Green Streets

Environmentally Friendly Landscapes for Healthy Watersheds

July 9, 2012

Jennifer St. John, Watershed Planner
Watershed Management Division
Department of Environmental Protection
jennifer.st.john@montgomerycountymd.gov

Outline

- What are Green Streets?
- Stormwater 101
- Green Streets Project Selection
- Green Streets Goals
- Green Streets Practices
- Green Streets Locations
- FAQs
- RainScapes Rebate Program

What are Green Streets?

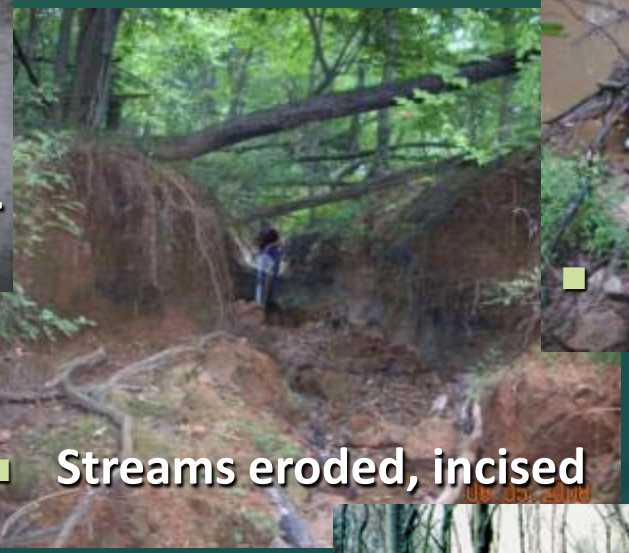
- Low Impact Development (LID) located within street right of way areas.
- LID Practices Include:
  - Rain gardens
  - Bioretention gardens
  - Bioswales
  - Tree Box filters
  - Curb extensions
  - Pervious sidewalk
  - Permeable pavers

- Stormwater runoff is captured and filtered in small landscaped areas that allow water to soak into the ground while plants and soils filter pollutants.
- Help replenish groundwater and baseflows in our streams, rather than sending polluted, heated water through pipes directly into our streams.
- Create aesthetically attractive streetscapes, provide natural habitat, and help to visually connect neighborhoods, schools, parks, and business districts.

Stormwater 101

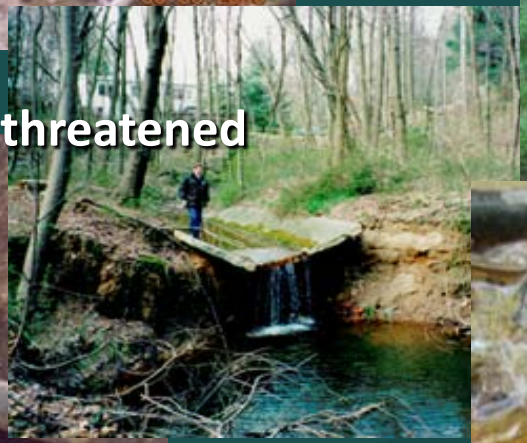
- Impervious (hard surfaces) = Increased runoff & pollutants

- Reduced groundwater recharge (infiltration)
- Increased storm flows & decreased base flows



- Streams eroded, incised

- Infrastructure threatened



- Storm drain systems convey heated, dirty water directly to streams
- Degraded aquatic habitat & water quality

Green Streets Project Selection

- MCDEP plans Green Streets projects:
  - For priority areas identified in Watershed Studies or Restoration Plans, and/or
  - Concurrently with the Department of Transportation's (MCDOT's) planned roadway maintenance and/or rehabilitation work.

Green Streets Goals

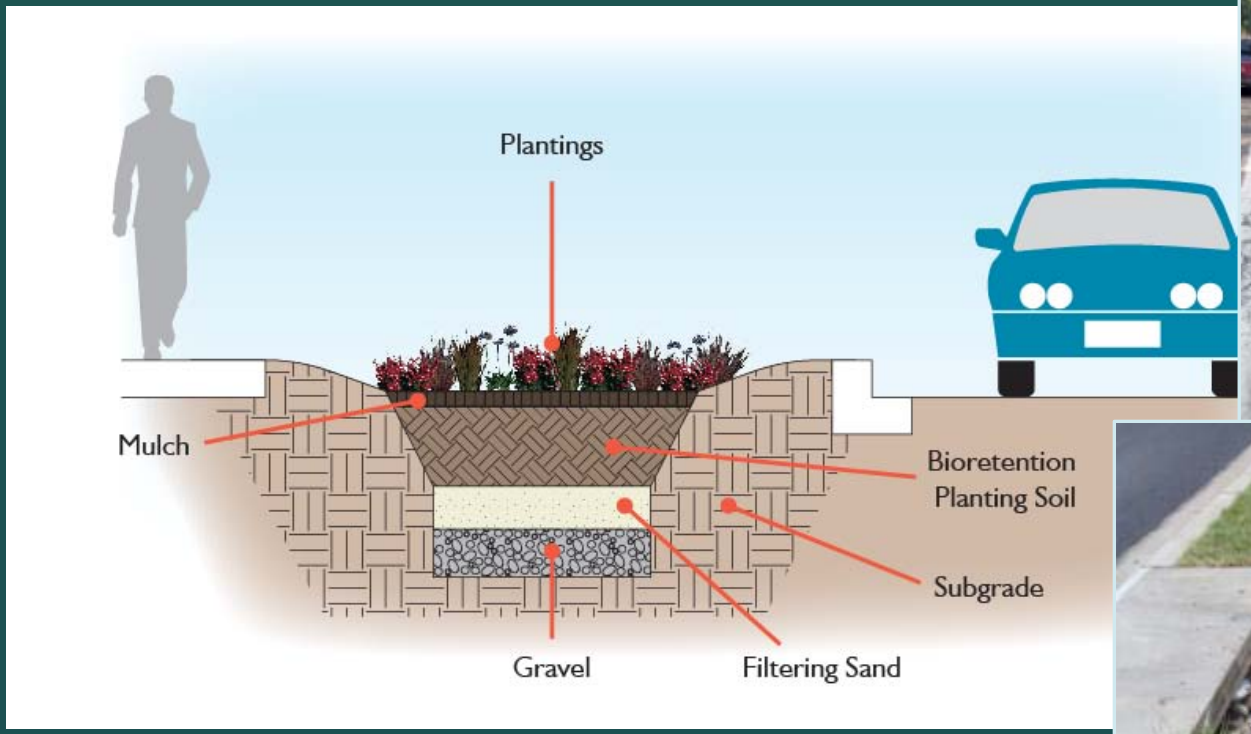
- Maximize stormwater management to improve stream conditions
- Improve water quality treatment
- Encourage infiltration of runoff from roadways, parking lots, and other impervious surfaces
- Fulfill the requirements in the County's National Pollutant Discharge Elimination System (NPDES) permit (issued in 2010), which requires:
  - New stormwater management for 20% of existing impervious area that is currently unmanaged (~ 4,300 acres).
  - Meet goals set forth in the "Potomac River Watershed Trash Treaty"
  - Identify pollution sources and improve water quality in all county watersheds
  - Increase use of Environmental Site Design (ESD), or Low Impact Development (LID)

Green Streets Practices

- Potential Green Streets Practices:
  - Rain Garden
  - Bioretention Garden
  - Tree Box Filter
  - Pervious Sidewalk, Permeable Pavers & Pavement Removal
  - Curb Extension
  - Grass Bioswale

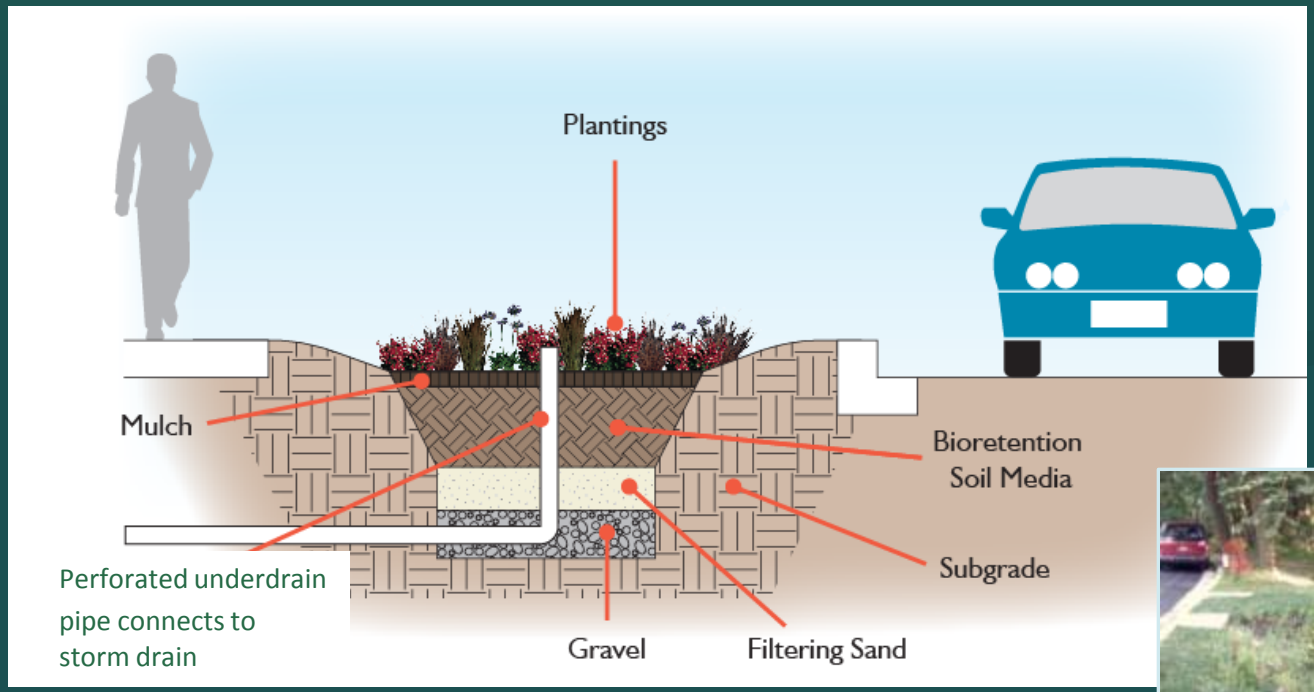
Green Streets Practices

- Rain Garden



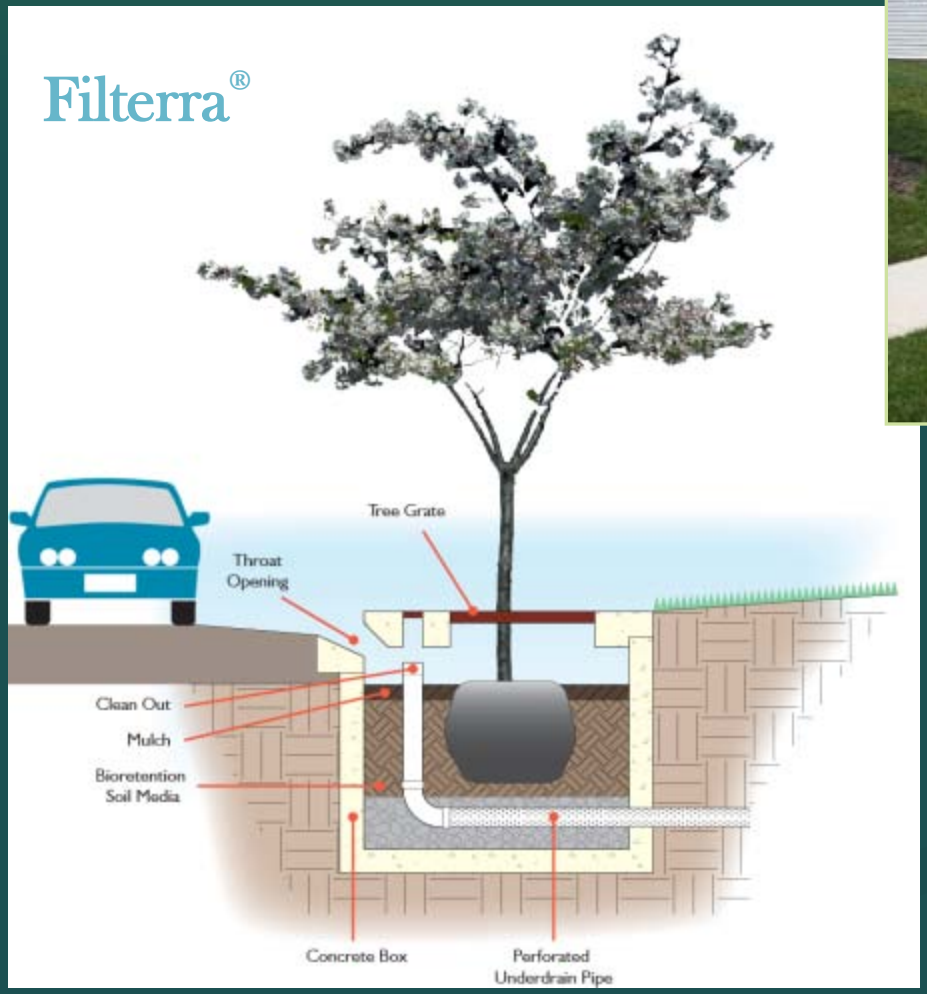
Green Streets Practices

- Bioretention Garden



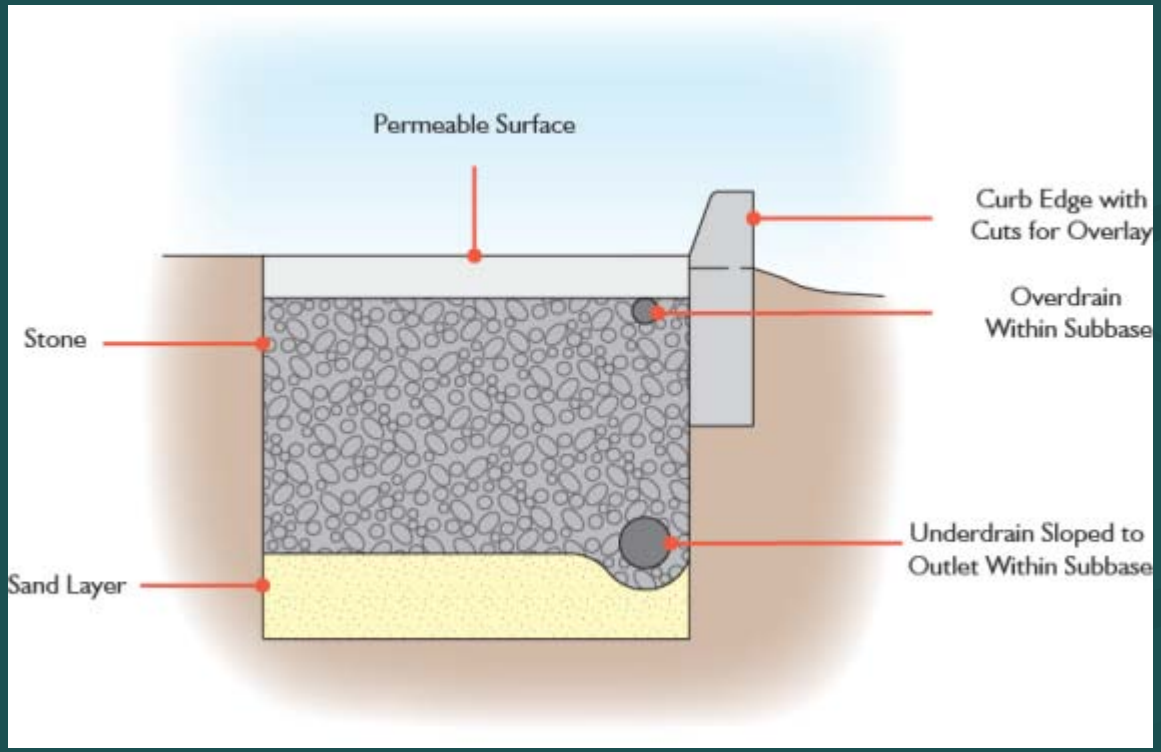
Green Streets Practices

- Tree Box Filter



Green Streets Practices

- Pervious Sidewalk, Permeable Pavers & Pavement Removal



Green Streets Practices

- Curb Extensions

Green Streets Practices

- Grass Bioswales

Forest Estates

Kingshouse Rd

Green Streets Locations

- Completed Projects:

  Sligo Creek
  - Arcola Ave
  - Forest Estates Neighborhood*

  Lower Rock Creek
  - Aspen Hill Rd (in front of library)

Arcola Avenue

Forest Estates Neighborhood*

Aspen Hill Road

** RainScapes Targeted Neighborhood*

Green Streets Locations

- In-Design or In-Construction Projects:

Sligo Creek

- Dennis Ave (In-Construction)
- Amherst Ave
- University Towers
- Sligo Park Hills Neighborhood*
- Breewood Neighborhood*

* *RainScapes Targeted Neighborhood*

MCDOT – Rainbow Dr
Under Construction

SHA (ICC) Kingshouse Rd
Under Construction

Northwest Branch

- Franklin Knolls & Clifton Park Neighborhoods

Paint Branch

- SHA ICC – Upper Paint (In-Construction)
- MCDOT – Rainbow Drive (in-Construction)
- White Oak (In-Construction)

White Oak - Under Construction

Green Streets Locations

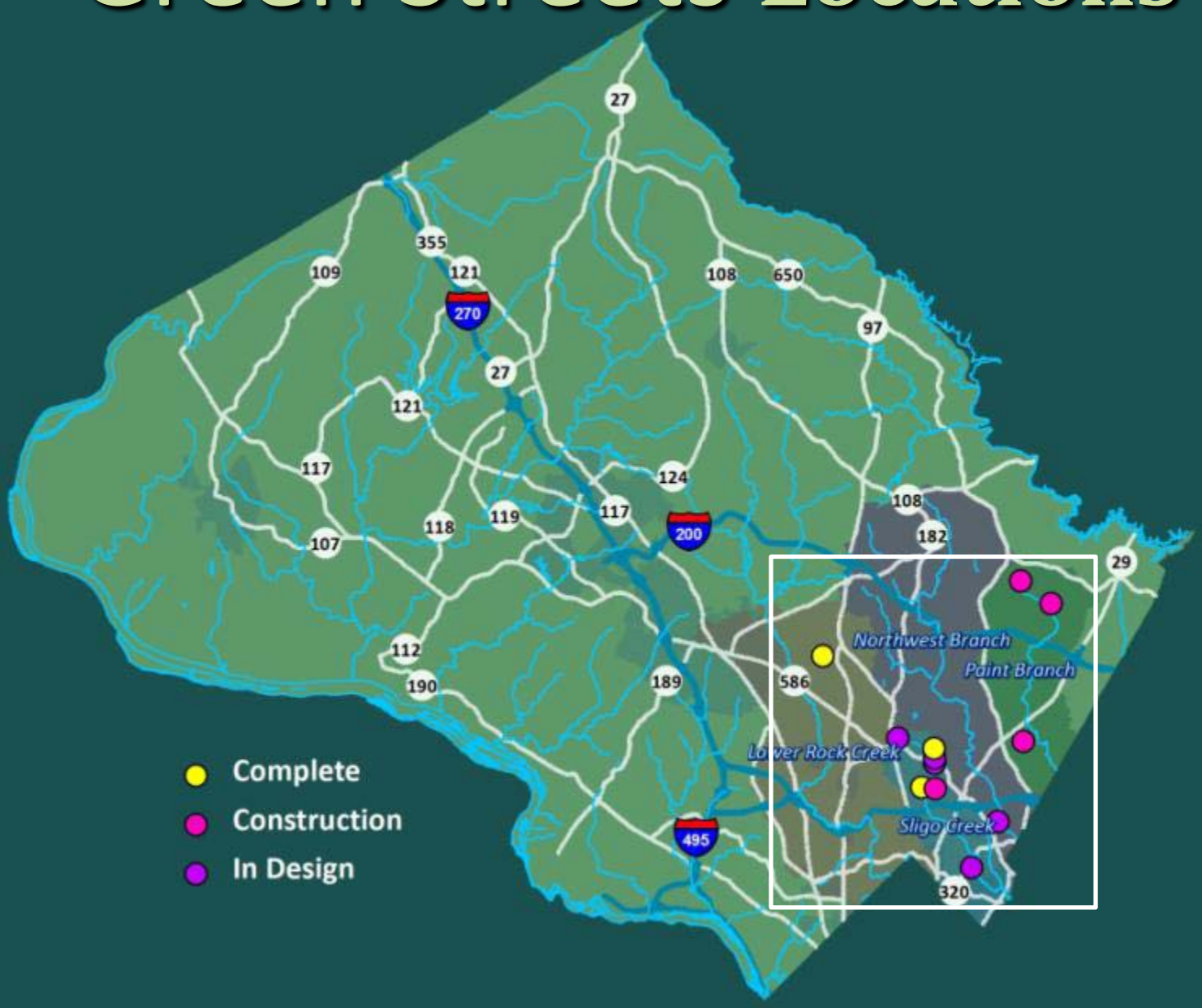
- Construction Process

Before

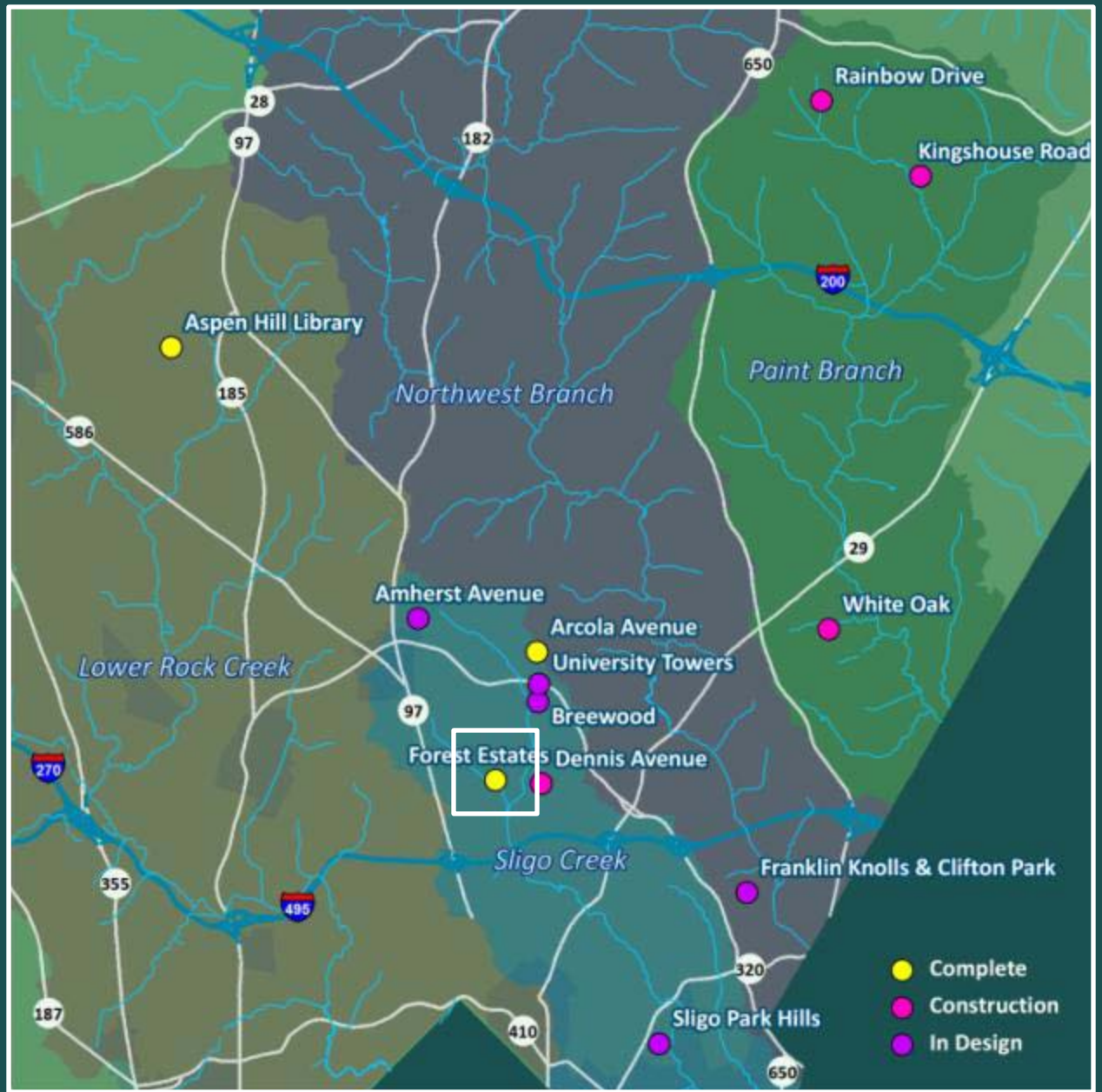
During

After

Green Streets Locations



Green Streets Locations



Green Streets Locations

Efforts on Wheaton Branch, Sligo Creek & *Forest Estates*

Dennis Ave
Health Center
LID Retrofit

Wheaton Branch
Stormwater Pond

Green Streets
& RainScapes

JULEP

DENNIS

INWOOD

Project Limits

Stream
Stabilization

Treats drainage upstream of Forest Estates

FOLK

WOODMAN

Bioretention

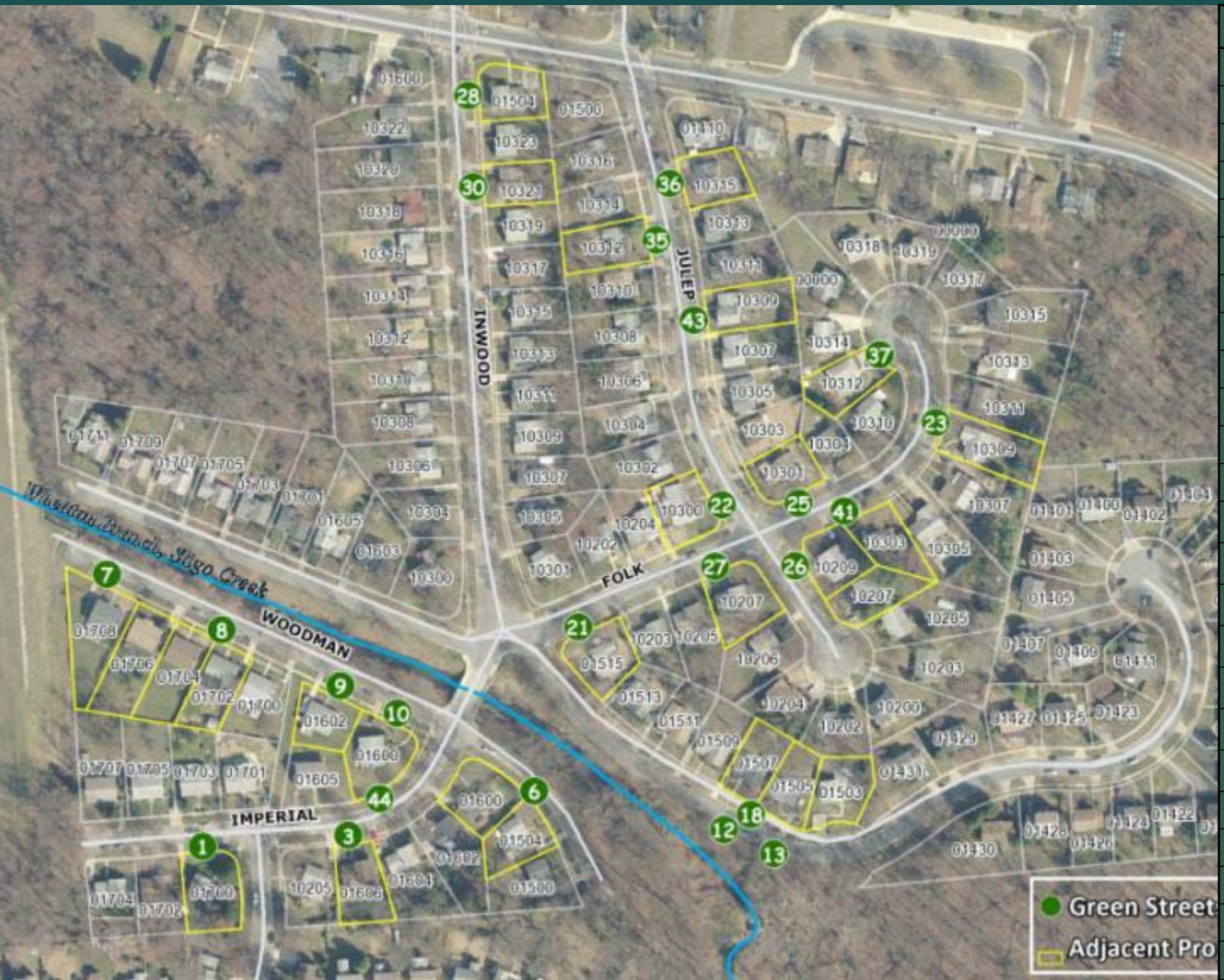
Original pond built in 1975
Retrofitted in 1990

Stream
Restoration
& Fish
Reintroduction

Wheaton Branch

Green Streets Locations

- **Example: Forest Estates** ~10 acres Impervious Treatment



ID	FEATURE TYPE
1	Bioretention Garden
3	Rain Garden
6	Rain Garden
7	Bioretention Garden
8	Bioretention Garden
9	Bioretention Garden
10	Bioretention Garden
12	Bioretention Garden
13	Bioswale
18	Bioretention Garden
21	Bioretention Garden
22	Rain Garden
23	Rain Garden
25	Bioretention Garden
26	Rain Garden
27	Rain Garden
28	Rain Garden
30	Rain Garden
35	Rain Garden
36	Rain Garden
37	Rain Garden
41	Rain Garden
43	Rain Garden
44	Rain Garden

Frequently Asked Questions

- How do the Green Streets practices work?
  - Depends on type of practice, but generally:
    - Stormwater runoff from the roadway is diverted into an inlet opening in the curb, and is filtered through a mixture of highly permeable soils (sand, mulch, compost), then stored in an underlying gravel layer before percolating into the groundwater and/or entering into an underdrain that flows to the storm drain system.
    - When certain facilities are full after rain events, water may pond up to 6 inches before draining within 12 to 48 hours.

Frequently Asked Questions

- Who is responsible for maintaining Green Streets practices?
  - MCDEP is responsible for maintenance
  - MCDEP will monitor the practices regularly to make sure they are functioning properly. MCDEP will:
    - Ensure that plants are healthy
      - Water during initial plant establishment
      - Remove dead, diseased, or dying plants
      - Replace plants as needed
    - Replenish mulch
    - Regularly weed
    - Remove sediment & trash

Frequently Asked Questions

- How Can I Help?
  - Become a Watershed Keeper and help MCDEP by adopting projects on public property, such as Green Street practices, tree plantings, or trash clean ups.
    - Adoption of a project may require routing visual inspection, removing trash or debris, and weeding as necessary.
    - Volunteers will communicate with MCDEP staff any major issues with their adopted project, as instructed during project-specific training.
  - The County's RainScapes program promotes and implements projects on residential, institutional, and commercial properties to reduce stormwater pollution.

RainScapes Rebate Program

- Maximum Rebate

  for a Residential Property:

  $1,200

- RainScapes Techniques:
  - Downspout Diversion
  - Rain Barrels, Cisterns* (water re-use)
  - Rain Gardens*
  - Permeable Pavers*
  - Green Roofs*
  - Conservation Landscaping*
  - Urban Tree Canopy*
  - Pavement Removal*
  - Dry Wells*
  - Soil Reconditioning and Amendment

* Eligible for Rebate

- Visit www.rainscapes.org for more information and to apply online.

Questions?