

# Watershed Planning Workshop

Upper Four Mile Run, Gulf Branch  
and Donaldson Run

March 18, 2010

Langston Brown Community Center



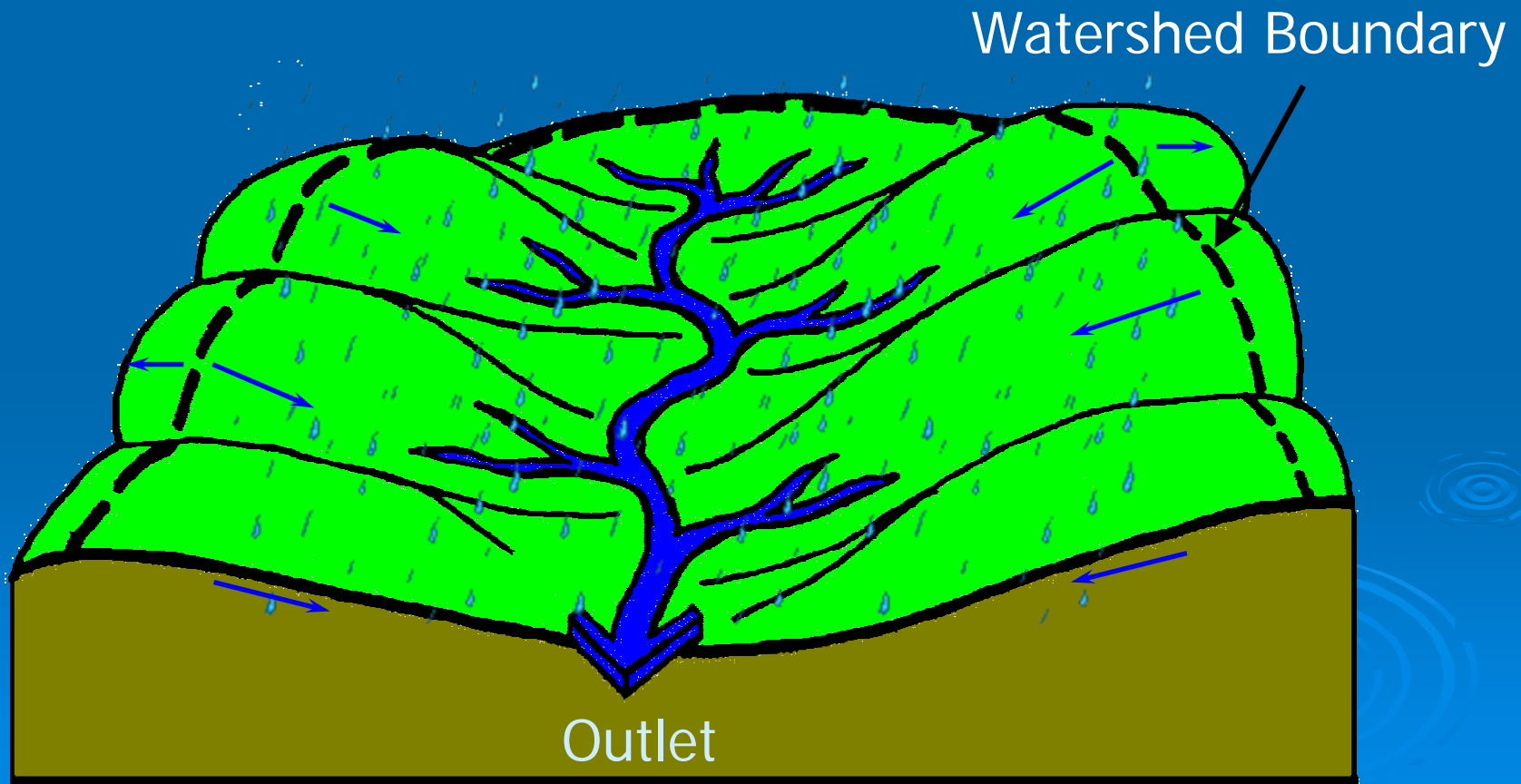
ARLINGTON  
VIRGINIA

# Outline

- Overview of Arlington's Watersheds
- Watershed Management in Arlington
- Gulf Branch/Donaldson Run
- Crossman Run/Torreyson Run/Westover Branch
- Taking Action

# What is a Watershed?

Area of land where all of the water drains into a common body of water, also referred to as “drainage basins.”



# Arlington's watersheds



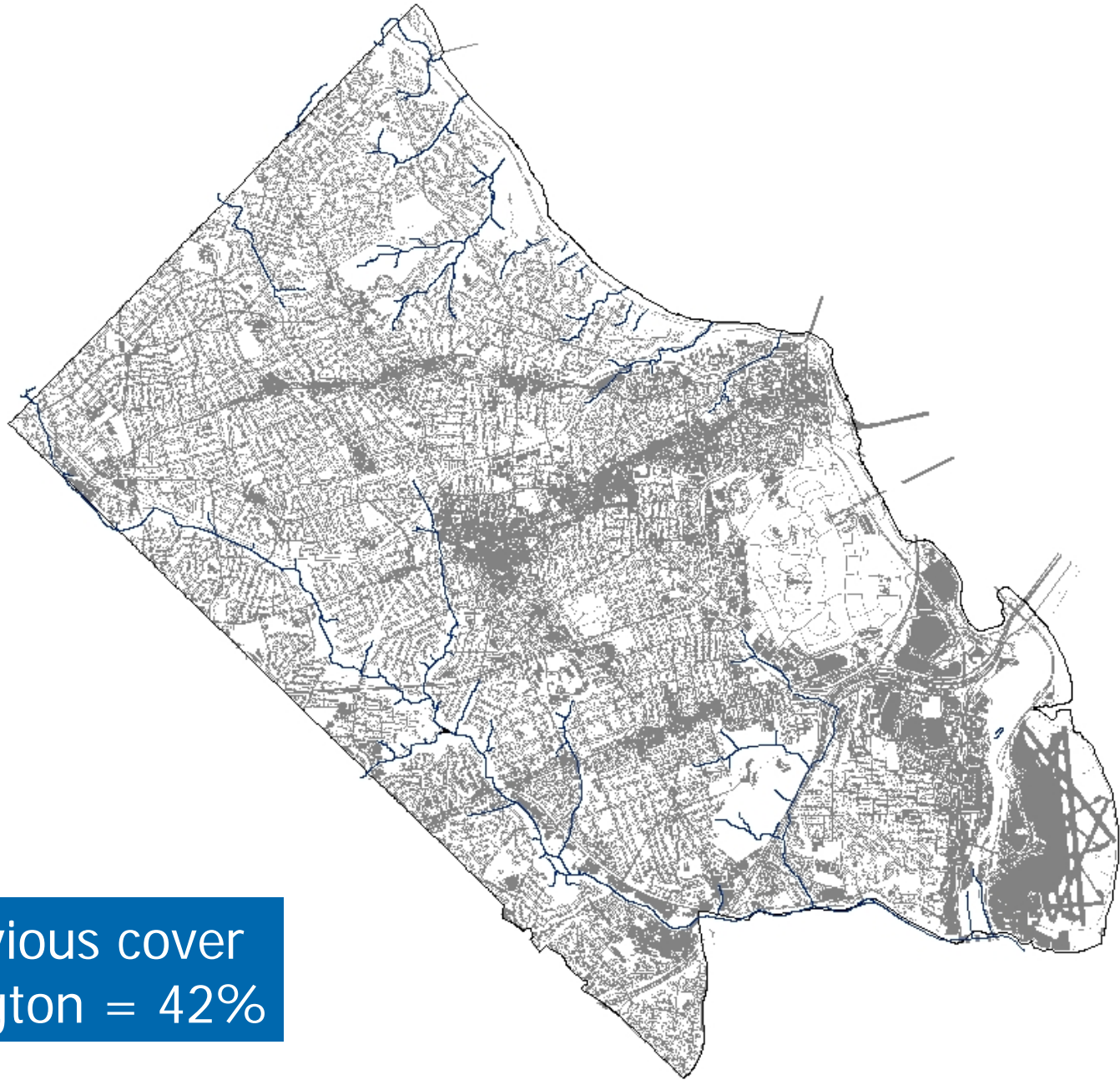
# Chesapeake Bay watershed



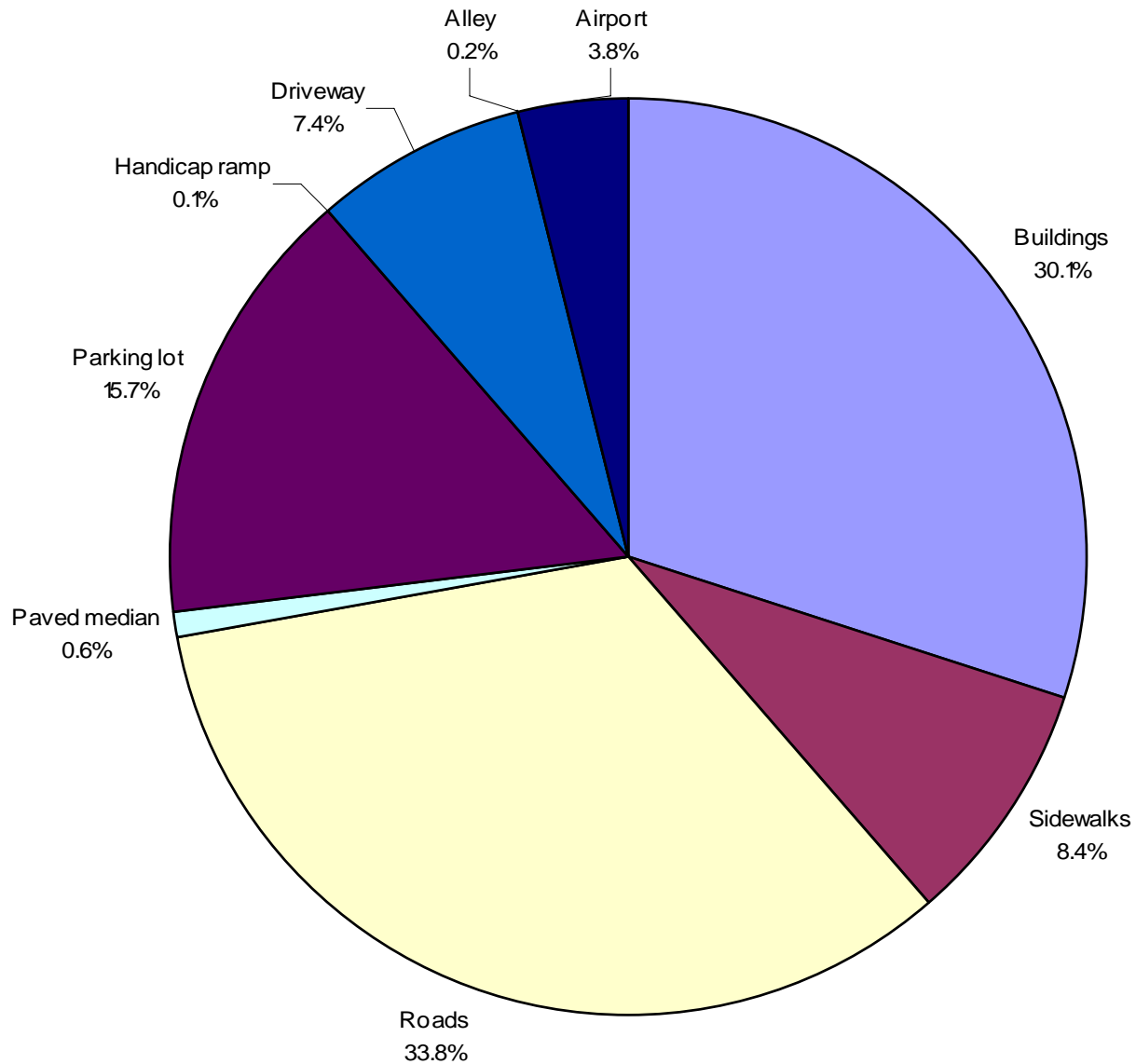
# Arlington Watershed Facts

- 2009 Census: 209,300 people
- 26.5 square miles
- 7,898 persons/square mile
- 42% impervious cover
- 334 miles of storm sewers
- 28.5 miles of perennial streams
- Potomac and Chesapeake Bay drainages

Impervious cover  
in Arlington = 42%

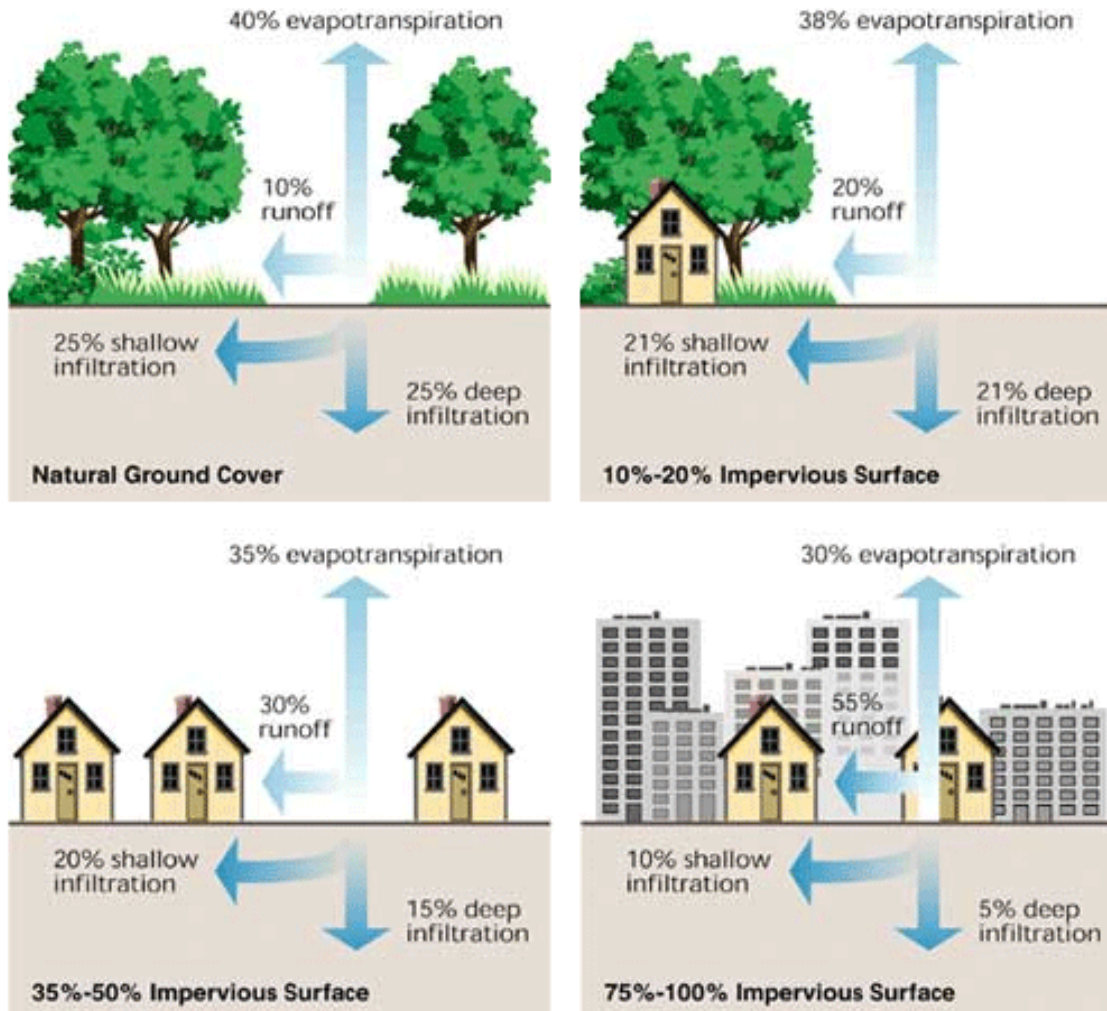


# Impervious cover in Arlington County - 2007





# Effect of Urbanization on Watersheds



↑ Impervious surface

↑ Runoff speed and volume

↓ Water Quality

↓ Groundwater supply



# Effect of Urbanization on Watersheds



- Sensitive: 0-10% impervious surfaces
- Impaired: 10-25%
- Non-supporting: 25% or more

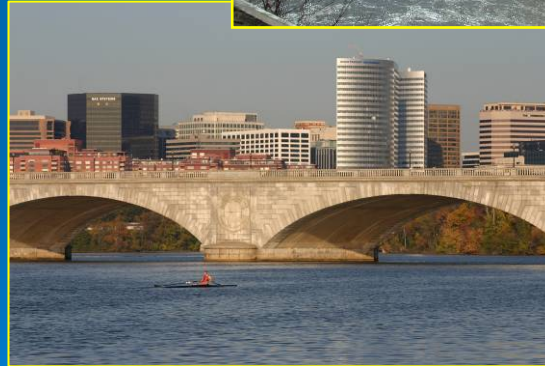
Storm drain to local stream...



*Water in storm drains does not go to a treatment plant...*



To the Potomac River



On to the Chesapeake Bay



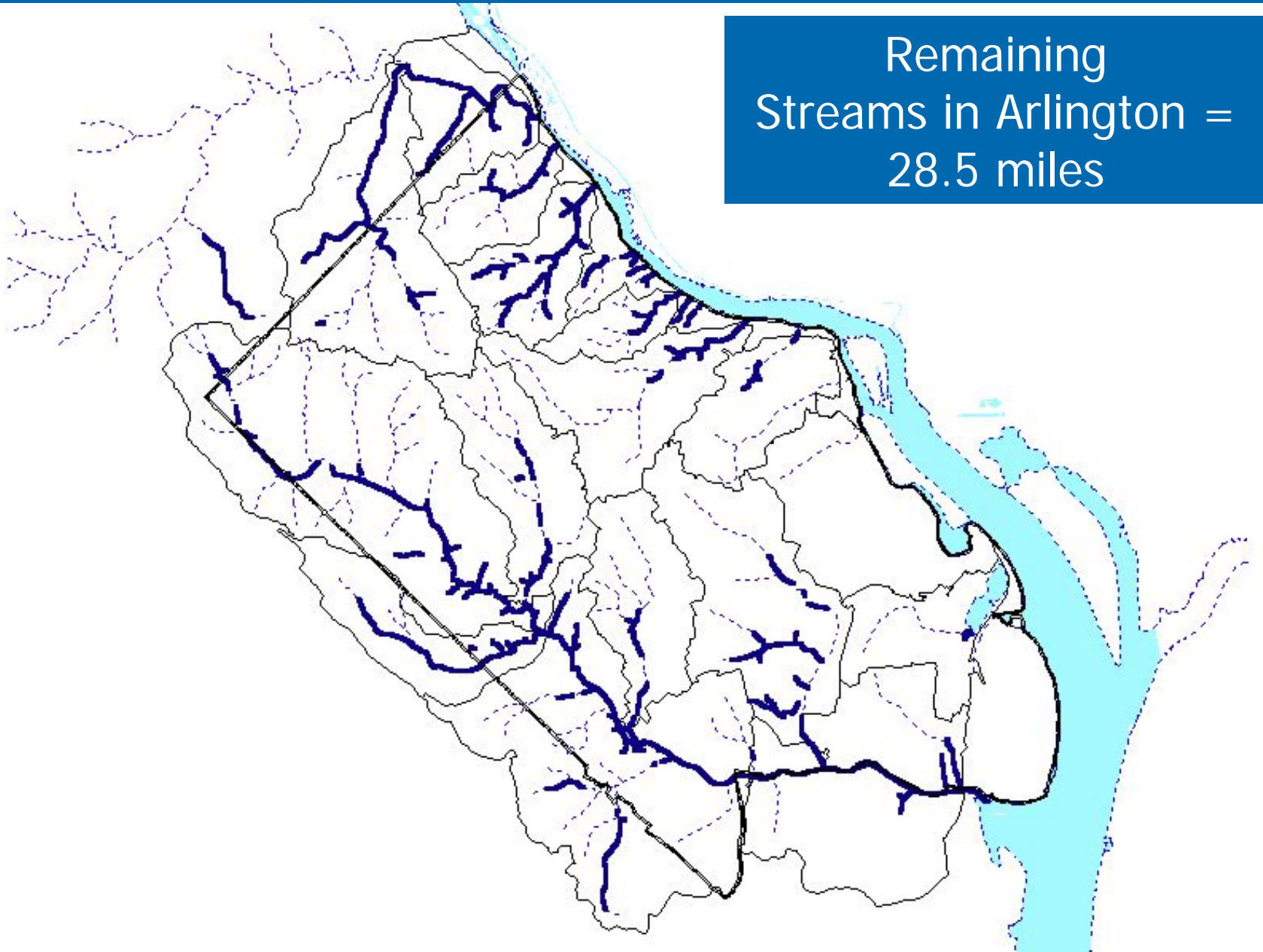


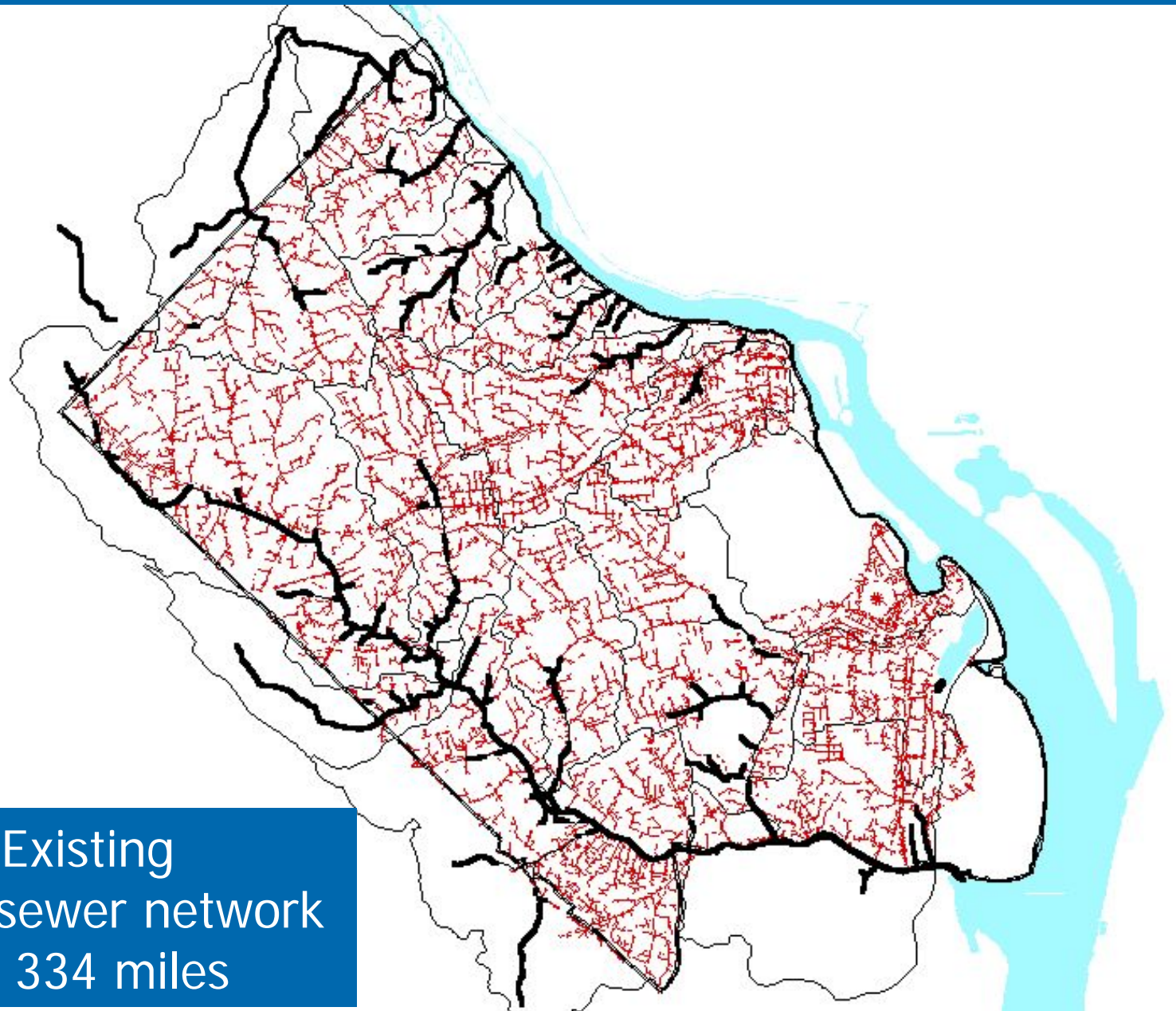
# Sediment and Nutrients






Remaining  
Streams in Arlington =  
28.5 miles





Existing  
storm sewer network  
= 334 miles

# Arlington's Stormwater Challenges

- Must work within limits imposed by existing land use and historic drainage decisions
  - Aging infrastructure
  - Insufficient system capacity
  - Degraded water quality and stream corridors
  - Tightening state and federal regulations
  - Climate change
- 



# Water Quality and Stream Corridor Challenges

- Most development occurred before regulations that protect water quality and streams
- County streams are heavily impacted
- Existing development has much greater impact on stream ecology and infrastructure than new development



# Stormwater Program Goals

The County's Stormwater Management program seeks to balance the following goals:

- Reduce the potential for stormwater threats to public health, safety, and property;
- Reduce the impacts of new and existing urban development on Arlington streams, the Potomac River and the Chesapeake Bay; and,
- Comply with State and Federal stormwater, water quality, and floodplain management regulations.

# Arlington's Stormwater Strategy

- Implement urban housekeeping 'best practices' (e.g., street sweeping, catch basin cleaning, pollution prevention, etc.)
- Outreach and education
- Protect public/private property from flooding
- Maintain stormwater infrastructure
- Institute and enforce development requirements for on-site stormwater controls
- Restore stream corridors
- Monitoring
- **Implement watershed retrofits**

# Retrofits

A retrofit is a stormwater management facility designed to store, infiltrate, and/or filter stormwater runoff from a contributing drainage area for which a stormwater management facility currently does not exist.

- Along with redevelopment and stream restoration, stormwater retrofits provide our best opportunities to improve watershed health.

# Stormwater Master Plan Update

- Stormwater Master Plan (1996) and Watershed Management Plan (2001) will be updated and combined into a comprehensive Master Plan.
  - **Storm Sewer Capacity Analysis** to study the County's current storm sewer pipes.
  - **County-wide stream inventory** to assess stream conditions and prioritize stream restoration projects.
  - **Watershed retrofit plans** to identify locations where stormwater treatment facilities can be added to help slow down and filter stormwater runoff.

# Watershed Retrofit Planning in Arlington

- Little Pimmit Run – East and West Branch
- Initiated May 2008
- Completed December 2009
- First projects are in design
- <http://www.arlingtonva.us/departments/EnvironmentalServices/cpe/page60407.aspx>



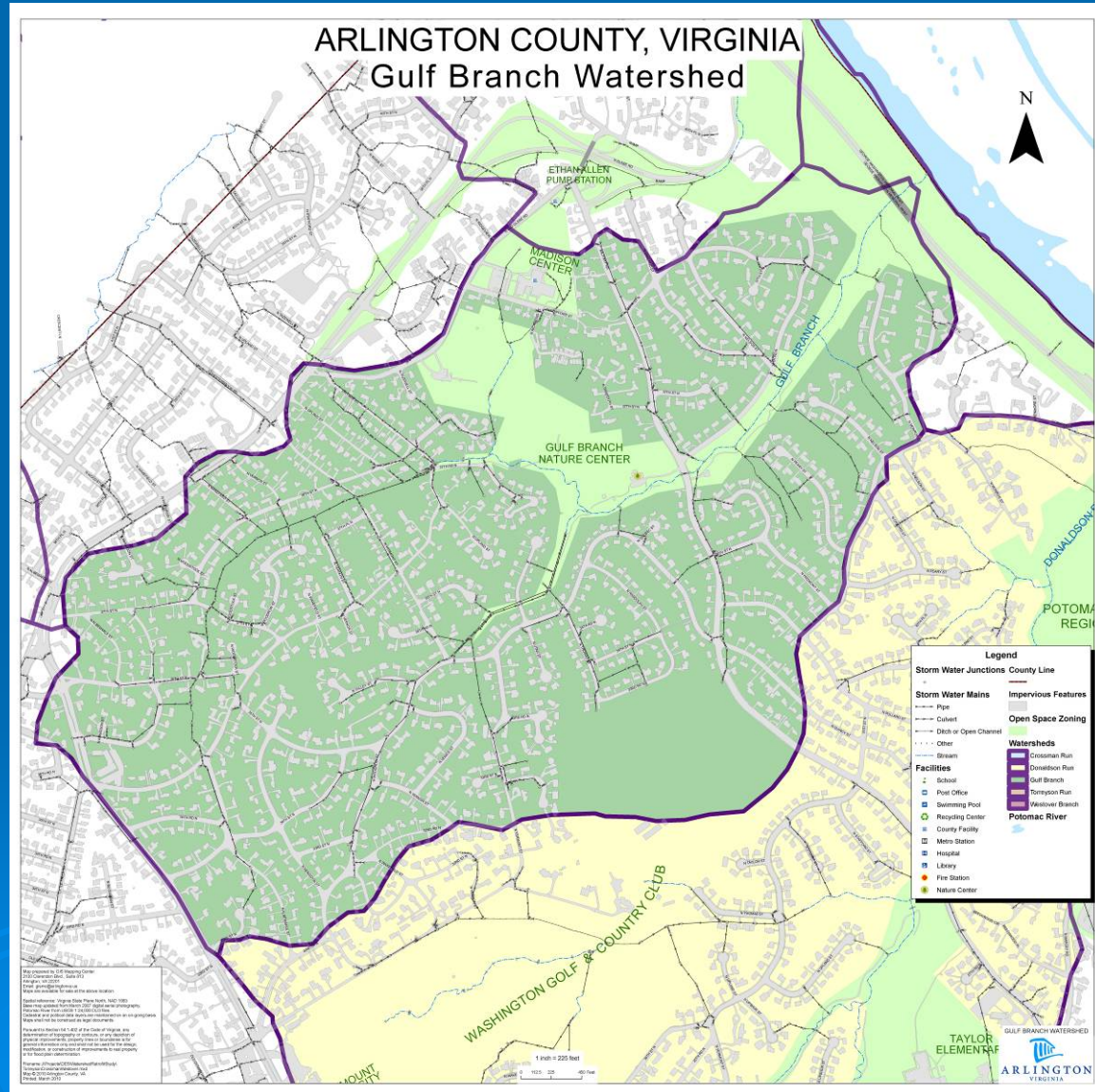
# Watershed Planning Areas



# Gulf Branch Watershed

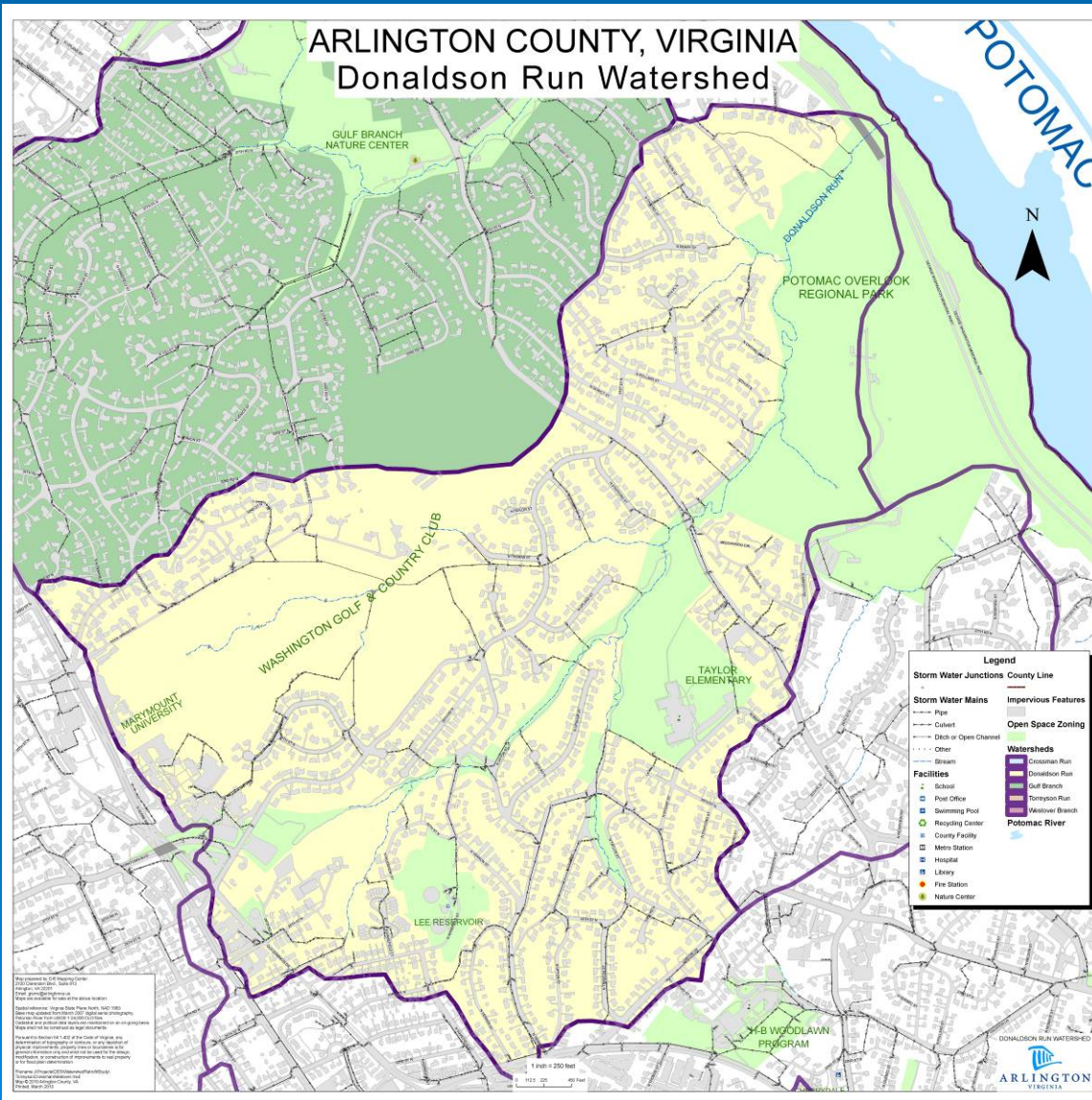
## ➤ Gulf Branch

- 530 acres
- 1.3 mi stream
- 8.8 mi storm sewer





# Donaldson Run Watershed



## ➤ Donaldson Run

- 656 acres
- 3.5 mi stream/  
open channel
- 7.4 mi storm sewer

# Land Use

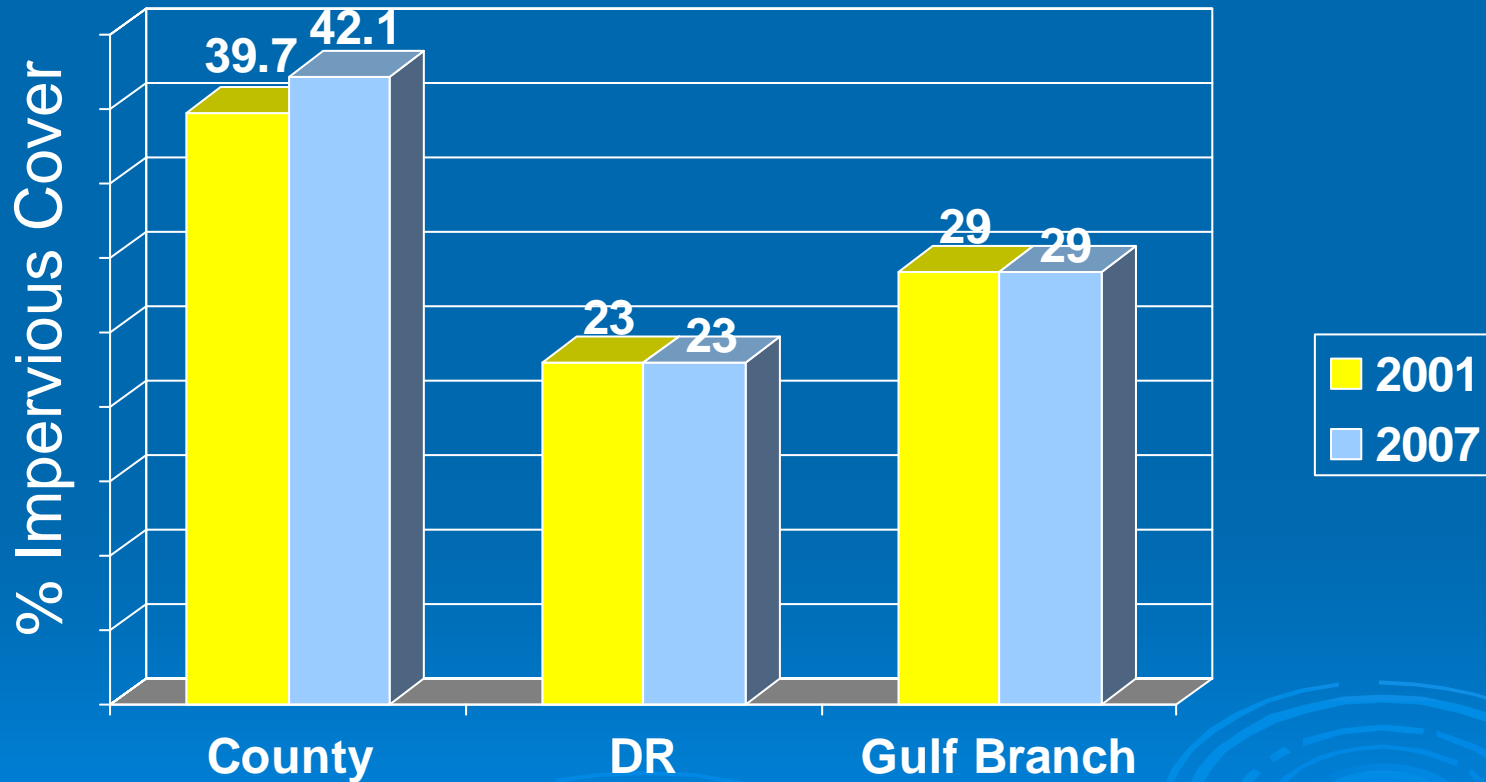
## Gulf Branch/Donaldson Run

Source: 2001 Watershed Management Plan

- **Primarily single-family residential**
    - Gulf Branch - 78 %
    - Donaldson Run – 57 %
  
  - **Remainder public/semi-public (parks, schools, etc.)**
    - Gulf Branch - 20 %
    - Donaldson Run – 40 %
  
  - **Little new development expected**
    - <2 % vacant/developable land in both watersheds
- 
- **County-wide**
    - 47 % single-family residential; 13% medium/high density
    - 29% public/semi-public
    - 6 % commercial
    - <4 % vacant/developable land

# Impervious Surface Data

## Gulf Branch/Donaldson Run



# Impervious Surface Data

## Gulf Branch/Donaldson Run

### ➤ Gulf Branch

- Streets = 38%
- Buildings = 37%
- Driveways = 18%
- Parking lots = 1%
- Sidewalks = 6%

### ➤ Donaldson Run

- Streets = 35%
- Buildings = 39%
- Driveways = 14%
- Parking lots = 6%
- Sidewalks = 6%

### ➤ County-wide average

- Streets = 34%
- Buildings = 30%
- Driveways = 7%
- Parking lots = 16%
- Sidewalks = 8%

Impervious surfaces are both public and private. There is a shared responsibility for the problem and the solution!



# Considerations and Challenges

## Gulf Branch/Donaldson Run

- Gulf Branch less impacted than other watersheds in the county (County Stream Inventory, 2000).
- Stream restoration along Donaldson Run.
- High proportion of public/semi-public land in the Donaldson Run watershed could provide retrofit opportunities.
- Streets and private roofs make up the majority of the impervious area. Driveways are also significant.
- Both private and public efforts are needed!

# ARLINGTON COUNTY, VIRGINIA

## Torreyson Run, Crossman Run, & Westover Branch Watersheds



**Legend**

**Storm Water Junctions County Line**

- Storm Water Junctions
- County Line

**Storm Water Mains**

- Pipe
- Culvert
- Ditch or Open Channel
- Other

**Facilities**

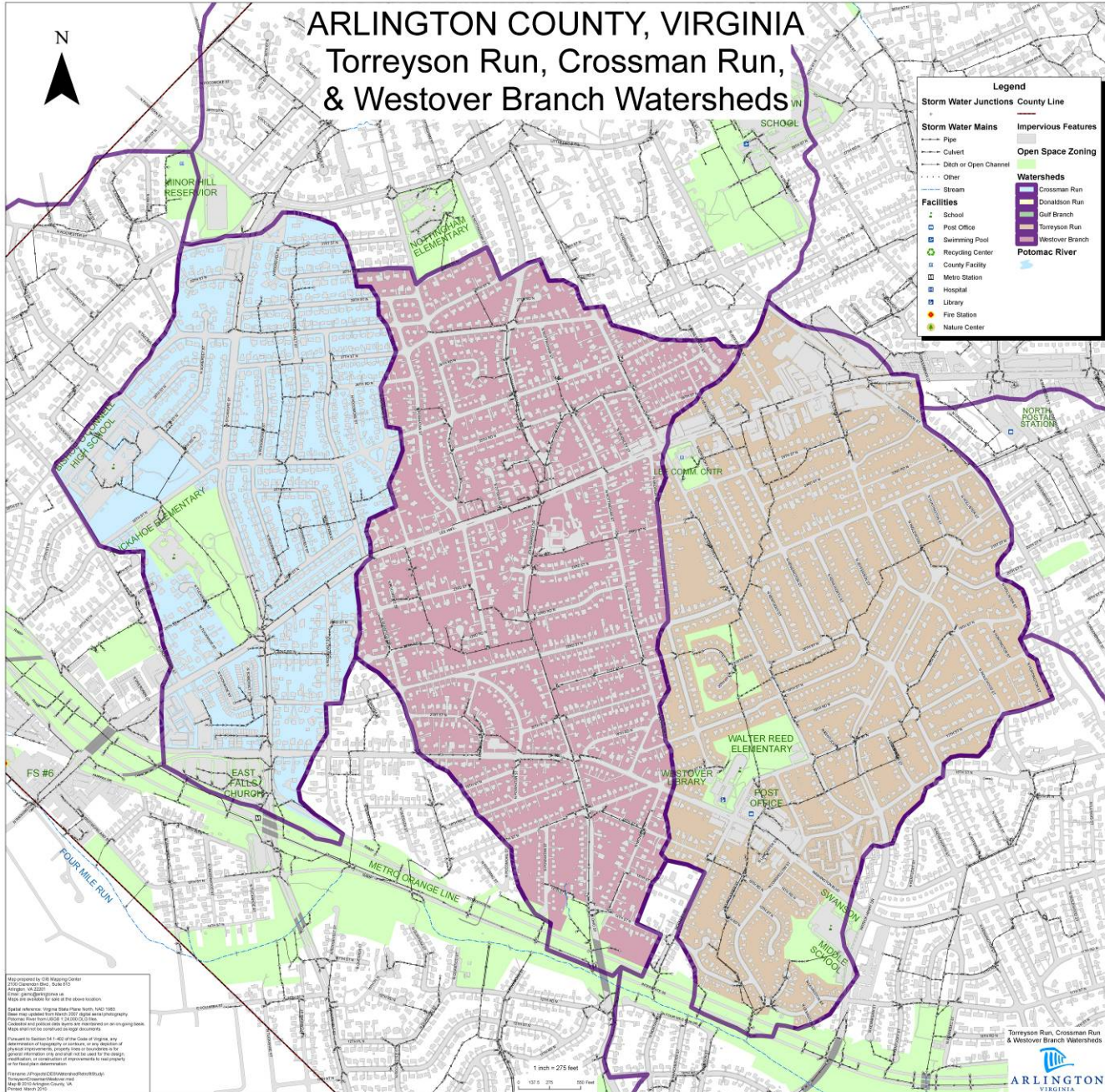
- Stream
- School
- Post Office
- Swimming Pool
- Recycling Center
- County Facility
- Metro Station
- Hospital
- Library
- Fire Station
- Nature Center

**Impervious Features**

**Open Space Zoning**

**Watersheds**

- Crossman Run
- Crossman Run
- Gulf Branch
- Torreyson Run
- Westover Branch
- Potomac River



Map prepared by GIS Mapping Center  
 2100 Cameron Blvd., Suite 412  
 Fairfax, VA 22031  
 Email: gis@arlingtonva.gov  
 Date: 08/06/2015

Scale: 1 inch = 275 feet

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1 inch = 275 feet

0 100 200 Feet

# Watershed Facts

## Crossman Run, Westover Branch and Torreyson Run

- Part of the Upper Four Mile Run watershed area.
- Four Mile Run system – drains 60% of the County.
- Streams for the most part are piped or filled.

### ➤ Crossman Run

- 228 acres
- 4.6 mi storm sewer

### ➤ Torreyson Run

- 325 acres
- 0.1 mi open channel
- 5.2 mi storm sewer

### ➤ Westover Branch

- 301 acres
- 0.1 mi stream
- 5.8 mi storm sewer



# Land Use

## Crossman Run, Westover Branch and Torreyson Run

Source: 2001 Watershed Management Plan

### ➤ Upper Four Mile Run

- Primarily single-family residential – 72 %
- Medium/High density – 3 %
- Less public/semi-public land than average – 20 %
- 3 % Commercial/industrial
- <2 % Developable/vacant land

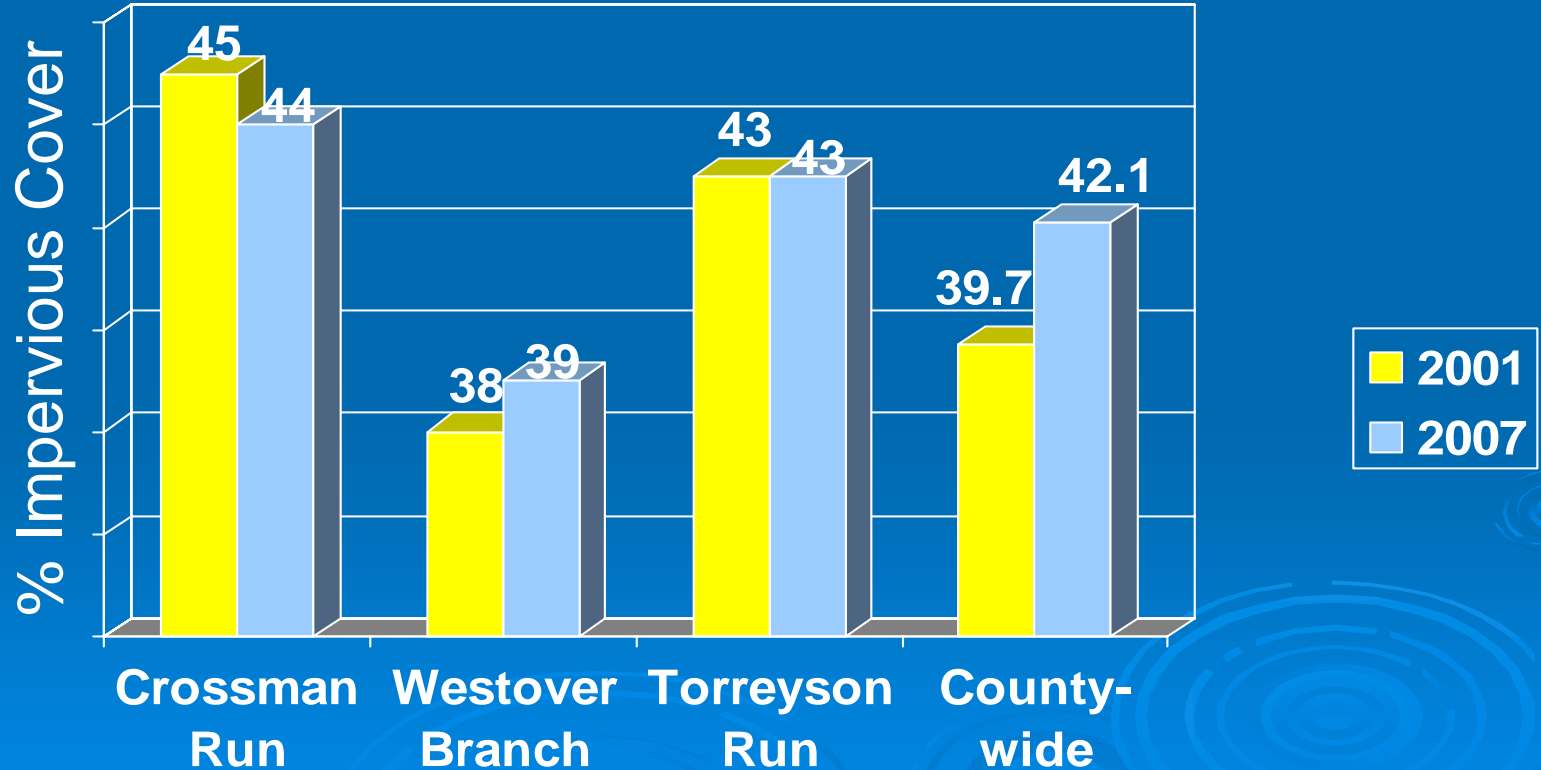
### ➤ County-wide

- 47 % single-family residential; 13 % medium/high density
- 29 % public/semi-public
- 6 % commercial/industrial
- < 4 % developable/vacant land



# Impervious Surface Data

## Crossman Run, Westover Branch and Torreyson Run



# Impervious Surface Data

## Crossman Run, Westover Branch and Torreyson Run

### ➤ Crossman Run

- Streets = 38%
- Buildings = 31%
- Driveways = 10%
- Parking lots = 13%
- Sidewalks = 8%

### ➤ Westover Branch

- Streets = 42%
- Buildings = 36%
- Driveways = 14%
- Parking lots = 2%
- Sidewalks = 6%

### ➤ Torreyson Run

- Streets = 37%
- Buildings = 34%
- Driveways = 10%
- Parking lots = 11%
- Sidewalks = 8%

Impervious surfaces are both public and private. There is a shared responsibility for the problem and the solution!



# Considerations and Challenges

## Crossman Run, Westover Branch and Torreyson Run

- High percentage impervious cover.
- Below average amount of public/semi-public land – 20 %.
- Commercial areas may include pollutant “hotspots.”
- Streets and private/commercial roofs, make up the majority of the impervious area. Parking lots also significant.
- Both public and private efforts are needed!

# Opportunities for streetscape retrofits?



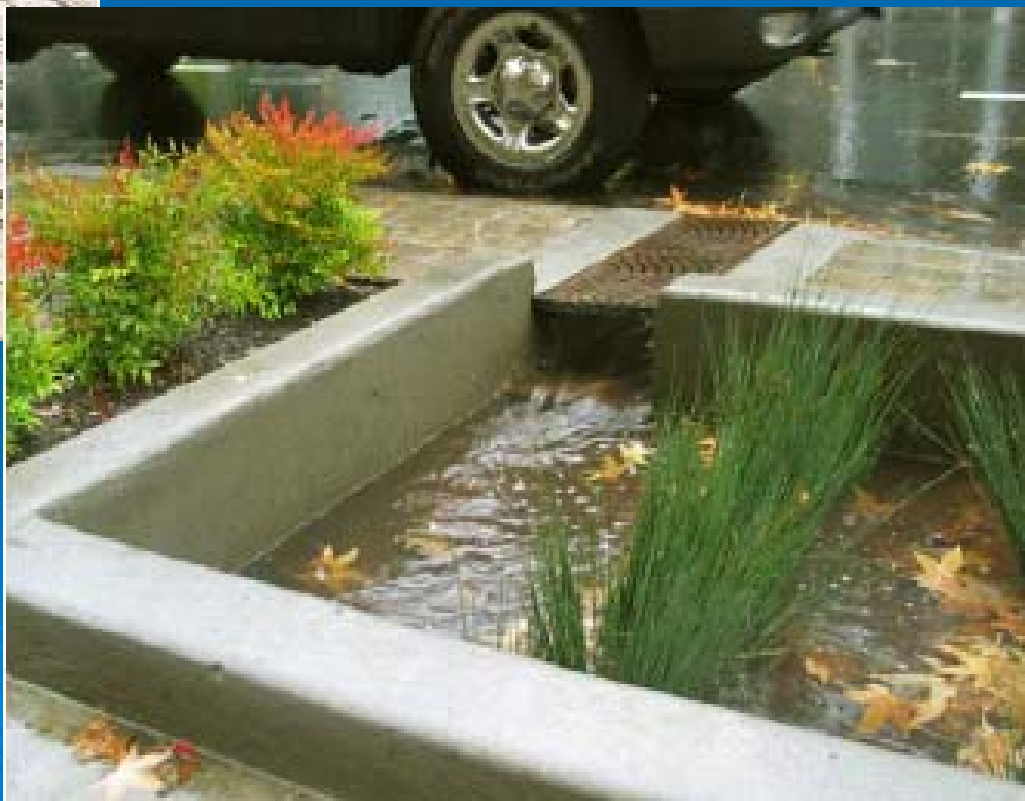
- **Can we?**
  - **Narrow streets**
  - **Use medians and islands**
  - **Convert to pervious pavement**



# Green streets



# Green streets





# Homeowner retrofit examples



Cistern



Rain Garden



## Homeowner retrofit examples



Rain Barrel(s)



Pervious Pavement

# Upcoming Workshops

Saturday, March 27th, 9:30 – 12:30 AM

## **Rain Gardens for Homeowners**

Learn how to properly locate, design, construct and maintain a small-scale rain garden.

Green Spring Gardens Park, Alexandria, VA

Workshop fee is \$20. Please call ahead to register at 703.642.5173.

Thursday, April 8th, 7:30 – 9:00 PM

## **Build Your Own Rain Barrel**

Williamsburg Middle School Cafeteria, Arlington, VA

Materials fee: \$50. Register on-line at

<http://www.arlingtonenvironment.org/barrel.php>

# Limitations of Watershed Retrofits

- Watershed retrofits will be implemented and will accrue benefits incrementally over the long-term.
- Even cumulatively, retrofits in urban watersheds generally cannot store enough runoff to solve current flooding, infrastructure and stream erosion problems.
- County must also pursue near-term efforts that directly address property flooding, infrastructure concerns and stream damage.

# Questions??

## ➤ Contact info:

- Phone: (703) 228-3588
- Email: [cjolicoeur@arlingtonva.us](mailto:cjolicoeur@arlingtonva.us)
- Web: [www.arlingtonva.us](http://www.arlingtonva.us)

Residents

Environment

Watershed Management

<http://www.co.arlington.va.us/departments/EnvironmentalServices/epo/page74076.aspx>