

# Path to a Flood Resilient Spout Run

Flood Resilient Arlington

September 7, 2022



**ARLINGTON**  
VIRGINIA



# Agenda

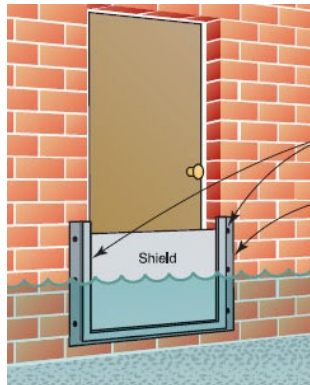
- Why are we having this discussion?
- Causes of Flooding and Overland Relief
- Discussion of Design Options
- Resilience
- Options Explored, Watershed Strategy & Cost
- FAQ's
- CIP Funding
- Update on ANP project Z290
- Brief Updates on other Initiatives
- Questions



A reminder, why we are  
having this discussion:



# Key Elements of Flood Resilient Arlington



Analytics and Data Assessment

New Types and Locations for Capacity Projects

Increased Stormwater Requirements


Increased Funding

Voluntary Property Acquisition

Floodproofing Outreach

# Mapping Program Investments


## Legend


 Watersheds


## Storm Water Management Projects


### Program / Status


 Capacity Complete / Under Construction

 Capacity / Planned


 Maintenance Capital / Complete


 Maintenance Capital / Planned

 Water Quality / Complete


 Water Quality / Planned


## Past Storm Water Management Initiatives

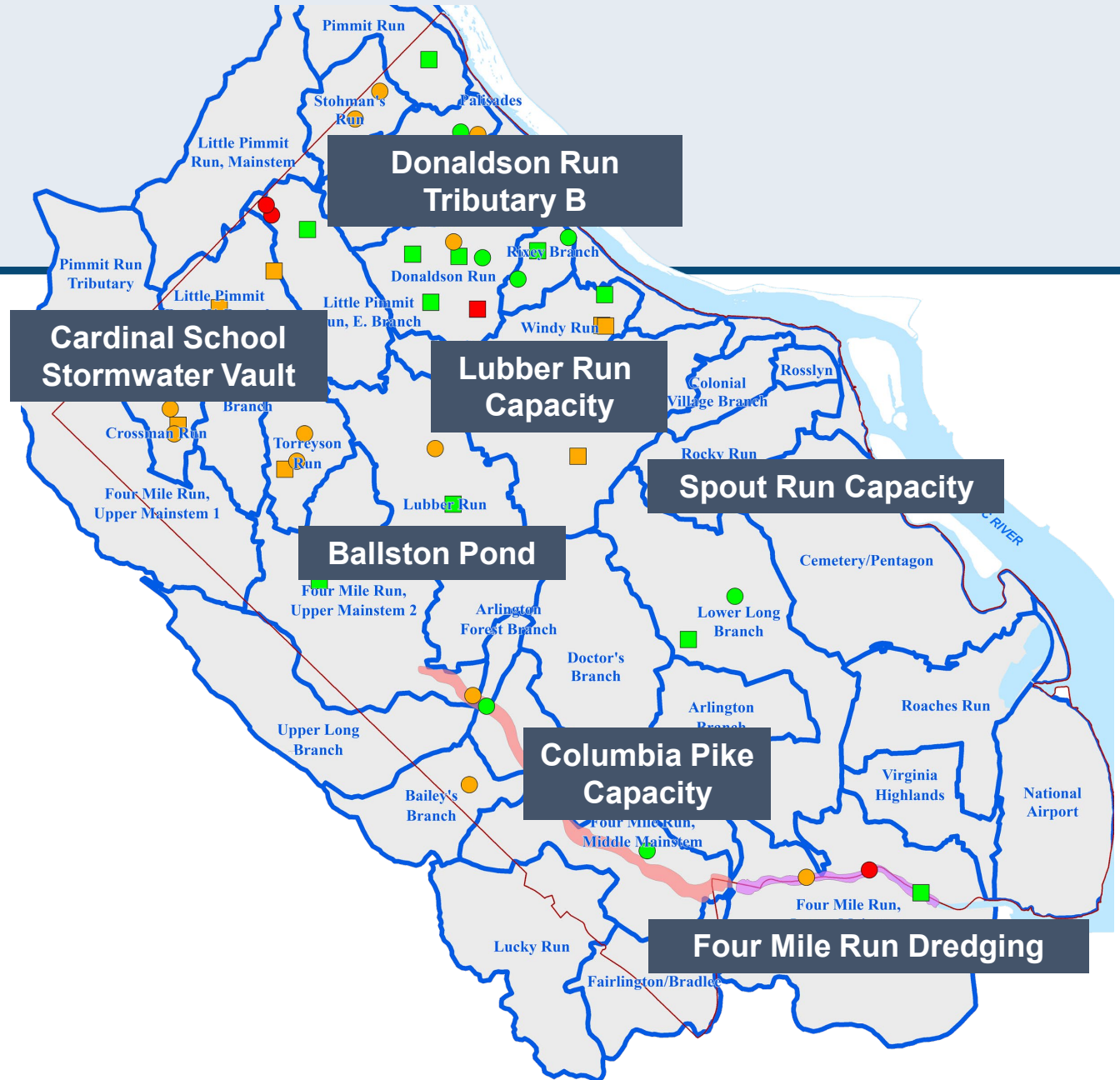
 Flood Control 1984

 Flood Plain Acquisition 60's-70's

## Other Map Elements

 County Line

 Potomac River




# County Watersheds

## ARLINGTON COUNTY, VIRGINIA Watersheds



### Legend

- Watershed Boundary
- Stream and Open Channels
- Landmark Buildings
- Major Roads
- Potomac River
- County Line

 Target program areas for Capacity Improvements program

# Causes of Flooding

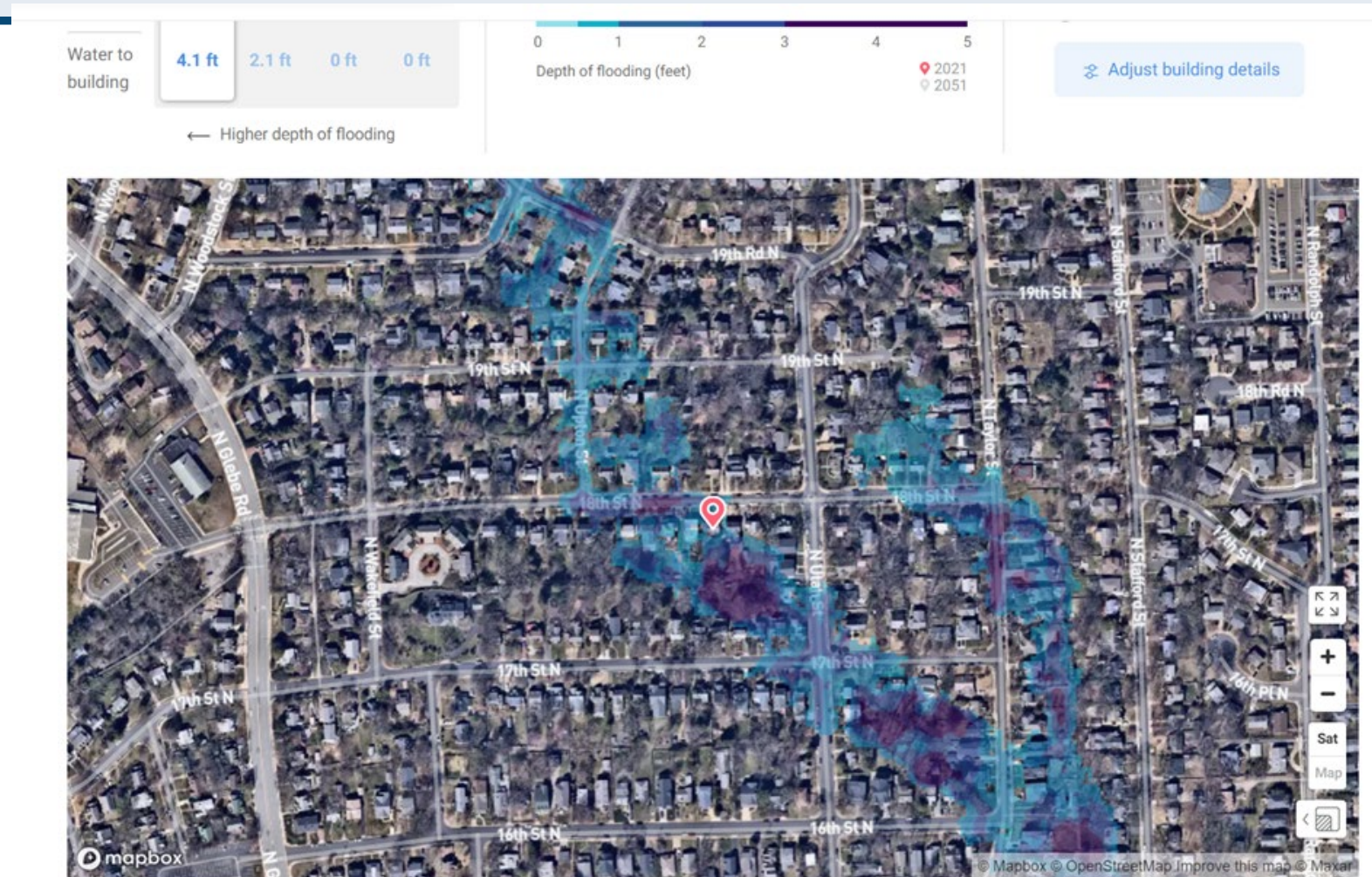
***Some properties are at a higher risk of flooding due to their location in former stream valleys.***

- During Arlington's early development, there were no stormwater management regulations, and standards for storm systems were less rigorous than today.
- Streams were buried in storm sewers and homes and businesses were built within the former floodplains.
- Given the low topography in these former stream valleys, these areas remain at higher risk of flooding despite the presence of the underground storm sewer.



# Riskfactor.com

Riskfactor.com provides risk assessment information to the public and is being promoted by major real estate listing websites such as Redfin, Zillow, etc.





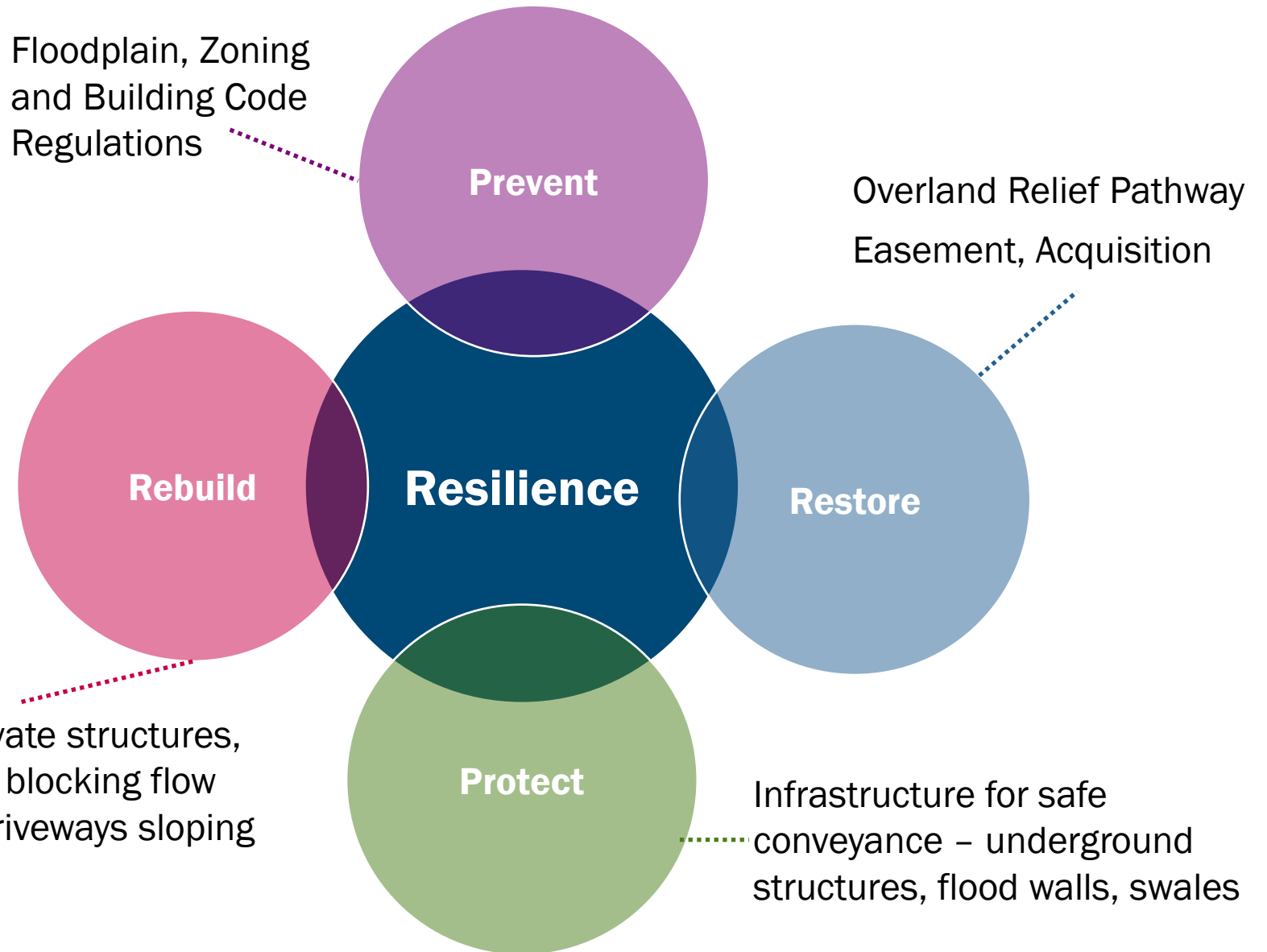
# Storm Sewer Design Standards and Overland Relief

- Over time, the US government has collected rainfall data. This database of storm events is used to define the likelihood of a storm occurring.
- The 10-year storm is defined as having a 10% chance of happening each year, 100-year storm a 1% chance.
- Currently, stormwater systems are designed for a 10-year storm, with the assumption that there is overland relief present for larger storms.
- Overland relief is a safe pathway for stormwater to flow for storms greater than the 10-year storm.



**Goal = 10-Year storm + Overland Relief**

# Balancing Stormwater Priorities and Issues



The Stormwater Team is working on all of these priorities and has multiple initiatives underway

# Multiple Options Evaluated for Waverly Hills

- Various vault configurations at Woodstock Park
- Distributed detention – various scenarios
- Graded channel
- Overland relief pathway
- Piped system – 10 year storm – multiple alignments
- Piped system – 100 year storm
- Climate change impacts





# Proposed Watershed Strategy

## Voluntary Property Acquisition for Overland Relief



Restore

- None of the solutions evaluated can manage the updated 10-year storm.
- Designing for a 10-year storm event is only appropriate where overland relief is available for larger storm events.
- There is not sufficient available space within existing rights-of-way to maintain the infrastructure, make resilient system upgrades, or to provide overland relief.
- **There is no long-term solution to reduce flood risk in Spout Run without adding overland relief.**
- Phased Property Acquisition is a necessary component of a resilient stormwater improvement program to provide overland relief and reduce flood risk to the community.


# Proposed Watershed Strategy

## Voluntary Property Acquisition for Overland Relief



Restore

- Land acquisition of properties in 100-year inundation zone proposed to be phased in prioritized/tiered approach
- Property would become open space to maintain the infrastructure, enhance the system, or to provide overland relief. Properties would be protected from development encroachments by regulation
- Problematic flooding areas and stormwater overflow paths have been identified by numerous studies and empirical evidence:
  - Capacity Study, Stormwater Masterplan and Engineering Studies
  - Riskfactor.com
  - RAMP
  - Flood events (2006, 2018, 2019, 2020)
- Voluntary land acquisitions



**Letters from the County Real Estate Bureau will be sent to property owners** indicating opportunity to participate in a Voluntary Property Acquisition Program for the purpose of improving overland flow relief within the Spout Run Watershed – specifically beginning with Waverly Hills neighborhood.

There are advantages in participating in the program:

1. Lower closing costs
2. No commissions to be paid
3. Stable negotiating environment
4. Peace of Mind

# FAQs Available Online

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**How do I know if the County is interested in purchasing my property?** *The County's real estate team will begin contacting homeowners this fall -about potential property acquisitions by letter. Properties will be considered based on the degree that they can be used by the County for the purposes noted above and the flood risk present in specific areas of the watershed based on historic development patterns, topography, etc.*

**What will the purchased properties be used for?** *Properties acquired through voluntary acquisitions will be used to:*

- *re-establish overland relief flow paths for water during large storm events for flood mitigation,*
- *provide access to existing stormwater infrastructure to conduct necessary maintenance or upgrades,*
- *locate future stormwater infrastructure stormwater detention facilities and/or water quality facilities*

[Property Acquisition FAQs](#)



# Break for Questions

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# CIP Funding for Spout Run

## Adopted FY 23 – FY 32 CIP

Cost Center	Program Name	Phase	Project Name	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	10 Year Total
47222	System Expansion/Capacity	Land Acquisition	Spout Run Watershed Capacity Improvements	5,000	7,000	5,150	5,150	5,300	5,300	4,360	3,270	3,360	3,360	<b>47,250</b>
47222	System Expansion/Capacity	Design	Spout Run Watershed Capacity Improvements	150	150	155	155	160	160	165	165	170	170	<b>1,600</b>
47222	System Expansion/Capacity	Construction	Spout Run Watershed Capacity Improvements	-	6,295	3,180	3,090	3,180	3,180	2,475	2,570	2,645	1,525	<b>28,140</b>
<b>13. Spout Run Watershed Capacity Improvements</b>				<b>5,150</b>	<b>13,445</b>	<b>8,485</b>	<b>8,395</b>	<b>8,640</b>	<b>8,640</b>	<b>7,000</b>	<b>6,005</b>	<b>6,175</b>	<b>5,055</b>	<b>76,990</b>

**NOTE: Proposed funding is NOT for improvements in the Langston Blvd. Planning corridor, but is for downstream flooding mitigation.**

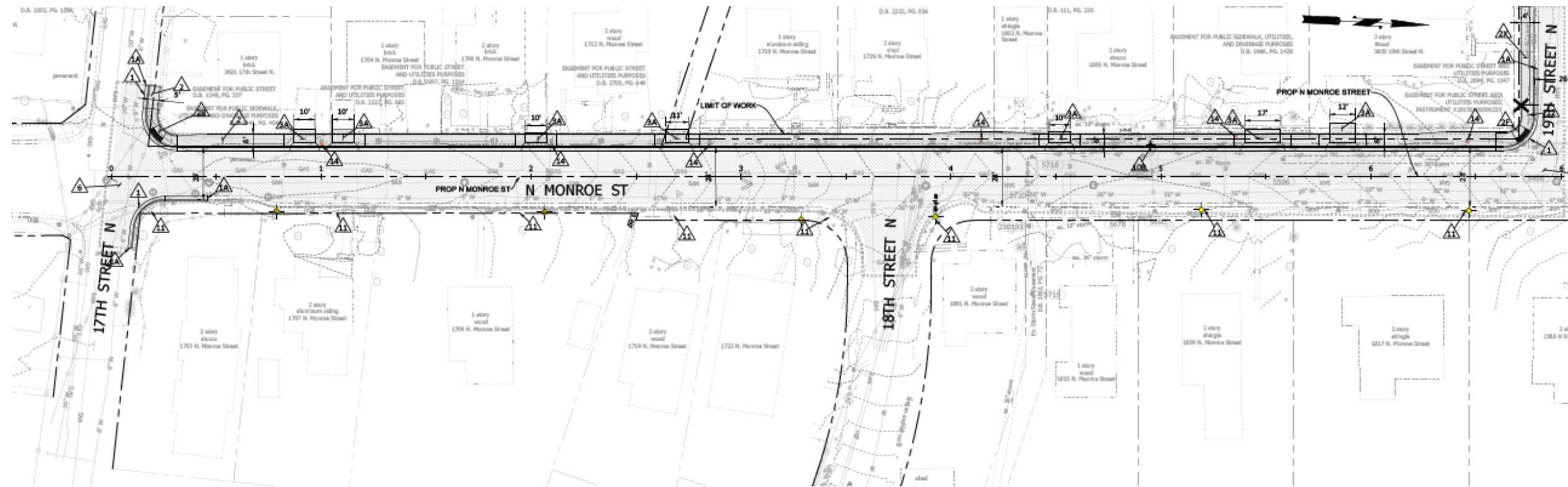
**\* Property Acquisition will be phased and prioritized over multiple CIP cycles. There is some flexibility in project design, acquisition and construction categories.**

Note: The proposed level of funding for this projects begins to approach the funding levels for stormwater that sister jurisdictions already provide.

# Arlington Neighborhoods Project Z290 Update - Sidewalks on Monroe St.

Lower Spout Run including property on N 18th St in Cherrydale

No Additional contact with property owner, who has stated they will rebuild and elevate home  
ANP project to proceed without modifying storm sewers in any way – sidewalks only



For More Information, contact:

Tim McIntosh  
Arlington Neighborhoods Program Manager  
Arlington County  
2100 Clarendon Boulevard, Suite 700  
Arlington, VA 22201  
703-228-3829

## Updates on Other Stormwater Initiatives

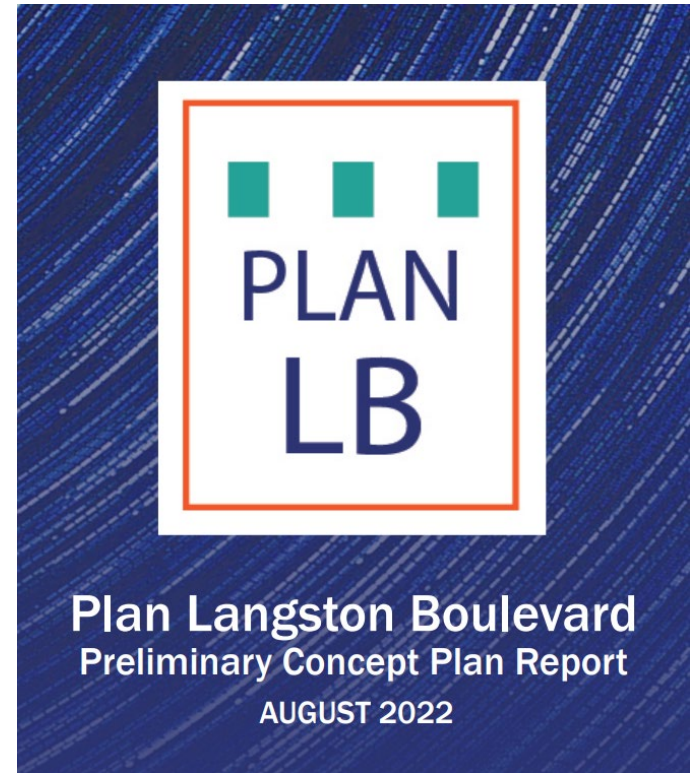
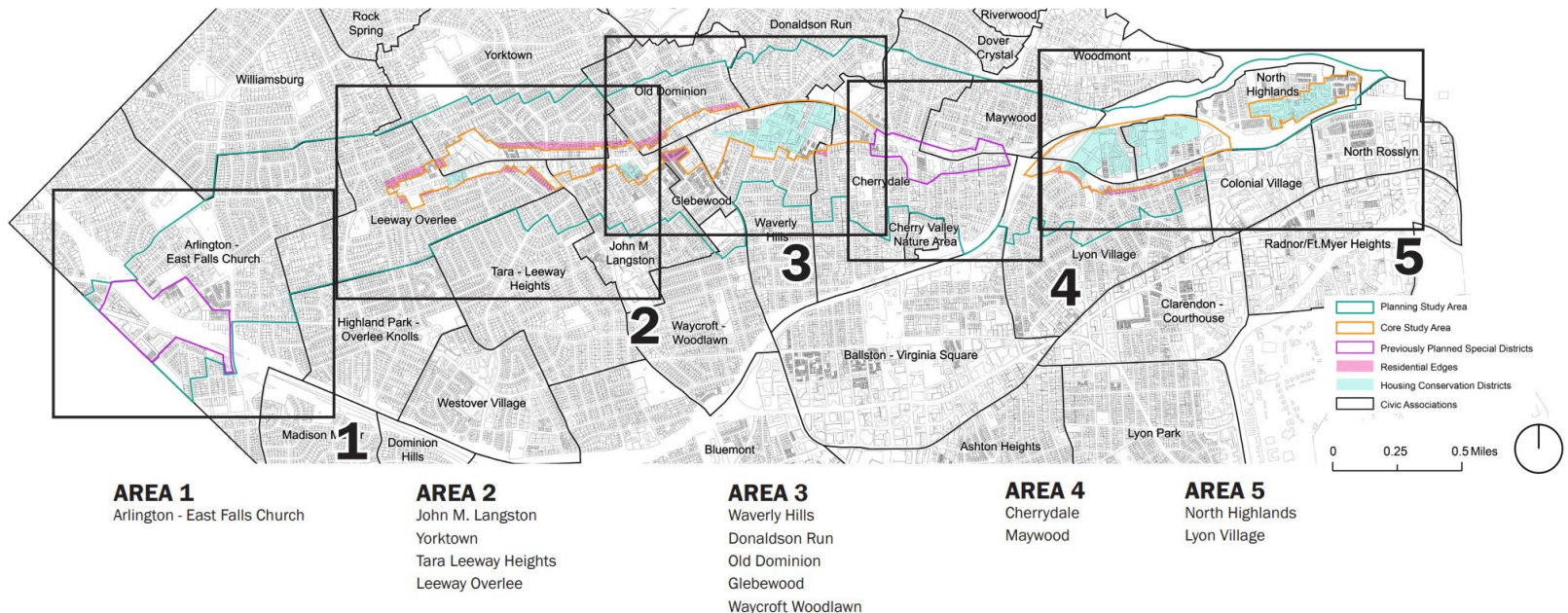
- Plan Langston Boulevard (PLB)
- FEMA FIRM update
- Arlington County Floodplain Ordinance update
- Stormwater Utility Update
- RAMP update
- High Water Detection Sensors
- LDA 2.0
- Zoning Study
- Flood Resilient Design and Construction Manual



# Plan Langston Boulevard Engagement

## Preliminary Concept Plan

- Preliminary Concept Plan Report is available online
- Series of public meetings scheduled:
  - Wednesday, Sept. 14
  - Wednesday, Sept. 21
  - Thursday, Sept. 22
  - Tuesday, Oct. 11
- Multiple opportunities for providing feedback on the PCP



### CONTACT US

[planlangstonblvd@arlingtonva.us](mailto:planlangstonblvd@arlingtonva.us)

#### Coordinator

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703-228-3691

#### Communications & Engagement

Rachel LaPiana  
703-228-0059

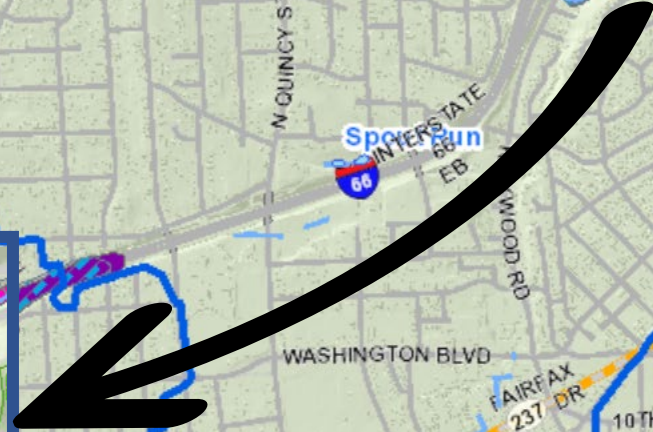
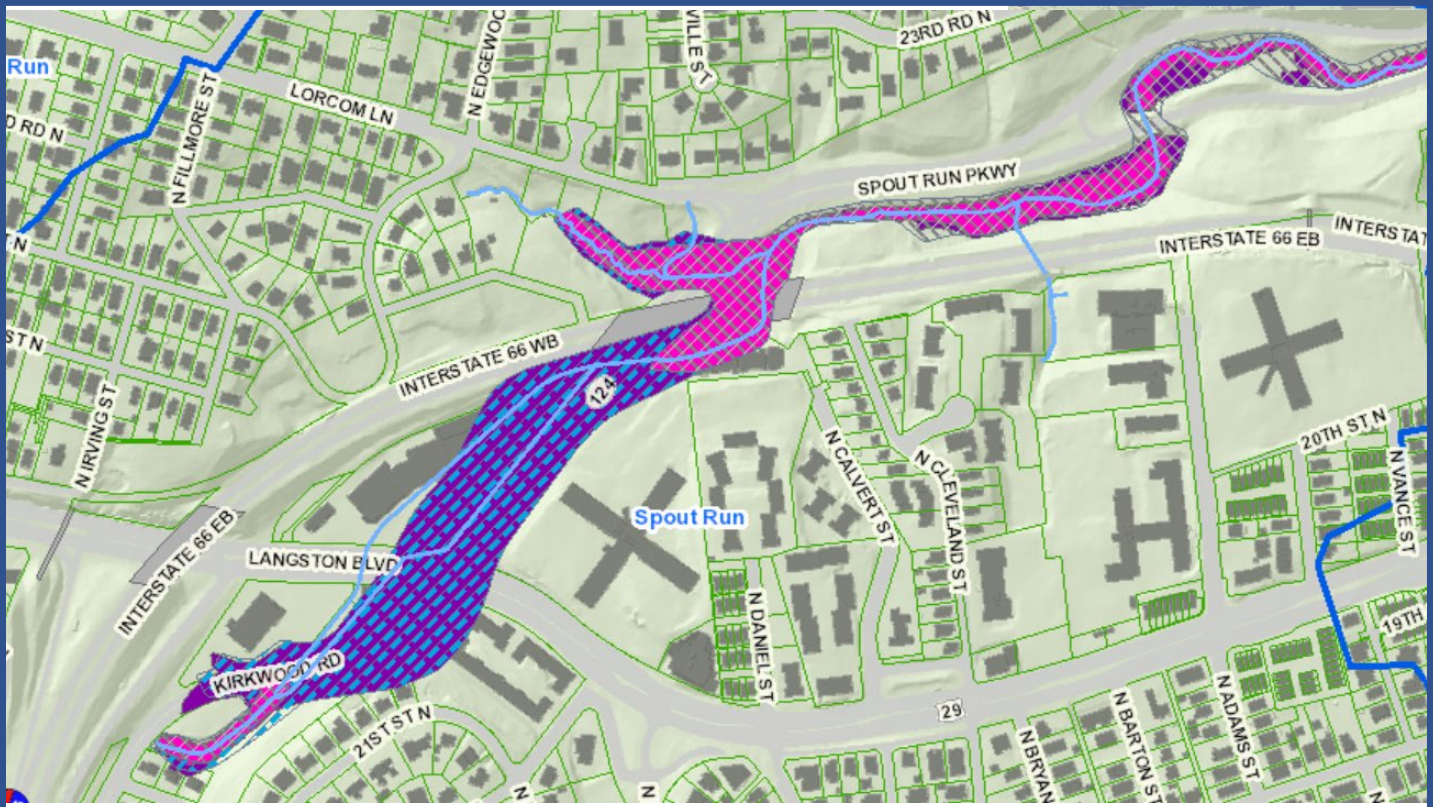
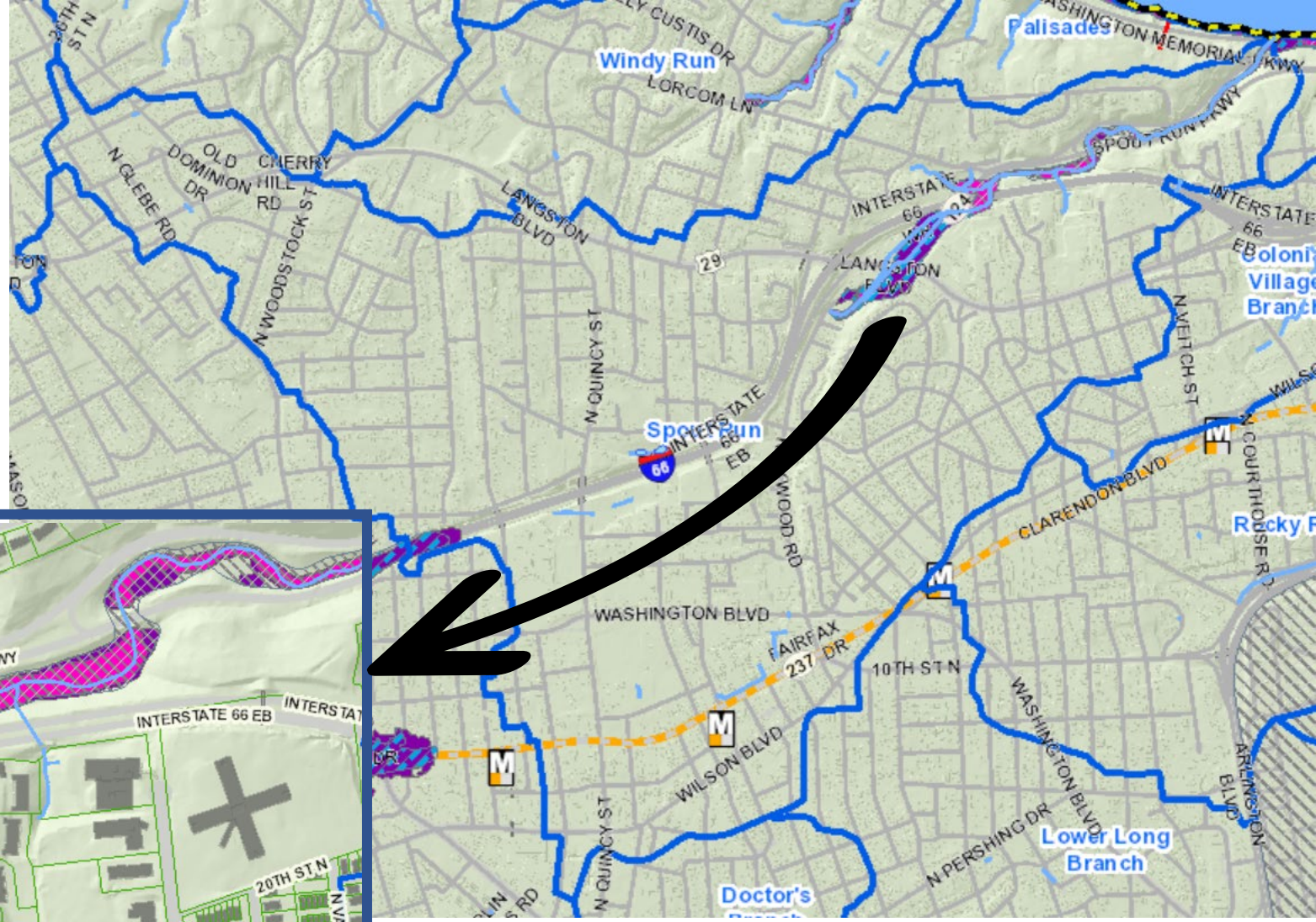


# FEMA Floodplain Map Update

Overall view of Spout Run watershed with floodplains



Detail of floodplains



In general, Floodplains and changes to FIRM and the Floodplain Ordinance have minimal impacts on the Spout Run watershed



## Tentative Schedule for updated FIRM and Floodplain Ordinance:

Step / Milestone	Start Date	End Date	Notes
Revised Preliminary Issued	04/29/2022	n/a	County received / downloaded files
30-Day comment period	04/29/2022	05/29/2022	County provided comments to FEMA
Prep work for Appeal Start	June 2022	July 2022	FEMA's contractor will begin prep work for the Appeal Period*
FR notice prepared, submitted, and published	July 2022 (submitted)	08/02/2022 (published)	FEMA's contractor will prepare and submit the <i>Federal Register</i> notice for publication
Newspaper publications (2)	09/29/2022 (tentative)	10/06/2022 (tentative)	FEMA's contractor will contact local newspaper and arrange for 2 publications
Appeal Period (90 days)	10/06/2022 (tentative)	01/06/2023 (tentative)	FEMA's contractor will mail out the Appeal Start letter
Prep work to ready the study for LFD	Jan. 2023	Mar. 2023	FEMA's contractor will begin prep work for completing the study*
Study is independently reviewed by another contractor	May 2023	June 2023	Independent contractor has 60 days to review and approve the study
Letter of Final Determination	June 2023	Dec. 2023	Independent contractor has 60 days to review and approve the study
New Study Effective Date	Dec. 2023	n/a	County will receive new products



## Floodplain Ordinance Update

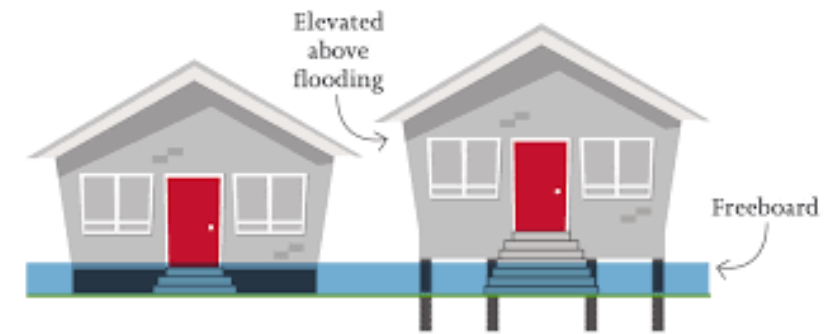
- Required due to FIRM updates
- Must be approved by DCR and FEMA
- Must conform to model ordinance
- Must be adopted within 6 months after Letter of Final Determination (LOD) or approximately December, 2023

Overall, proposed changes are minor



# Proposed changes to Floodplain Ordinance

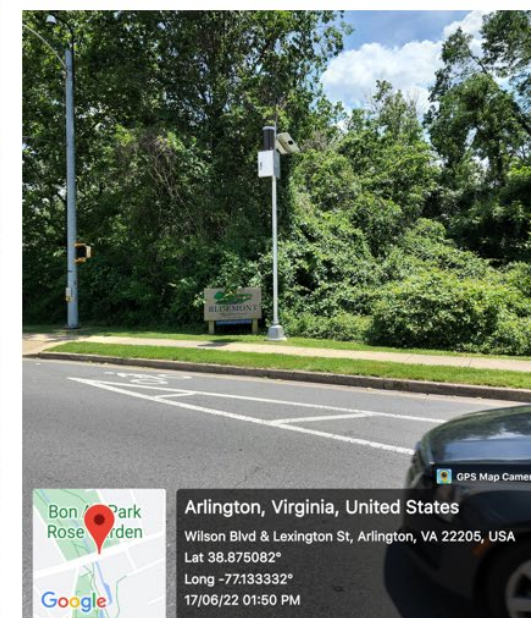
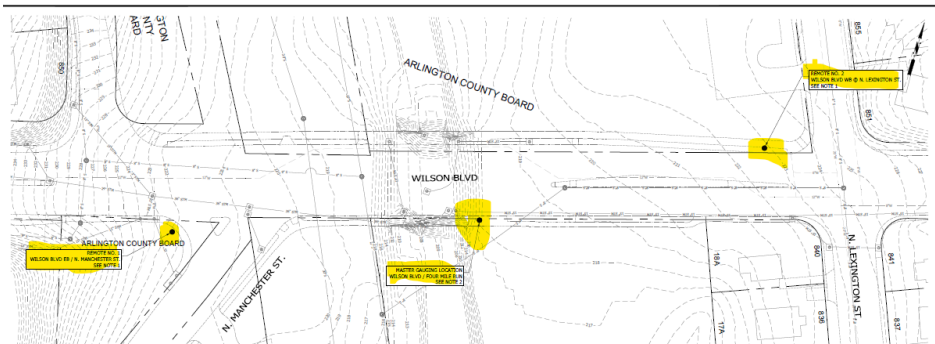
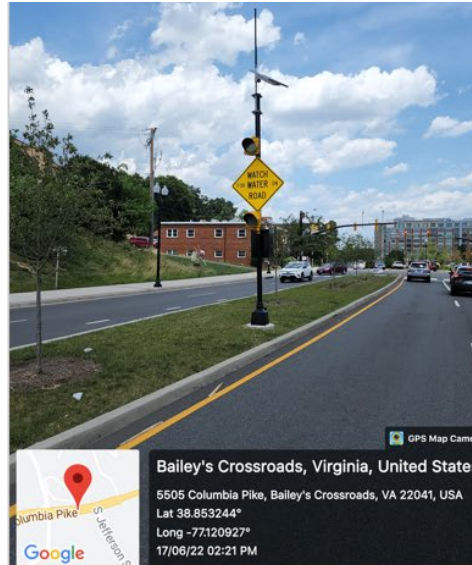
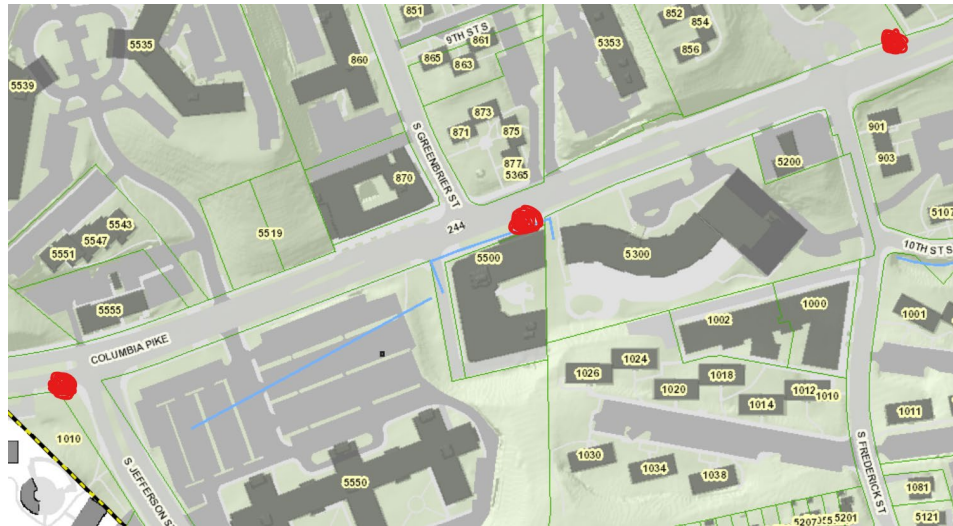
- Increase in required freeboard (distance above base flood elevation) from 12 to 18 inches, or
- Buildings in 100-year floodplain must be watertight 2 feet above the base flood elevation (previous requirement 1 foot)
- Accessory structures can not be larger than 600 feet
- No emergency service records, medical records or government records can be stored in 500 year floodplain



# High Water Detection Devices

Two high water detection devices installed

Location #1: Columbia Pike near Greenbrier



A third set of devices is slated for Kirkwood Rd. @ Langston Blvd.

Location #2 Wilson Blvd. near N Lexington St. and N Manchester St.<sup>27</sup>

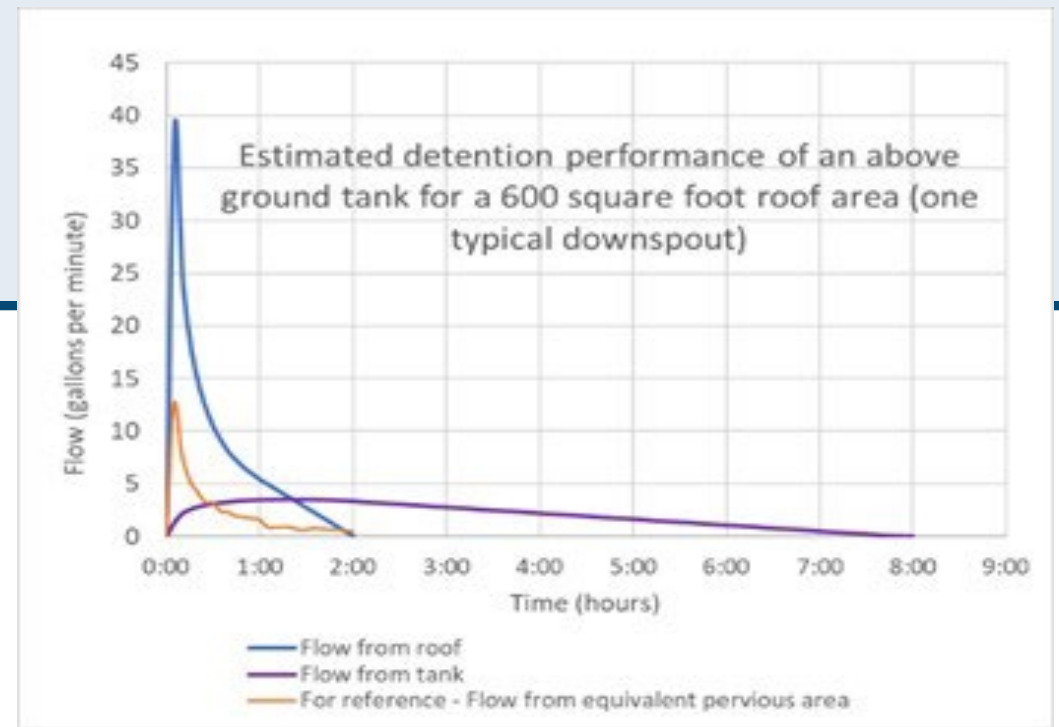
# LDA 2.0 - Increased Stormwater Management Requirements

LDA = Land disturbing activity permit

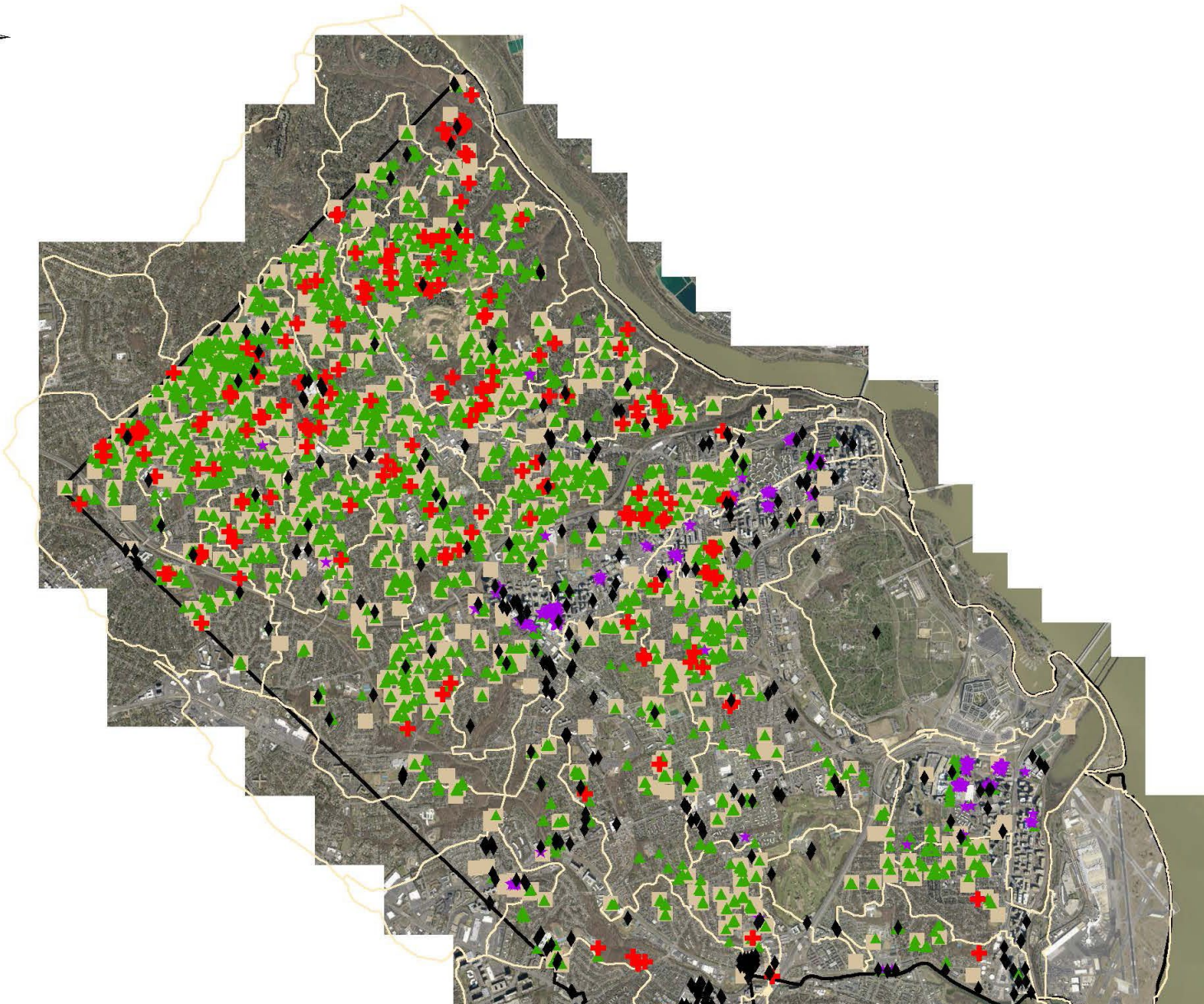
With LDA 2.0, the County has increased stormwater management requirements for single-family home projects to reduce impacts to neighboring properties.

Took effect September 2021

Requirement to detain up to 3 inches of runoff from new impervious area on site and restore soil permeability after construction



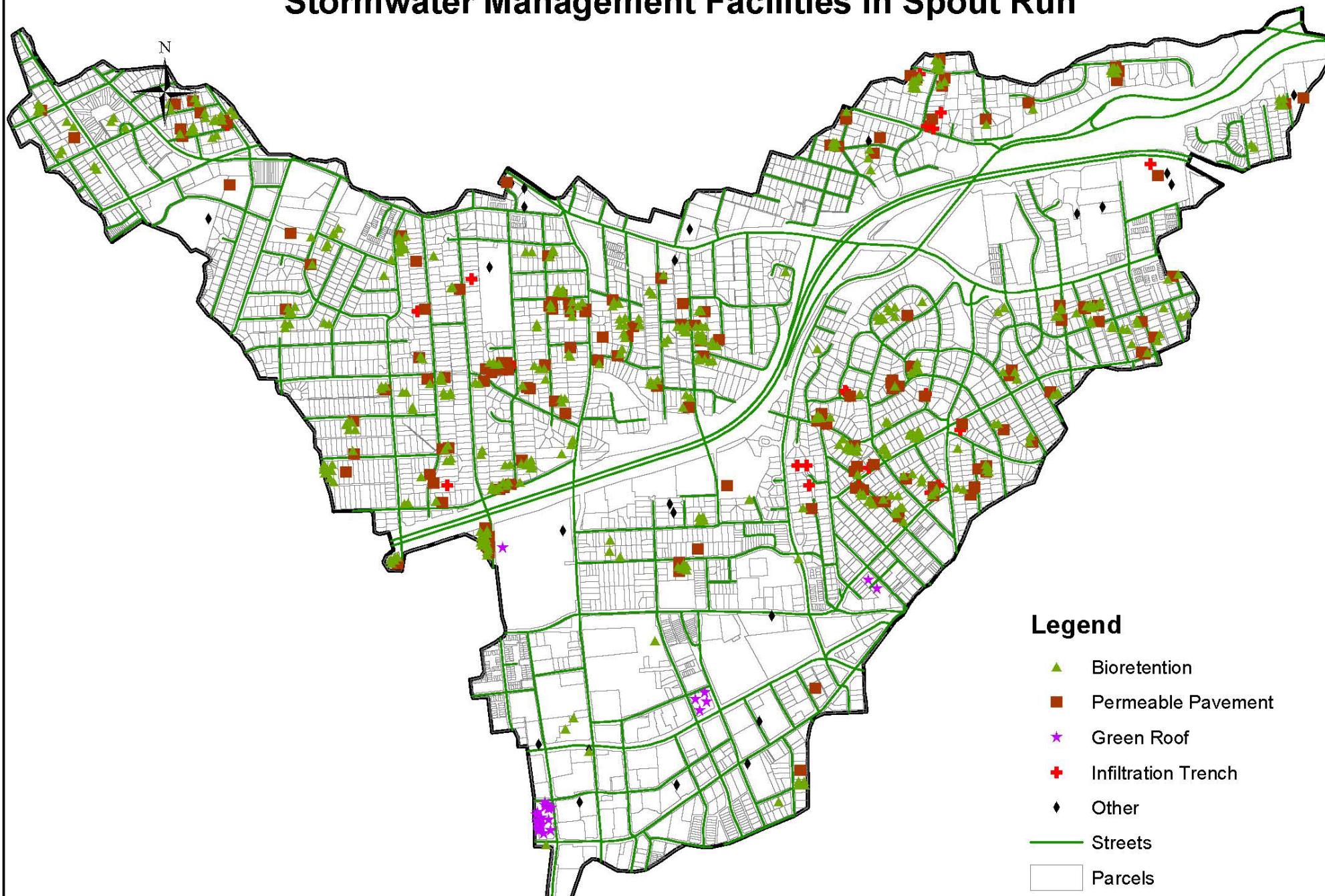
# Stormwater Management Facilities in Arlington County



## Legend

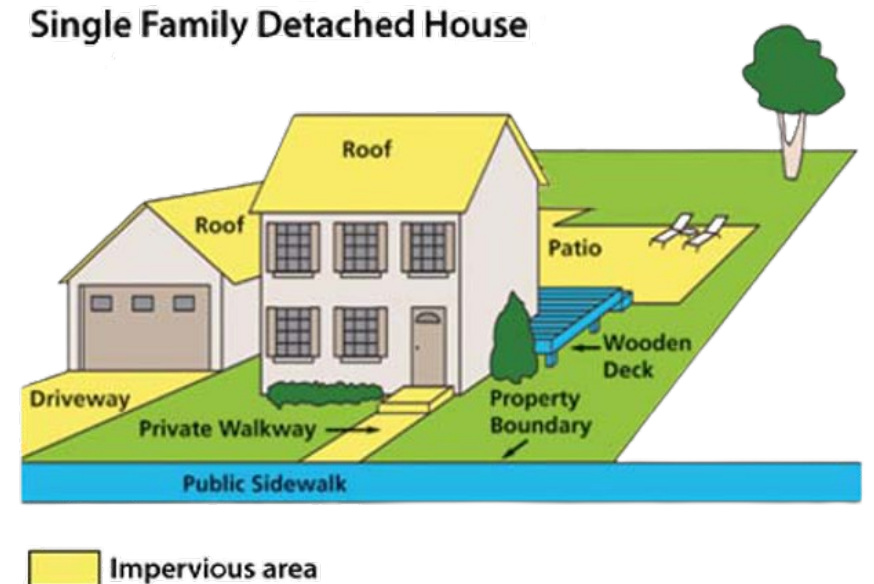
- ▲ Bioretention
- Permeable Pavement
- ✚ Infiltration Trench
- ★ Green Roofs
- ◆ Other
- Watersheds
- Arlington County

# Stormwater Management Facilities in Spout Run



# Stormwater Utility

- County is considering changing to a stormwater utility for funding the stormwater program
- Currently, property owners pay a stormwater tax based on property assessment
- Stormwater utility fee would instead be based on impervious cover on the lot (yellow areas on the diagram)
- Credit would be offered for actions taken to reduce runoff
- More information and resources on the web page



<https://bit.ly/ArlingtonStormwaterUtility>

# Risk Assessment and Management Plan (RAMP)

- Will deliver updated rainfall curves, 10 year design standard and 2040 and 2070 climate projections
- The RAMP maps critical community facilities in all sectors to support vulnerability and risk assessments, and allow mitigation planning.
- Map County's "urban" floodplains (outside FEMA floodplains)
- Measures both Flooding and Sea Level Rise/Storm Surge Risks
- Define and value risks from flooding
- Informs flood resilient design and construction standards





# Upcoming Zoning Study for Stormwater Facilities

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**Improve Consistency:** The Zoning Ordinance treats stormwater systems differently for public zoned sites (ex., parks, schools) and also differs from how other water utilities are treated

**Add Flexibility:** The current zoning regulations do not readily enable the use of certain stormwater stormwater system components

- **Zoning study will take place over the next 6 months.** Public meeting tentatively planned for late October/early November.
- Unrelated to this study, we are beginning work on a Flood Resilient Design Manual as well

# Path to a Flood Resilient Spout Run

**Questions?**

