Welcome!
We will begin shortly…

Virtual Meeting Schedule	
6:00 – 6:10	Welcome
6:10 – 7:00	Presentation
7:00 – 7:30	Questions & Answer Session

CITY OF MADISON

Nine Springs Watershed Study
Public Information Meeting #2

City of Madison Engineering Division
March 30th, 2026

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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 **"Q and A"** button for technical issues with meeting to troubleshoot with staff to assist.
- Use the **"Q and A"** 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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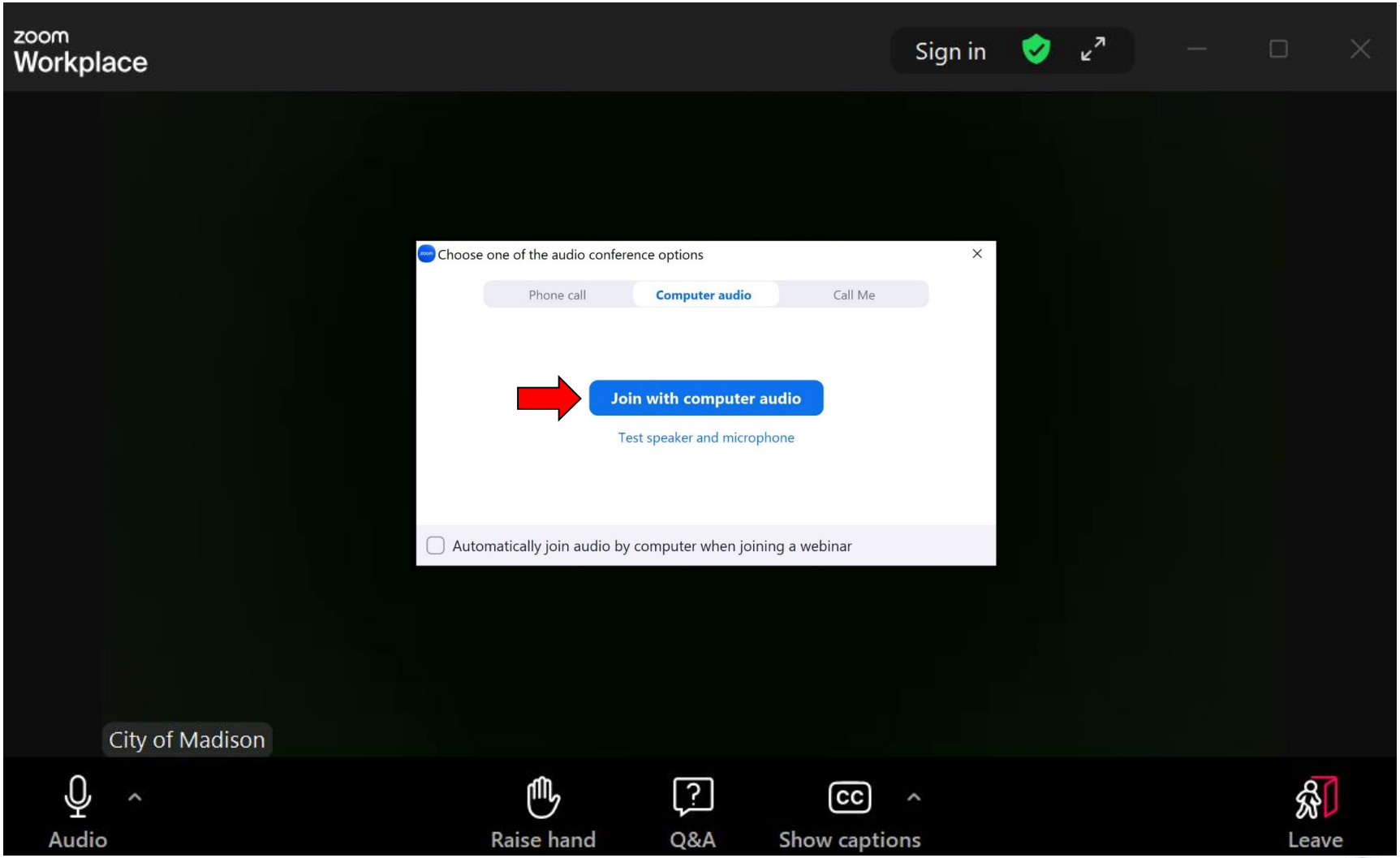
How to Participate



Make sure to join audio

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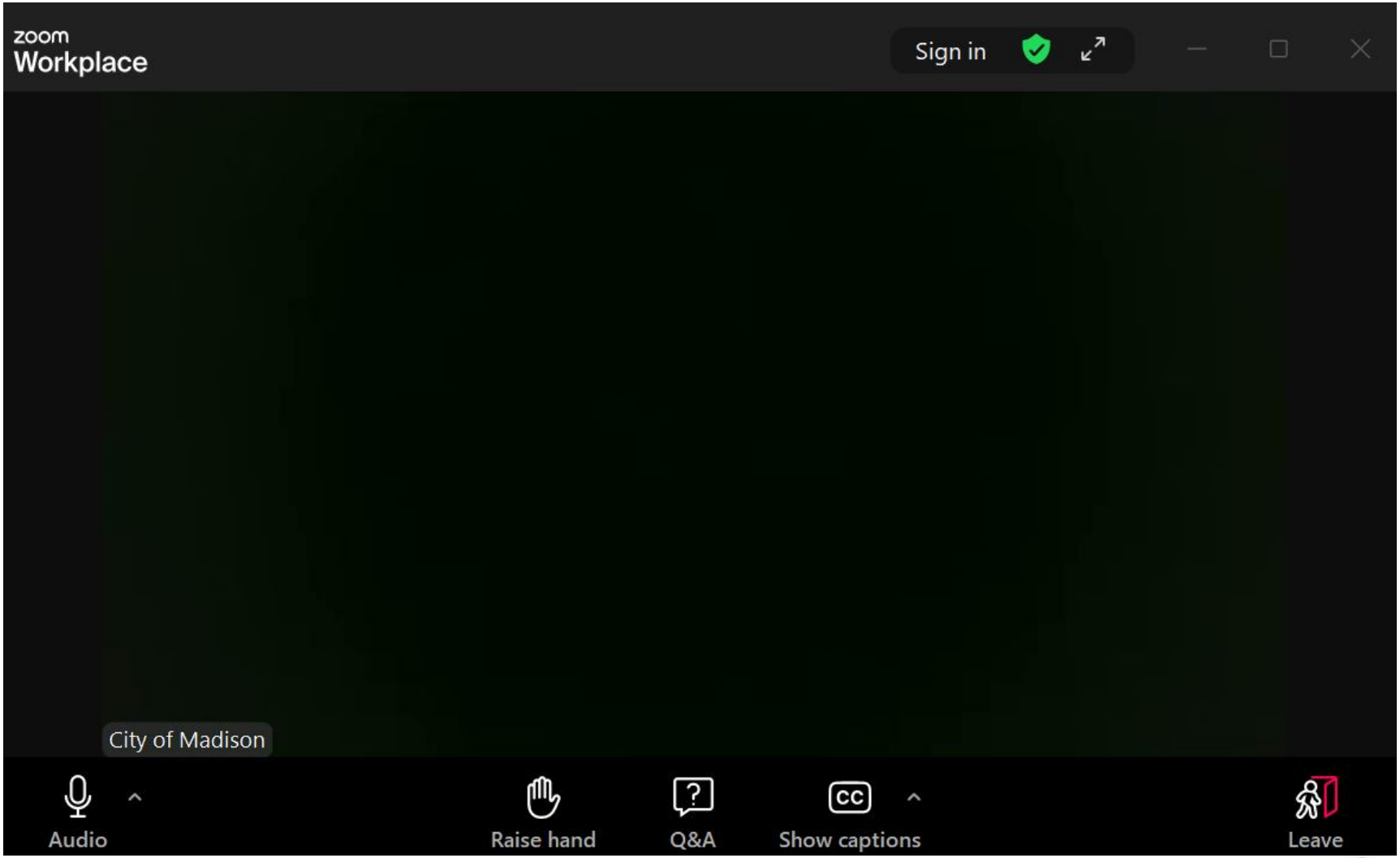
How to Participate



Raise your hand to be unmuted for comments or ask additional questions.

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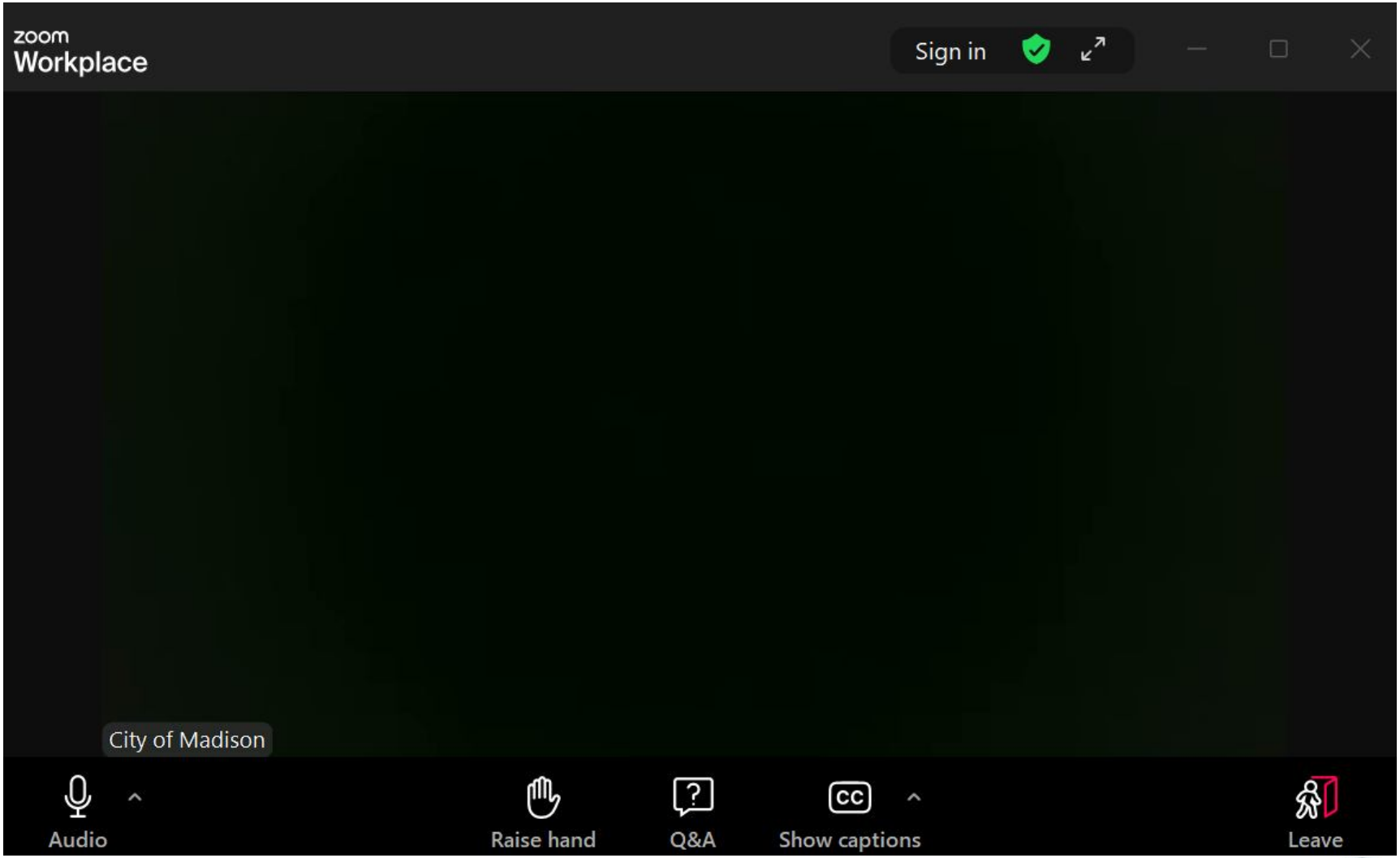
How to Participate



Use Q&A button if you have technical issues or a question for the panelists.

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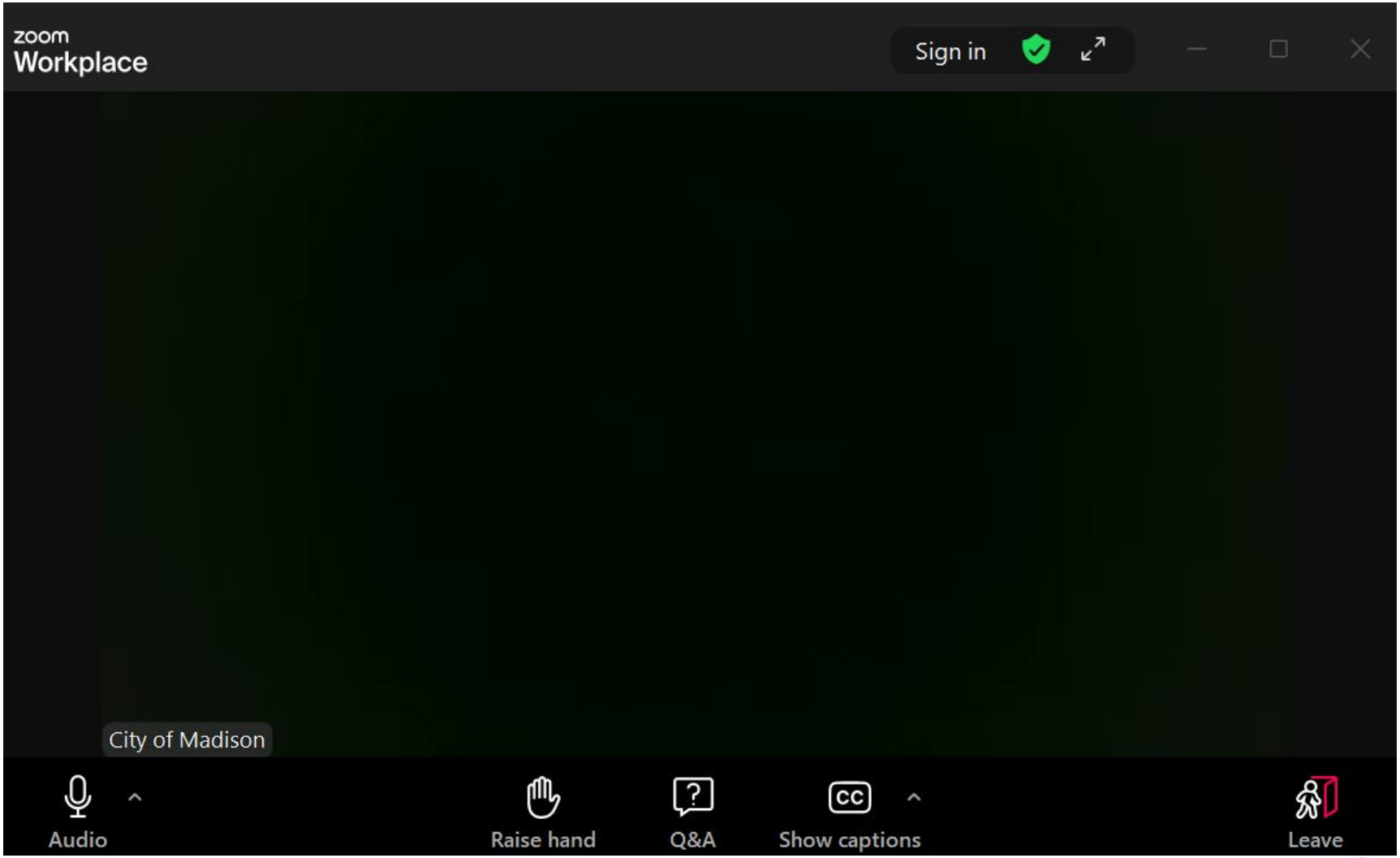
How to Participate



Use Q&A button for all other questions.
We will answer after the presentation.

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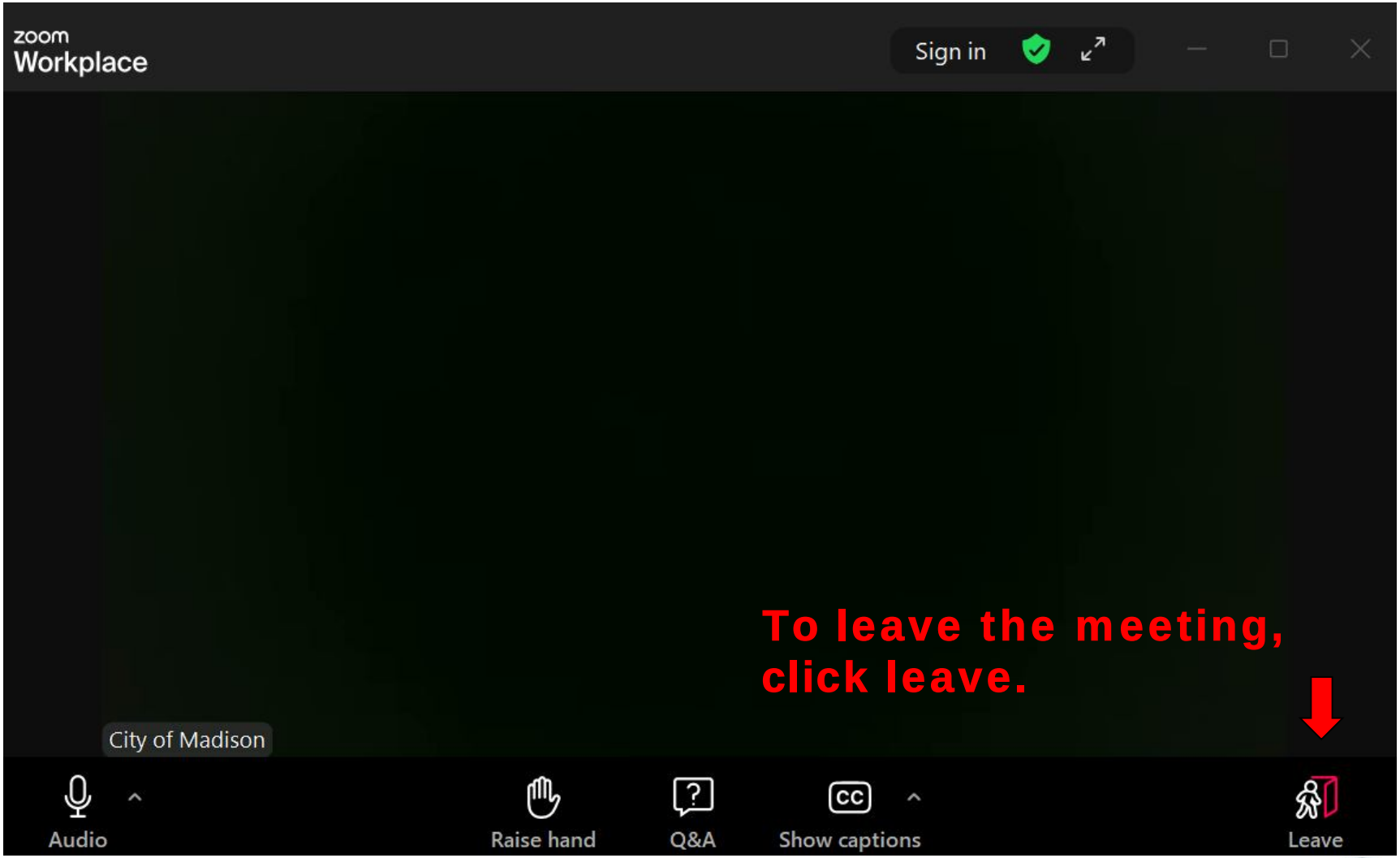
How to Participate



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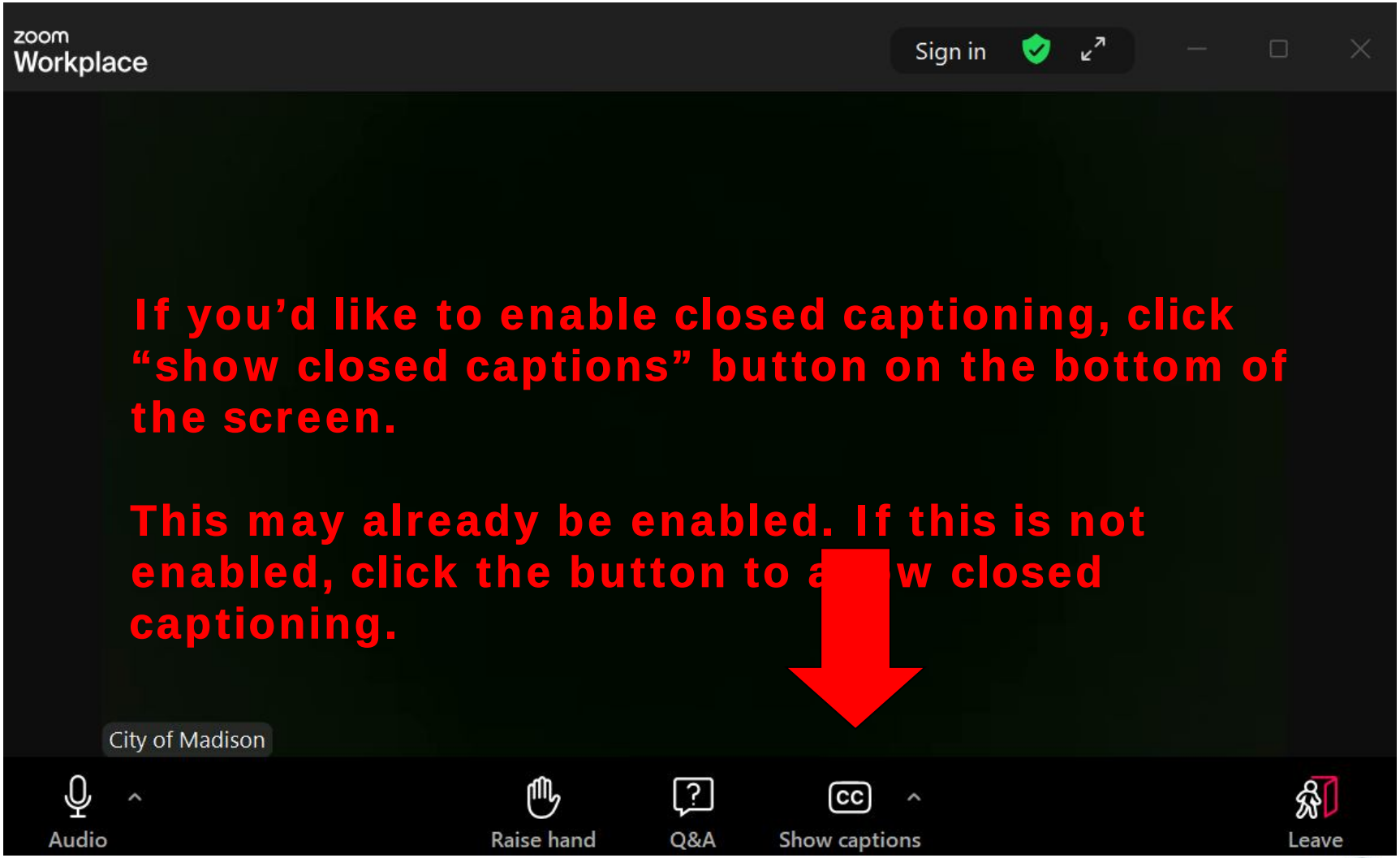
How to Participate



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Project Contact Introductions

- Project Manager: Ryan Stenjem, Stormwater Engineer
- Other City Staff
  - Hannah Mohelnitzky, Public Information Officer
  - Janet Schmidt, Stormwater Section Principal Engineer
  - Greg Fries, Deputy City Engineer – Sanitary, Storm, and Landfill
- Alder
  - District 10 – Alder Yannette Figueroa Cole
  - District 14 – Alder Isadore Knox Jr.

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Evening Overview

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

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Presentation Outline

1. Background & PIM#1 Recap
2. Project location
3. Watershed study progress
4. Flood mitigation targets
5. Existing conditions Inundation mapping
6. Flood mitigation solution development process
7. Recommended solutions
8. Implementation and cost
9. Why aren't all flood targets met?
10. Study Next steps
11. Question & Answer Session

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Definitions of commonly used terms

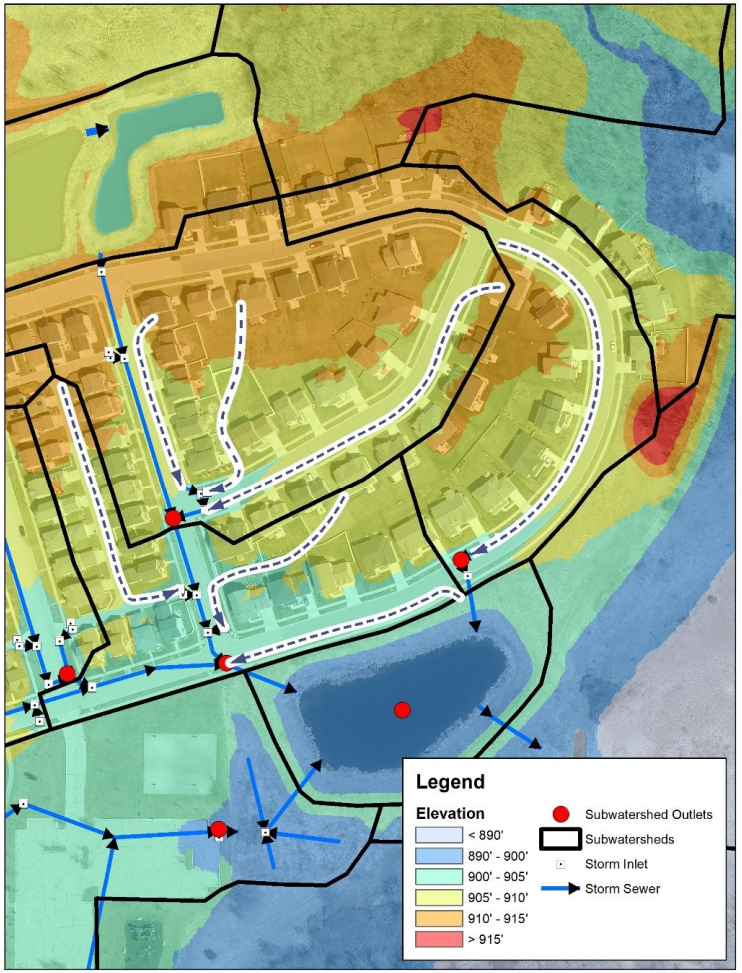
- **Stormwater runoff**: the portion of the rainwater that does not soak into the ground
- **Stormwater inlets**: grates in the ground that take in stormwater runoff; connected to the stormwater conveyance system
- **Detention ponds**: ponds designed to hold stormwater runoff to improve water quality and/or help prevent flooding
- **Model**: computer software that is used to evaluate the stormwater conveyance system
- **Local Sewer Projects**: storm sewer that is reconstructed with another already-scheduled project – typically street reconstruction
- **Stand-alone Projects**: Flood mitigation projects that will be constructed on their own – not tied to another already-scheduled project

Where the Water Goes

What is a watershed?

- A watershed is the area of land that drains precipitation (rain, snow, etc.) to a common low point, such as an inlet, stream, or lake.

- Determined by surface terrain and underground pipe system.



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Where the Water Goes: Sewer Systems

- Madison has separate storm and sanitary sewers
- Storm sewer system is NOT the same as the sanitary sewer system

https://www.azstorm.org/stormwater-101/storm-vs-sanitary-sewer

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Causes of Flooding

- Flash flooding: when storm sewer system cannot handle high amounts of rain
- Comparative example: a traffic jam
  - Too many cars on the Beltline at rush hour → backups happen
  - During a storm, more water tries to move through the storm sewer system → backups happen

Beltline, looking west from Park Street, WisDOT

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1% Chance (AEP) Rainfall Definition

- Annual exceedance probability (AEP): chance that a rainfall event will occur in one year.
- 100-yr storm = 1/100 = 1% AEP
  - Does **NOT** mean that a storm will only occur once in 100 years.
  - During a 30-year mortgage, there's a 26% chance of experiencing a 100-year (1%) event.
- City refers to storm as "1% chance event"

Annual Exceedance Probability (AEP)	Chance of occurring in 1 Year	Return Period or Average Recurrence Interval (ARI)
100%	1 in 1	1-year
50%	1 in 2	2-year
10%	1 in 10	10-year
4%	1 in 25	25-year
1%	1 in 100	100-year
0.10%	1 in 1000	1000-year

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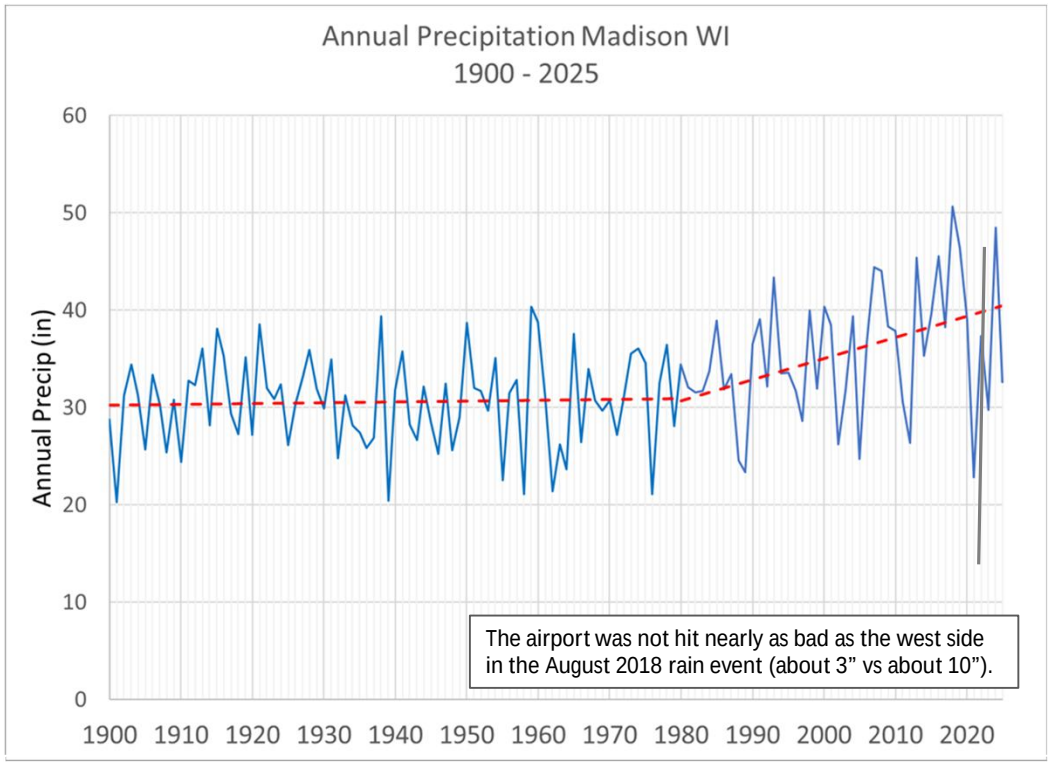
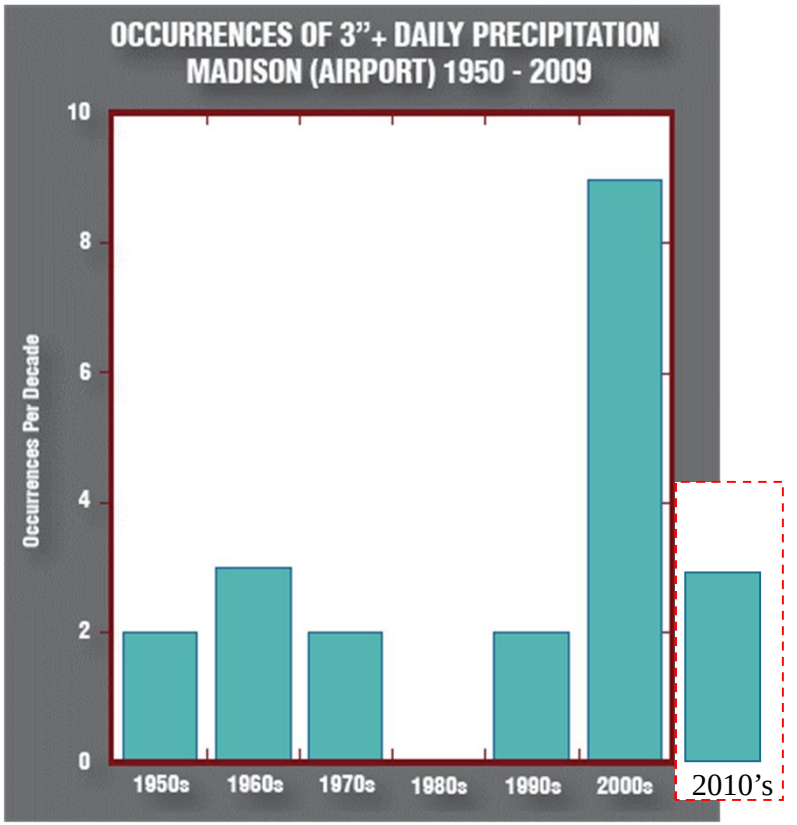
Recent Storms

Why do Watershed Studies?

- More frequently occurring large rain events



Data from Wisconsin State Climatology Office: prior to 1947 measured at Madison City Weather Bureau Office and 1947-present at Dane County Regional Airport



Wisconsin's Changing Climate: Impacts and Adaptation. 2011. Wisconsin Initiative on Climate Change Impacts. Nelson Institute for Environmental Studies, University of Wisconsin-Madison and the Wisconsin Department of Natural Resources, Madison, WI.

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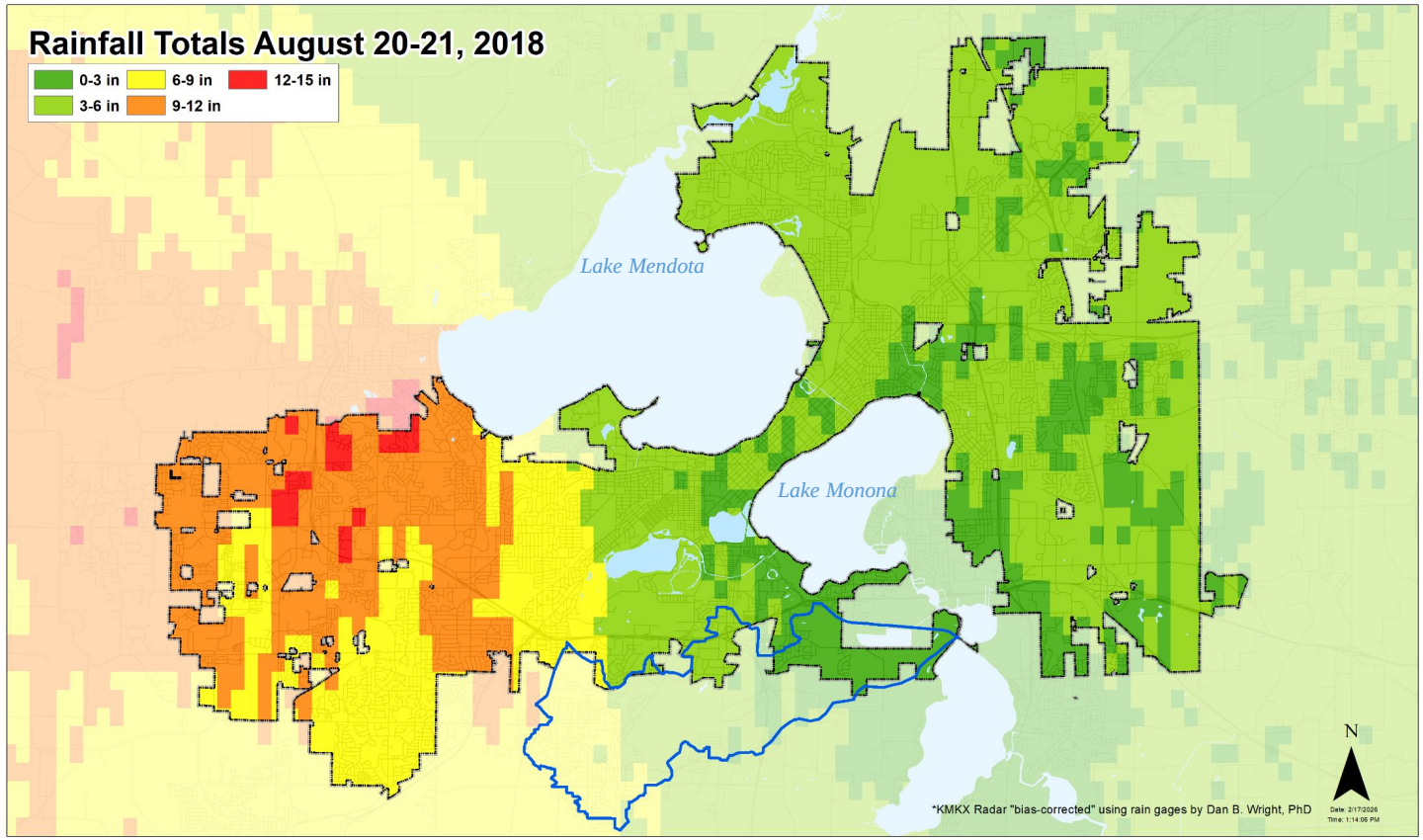
Madison Rainfall Totals August 20-21, 2018



KMKX Radar that was "bias corrected" using rain gauges by UW Professor Dan Wright

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Why We Are Here: Historic Rain Events

- Recent storms have
  - amplified known inadequacies
  - revealed new storm sewer deficiencies
- Result: flood damage

August 20, 2018, event: substantial damage
- Public infrastructure: $4 million
- Private property: reported $17.5 million, estimated $30 million

- City's plan
  - Complete watershed studies of impacted areas
  - Develop solutions from watershed studies

Deming Way, Madison, WI

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Watershed Study Limitations

- Utilizing computer models for analysis (computer models have inherent limitations, require assumptions, and are for one specific set of circumstances)
- Retrofitting infrastructure takes a lot of time and money
- Not all problems can be solved
- Repairs are not always easy, popular, or inexpensive
- Best engineering solution may not be the one chosen
- Property owners will need to create solutions too
- Solutions will need broad community cooperation
- Groundwater problems not easily addressed by infrastructure

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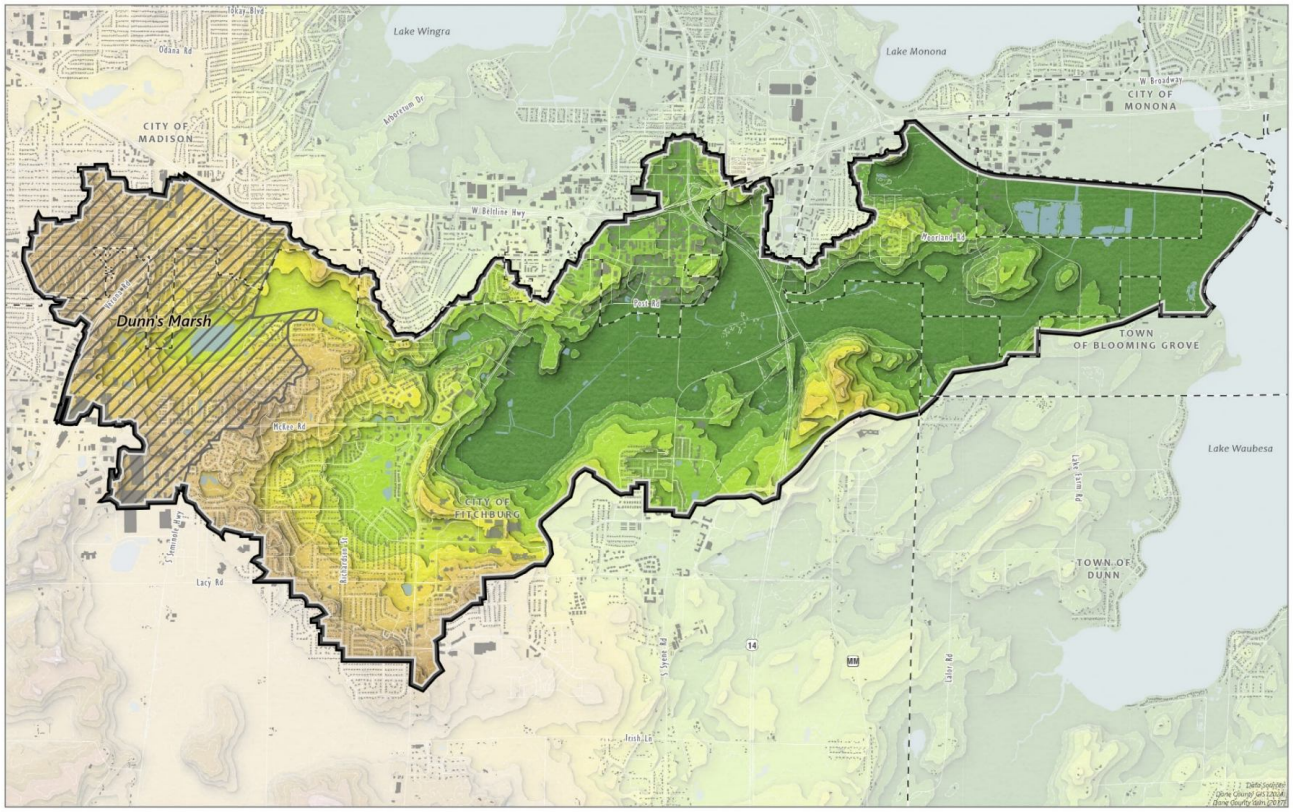
Project Location



A watershed is an area of land that drains to a single location.

The black outline delineates the entire Nine Springs Watershed

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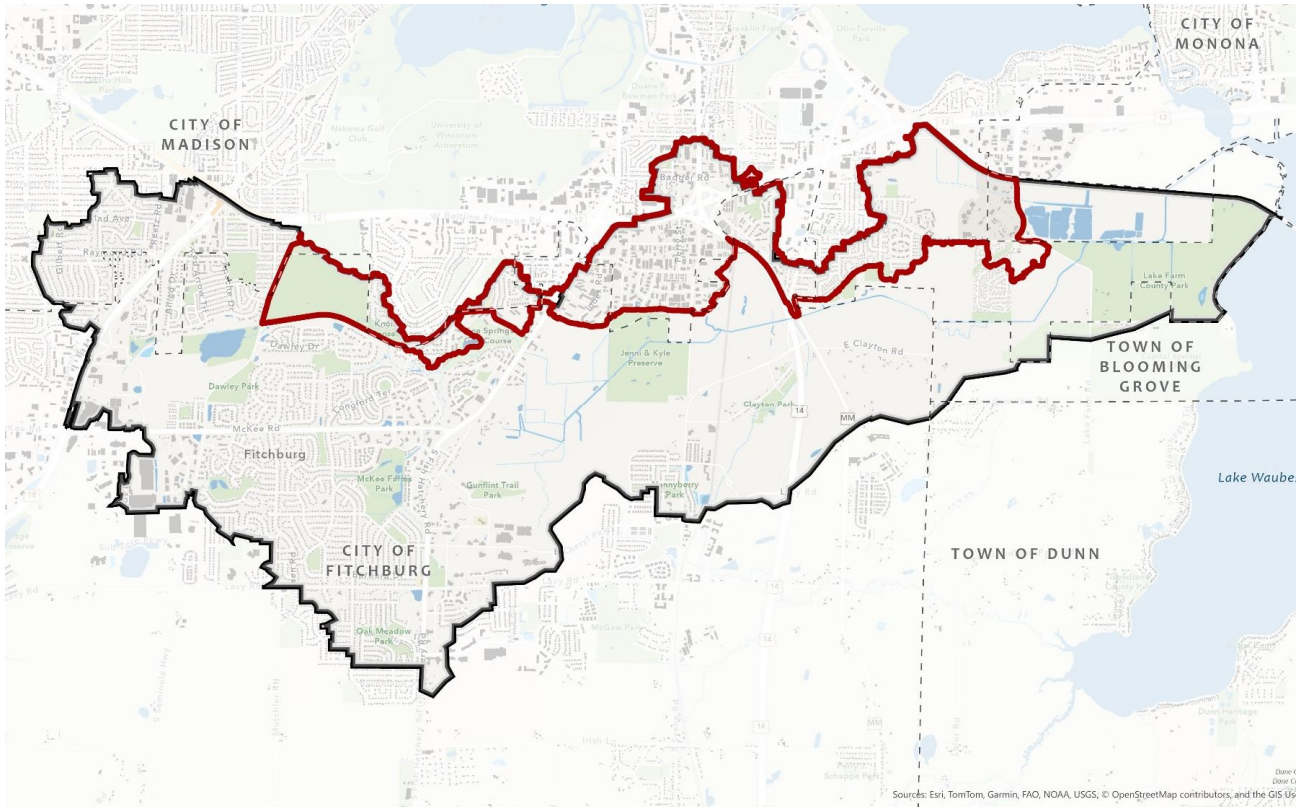
Project Location



A watershed is an area of land that drains to a single location.

The black outline delineates the entire Nine Springs Watershed

The red outline delineates the portion modeled for this study

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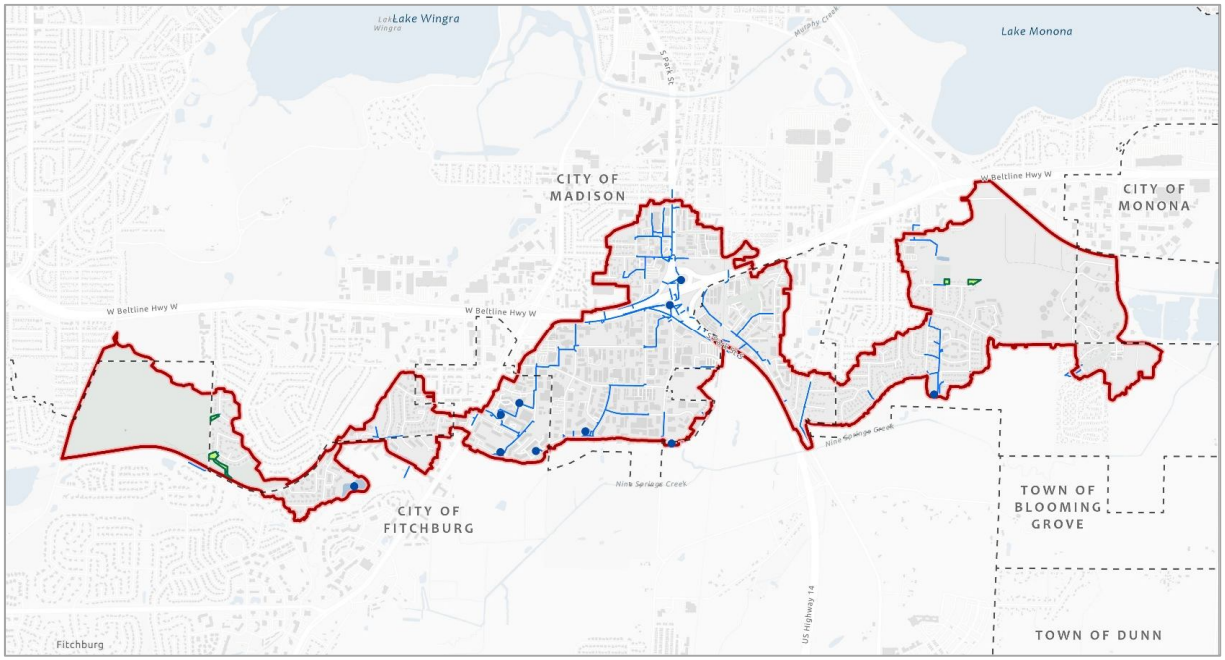
Project Location

Item	Quantity
Modeled Area	1,379 acres
Madison Public Stormwater Inlets and Access Structures	197
Madison Storm Sewer Pipes & Culverts	4.8 miles
Stormwater Ponds	10
Open channels/Greenways	4



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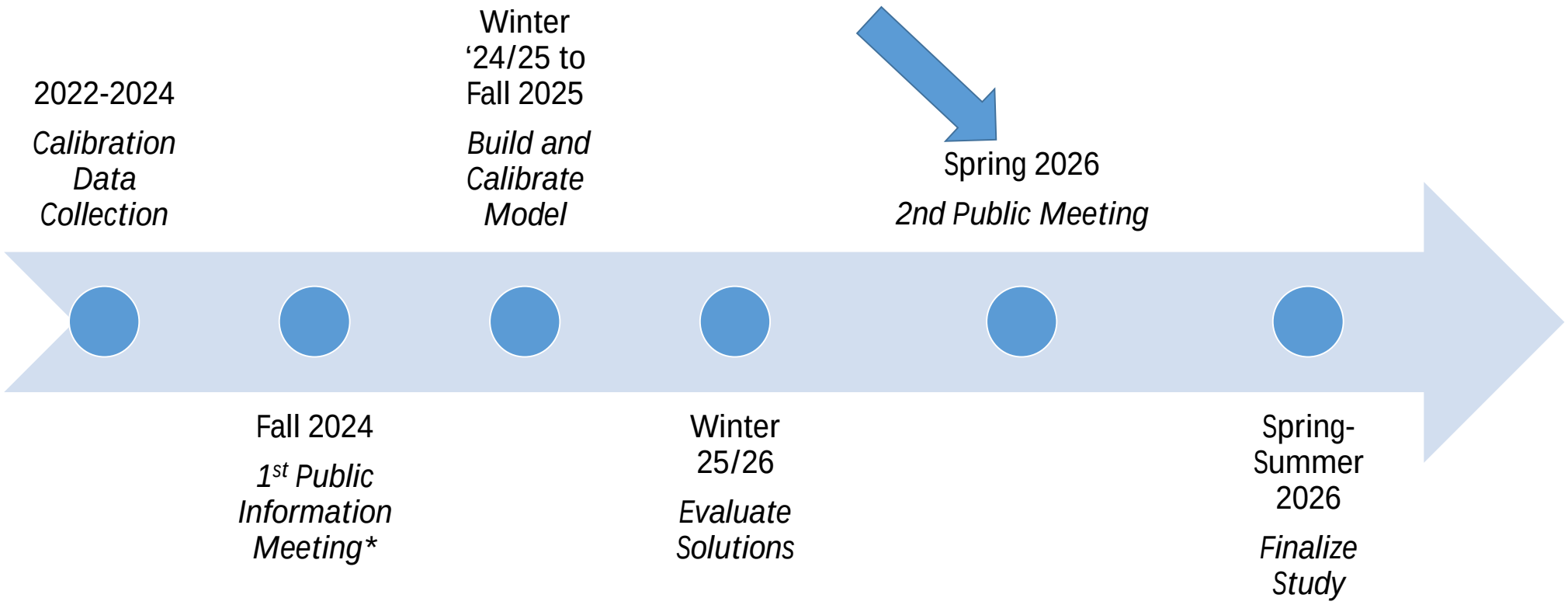
Progress to Date



*Presentation from PIM1 can be found on the Watershed Study Website

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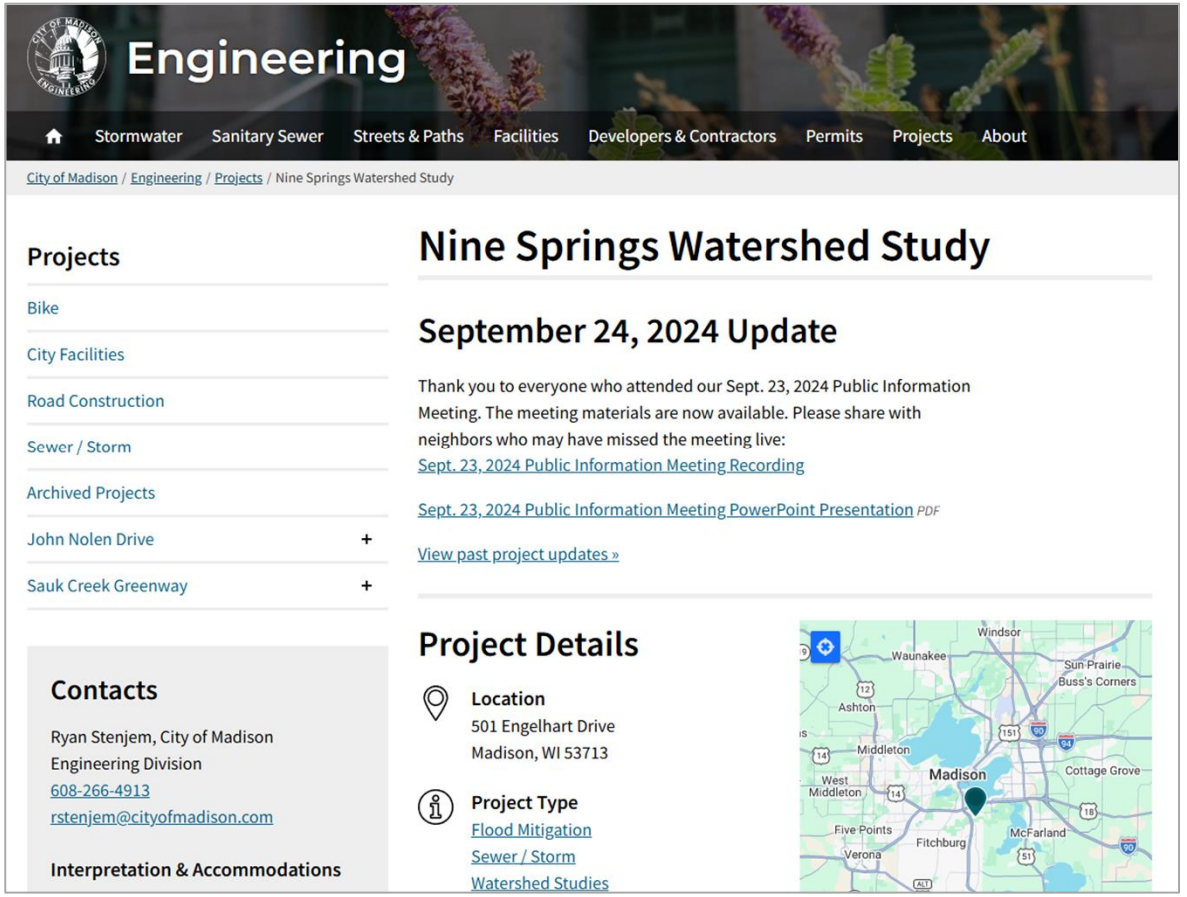
Progress to Date

- Project Start
  - August 2024
- Public Input Meeting #1
  - September 23, 2024
- Data Collection Complete
  - Fall 2024
- Existing Conditions Model Built
  - July 2025
- Model Calibrated
  - October 2025
- Mitigation Targets Assessed
  - Winter 2025
- Solutions Evaluated
  - Spring 2026



https://www.cityofmadison.com/engineering/projects/nine-springs-watershed-study

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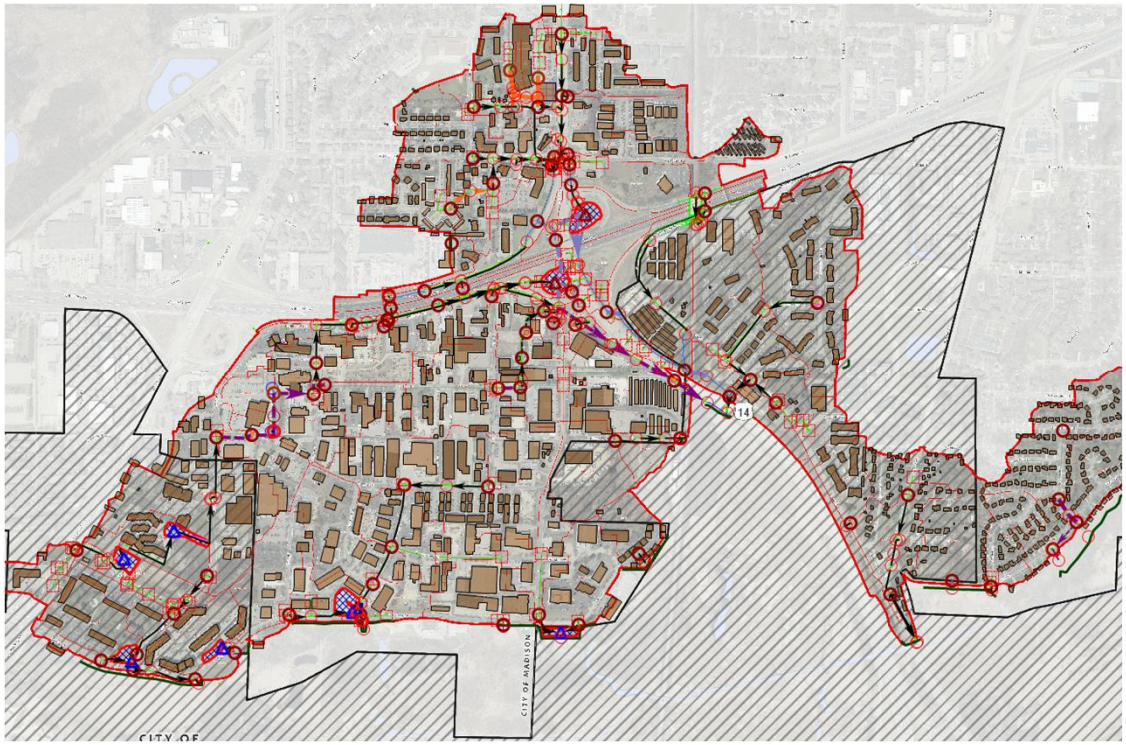
Progress to Date

- Hydrologic and Hydraulic Computer Model (XPSWMM)
- Existing Conditions Model Construction

Item	Quantity
Modeled Area (acres)	1,379
Number of Subcatchments *(discrete drainage areas in the model)*	127
Storm sewer pipes in model	10.3 miles
Detention ponds in model	10



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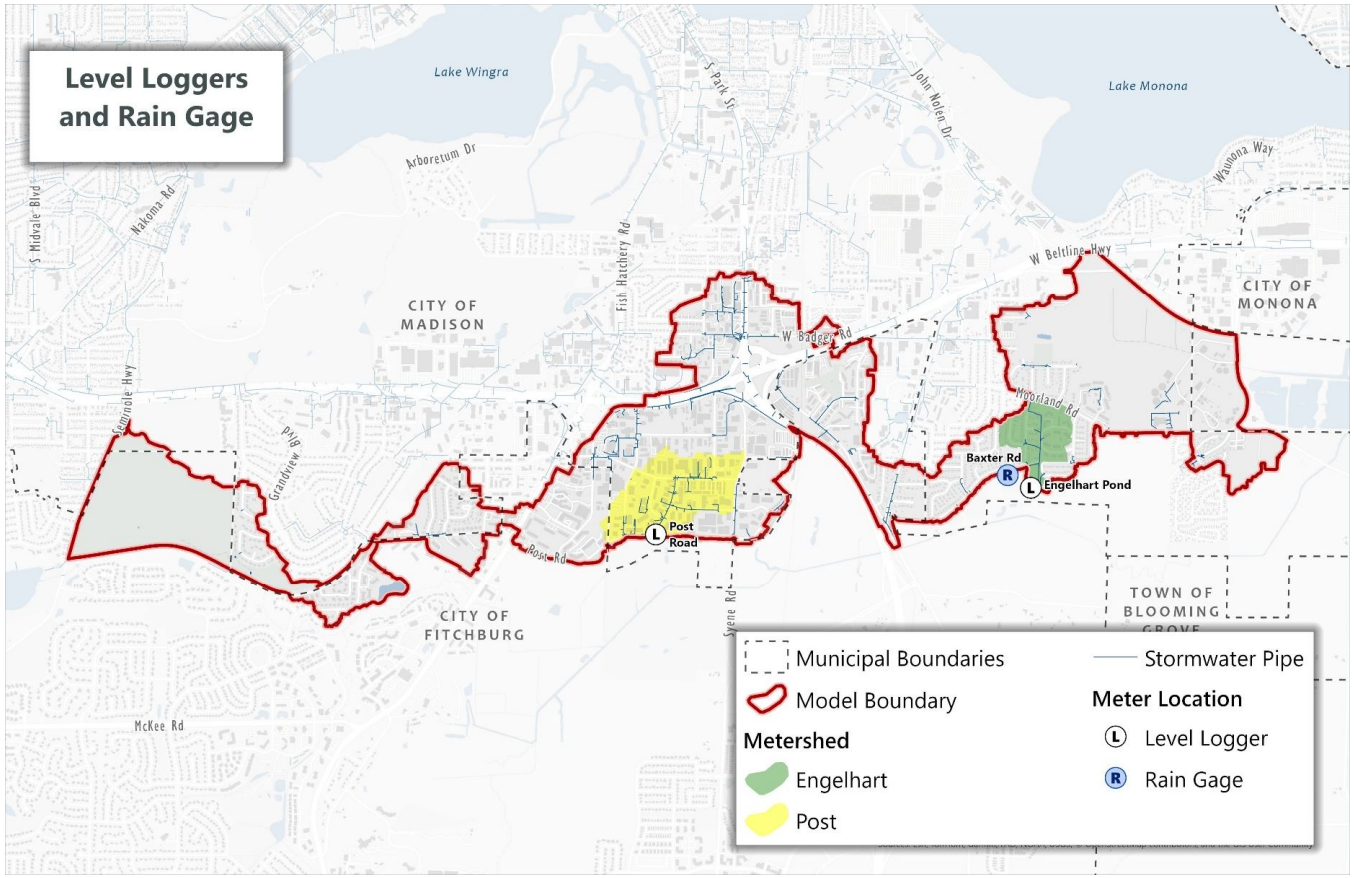
Progress to Date

Model Calibration



Model Calibration

Calibration is a process of adjusting model input so that model output for a known event matches observations

Model Calibration Equipment

- Two (2) Rain Gauges
- Two (2) Level Loggers

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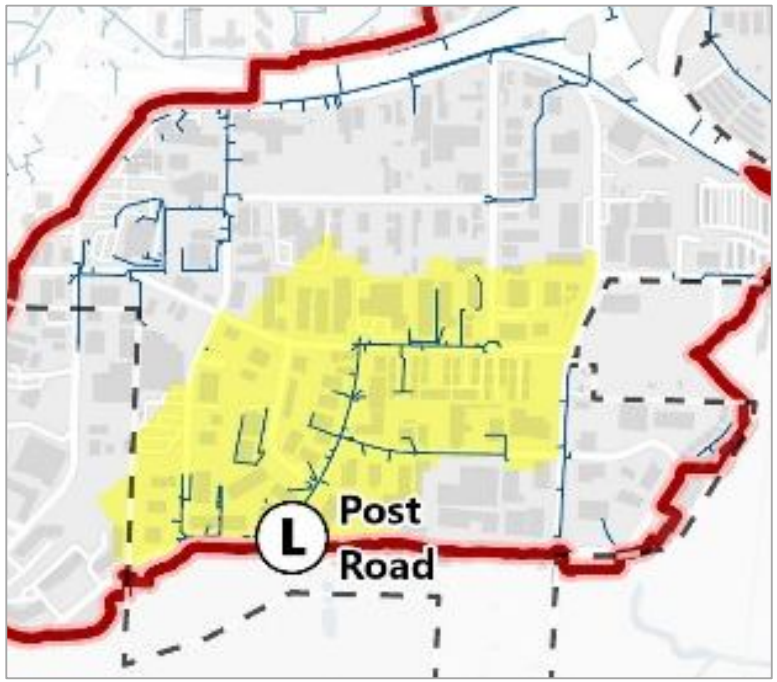
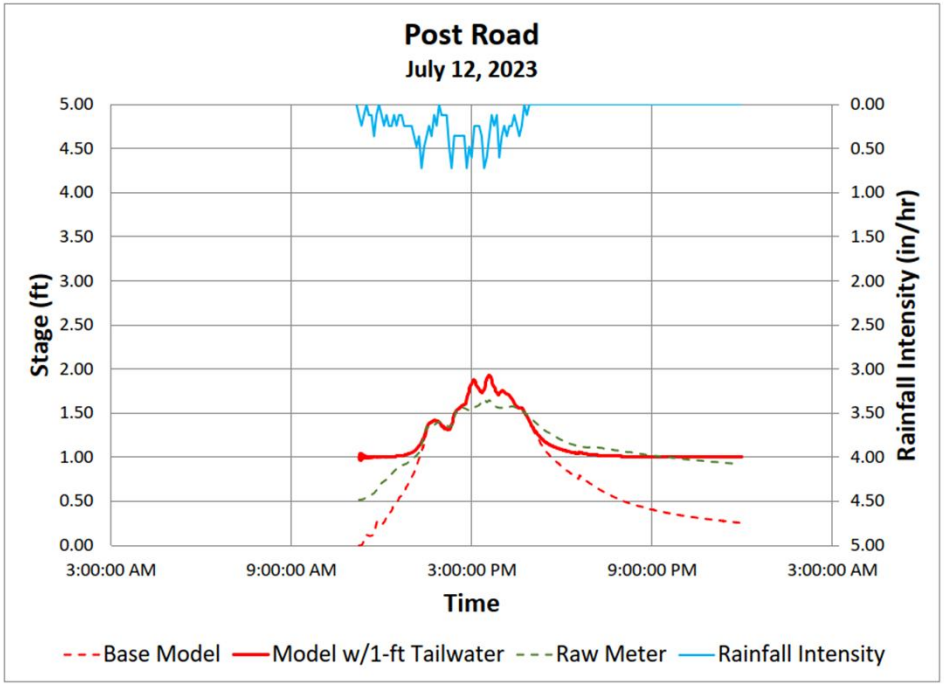
Progress to Date

Model Calibration





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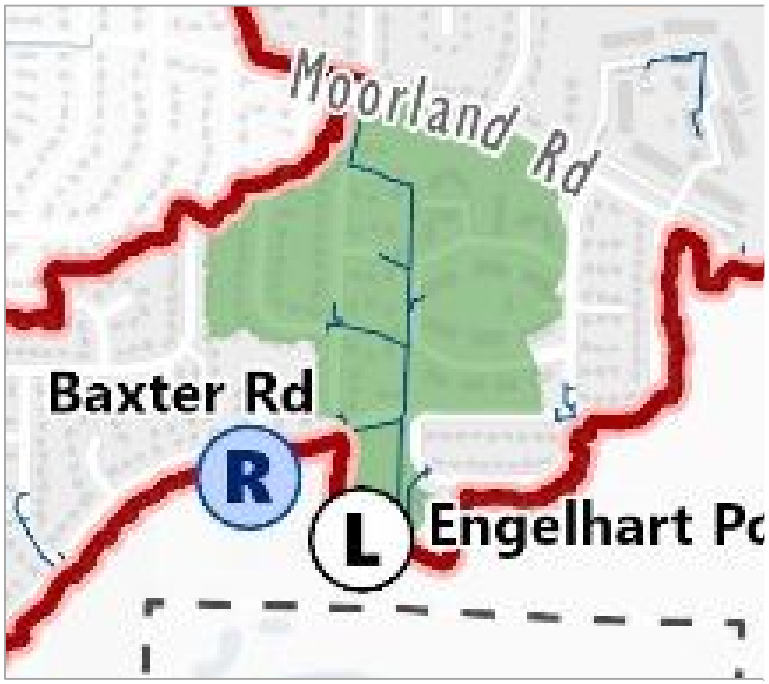
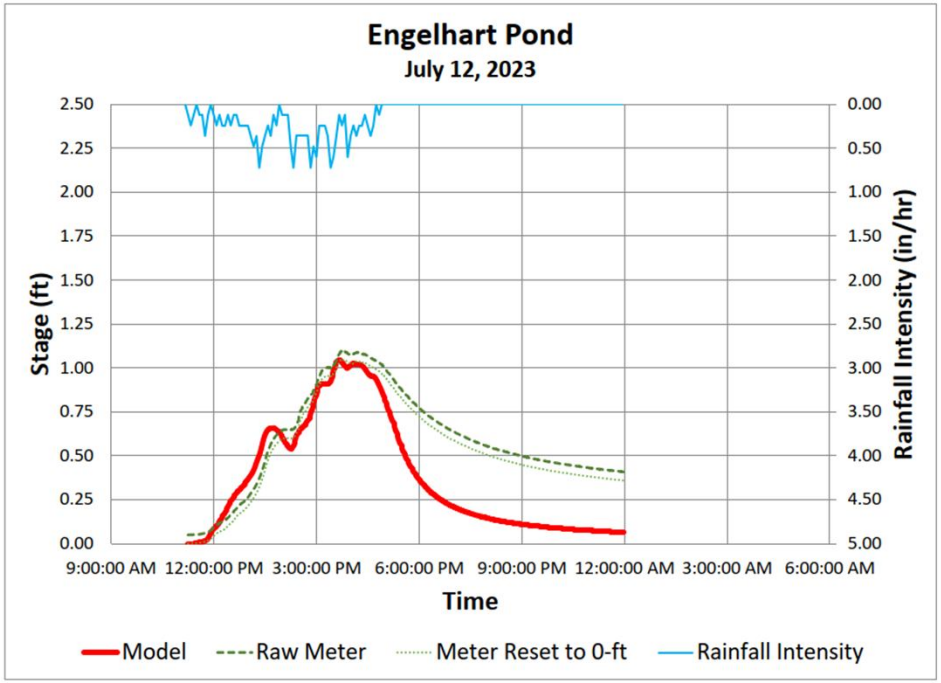
Progress to Date

Model Calibration





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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

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INUNDATION MAPPING DISCLAIMER

THE INTENT OF THE INUNDATION MAPS ARE TO ASSIST INDIVIDUALS IN QUICKLY FINDING GENERAL FLOOD RISK INFORMATION FOR THE INCORPORATED AND UNINCORPORATED AREAS OF THE CITY OF MADISON. INUNDATION MAPS DO NOT NECESSARILY IDENTIFY ALL AREAS SUBJECT TO FLOODING. THE CITY OF MADISON PROVIDES THE MAPS AS AN ADVISORY TOOL FOR FLOOD HAZARD AWARENESS. INDIVIDUALS SHOULD NOT USE INUNDATION MAPS AS THEIR PRIMARY RESOURCE FOR MAKING OFFICIAL FLOOD RISK DETERMINATIONS FOR INSURANCE, LENDING, OR OTHER RELATED PURPOSES. THIS IS NOT AN OFFICIAL FLOOD MAP.

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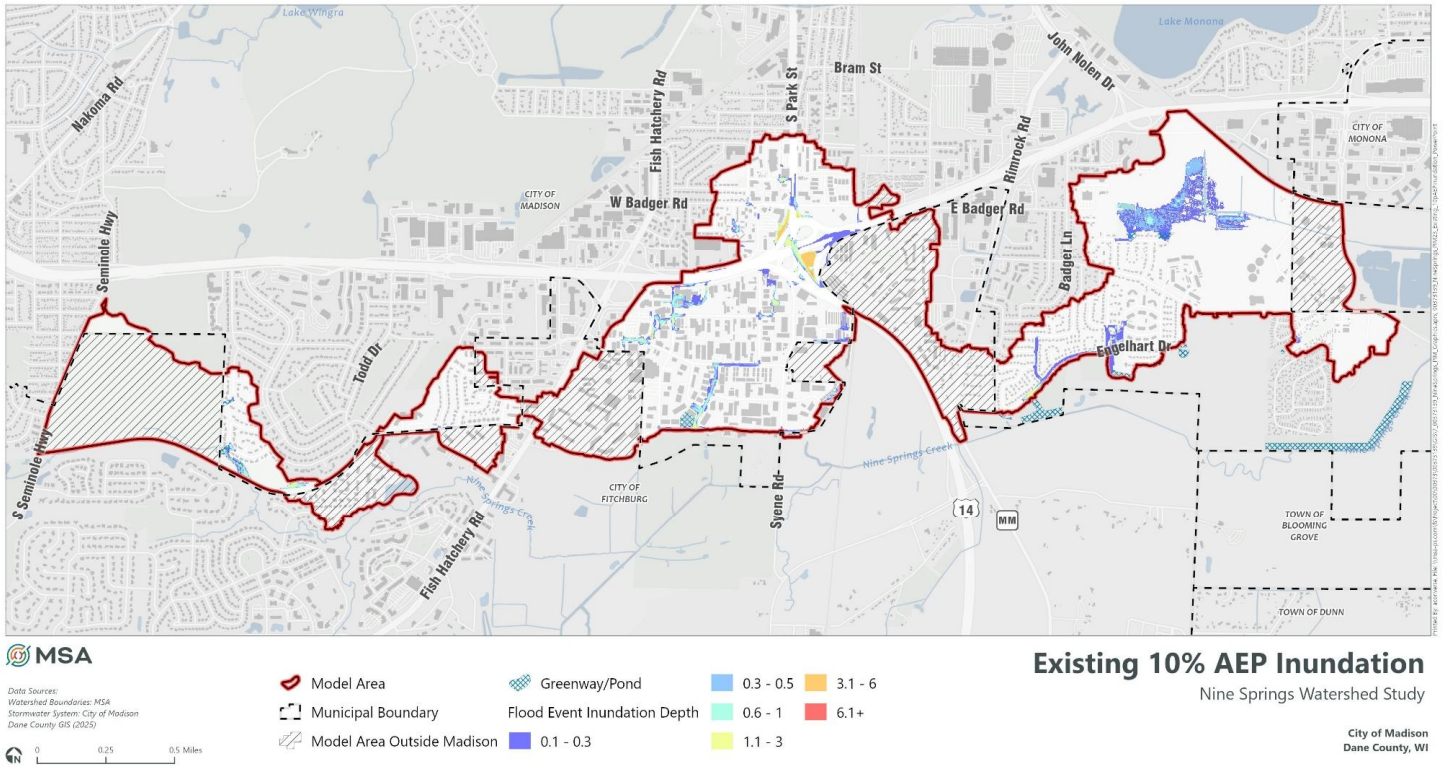
10% Chance (10-year) Existing Inundation Mapping



- 85 out of 197 stormwater structures do not meet 10% chance target

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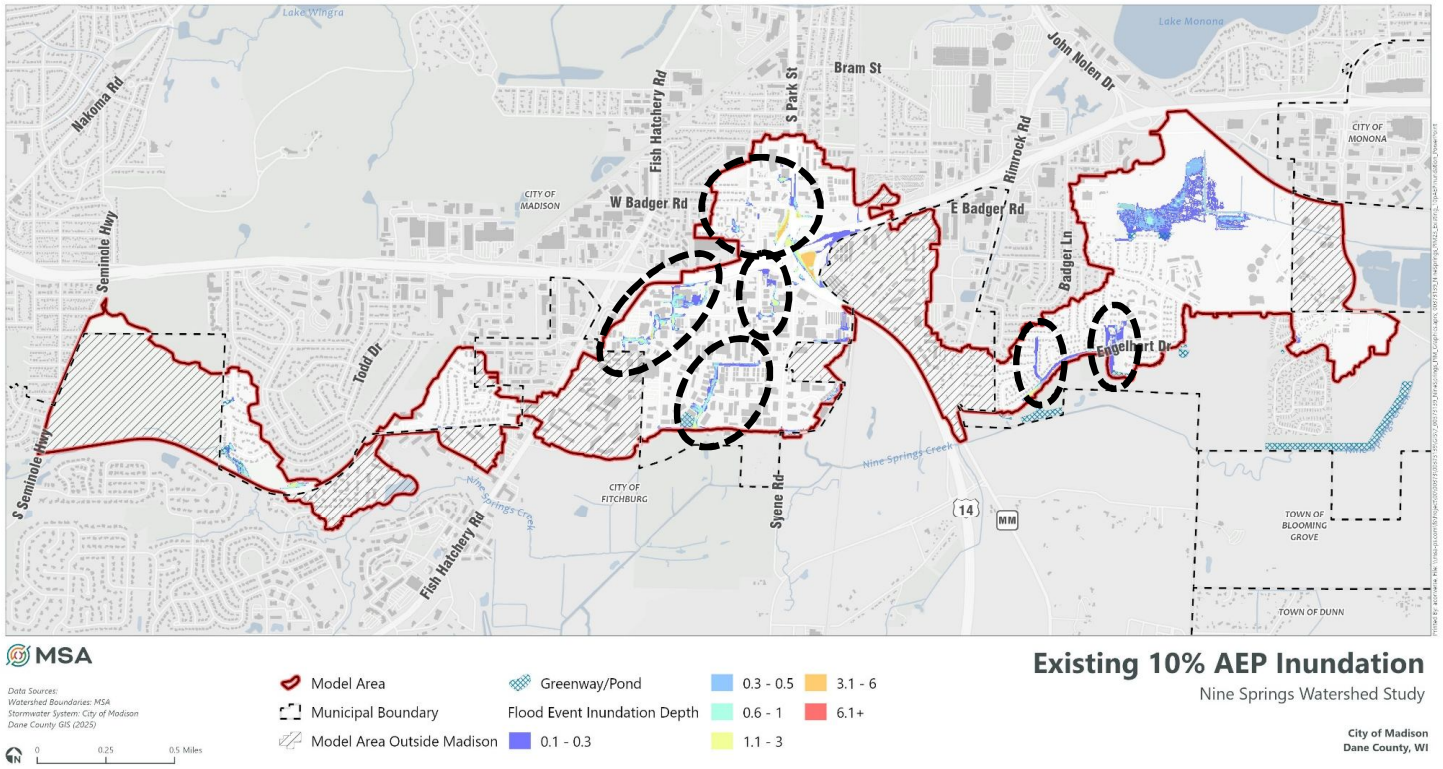
10% Chance (10-year) Existing Inundation Mapping



- 85 out of 197 stormwater structures do not meet 10% chance target

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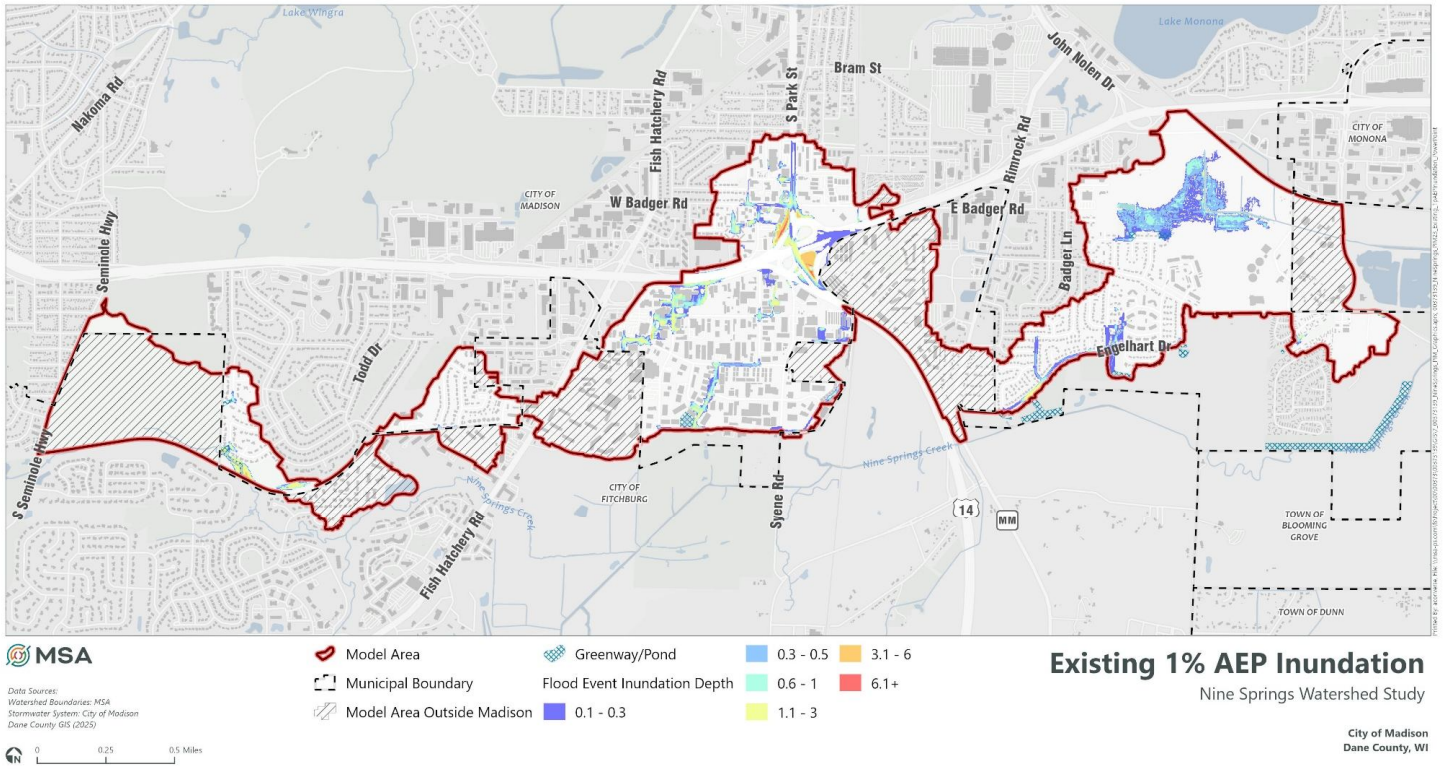
1% Chance (100-year) Existing Inundation Mapping



- 16 out of 1,203 buildings do not meet 1% chance target

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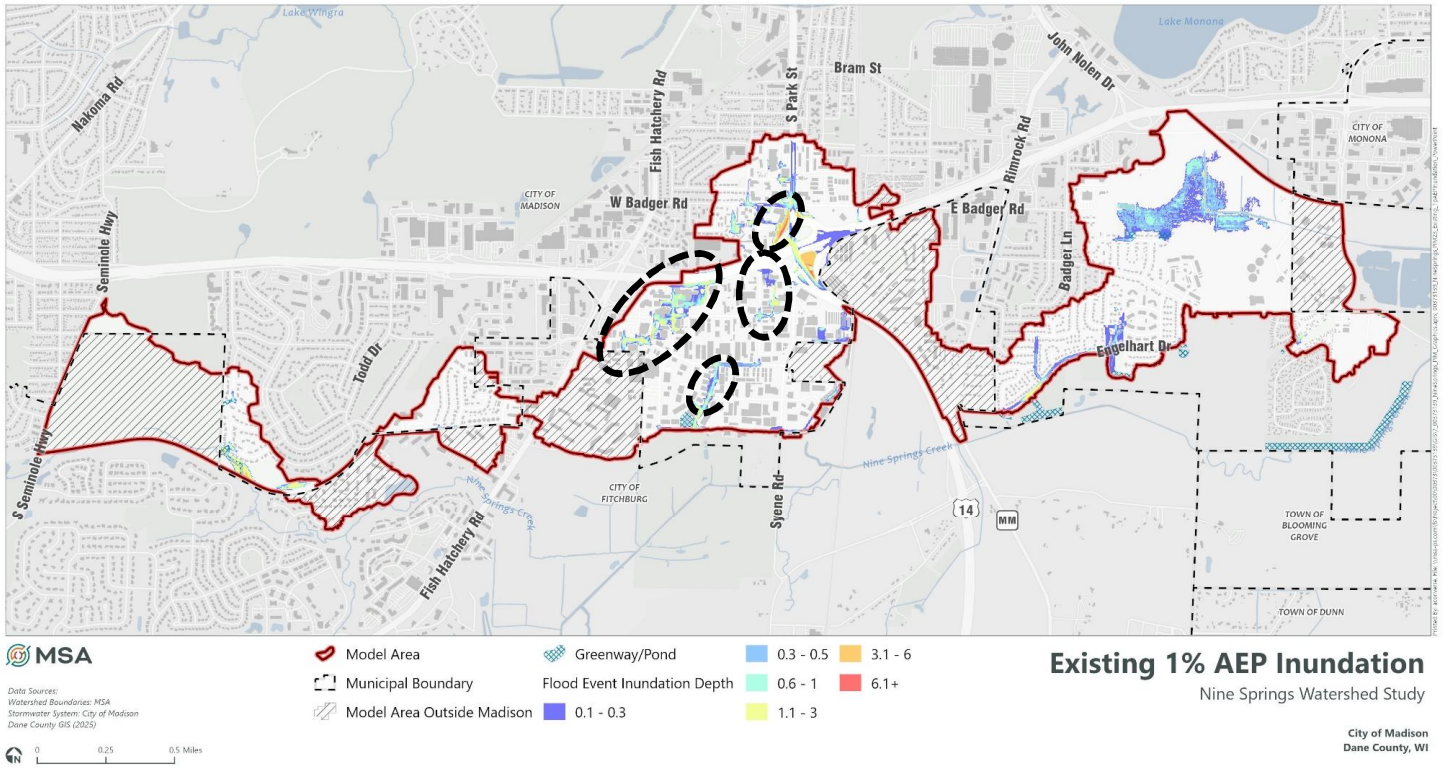
1% Chance (100-year) Existing Inundation Mapping



- 16 out of 1,203 buildings do not meet 1% chance target

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Flood Mitigation Solution Evaluation Process

- Iterative process
  - Brainstormed solutions
  - Consultant analyzed ideas and provided results
  - Some solutions not found to be viable for various reasons
  - Several meetings to develop the “suite of solutions”
- Feedback from Stakeholders
  - Public Input
  - Meet wit City Agency’s
    - Impacts to Agency’s infrastructure/property
    - Additional solutions
    - Places for cooperation/win-win solution
- Revised solutions based on agency feedback – If needed

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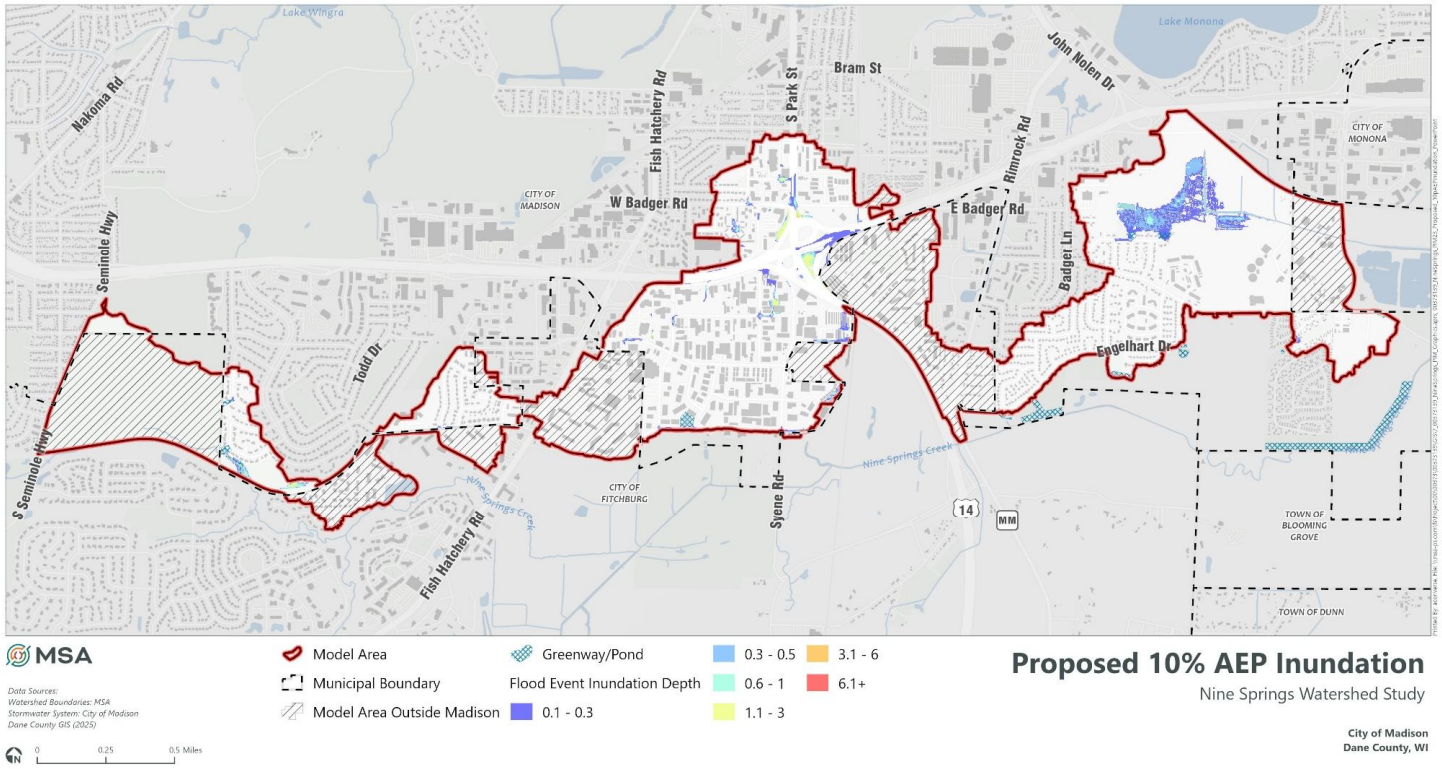
10% Chance (10-year) Improved Conditions Inundation Mapping



- Existing: 85 out of 197 stormwater structures do not meet 10% chance target
- 22 additional stormwater structures will meet 10% target

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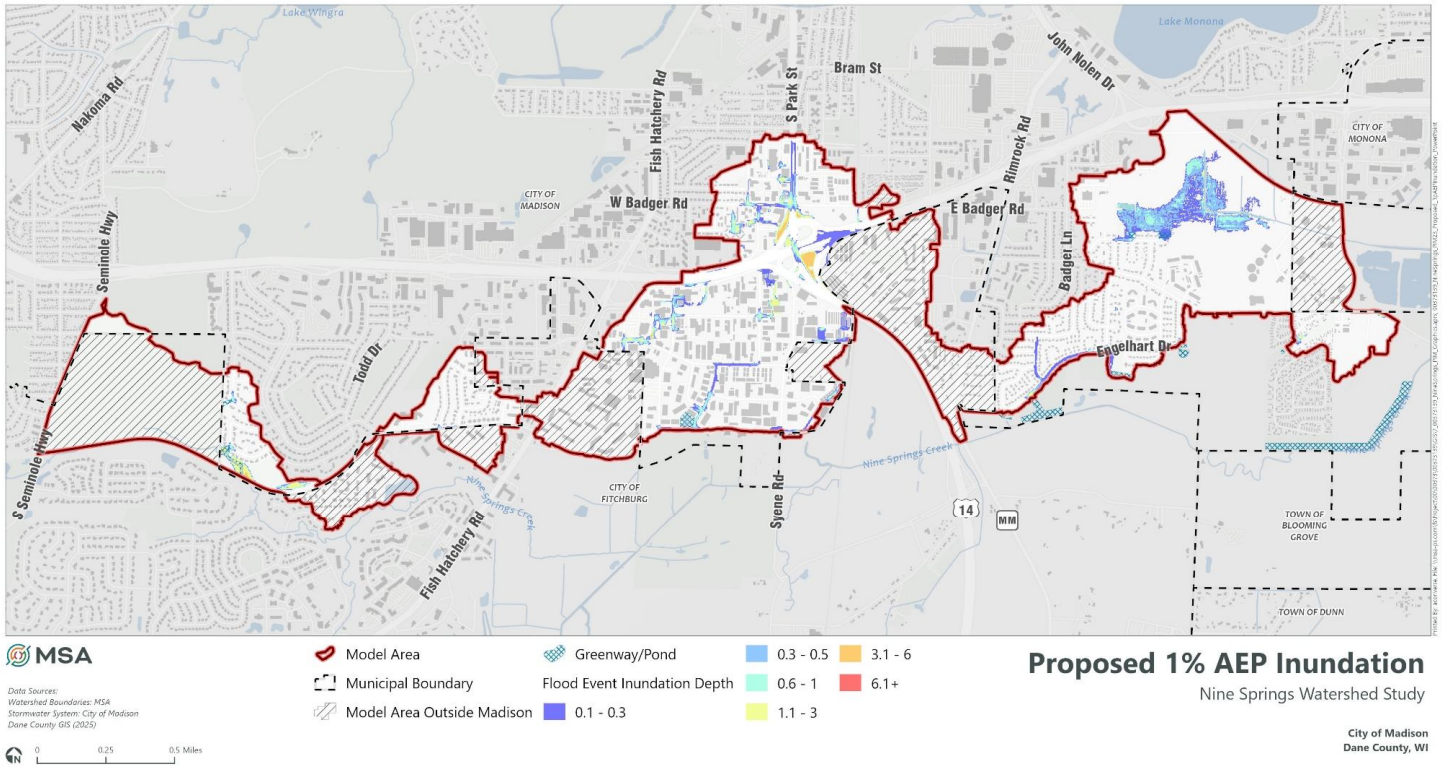
1% Chance (100-year) Improved Conditions Inundation Mapping



- 16 out of 1203 buildings do not meet 1% chance target
- 5 additional buildings will meet 1% chance storm target

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Current Recommended Flood Mitigation Solutions

Seven (7) local storm sewer improvements

All improvements would likely happen in conjunction with scheduled street reconstruction

1. Westview Ln
2. Post Rd
3. Applegate- New Bypass
4. Applegate Outfall Pipes and HWY 14 Cross Pipe
5. DOT Ponds and Park/Beltline On-ramp Enclosure
6. Engelhart and Settlement Dr
7. Fell Rd

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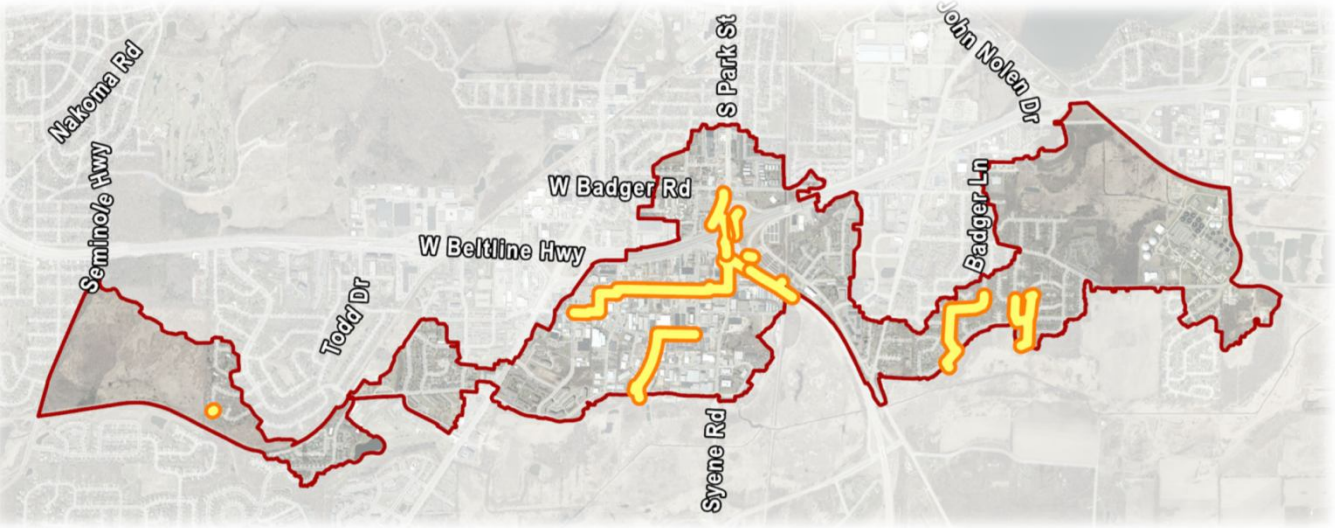
Local Storm Sewer Improvements



These will primarily be scheduled with street reconstruction projects. Recently reconstructed streets will likely not have storm sewer improvements for a long time.

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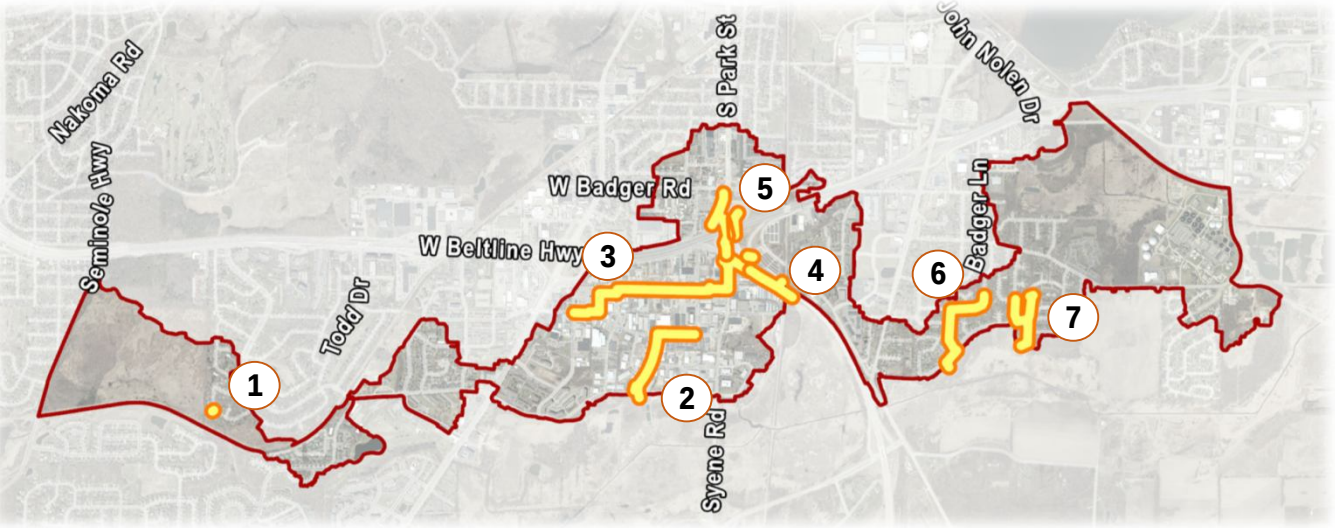
Local Storm Sewer Improvements



1. Westview Ln
2. Post Rd
3. Applegate- New Bypass
4. Applegate Outfall and HWY 14
5. DOT Ponds and Park/Beltline On-ramp enclosure
6. Engelhart and Settlement Dr
7. Fell Rd

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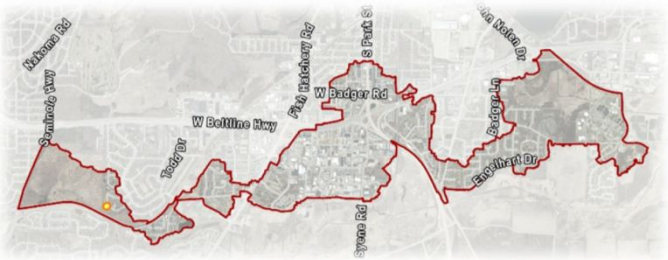
Westview Lane

- Reduce localized flooding for 25-yr event
- Increase storm sewer size
- Est. Cost - $30K



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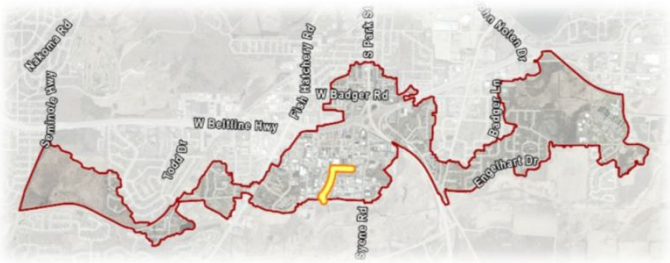
Post Road

- Reduce street flooding for 25-yr event
- Increase storm sewer size
- Est. Cost - $2.8M



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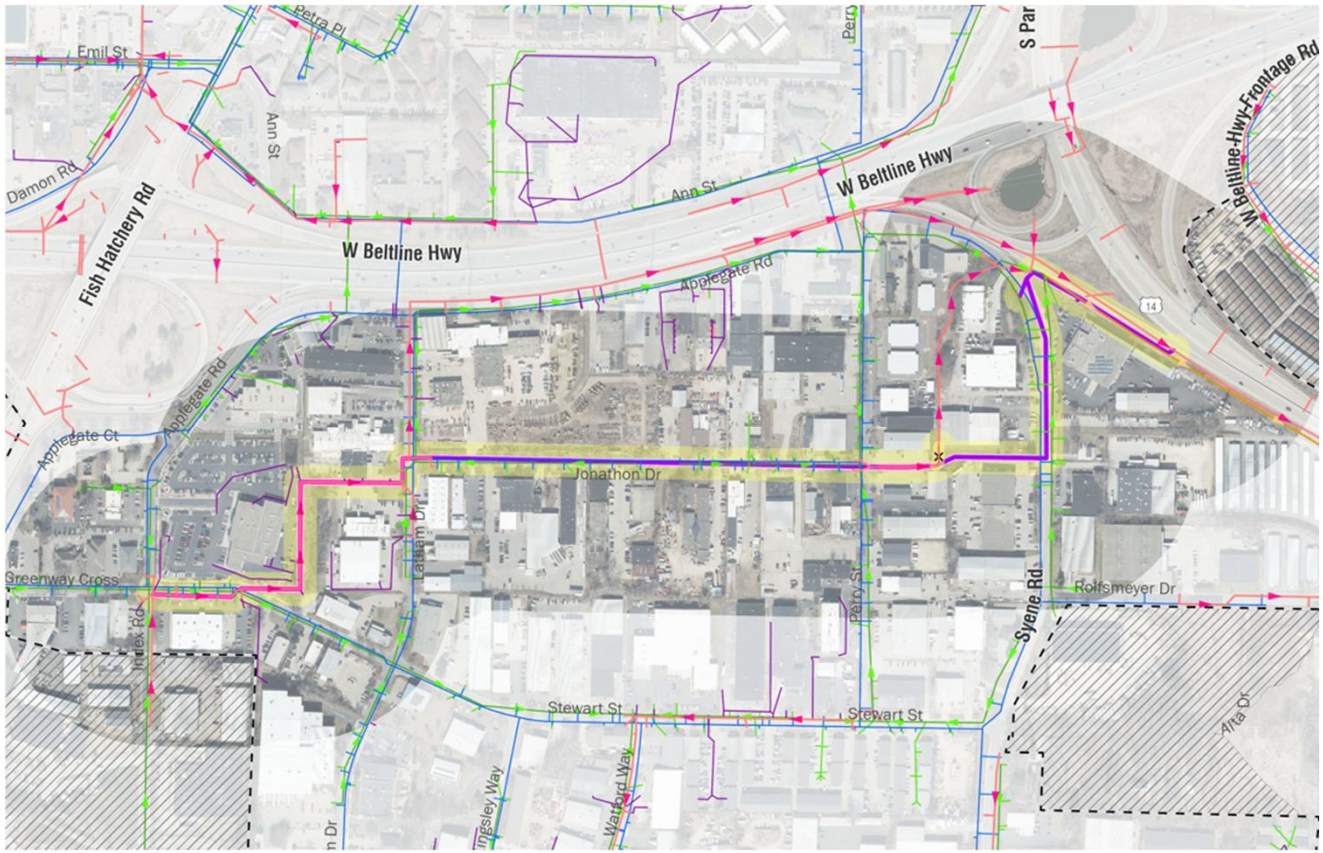
Applegate- New Bypass

- Relocate storm sewer to be within the City's right-of-way
- Reduce street flooding for 25-yr event
- Reduce impacts to buildings for the 100-yr event
- Est. Cost - $4M



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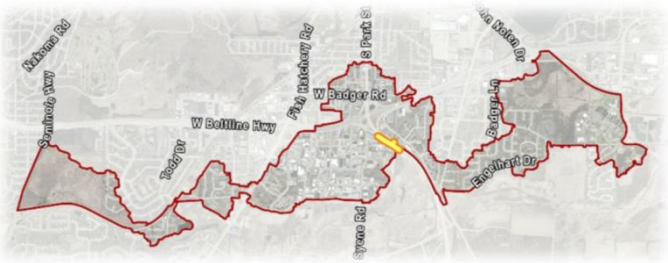
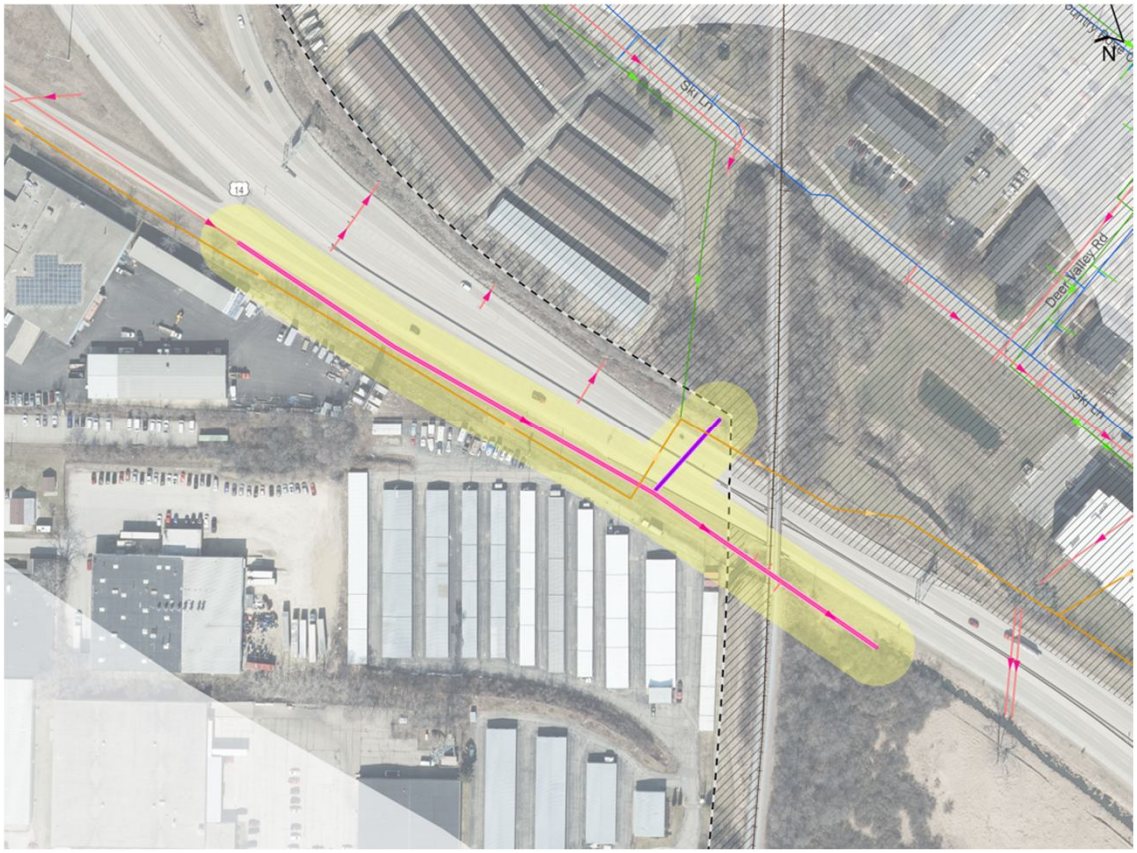
Applegate Outfall Pipes and HWY 14 Cross Pipe

- Upsize outfall, connected to prior improvement
- Coordinate with WisDOT
- Est. Cost - $1M





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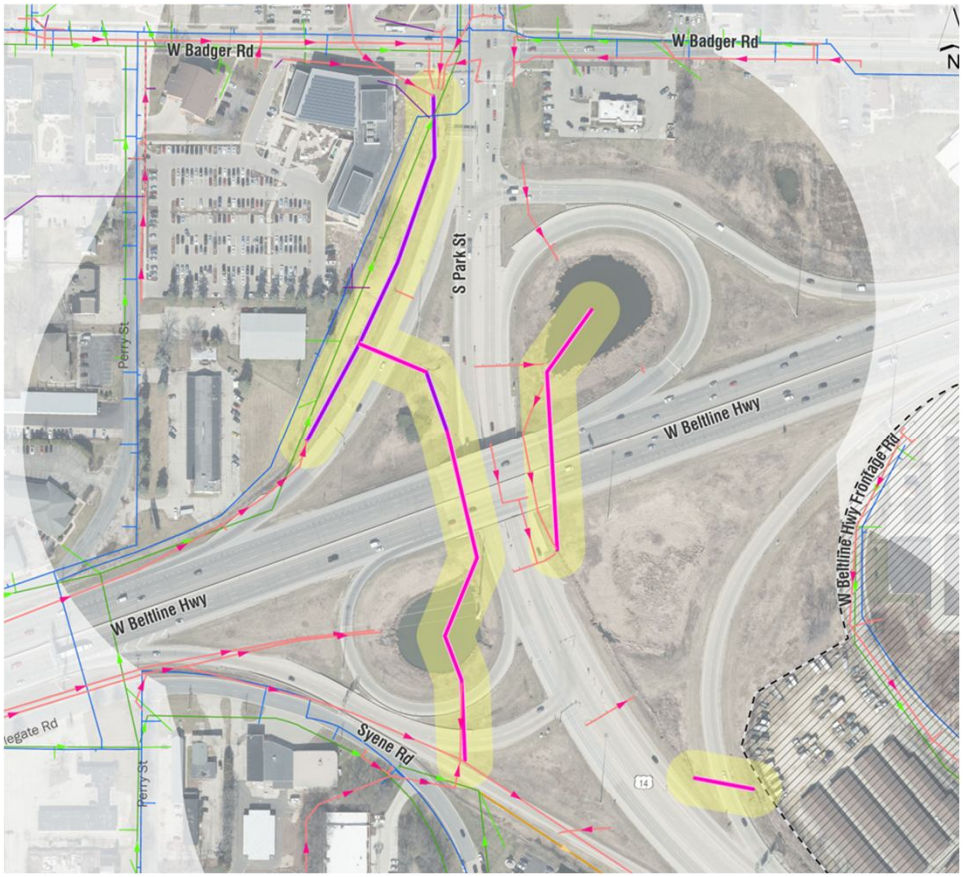
DOT Ponds and Park/Beltline On-ramp enclosure

- Improve flows through Beltline Interchange
- Reduce street flooding for 25-yr event
- Coordinate with WisDOT
- Est. Cost - $1.6M



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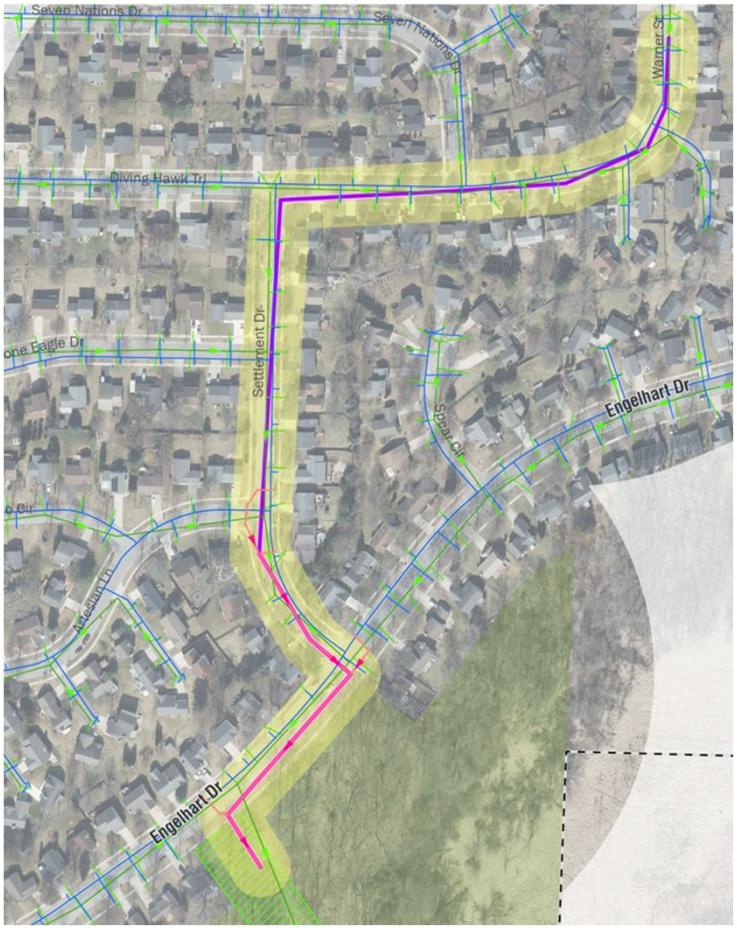
Engelhart Dr and Settlement Dr

- Reduce street flooding for 25-yr event
- Reduce fast overland flows within the streets
- Increase storm sewer size
- Est. Cost - $0.9M



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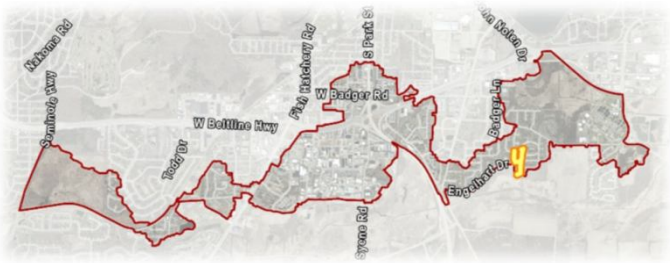
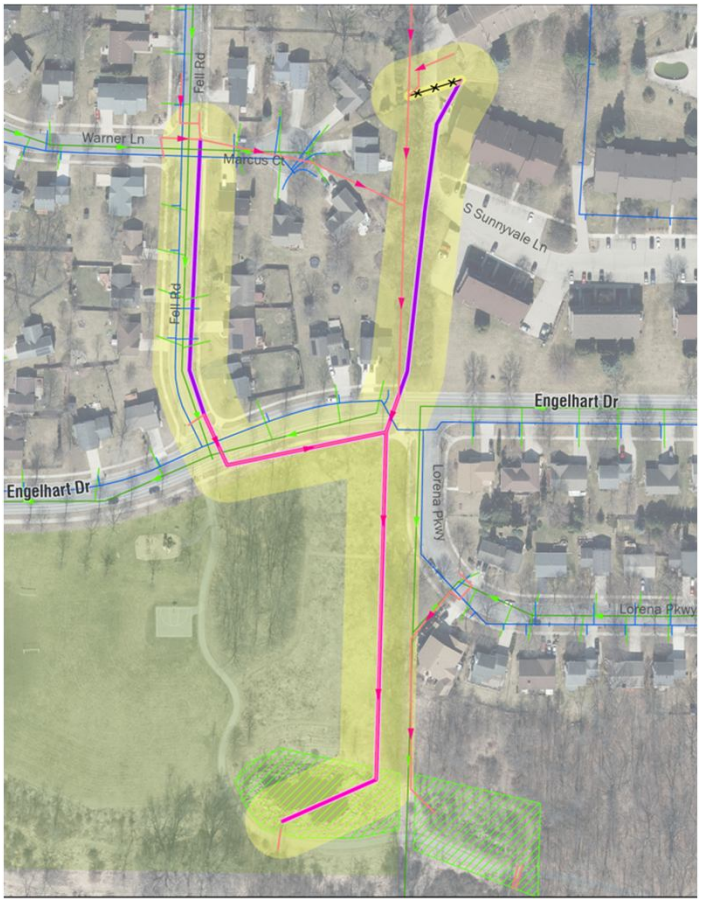
Fell Road

- Reduce street flooding for 25-yr event
- Reduce flooding into private backyards
- Relocate more storm sewer into the City's right-of-way
- Increase storm sewer size
- Est. Cost - $0.6M





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Recommended Implementation Order and Cost

Project	Estimated Total Cost
Westview Ln	$0.03M
Post Rd	$2.8M
Applegate – New Bypass	$4.0M
Applegate Outfall Pipes and HWY 14 Cross Pipe	$1.0M
DOT Ponds and Park/Beltline On-ramp enclosure	$1.6M
Engelhart and Settlement Dr	$0.9M
Fell Rd	$0.6M

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Budgeting Considerations

- Not all projects are yet identified
  - Currently 85 stand-alone projects in 16 study areas (6 more studies in progress)
  - $336M (2026 dollars)
- Stormwater Utilities fees fund projects
  - Frequent double digit rate increases – not sustainable
  - Without additional funding, only 1-2 medium/large projects completed each year
- Additional funding mechanisms
  - Grants, appropriations, earmark funds
- Most projects take 1 ½ - 2 years to design & permit before construction

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Citywide Prioritization Tool

- City creating prioritization tool to prioritize when solutions will be constructed
  - Will include all flood mitigation solutions in the City (22 watersheds)
  - Currently revisited annually as more studies are completed and solutions are added.
- Solutions prioritized based on:
  - Flood reduction abilities
  - Vulnerability
    - Income
    - Evacuation
  - Ability to improve emergency service access
  - Cost
  - Water quality benefits
- Surveys completed to provide input on how solutions are prioritized

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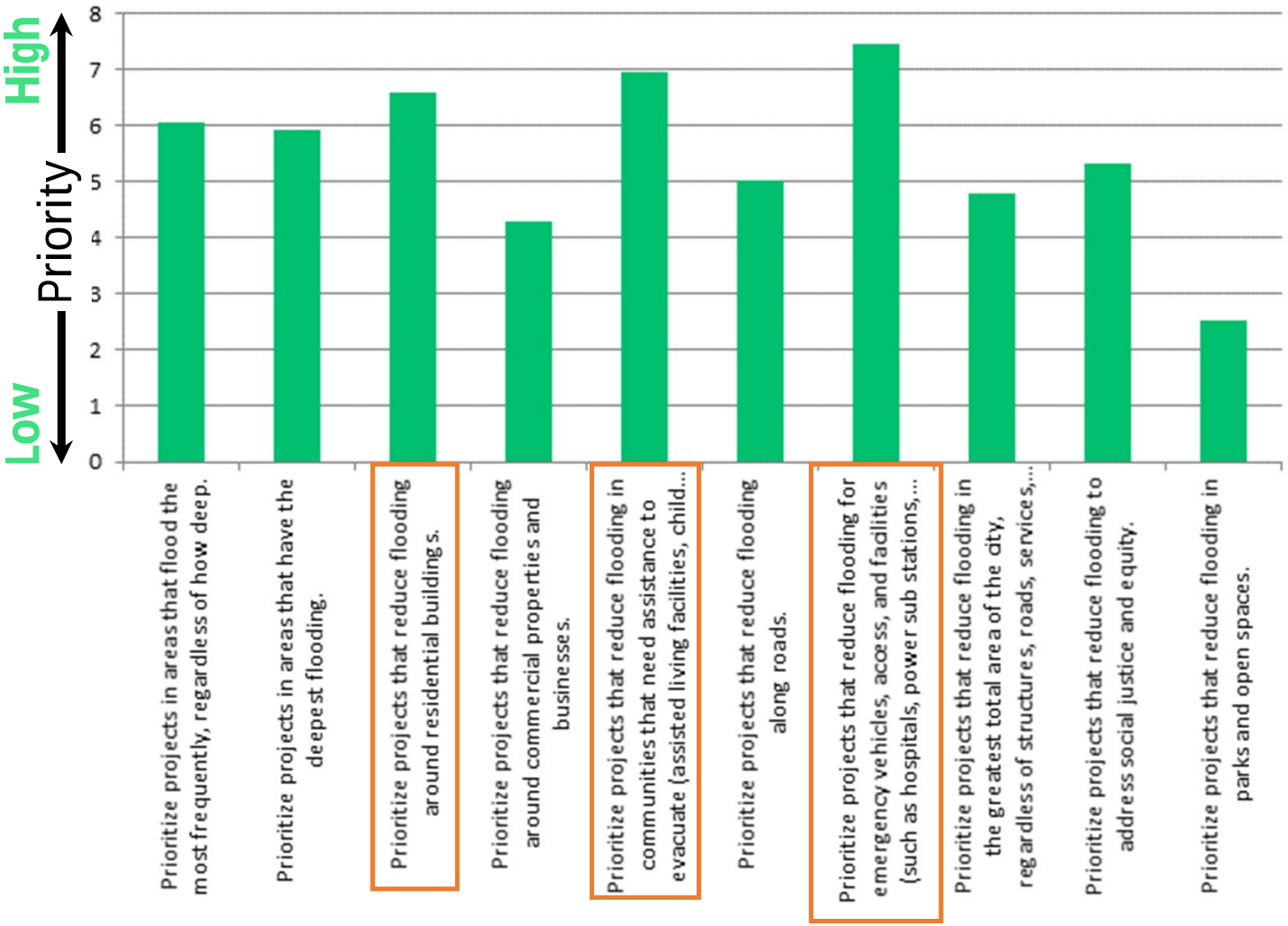
Prioritization Survey Results



Effort to collect resident input citywide on what type projects should be prioritized.

Results were used to develop scoring system for prioritization tool, along with other factors previously shown

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Why Aren’t All Targets Met for the Watershed?

- Space constraints
- Conflict with other major utilities (watermain, sanitary sewer, large gas mains, etc)
- Property ownership
- Cost impacts
- When levels are high, stormwater has nowhere to go — drains can back up, and flooding worsens

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Study Next Steps

- Revise Solutions depending on feedback
- Finalize Report
  - Public Comment
  - BPW, BPC, Other committees
- Finalize Prioritization Process
- Begin Implementing Solutions

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Contact Information & Resources

- Project Manager: Ryan Stenjem, rstenjem@cityofmadison.com
-
- Public Information Officer: Hannah Mohelnitzky, hmohelnitzky@cityofmadison.com

- Project Webpage: https://www.cityofmadison.com/engineering/projects/nine-springs-watershed-study
  - 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

- New Flooding Website: www.cityofmadison.com/flooding
- Everyday Engineering Podcast
- Instagram: @MadisonEngr
- Facebook – City of Madison Engineering
- X – @MadisonEngr
- Provide your feedback! https://www.cityofmadison.com/news/survey-open-city-engineering-works-to-prioritize-flood-projects

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Q & A

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