John Nolen Watershed Study
Public Information Meeting #2

Public Information Meeting
City of Madison Engineering Division
April 24, 2024

Thank you for attending. We will begin shortly…

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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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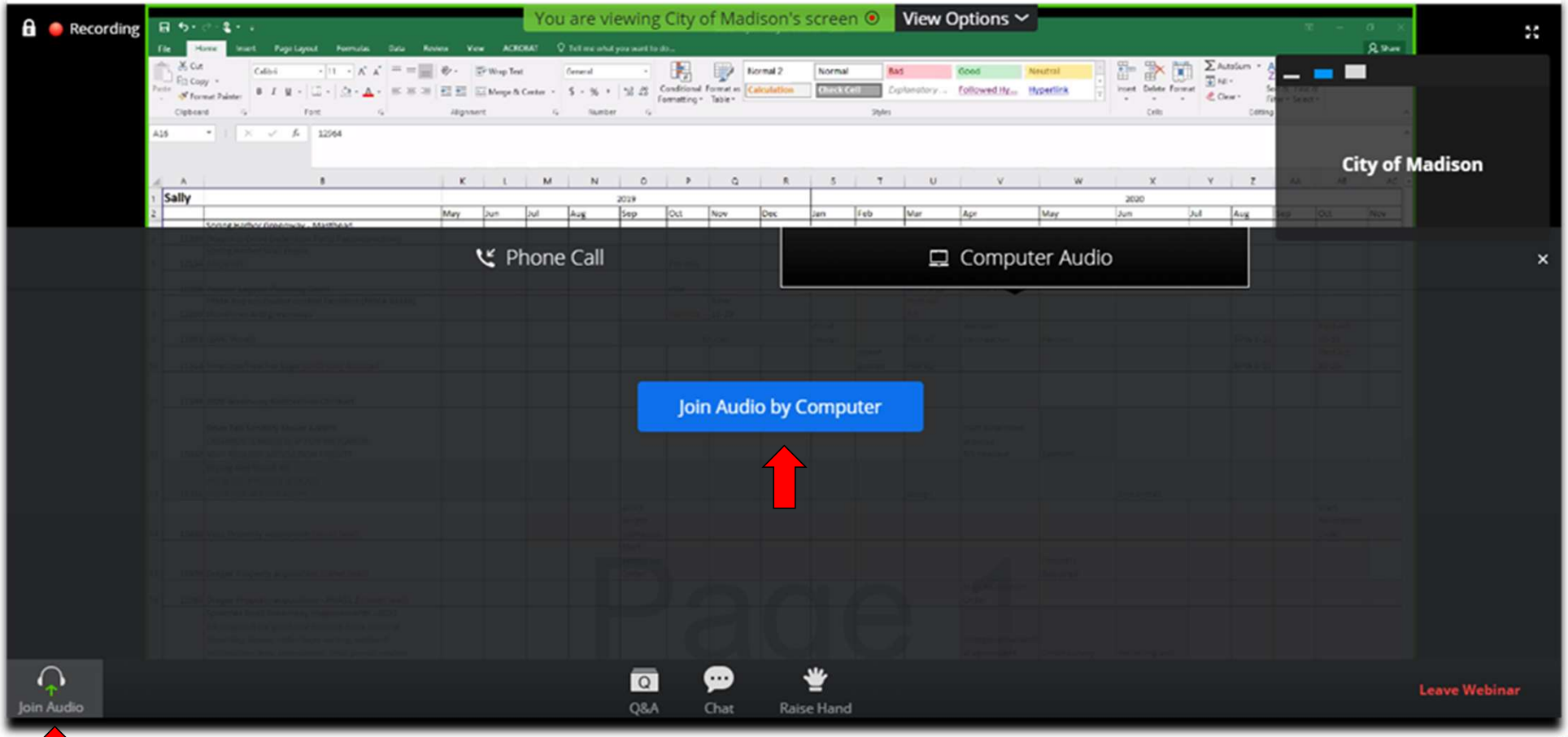
How to Participate



Make sure to join audio

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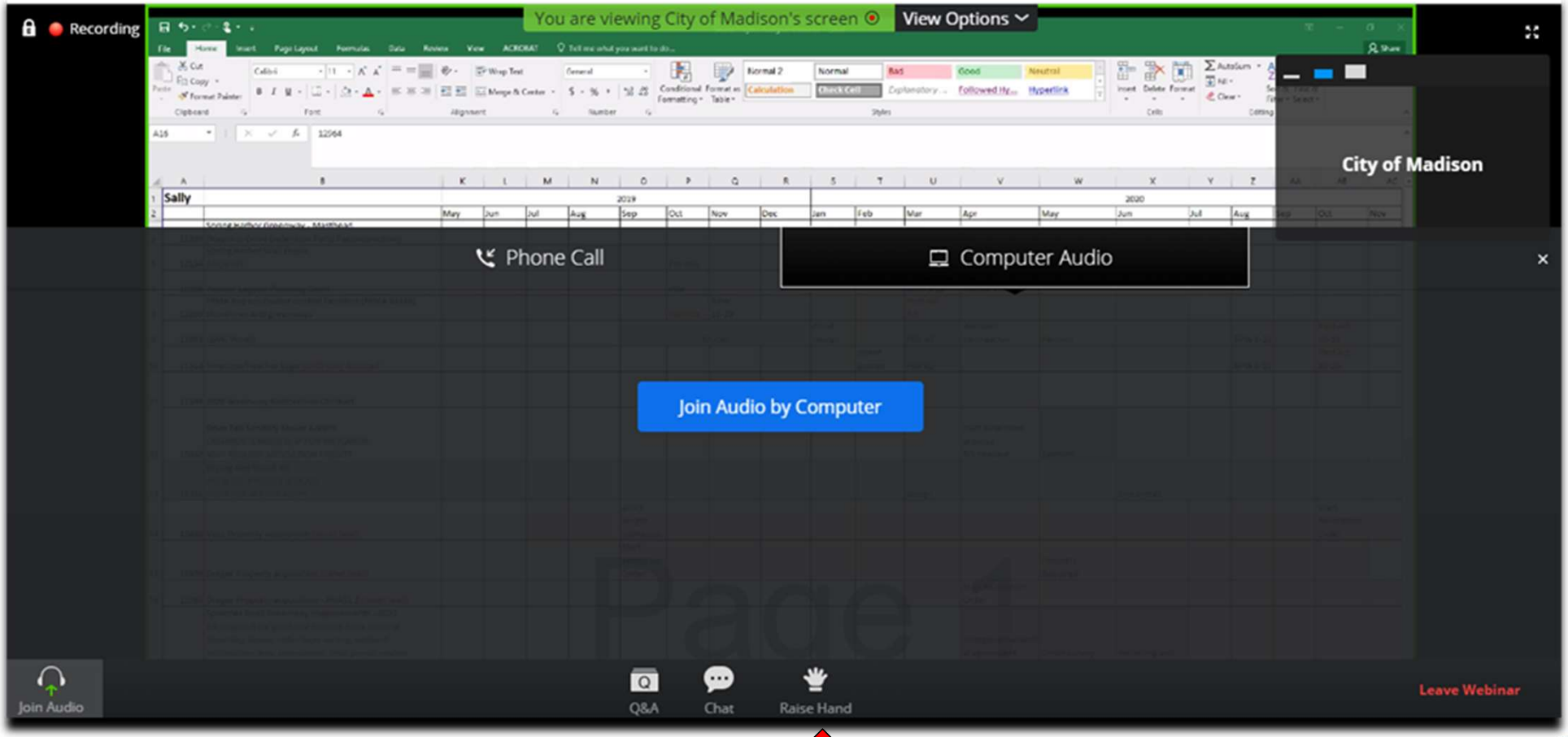

Raise your hand to be unmuted
For comments or ask additional questions.

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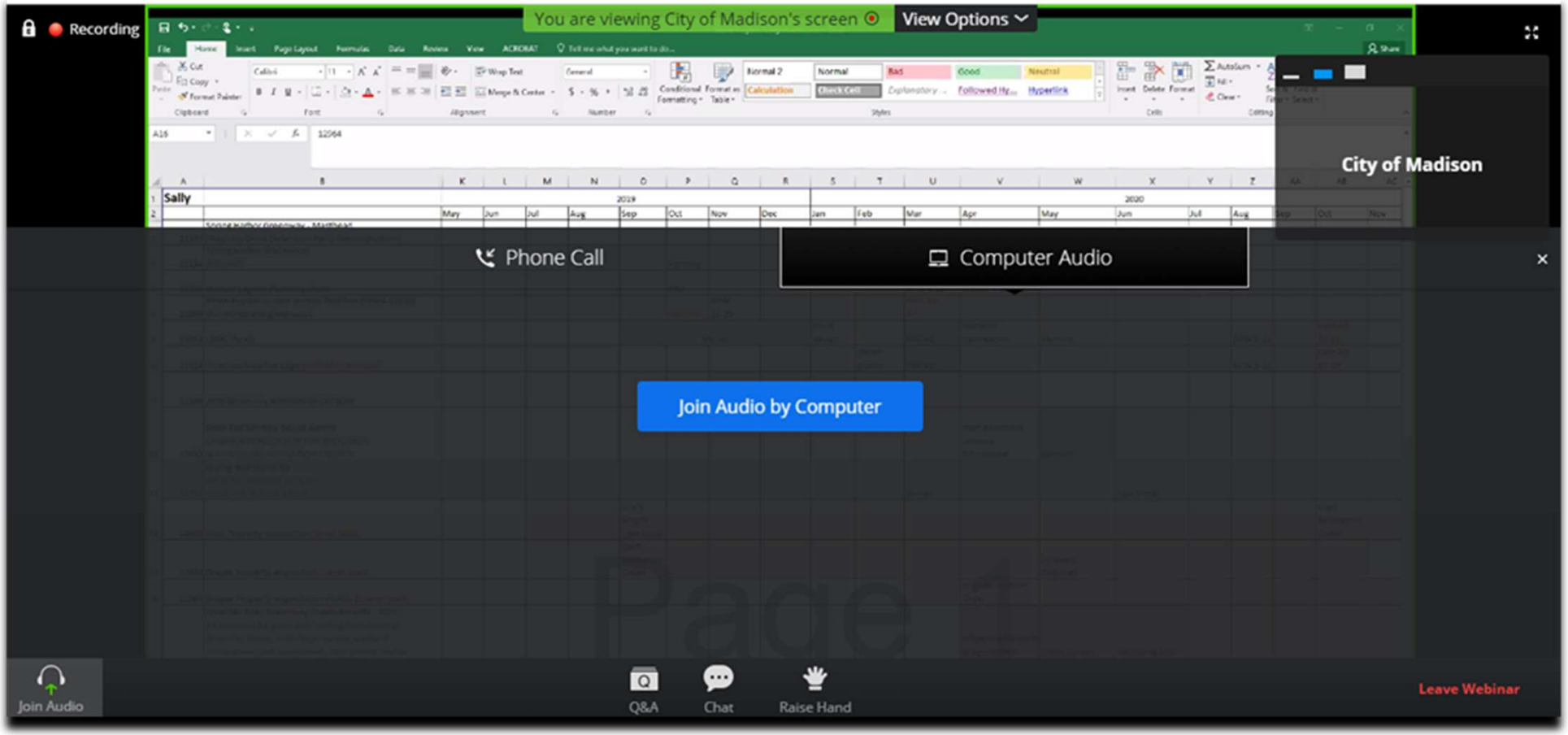
How to Participate



Use chat if you have technical issues or a question for the panelists after the presentation

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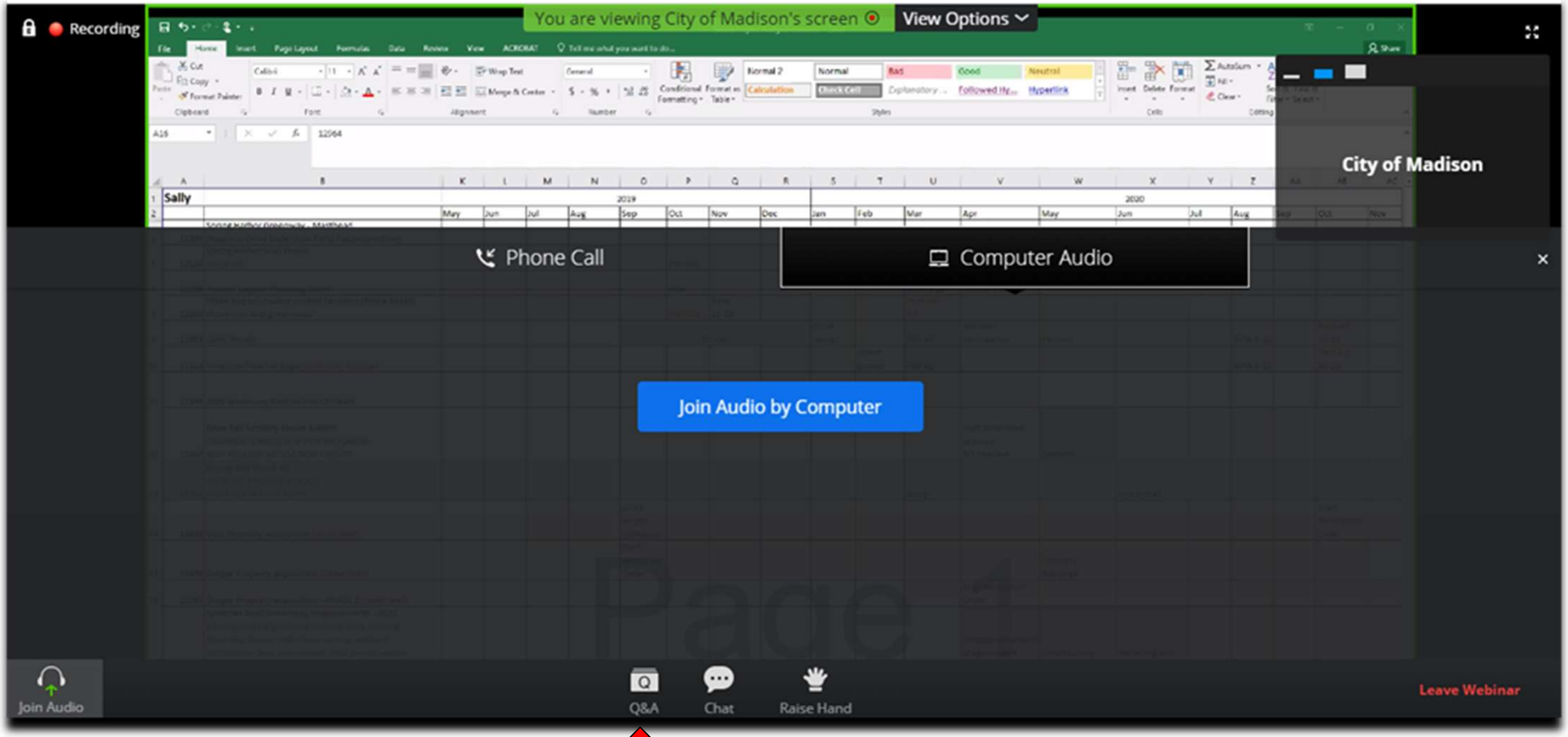

Use Q/A if you have questions.
We will answer after the presentation

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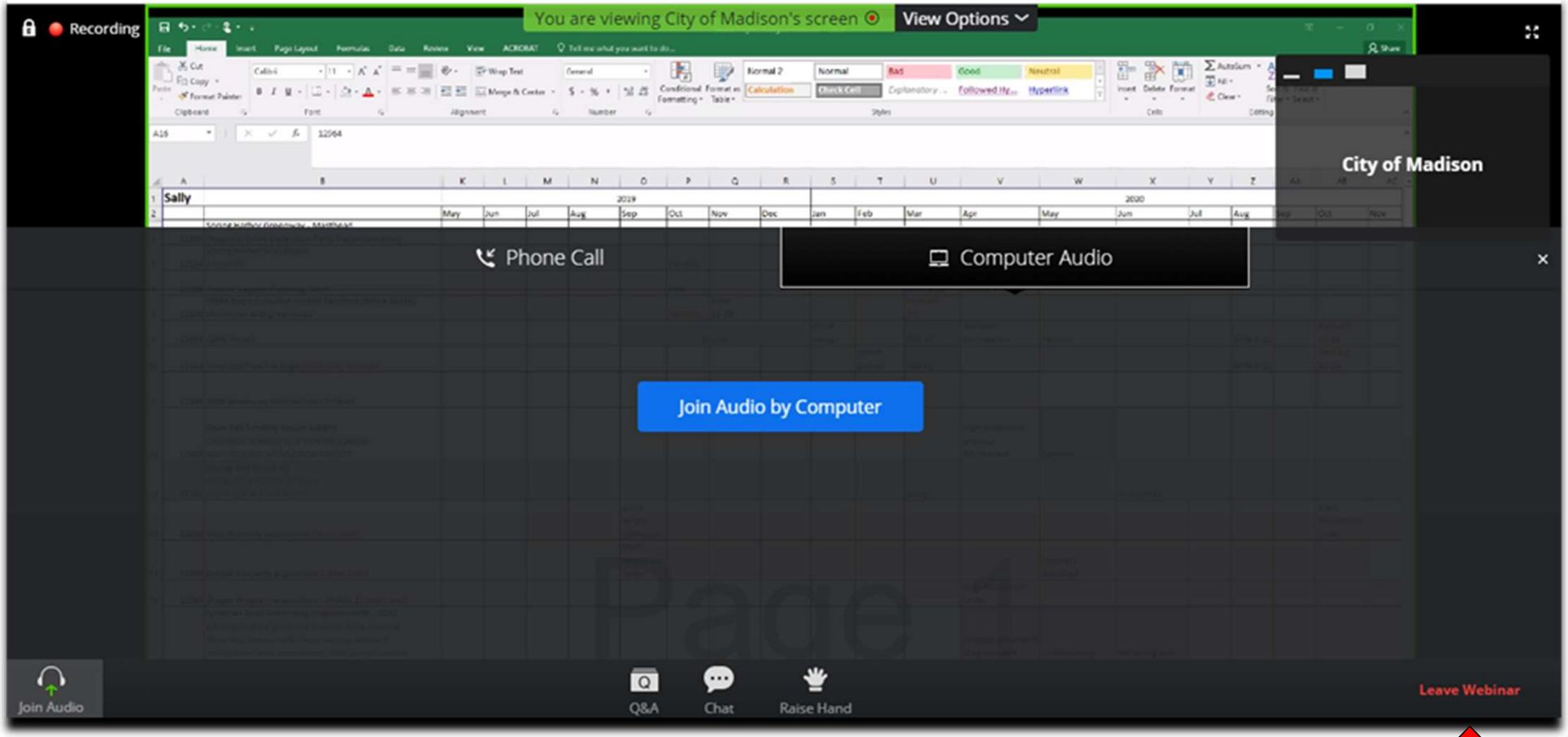
How to Participate



To leave the meeting click here

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Presentation Overview

- Welcome – Ryan Stenjem, City of Madison
- Presentation – Eric Thompson, MSA Professional Services
  - Definition of commonly used terms
  - Why are we here
  - Project location
  - Progress to date
  - Inundation mapping
  - Flood mitigation targets
  - Next steps
  - Watershed study limitations
- Q&A – facilitated by Hannah Mohelnitzky, City of Madison
  - Submit questions through Zoom Q&A
- Flood map feedback —facilitated by Ryan Stenjem
- Wrap Up – Ryan Stenjem, City of Madison

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Definitions of commonly used terms

- **Stormwater:** rainwater produced from a rain event
- **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

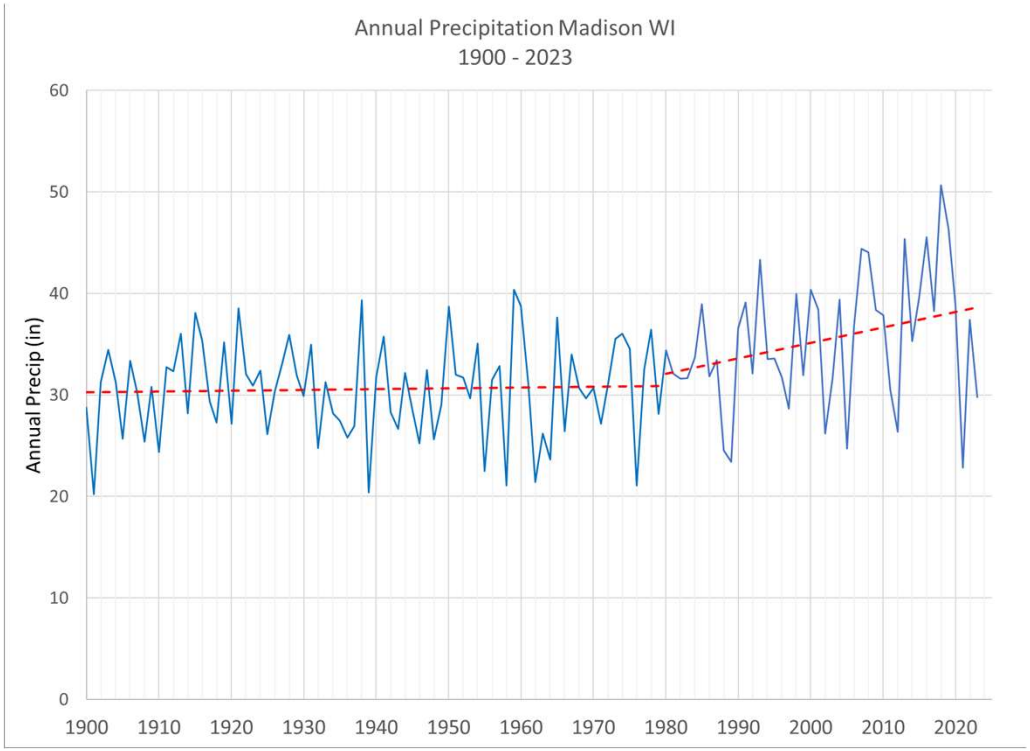
1% Chance Storm Definition

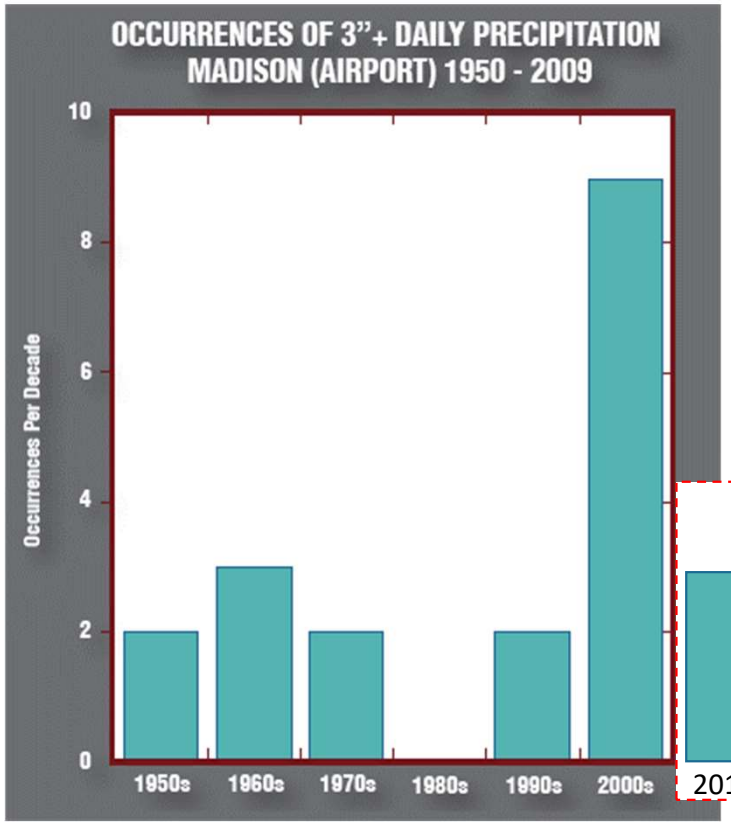
- % Chance Storm Definition: chance that a rainfall event will occur each year
- 1% chance storm is also known as the 100-yr storm
  - 6.66-inches of rain in 24-hours
  - Does NOT mean that a storm will only occur once in 100 years.
  - During a 30-year mortgage, there's a 26% chance of experiencing a 100-year (1%) event
- Also referred to as the "Annual Exceedance Probability" (AEP)

% Chance Storm	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

Why We Are Here: Historic Events

- More rain
- More rain events greater than 3”





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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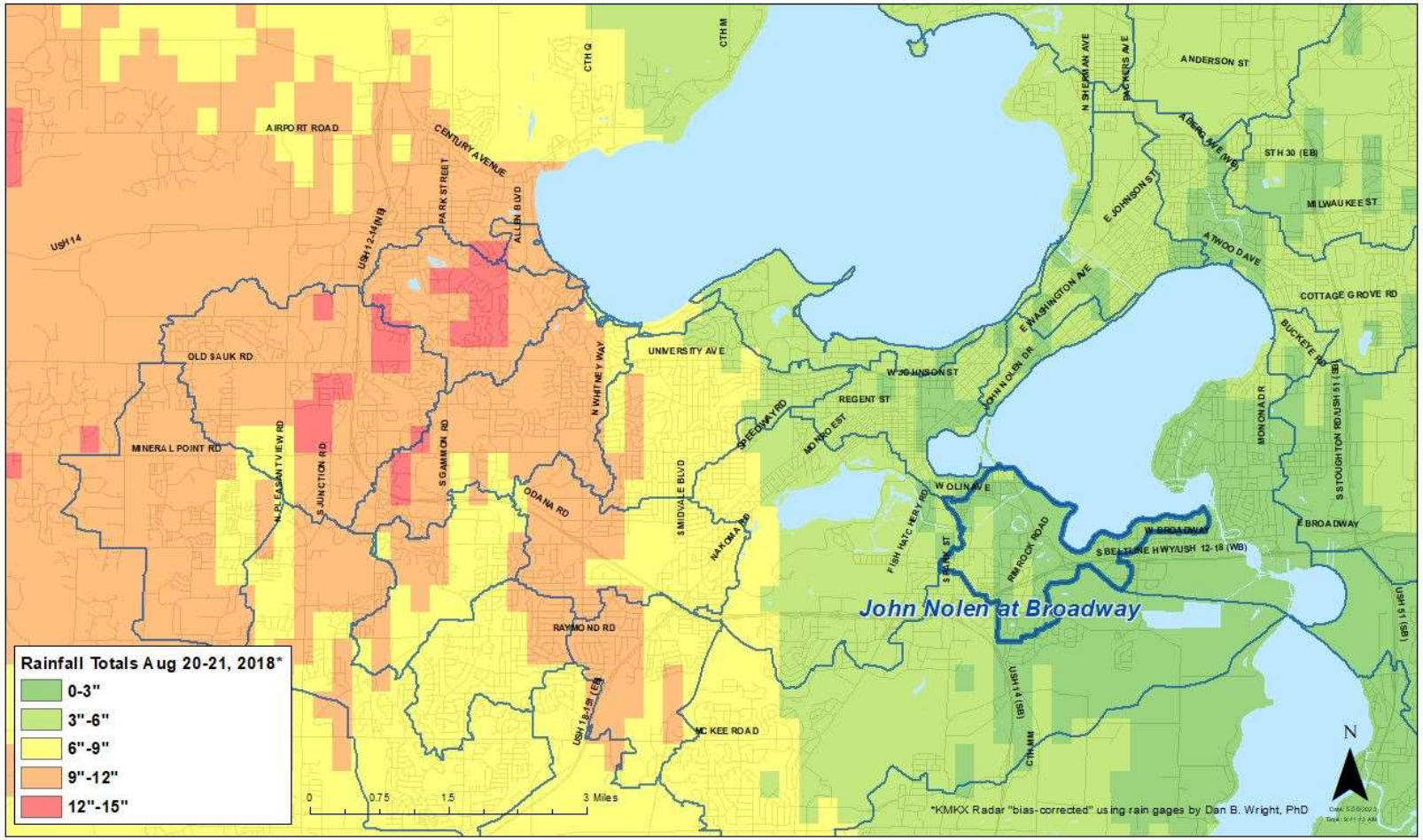
Rainfall Totals August 20-21, 2018



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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Where the Water Goes

What's 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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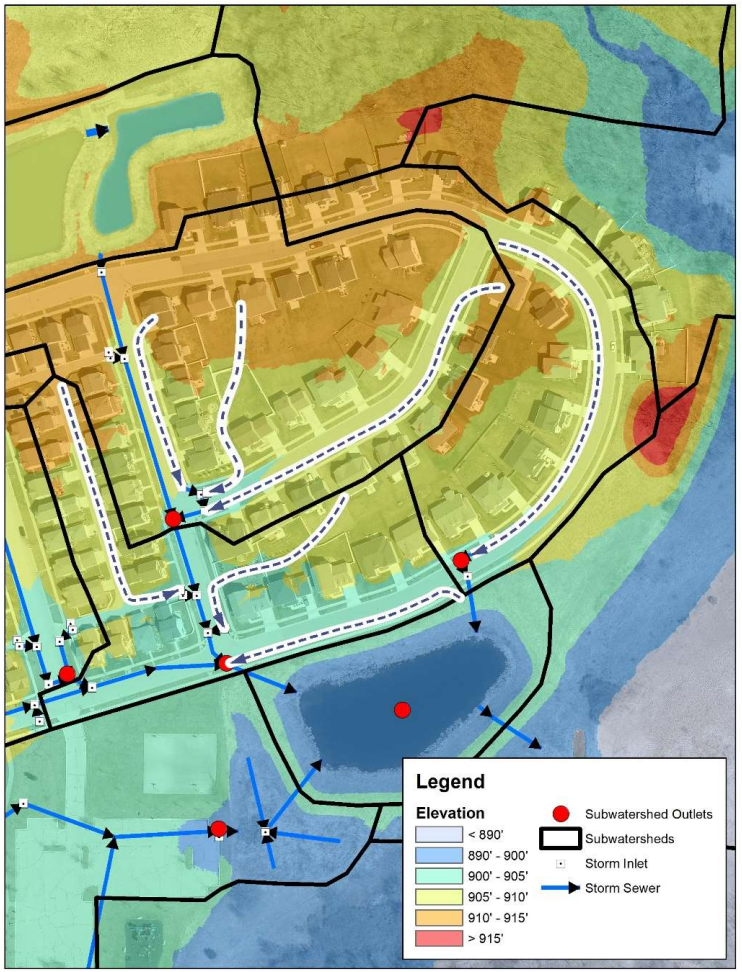

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Where the Water Goes: Sewer Systems

- 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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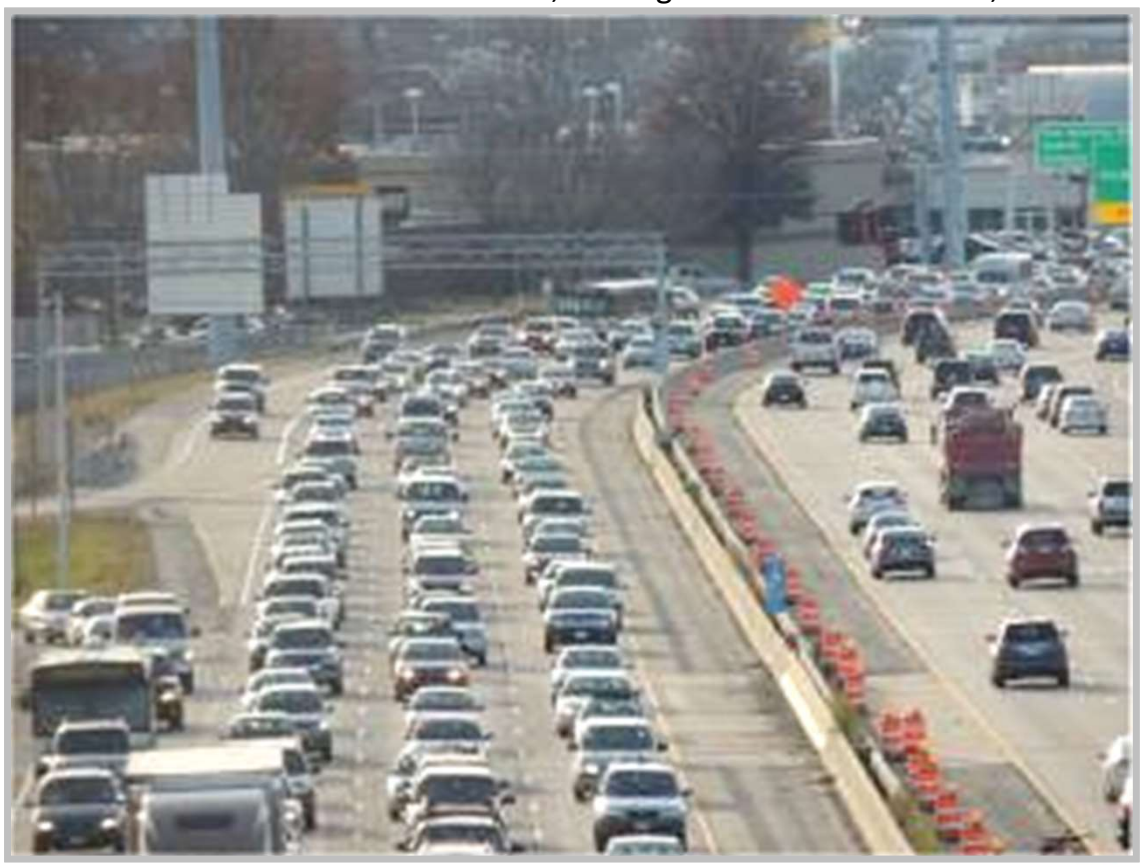
Reasons for Flooding Issues
Flash Flooding

- Flash flooding: when storm sewer system cannot handle high amounts of rain
- Comparative example: a traffic jam
  - Too many cars on the Beltline during 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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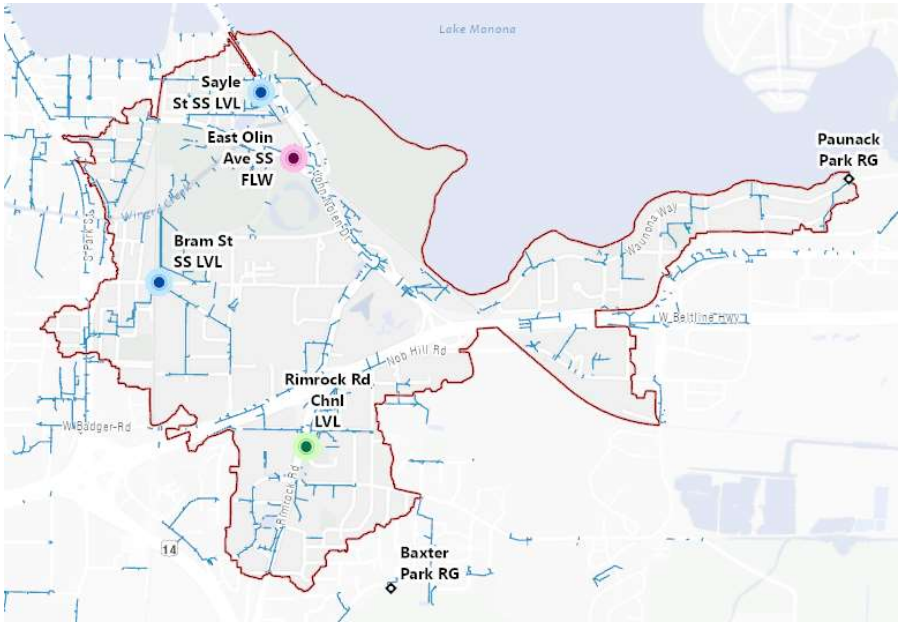
Project Location

JOHN NOLEN WATERSHED

Item	Quantity
Watershed Area	1,315 acres
Public Stormwater Inlets and Access Structures	1,572
Storm Sewer Pipes & Culverts	19 miles
Open Channels/Greenways	0 miles
Streams	0 miles*



** Wingra Creek flows through John Nolen Drive watershed but was not specifically included in the modeling completed for this project.*

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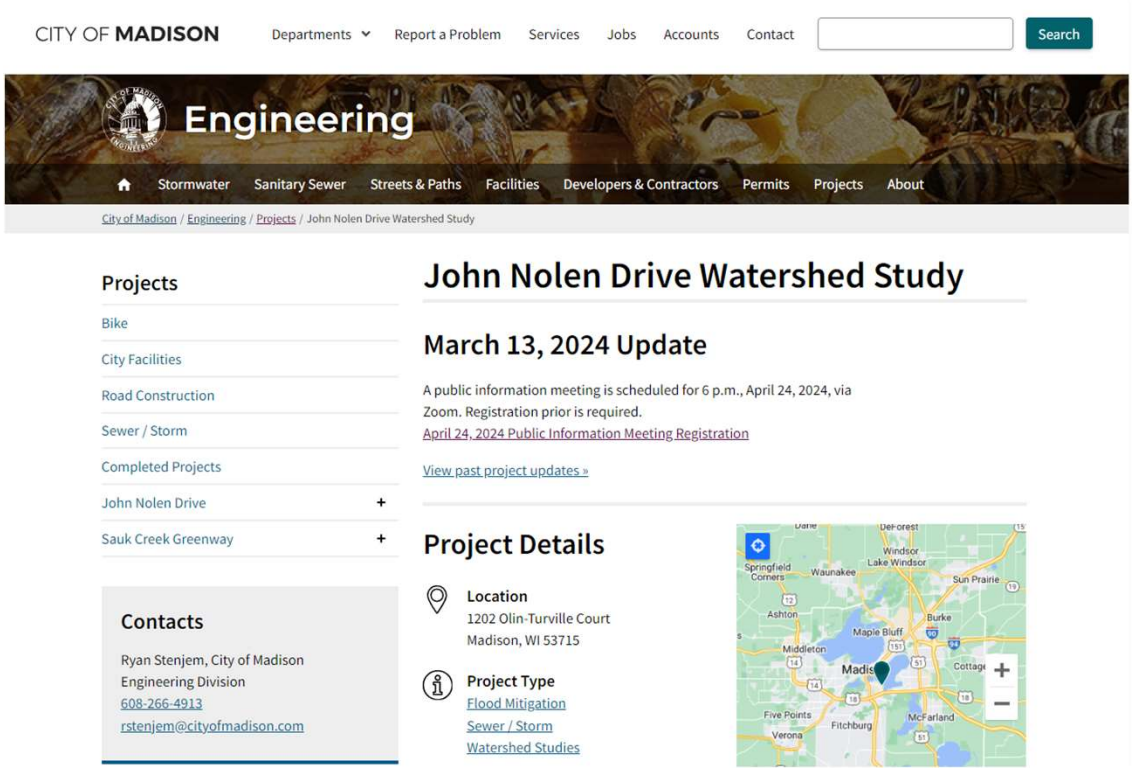
Progress To Date

- Project Start
  - February 2023
- Public Input Meeting #1
  - May 30, 2023
- Data Collection Complete
  - October 2023
- Existing Conditions Model Built
  - January 2024
- Model Calibrated
  - February 2024



[John Nolen Drive Watershed Study | Engineering | City of Madison, WI]

https://www.cityofmadison.com/engineering/projects/john-nolen-drive-watershed-study

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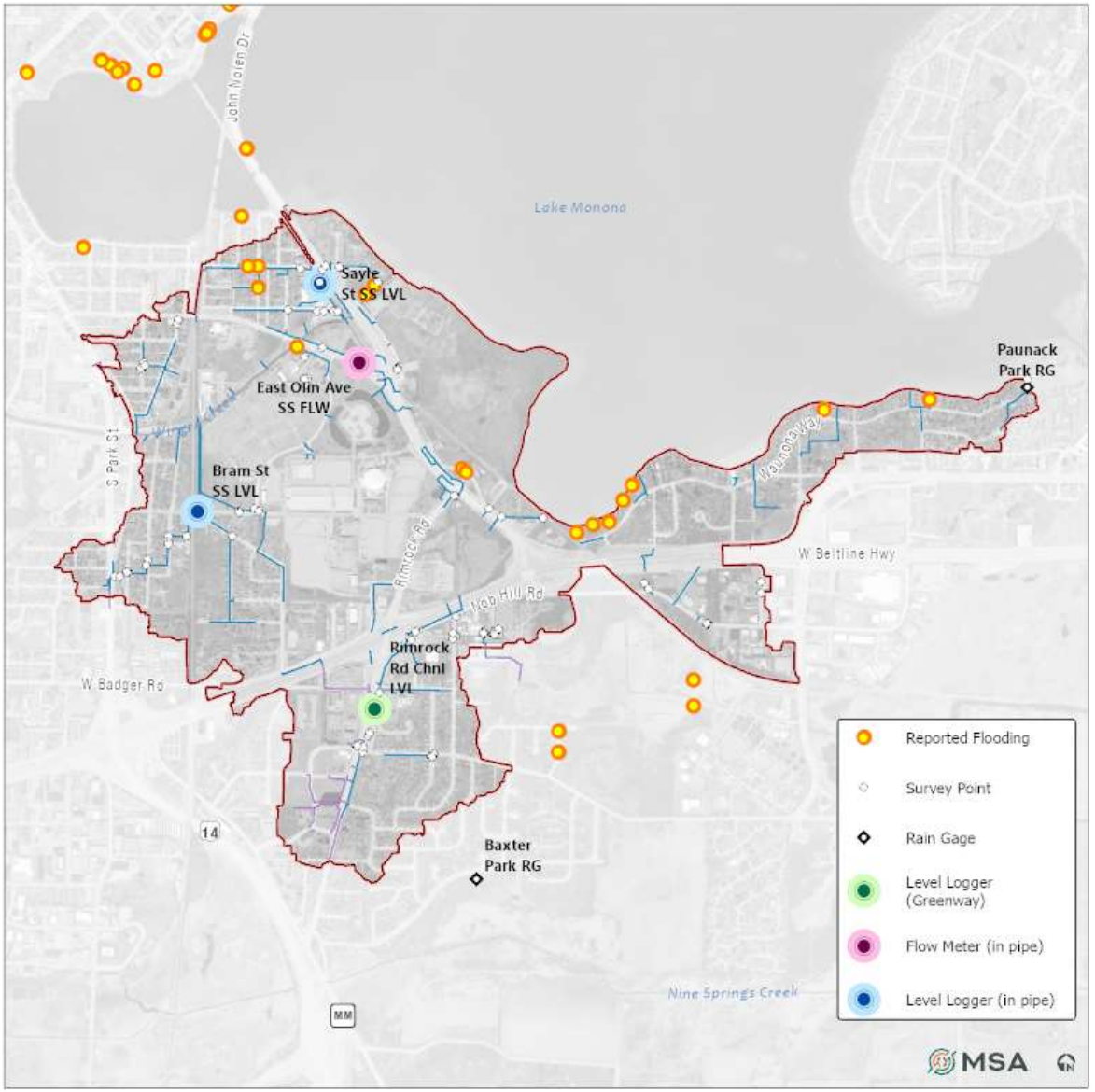
Progress To Date

DATA COLLECTION

- Ground/storm sewer survey
- Monitoring
  - 1 year (2023)
  - Rainfall
  - Storm Sewer Flow
  - Storm Sewer Depth
- Flood reports

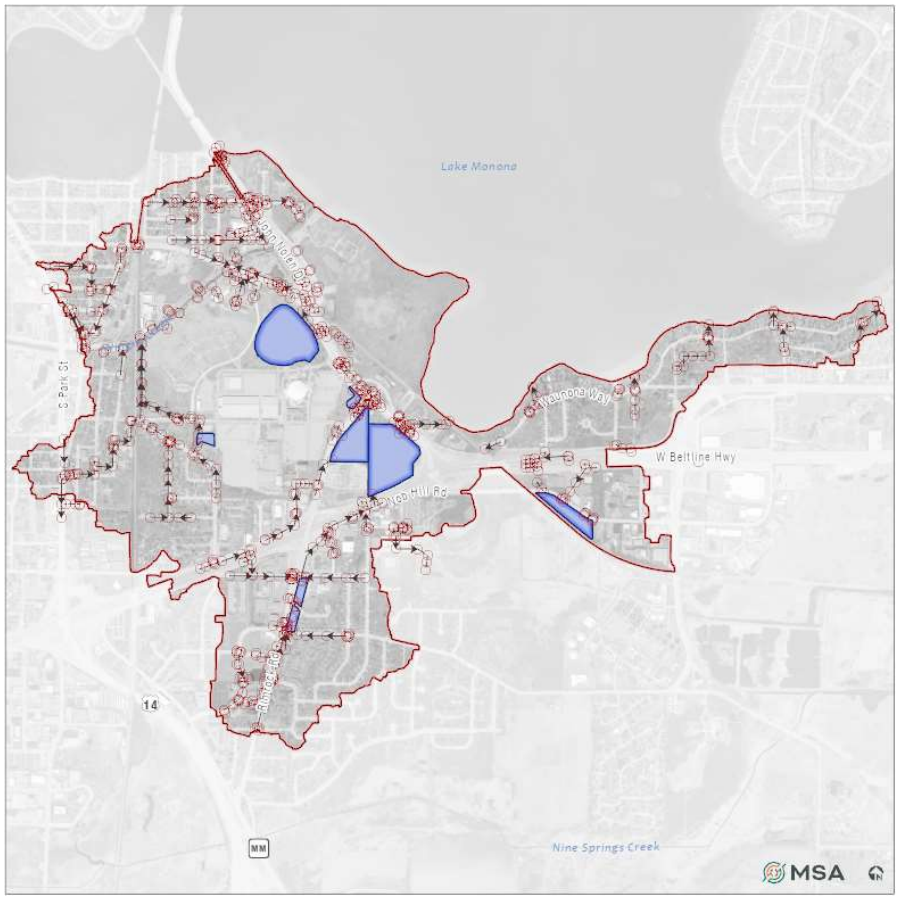


Progress To Date

MODEL DEVELOPMENT

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

Item	Quantity
Watershed Area (acres)	1,315
Number of Subcatchments *(discrete drainage areas in the model)*	190
Storm sewer pipes in model	10.9 miles
Detention ponds in model	8



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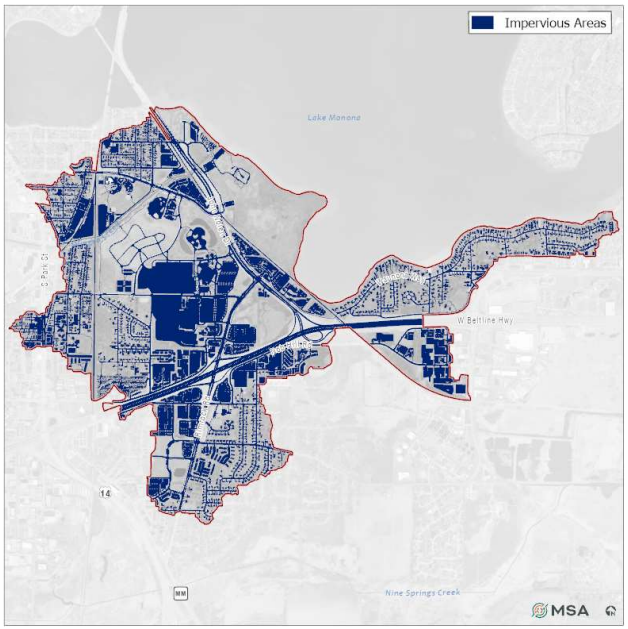
Progress To Date

MODEL DEVELOPMENT

Land Uses, Impervious Coverage, and Soil Conditions in the Watershed

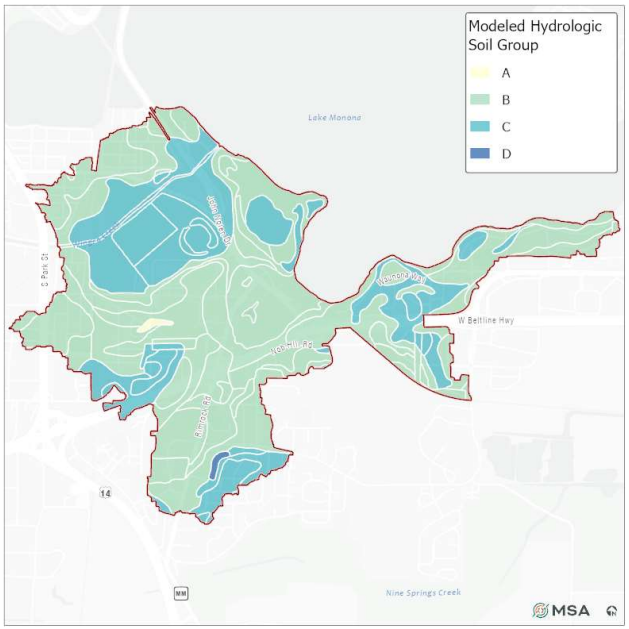


Total Watershed Area

1,315 acres

Total Impervious

462 acres (35%)



Hydrologic Soil Group

Texture

A ~ Sandy	(4.0-1.0 in/hr)
B ~ Silty	(2.0-0.5 in/hr)
C ~ Clayey	(1.0-0.2 in/hr)
D ~ Clayey	(0.5-0.1 in/hr)

Infiltration Rate

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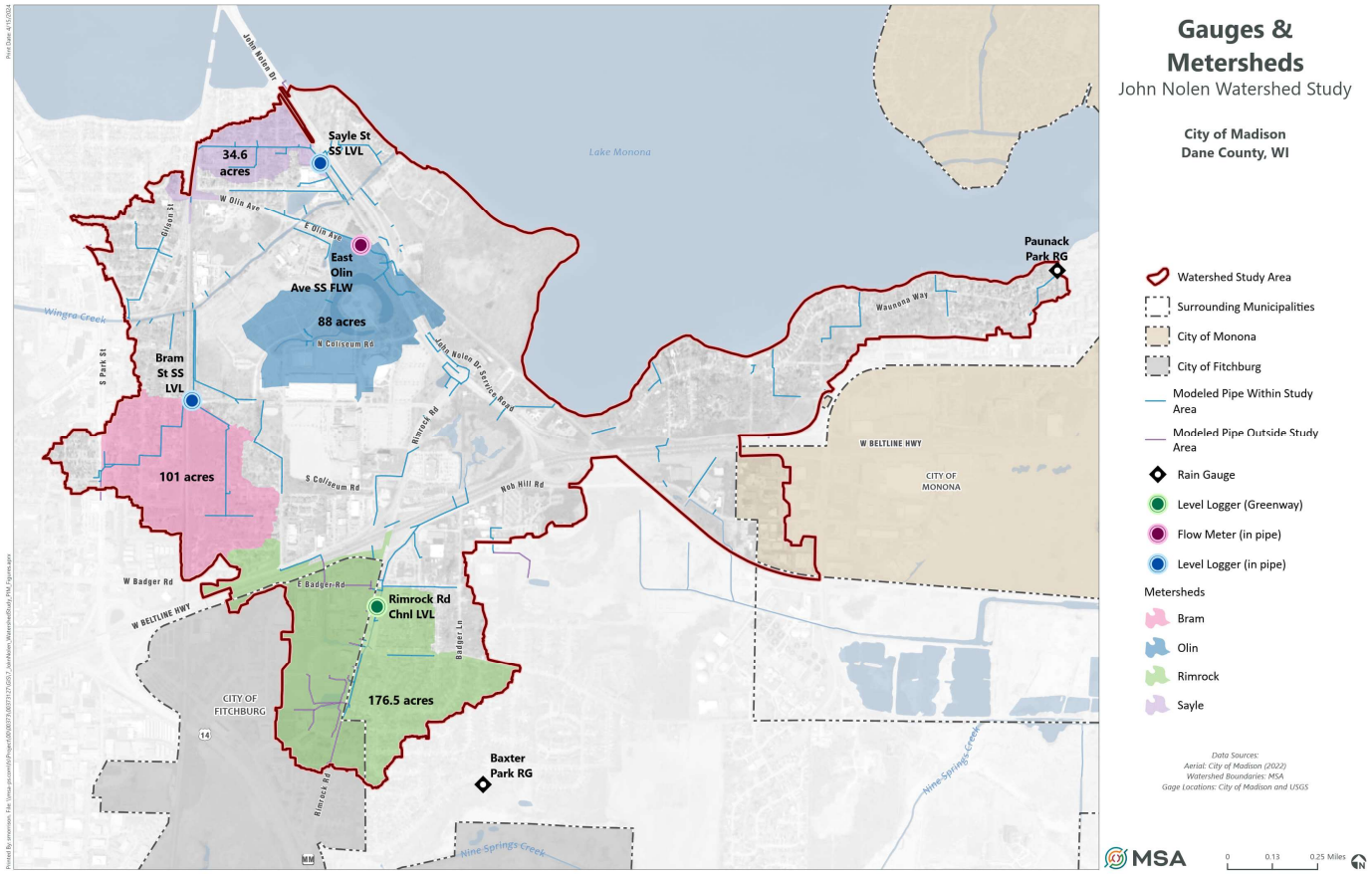
Progress To Date

MODEL CALIBRATION



<u>Model Calibration</u>

Calibration is a process of comparing the model results to monitored results and making changes so the model matches more closely

<u>Model Calibration Equipment</u>

- Two (2) Rain Gauges
- Three (3) Level Loggers
- One (1) Flow Meter

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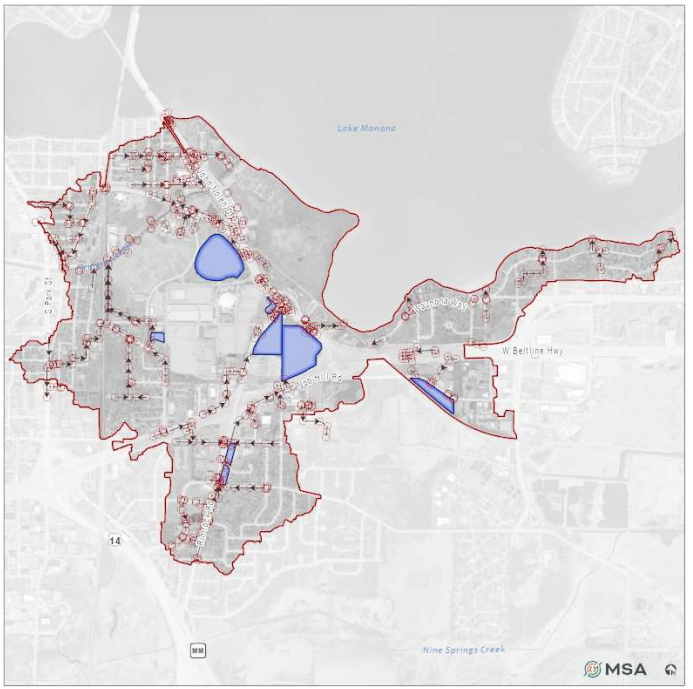
Progress To Date

MODEL CALIBRATION

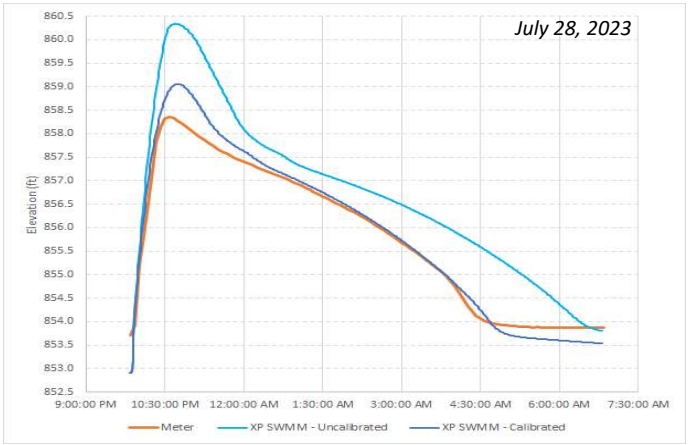
- Existing Conditions Model Calibration

  Calibration is a process of comparing the model results to monitored results and making changes so the model matches more closely

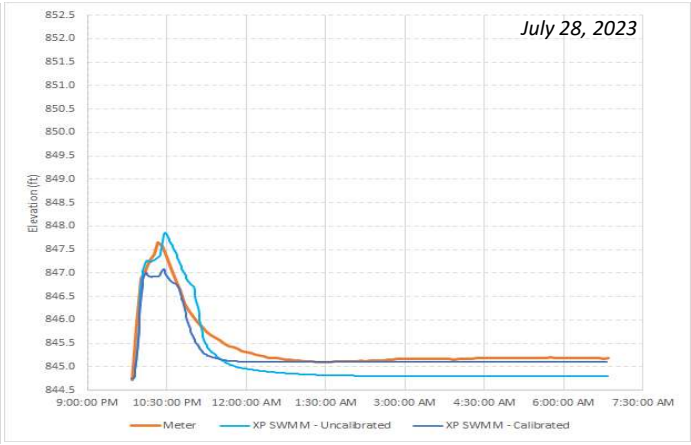
- Level loggers and rain gauges
- Reported flooding locations



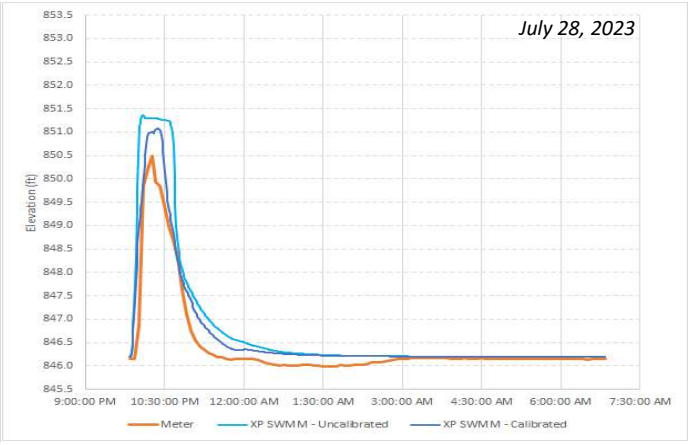
Rimrock Rd.



Sayle St.



Bram St.



Flood Mapping Disclaimer

This map exists to help you quickly get information about general flood risks. This map does not identify all areas that may flood or predict future flooding.

Do not use this map to make official flood risk determinations for insurance, lending, or other purposes. This is not an official FEMA federal Flood Insurance Rate Map 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 this map.

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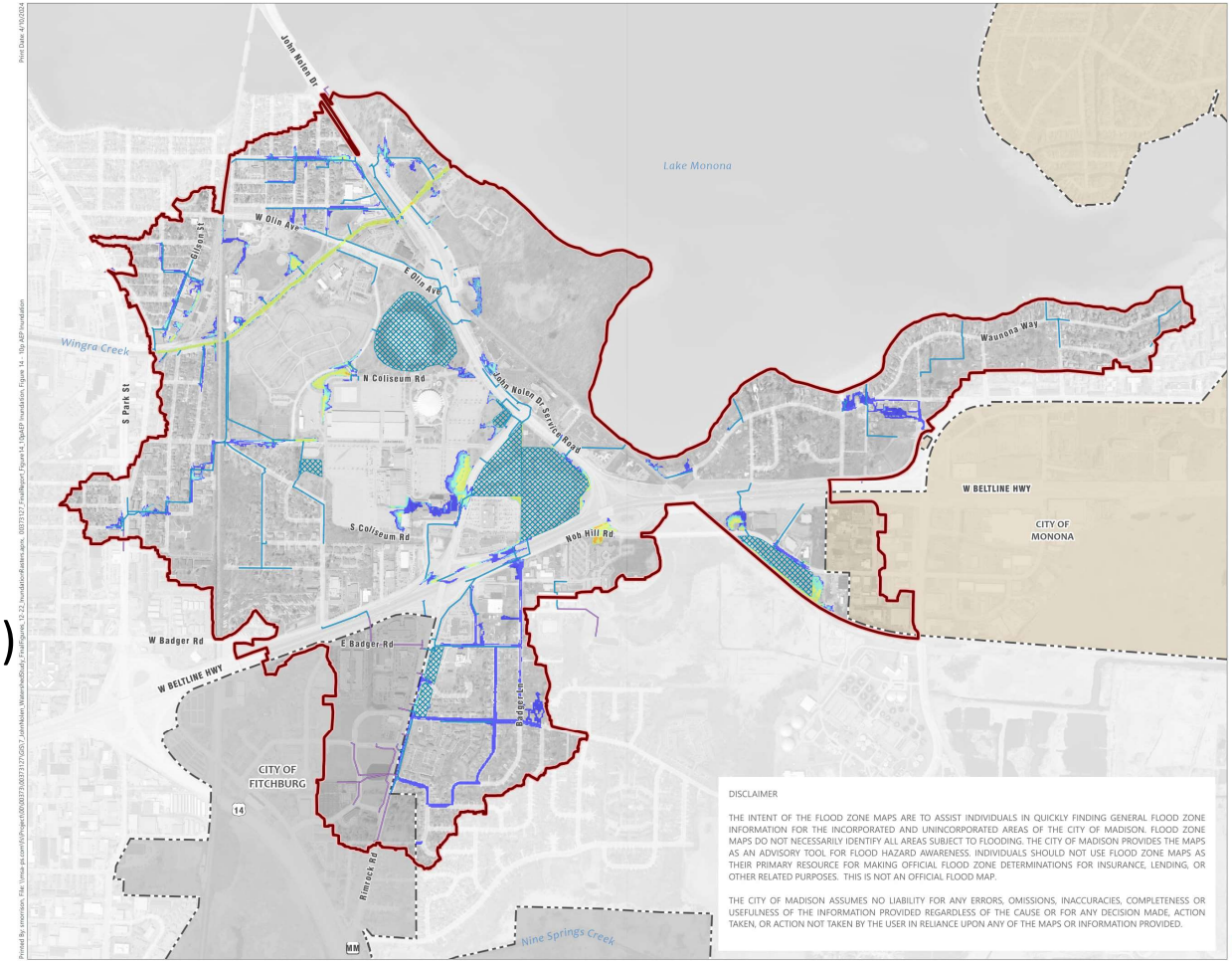
Existing Conditions Inundation Mapping

10% Chance Event
(4.09 inches in 24 hours)



10% AEP Inundation

John Nolen Watershed Study Report

City of Madison
Dane County, WI

- Watershed Study Area
- City of Fitchburg
- City of Monona
- Greenway/Pond
- Modeled Pipe Within Study Area
- Modeled Pipe Outside Study Area

Flood Event Inundation Depth
- 0.1 - 0.3
- 0.3 - 0.5
- 0.6 - 1
- 1.1 - 3
- 3.1 - 6
- 6.1+

Data Sources:
Aerial: City of Madison (2022)
Watershed Boundaries: MSA
Stormwater System: City of Madison

MSA

0 0.1 0.2 Miles

N

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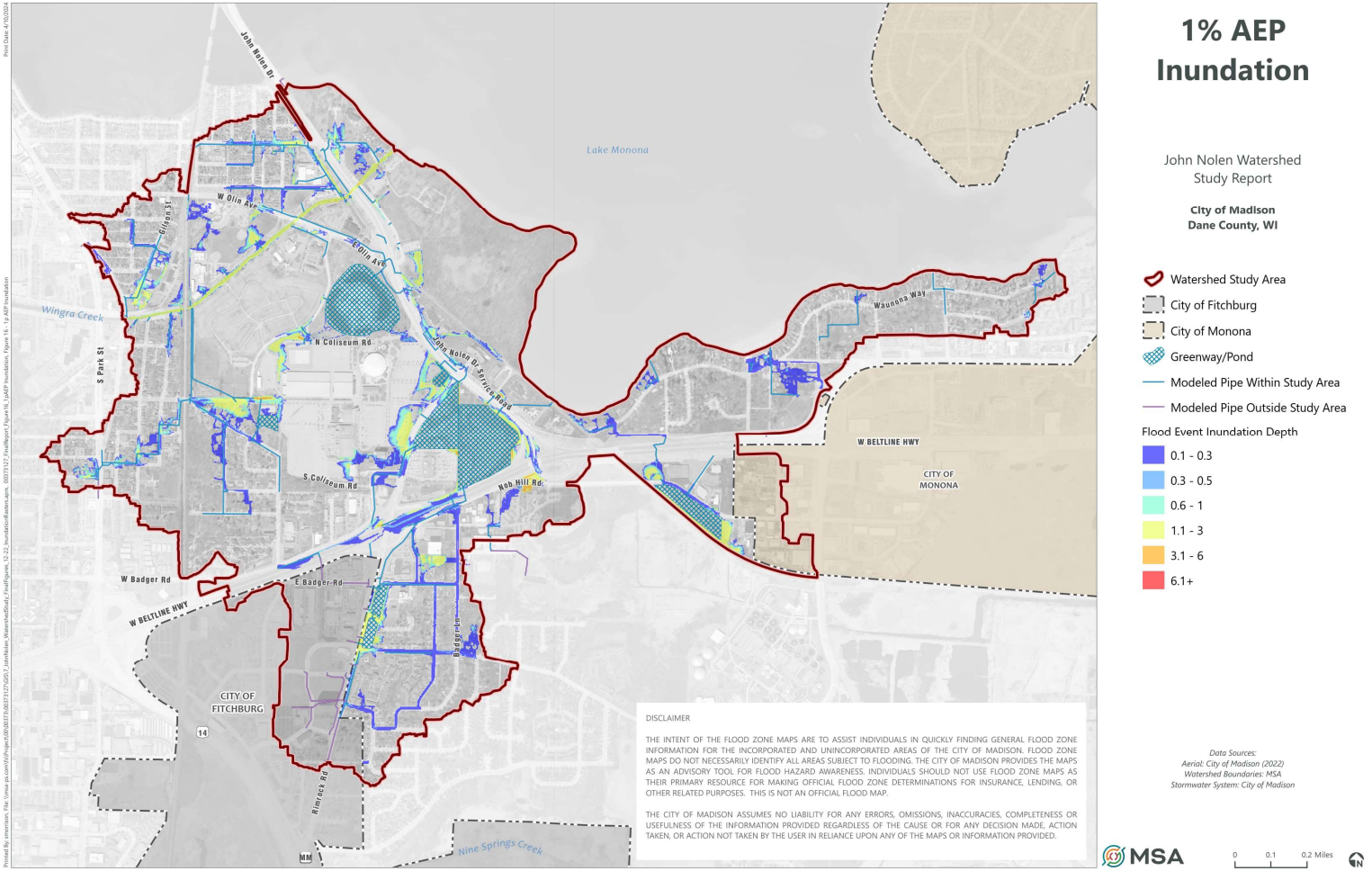
Existing Conditions Inundation Mapping

1% Chance Event
(6.66 inches in 24 hours



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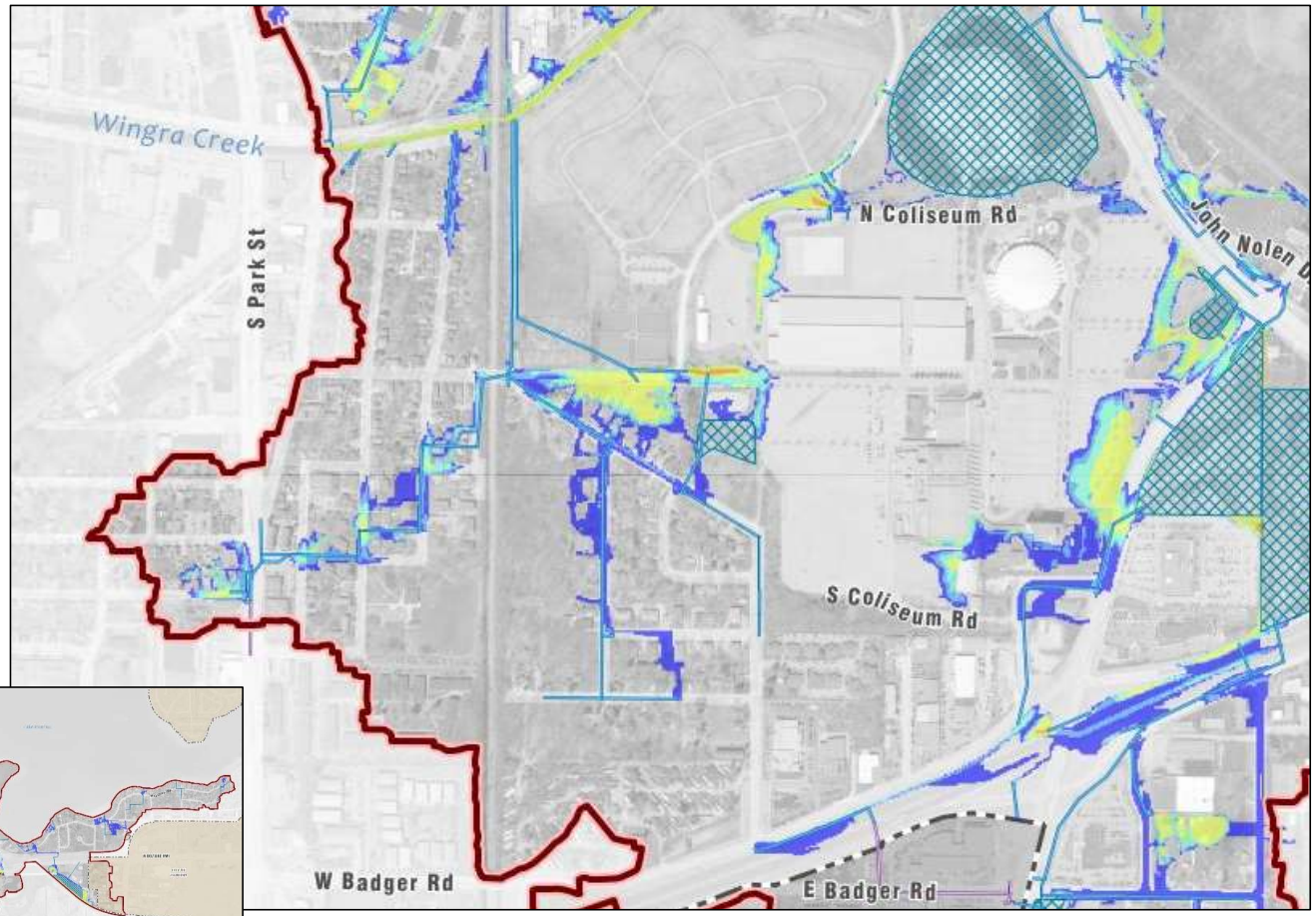
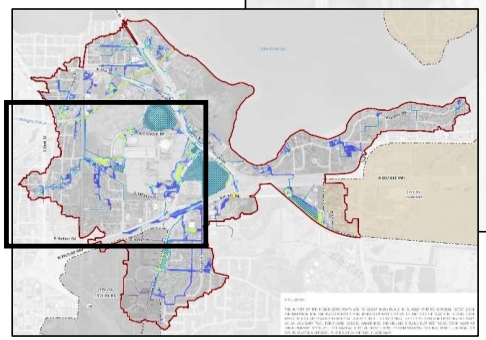
Existing Conditions Inundation Mapping

1% Chance Event
(6.66 inches in 24 hours)

Bram's Addition Area





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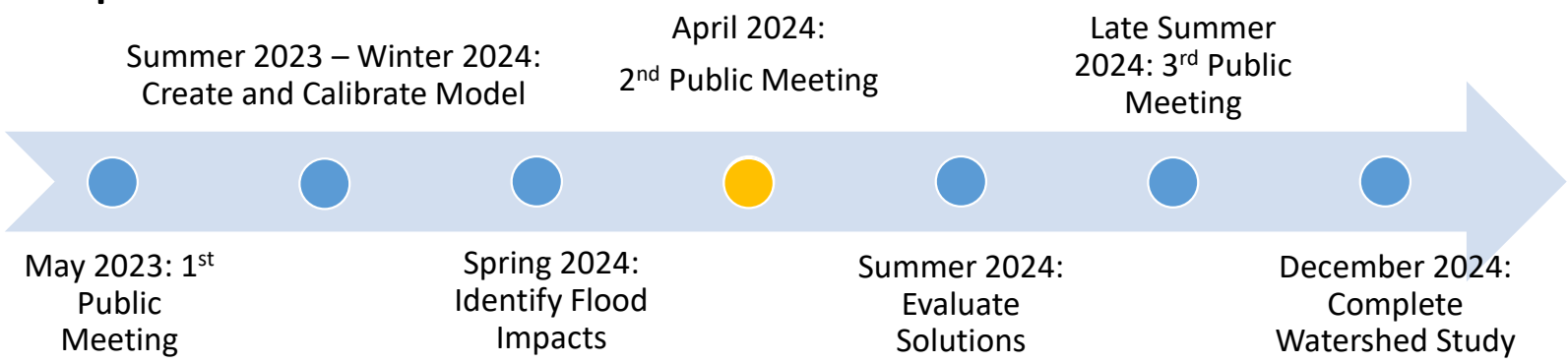
Next Steps



- Identify Flooding Problem Areas
- Evaluate Solutions
- Public Meeting #3 to present solutions
- Final Report
- Begin Implementing Solutions

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Next Steps

FLOOD MITIGATION TARGETS

- 10% Chance Event (4.09 inches in 24 hours)
  - No surcharging of storm sewer onto roadway
  - Storm sewer pipes are sized to carry storm
- 4% Chance Event (5.01 inches in 24 hours)
  - 0.2 feet at Centerline of Roads
  - Roads passable for emergency vehicles
- 1% Chance Event (6.66 inches in 24 hours)
  - No structure (home/building) flooding
  - No greenway crossing overflow (stormwater does not come out of greenway and flow over the road)
- 0.5% Chance Event (8.81 inches in 24 hours)
  - Safe conveyance of overflow

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

Contact Information & Resources

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

➢ Project Website:
  - ➢ https://www.cityofmadison.com/engineering/projects/john-nolen-drive-watershed-study

➢ Sign-up for project email updates on the website
  - Updates on study status will be posted to the project website
  - Recording for this meeting will be posted on project webpage

- Facebook – City of Madison Engineering
- Twitter – @MadisonEngr
- Engineering Podcast: Everyday Engineering on iTunes, GooglePlay

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First: General Q&A

- Please type general questions in chat box or “raise hand”

Next: Specific feedback on flood maps

- Please save specific comments on flood maps for the end of the presentation. We will stay on and gather your feedback, but we’d like to address general questions with the whole group first.

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Breakout Group Areas

- North
(Areas North of Wingra Creek)

- East
(Areas East of John Nolen Drive)

- South
(Areas South of the Beltline)

- West
(Areas West of Alliant between Wingra Creek & Beltline)

- Central
(Non-Residential Areas including Alliant and Olin Park)