

## Things to Know

- You can leave and rejoin the meeting at any time (unless the meeting is at capacity or you are removed for inappropriate behavior).
- Time for questions and discussion will follow a brief presentation.
- All attendees are muted (instructions to unmute will be covered).
- Video and screen share are disabled for attendees.
- The meeting presentation will be posted at [www.a2gov.org/JuneStorm](http://www.a2gov.org/JuneStorm)

# June 25-26 Storm Event Analysis

Thursday, February 24, 2022



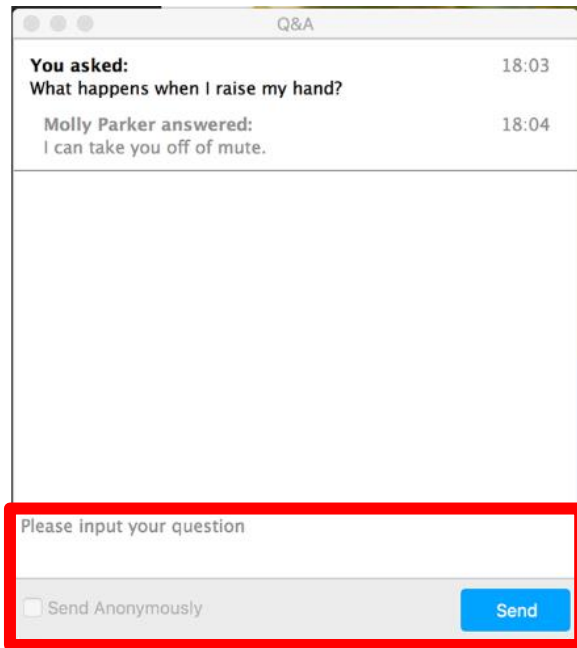
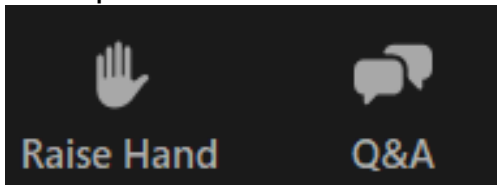


# Technology Overview

## Ask a Question or Share a Comment

### Computer

- Please use the Q&A or raise hand feature located at the bottom of the screen to ask a question/comment.
- For the Q&A feature, please type your question/comment.



### Phone

- Select \*9 to raise your hand
- You will be identified by the last 3 digits of your phone number





# Zoom Meeting Guidelines

- **Commit to learning and avoid speculation** – we encourage you to ask questions so we can explore the issue together.
- **We want to hear from each of you!**
  - Raise your hand and be recognized to speak; there will be one speaker at a time.
  - When speaking, please move to a quiet area and silence any background sounds.
  - Speak loud and clearly.
  - Everyone will be provided a chance to speak before a repeat speaker.
- **Please remember the importance of rights and the dignity of other people:**
  - Critique ideas, not people.
  - Be thoughtful about your language so this can be a comfortable and respectful forum for all participants - inappropriate written and/or verbal comment or language, including personal attacks and accusations, will result in the attendee being removed from the meeting.

**Is there anything else anyone would like to add?**

# Agenda

- Introductions
- Purpose of Meeting
- Background
- Summary of Analyses
- Conclusions and Recommendations
- Questions





# Welcome and Introductions

- **City of Ann Arbor**

- Troy Baughman
- Molly Maciejewski
- Jennifer Lawson
- Kayla Coleman



- **Washtenaw County Water Resources Commissioner**

- Evan Pratt
- Harry Sheehan



- **OHM Advisors**

- Robert Czachorski
- Mackenzie Johnson

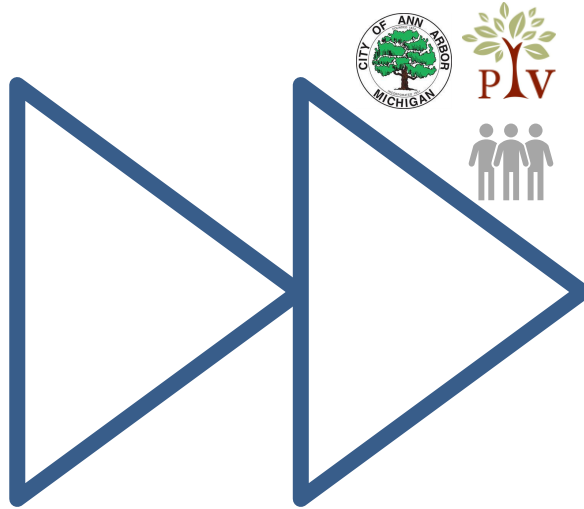


# Purpose of Meeting

Share findings  
from the study



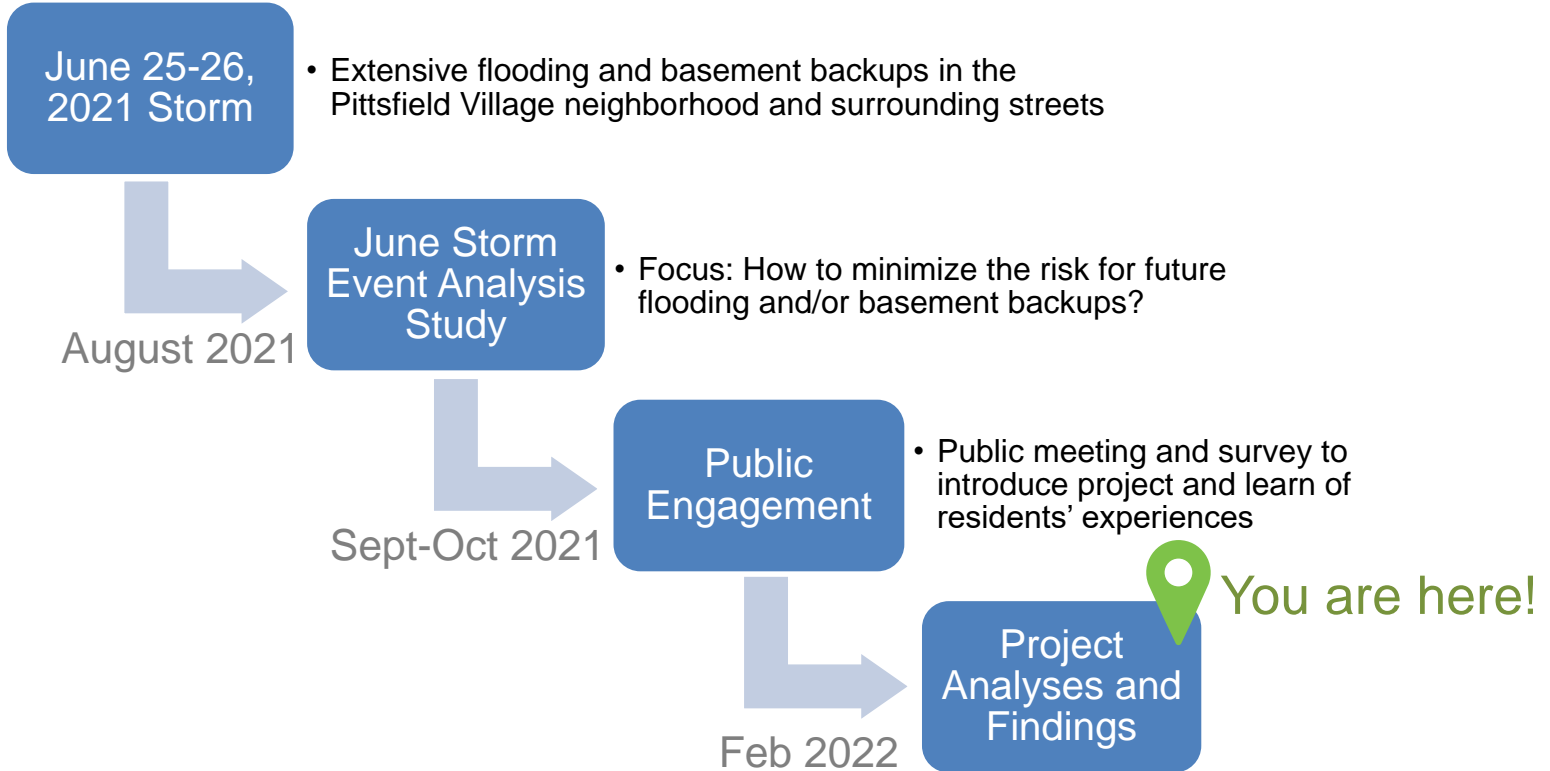
Identify next steps



Answer  
questions



# Timeline









# Project Location

## June 25-26 Storm – Southeast Ann Arbor

For terms of use visit [a2gov.org/terms](http://a2gov.org/terms)

	Reported Back-up/Water Issue		County Drain
	Flooding in street or yard		Study Area

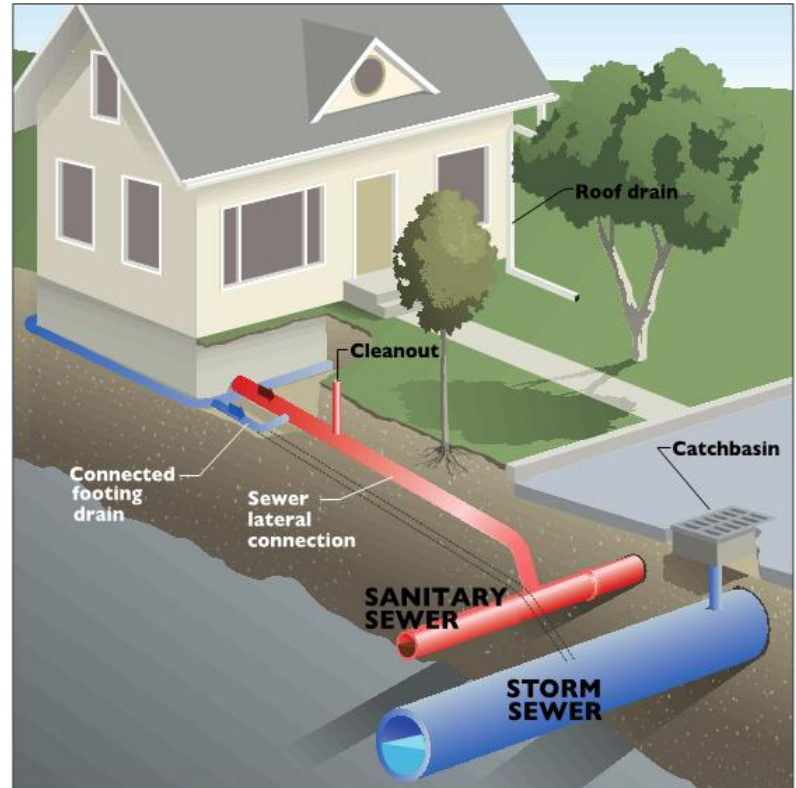
- Pittsfield Village
- Darlington
- Forestbrooke
- And other surrounding neighborhoods in Southeast Ann Arbor





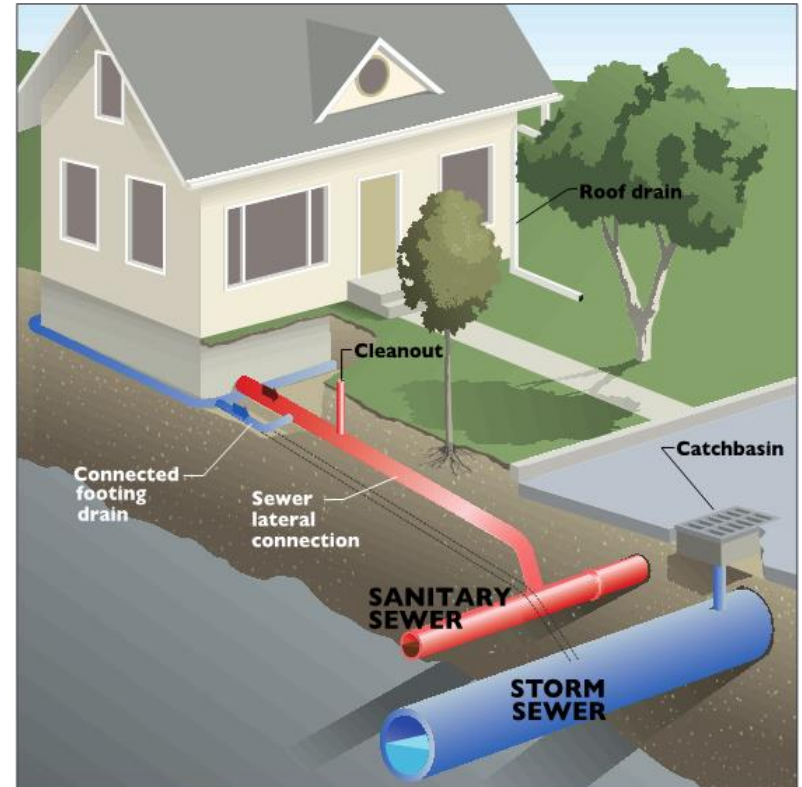
# Definitions – Stormwater System

- **Storm Sewer** - transports most of the stormwater runoff from buildings and streets
- **Catch Basin** - collects stormwater and traps debris so that it cannot enter the storm sewer pipes
- **Roof Drain** – transports stormwater from the roof to the storm sewer or detention area



# Definitions – Sanitary Sewer System

- **Sanitary Sewer** - transports sewage as well as some groundwater and stormwater that finds its way into the system (connected footing drains, cracks, etc.)
- **Footing Drain** - drain pipes beneath a structure that collect and drain groundwater away from the building's foundation
- **Basement Backup** - the backup of flow from the sanitary sewer into a basement



# Other Definitions

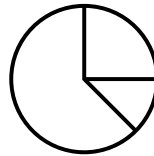
- **Design Storm** – selected rainfall event used to size/design stormwater and sanitary sewer infrastructure
- **Hydraulic Modeling** – the use of a software program to simulate rainfall runoff flow into the stormwater and sanitary sewer systems to predict water levels within these systems
- **Curb Drains** – small diameter pipes that run between the road and property line that receive sump pump discharge flow
- **Stormwater Detention** – an area where stormwater is temporarily stored and eventually allowed to drain once water levels decrease downstream



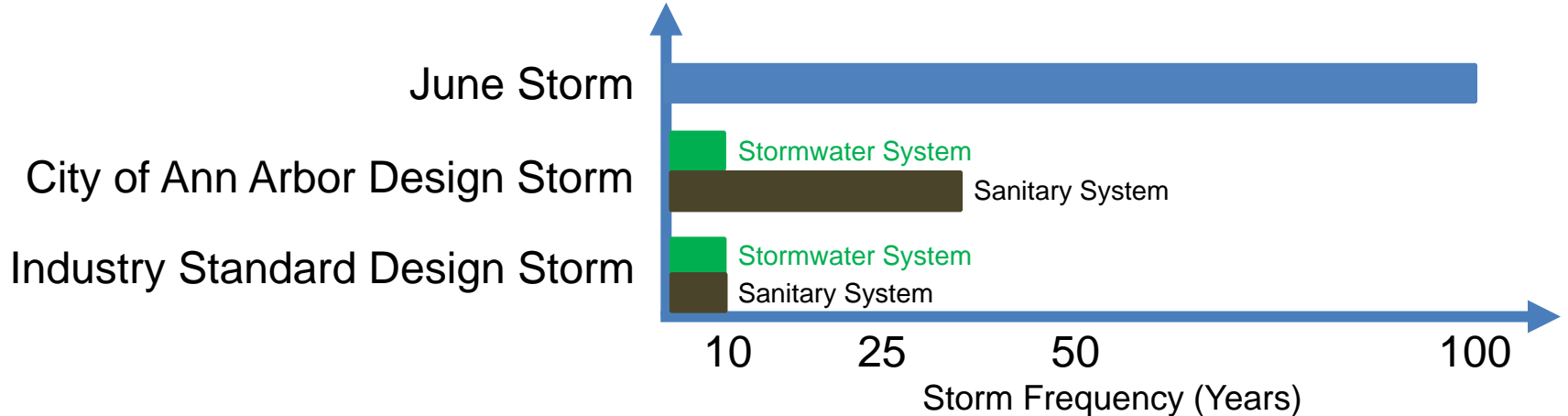
# June Storm Event Characteristics



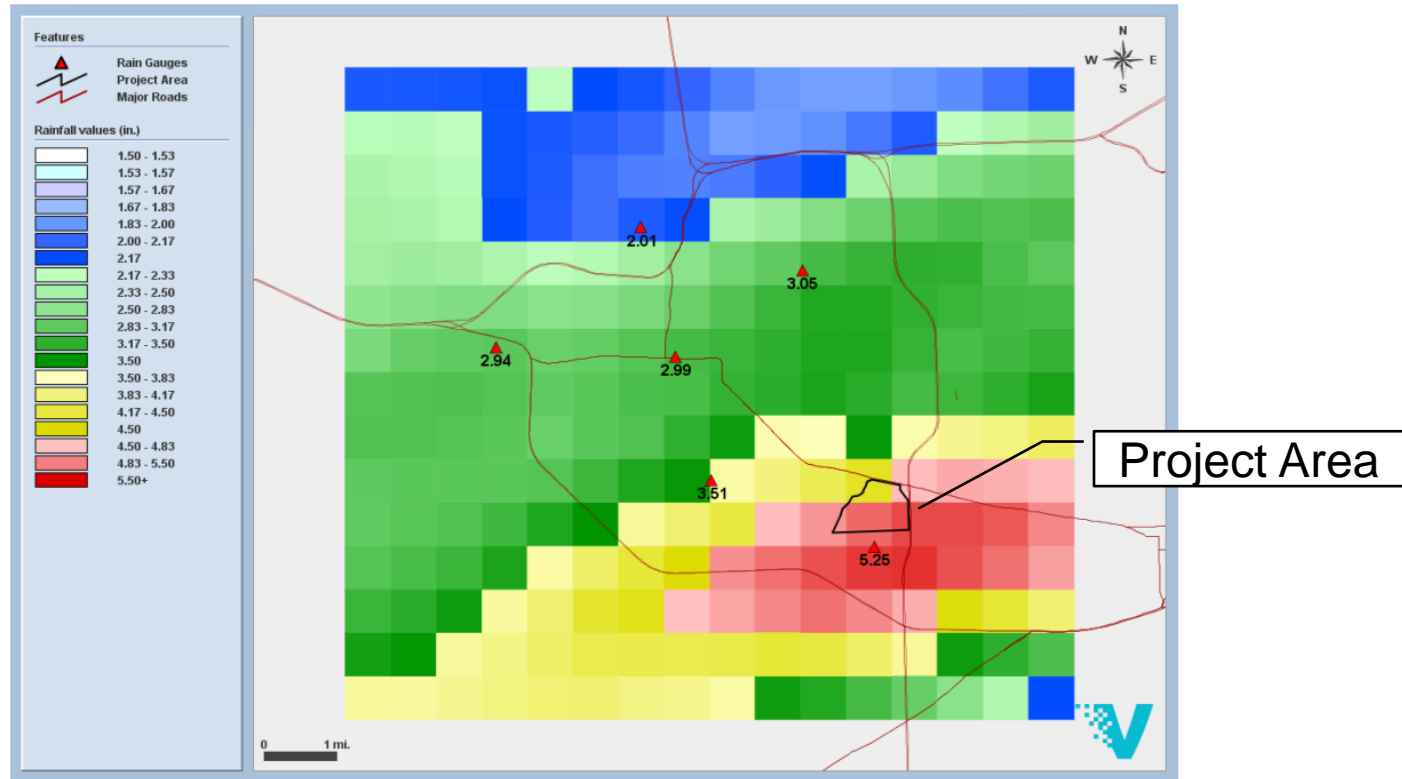
4.8 inches of rain, per local rain gauges



1% annual probability that a storm of this intensity would occur (i.e., 100-year storm)



# Rainfall Variability Across Ann Arbor



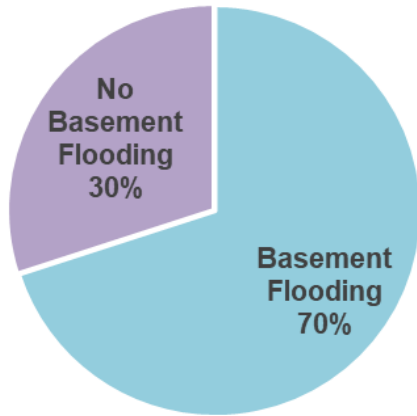
# Public Engagement Findings

- Public Meeting 1
  - Learned about resident experiences and concerns
- Pittsfield Village Condo Association Interview and Site Visit
  - Greenspace north of Packard Road collects stormwater
    - Flooding level in this area approached home foundations
  - Swift Run Drain flooded over Packard Road causing closure
  - Extensive street flooding and basement backups

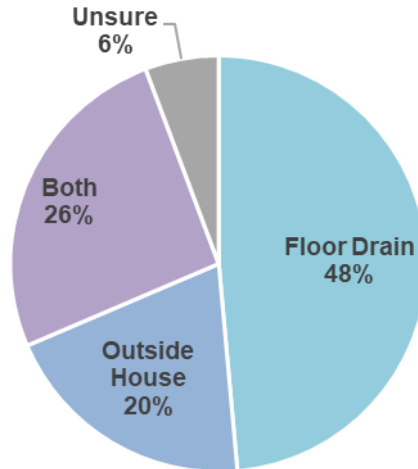
# Public Engagement Findings

## Resident Survey Results:

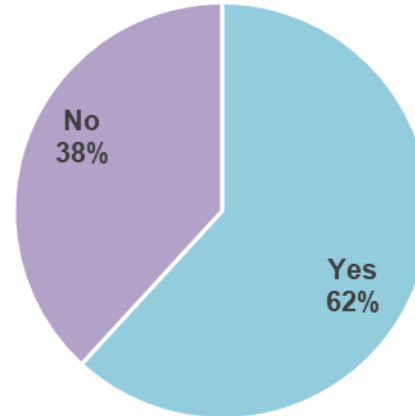
**Of Those with a Basement**



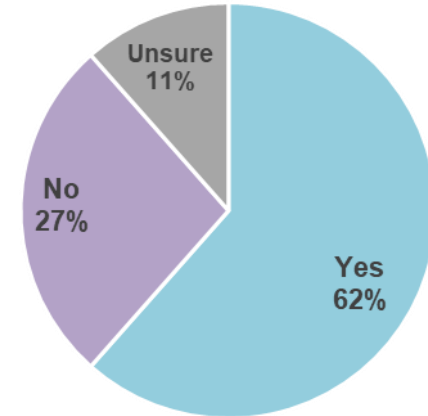
**Of Those with Water in their Basements, Water Came From...**



**Surface Flooding Near Home?**



**Previous Basement Backups or Flooding?**



# Public Engagement Findings

- Follow-up Discussions with Residents
  - Observations supported information gathered during Condo Association interview
    - Several feet of flooding in greenspace area north of Packard Road
    - Evidence of sanitary sewer and stormwater surcharging near Norwood/Whitewood
  - Situational flooding questions



# Stormwater Analysis

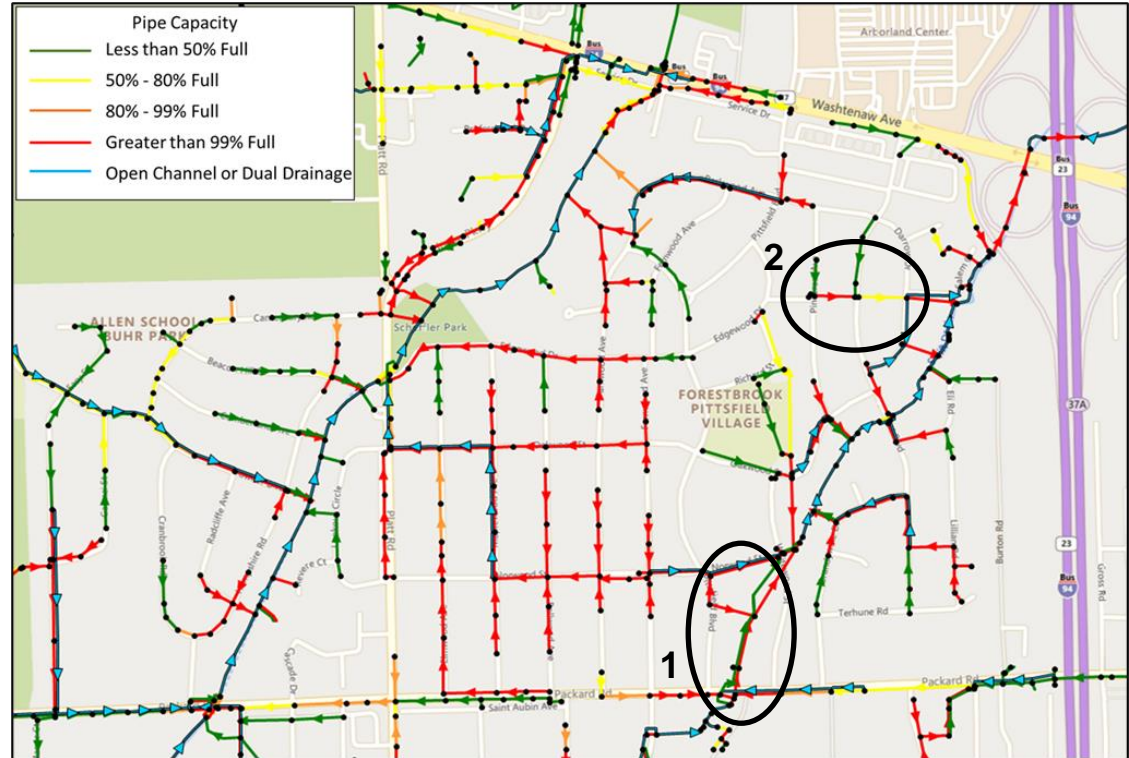
- Stormwater hydraulic modeling was performed
- The model predicted widespread flooding during both the June rain event and design storm

**Since the predicted level of flooding for the June storm was similar to that of the design storm, the stormwater system performed as expected during the June rain event.**

# Stormwater Analysis

## Additional Areas of Concern:

1. Swift Run and Packard
2. Pinecrest to Darrow

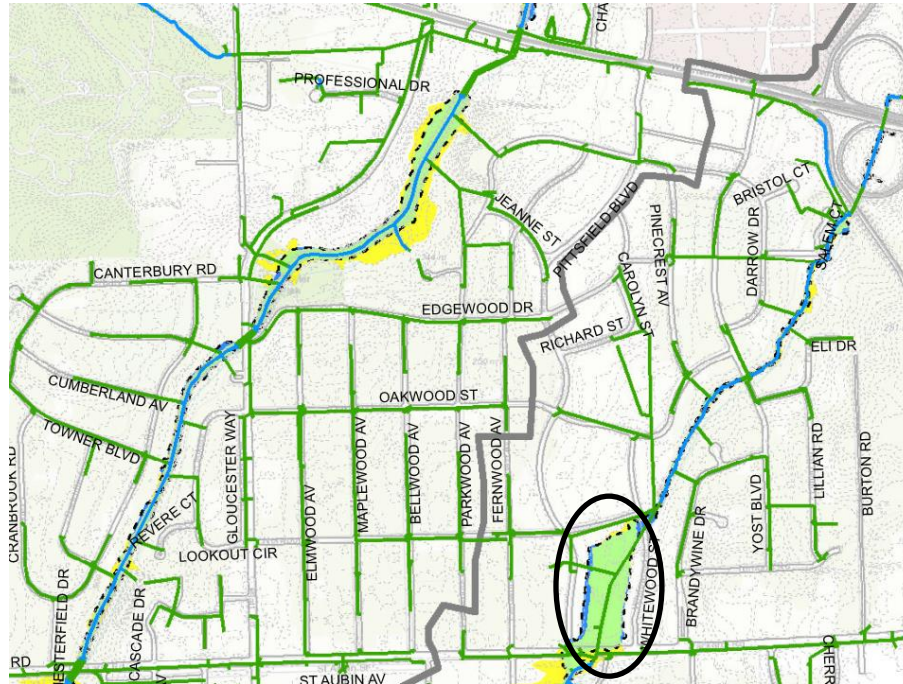


# Swift Run and Packard

Model predicted flooding in the greenspace area north of Packard Road during both the June rain event and design storm

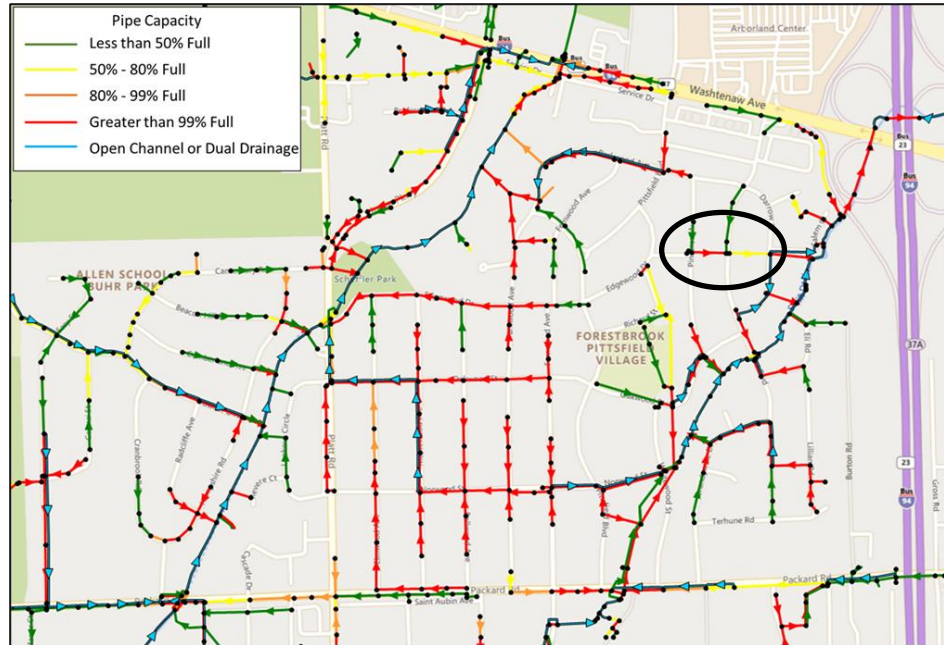


**This area may have been intended to provide some level of surface storage during rain events**



--- Floodplain Boundary

# Pinecrest to Darrow



Model suggests the storm pipes between Pinecrest and Darrow have insufficient capacity to transport the local runoff predicted during the design storm



**Recommended to  
upsized to 24 inches**

# Sanitary Sewer Analysis

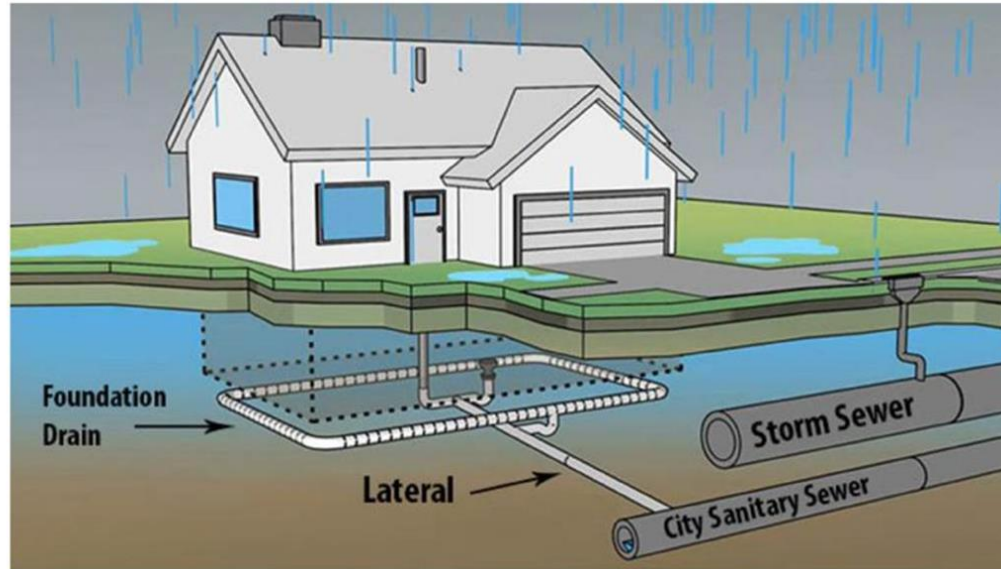





Image Credit: Milwaukee Metropolitan Sewerage District

Sanitary sewer hydraulic modeling was performed



**Connected footing drains contributed a large amount of flow into the sanitary sewer system resulting in basement backups**

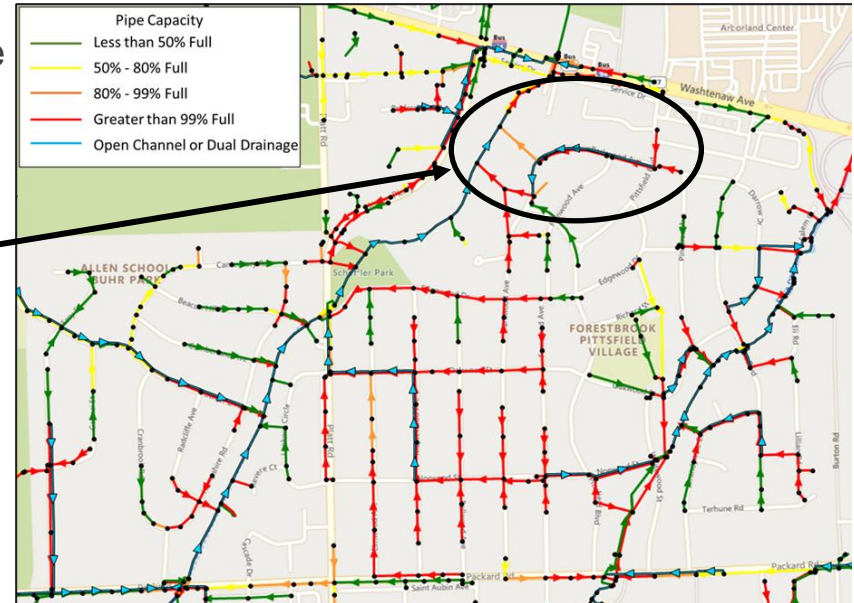
# Conclusions

- Project area received 4.8 inches of rain, which equates to a 100-year storm event (or 1% annual probability), exceeding the City's design standards for stormwater and sanitary sewer systems 
- The stormwater infrastructure performed as expected during the June rain event
- The greenspace area north of Packard Road may have been intended to provide some level of surface storage during rain events 
- Connected footing drains contributed a large amount of flow into the sanitary sewer system resulting in basement backups 

# Recommendations for the City

## Near-Term Recommendations:

1. Extend curb drains within Pittsfield Village to facilitate sump pump discharge connections in support of Developer Offset Mitigation (DOM) program
2. Stormwater Management Project (July 2023)
  - a. Pipe upsizing and stormwater detention
3. Utility Improvements Evaluation Project (2023, portions ongoing)
  - a. Includes public sewer investigation and rehabilitation to find and eliminate sources of stormwater into the sanitary sewer system



# Recommendations for the City

## Long-Term Recommendations:

1. Swift Run Drain Study (with WCWRC)
  - a. Stormwater detention opportunities throughout creekshed
2. Upsize stormwater infrastructure between Pinecrest and Darrow
3. Reevaluate design storm to account for climate change
  - a. Used to size improvements to the storm and sanitary sewer systems
  - b. Monitor regional efforts
  - c. Source control ideal for system resiliency





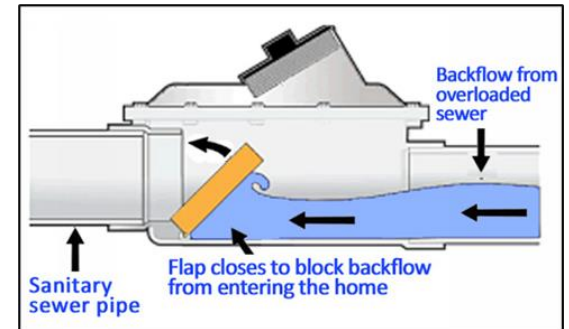
# Recommendations for Pittsfield Village

1. Continue adding gutters to residential units to facilitate stormwater drainage
2. Clean and televise sanitary sewer leads to ensure the full pipe capacities are being utilized during rain events
3. Perform a capacity analysis on the private stormwater infrastructure to ensure it is adequately sized for the desired level of service
4. Assist residents with DOM Program efforts



# Recommendations for Homeowners

1. Participate in the DOM Program to disconnect footing drains
  - a. Costs negotiated with developer
  
2. Implement best practices to reduce the risk for basement backups and flooding, for example:
  - a. Ensure soil is sloped away from the house
  - b. Extend downspouts away from the house
  - c. Install a check valve on the sanitary sewer lead
  - d. Visit [a2gov.org/JuneStorm](https://a2gov.org/JuneStorm) for a complete list



# DOM Program

- Purpose: Reduce overall flow to the sanitary sewer system
  - Reduce sanitary sewer overflows
  - Reduce unnecessary treatment of stormwater
- New developments must offset their additional flow to the sanitary sewer system by removing flow elsewhere in the system
- Contact Pittsfield Village to participate
  - Visit [a2gov.org/DOM](https://a2gov.org/DOM) for more information

# Questions?





**Project Website:** [a2gov.org/JuneStorm](https://a2gov.org/JuneStorm)



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**Thank you!**