Spring Harbor Watershed Study Public Information Board of Parks Commissioners

City of Madison Engineering Division
Wednesday, September 6th

CITY OF MADISON

Background

Background

-City's Watershed Study Program

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

↓

Flash flooding revealed widespread deficiencies in our stormwater system brought about by climate change

↓

The City's Watershed Study Program
- Tasked to identify existing problems, develop solutions, and prioritize improvements in the City's 22 watersheds (5-10 years of development)

↓

Future Project and Budgeting
- Will use these high-level solutions as a guide to understand what mitigation efforts will be needed if we are to alleviate flooding

Flooding Near West Towne Pond

CITY OF MADISON

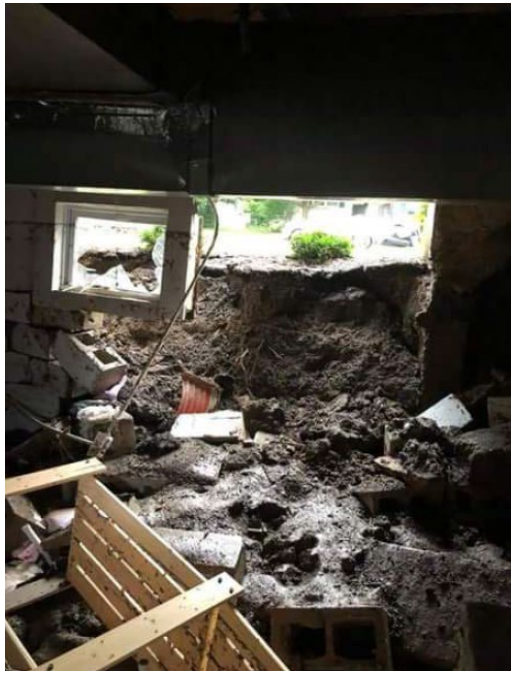
Background

-City's Watershed Study Program

Note:
These solutions should be considered conceptual. They can be used as a guide to understand the level of effort necessary to fix flooding.

It is recognized that fixing flooding in fully urbanized areas is not easy and solutions may not be popular or achievable. This should be considered a plan for what it would take if we were to implement flood solutions.

Bordner Park flood debris



Basement collapse from 2018 flood

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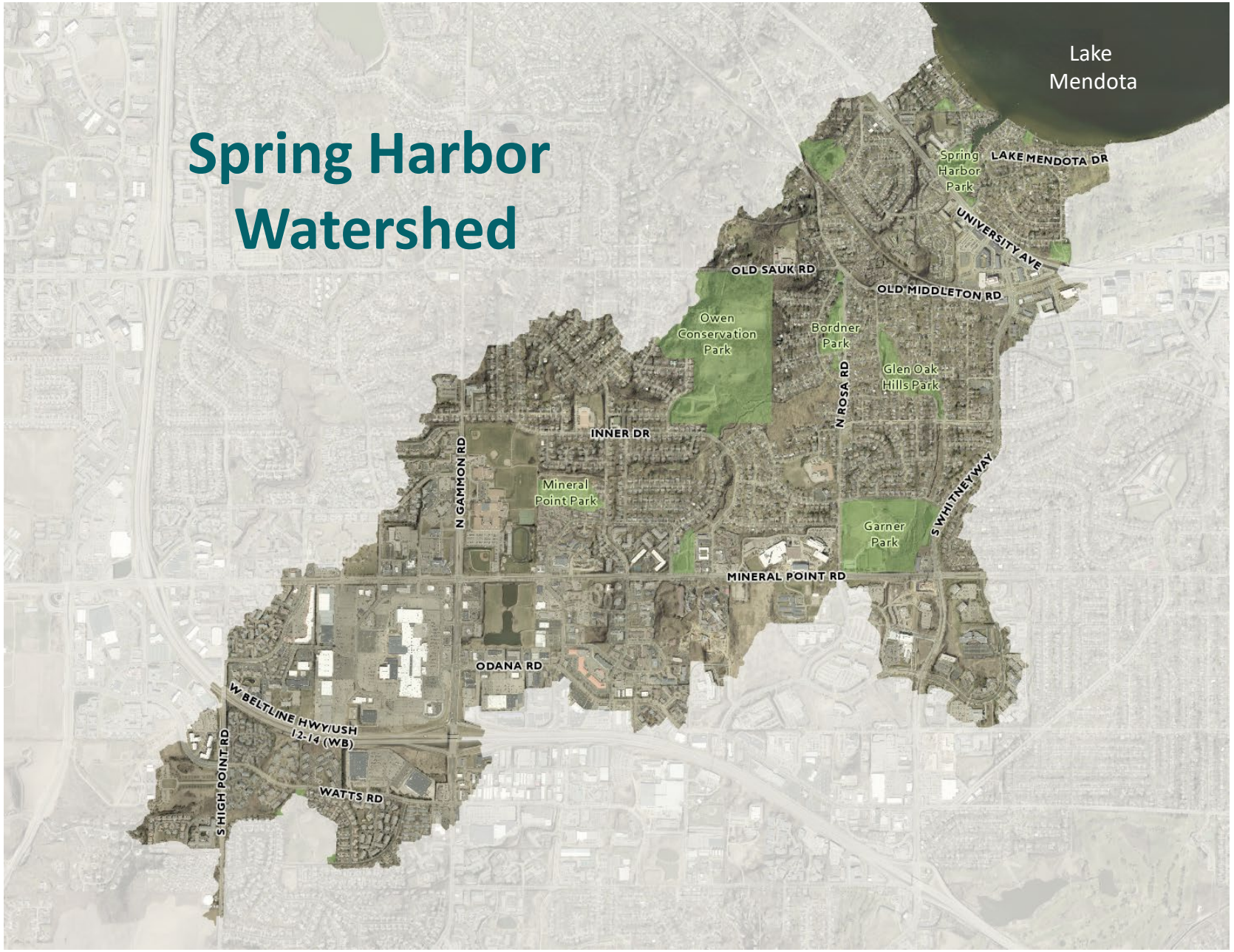
Background

-Watershed Study Flood Mitigation Goals

- 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

Greenway crossing overtopping at Quarterdeck Dr

Spring Harbor Watershed



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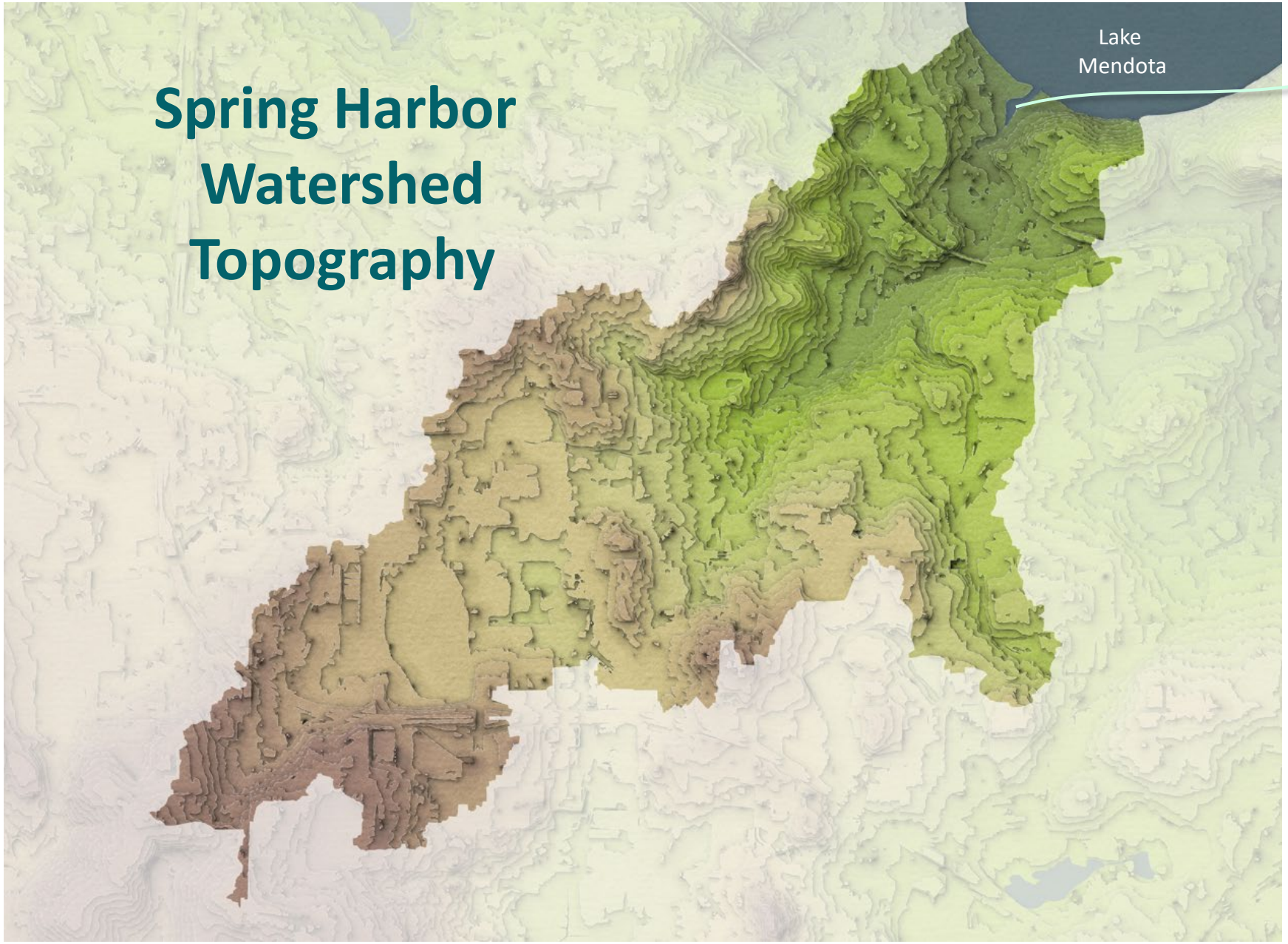
Spring Harbor Watershed Topography



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Background – 2 Rounds of Engagement

-Previous Engagement

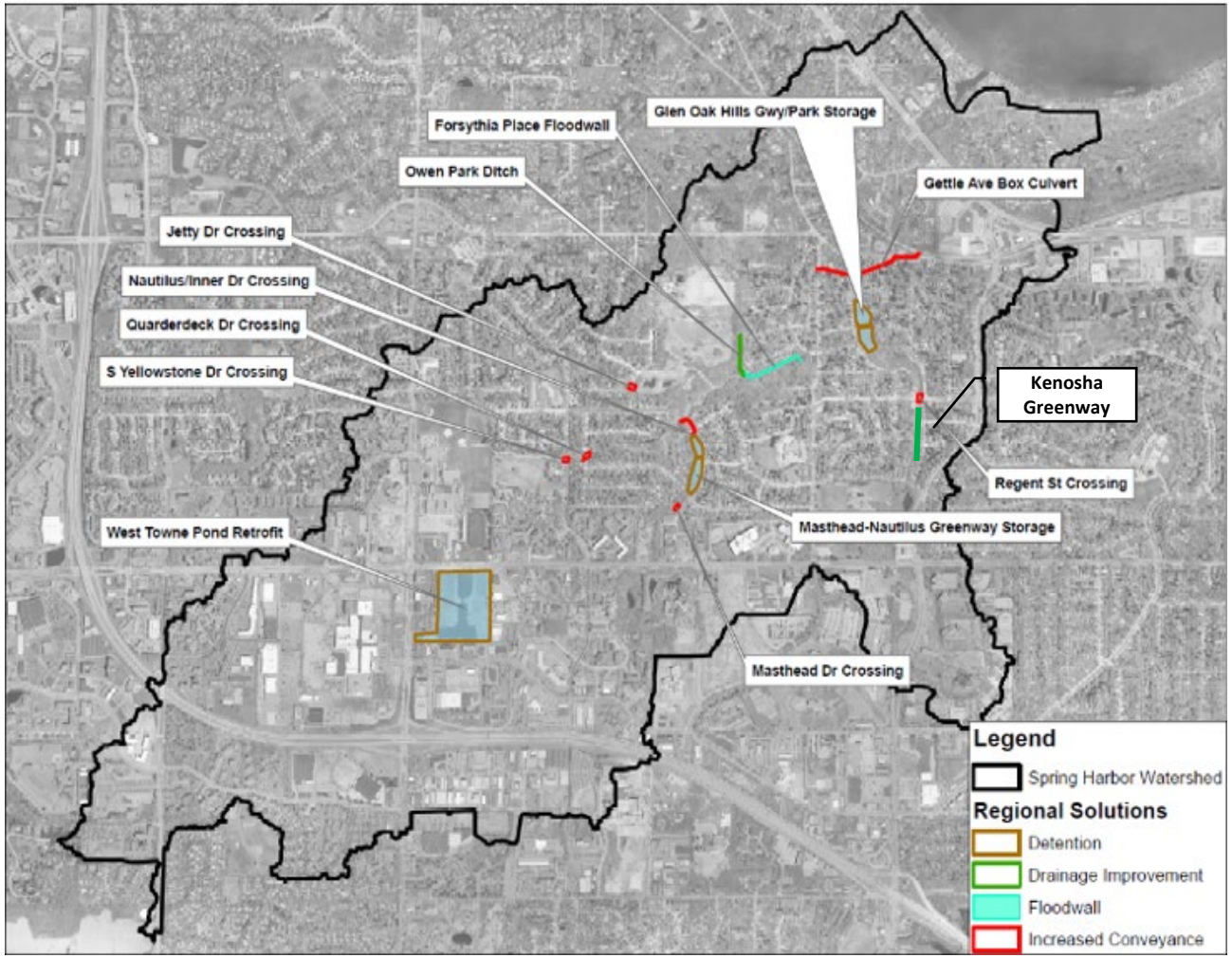
- Round 1 Study Engagement
  - PIM 1 - April 25, 2019
  - PIM 2 - February 24, 2020
  - PIM 3 - June 30, 2021
  - Meeting with Parks staff
  - 30 Day Public Comment Period
  - Focus Groups
    - Mineral Point Park to Owen Park (August 28, 2019)
    - Owen Park Concrete Cunnette (August 29, 2019)
    - Regent Street, Burnett Drive and Calumet Circle (August 29, 2019)
    - Marbella Condo Association (August 30,2019)
    - Oakwood Village Association (September 18, 2019)
    - Bordner Park (September 19, 2019)
    - West Towne Pond (September 16, 2019)
    - Spring Harbor Neighborhood Association (October 3, 2019)
    - Focus Group / Zoom Breakout room for each solution proposed at the end of PIM 3

Learn more at: www.cityofmadison.com/SpringHarborWatershed

Background

-Original Spring Harbor Watershed Study

- January 2019 – June 2022 by consultant
- Recommended series of solutions to reach flood targets
  - Received a lot of public comments with questions and concerns
  - **Largest concerns around the Kenosha Greenway and Forsythia Flood Wall solutions**
    - **Trees, habitat, aesthetics**



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Background

-Additional Modeling Needed

- **Public Feedback**

  → **2nd Round of Watershed Modeling** by the City

- **2nd Round of Watershed Modeling Goals:**
  - Determine viability of not implementing unpopular solutions
  - Answer resident questions
  - Develop a near-term plan for flood mitigation in the watershed

Background – 2 Rounds of Engagement

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- Round 2 Study Engagement
  - PWI* – April 30th, 2024
  - Meeting with Parks staff
  - Alders Meeting – June 6th, 2024
  - PIM 4 – August 28th, 2024

*PWI is the city internal Public Works Improvement Team Meeting, a group comprised of department heads and mayor's staff.

Learn more at: www.cityofmadison.com/SpringHarborWatershed

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Background

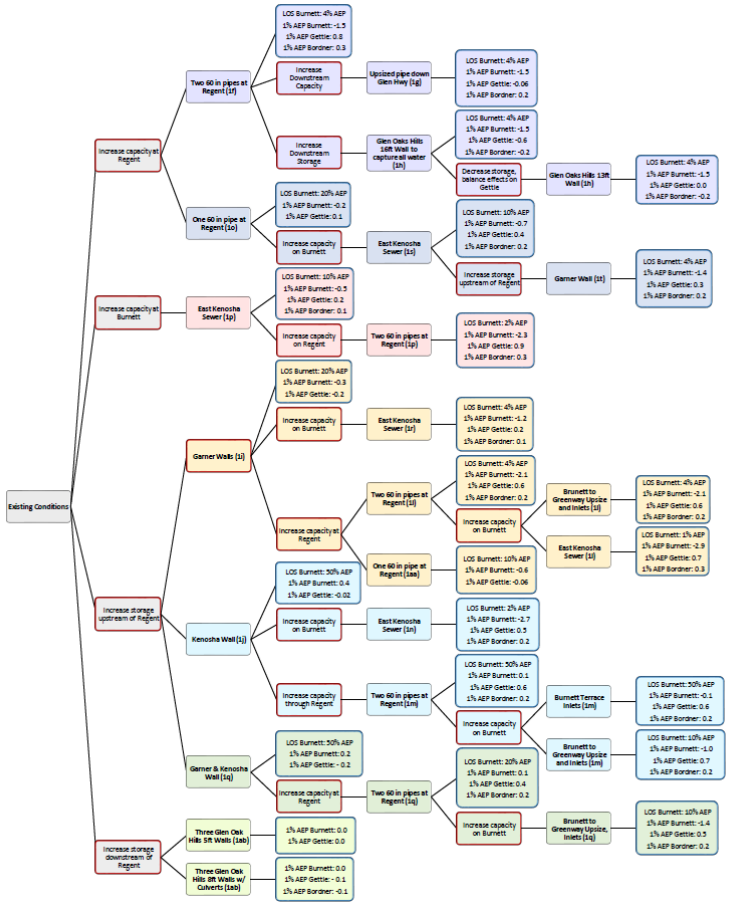
-Additional Modeling Process

Ran 100's of models with different combinations of solutions

In the end the, we developed 2 sets of solutions:

- **"All Solutions"**
  - A set of future hypothetical solutions that meet the flood mitigation targets and will be used to show future engineers the sizes and types of solutions that are needed in the Spring Harbor Watershed to meet the City's Flood Mitigation Targets
- **"Near-Term"**
  - A more concrete set of solutions for the near-term, that does not

For Example: Kenosha/Burnett Area - Solutions Combination Scenarios



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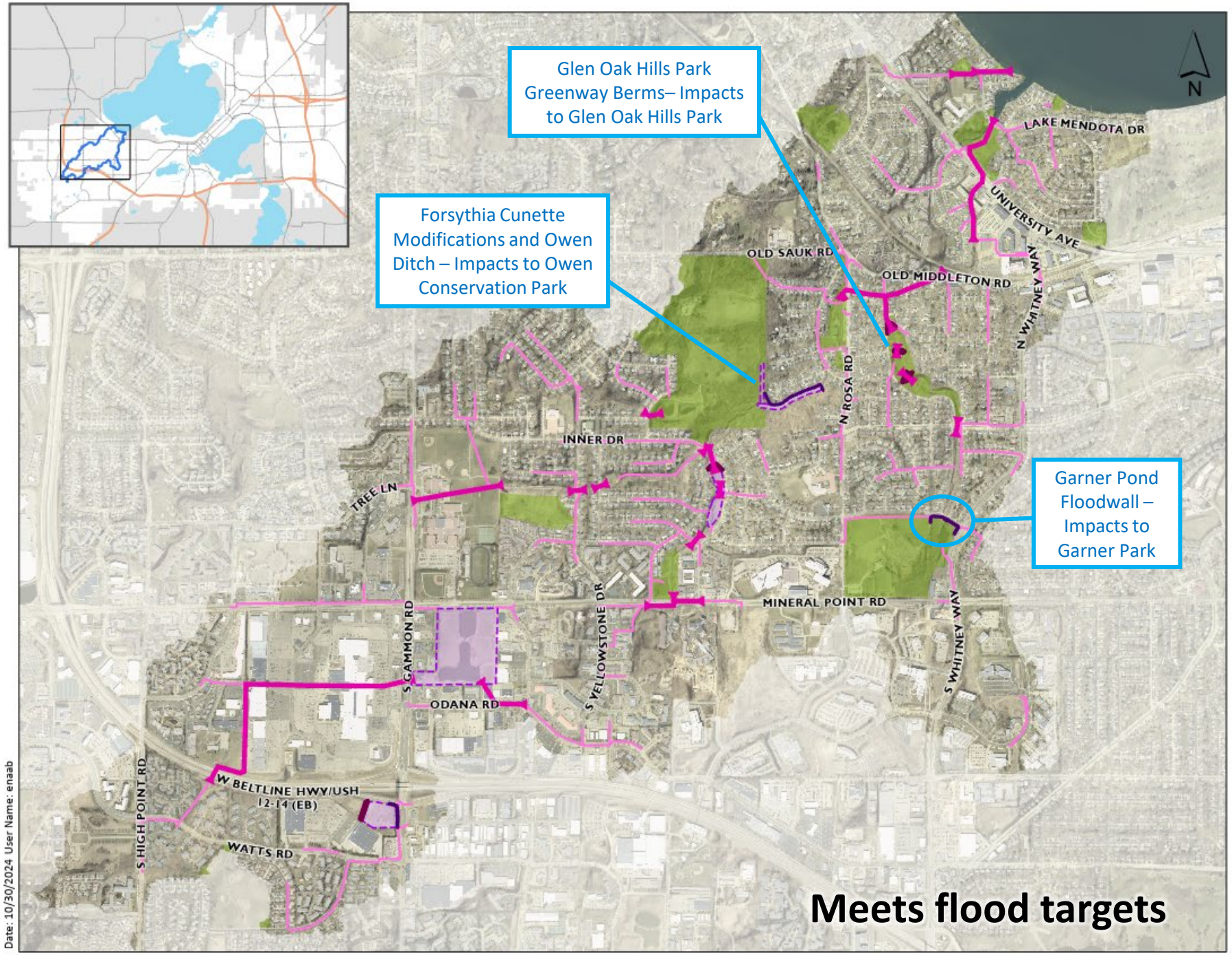

All Recommended Solutions (0-50 yrs)

Amendment: 1
Figure: 1H

Spring Harbor Watershed Study
City of Madison

Proposed Solutions

- Proposed Box
- Proposed Pipes
- Berm
- Floodwall
- Channel; Pond; Other

Other Data

- Parks

0 275550 1,100 Feet

CITY OF MADISON ENGINEERING

Date: 10/30/2024 User Name: enaab

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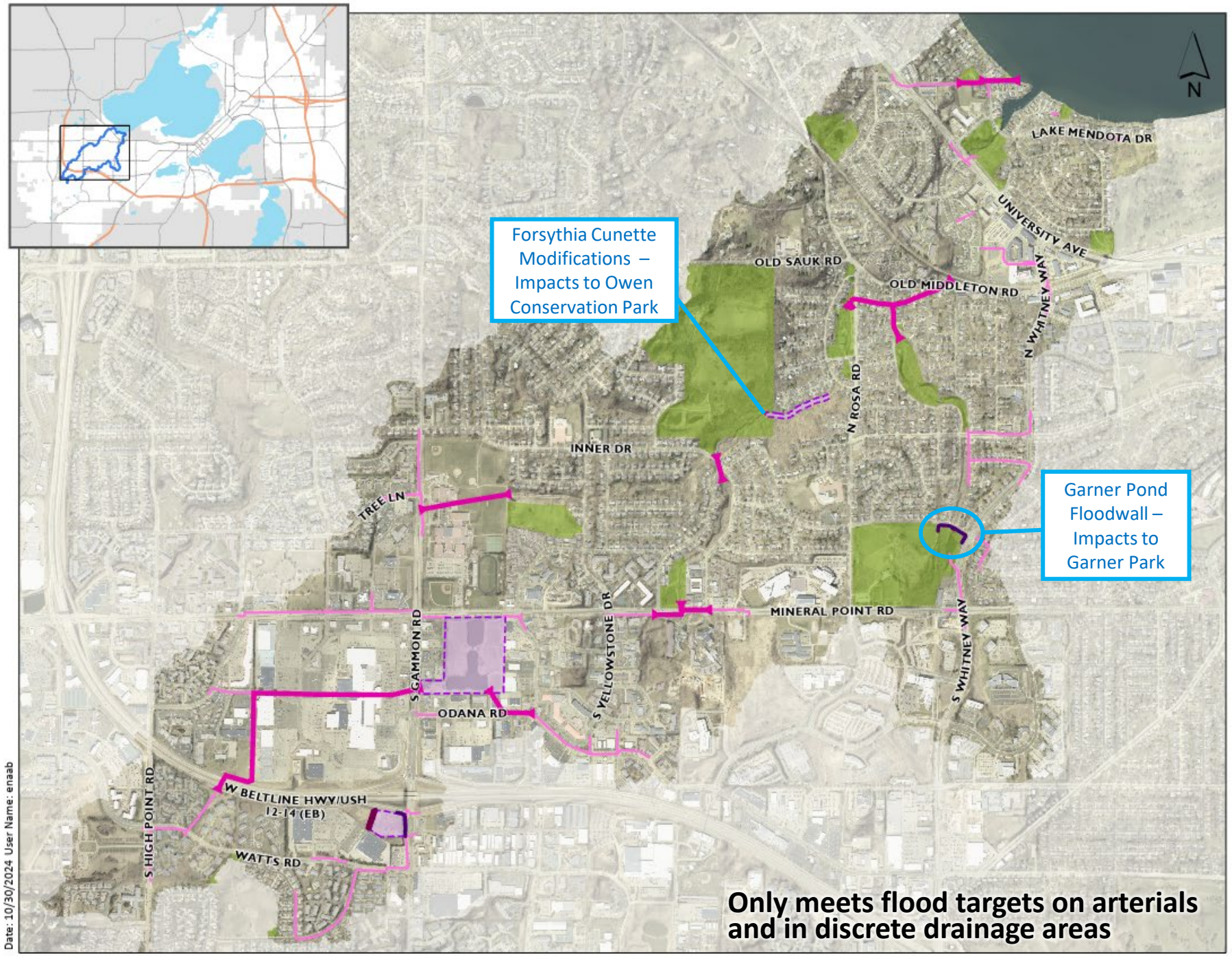

Near-Term Recommended Solutions (0-25 yrs)

Amendment: 1
Figure: 1M

Spring Harbor Watershed Study
City of Madison

Proposed Solutions

- Proposed Box
- Proposed Pipes
- Berm
- Floodwall
- Channel; Pond; Other

Other Data

- Parks

0 275550 1,100 Feet

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Solutions Timeline

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

Budgeted Projects

2025-2030

Present

2030-2050

Near-Term Solutions

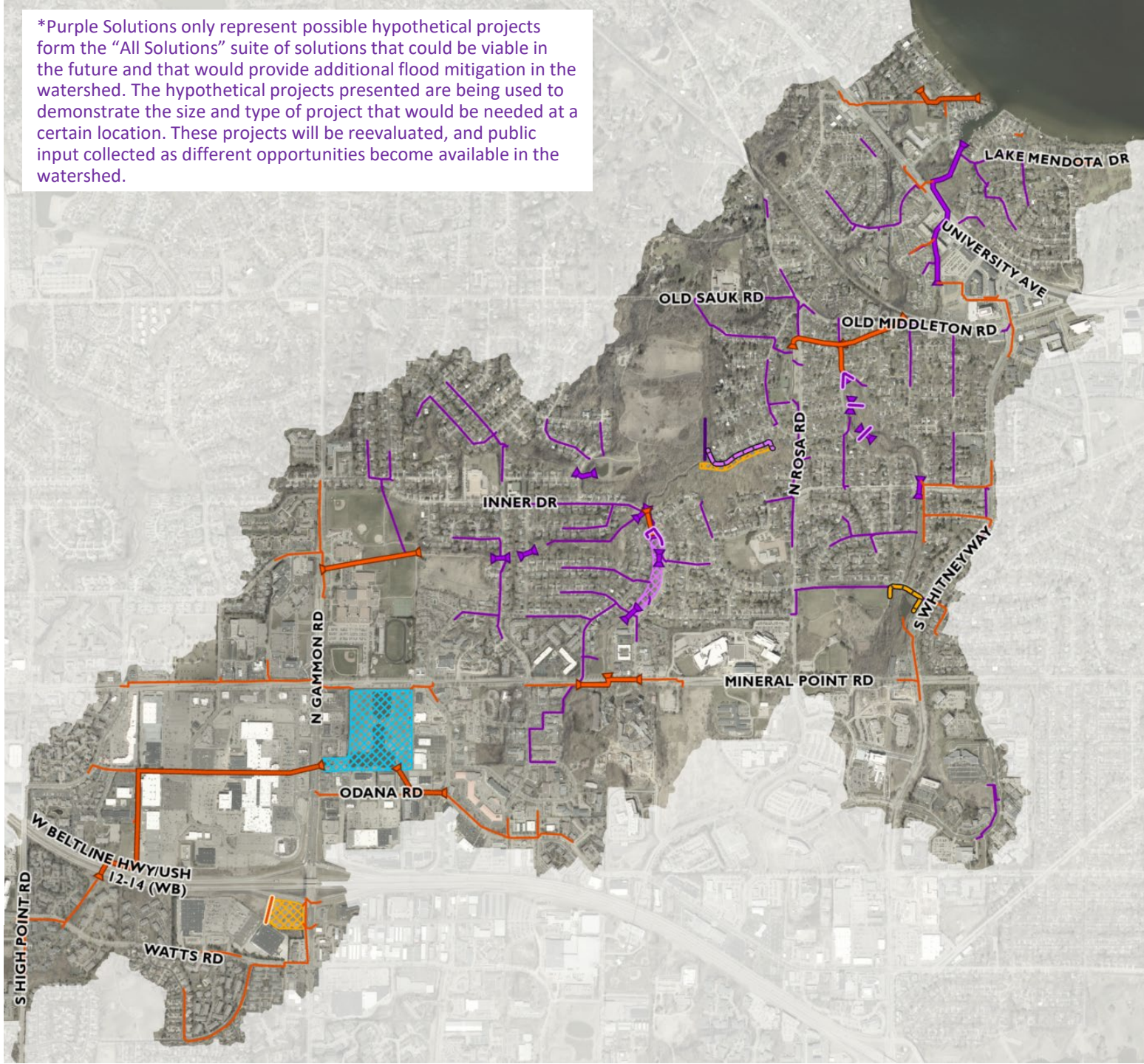
Beltline Off-Ramp Pond
Gettle Avenue Box (Upper Spring Harbor Box)
Glen Hwy Box
Kenosha Relief Pipe
Garner Park Flood Wall
Forsythia Cunette Modifications
South Hill Culvert
Local Sewer Upgrade on Craig Ave
Local Sewer Upgrades on Arterials
Local Sewer Upgrades for West Towne Pond and Direct Lake Mendota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

Hypothetical 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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Near-Term Solution - West Towne Retention Pond

Amendment: 1
Figure: 1S

Spring Harbor Watershed Study
City of Madison

Stage Area Relationship	
Elevation (ft)	**Area (sq ft)**
1023.5	792668
1024	798967
1025	811614
1026	824326
1027	837102
1028	849943
1029	862845

ADDITIONAL NOTES THAT IMPACT PROJECT IMPLEMENTATION:
-Wellhead protection zone
-Depth to groundwater
-Relocated soccer fields
-Allow for forebays and access roads with final design, which may reduce pond footprint

Removal of existing soccer fields

Proposed Pump House
Pump On: 1025.5'
Pump Off: 1023.5'
Capacity: 10,000 gpm

Proposed Pond
Excavate entire floor of existing detention basin to elevation 1023.5

Remove existing berm and discharge control structure

Updated Original Watershed Study Conceptual Solution

Recommended Solutions
- New Box
- Parallel Box
- Removal Box
- Special Box
- Upsize Box
- New Pipe
- Parallel Pipe
- Removal Pipe
- Special Pipe
- Upsize Pipe
- Channel
- Pond
- Berm
- Floodwall
- Other
- 1' Project Contour
- Project Area of Interest

Other Data
- Ponds and Greenways
- Parks
- Railroads

Storm Sewer
- Storm Pipe
- Inlet
- Headwall
- Other
- Apron End
- Access Structures
- Storm_Lift_Stations
- PVT Storm Structure -Approx.
- PVT Storm Pipe -Approx.

Other Utilities
- Water Value
- Water Main
- Water Service
- Water Hydrant
- SAS
- Sanitary Main
- Sanitary Lateral
- MMSD SAS
- MMSD Main

0 40 80 160 Feet

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Near-Term Solution - Garner Park Flood Wall & Kenosha Relief Pipe

Amendment: 1
Figure: 1R

Spring Harbor Watershed Study
City of Madison

Additional time that stormwater will be held the Garner Pond Area during a certain percent chance storm

Annual Percent Chance Event	Additional Flooded Duration in Pond Area
1%	3.5 hours
10%	1.5 hours
50%	30 mins

ADDITIONAL NOTES THAT IMPACT PROJECT IMPLEMENTATION:
-Impacts to north-east corner of Garner Park and to Garner Pond
-Wellhead protection zone
-Coordination with the Water Utility and future Water Utility well site needed to construct project
-We do not anticipate impacts to trees from the additional time the area will experience flooding, see table above

NEW CONCEPTUAL SOLUTION IS AN ALTERNATIVE TO GRADING THE KENOSHA GREENWAY
-Addresses community desire to preserve the wooded Kenosha greenway that volunteers have been actively managing by removing invasives since 2020

Impacts to Garner Park

Proposed Glen Hwy Storm Sewer Replacement
34"x53" - 38"x60" HERCP
# of Cells: 1
Barrel Length: 830 ft
Upstream Invert: 962.9
Downstream Invert: 958.0

Terrace Inlets added at intersection

Garner Park Flood Wall
Designed to allow current access paths into park to remain
Crest Elevation: 978.5
Max Height: 4 ft
Length: 770 ft

New Watershed Study Conceptual Solution

Garner Park

Recommended Solutions
- New Box
- Parallel Box
- Removal Box
- Special Box
- Upsize Box
- New Pipe
- Parallel Pipe
- Removal Pipe
- Special Pipe
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0 40 80 160 Feet

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ADDITIONAL NOTES THAT IMPACT PROJECT IMPLEMENTATION:
-Impacts to south-east corner of Owen Conservation Park
-Major road reconstruction projects in the area will be needed to allow for the rerouting of the sanitary sewer currently underneath the existing concrete cunette.

Impacts to south-east corner of Owen Conservation Park

Near-Term Solution - Forsythia Cunette Modifications

Amendment: 1
Figure: 1Q

Spring Harbor Watershed Study
City of Madison

Existing storm sewer box gates will need to be reconstructed to match cunette modifications

Sanitary Sewer Crossings

Owen Conservation Park

Tie into existing channel

Tie into existing storm sewer

Forsythia Cunette Modification
Lower existing cunette ~2 ft
Widen existing cunette from 20 ft to an estimated 25-30 ft
Cunette Length: 1020 ft
Upstream Invert: 915.2
Downstream Invert: 895.73

New Watershed Study Conceptual Solution

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- New Box
- Parallel Box
- Removal Box
- Special Box
- Upsize Box
- New Pipe
- Parallel Pipe
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0 25 50 100 Feet

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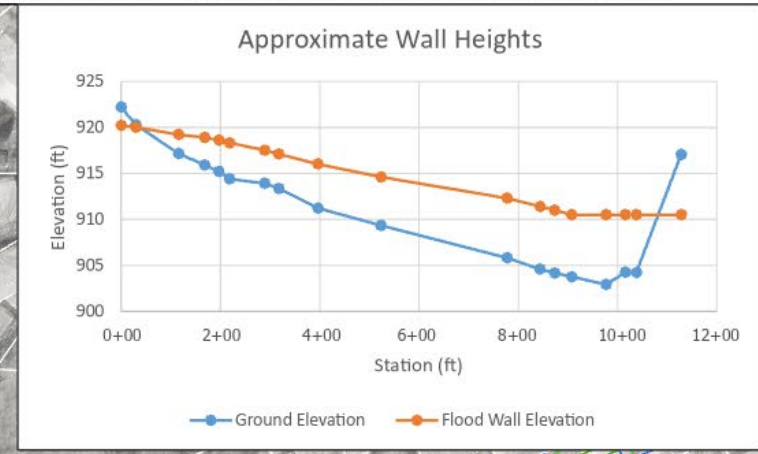
Future Hypothetical Solution - Forsythia Wall & Owen Park Ditch

Amendment: 1
Figure: 1X

Spring Harbor Watershed Study
City of Madison

ADDITIONAL NOTES THAT IMPACT PROJECT IMPLEMENTATION:
- -Access / removable floodwall section needed near gate / connection with existing box
- -Sanitary depth relative to footing depth / design
- -Floodwall height / overturning stability
- -Impacts to north-east corner of southeast corner of Owen Park
- -Coordination needed on impacts to existing walking paths within Owen Conservation Park and on Crestwood Neighborhood land
- -Design to consider drainage on north side of wall, which may include piping downspouts through wall with backflow preventers or a drainage pipe to Bordner Park via Bordner Drive
- -Construction of Modified Forsythia Cunette required for solution to meet flood mitigation targets



Existing trail access considerations

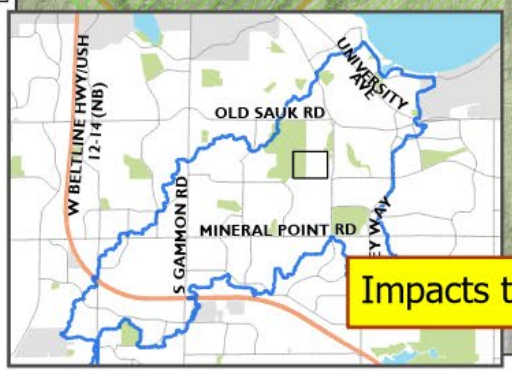
Proposed Owen Park Ditch

Owen Conservation Park

0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00 11+30

Proposed Forsythia Flood Wall
Updated wall height than floodwall proposed in original watershed study
Max Height: 10 ft
Length: 1,130 ft

Near-Term Proposed Solution
Forsythia Cunette Modification



Impacts to south-east corner of Owen Conservation Park

Updated Original Watershed Study Conceptual Solution

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- Removal Box
- Special Box
- Upsize Box
- New Pipe
- Parallel Pipe
- Removal Pipe
- Special Pipe
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0 20 40 80 Feet

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ADDITIONAL NOTES THAT IMPACT PROJECT IMPLEMENTATION:
-Impacts to Glen Oak Hills Park

Impacts to Glen Oak Hills Park

N

Proposed Glen Hwy Storm Sewer Replacement Box
Span: 8 ft
Rise: 4 ft
# of Cells: 1
Barrel Length: 480 ft
Upstream Invert: 904.5
Downstream Invert: 889.6

Remove or abandon existing storm sewer

Proposed Box Culvert
Span: 7 ft
Rise: 4 ft
# of Cells: 1
Barrel Length: 83 ft
Wingwall Type: 45°
Upstream Invert: 917
Downstream Invert: 915

Glen Oak Hills Park Berm 1
Max Height: 6 ft

Glen Oak Hills Park Berm 2
Max Height: 9 ft

Proposed Box Culvert
Span: 6 ft
Rise: 4 ft
# of Cells: 1
Barrel Length: 116 ft
Wingwall Type: 45°
Upstream Invert: 928
Downstream Invert: 927

Glen Oak Hills Park

Glen Oak Hills Park Berm 3
Max Height: 19 ft

Updated Original Watershed Study Conceptual Solution

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Future Hypothetical Solution - Glen Oak Hills Berms

Amendment: 1
Figure: 1W

Spring Harbor Watershed Study
City of Madison

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0 25 50 100 Feet

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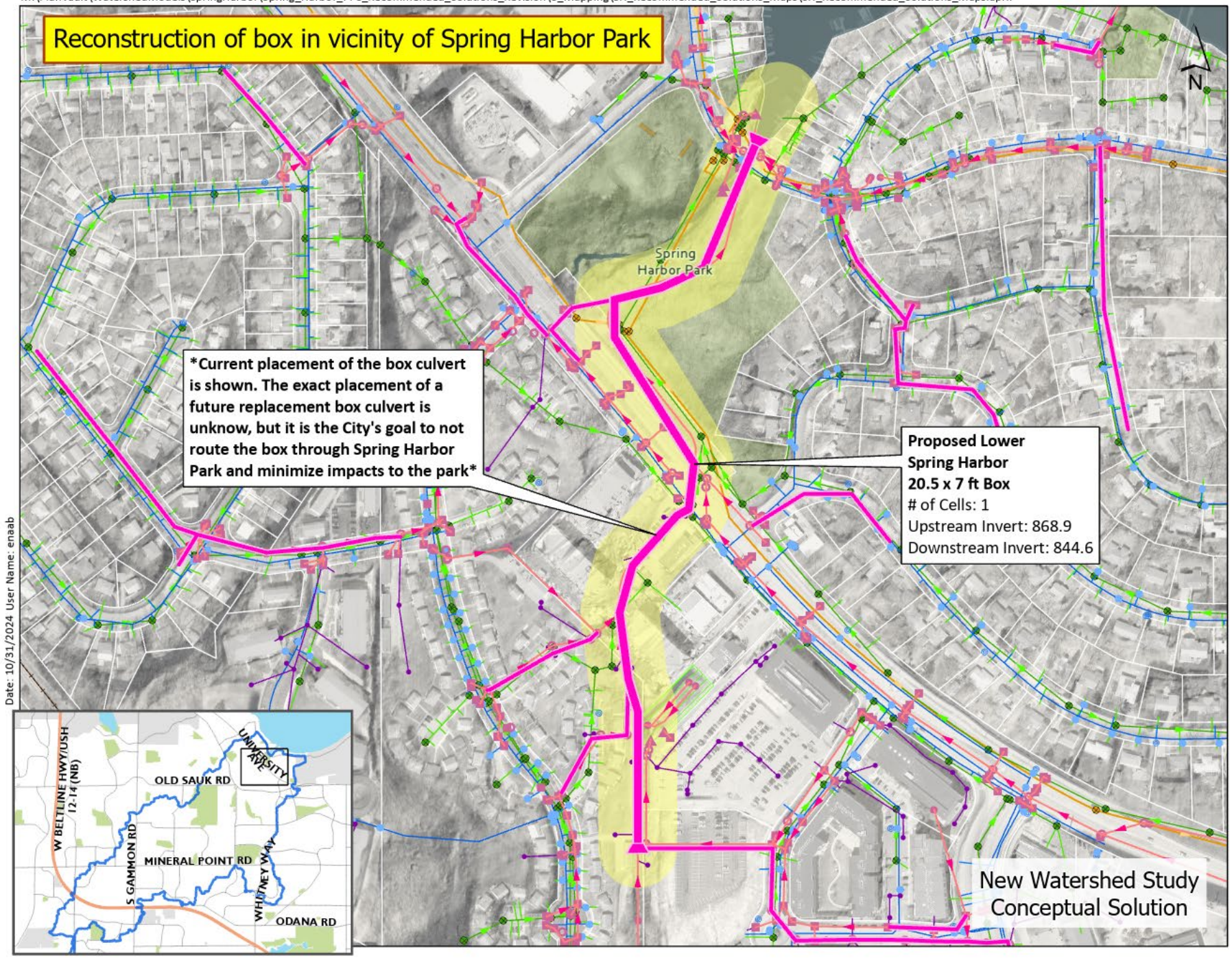

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Future Hypothetical Solution - Upsized Lower Spring Harbor Box

Amendment: 1
Figure: 1V

Spring Harbor Watershed Study
City of Madison

Recommended Solutions
- New Box
- Parallel Box
- Removal Box
- Special Box
- Upsize Box
- New Pipe
- Parallel Pipe
- Removal Pipe
- Special Pipe
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- MMSD SAS
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0 45 90 180 Feet

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Questions