

# River Falls Drainage Preliminary Engineering Design

## Public Kickoff Meeting

November 21, 2024

This meeting is being recorded.

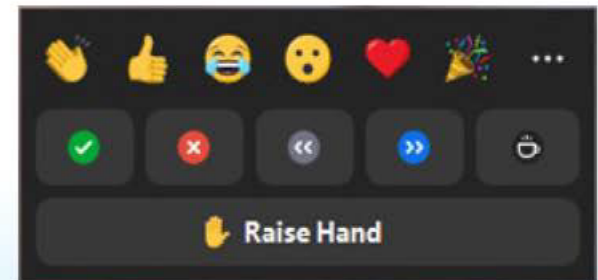
<https://www.montgomerycountymd.gov/dot-dte/projects/riverfalls/>

**MC DOT**

Montgomery County *Department of Transportation*

# Zoom Meeting Controls

- All microphones have been muted and cameras turned off.
- To reduce the bandwidth of tonight's meeting, please do not turn on your video camera.
- Following tonight's presentation, there will be a Question-and-Answer session if time allows. Please wait until the presentation ends to raise your hand to ask a question. Alternatively, you may type your question into the chat box throughout tonight's presentation.
- To raise your hand following the presentation, please click on the "Reactions" icon at the bottom of your screen, and then click "Raise Hand."
- If you called into tonight's meeting via telephone, press \*9 to raise your hand and \*6 to unmute yourself.



# Agenda

- Introductions
- Organizational Overview
- Flooding Background
- Completed Projects
- Scope of Work
- Schedule
- Questions

# Agenda

This is an overview meeting to outline the upcoming preliminary engineering design process.

Please limit questions/discussion to the design process in general, we will not have time to discuss individual issues or specific areas.

If you wish to submit a question/comment regarding a particular concern, please visit the project website and click the “Participate” tab:

[www.montgomerycountymd.gov/dot-dte/projects/riverfalls/](http://www.montgomerycountymd.gov/dot-dte/projects/riverfalls/)

# Introductions

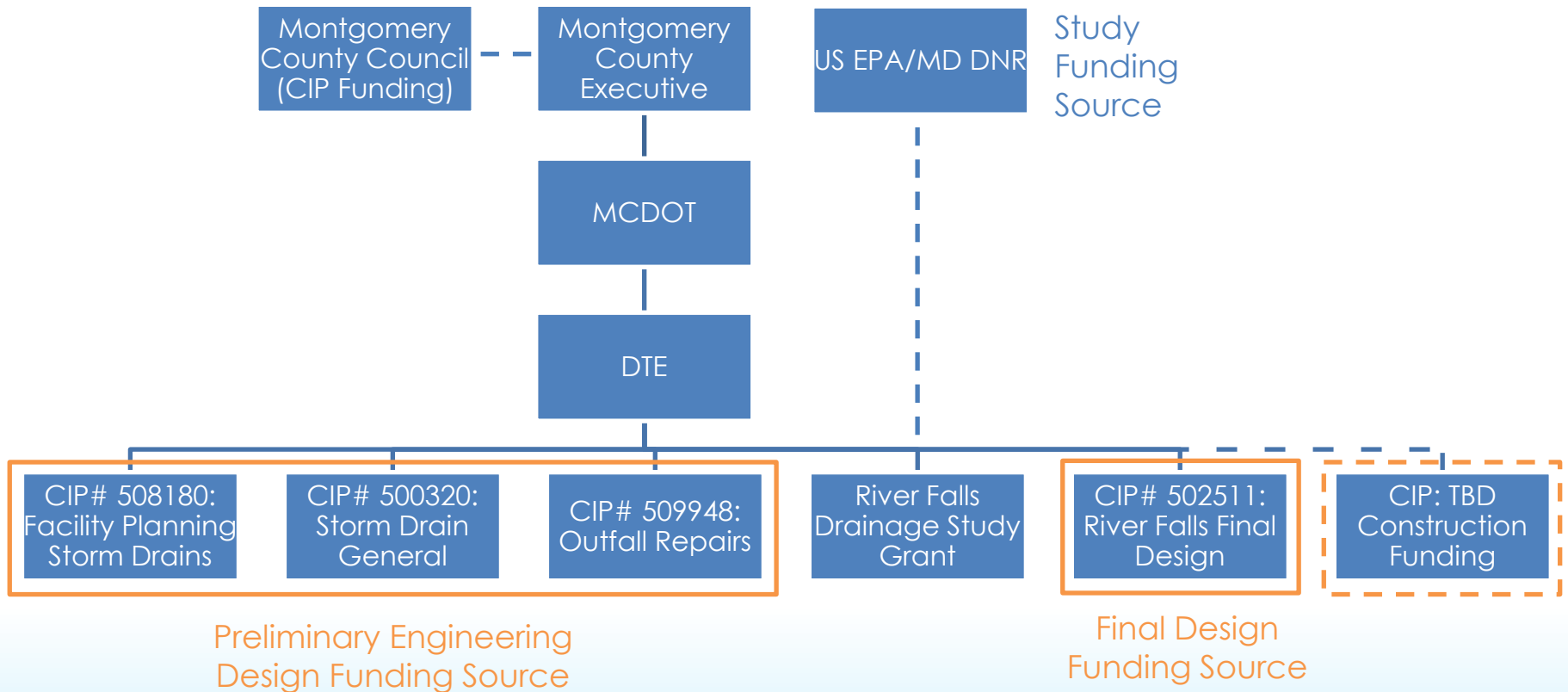
## Key Organizations:

- MC DOT - Montgomery County Department of Transportation
- DTE - Division of Transportation Engineering
- DAR - Drainage Assistance Request Program

## Key Personnel

- Dan Sheridan
  - Chief, DTE Design Section
- Kyle Hanley
  - DTE Engineer, DAR program Project Manager
- Matt Spielman
  - DAR In-house Drainage Consultant (GPI), Case Manager
- Bill Park
  - DAR Program Consultant (GPI), Engineering Services Manager
- Special Thanks - Lori Main, Planning Specialist, DTE

# Organizational Overview



• CIP – Capital Improvement Project

<https://www.montgomerycountymd.gov/dot-dte/projects/riverfalls/>

# Return Periods

- Design storm return periods are probabilistic:
  - 10-year = 10% chance each year
  - 100-year = 1% chance each year
  - 1,000-year = 0.1% chance each year
- Probabilities based on past observational records, updated as newer and/or better data is gathered
- Model storms based on 24-hour rainfall patterns
- Unusual storms (short duration downpours, Hurricane Ida) cause unpredictable flooding
- At least 5 storms in the past 10 years had hourly rainfall significantly exceeding current 10-year design capacity

# Storm Drain Design Criteria

- Drainage systems designed for specific return periods
- Runoff volume calculated using 10-year design storm (standard practice)
- Building a new system is easier than upgrading an existing system
  - Changes in design standards apply to new construction
  - There is currently no requirement or funding to upgrade all existing storm drain systems to newest standards
- Montgomery County Comprehensive Flood Management Plan:



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Montgomery County Government

## Drainage Design Criteria

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Department of Transportation

November 2013 • Rockville, Maryland

Revised Final  
June 10, 2014

[www.montgomerycountymd.gov/flooding/county/flood-management-plan.html](http://www.montgomerycountymd.gov/flooding/county/flood-management-plan.html)



# Past Flooding



Coach St.



Stable Ln.

July 8, 2019 storm calculated to exceed 1,000 year return period  
Sep 1, 2021 (Hurricane Ida) calculated to exceed 200 year return period



Coach St.



Stable Ln.

# Piping Streams

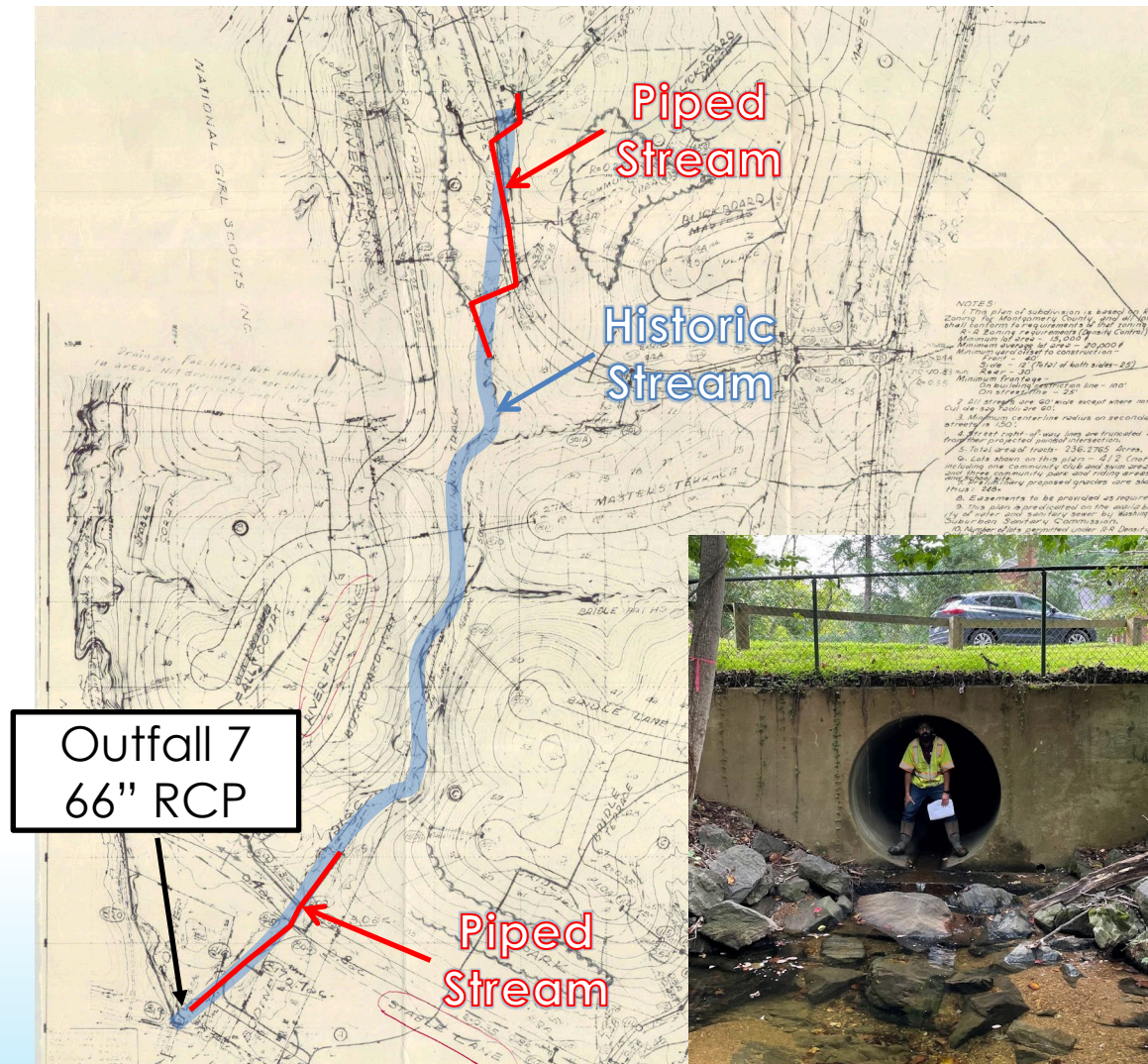
- Natural streams usually have wide banks and broad floodplains
- Piped streams handle base flow and some storms, but flooding will try to follow historic path of stream



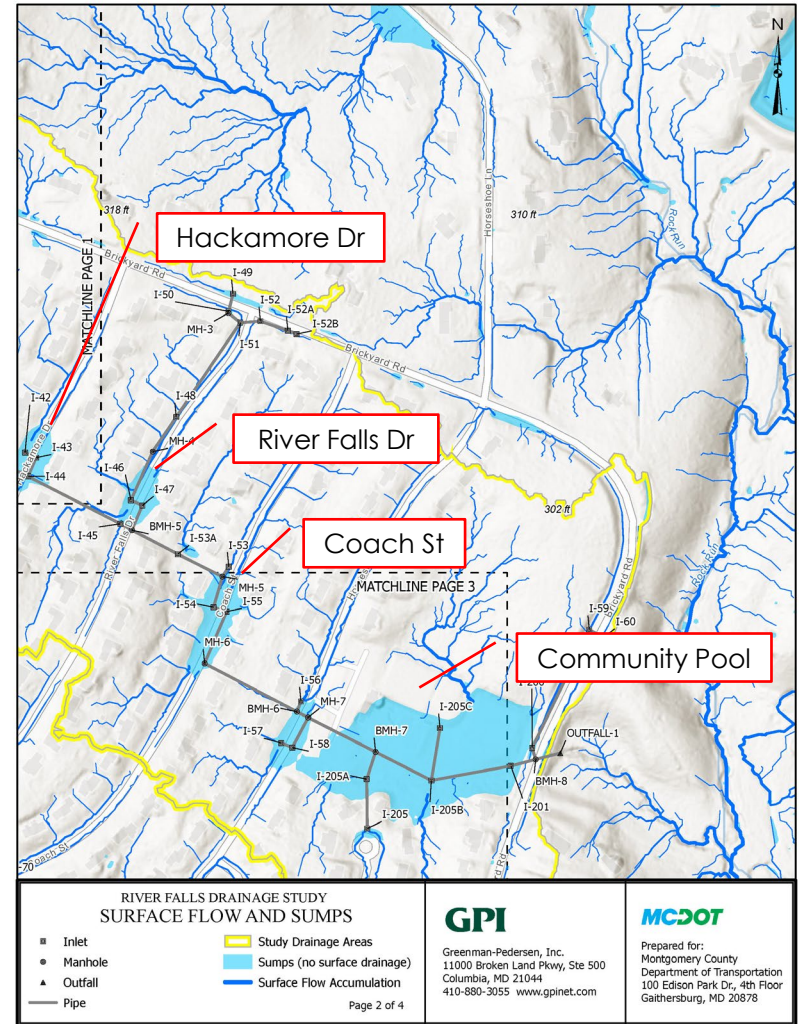
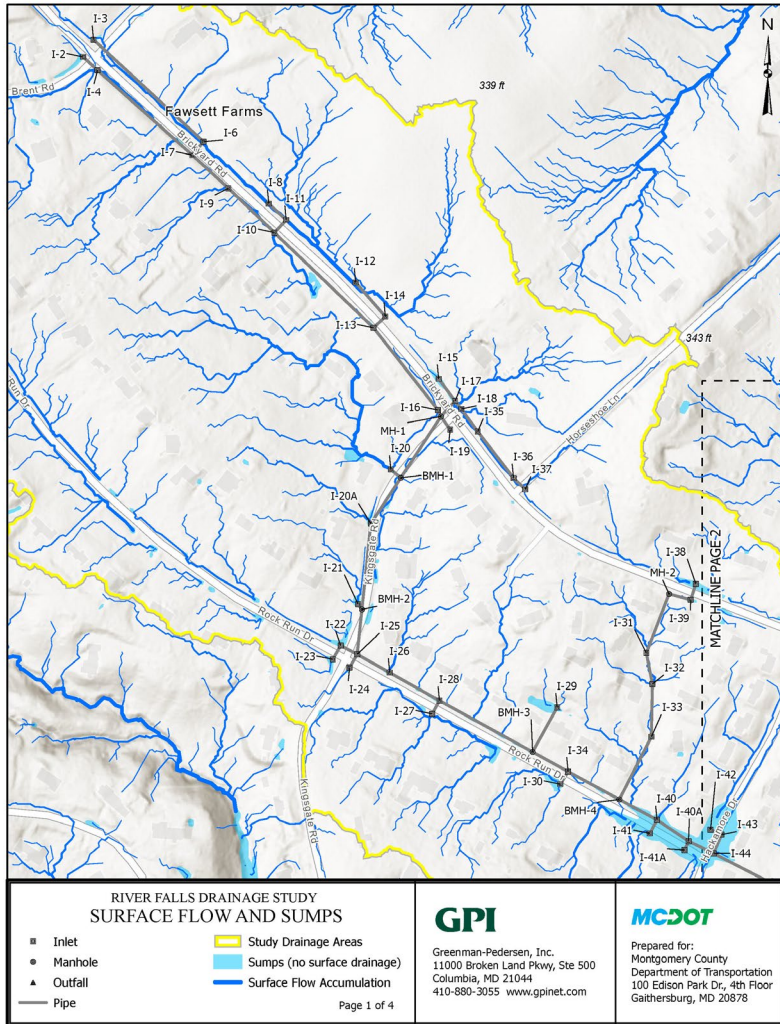
# Neighborhood Plan: 1963 (North)



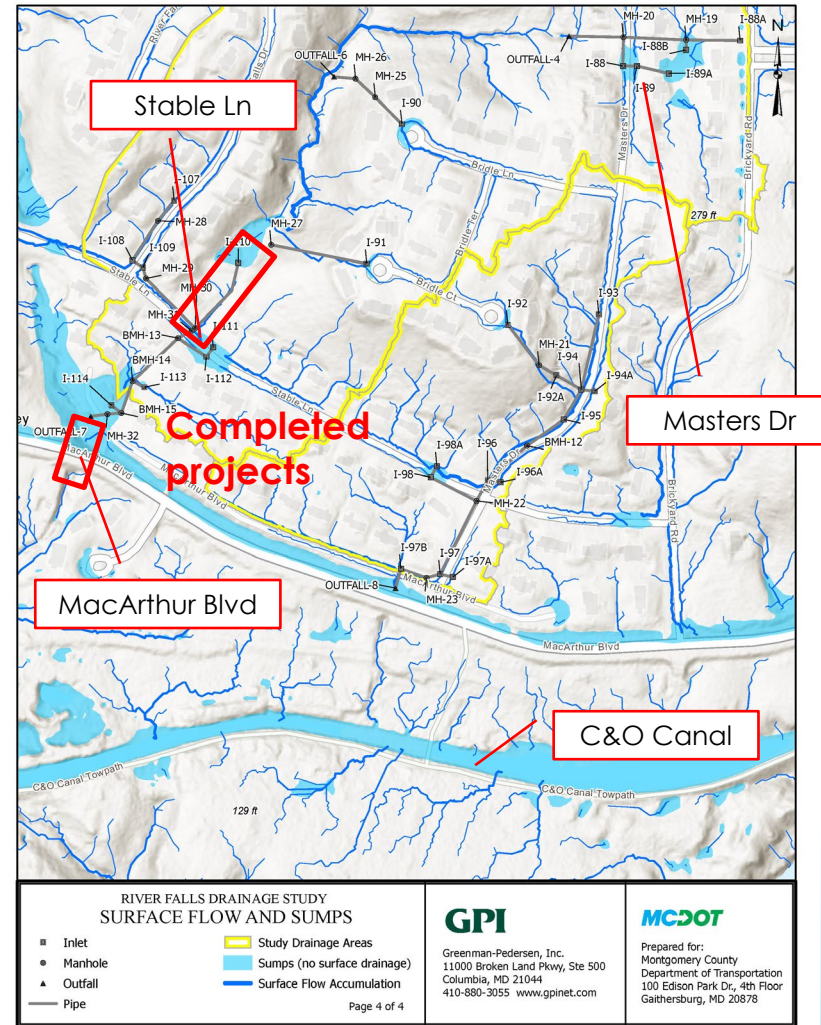
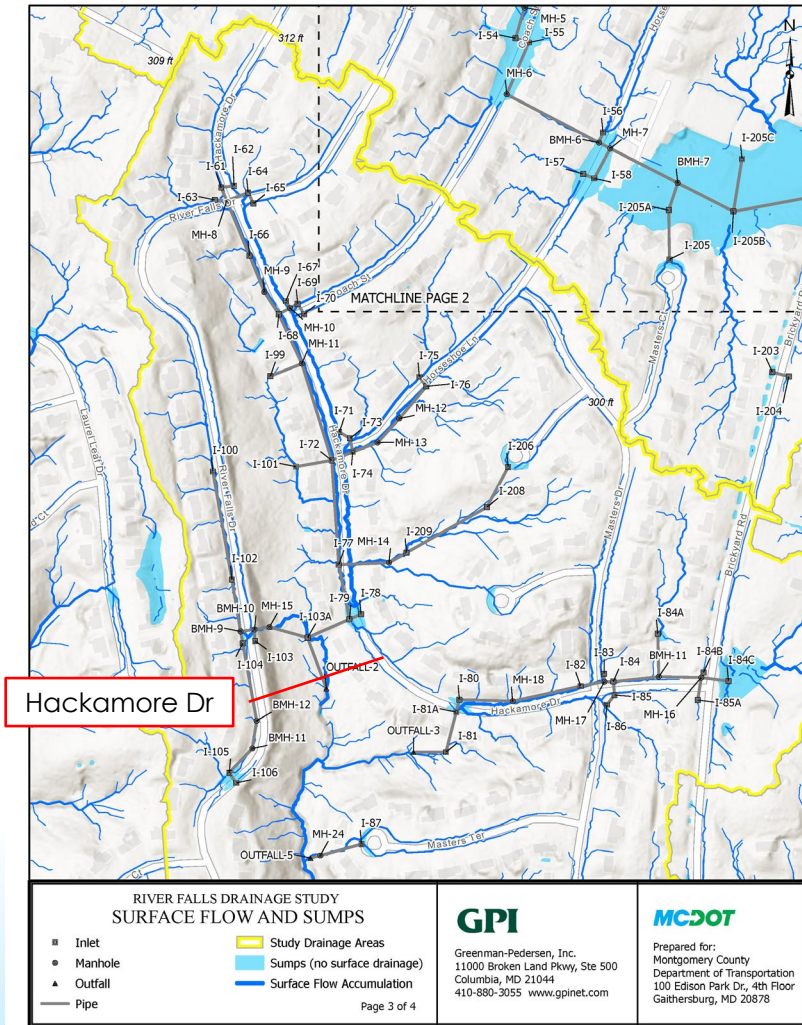
# Neighborhood Plan: 1963 (South)



# Sumps and Flood Risk



# Sumps and Flood Risk



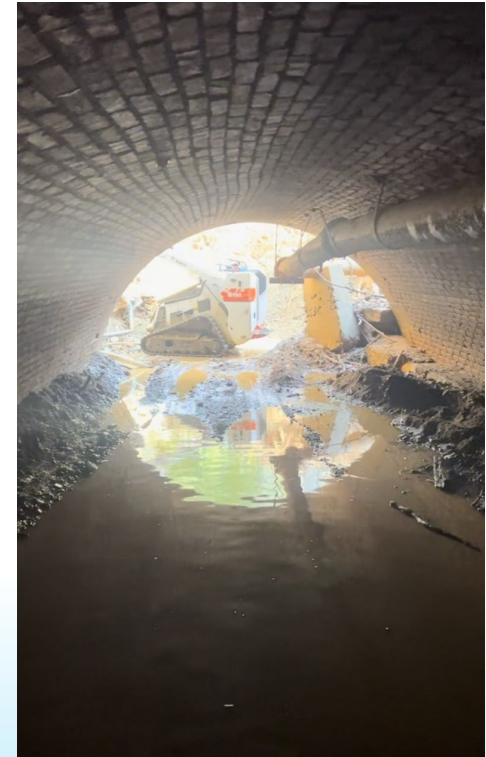
# Completed Project: Stable Ln

- Realigned pipe at road to reduce clogging
- Improved pipe headwall and stream to improve inlet efficiency
- Existing maintenance easement, does not extend to entire stream



# Completed Project: MacArthur Blvd Culvert

- Excavate opening and clear interior clogging
- Owned by US Army (DC aqueduct), MCDOT maintenance





# Scope of Work for Concept Design

- Field Data Collection
  - Topographic Survey
  - Utility Designation
  - Environmental Impact Assessment
- Drainage Improvement Design
  - Preliminary Engineering Alternatives
  - Alternative H&H Reports
  - Alternative Cost Estimates
- Final Concept Selection and Report

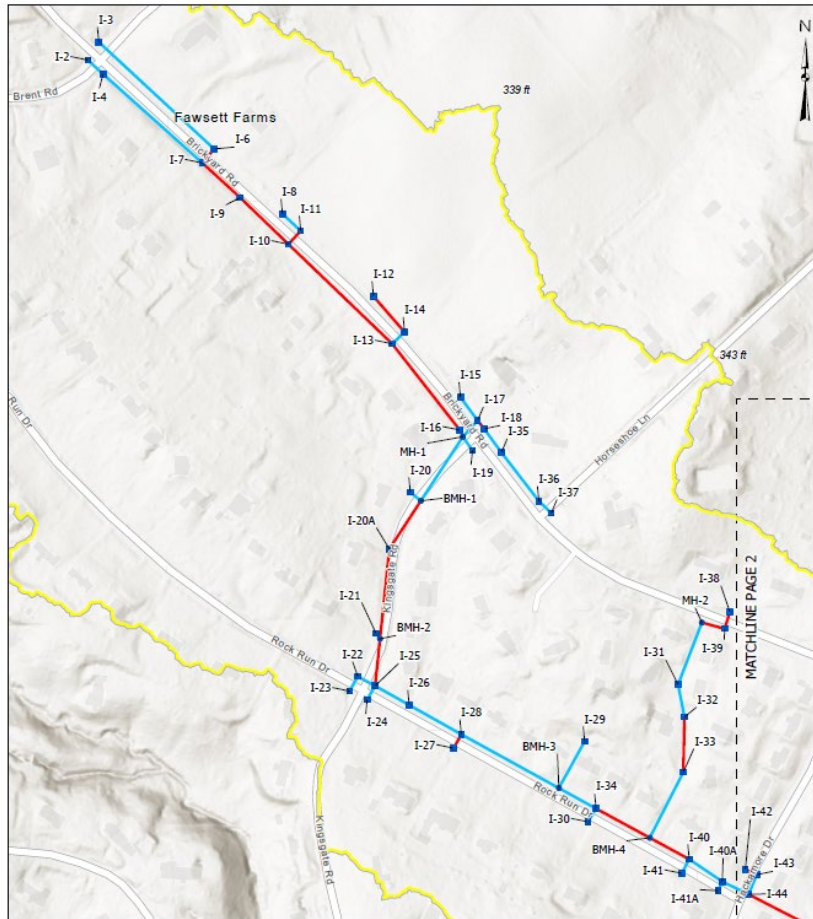
# Evaluating Potential Improvements

- Capacity Increase
  - Pipe replacement / upsizing
  - Inlet upgrades
- Storage
  - Best Management Practices (BMPs)
    - Bioswale / Bioretention
    - Grass swales
  - Stream daylighting
  - Underground storage
- Mitigation
  - Sidewalk lowering

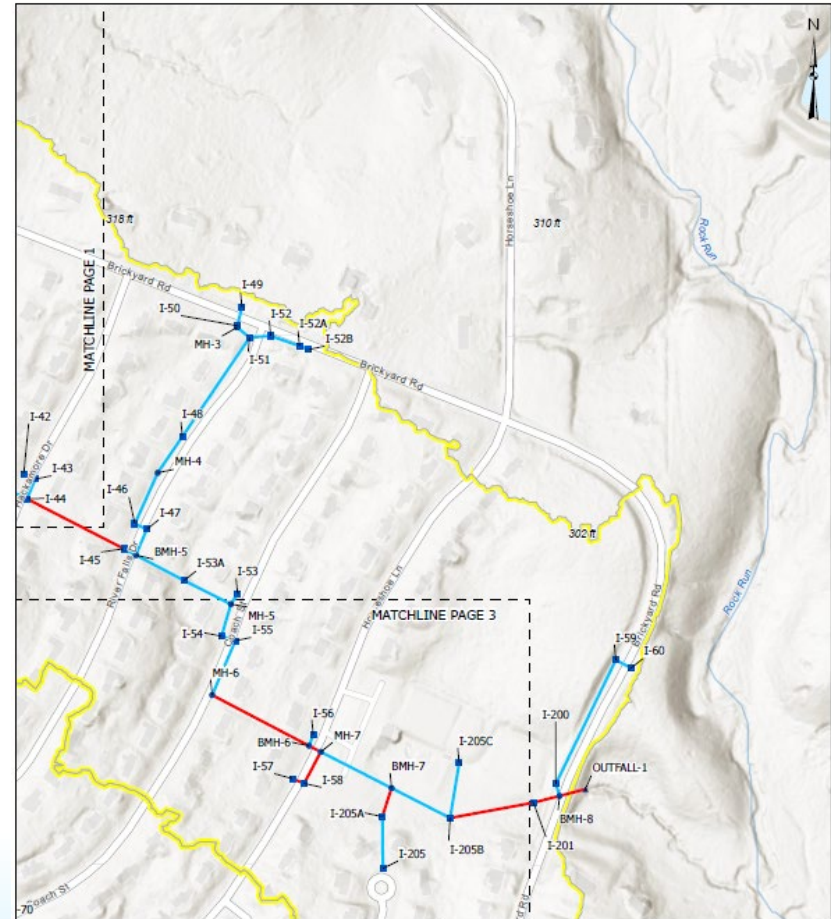
# Pipe Replacement



# Pipe Capacity Analysis

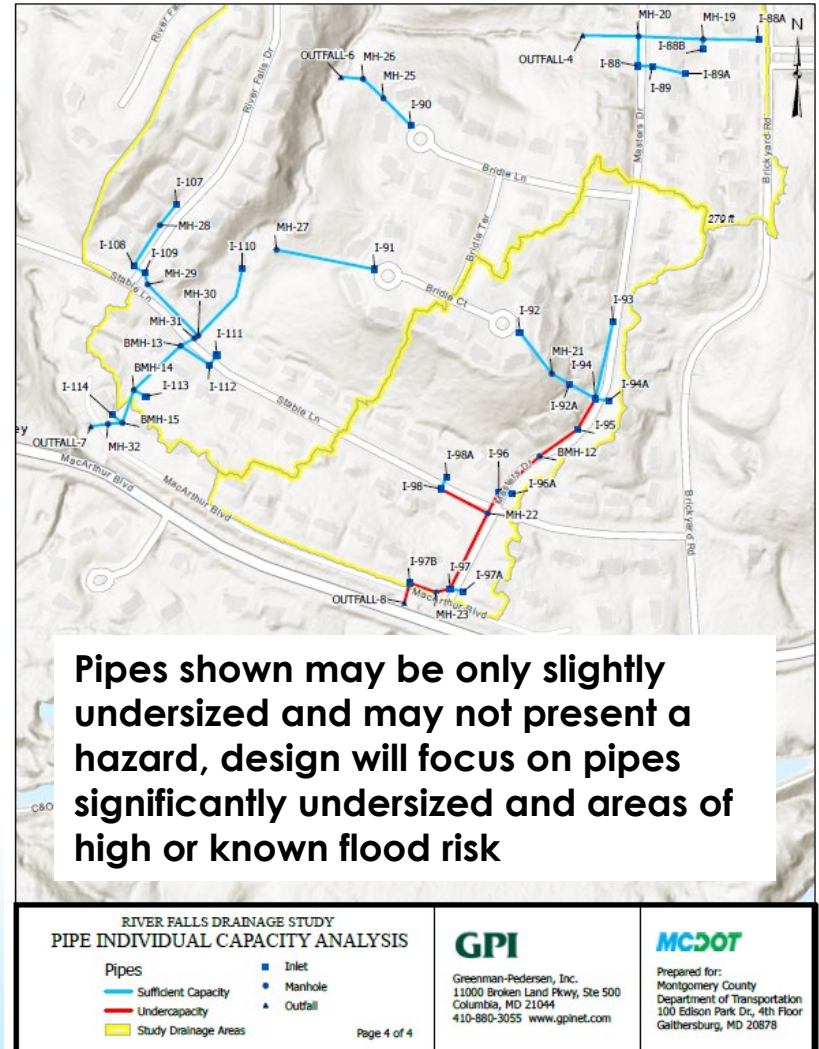
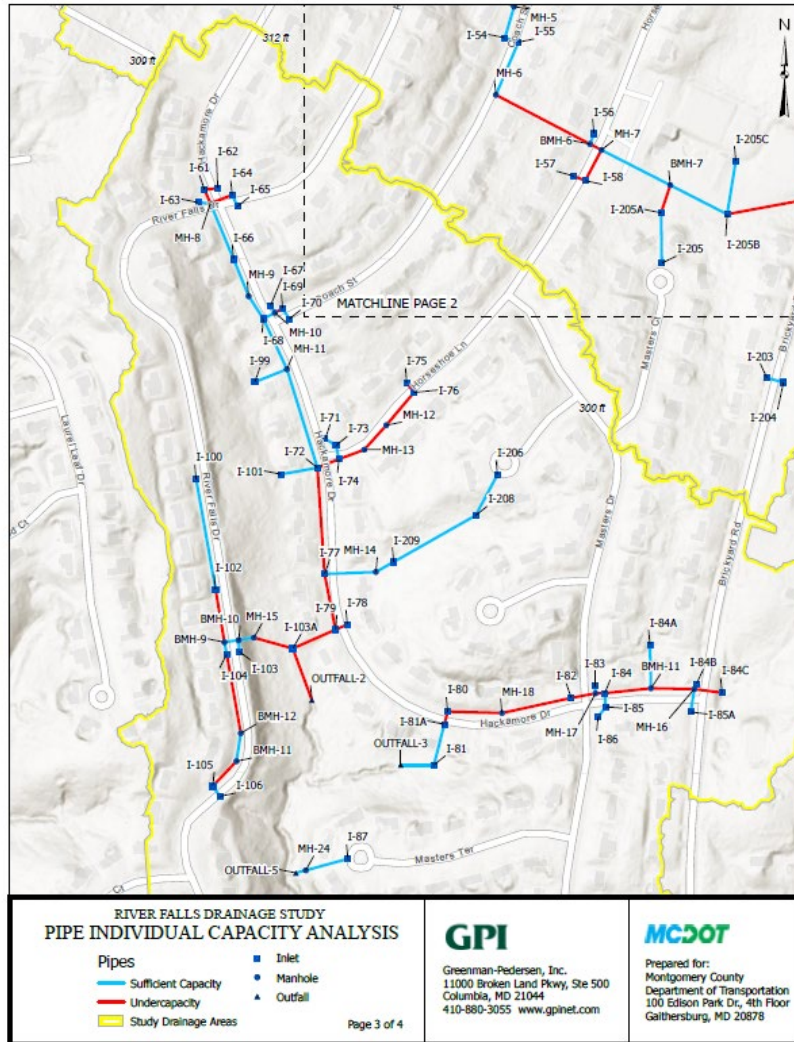


<p><b>RIVER FALLS DRAINAGE STUDY PIPE INDIVIDUAL CAPACITY ANALYSIS</b></p> <p><b>Pipes</b></p> <ul style="list-style-type: none"> <li><span style="color: blue;">—</span> Sufficient Capacity</li> <li><span style="color: red;">—</span> Undercapacity</li> <li><span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> Study Drainage Areas</li> </ul> <p><b>Manholes</b></p> <ul style="list-style-type: none"> <li><span style="color: blue;">■</span> Inlet</li> <li><span style="color: blue;">●</span> Manhole</li> <li><span style="color: blue;">▲</span> Outfall</li> </ul> <p>Page 1 of 4</p>		<p><b>GPI</b></p> <p>Greenman-Pedersen, Inc. 11000 Broken Land Pkwy, Ste 500 Columbia, MD 21044 410-880-3055 www.gpinet.com</p>	<p><b>MCDOT</b></p> <p>Prepared for: Montgomery County Department of Transportation 100 Edison Park Dr., 4th Floor Gaithersburg, MD 20878</p>
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# Pipe Capacity Analysis



Pipes shown may be only slightly undersized and may not present a hazard, design will focus on pipes significantly undersized and areas of high or known flood risk

# Inlet Upgrades



Before



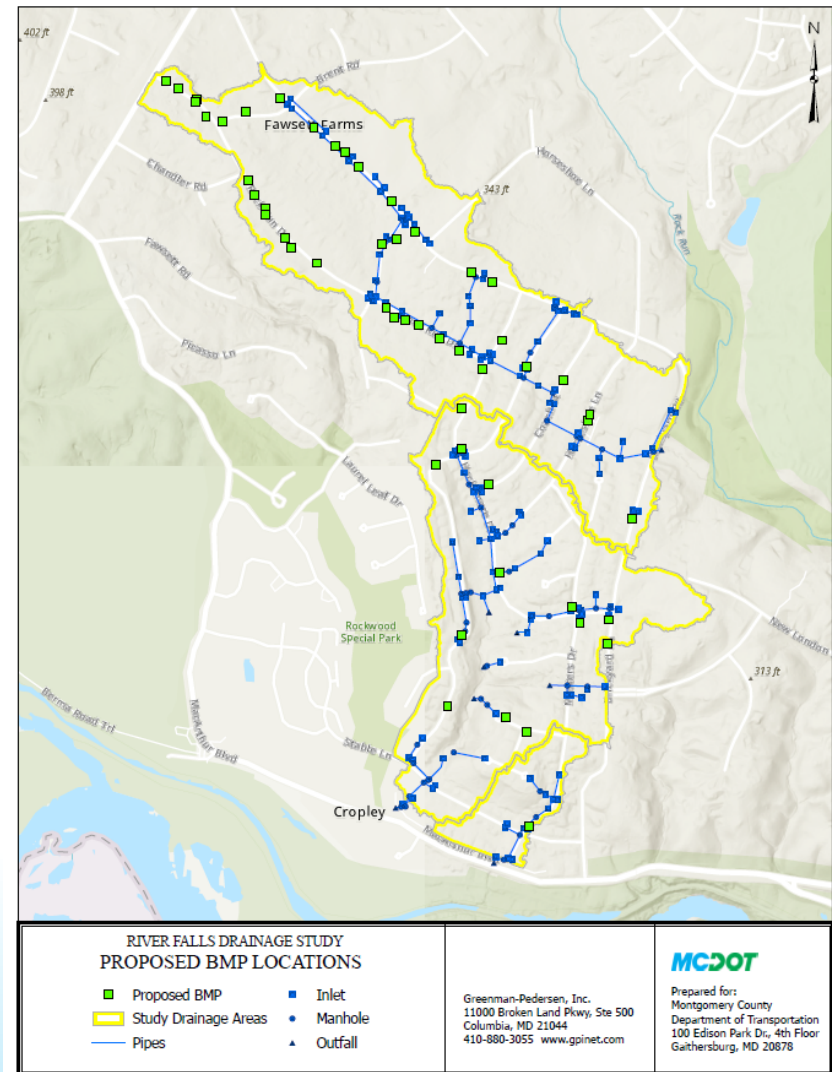
After

# Bioswale/Bioretention



# Potential BMP Locations

- Identified over 50 locations for potential BMP installation
- Ideal locations are open and flat in county's ROW with limited tree and utility disturbance

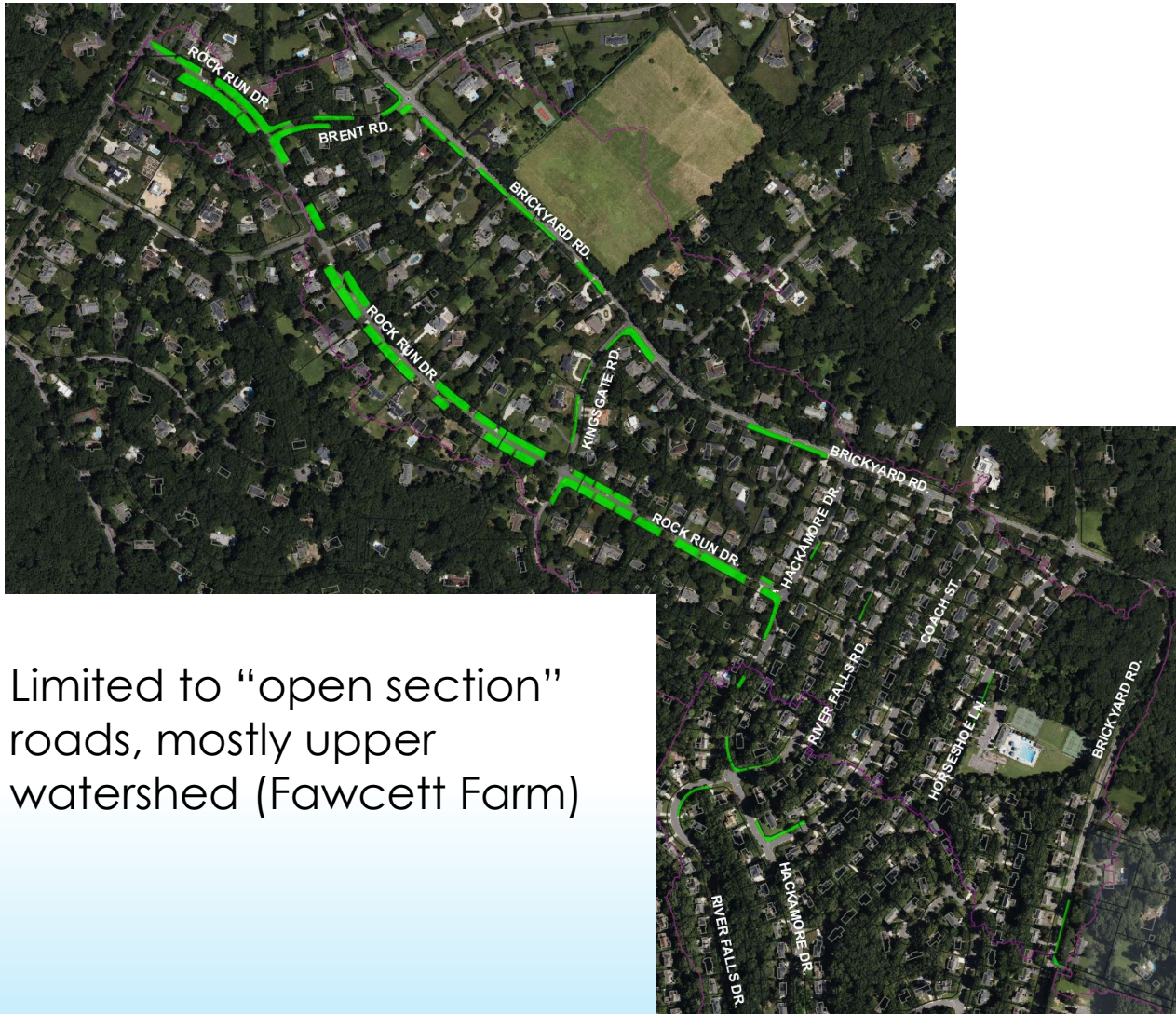




# Grass Swales



# Potential Grass Swale Improvements



Limited to “open section” roads, mostly upper watershed (Fawcett Farm)

# Stream Daylighting

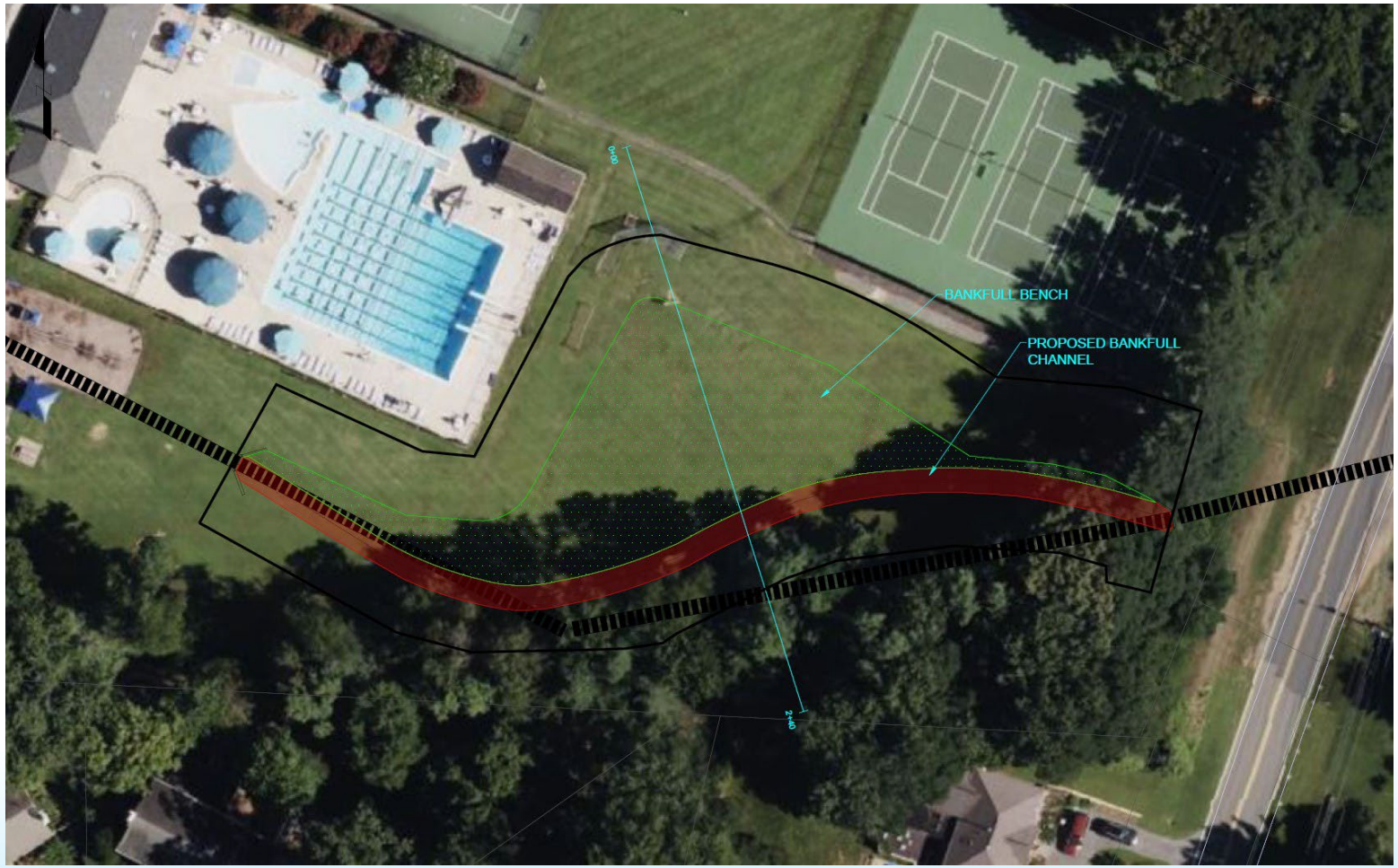


Before

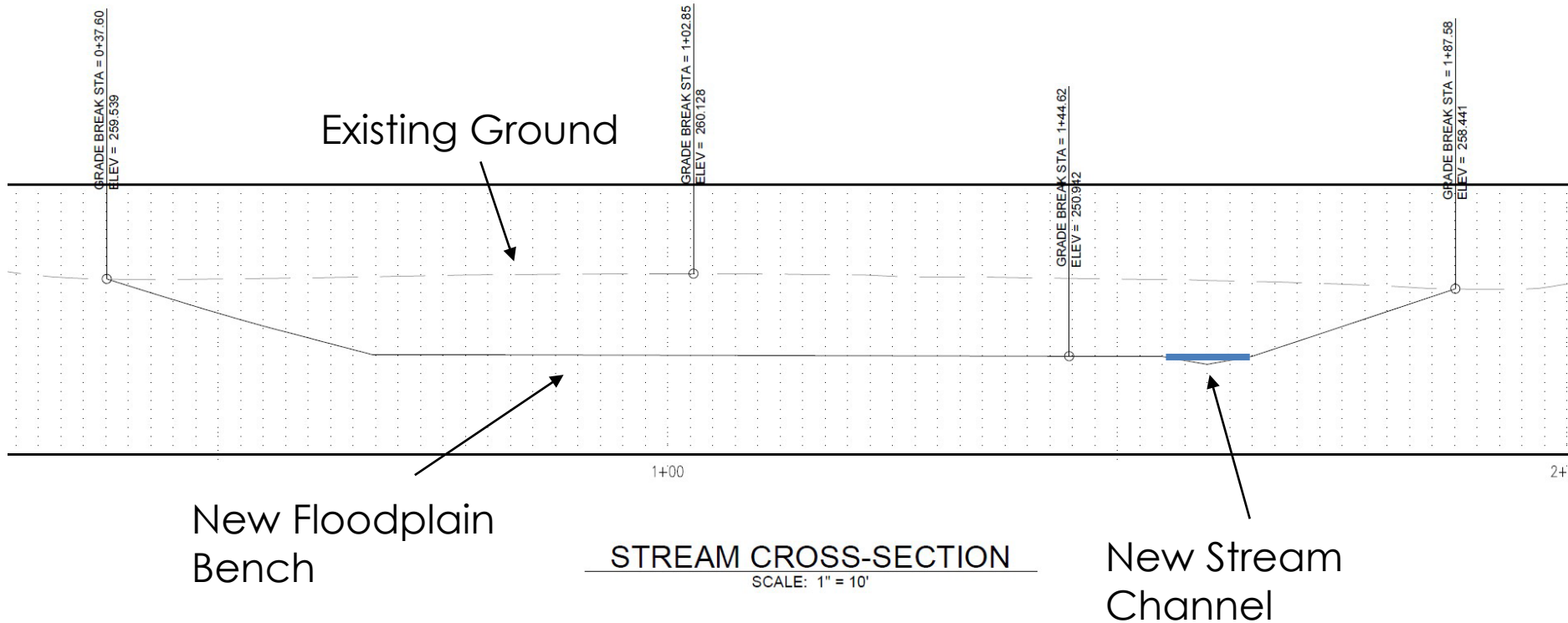
After

Credit: [restorationdesigngroup.com](http://restorationdesigngroup.com)

# Stream Daylighting



# Stream Daylighting



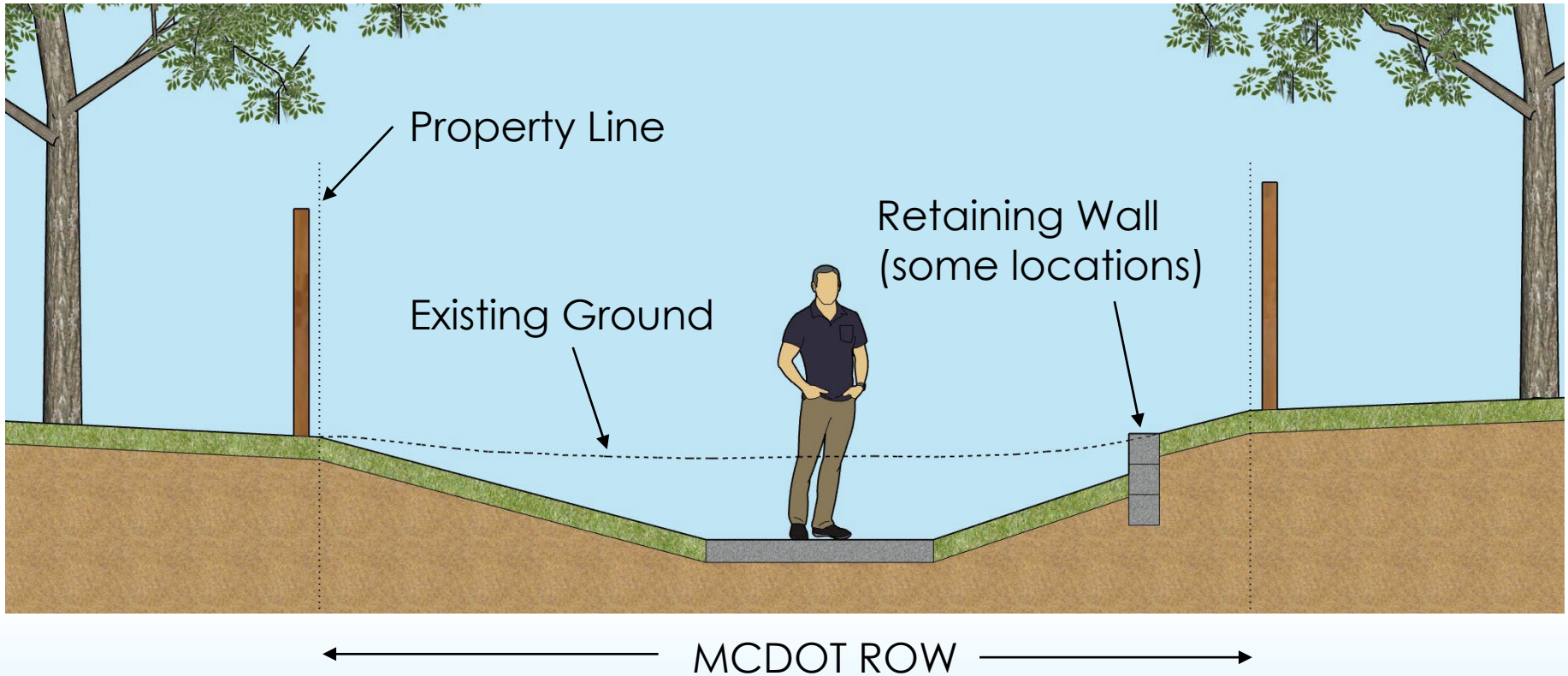
Existing storm drain has base flow from groundwater, not stagnant  
[www.montgomerycountymd.gov/mosquito/NaturalEnvironment.html](http://www.montgomerycountymd.gov/mosquito/NaturalEnvironment.html)

# Underground Storage

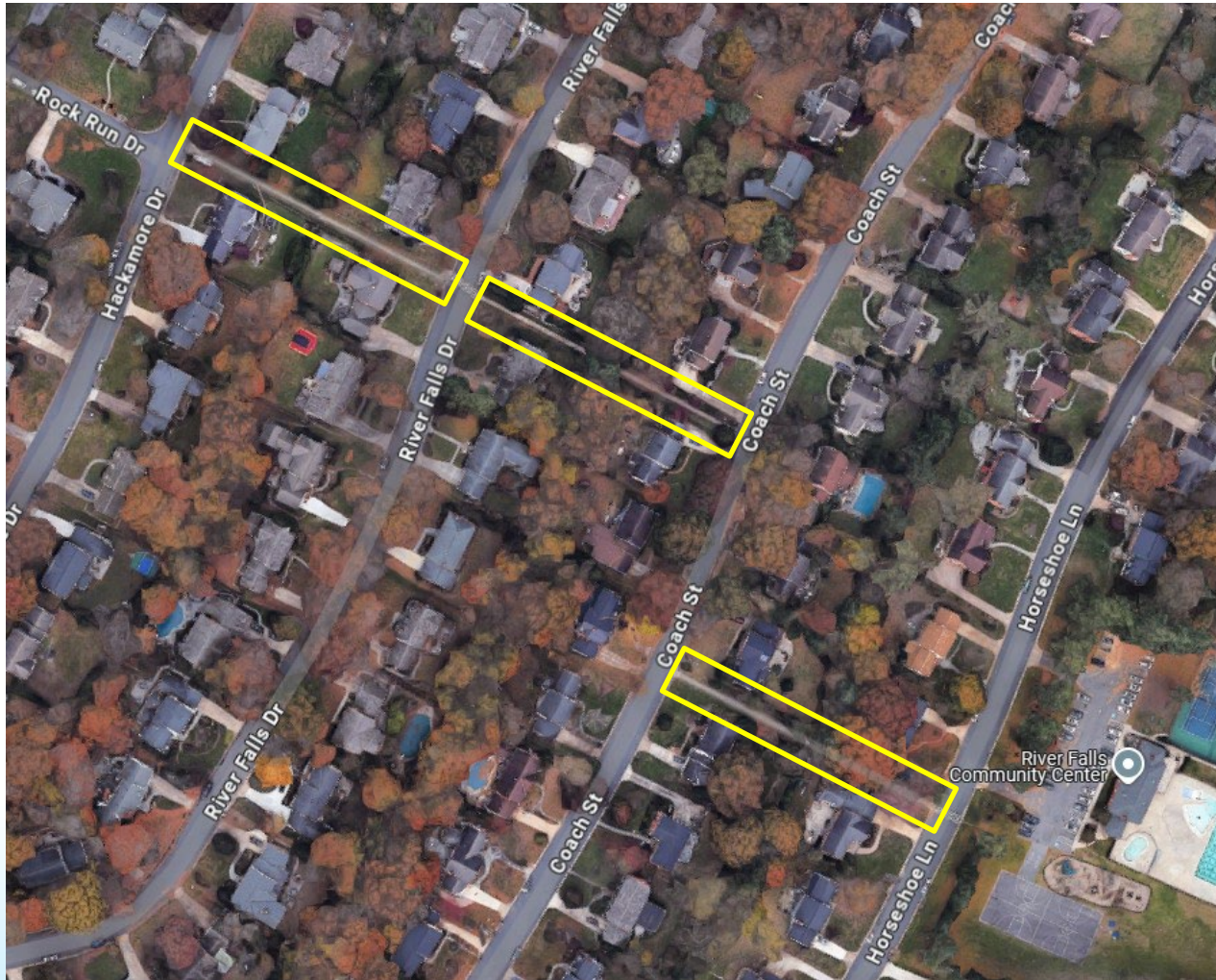


Credit: [conteches.com](http://conteches.com)

# Sidewalk Lowering



# Sidewalk Lowering





# Sidewalk Lowering



# Pros and Cons of Potential Improvements

Practice	Pros	Cons
Grass Swale Improvements	Simple, eco-friendly, provides storage, mowable	Limited by location and size of existing shoulder
Inlet Upgrades	Easy to construct, often drainage bottleneck	Performance limited by pipe capacity
BMPs (bio-swale, -retention)	Eco-friendly, improves water quality, provides storage	Need to be large to provide best benefits, costly
Sidewalk Lowering	Can significantly reduce roadway and property flooding	Will only function during extremely large storms
Pipe Upgrades	Increase speed of drainage, reduces flood risk	Space limitation, utility conflicts, expense increases significantly with pipe size
Underground Storage	Provides storage, not visible	Expensive, space limitation
Stream Daylighting	Large amounts of storage, very eco-friendly, can be community amenity	Expensive, loss of existing grass field

# Major Hurdles

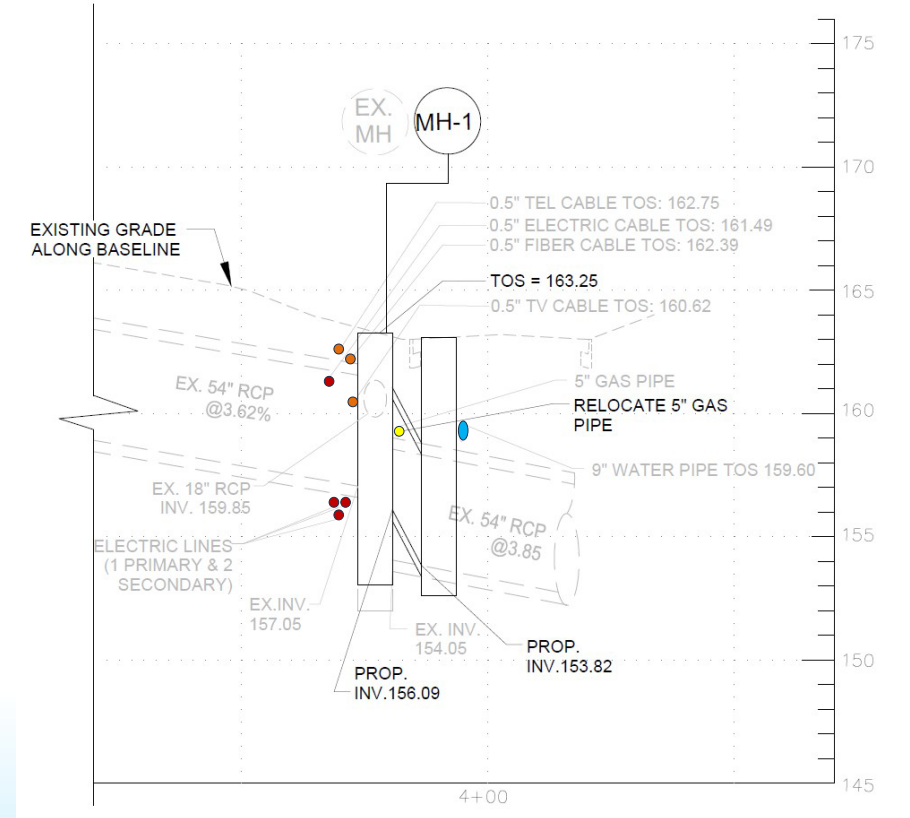
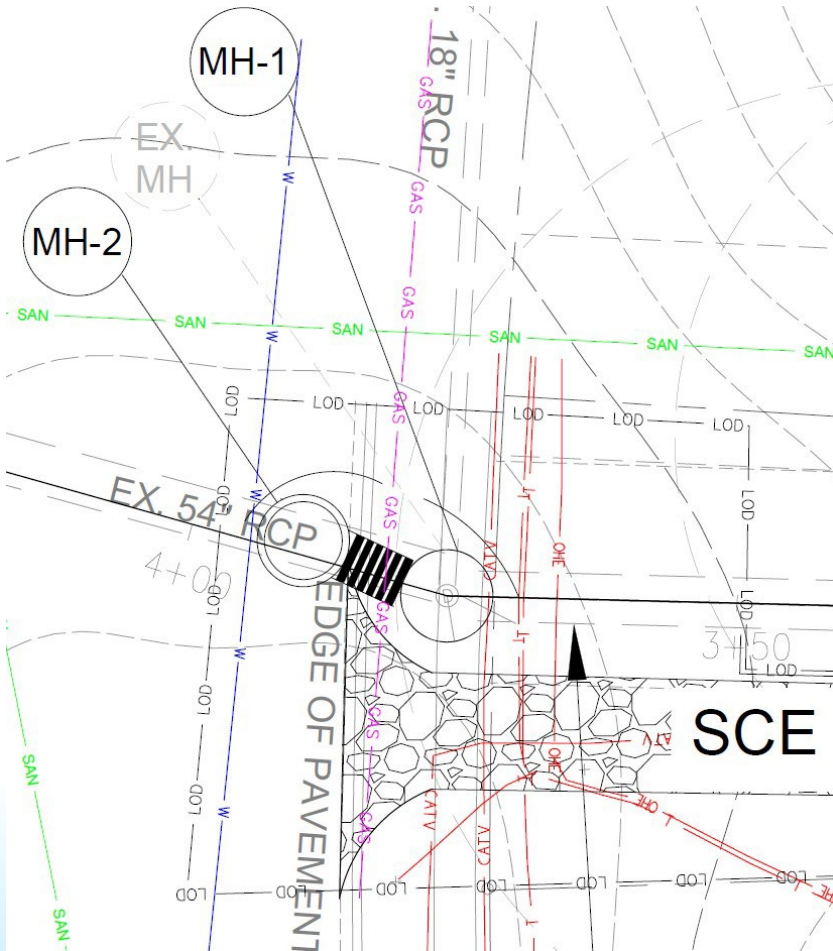
## **Available Space:**

- Limited to existing rights-of-way (ROW) and storm drain easements
- ROW along sidewalks narrow with other utilities
- Obtaining new ROW/easements a lengthy process, requires owner approval

## **Utilities:**

- San. sewer, water, electric, gas, telecom/fiber
- Most utilities require vertical and horizontal offsets
- Locating, test pitting, relocating a major cost driver
- Relocation done on utility company schedule

# Utility Conflicts



# Schedule

1. Field Data Collection – In progress
2. Begin Concept Design – January 2025
3. Community Input Meeting – April 2025
4. Final Concept Selection – May 2025
5. Begin Final Design – June 2025

# How You Can Help

- Even if you aren't affected, you can help reduce runoff
- Reduce Impervious
  - Remove unnecessary concrete/asphalt
  - Install pervious pavers instead of concrete/asphalt, replace existing
- Increase Retention Time
  - Rain Barrels
  - Rain Gardens
  - Tree Planting/Conservation Landscaping
- Every little bit helps!
- <https://www.montgomerycountymd.gov/water/rainscapes/>



# Preparedness

- These storms are natural disasters, risk cannot be eliminated
- You don't need to be in a floodplain to get flood insurance
- Maryland Insurance Administration
- Montgomery County Office of Emergency Management and Homeland Security (OEMHS)
- <https://www.montgomerycountymd.gov/flooding/>

**Questions?**