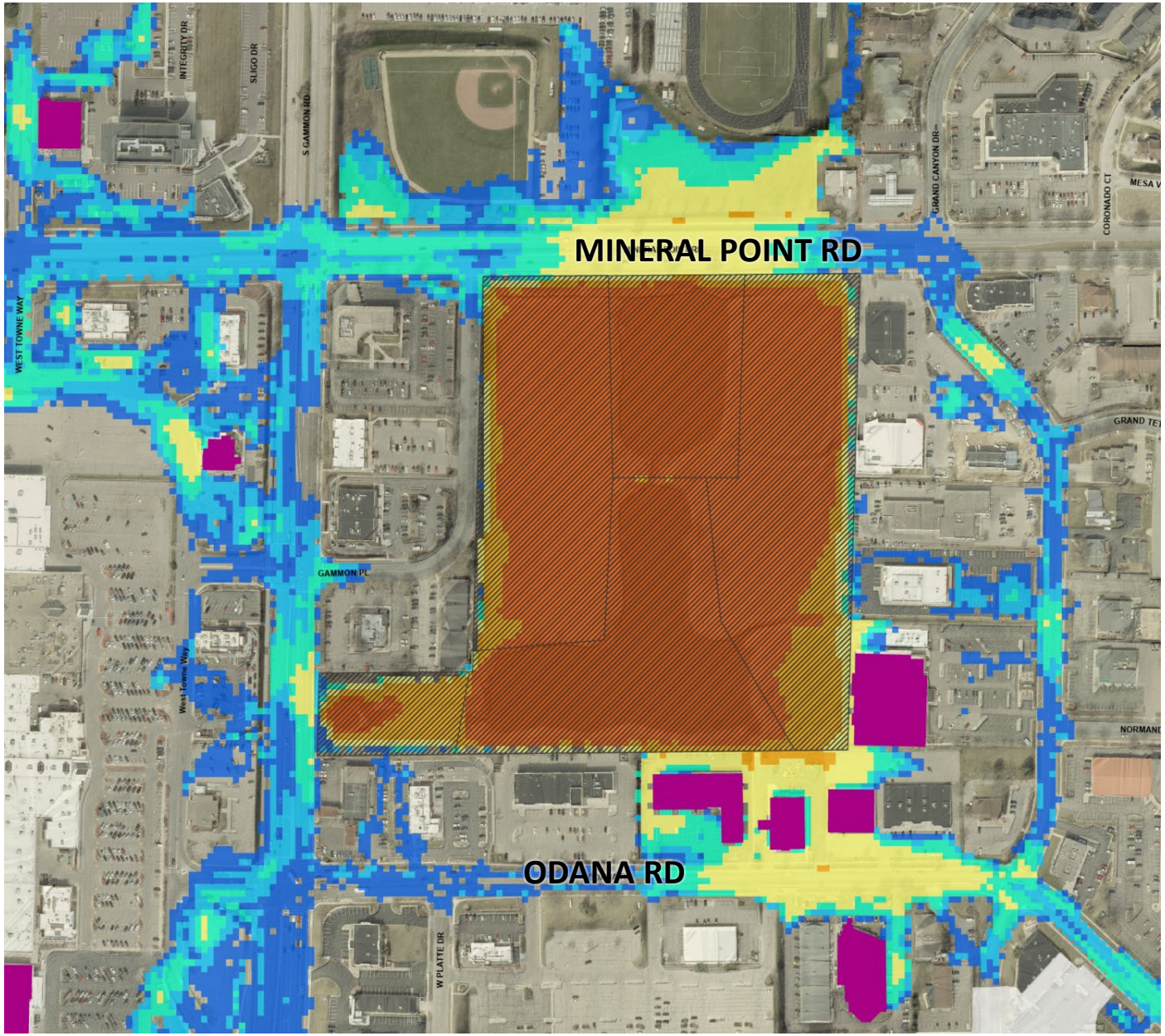
Garner Wall Additional Inundation Duration: 3 hr 25 mins

**The amount of time with depths higher than what is predicted in existing conditions.*

CITY OF MADISON

1% Chance Flooding
- West Town Pond

- Flooding of multiple arterial roads
- Significant business flooding



CITY OF MADISON

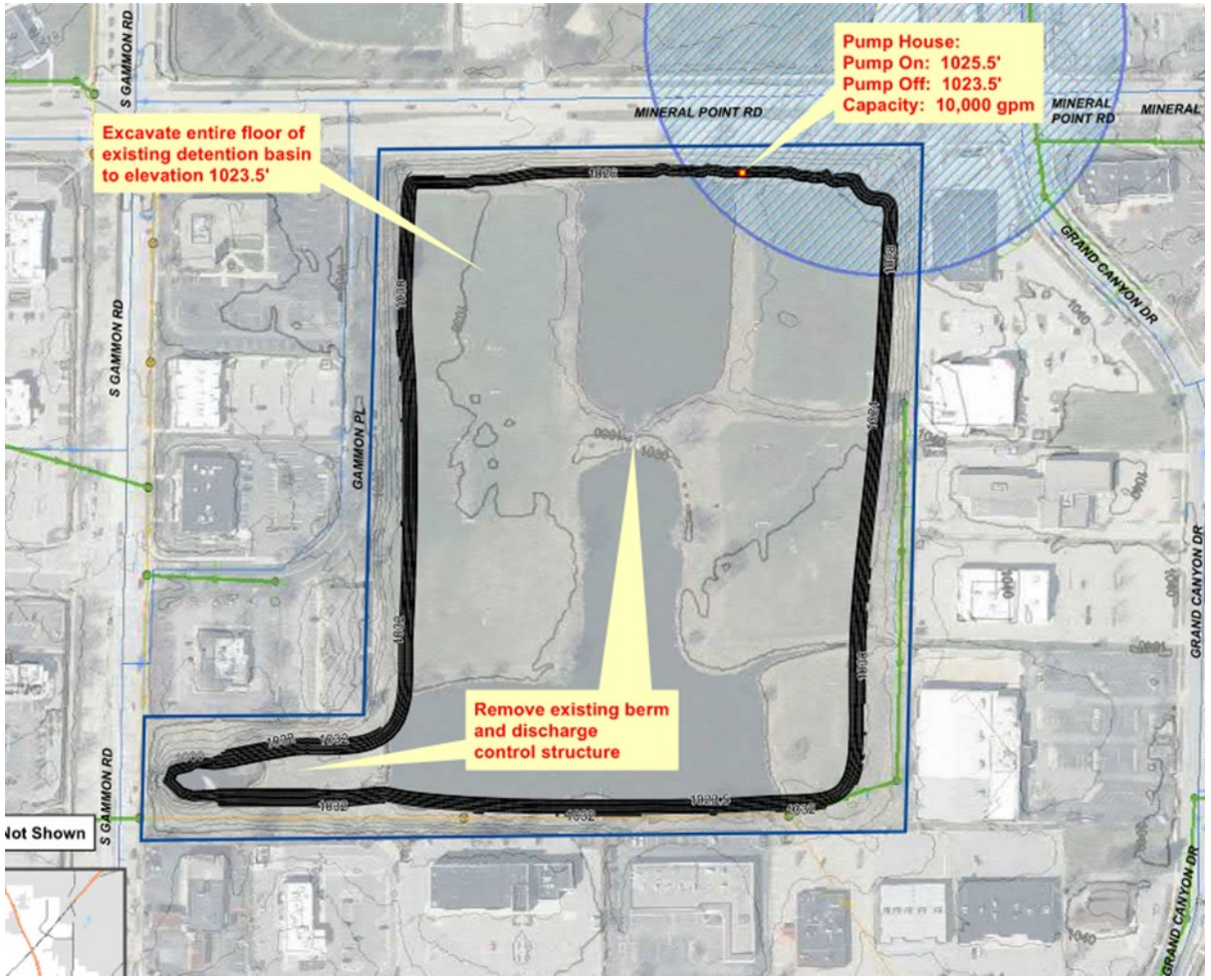
Recommend Solutions

-West Towne Pond – Original Conceptual Solution

SOLUTION CURRENTLY PROGRAMMED IN 2025-2026

Proposed Improvements

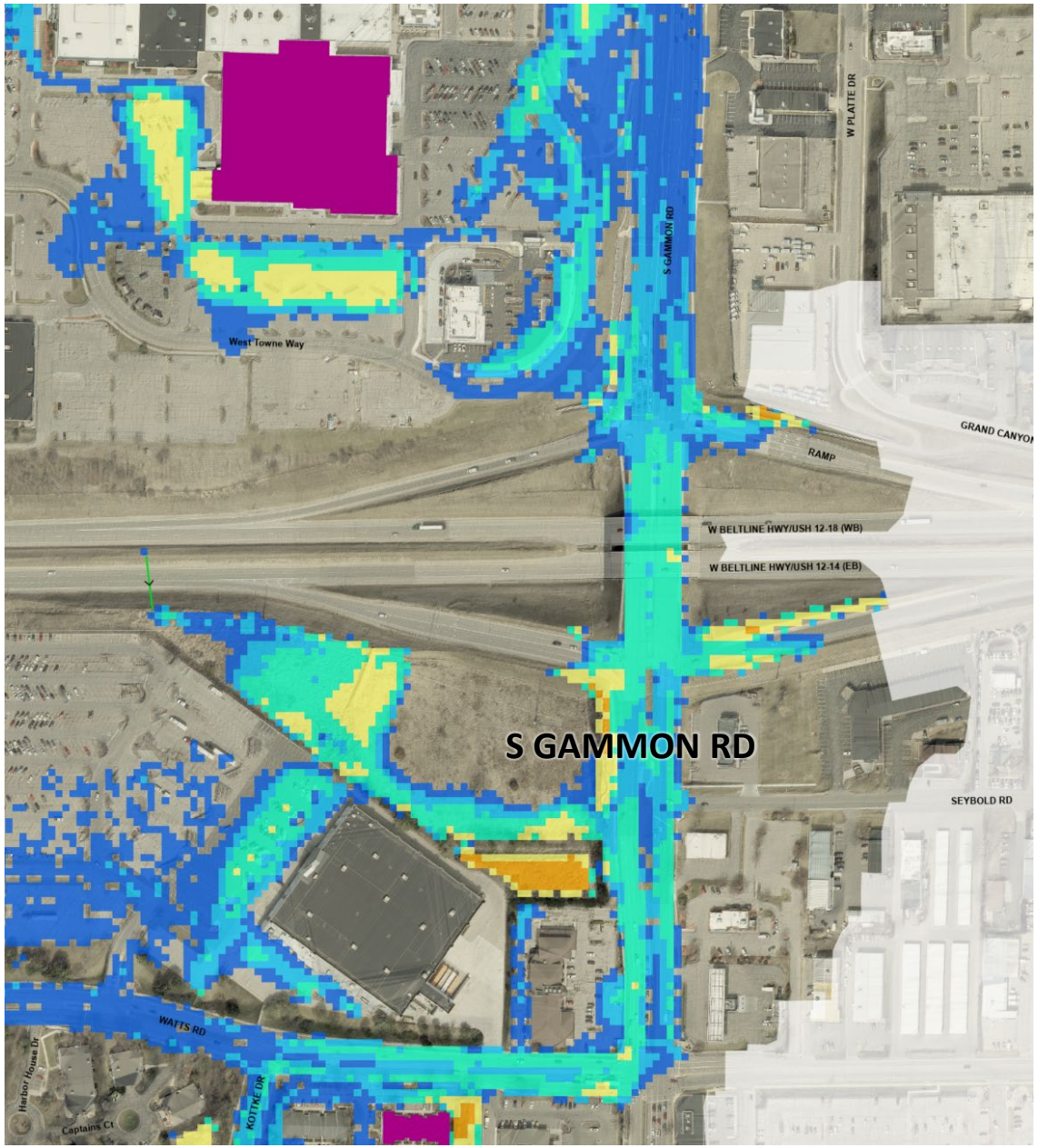
- Same as Original Watershed Study Conceptual Solution
- Excavate existing soccer field area down ~7’ to make room for additional flood water storage
- Combine current three “ponds” into a single large pond
- Lower normal pool 2.0’ by using a small pump house (10,200 Gpm/1-day drawdown)
- Pump house discharges to existing pond outlet
- **Proposed pond improvements do not add to downstream flooding issues**



CITY OF MADISON

1% Chance Flooding
- S Gammon Rd

- Significant flooding of an arterial road



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

CITY OF MADISON

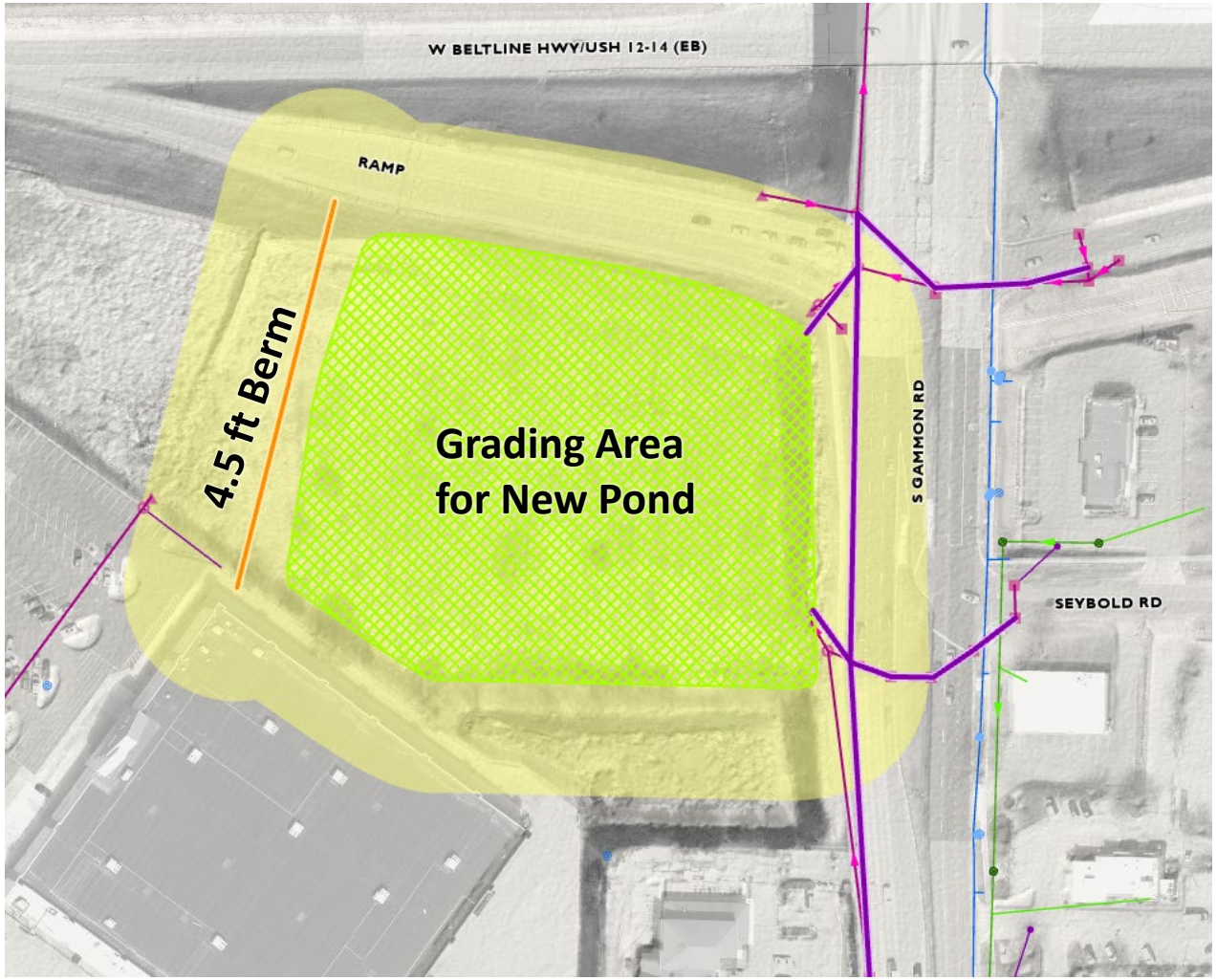
Recommend Solutions

-Beltline Off-Ramp Pond and Berm

NEAR TERM SOLUTION

Proposed Improvements:

- New conceptual solution
- Regrading over 3.37 acres to create new pond storage
- Creation of 4.5ft berm along the western edge of new pond storage area



CITY OF MADISON

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 Wall (shorter) + cunette modifications - $5 M
- South Hill Culvert - $0.7M
- Local Sewer

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

All Solutions (0-50 yrs)

- 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 Gwy Pond - $2.6M
  - Forsythia Wall (shorter) + cunette modifications - $7.1M
  - Glen Oak Hills berms – $1.8M
- Greenway Crossings - $4.7M
- Local Sewer

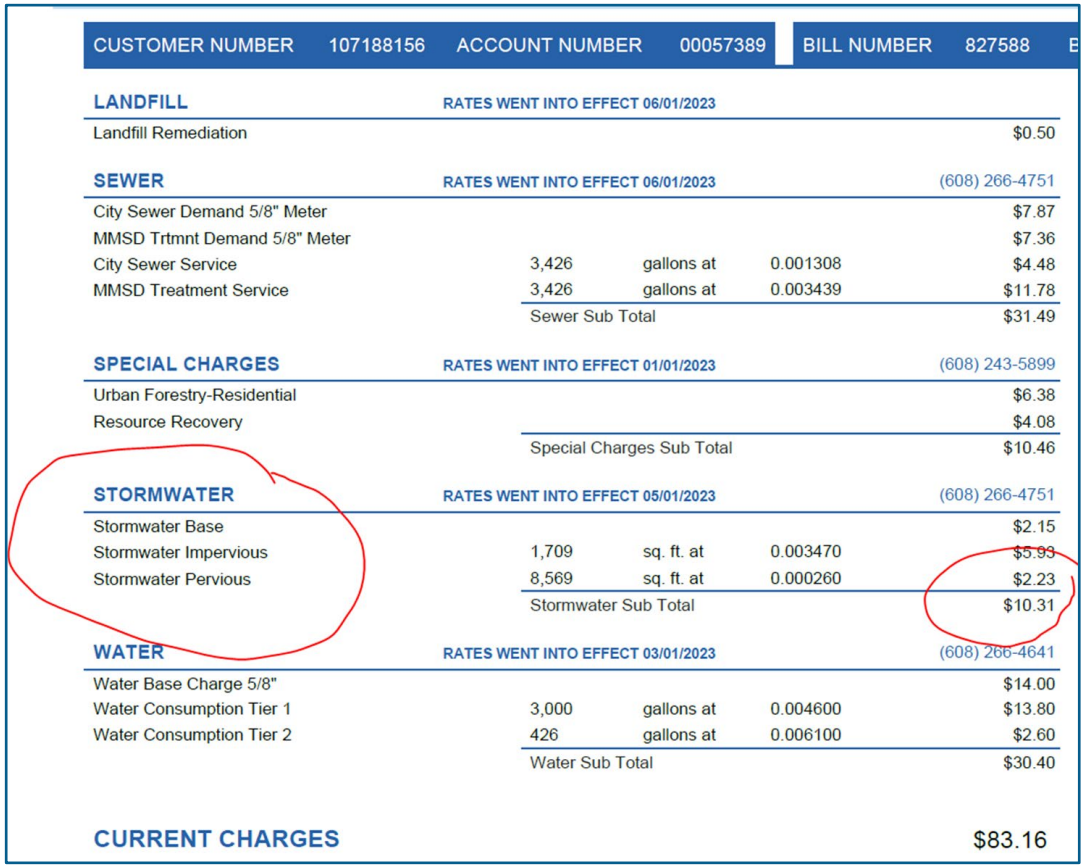
- **Total without local sewer: $46M**

Recommended Solutions Timeline

Solutions Timeline

- Stormwater Utility Funding

- **Not** funded from property taxes, which funds the General Fund
- All stormwater related improvements are funded through a charge on your monthly water bill called “stormwater”.
- The average single family house pays **$11/month** which is used to fund stormwater utility



CUSTOMER NUMBER 107188156	ACCOUNT NUMBER 00057389	BILL NUMBER 827588	E
LANDFILL	**RATES WENT INTO EFFECT 06/01/2023**		
Landfill Remediation			$0.50
SEWER	**RATES WENT INTO EFFECT 06/01/2023**		(608) 266-4751
City Sewer Demand 5/8" Meter			$7.87
MMSD Trtmnt Demand 5/8" Meter			$7.36
City Sewer Service	3,426 gallons at	0.001308	$4.48
MMSD Treatment Service	3,426 gallons at	0.003439	$11.78
	Sewer Sub Total		$31.49
SPECIAL CHARGES	**RATES WENT INTO EFFECT 01/01/2023**		(608) 243-5899
Urban Forestry-Residential			$6.38
Resource Recovery			$4.08
	Special Charges Sub Total		$10.46
STORMWATER	**RATES WENT INTO EFFECT 05/01/2023**		(608) 266-4751
Stormwater Base			$2.15
Stormwater Impervious	1,709 sq. ft. at	0.003470	$5.93
Stormwater Pervious	8,569 sq. ft. at	0.000260	$2.23
	Stormwater Sub Total		$10.31
WATER	**RATES WENT INTO EFFECT 03/01/2023**		(608) 266-4641
Water Base Charge 5/8"			$14.00
Water Consumption Tier 1	3,000 gallons at	0.004600	$13.80
Water Consumption Tier 2	426 gallons at	0.006100	$2.60
	Water Sub Total		$30.40
CURRENT CHARGES			$83.16

Solutions Timeline

- Stormwater Utility Budget

- Annual Citywide Stormwater Utility Budget = **$15 million**
  - **Annual budget cover ALL operations of the entire stormwater sewer system as well as funding capital projects.**
- Spring Harbor Watershed “All Solutions” suite of solutions Cost without local sewer = **$46M**
- Spring Harbor Watershed is only **1 of 22 watershed** in the City of Madison
- Correcting systemic and historic flooding issues will take **decades**

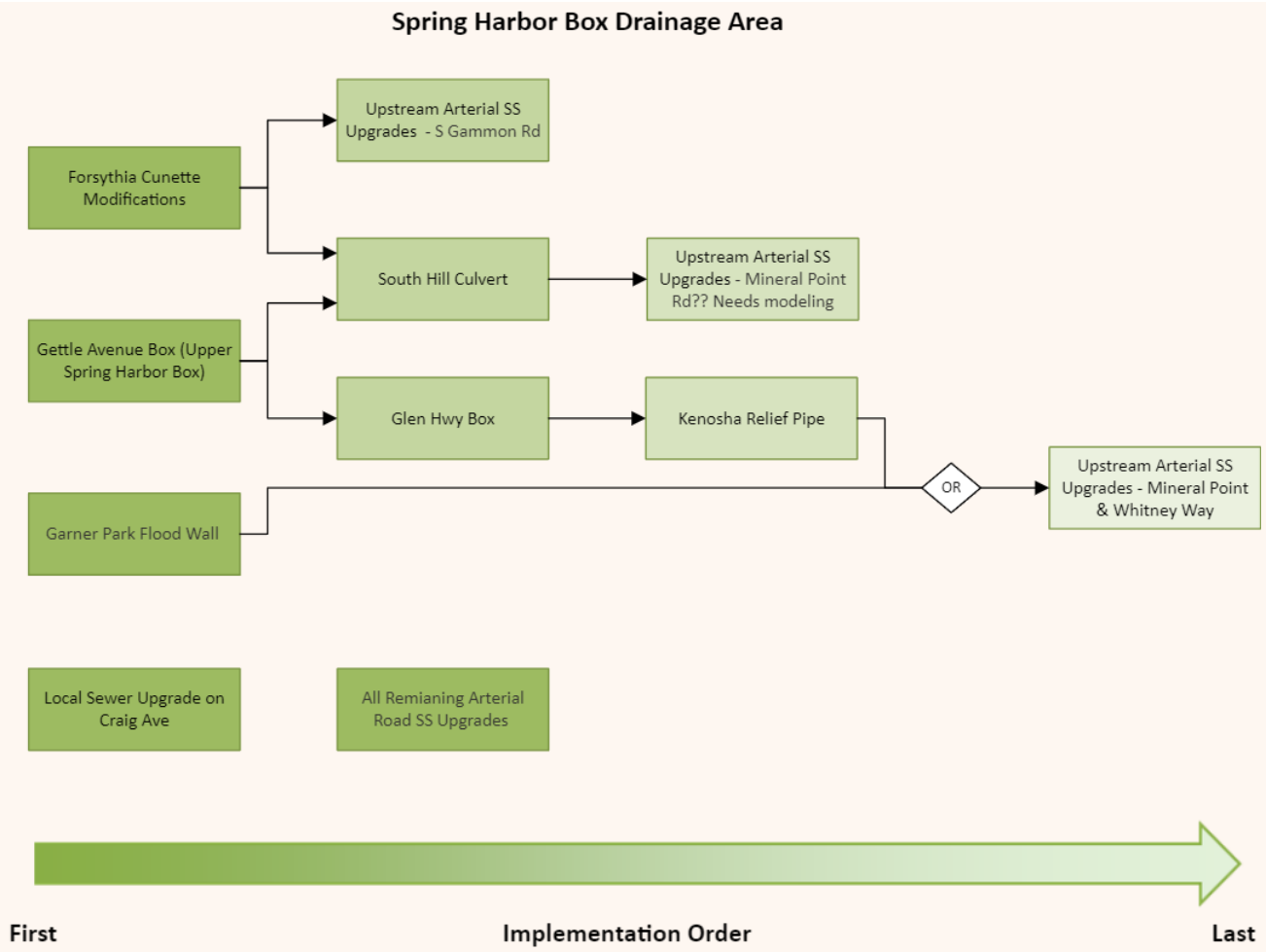
Solutions Timeline

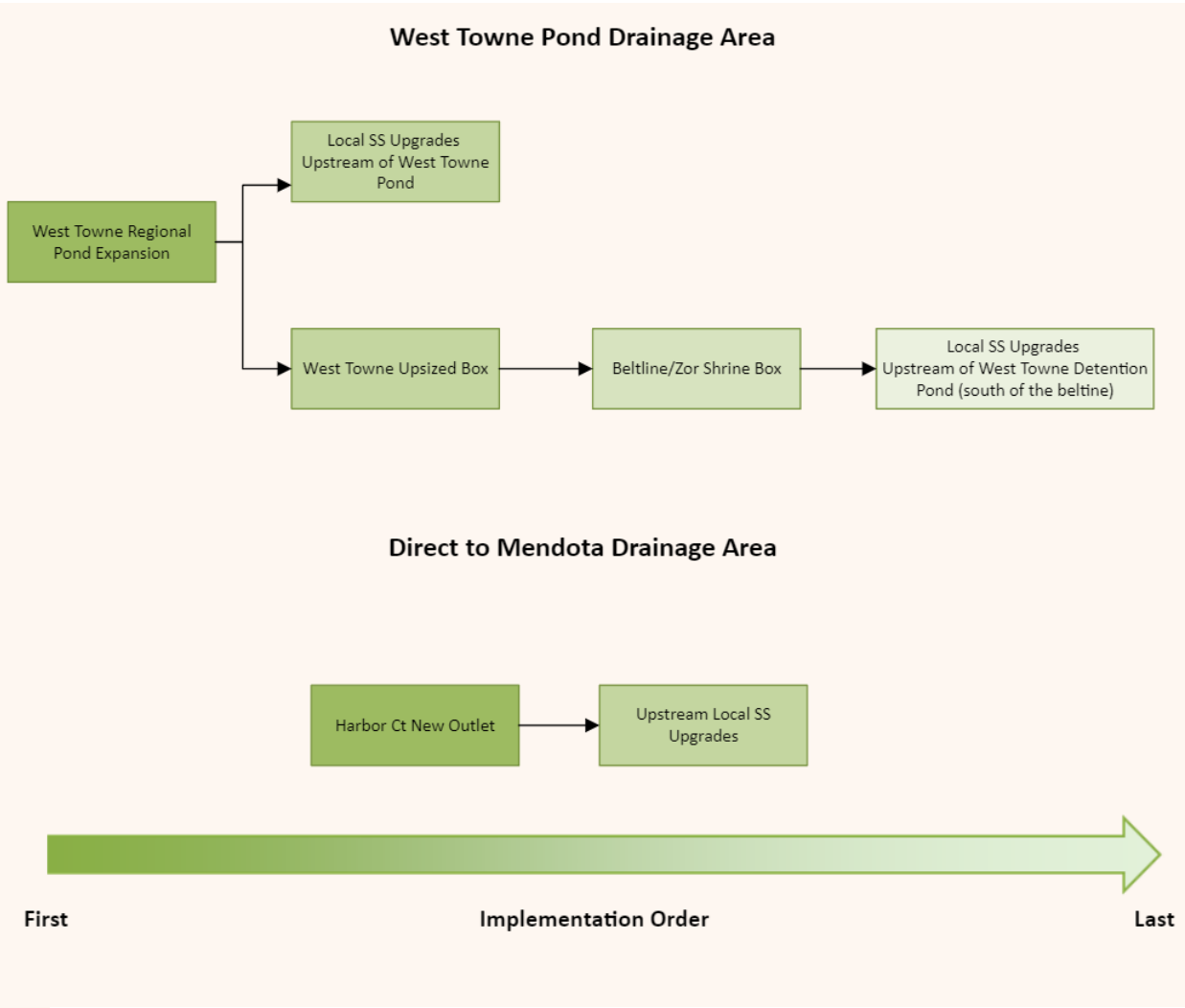
- Determination of Implementation Order

- The City will not implement a flood mitigation project if it results in an increase in flooding downstream. Implementation sequences were developed to follow this policy.
- As new opportunities become available to implement solutions in the watershed, out of the recommended order, additional modeling will be done to explore those options which were not foreseen at the time of this modeling.

Solutions Timeline

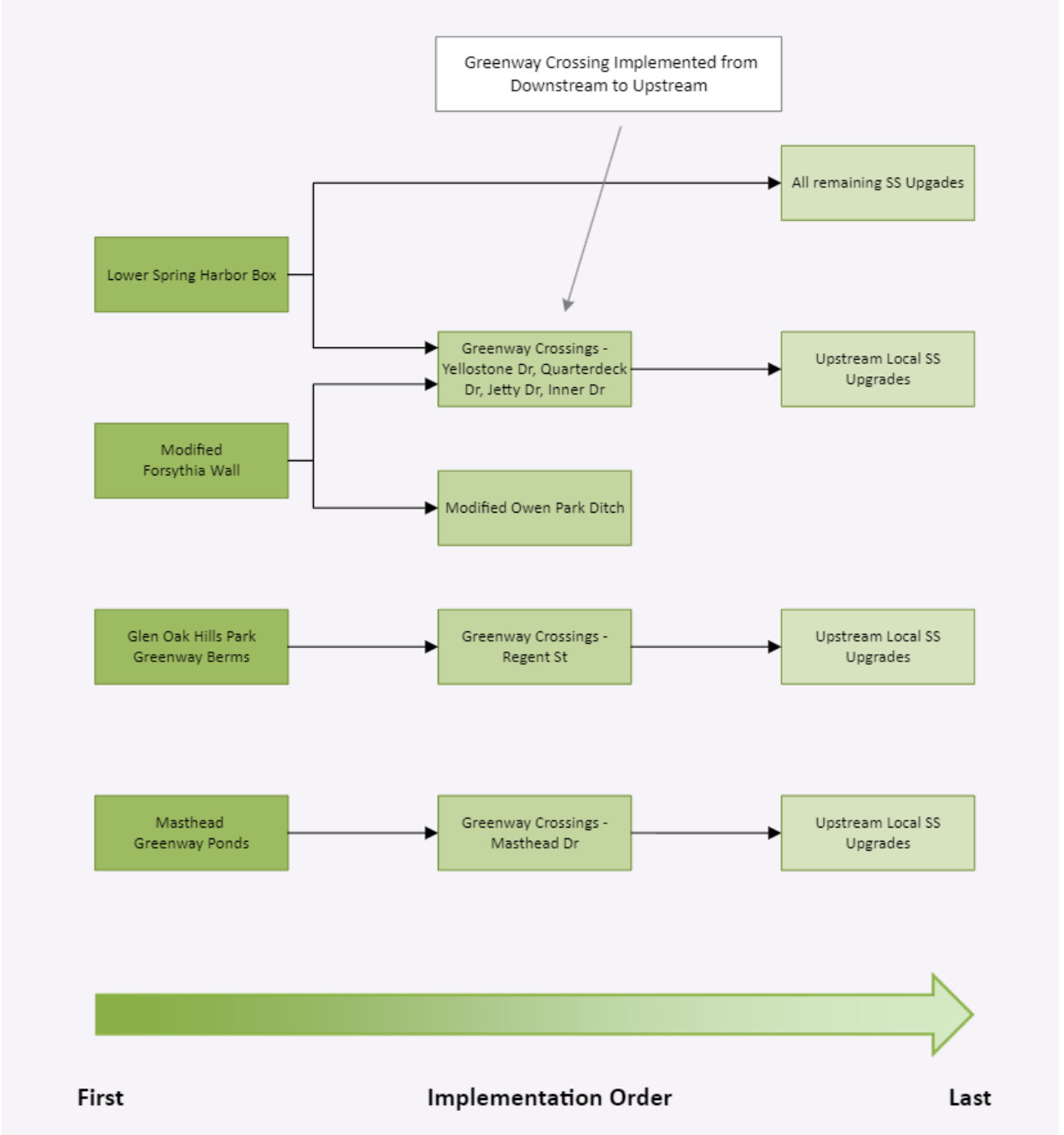
- Implementation Order Near-Term



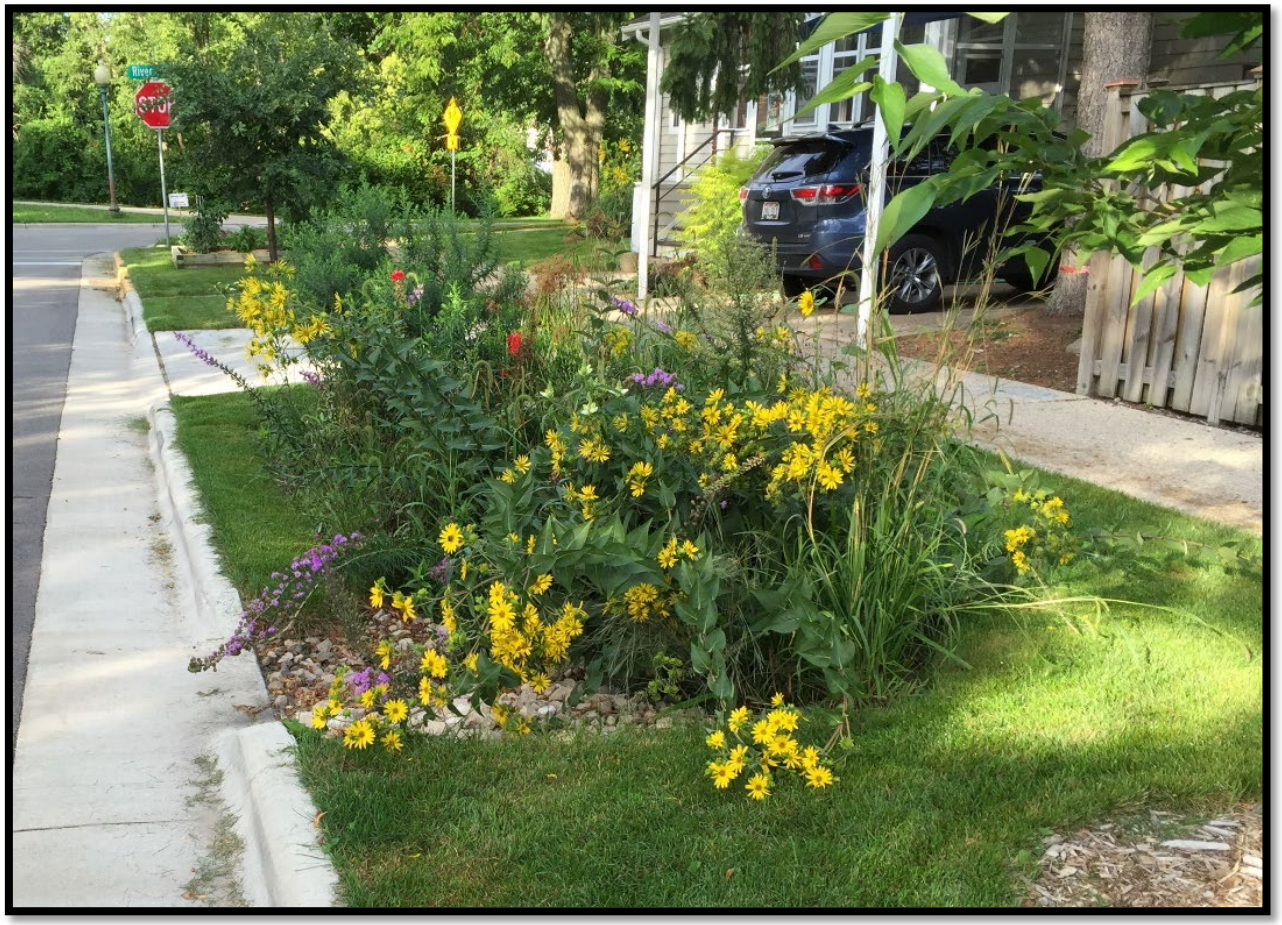


Solutions Timeline

-Implementation Order Hypothetical Future Solutions (Watershed Wide)



Other Watershed Opportunities - What The City is Doing



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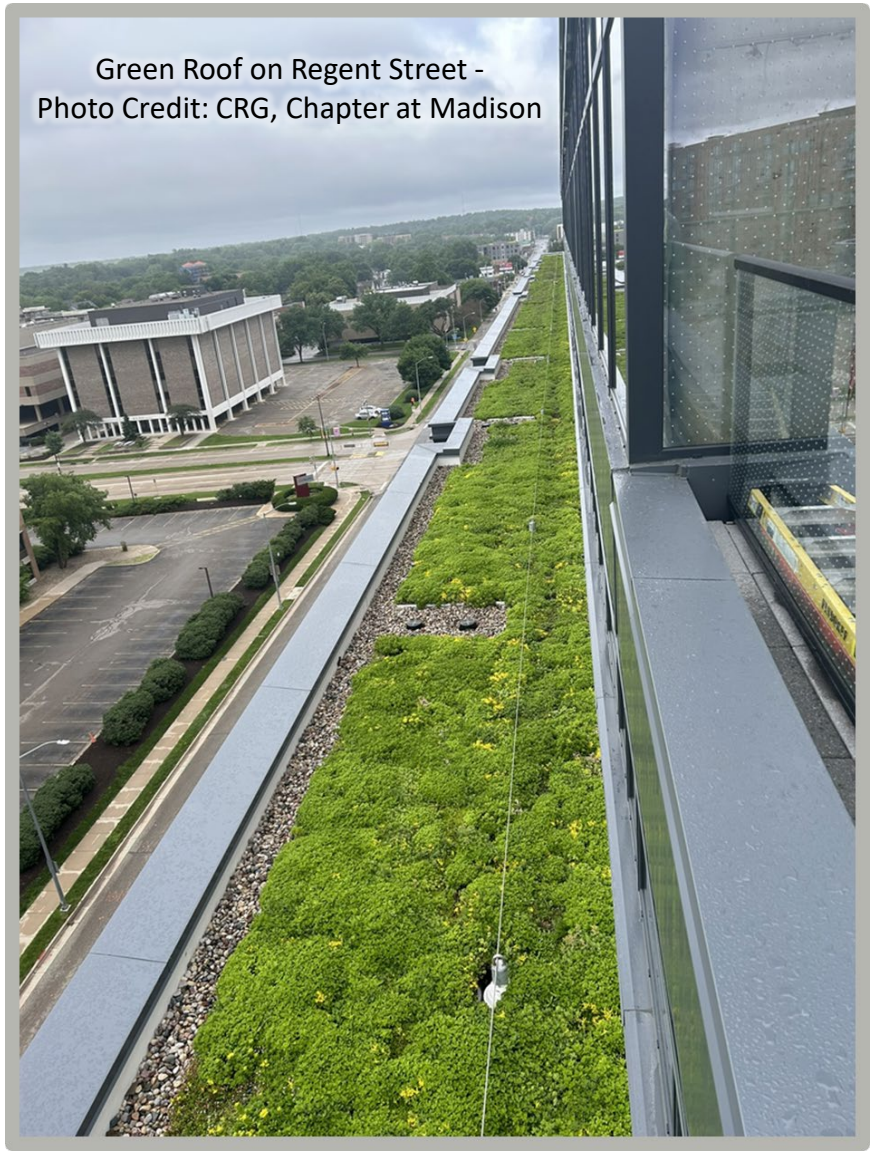
What The City is Doing

- Revised Municipal Government Ordinance (MGO) 37 to Increase Flood Resiliency

- New Development
  - Added 0.5% chance detention requirement
  - Increased sizing standards for greenway crossings
  - Set low building openings for critical areas
- Re-Development
  - Reduce 10% chance peak flow by 15%
  - Reduce 10% chance runoff volume by 5%
  - Green Infrastructure required
  - Set low building openings for critical areas
- Utilize models created for watershed studies
- Learn more at:

www.cityofmadison.com/engineering/stormwater/stormwater-ordinance



Green Roof on Regent Street -
Photo Credit: CRG, Chapter at Madison

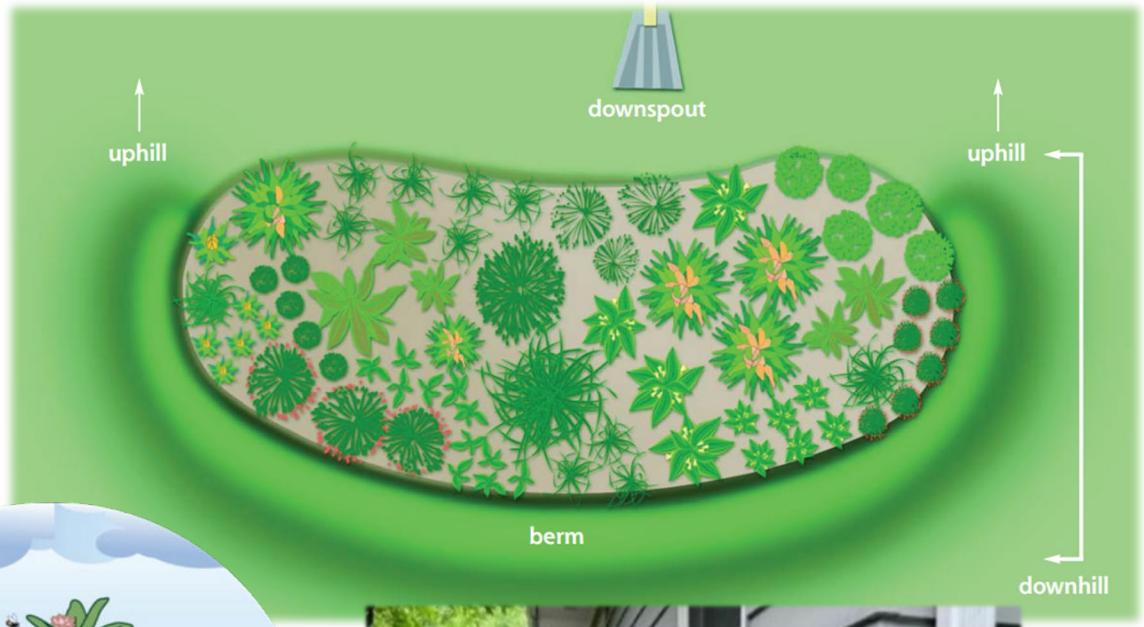
CITY OF MADISON

What The City is Doing

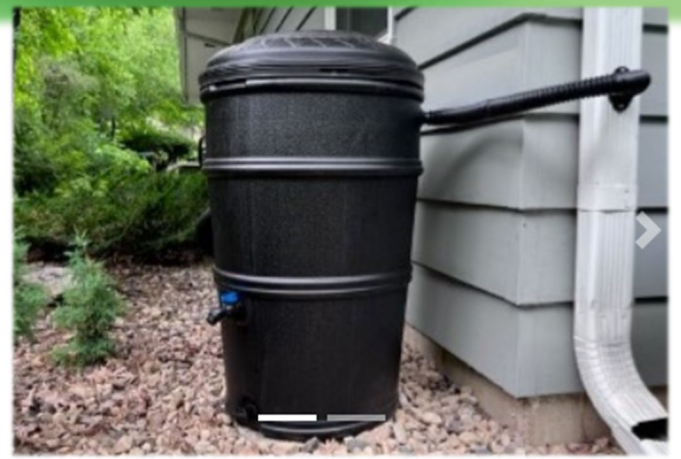
-What is Green Infrastructure?

- "The range of measures that use plant or soil systems, permeable pavement or other permeable surfaces or substrates, stormwater harvest and reuse, or landscaping to store, infiltrate, or evapotranspirate stormwater and reduce flows to sewer systems or to surface waters."

www.epa.gov/green-infrastructure/what-green-infrastructure



- Green Infrastructure Includes:
  - Rain Barrels
  - Rain Gardens
  - Planter Boxes
  - Bioswales
  - Permeable Pavements
  - Green Roofs

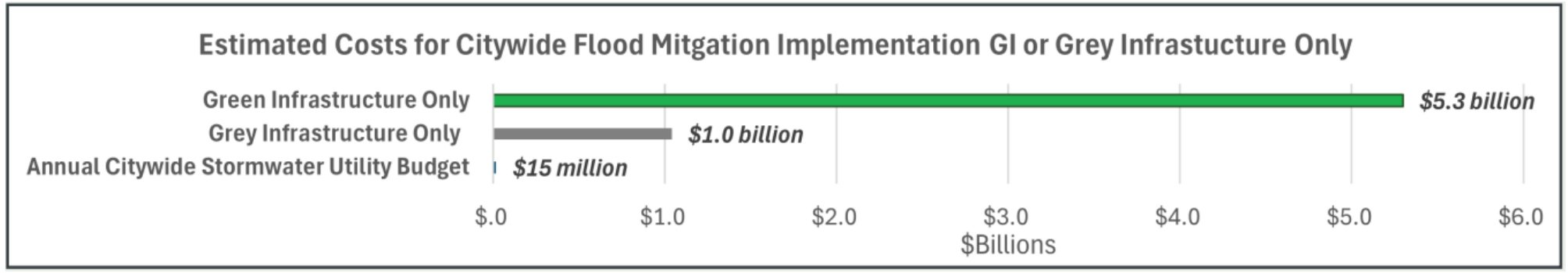


CITY OF MADISON

What The City is Doing

-Green Infrastructure (GI) Flooding Effectiveness Analysis

- A GI analysis was completed with the Pheasant Branch Watershed study to evaluate Green Infrastructure as a means to reach our flood mitigation targets
- Analysis results:
  - Significant amount of GI needed to meet flood reduction targets
  - GI is meant to improve water quality, and is designed for smaller frequent storms (which carry most of the pollutants), not large flood storms. When GI fills up at the start of a large storm, the water flows out like a cup that is full.
  - Citywide implementation of GI as the primary flood control measure would exceed $5 billion, several times the cost of necessary grey infrastructure.
  - City lack sufficient city-owned land to feasibly put in the amount of green infrastructure required.



*Does not include maintenance costs

For more information, including the GI analysis report, and summary fact sheet, please visit:

www.cityofmadison.com/flooding/city-initiatives/watershed-studies/watershed-study-learning-hub/green-infrastructure-water

CITY OF MADISON

What The City is Doing

-Green Infrastructure (GI) Flooding Effectiveness Analysis

- GI will continue to be a piece of the larger puzzle for flooding
- GI has many additional benefits:
  - Ecological – habitat for pollinators
  - Water Quality – removes pollutants from stormwater in small storms
  - Social
  - Aesthetic
  - Economic

Rusty Patch Bumble Bee (endangered) – South Point bioretention

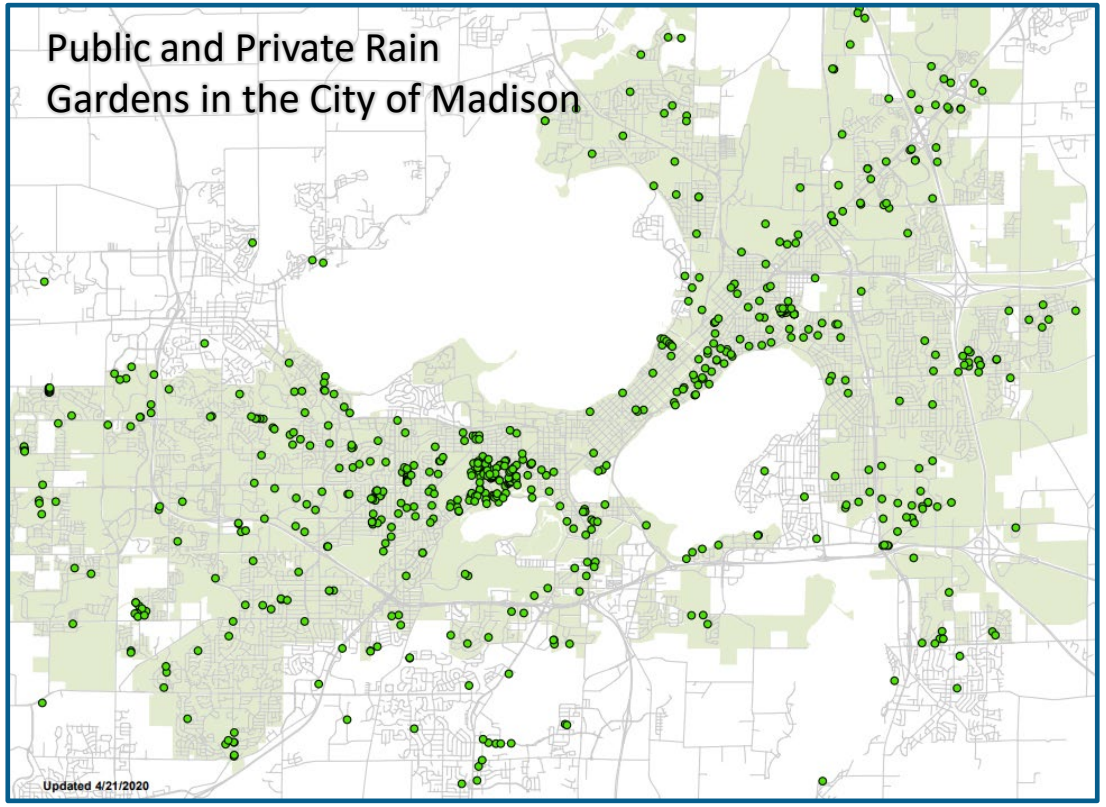
Monarch caterpillar at Regent St Median Rain Garden

Dragonfly at Lake Mendota Drive Terrace Rain Garden

What The City is Doing

- Green Infrastructure (GI) Successes in The City

- GI Effectiveness Analysis – looked at impact of using GI for flood mitigation
- Westmorland GI Pilot Study – Paired with the USGS to implement significant amounts of GI and study the downstream impact
- Roger Bannerman Rain Garden Initiative (Terrace Rain Garden Program)
    - The City is well on its way to the 1000 Rain Garden Goal! As of February 2024, there are 773 which is a 24% increase since 2020!
- Stormwater Ordinance Revision – resulted in an increase in GI with private development. Over 20 green roofs have been built since the ordinance revision
- Supplies residents with additional online Educational Resources



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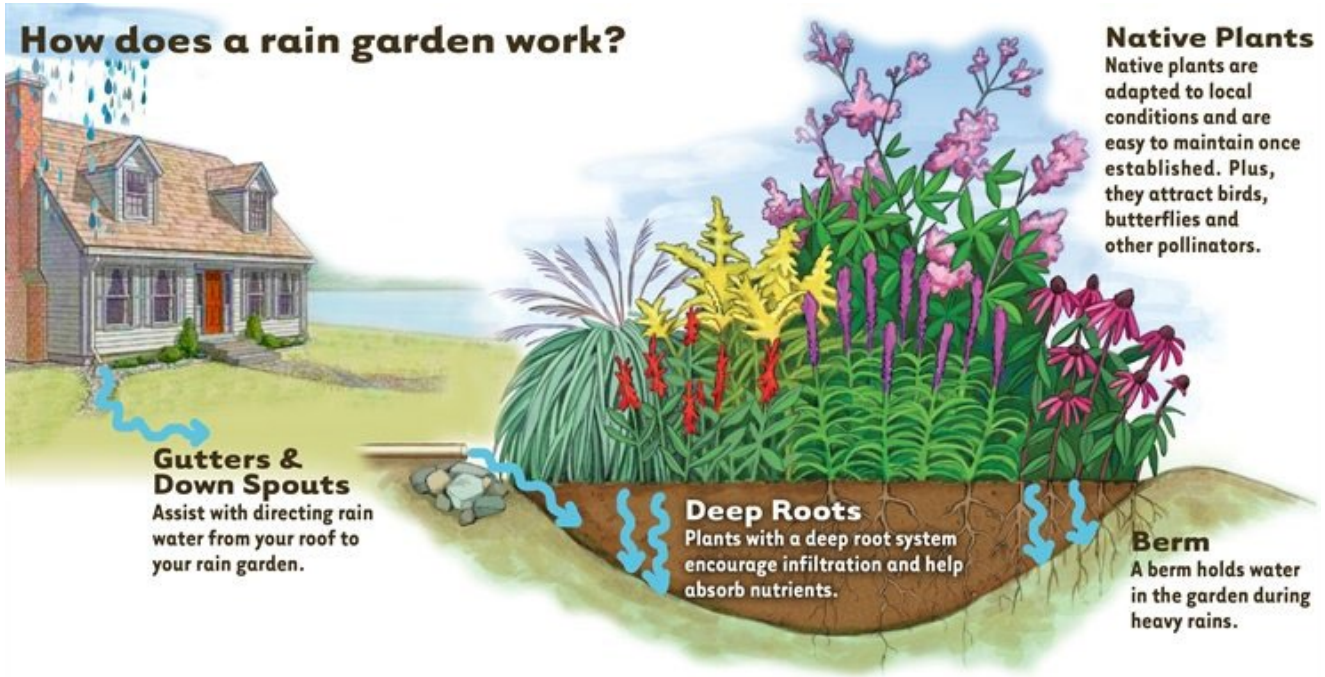
Other Watershed Opportunities - What Can Residents Do

GI's many benefits are increased when we are able to infiltrate clean water (i.e. water from roofs of buildings, as opposed to runoff from parking lots or roads)

Residents building rain gardens to infiltrate their roof water is a great way to help!



How does a Rain Garden Work Photo Courtesy of the Tip of the Mitt Watershed Council, MI

CITY OF MADISON

What Residents Can Do

- Be a Watershed Steward

- Share the Impacts of Stormwater Runoff with Neighbors
- Install a rain garden --> credit on your stormwater bill
  - Learn how to build a rain garden to collect stormwater from your roof
  - Buy reduced costs native plants from Plant Dane
  - Apply for a Stormwater Fee Adjustment
- If you're impacted by road reconstruction, you may qualify for the City's terrace rain garden program
- Modify your leaf management techniques by removing leaves from the street and using them in your yard
- Learn about Ripple Effects, Madison Area Stormwater Partnership
  - Celebrate Wisconsin Stormwater Week - September 21- 29, 2024
  - Adopt A Storm
  - Install a Rain Barrel
- See Illegal Dumping to Storm Drains or Waterways – Report it!

Scan me!

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What Residents Can Do

- Prepare for and Report Flooding

- Learn More about flooding in Madison
- Prepare Yourself for flooding
- Make your home more flood resilient
- Report Flooding online in the City's reporting tool

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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
- Next Steps:
  - Finalizing the updated Spring Harbor Watershed Study Final Report. Will be posted to the project webpage with an appendix that details the updated modeling and recommended solutions with a 30-day public comment period.

Contact Information & Resources

- Project Manager: Jojo O'Brien , jobrien@cityofmadison.com
- Project Modeler: Alaina Baker, abaker@cityofmadison.com
- Public Information Officer: Hannah Mohelnitzky, hmohelnitzky@cityofmadison.com

- Project Webpage: www.cityofmadison.com/SpringHarborWatershed
  - Sign-up for project email updates on the website
  - Report flooding, past or current on the Report Flooding form
  - Learn ways to protect your property from flooding with on-site fixes

- Flooding Website: www.cityofmadison.com/flooding
- Everyday Engineering Podcast
- Instagram: @MadisonEngr
- Facebook – City of Madison Engineering
- X – @MadisonEngr

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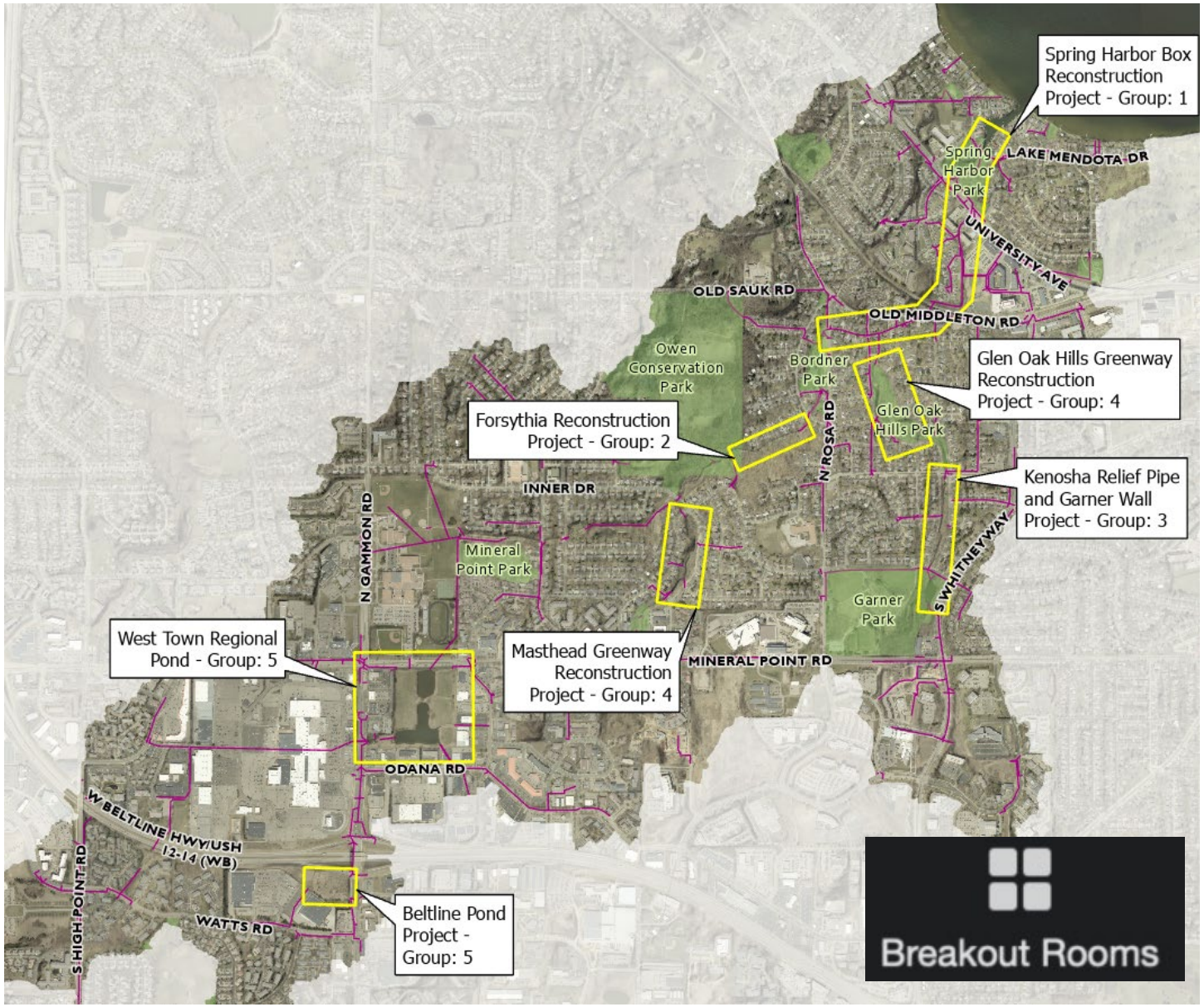
Questions?

Zoom Breakout Rooms

- Join a Zoom Breakout Room Session
  - Window will pop up where you can select which group you'd like to join
  - If a window doesn't pop up, look for a button on the bottom that says "Breakout Rooms." Click the button and room options will appear.

Breakout Groups

1. **Spring Harbor Box Reconstruction Project**
2. **Forsythia Reconstruction Project**
3. **Kenosha Relief Pipe** and **Garner Wall Projects**
4. **Masthead** and **Glen Oak Hills Greenway Reconstruction Projects**
5. **West Town Regional Pond** and **Beltline Pond Projects**



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Meeting Wrap Up

Thank you for coming!

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