

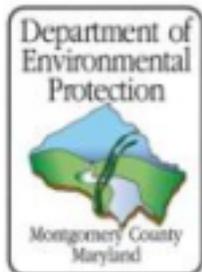
Green Streets Glenmont Forest

Environmentally Friendly Landscapes
for Healthy Watersheds



Concept Design Presentation

March 12, 2014



www.montgomerycountymd.gov/watershedrestoration





Introductions

- Jane McDonough, P.E.
 - DEP Project Manager (Consultant)
- Paul Bogle, P.E.
 - DEP Senior Engineer
- Christy Ciarametaro
 - DEP Watershed Planner
- Lucy Noya, P.E.
 - RK&K Design Project Manager
- Krista Greer, P.E.
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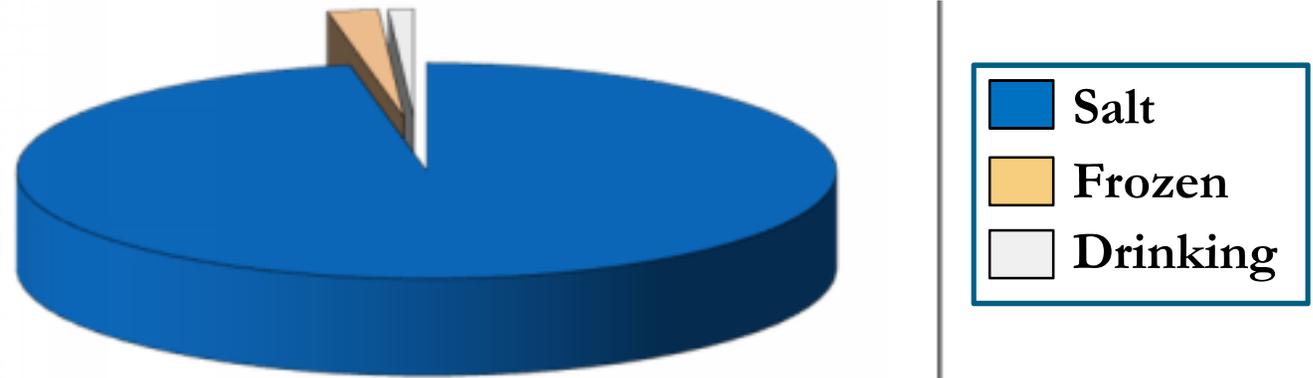
Today's Agenda

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



Watershed 101

- Sources of Water

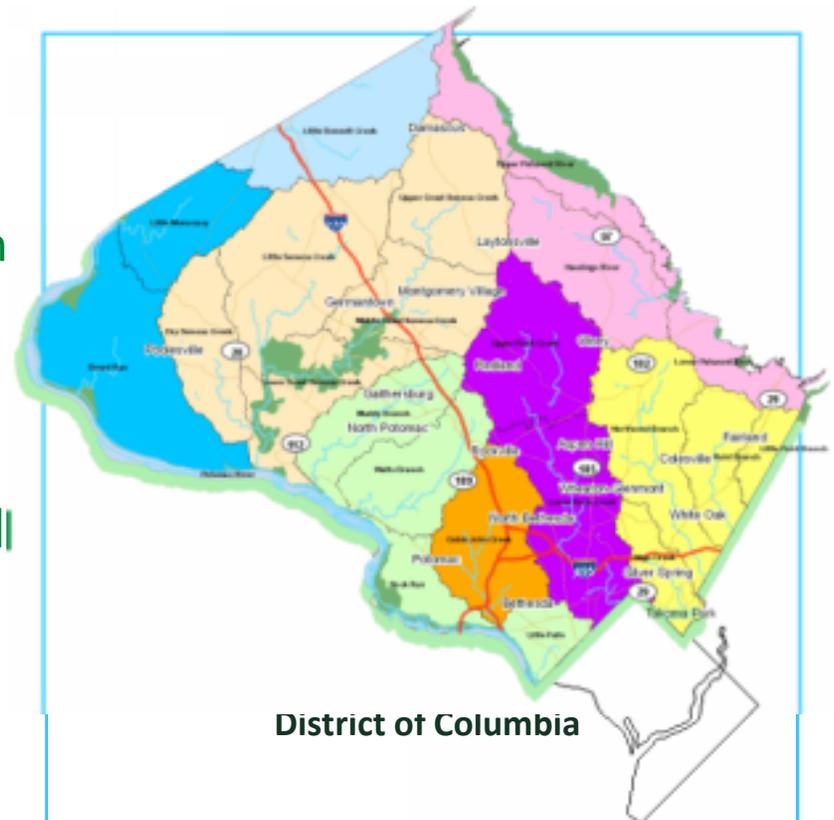


- About 97% is salt water
- About 2% is frozen
- Only 1% is available for drinking water
 - Across the Country, about 57% comes from groundwater sources
 - In Maryland, 74% is from surface water sources
- Potential for greater impacts from runoff in Maryland

Watershed 101

- **Montgomery County, MD**

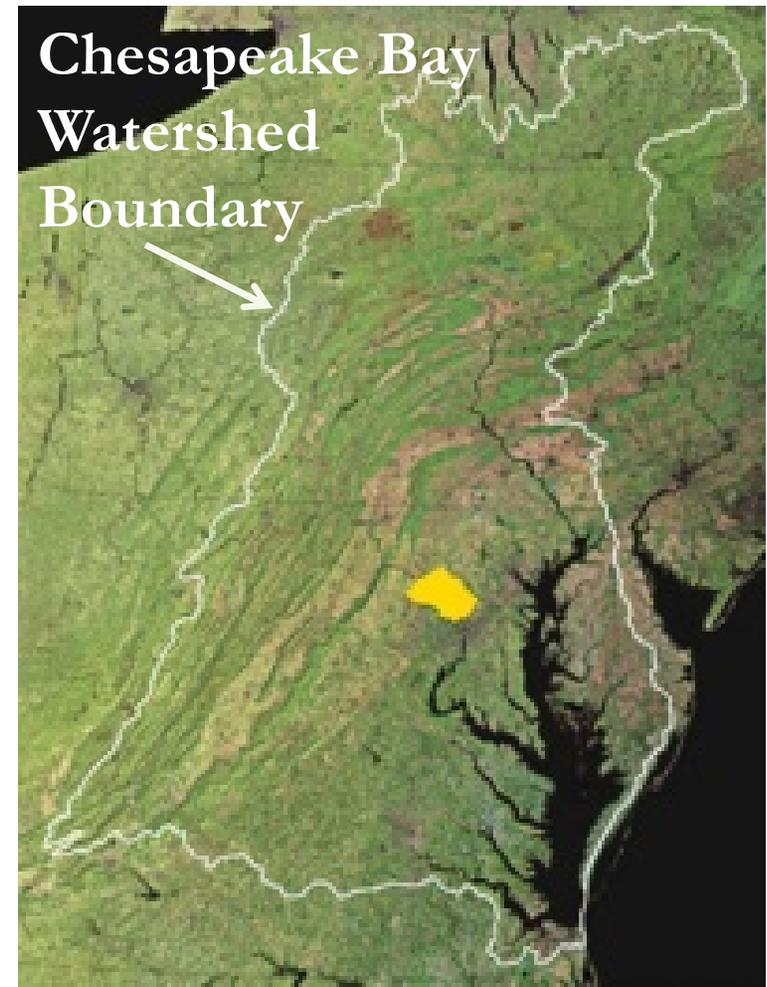
- 507 sq. miles
- 1,000,000 people
 - Second only to Baltimore City within Maryland in average people per square mile
 - 184 languages spoken
- About 12% impervious surface overall
 - About the size of Washington DC
- Over 1,500 miles of streams
- Two major river basins:
 - Potomac
 - Patuxent
 - Eight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

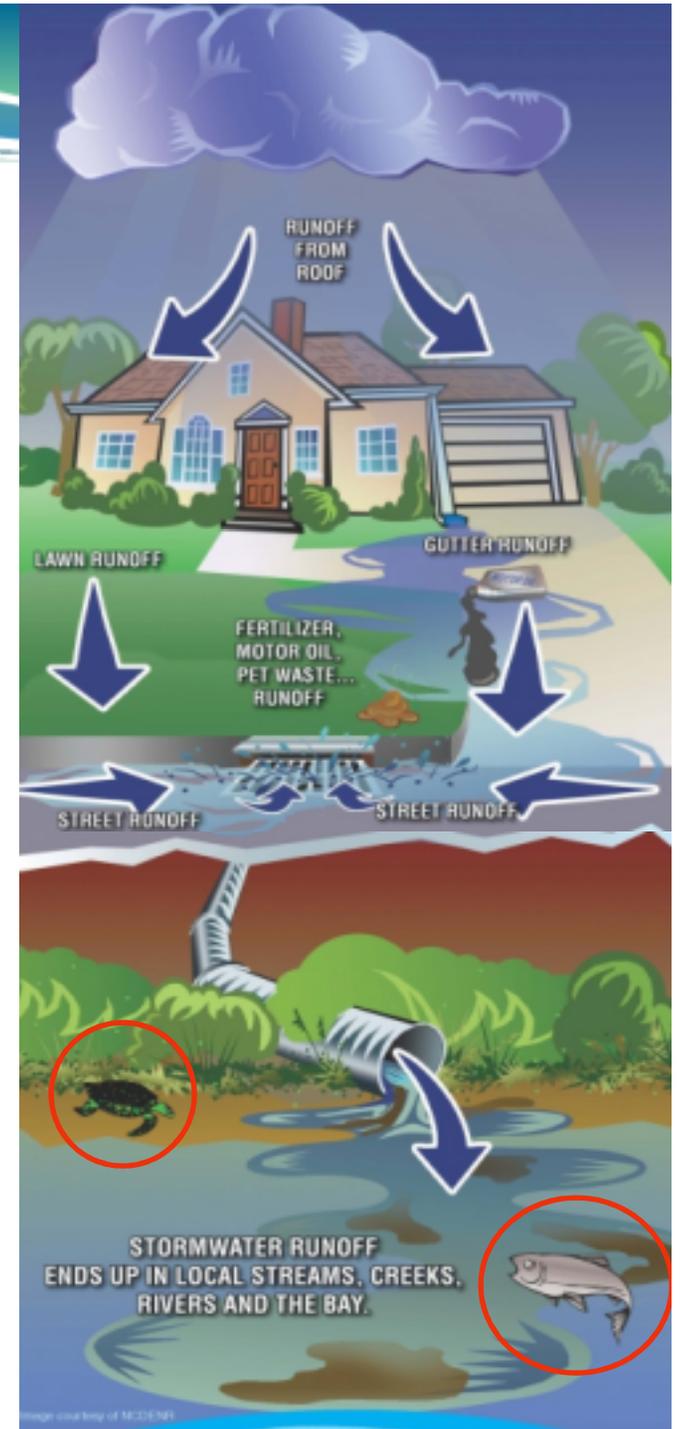


Watershed 101

- **What is Runoff?**

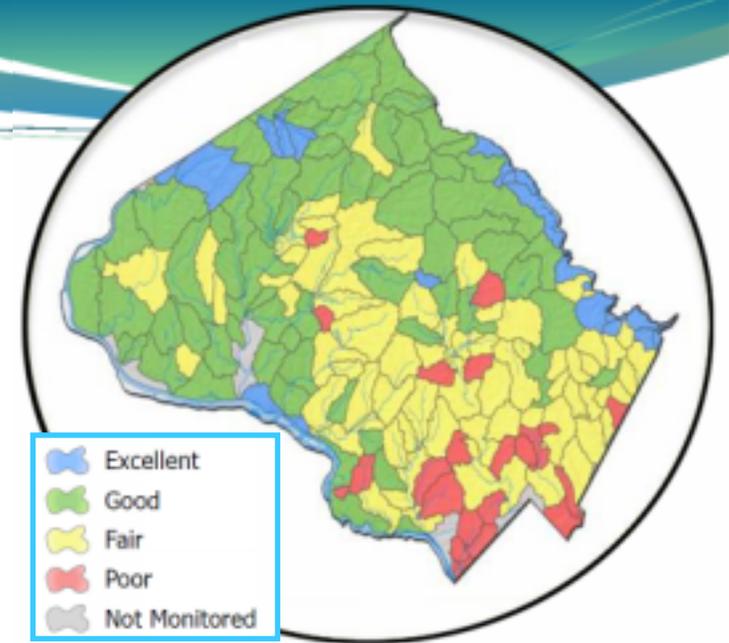
- Water that does not soak into the ground becomes surface runoff. This runoff flows over hard surfaces like rooftops, driveways and parking lots collecting potential contaminants and flows:
 - Directly into streams
 - Into storm drain pipes, eventually leading to streams
 - Into stormwater management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

Two Major Issues:
Volume/Timing of Runoff
Water Quality



Watershed 101

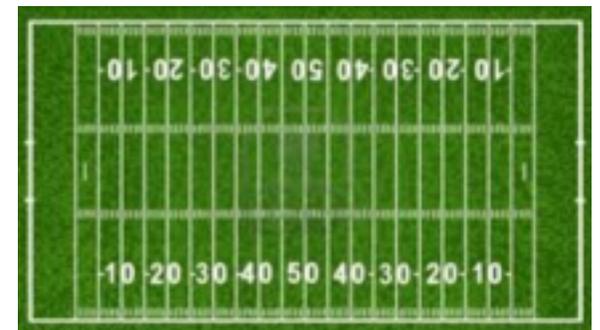
- What is the County doing to protect our Streams?
- Must meet regulatory requirements
 - Federal Clean Water Act permit program
 - MS4 = Municipal Separate Storm Sewer System
- Applies to all large and medium Maryland jurisdictions
- County Programs
 - Restore our streams and watersheds
 - Add runoff 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?

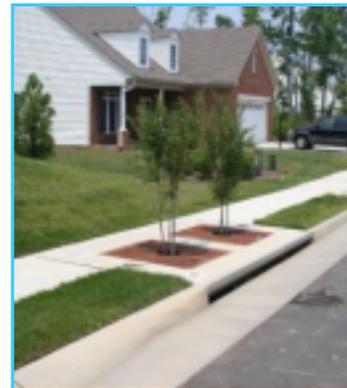
- Small scale stormwater practices located within street right of way areas.
- Approx. 1/3 of impervious surfaces in our County are roadways.



**RAIN GARDEN,
BIORETENTION**



BIOSWALE



TREE BOX



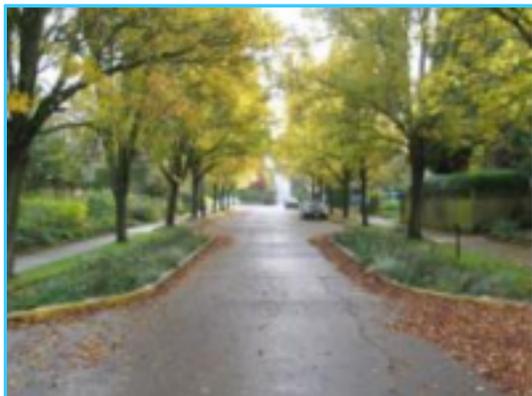
**PERVIOUS
PARKING &
WALKING PATHS**

Why Green Streets?

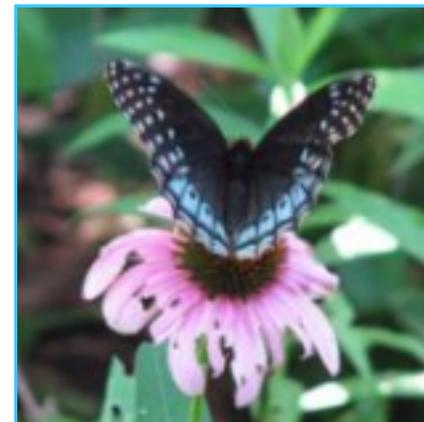
- Replenish groundwater and improve flow in local streams
- Water can soak into the ground while plants and soils filter pollutants



- Create aesthetically attractive streetscapes

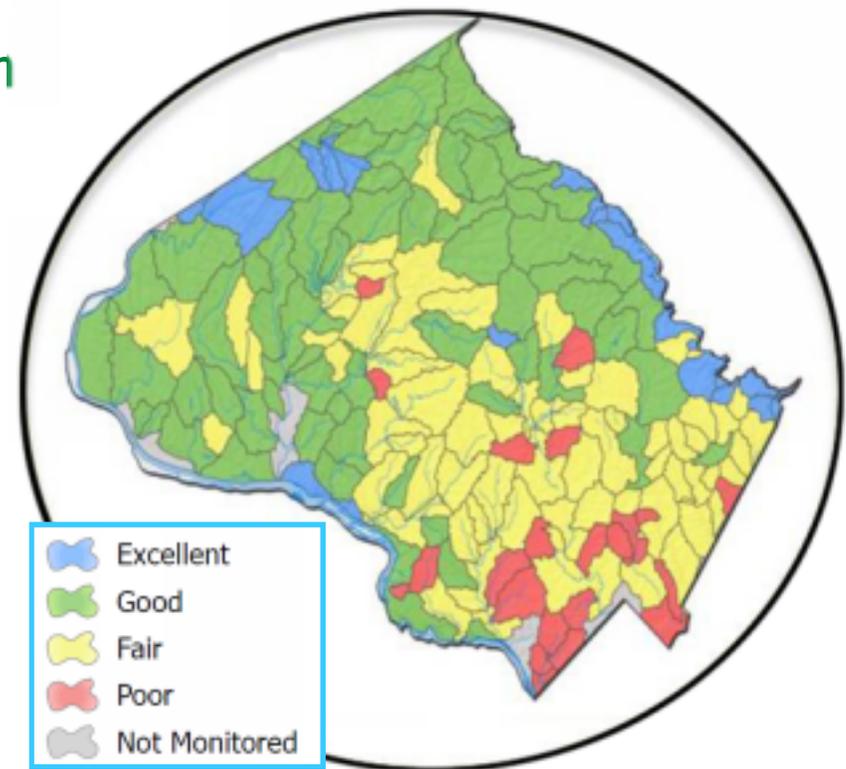


- Provide natural habitat

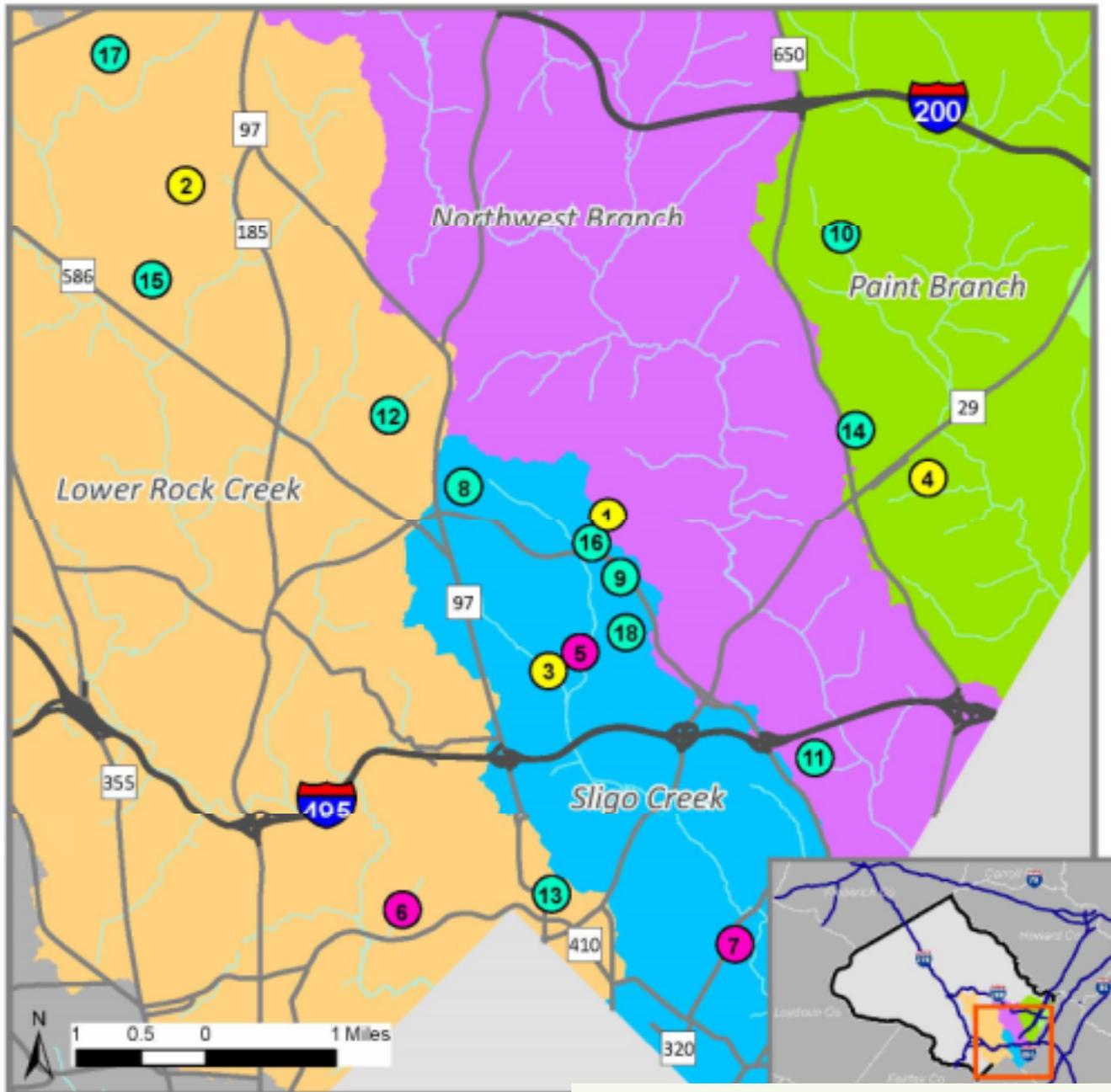


Where will Green Streets be?

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



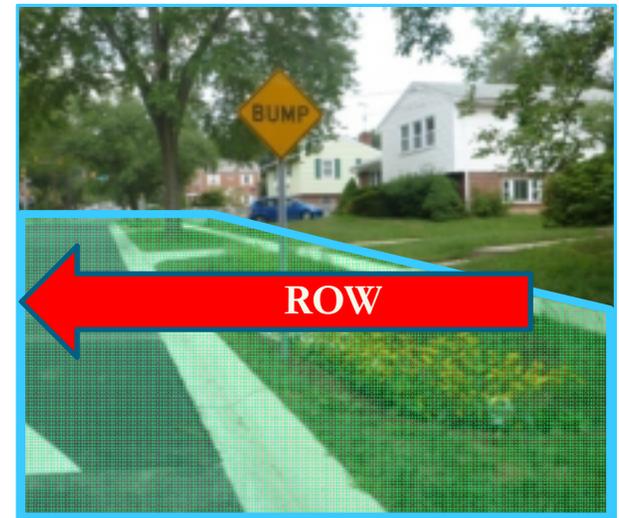
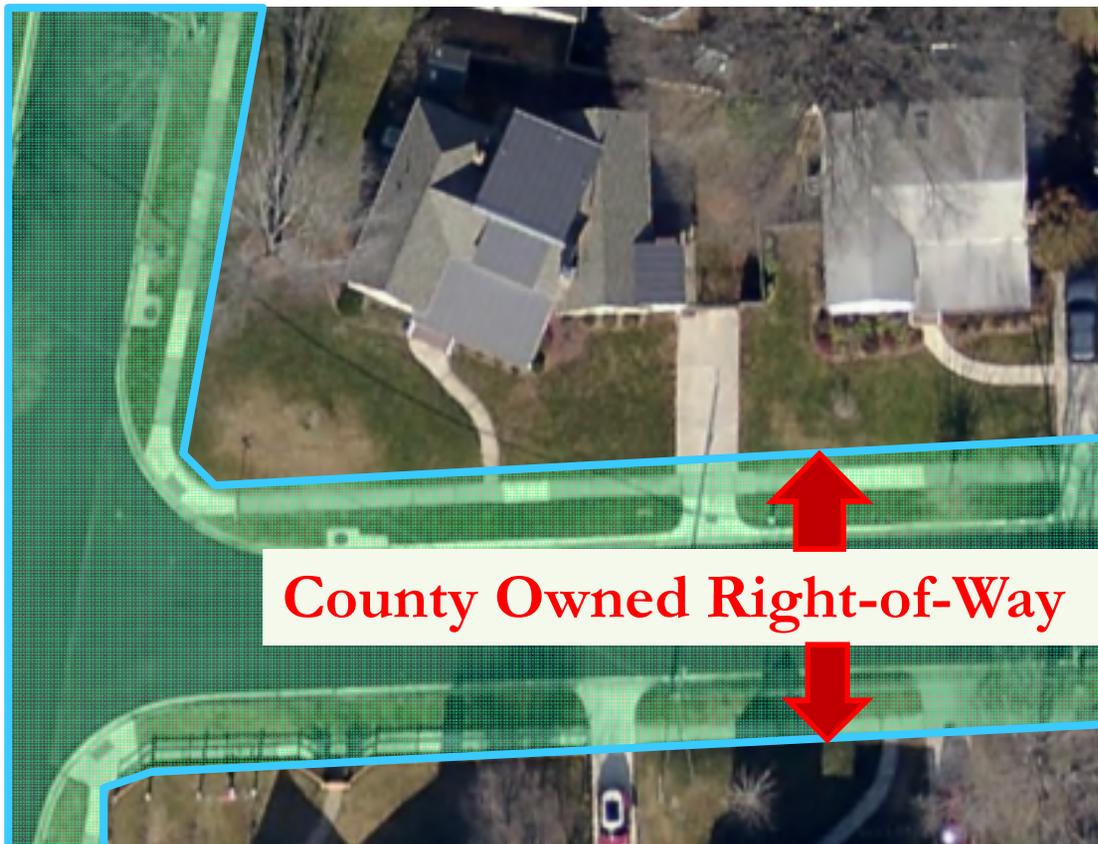
Montgomery County Green Streets



●	COMPLETE
1	Arcola Avenue
2	Aspen Hill Library
3	Forest Estates
4	White Oak
●	IN CONSTRUCTION
5	Dennis Avenue
6	Donnybrook
7	Sligo Park Hills
●	IN DESIGN
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)



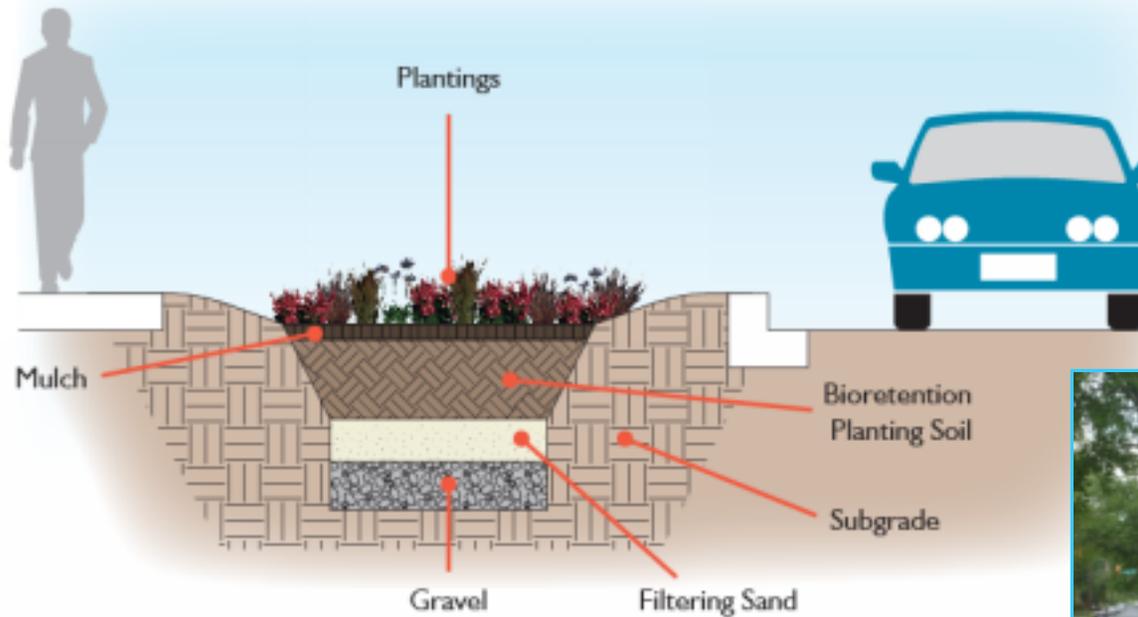
With Sidewalk



Without Sidewalk

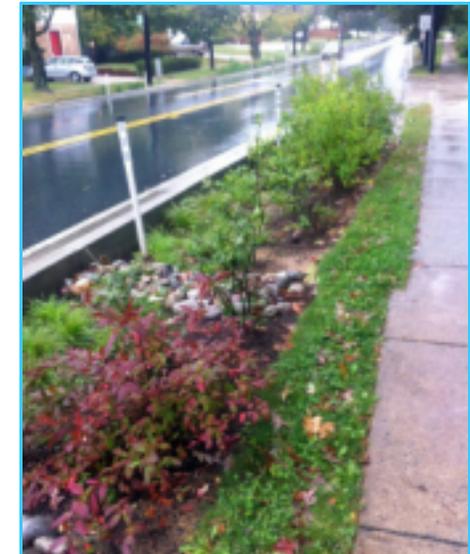
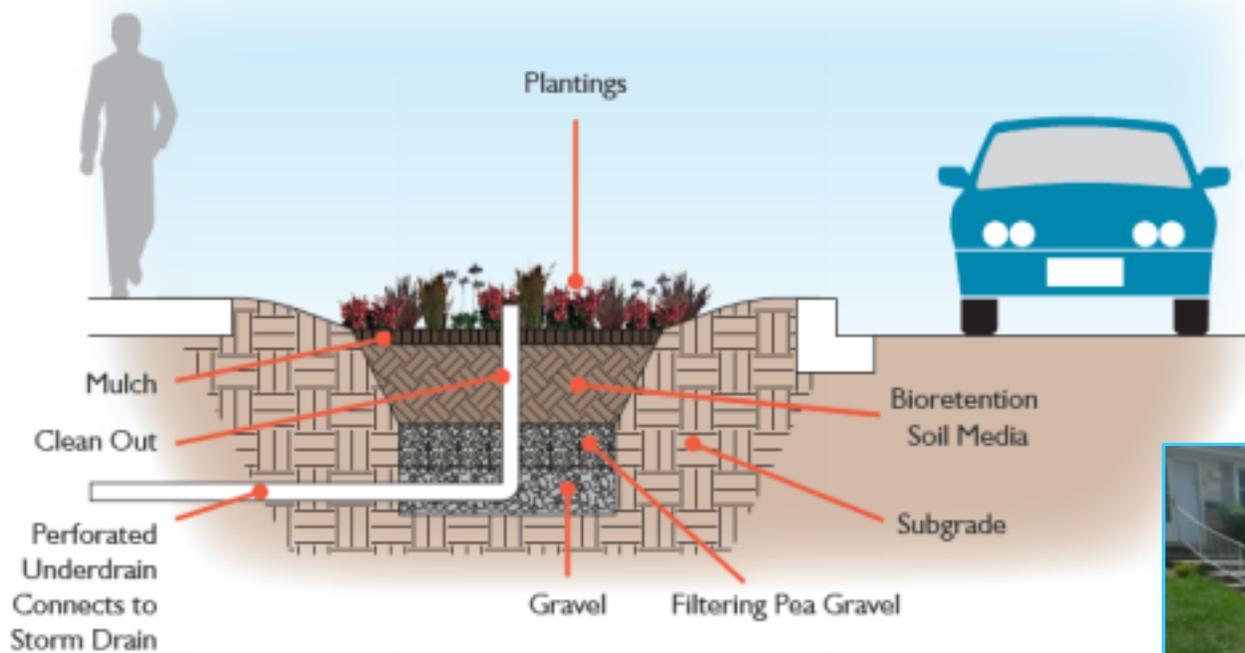
Green Streets Practices

- Rain Garden



Green Streets Practices

- Bioretention



Green Streets Practices

- Curb Extension



Green Streets Practices

- Bioswale



Arcola



White Oak



Redmiles Rd

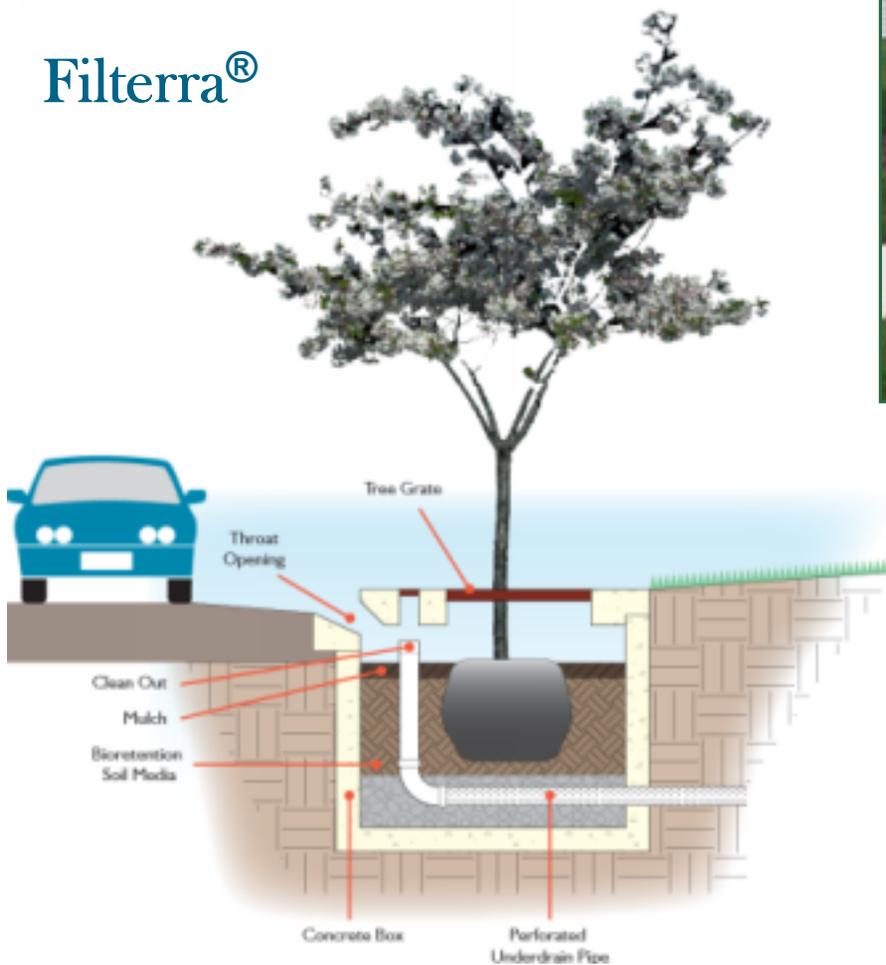


Redmiles Rd

Green Streets Practices

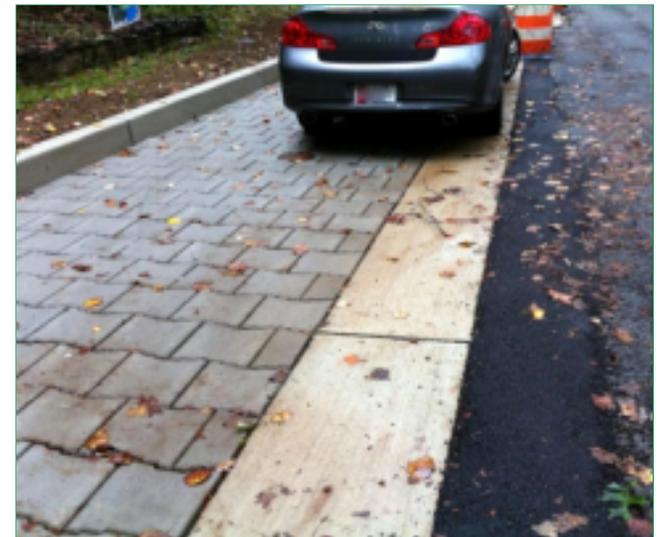
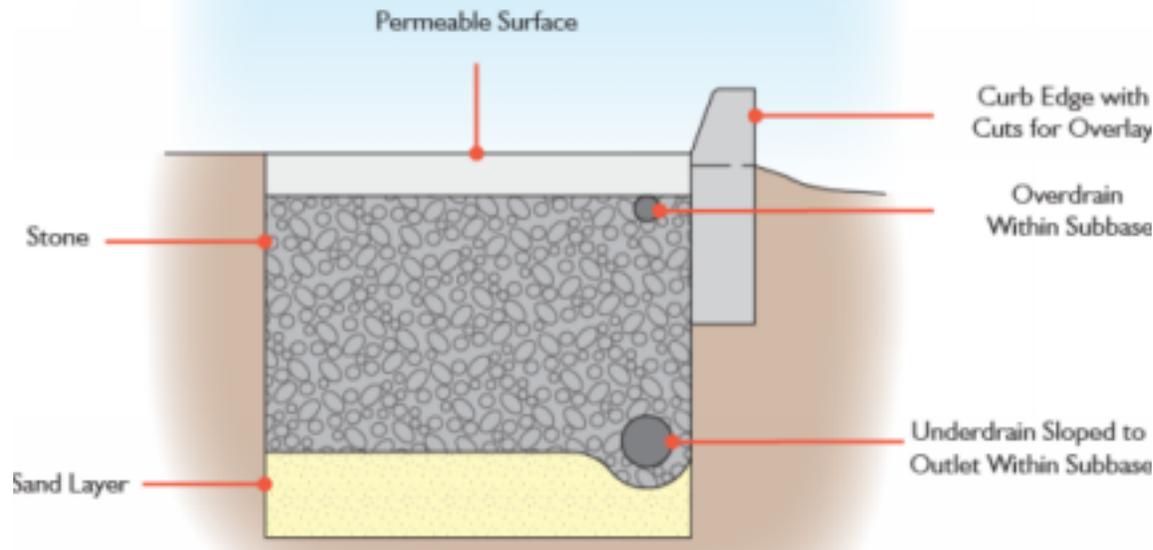
- Tree Box Filter

Filterra®



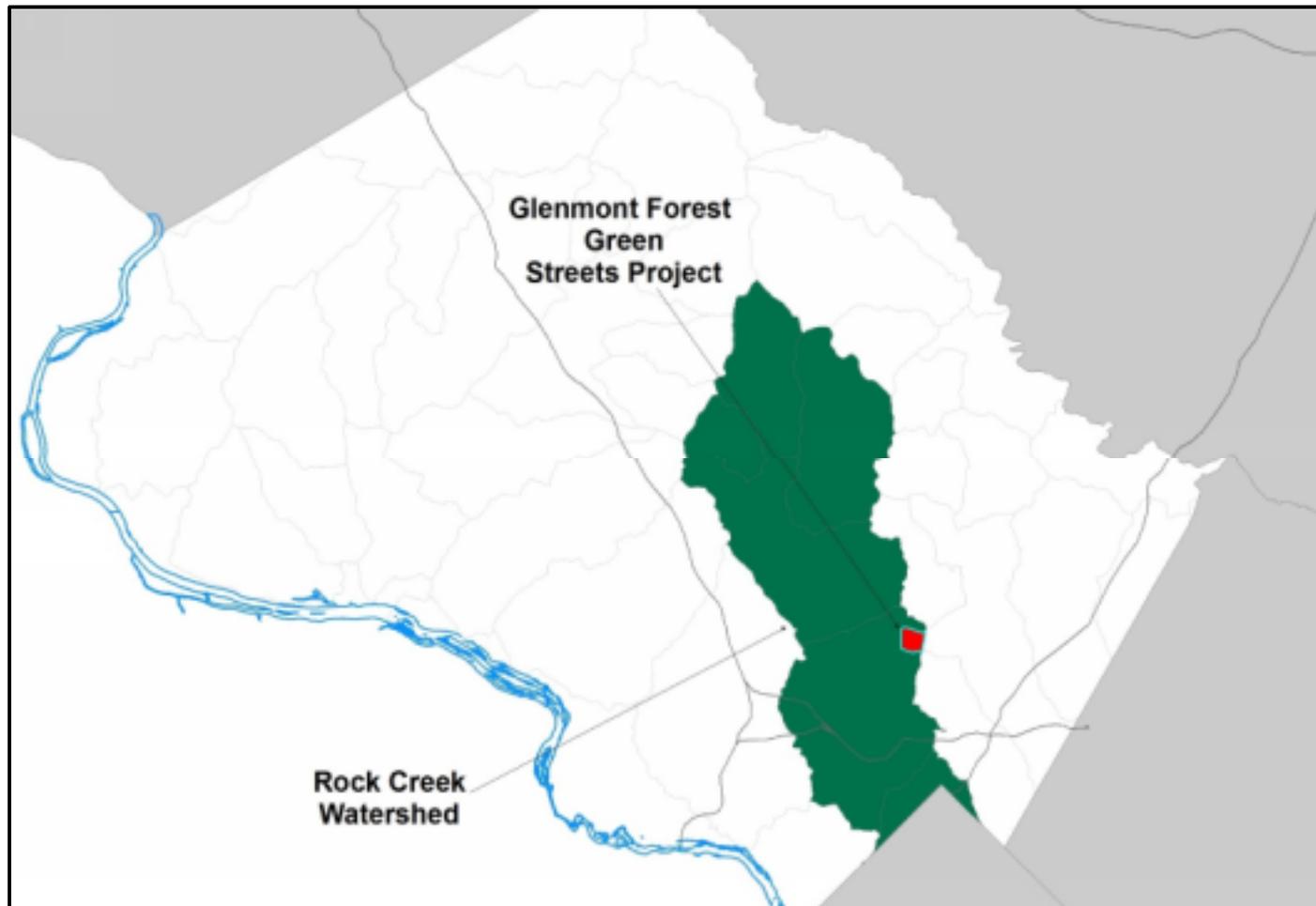
Green Streets Practices

- Pervious Parking & Walking Paths



Green Streets in Glenmont Forest

Project Location within County



Green Streets in Glenmont Forest

Project Location



Green Streets in Glenmont Forest

Neighborhood Background

- Dates of development – 40's and 50's
- Subdivisions – Glenmont Forest, Glenmont Village, Kingswell, Weisman, Wheaton Crest
- No existing stormwater management
- Primarily single family homes



Green Streets in Glenmont Forest

Constraints & Proposed Practices

Constraints that May Eliminate Practices:

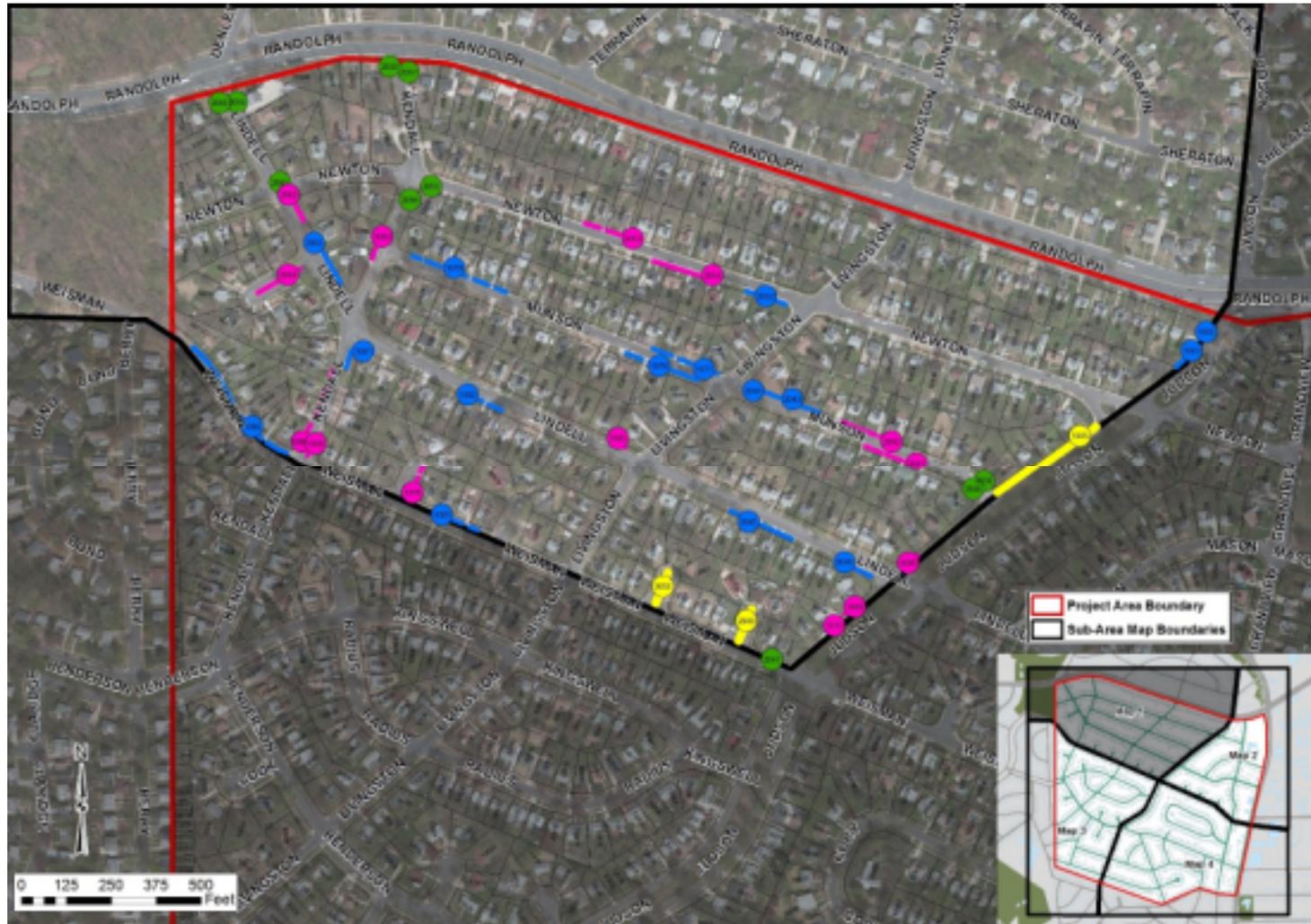
- Driveways
- Trees
- Utilities
- Parking demand
- Slope
- Soils

Proposed Practices:

- 158 Facilities
- Bioretention, Bioswales, Grass Swale, Permeable Pavement, Tree Boxes
- 38% of total impervious area treated (31.9 acres)

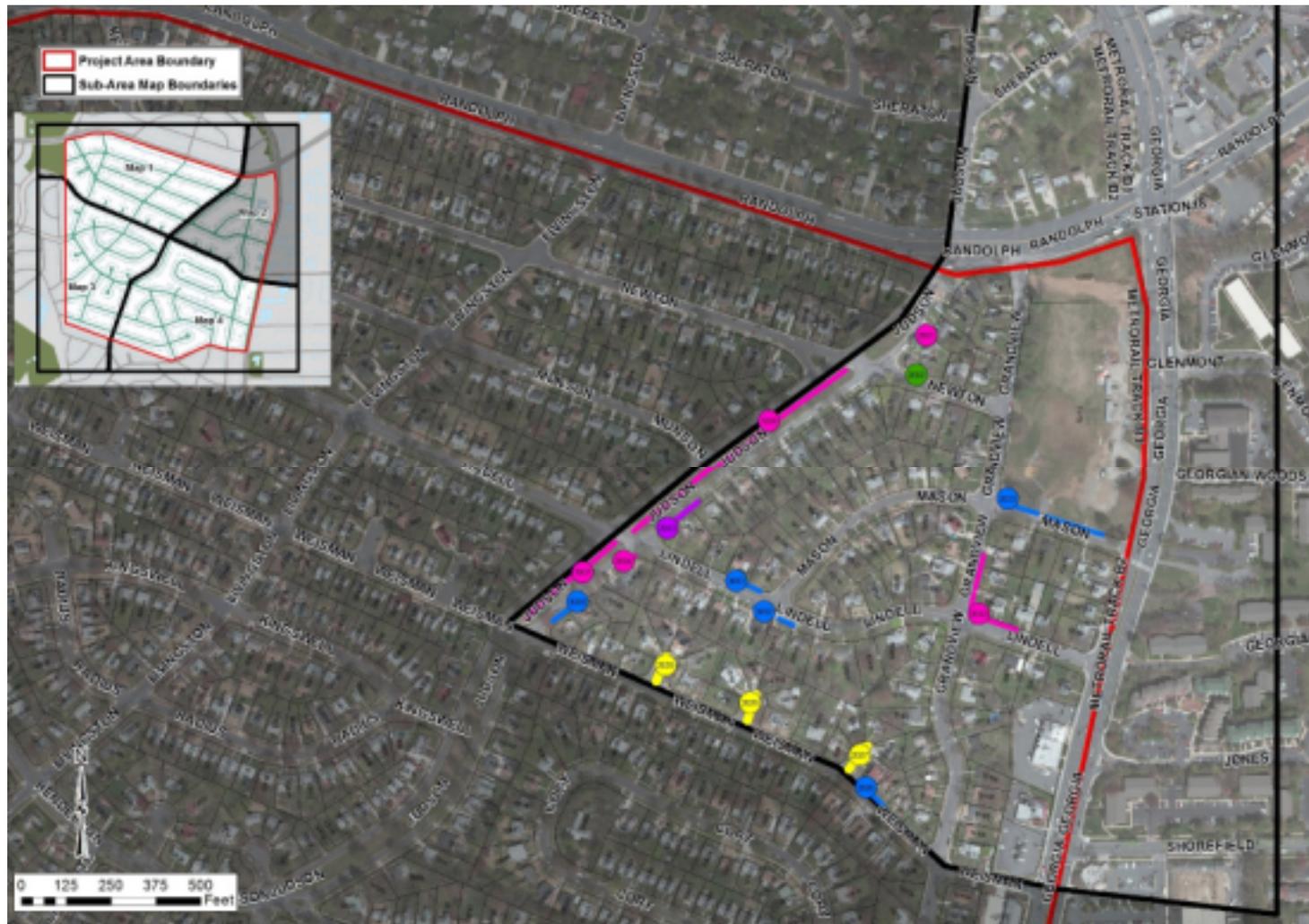
Green Streets in Glenmont Forest

Area Map 1



Green Streets in Glenmont Forest

Area Map 2



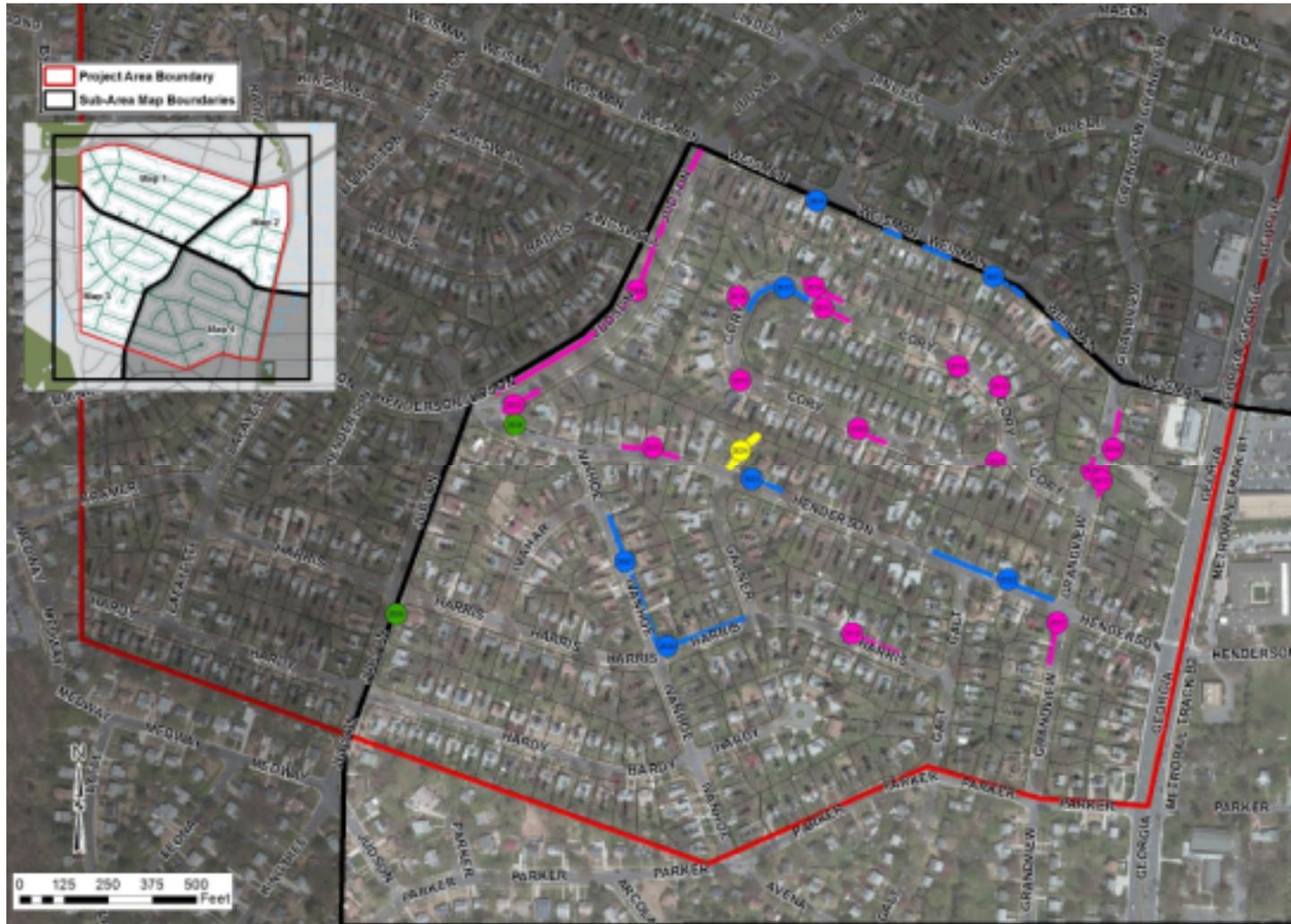
Green Streets in Glenmont Forest

Area Map 3



Green Streets in Glenmont Forest

Area Map 4



Community Involvement

- Public Meeting
- Community Walk
- Other meetings, as needed



Green Streets in Glenmont Forest

Public Events and Project Schedule (Tentative)

We are
here →

Event	Date / Time	Location
Preliminary Site Assessment	October 2013	
Public Meeting	March 12, 2014	Wheaton High School
Draft Designs	June 2014	
Community Walk	Summer 2014	Glenmont Forest Community
Final Designs	December 2014	
Construction	2015	

Maintenance

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



RainScapes Techniques at home



Green Roof

*.623 gallons of water falls on each sq. ft. of roof during the during a normal rainstorm of 1". A 1000 sq. ft conventional roof can shed 623 gallons when there is an inch of rain. Green roofs reduce and clean this stormwater runoff before it hits the ground.

Conservation Landscape

Loosened and improved soil, planted with easy-to-maintain native plants that soak up the rain.

Dry Well

collects stormwater from rooftops or driveways and filters the rainwater through a small stone-filled pit, then into the underlying soils



Canopy Trees

Leaves intercept raindrops and retain them, thus reducing stormwater runoff

Pavement Removal
allows more water to soak into the ground when you plant native plants.

Rain Gardens

A spoon-like, concave area filled with a special soil mix that collects rainfall and allows it to filter into the ground

Cistern

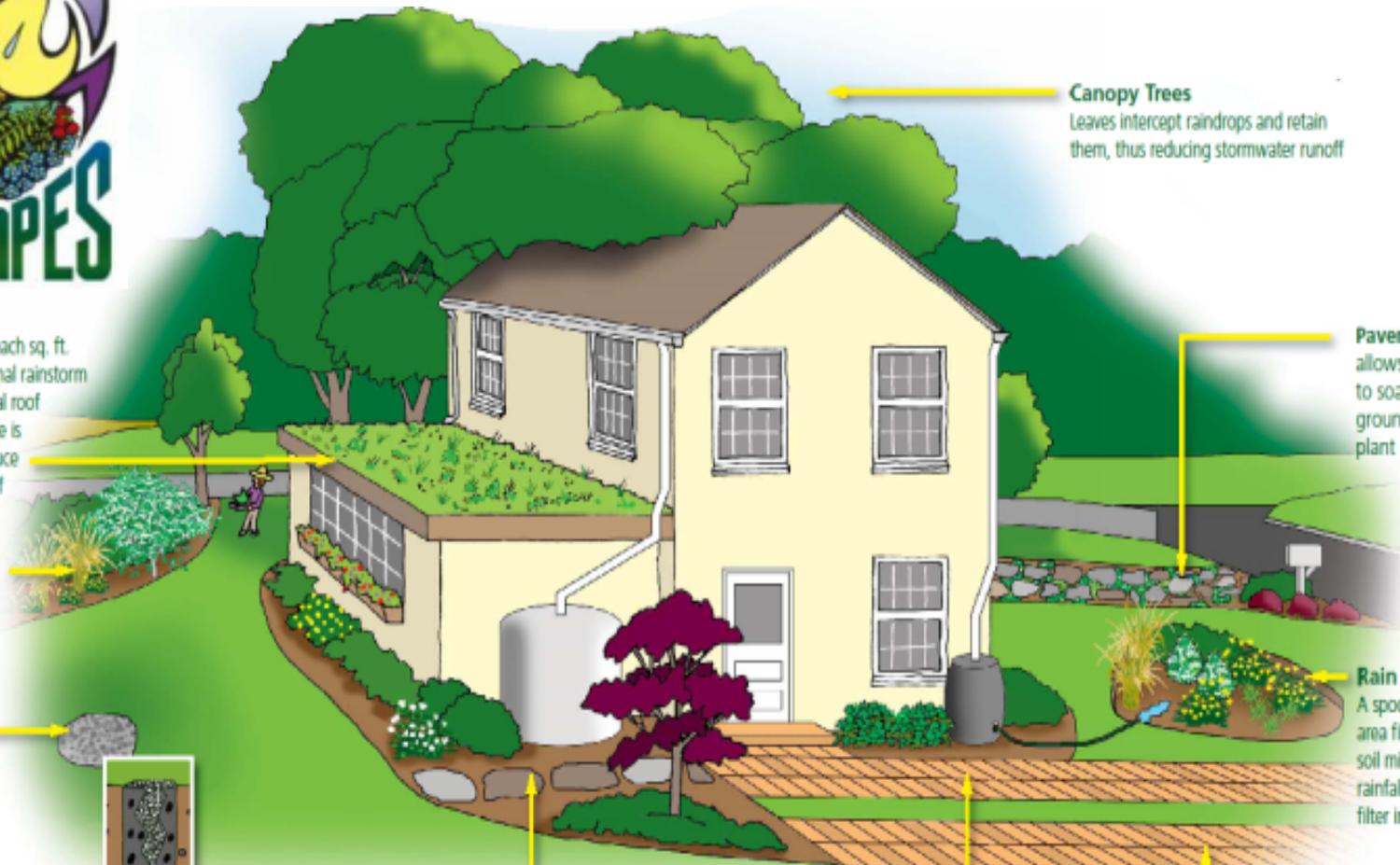
Larger than a rain barrel, cisterns perform the same water harvesting benefits and are no more aesthetically intrusive than an air conditioner.

Rain Barrels

collects and stores rain water from rooftops

Permeable Surfaces

allow rainwater to rapidly infiltrate and enter the ground where it is naturally filtered



Questions?

- For More Information:

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Projects Webpage: www.montgomerycountymd.gov/watershedrestoration

