

# Flood Resilient Arlington

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*Arlington Forest Civic Association*

2024



# Agenda

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- **Stormwater Program Elements**
- **Flooding Challenges**
  - Pivot to Flood Resilient Arlington
- **Strategies to Improve Capacity**
  - Blended Engineering
  - Multi-purpose use of public lands
- **Risk Assessment and Management Plan**
- **Stormwater Utility**



# Stormwater Program Elements



## Streams & Water Quality

- Stream resilience and repair, outfall repair, pond projects, green streets
- MS4 permit (regulatory TMDLs), pollution prevention, training and outreach, monitoring
- Managing stormwater from construction (LDA permits)
- Preserving resource protection areas (RPA)
- Routine maintenance



## Stormwater System Capacity

- Modeling, assessment, plan reviews
- System capacity projects
- Local drainage projects
- System repairs
- Channel maintenance
- Routine maintenance
- Floodplain management

# System Snapshot



**270**  
**miles**  
of pipes



**18,452**  
structures

*Includes:*  
8940 catch basins  
6780 manholes  
1251 grate inlets  
707 yard inlets  
774 end sections  
& end walls



**32**  
**miles**  
of streams



**45%**  
of County  
covered by  
impervious  
area



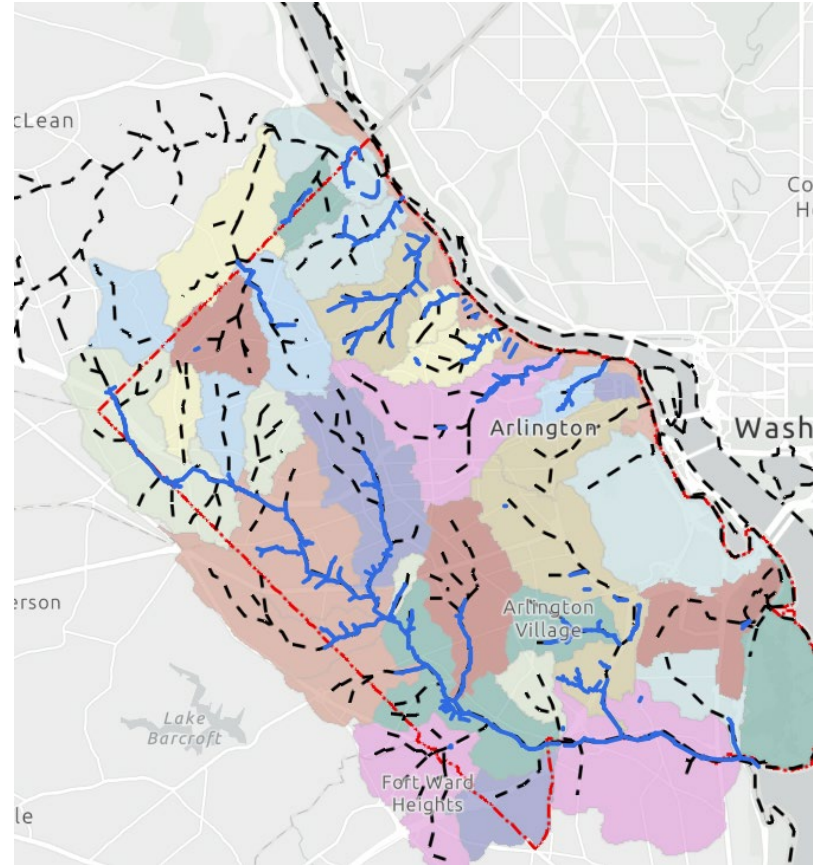
**243**  
public  
SWMFs

*\*included in  
'structures' total*



**8,017**  
private  
SWMFs

SWMF = Storm Water Management Facilities



# The Legacy, the Challenge, the Response

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# *Pivot to Flood Resilient Arlington*



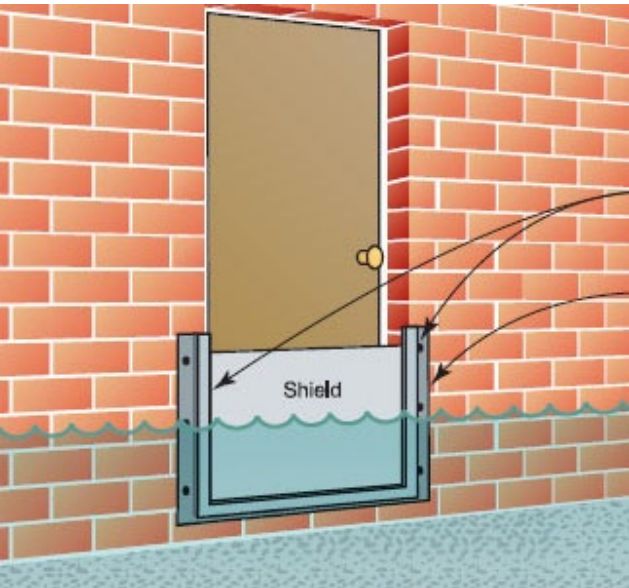
Analytics and Data Assessment



New Types and Locations for Capacity Projects



Increased Stormwater Requirements



Increased Funding

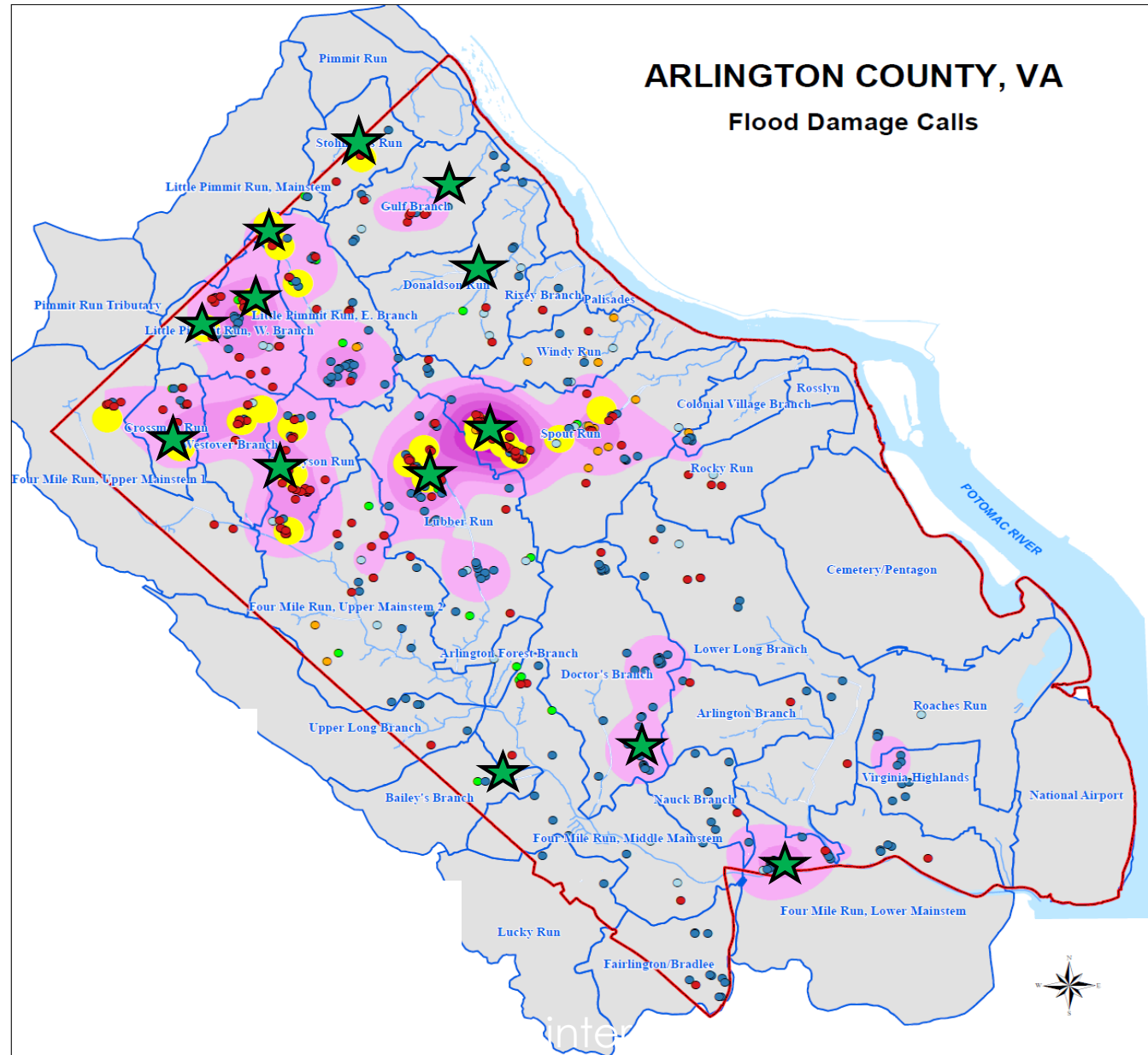


Voluntary Property Acquisition



Floodproofing Outreach

# Flood Risk Reduction Priority Areas



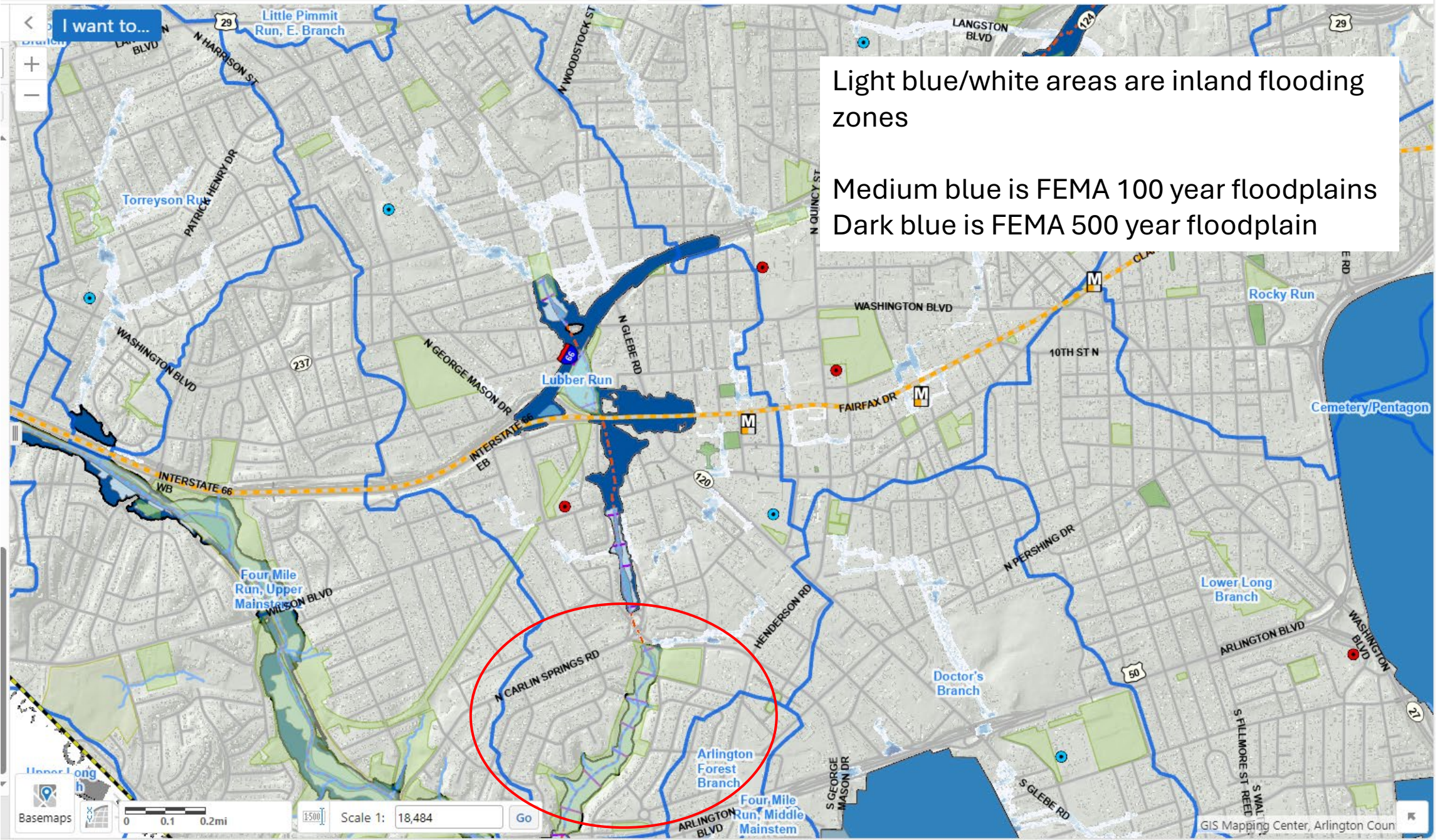
The five Critical Watersheds with the highest flood damage calls since June 2006:

- Torreyson Run/Westover
- Crossman Run
- Little Pimmit East and West
- Lubber Run
- Spout Run

I want to...



Light blue/white areas are inland flooding zones  
Medium blue is FEMA 100 year floodplains  
Dark blue is FEMA 500 year floodplain

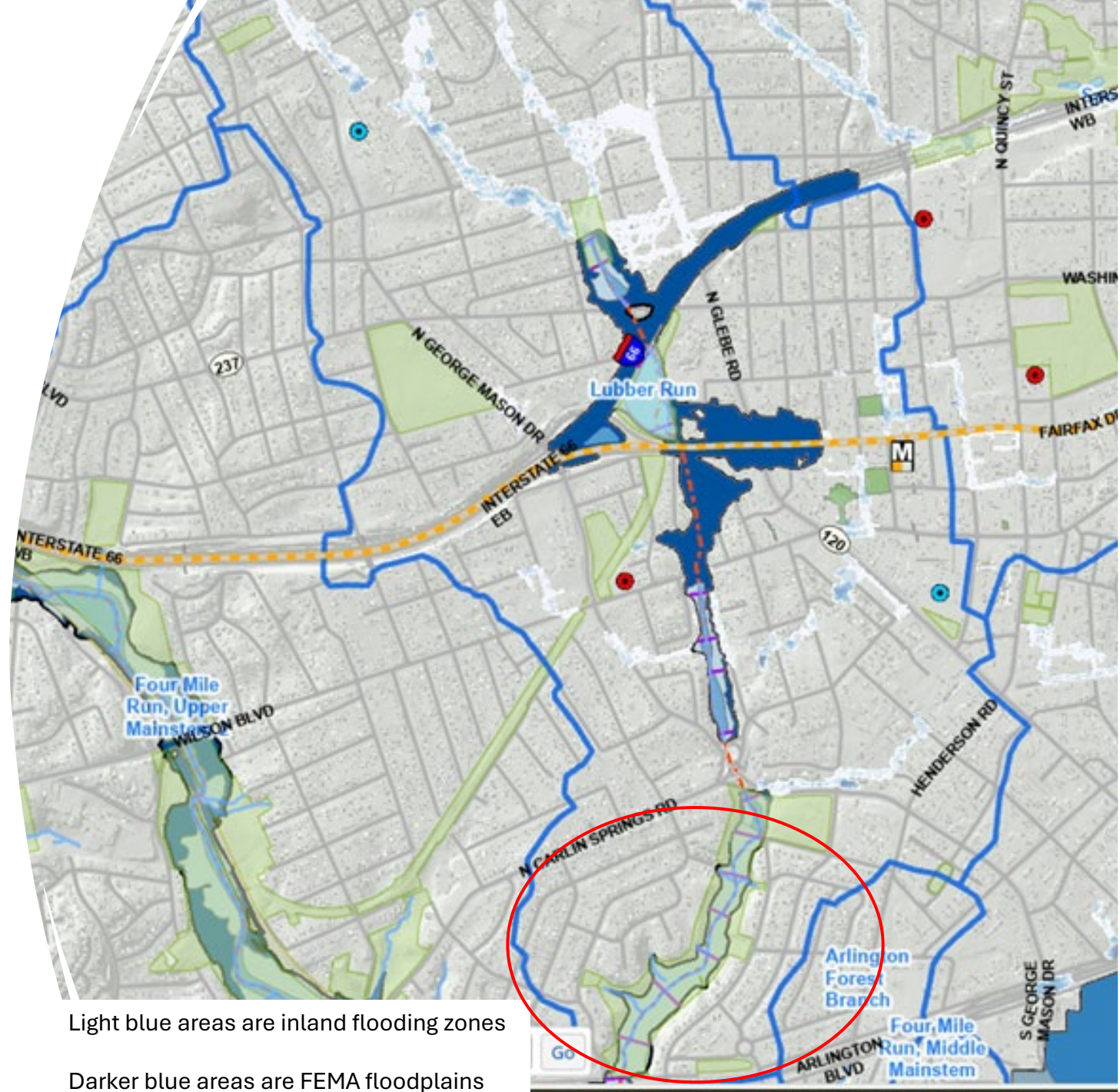




# Critical watersheds and strategy to reduce flood risk

Strategies for increasing system capacity include “blended engineering,” or a combination of:

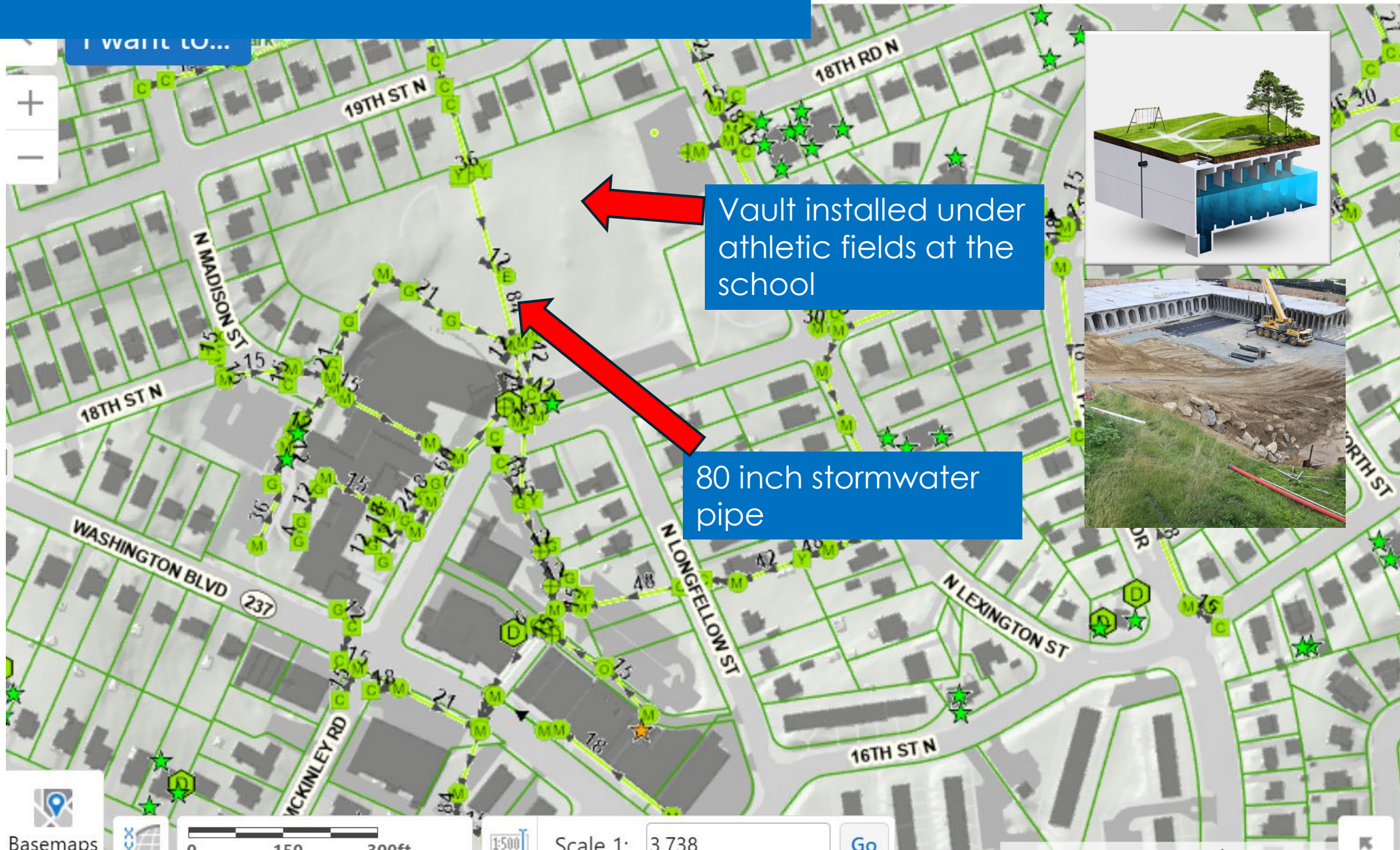
- Enlarging stormwater pipes or adding secondary pipes
- Adding storm drain inlets
- Stormwater detention
- Property acquisition
- Potential multi-purpose use of public lands



Light blue areas are inland flooding zones

Darker blue areas are FEMA floodplains

# Cardinal School Stormwater Vault



Vault installed under athletic fields at the school

80 inch stormwater pipe

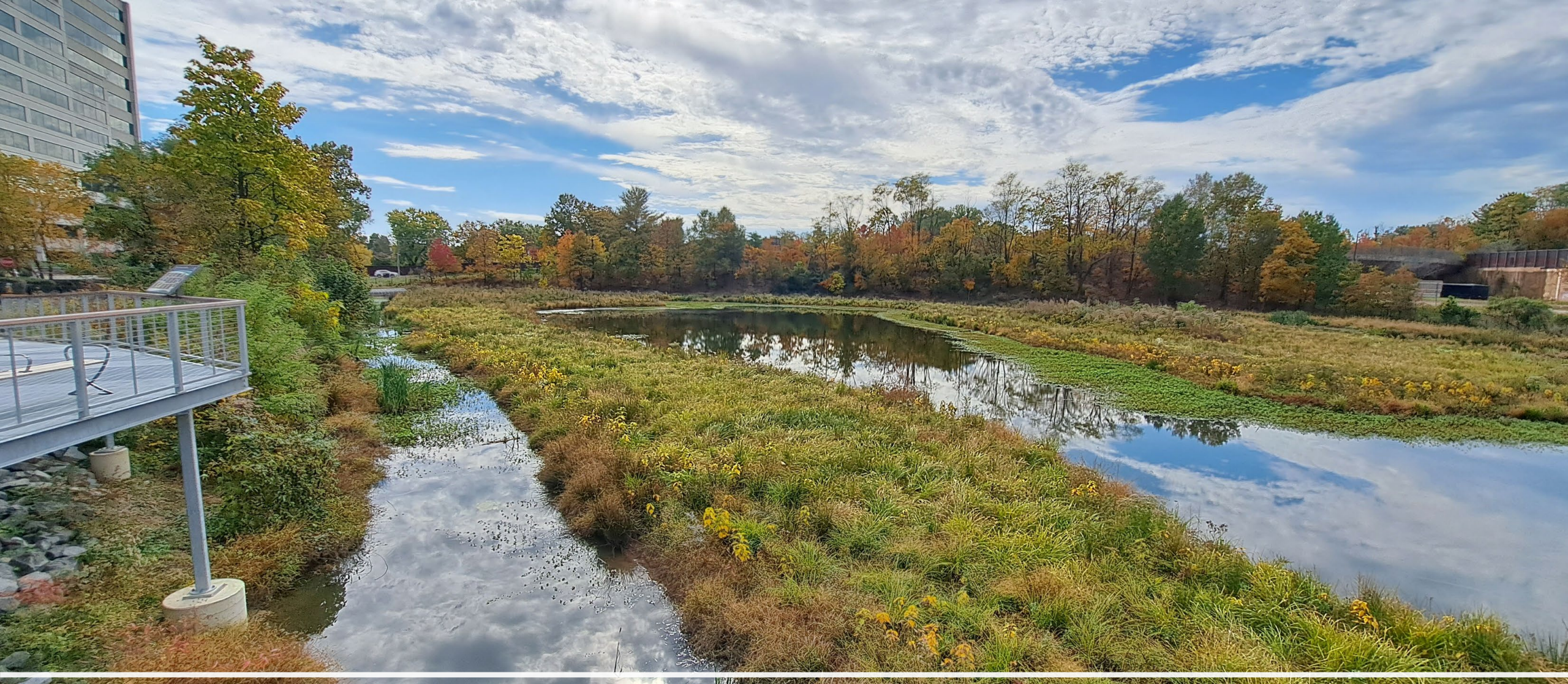


# Cardinal Elementary School Stormwater Vaults

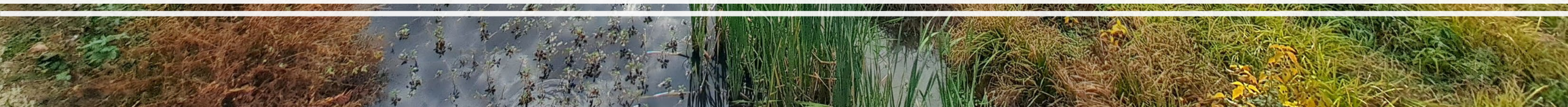
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- First project built under Flood Resilient Arlington initiative
- Effort to strategically use public land for multi-purpose goals
- Vault system can hold 4 million gallons of water, or six Olympic size swimming pools

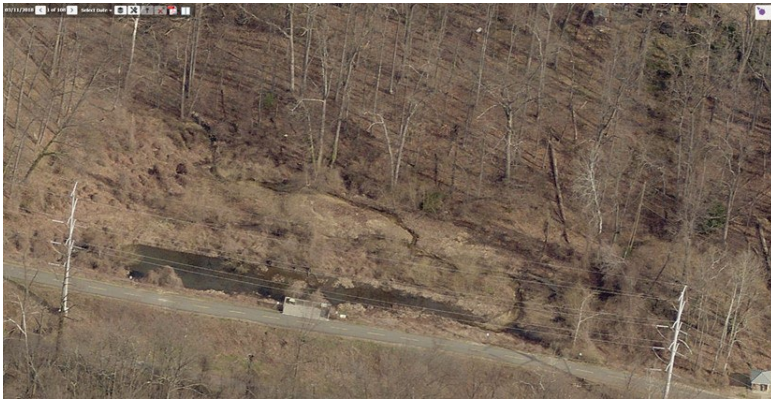




Ballston Wetland Park



# Sparrows Pond



# Quantity vs. Quality Stormwater Facilities

Both are important. They serve different purposes.



## Quality

- Goal is improving water quality and reducing runoff
- Manage smaller, everyday storms – less than 1 inch of rain. Manage water from 1-2 acres
- Overflow to stormwater system during larger storms



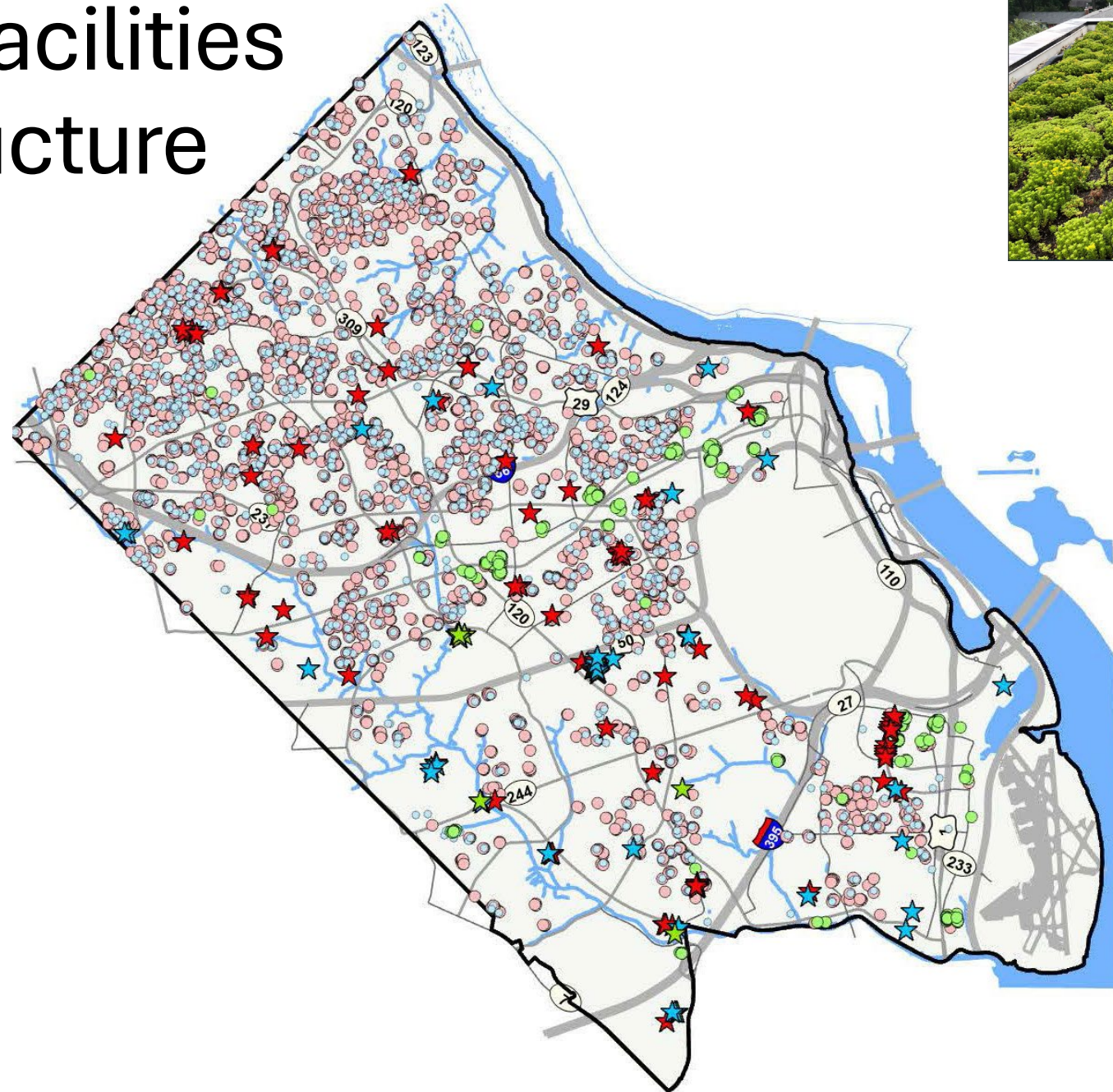
## Quantity

- Goal is flood mitigation
- Can contain up to 10 year storm
- Manage water from hundreds of acres (millions of gallons)

# Water quality facilities Green infrastructure

## Legend

- ★ Public Green Roof
- ★ Public Permeable Pavement
- ★ Public Bioretention
- Private Green Roof
- Private Permeable Pavement
- Private Bioretention
- County\_poly



A	B	C
Group Name	Value	Total Records
Private	8381	8381
School Board	128	128
Dept of Environmental Services	103	103
Dept of Parks and Recreation	98	98
Arlington Facilities Mgmt	49	49
Other	23	23

# RAMP-ING UP FOR STORMS

## RISK ASSESSMENT AND MANAGEMENT PLAN

RAMP, the County's Risk Assessment and Management Plan, is a comprehensive framework for modeling, measuring and reducing risk in the face of the increasing frequency and intensity of storms and flood-related impacts influenced or caused by climate change.

The RAMP has updated Arlington's climate projections for flooding, sea level rise and storm surge using 2040, 2070 and 2100 as the climate time horizons. Further, the RAMP has created inundation maps for each of the climate time horizons, identified Critical Government Facilities and completed Vulnerability and Risk Assessments for nine priority watersheds. The Risk Assessments combine economic, environmental and social risk; the latter designed to reflect vulnerability and risk specific to moderate- to high-Social Vulnerability Index communities.

# RAMP (Risk Assessment and Management Plan)

- Prior to the RAMP, flood mitigation planning used ATLAS 14, a NOAA tool to estimate precipitation amounts
- ATLAS 14 is outdated (2000) and also uses past and present storm/flood data only
- **The RAMP expands upon past and present data, with climate projections and modeling for 2040, 2070, and 2100**
  - RCP 8.5 with moderate forcing
  - Inland flooding, sea level rise, and storm surge
  - Present and future 2-D flood mapping within the key watersheds identified as flood-vulnerable

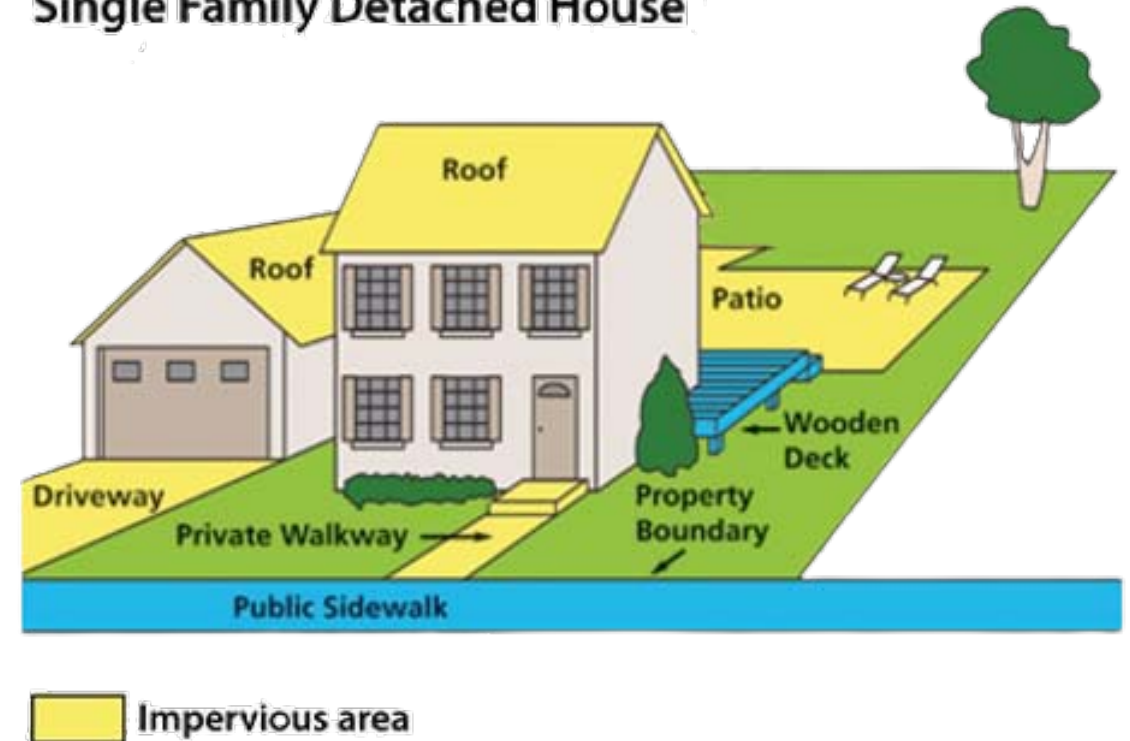
<https://storymaps.arcgis.com/collections/8d886f8ca5f1434f955091a3cf7a815f>



# Stormwater Utility Fee

- County has changed to from a tax to a stormwater utility fee for funding the stormwater program
- Since 2008, most property owners have paid part of real estate tax for stormwater program (based on property assessment)
- Stormwater utility fee is based on impervious cover on the lot
- Credit program opens for applications on December 16

Single Family Detached House



<https://bit.ly/ArlingtonStormwaterUtility>

# Single Family Residential Credits

<p><b>Mandatory Structural (Mandated by Statute)</b> 5 -15%</p>	<ul style="list-style-type: none"> <li>• Stormwater facilities installed as part of development (LDA permit)</li> <li>• Will receive automatic credit if in compliance with required inspection</li> <li>• Pre-2014 = 5%</li> <li>• Installed after 2014:             <ul style="list-style-type: none"> <li>▪ Less than 1 acre = 10%</li> <li>▪ Over 1 acre = 15%</li> <li>▪ LDA 2.0 = 15%</li> </ul> </li> </ul>
<p><b>Voluntary Actions</b> 5% each</p>	<ul style="list-style-type: none"> <li>• Conservation landscaping, 150 ft<sup>2</sup> (new, ongoing credit)</li> <li>• Tree planting, 1-3 trees (new, annual credit)</li> <li>• Rainwater collection, 100 gallons (new or existing, ongoing credit)</li> </ul>
<p><b>Voluntary Actions</b> 10% each</p>	<ul style="list-style-type: none"> <li>• Rain garden, 100 ft<sup>2</sup> (new or existing, ongoing credit)</li> <li>• Permeable driveway, 150 ft<sup>2</sup> (new or existing, ongoing credit)</li> </ul>
<p><b>Maximum Credit = 35% per property</b></p>	

# Multi-family and Non-Residential Credits

<p><b>Mandatory Structural</b> <i>(Mandated by Statute)</i> 5 -15%</p>	<ul style="list-style-type: none"> <li>• Stormwater facilities installed as part of development (LDA permit)</li> <li>• Will receive automatic credit if in compliance with required inspection</li> <li>• Pre-2014 = 5%</li> <li>• Installed after 2014:             <ul style="list-style-type: none"> <li>▪ Less than 1 acre = 10%</li> <li>▪ Over 1 acre = 15%</li> <li>▪ LDA 2.0 = 15%</li> </ul> </li> </ul>
<p><b>Voluntary Actions</b> 5% each</p>	<ul style="list-style-type: none"> <li>• Conservation landscaping, 300 ft<sup>2</sup> (new, ongoing credit)</li> <li>• Tree planting, 4 trees (new, annual credit)</li> <li>• Stormwater education event (annual credit)</li> <li>• Storm drain marking (annual credit)</li> </ul>
<p><b>Voluntary Actions</b> 10% each</p>	<ul style="list-style-type: none"> <li>• Rain garden, 200 ft<sup>2</sup> (existing or new, ongoing credit)</li> <li>• Permeable parking lot/driveway, 300 ft<sup>2</sup> (existing or new, ongoing credit)</li> <li>• Adopt-a-Street, 30 hours (annual credit)</li> <li>• Stream clean-up, 30 hours (annual credit)</li> <li>• Invasive plant removal, 30 hours (annual credit)</li> <li>• Parking lot/private street sweeping (annual credit)</li> </ul>
<p align="center"><b>Maximum Credit = 35% per property</b></p>	

# Stormwater Utility Credit Program

- In total, 5,706 properties (9%) of the 63,958 billable properties received voluntary and/ or mandatory credits.
  - 2,061 properties receiving voluntary credits
  - 3,645 properties received mandatory credits
  - [Detailed summary of credit program](#)

## **How to apply for credit video:**

<https://www.youtube.com/watch?v=7AeuN86PHp8>

## **Credit program screening tool**

<https://us.openforms.com/Form/925e56dc-619e-4518-9258-448e49dd0932>

# Questions?

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