

# Green Streets

Environmentally Friendly Landscapes  
for Healthy Watersheds

**Cannon Road and  
Surrounding  
Neighborhood**



**Concept Design Presentation**

**February 25<sup>th</sup> 2014**



[www.montgomerycountymd.gov/watershedrestoration](http://www.montgomerycountymd.gov/watershedrestoration)



# Introductions

- **Doug Streaker, PE**
  - Project Manager, Montgomery County MS4 Consultant
- **Jennifer St. John**
  - Watershed Planner, Montgomery County DEP
- **Paul Bogle, PE**
  - Senior Engineer, Montgomery County DEP
- **Justin Thompson, PE**
  - Project Engineer, Stantec
- **Kathleen Dahill, RLA**
  - Landscape Architect, Stantec

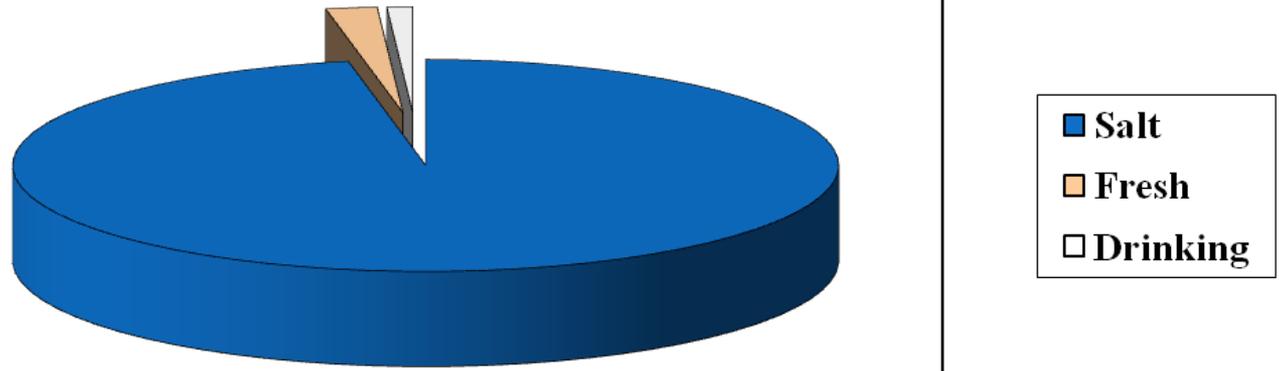
# Today's Agenda

- Watershed 101
- What are Green Streets?
- Why Green Streets?
- Green Street Locations
- Green Streets Practices
- Your Green Streets Project!



# Watershed 101

- Sources of Water

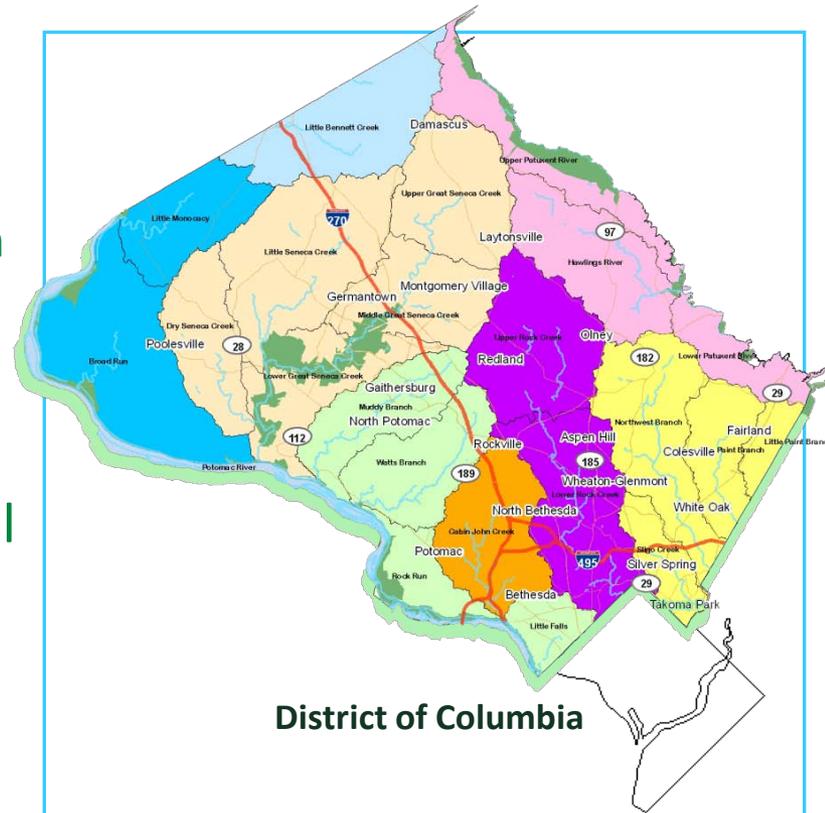


- About 97% is salt water
- About 2% is frozen
- Only 1% is available for drinking water
  - Across the Country , most drinking water is from groundwater sources
  - In Maryland , most drinking water is from surface water
- Potential for greater impacts from runoff in Maryland

# Watershed 101

- **Montgomery County, MD**

- 507 sq. miles
- 1,000,000 people
  - Second only to Baltimore City within Maryland in average people per square mile
  - 184 languages spoken
- About 12% impervious surface overall
  - About the size of Washington DC
- Over 1,500 miles of streams
- Two major river basins:
  - Potomac
  - Patuxent
- Eight local *watersheds*



- **Impervious:** Not allowing water to soak through the ground.

# Watershed 101

- What is a Watershed?
  - A *watershed* is an area from which the water above and below ground drains to the same place.
  - Different scales of watersheds:
    - Chesapeake Bay
    - Eight local watersheds
    - Neighborhood (to a storm drain)

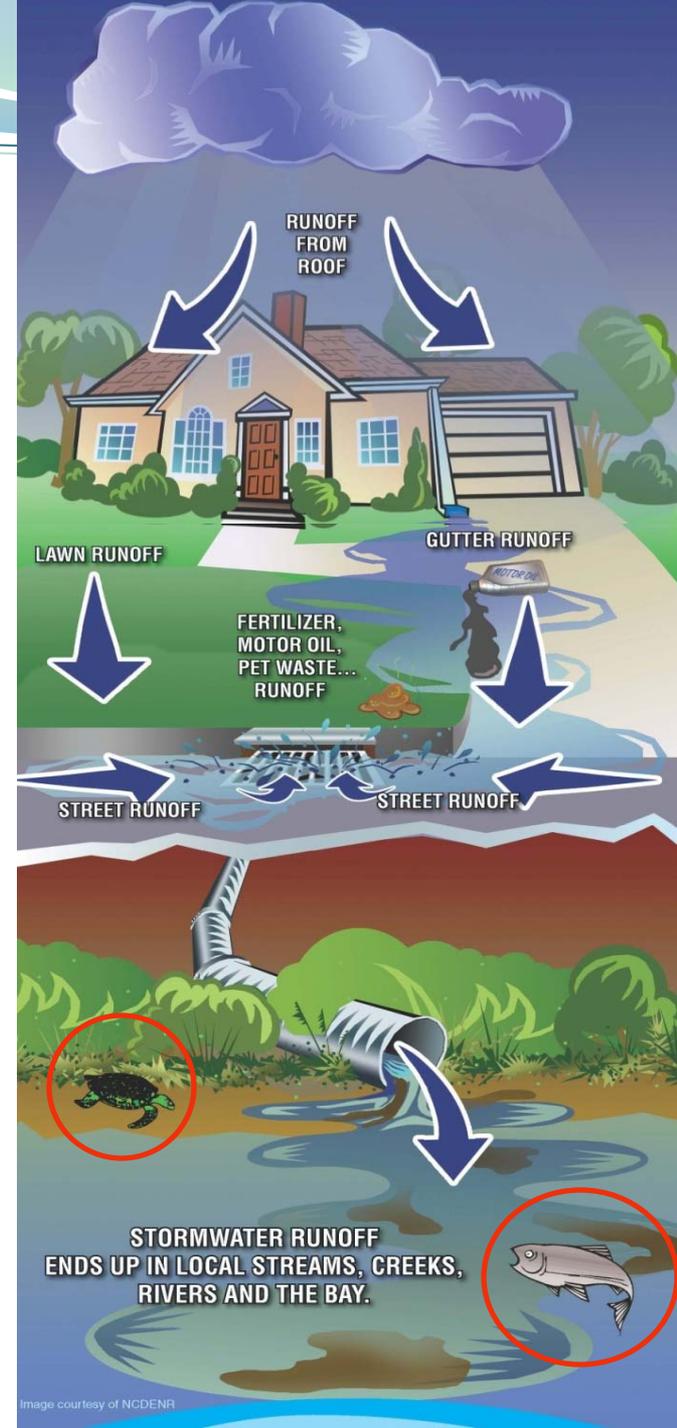


# Watershed 101

## • What is Runoff?

- Water that does not soak into the ground becomes surface runoff. This runoff flows over hard surfaces like rooftops, driveways and parking lots collecting potential contaminants and flows:
  - Directly into streams
  - Into storm drain pipes, eventually leading to streams
  - Into stormwater management facilities, then streams

**Two Major Issues:**  
**Volume/Timing of Runoff**  
**Water Quality**



# Watershed 101

- What is the County doing to protect our Streams?

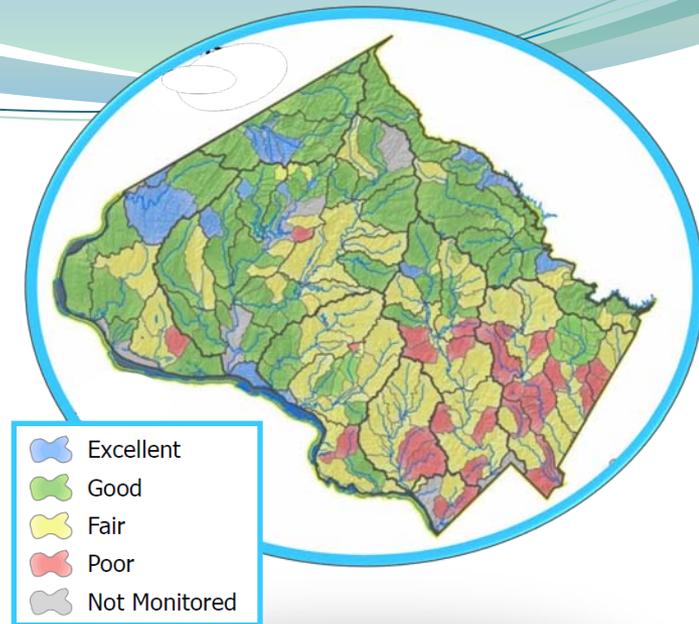
- Must meet regulatory requirements

- Federal Clean Water Act permit program
- MS4 = Municipal Separate Storm Sewer System

- Applies to all large and medium Maryland jurisdictions

- County Programs

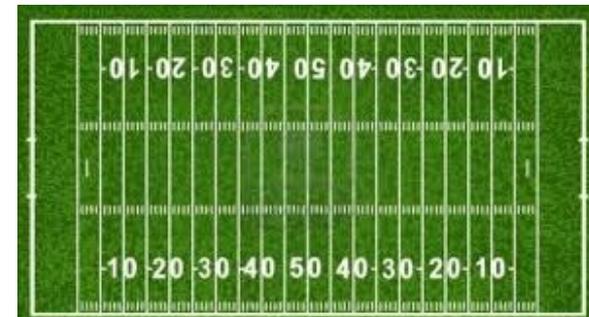
- Restore our streams and watersheds
  - Add runoff management
- Meet water quality protection goals
  - Reduce pollutants getting into our streams
- Educate and engage all stakeholders
  - Individual actions make a difference
- Focus on watersheds showing greatest impacts



# What is the County Doing to Protect our Streams?

- Montgomery County is responsible for:
  - What goes into our storm drain pipes
  - What comes out of them
  - What flows into the streams
- DEP is adding stormwater management for 20 % of impervious surfaces  
(4,292 acres = 6.7 square miles)... About three times the size of Takoma Park.

**That's equivalent to 3,307 football fields!**



# What are Green Streets?

- Small scale stormwater practices located within street right of way areas.
- Approx. 1/3 of impervious surfaces in our County are roadways.



**RAIN GARDEN,  
BIORETENTION**



**BIOSWALE**



**TREE BOX**



**PERVIOUS  
PARKING &  
WALKING PATHS**

# Why Green Streets?

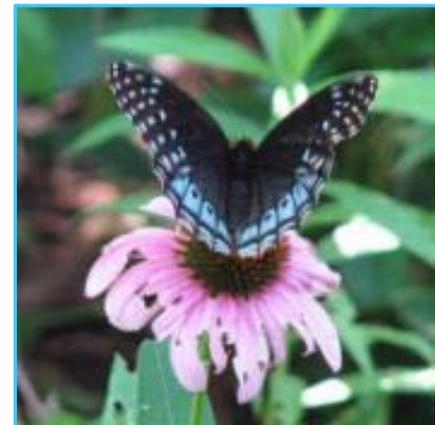
- Replenish groundwater and improve flow in local streams
- Water can soak into the ground while plants and soils filter pollutants



- Create aesthetically attractive streetscapes

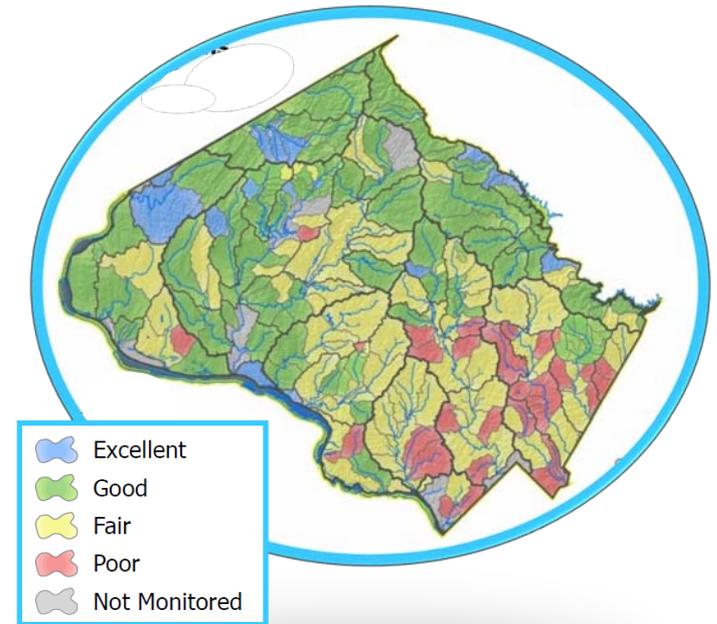


- Provide natural habitat

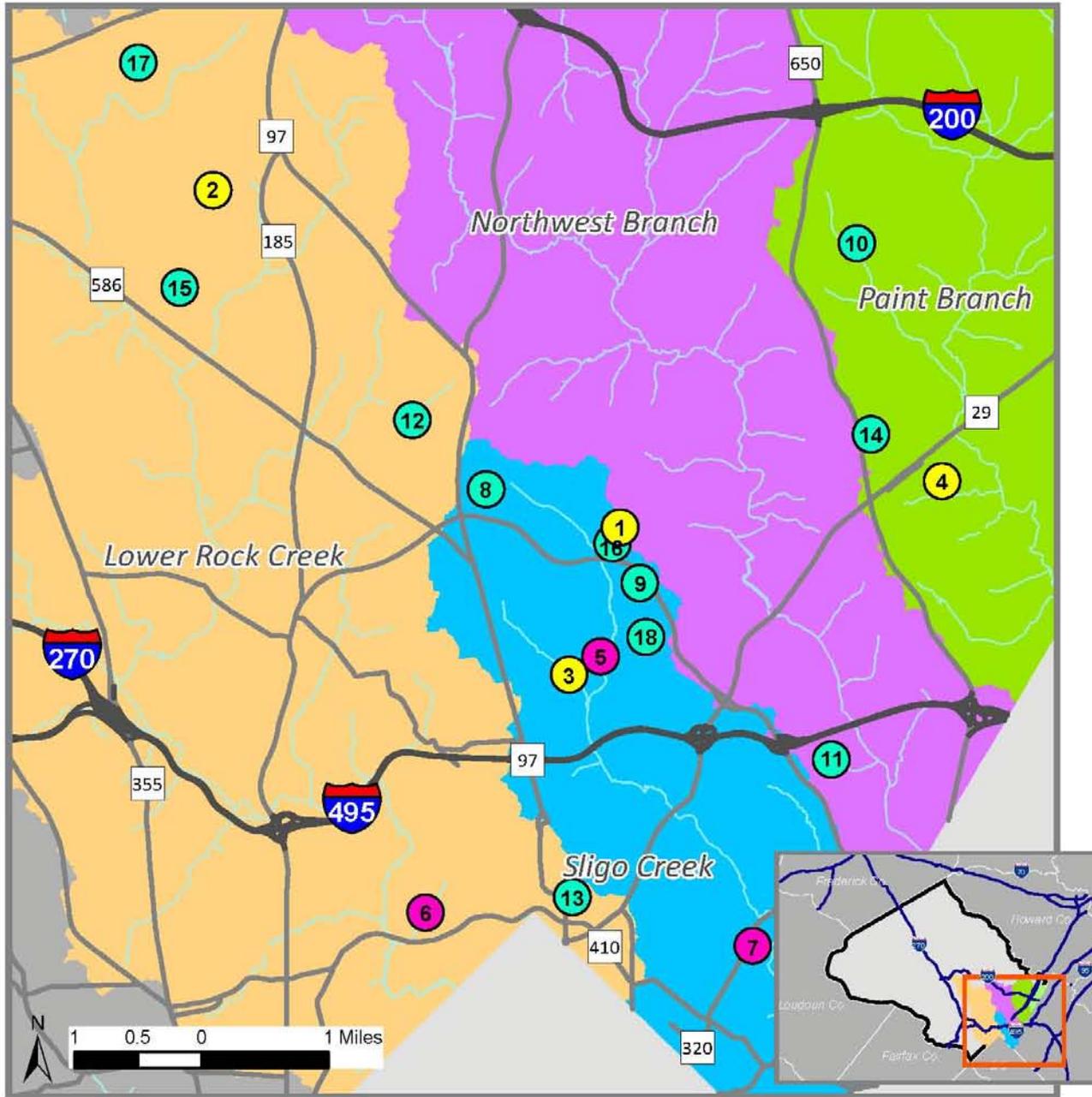


# Where will Green Streets be?

- MCDEP plans Green Streets projects:
  - For priority areas identified in Watershed Studies or Restoration Plans
  - Coordinate with Department of Transportation's road & sidewalk improvements



# Montgomery County Green Streets



<span style="color: yellow;">●</span>	<b>COMPLETE</b>
1	Arcola Avenue
2	Aspen Hill Library
3	Forest Estates
4	White Oak
<span style="color: pink;">●</span>	<b>IN CONSTRUCTION</b>
5	Dennis Avenue
6	Donnybrook
7	Sligo Park Hills
<span style="color: cyan;">●</span>	<b>IN DESIGN</b>
8	Amherst
9	Breewood
10	Cannon Road
11	Franklin Knolls and Clifton Park
12	Glenmont Forest
13	Spring Street and Second Street
14	Springbrook \ Homestead Estate
15	Wheaton Woods
16	University Towers
17	Manor Woods
18	McDonald Knolls \ Ballantrae \ Sligo Estates

# Where will Green Streets be?

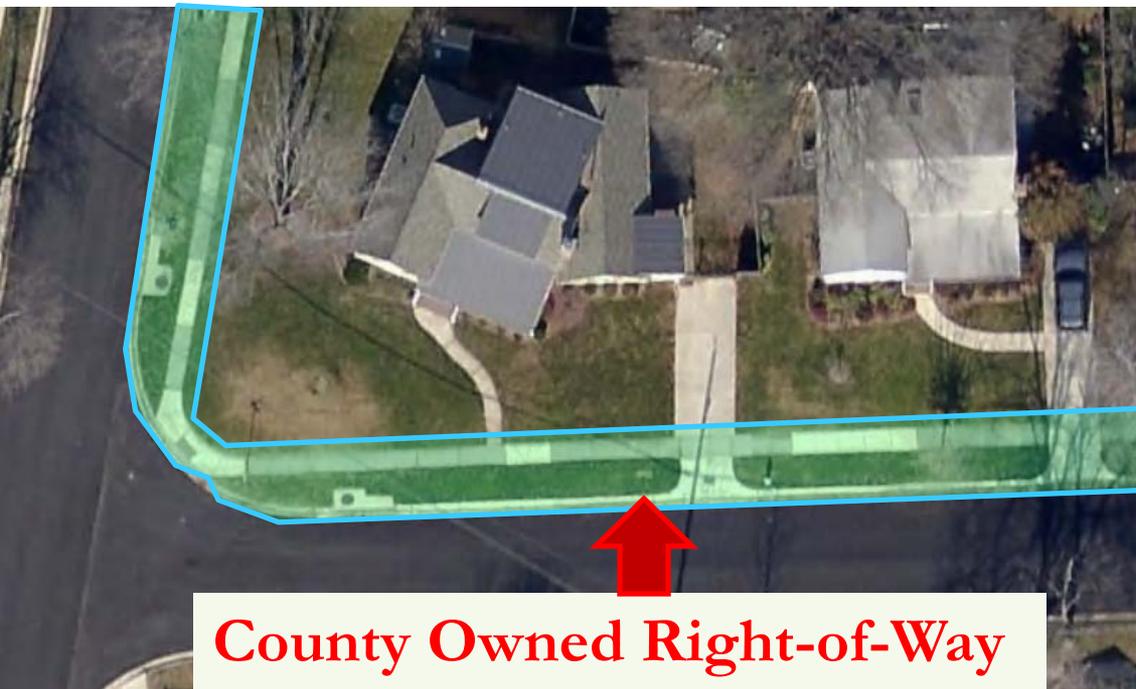
- Selected areas within the County Right-of-Way (ROW)



With Sidewalk



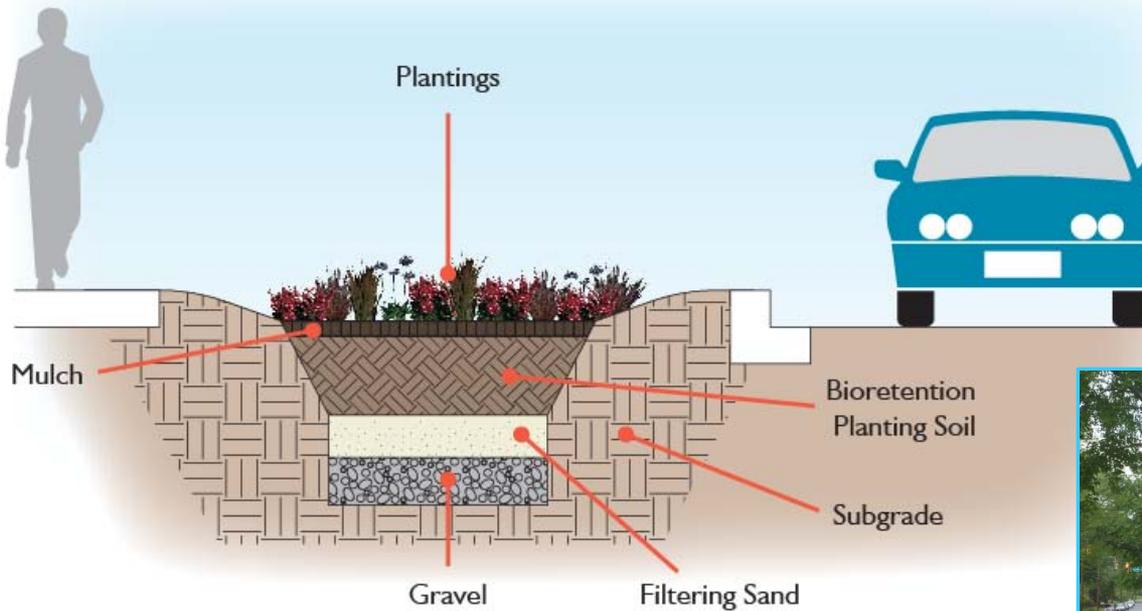
Without Sidewalk



County Owned Right-of-Way

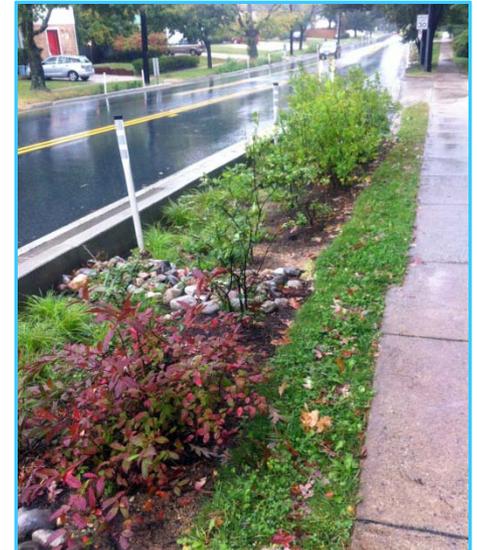
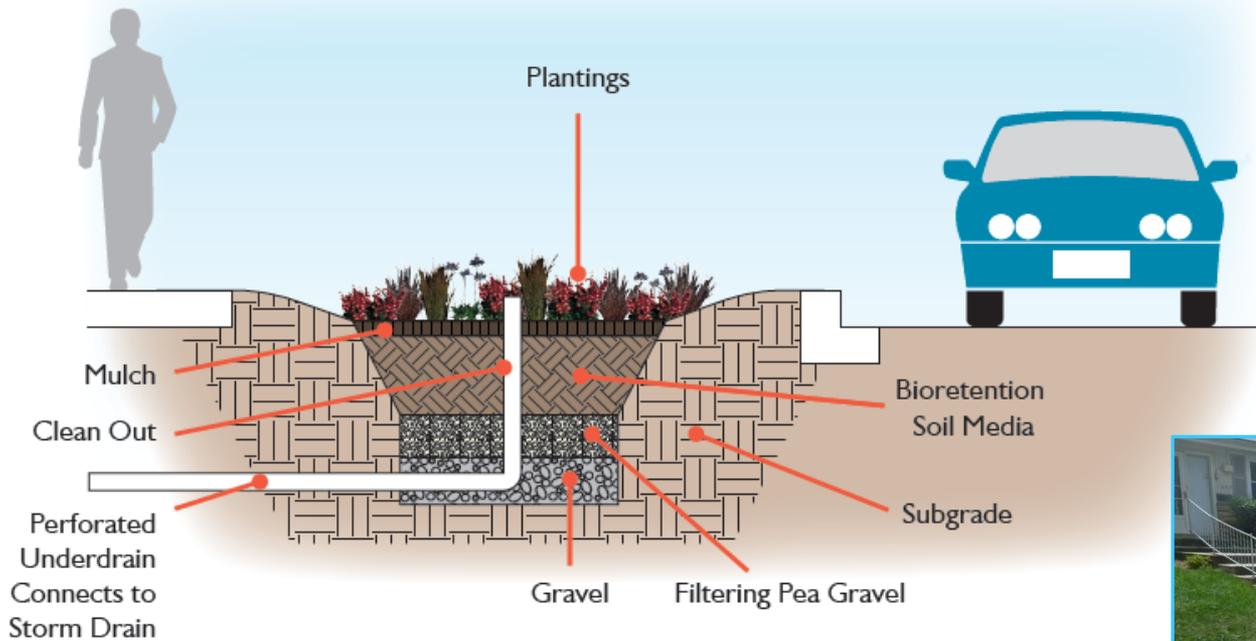
# Green Streets Practices

- Rain Garden



# Green Streets Practices

- Bioretention



# Green Streets Practices

- Curb Extension Bioretention



# Green Streets Practices

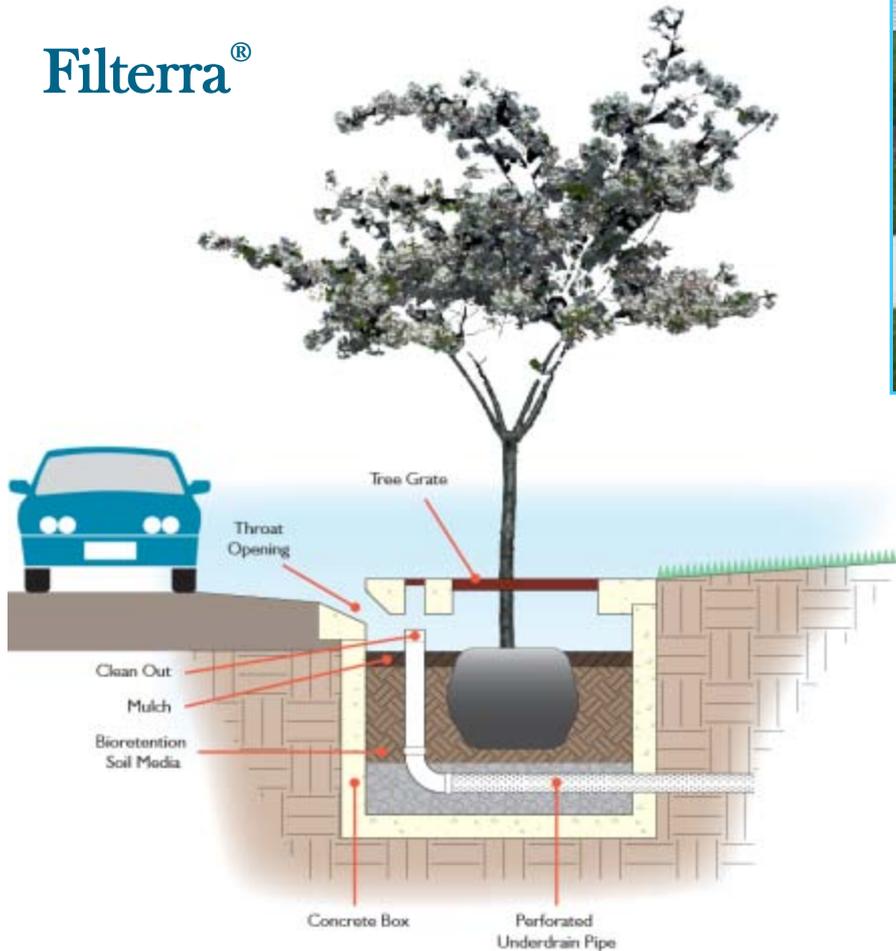
- Bioswale/Grass swale



# Green Streets Practices

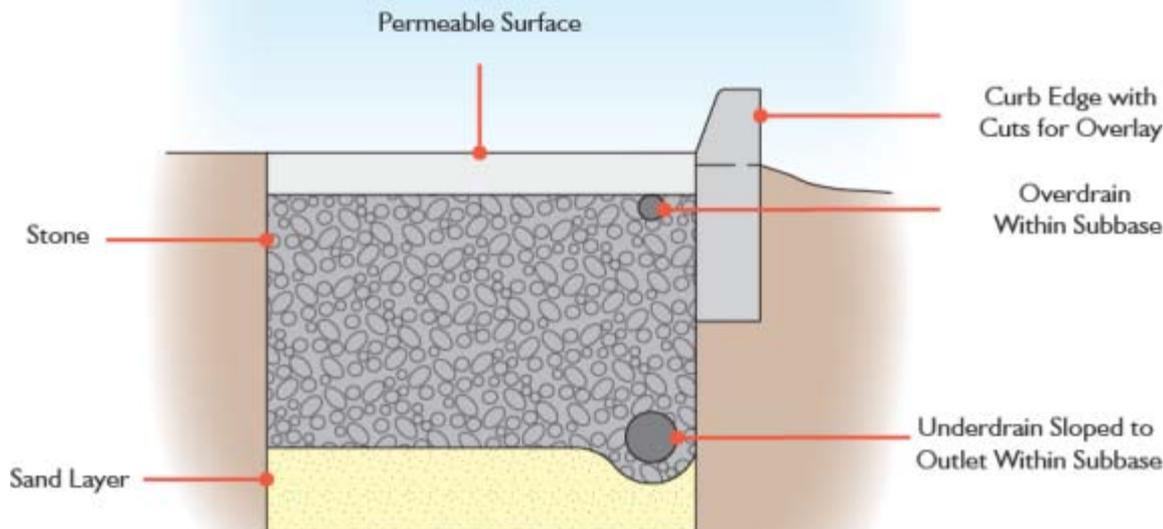
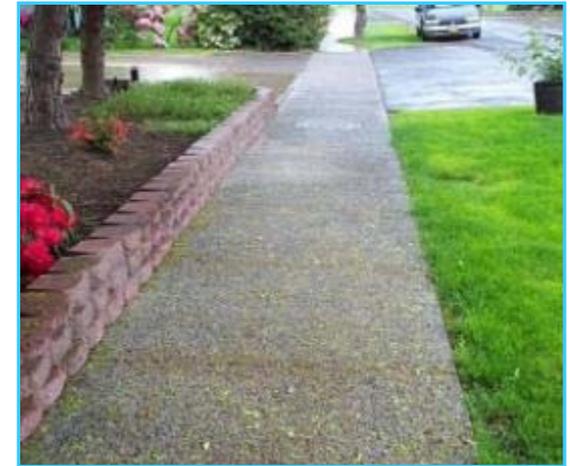
- Tree Box Filter

Filterra<sup>®</sup>



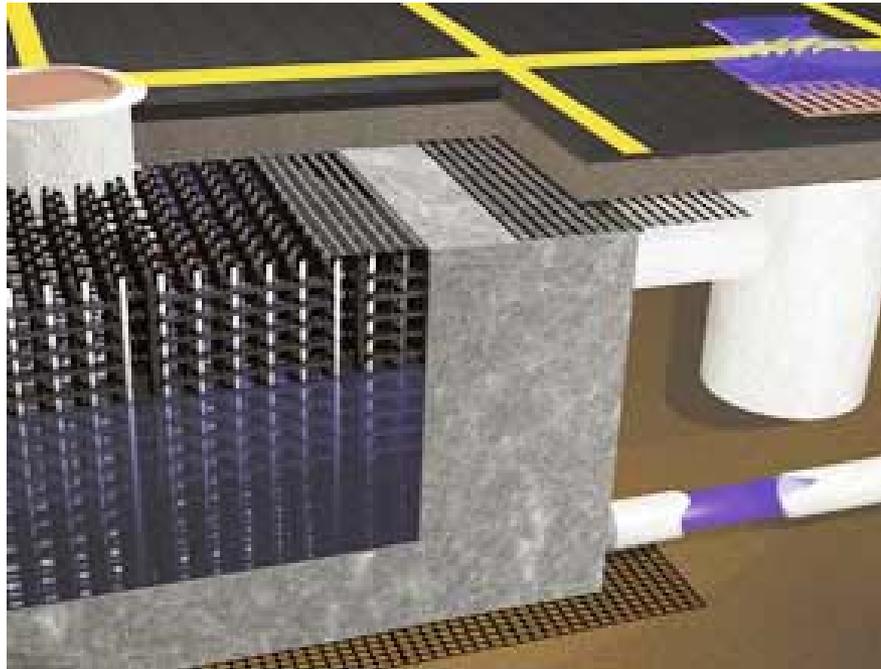
# Green Streets Practices

- Pervious Parking & Walking Paths



# Green Streets Practices

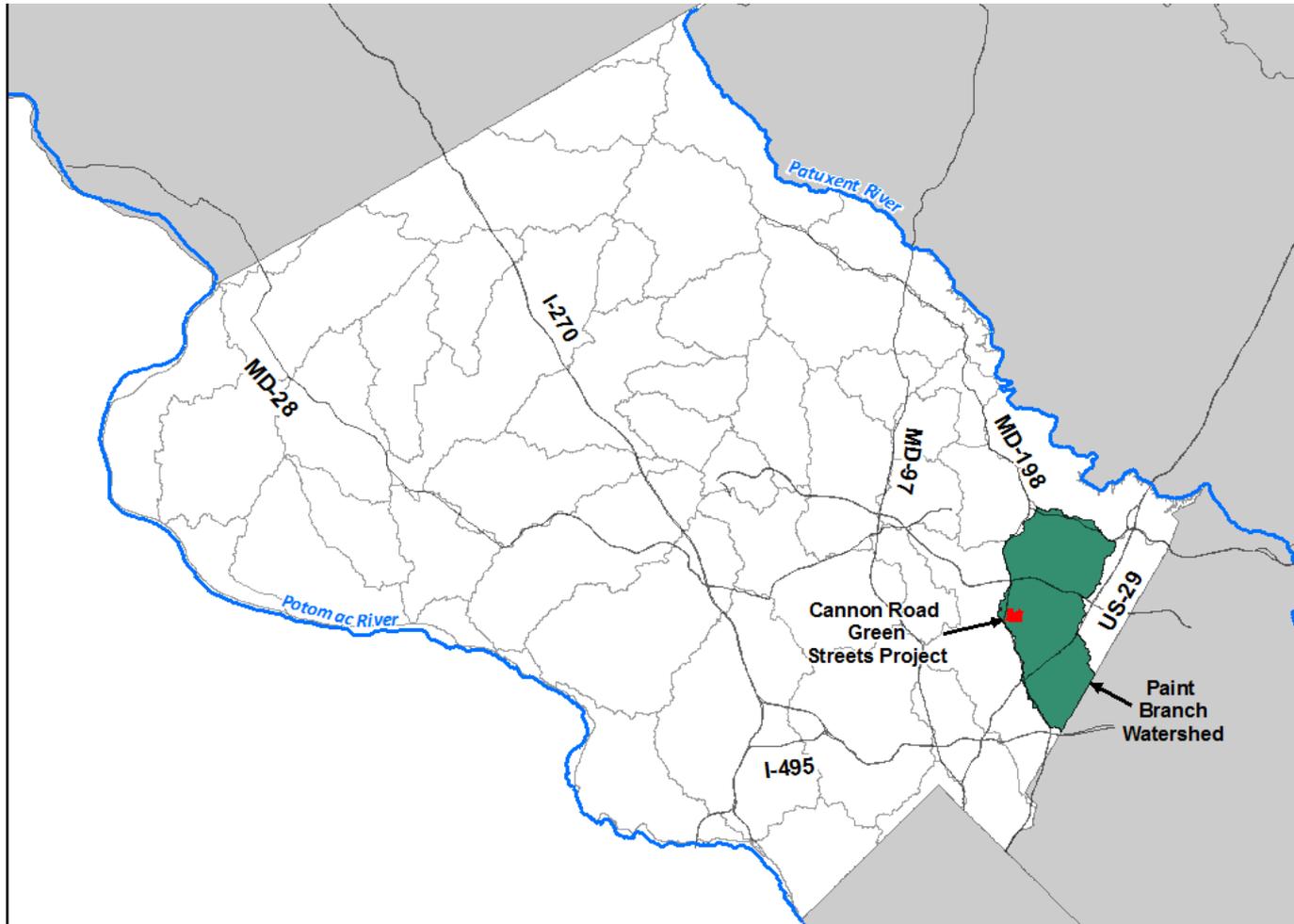
- Small Scale Underground Stormwater Practices
  - Rainstore<sup>®</sup> Infiltration



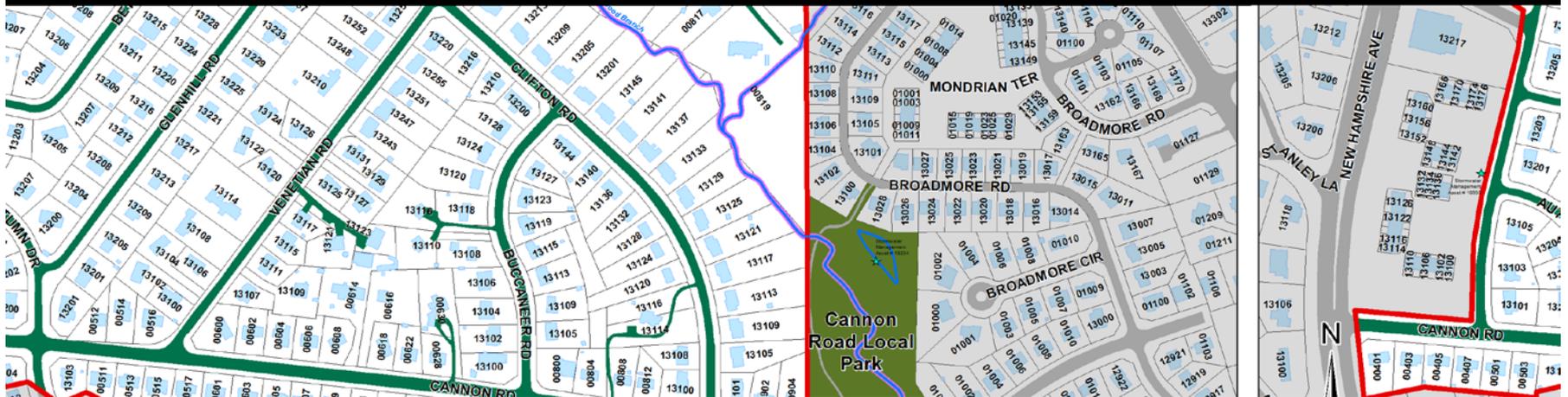
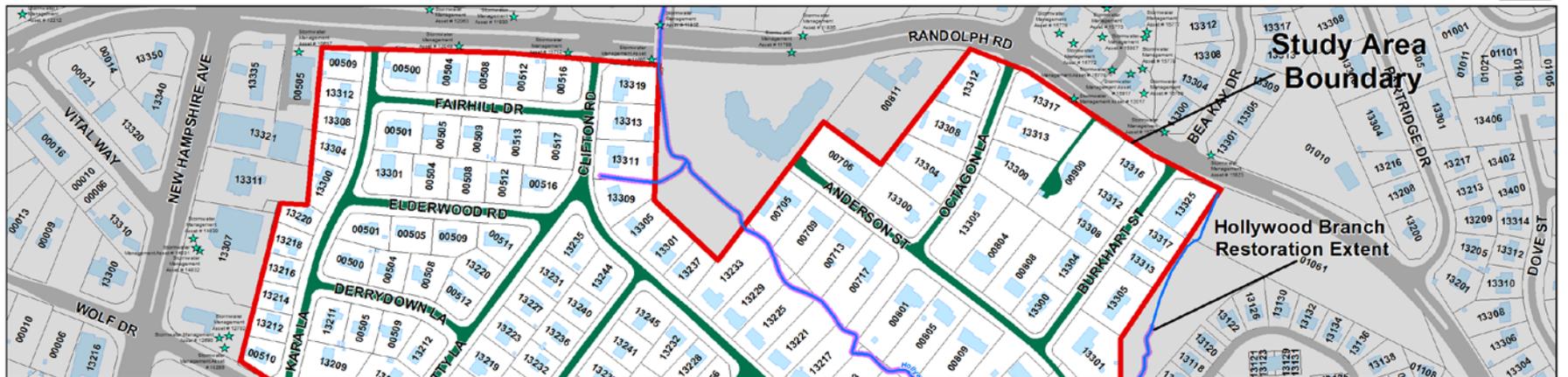
Source: <http://invisiblestructures.com/rainstore3.html>

# Green Streets in Cannon Road and Surrounding Neighborhood

## Project Location within County



# Green Streets in Cannon Road and Surrounding Neighborhood



# Green Streets in Cannon Road and Surrounding Neighborhood

## Neighborhood Background

- Initially developed in the 1940's
- No existing stormwater management
- Hollywood Branch bi-sects the project area



# Green Streets in Cannon Road and Surrounding Neighborhood

## Characteristics & Proposed Practices

### Site Characteristics:

- Open Section vs Closed Section Curb
- Driveways
- Street Trees
- Slope
- Utilities
- Soils

### Proposed Practices:

- 137 facilities
- Bioretention, Bioswale, Grass Swale, Curb Extensions
- Estimated 50% if impervious area treated

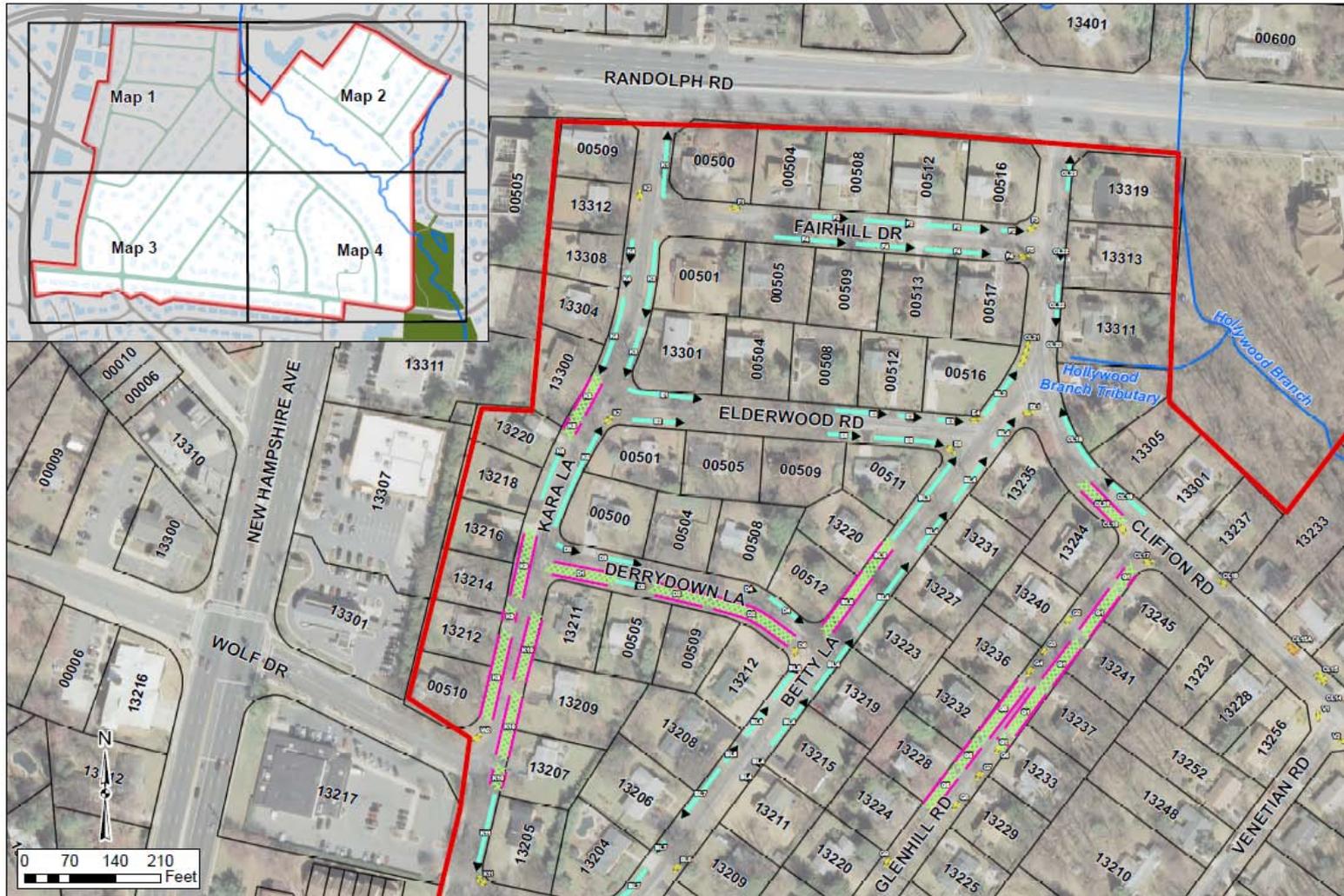


Closed Section (Curb and Gutter)

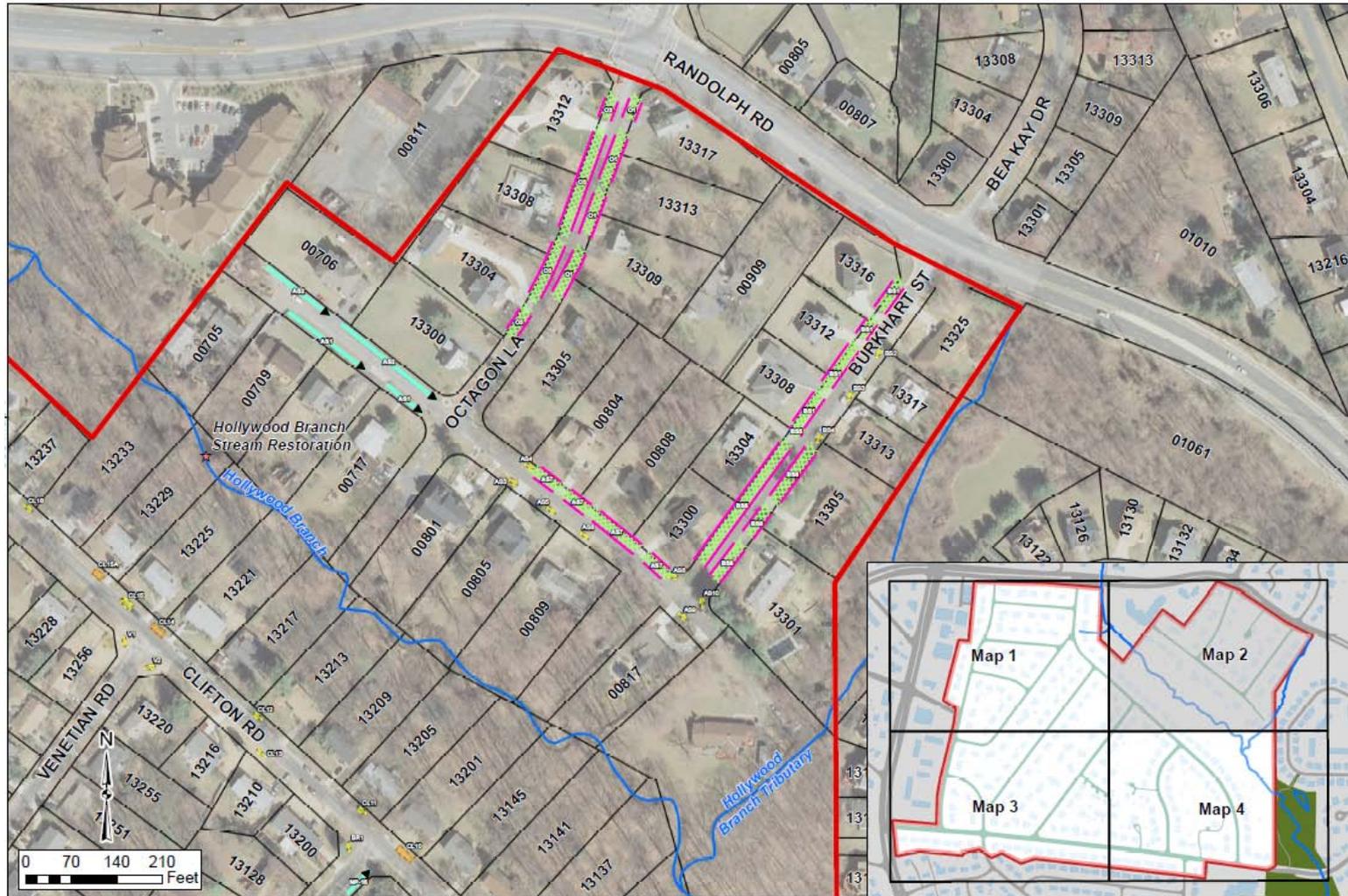


Open Section (No Curb)

# Green Streets in Cannon Road and Surrounding Neighborhood

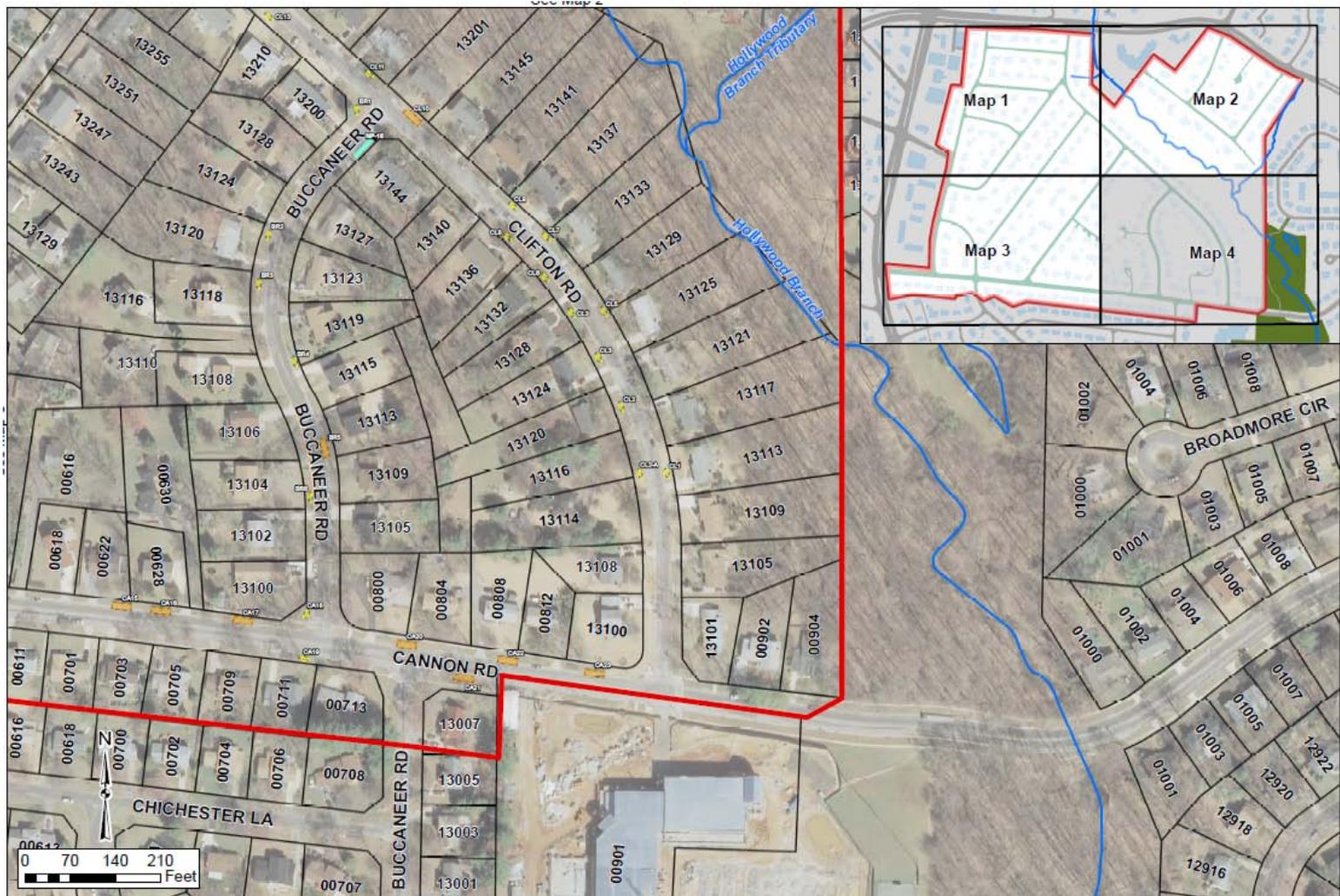


# Green Streets in Cannon Road and Surrounding Neighborhood





# Green Streets in Cannon Road Neighborhood (Carol Acres, Colesville Gardens, Buckley Downs)



# Green Streets in Cannon Road and Surrounding Neighborhood

## Public Events and Project Schedule (Tentative)

Event	Date / Time	Location
Preliminary Site Assessment	11/2013	
<b>Public Meeting</b>	<b>2/25/2014</b>	<b>Cannon Road Elementary School</b>
Draft Designs	Summer 2014	
Community Walk	Summer 2014	<b>Cannon Road and surrounding streets</b>
Final Designs	Fall 2014	
Construction Duration	Winter 2014/2015	Entire Project

We are here →

# Maintenance

- MCDEP will visit monthly (on average)
- We will:
  - Water plants, if needed
  - Replace plants as needed
  - Replenish mulch
  - Remove weeds
  - Remove sediment & trash



# Questions?

- For More Information:

**Contact Name**

**240-499-8531** [doug.streaker@montgomerycountymd.gov](mailto:doug.streaker@montgomerycountymd.gov)

**Project Webpage:** [www.montgomerycountymd.gov/DEP/Restoration/cannon-road.html](http://www.montgomerycountymd.gov/DEP/Restoration/cannon-road.html)



# Frequently Asked Questions

- How Can I Help? – **Stream Stewards Program**
  - Become a **Watershed Keeper** and help MCDEP by adopting projects on public property, such as Green Street practices, tree plantings, or trash clean ups.
    - Routine visual inspection, remove trash or debris, and weed as necessary.
    - Volunteers will communicate with MCDEP staff any major issues with their adopted project, as instructed during project-specific training.

