

# 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 ...



# Meeting Technical Housekeeping

- This meeting will be <u>recorded</u> and posted to the project page.
- All attendees should be **<u>muted</u>** to keep background noise to a minimum.
- Use the <u>"chat"</u> button for technical issues with meeting to troubleshoot with staff to assist.
- Use the <u>"chat"</u> 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.



### This meeting is being recorded.

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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



# 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 alreadyscheduled 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 <u>each year</u>
- 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<br>Storm | Chance of<br>occurring in 1<br>Year | Return Period or<br>Average<br>Recurrence<br>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, <u>WI</u>.

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## Rainfall Totals August 20-21, 2018



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



# 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



# 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.







# Where the Water Goes

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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

# 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



### Project Location JOHN NOLEN WATERSHED

| Item  | Quantity    | Lake Manona                                      |
|---|-------------|--|
| Watershed Area                                    | 1,315 acres | Sayle<br>St SS LVL<br>East Olin<br>Ave SS<br>FLW |
| Public Stormwater Inlets and<br>Access Structures | 1,572       | Bram St<br>SS LVL                                |
| Storm Sewer Pipes & Culverts                      | 19 miles    | Rimrock Rd<br>Chill                              |
| Open Channels/Greenways                           | 0 miles     | JT Webdger-Rd                                    |
| Streams   | 0 miles*    | Ha Baxter<br>Park RG &                           |

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



# 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

#### CITY OF MADISON Search Departments V Report a Problem Services Jobs Accounts Contact Engineering Sanitary Sewer Streets & Paths Facilities Developers & Contractors Permits City of Madison / Engineering / Projects / John Nolen Drive Watershed Stud John Nolen Drive Watershed Study Projects Bike March 13, 2024 Update **City Facilities** A public information meeting is scheduled for 6 p.m., April 24, 2024, via Road Construction Zoom. Registration prior is required. Sewer / Storm April 24, 2024 Public Information Meeting Registration **Completed** Projects View past project updates » John Nolen Drive Sauk Creek Greenway **Project Details** 0 Location 1202 Olin-Turville Court Contacts Madison, WI 53715 Rvan Steniem, City of Madison **Engineering Division Project Type** 608-266-4913 Flood Mitigation Sewer / Storm rsteniem@citvofmadison.com

Watershed Studies

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

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



# 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<br>(discrete drainage areas in the model) | 190        |
| Storm sewer pipes in model  | 10.9 miles |
| Detention ponds in model  | 8          |





### 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%)



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### Progress To Date MODEL CALIBRATION







0.25 Miles

#### **Model Calibration**

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

#### Model Calibration Equipment

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





### 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





# 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.





Existing Conditions Inundation Mapping

**10% Chance Event** (4.09 inches in 24 hours)





Existing Conditions Inundation Mapping

**1% Chance Event** (6.66 inches in 24 hours





# Existing Conditions Inundation Mapping

**1% Chance Event** (6.66 inches in 24 hours)







# Next Steps



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







### 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, <u>RStenjem@cityofmadison.com</u>
  - Public Information Officer: Hannah Mohelnitzky, <u>hmohelnitzky@cityofmadison.com</u>

#### ➢ 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 Engineeri



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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.



# 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)

