Green Streets Kensington Estates

Environmentally Friendly Landscapes for Healthy Watersheds

Concept Design Presentation

April 12, 2016

DEPARTMENT OF ENVIRONMENTAL PROTECTION
MONTGOMERY COUNTY • MARYLAND

www.montgomerycountymd.gov/watershedrestoration

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Responsive People | Creative Solutions

Introductions

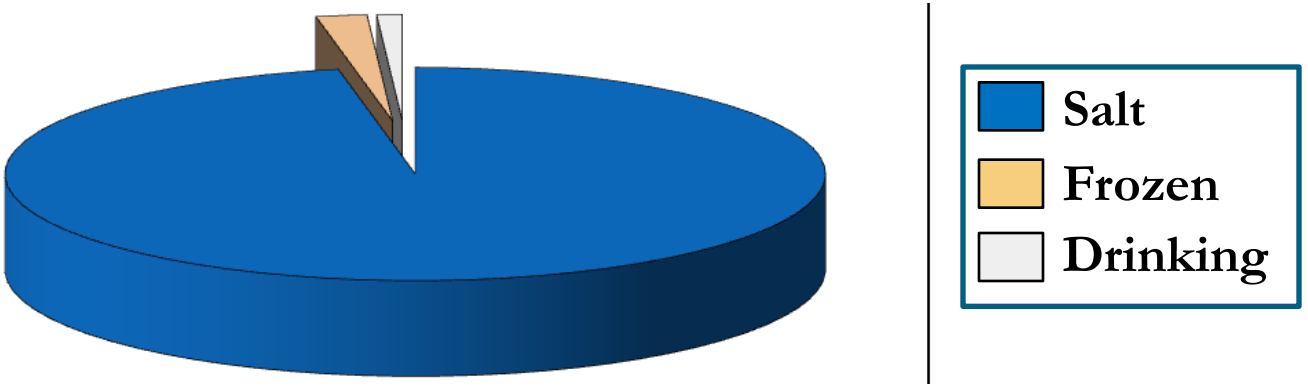
- Darian Copiz
  - DEP Watershed Planner
- Zainab Nejati
  - DEP Project Manager
- Lucy Noya
  - RK&K Project Manager
- Kristianne Sandoval
  - RK&K Engineer

Today's Agenda

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

Watershed 101

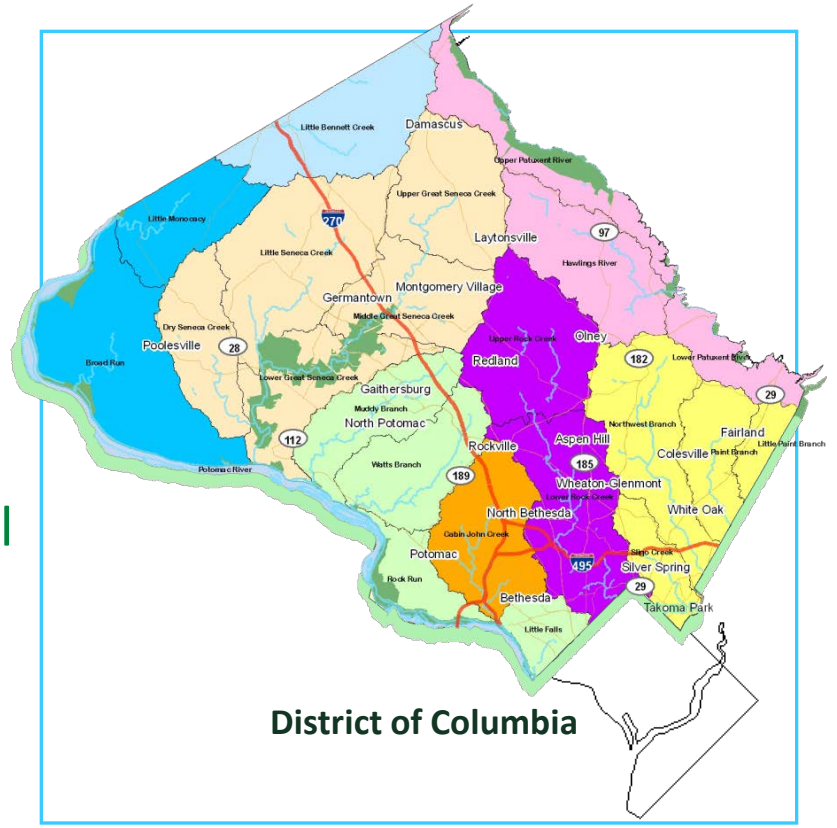
- **Sources of Water**



- About 97% is salt water
- About 2% is frozen
- Only 1% is available for drinking water
  - Across the Country, 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)

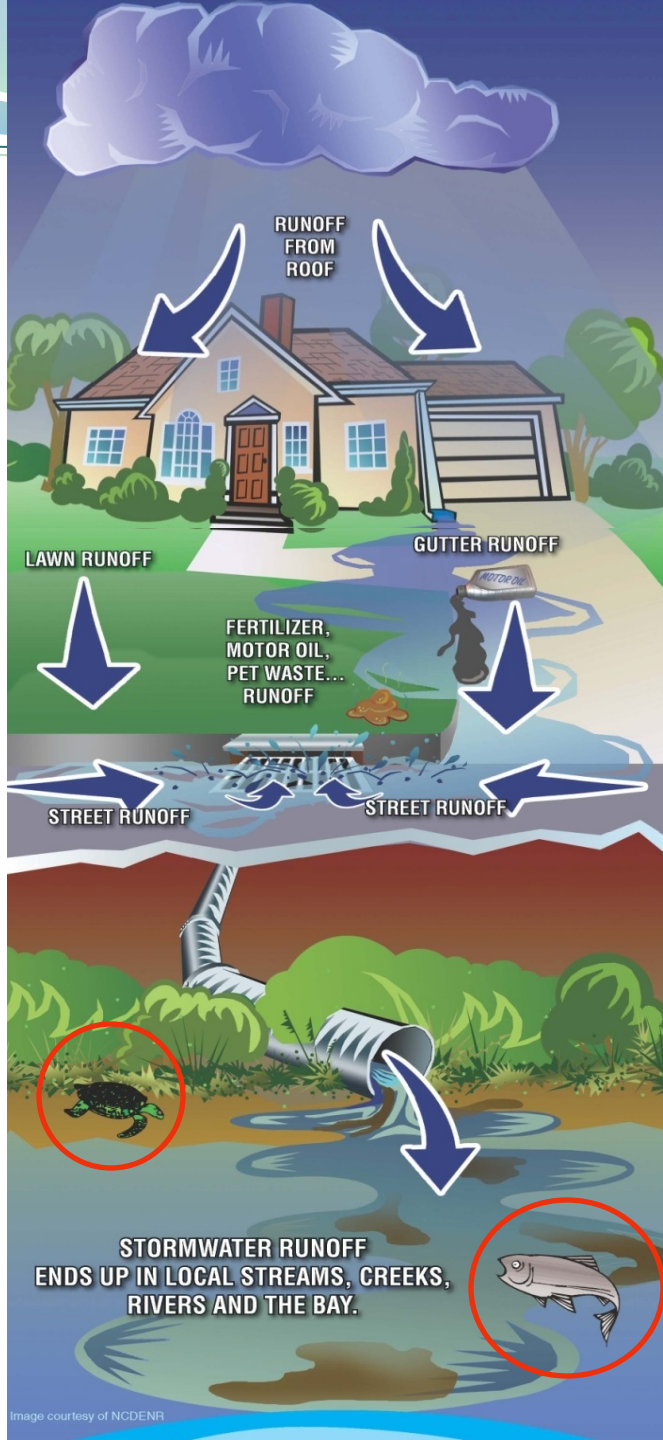
Watershed 101

- **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:

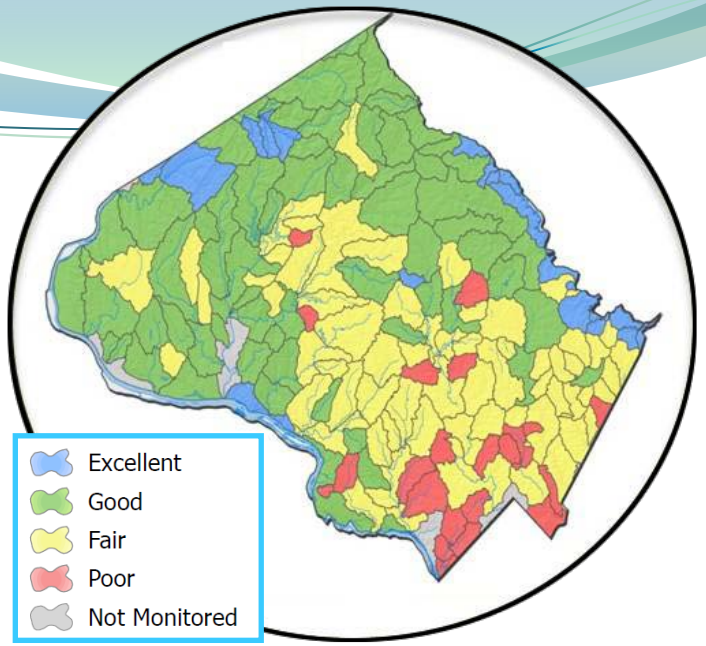
Volume/Timing of Runoff

Water Quality



Watershed 101

- **What is the County doing to protect our Streams?**



- Must meet regulatory requirements
  - Federal Clean Water Act permit program
  - **MS4** = **M**unicipal **S**eparate **S**torm **S**ewer **S**ystem
- 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

  (3,777 acres = 5.9 square miles)… About three times the size of Takoma Park.

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?

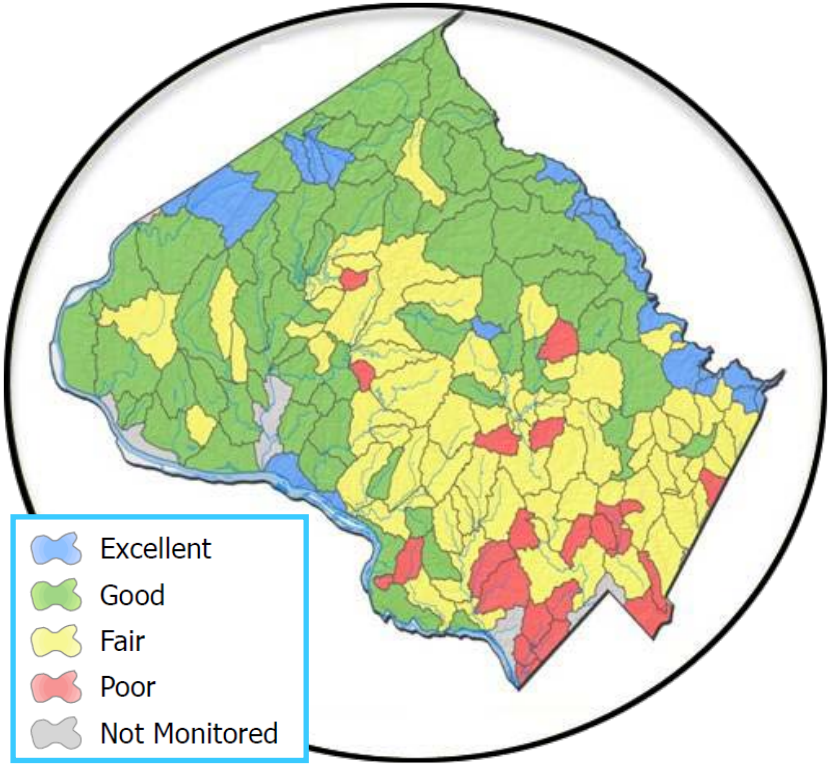
- Replenish groundwater and improve flow in local streams
- Water can soak into the ground while plants and soils filter pollutants

- Create aesthetically attractive streetscapes

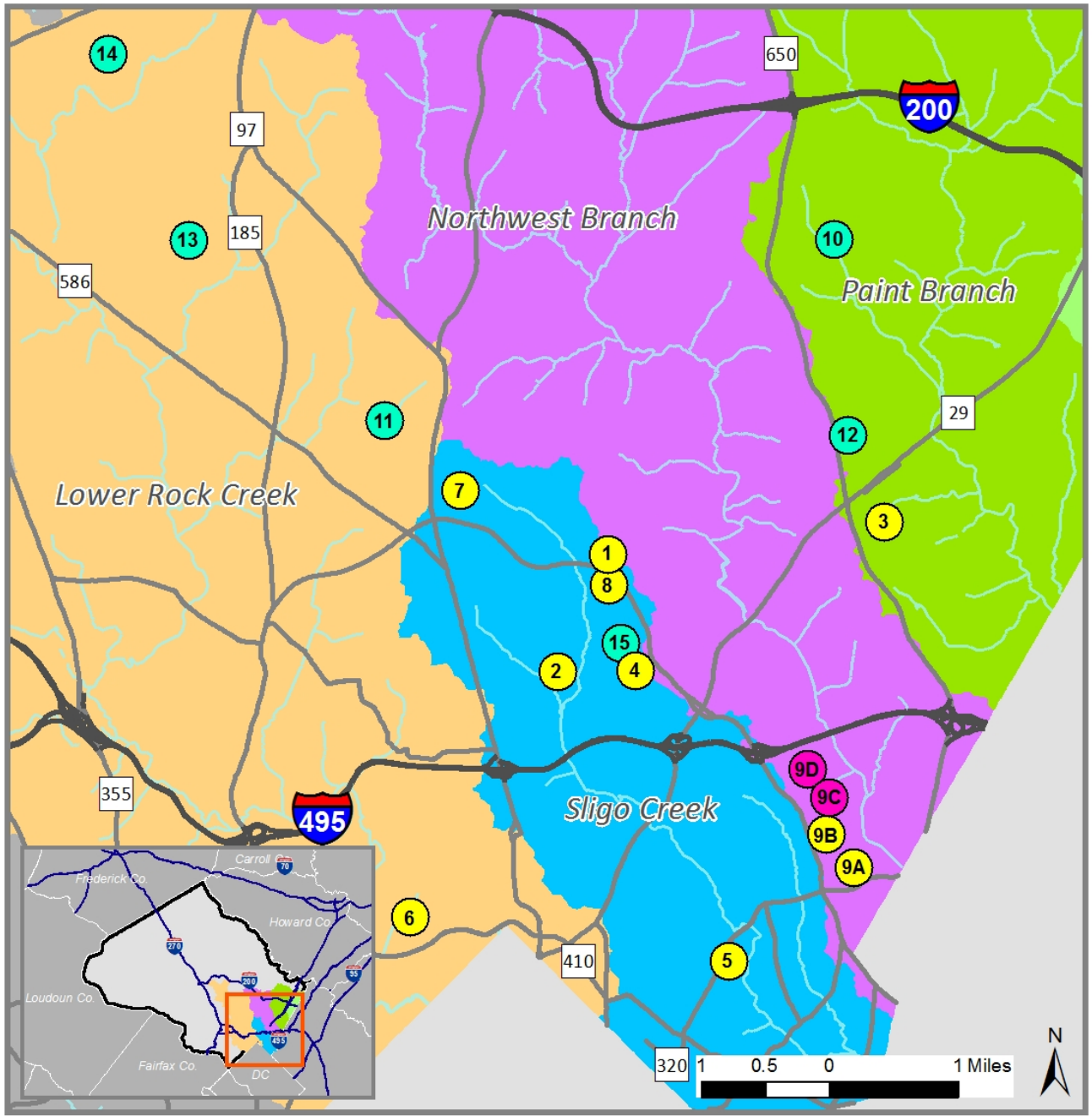
- Provide natural habitat

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 (March 2016)



	COMPLETE
1	Arcola Avenue
2	Forest Estates
3	White Oak
4	Dennis Avenue
5	Sligo Park Hills
6	Donnybrook
7	Amherst
8	Breewood
9A	Franklin Knolls - Phase 1
9B	Franklin Knolls - Phase 2
	IN CONSTRUCTION
9C	Franklin Knolls - Phase 3
9D	Franklin Knolls - Phase 4
	IN DESIGN
10	Cannon Road
11	Glenmont Forest
12	Springbrook \ Homestead Estate
13	Wheaton Woods
14	Manor Woods
15	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 in Kensington Estates

Project Location

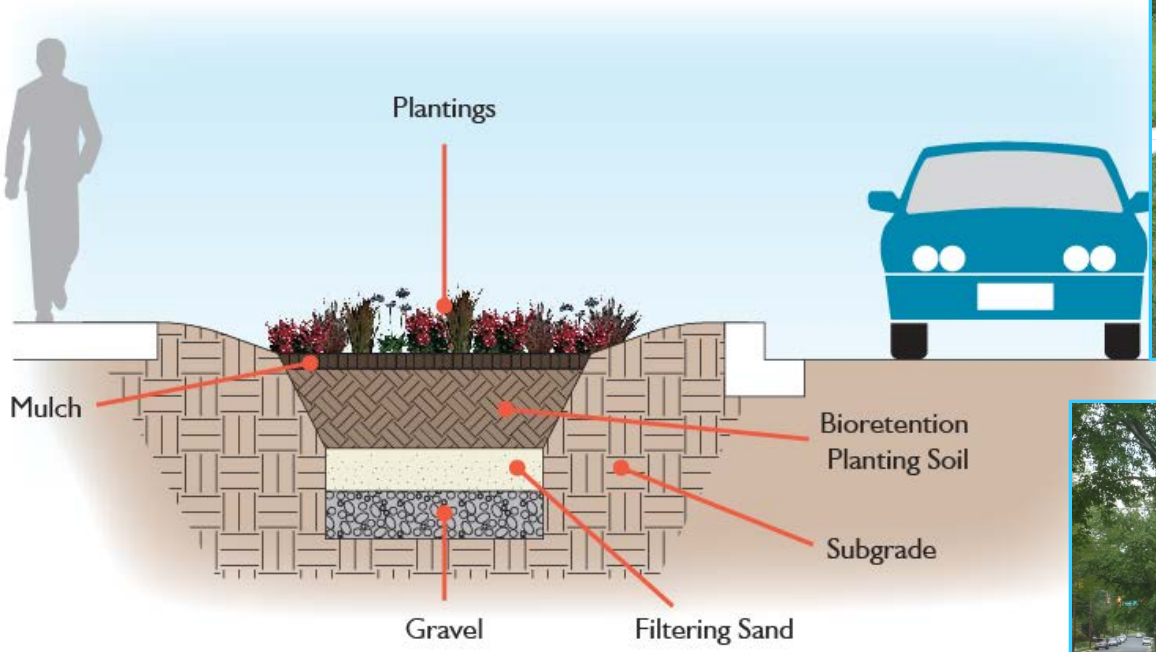
Green Streets in Kensington Estates

Neighborhood Background

- Study Area = 93 acres total
- 30 acres impervious surface
- 423 single family residential properties
- Originally developed in the 1940's, Significant re-development ongoing

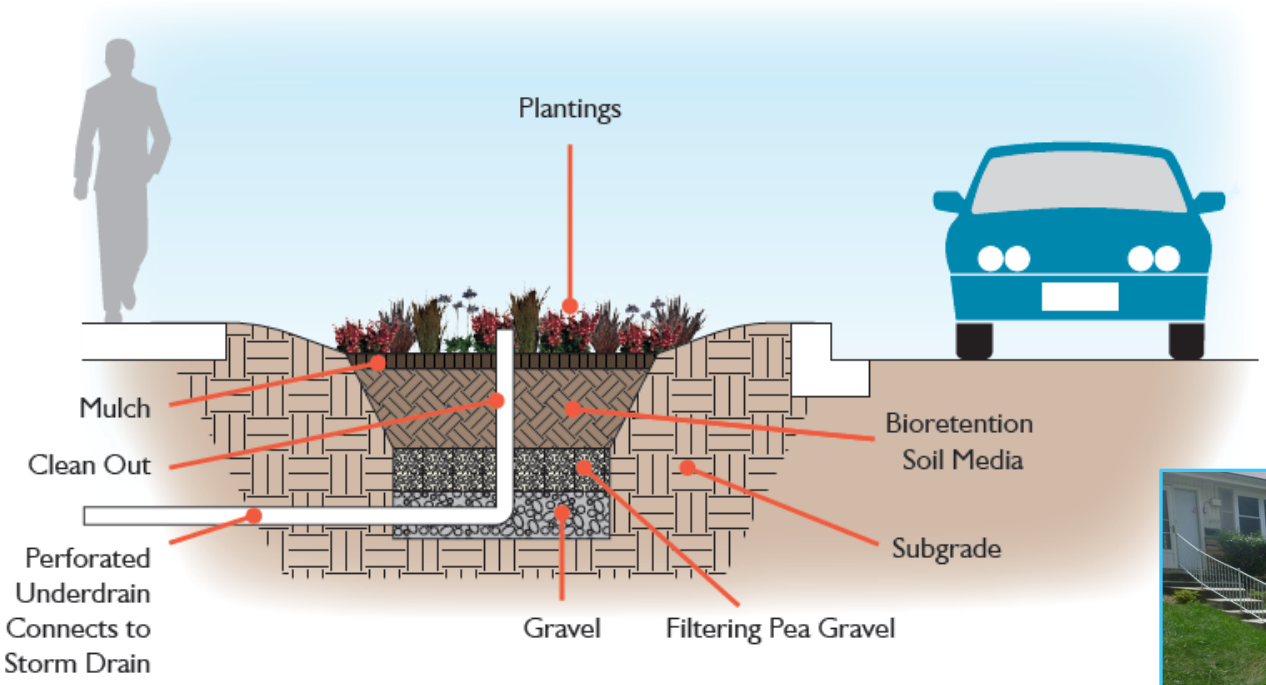
Green Streets Practices

- Rain Garden



Green Streets Practices

- Bioretention



Green Streets Practices

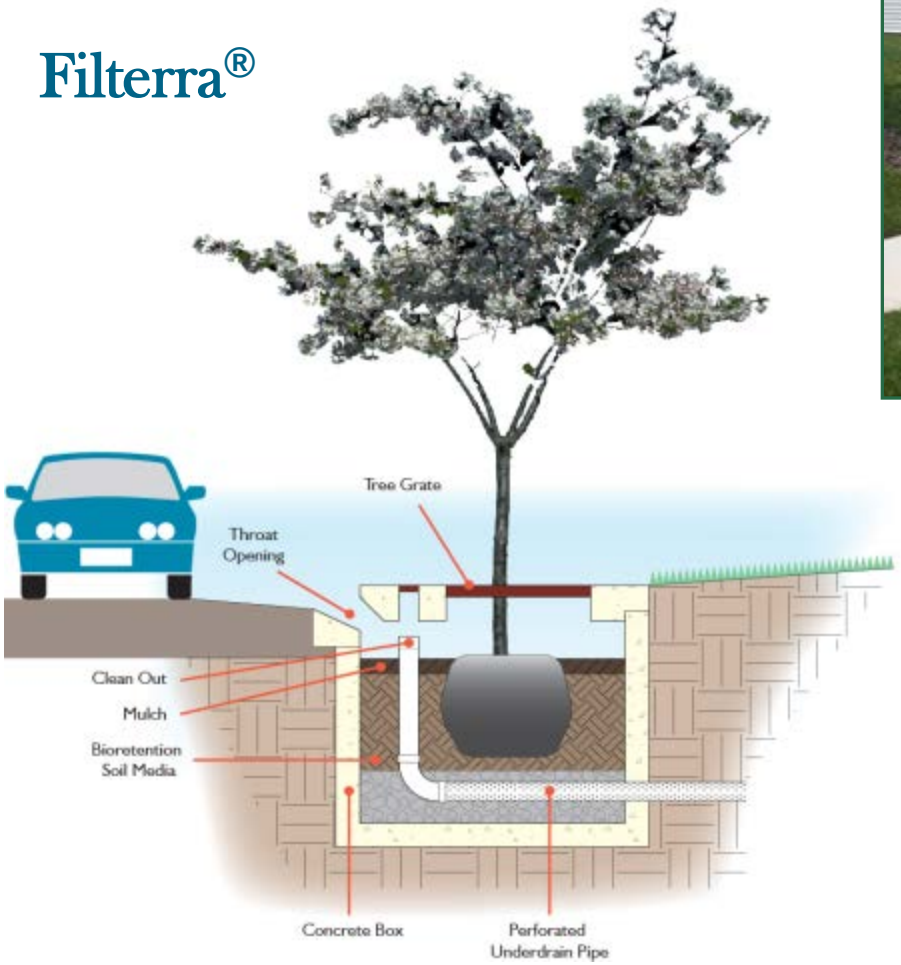
- Curb Extension

Green Streets **Practices**

- Bioswale

Green Streets **Practices**

- Tree Box Filter



Green Streets in Kensington Estates

Constraints & Proposed Practices

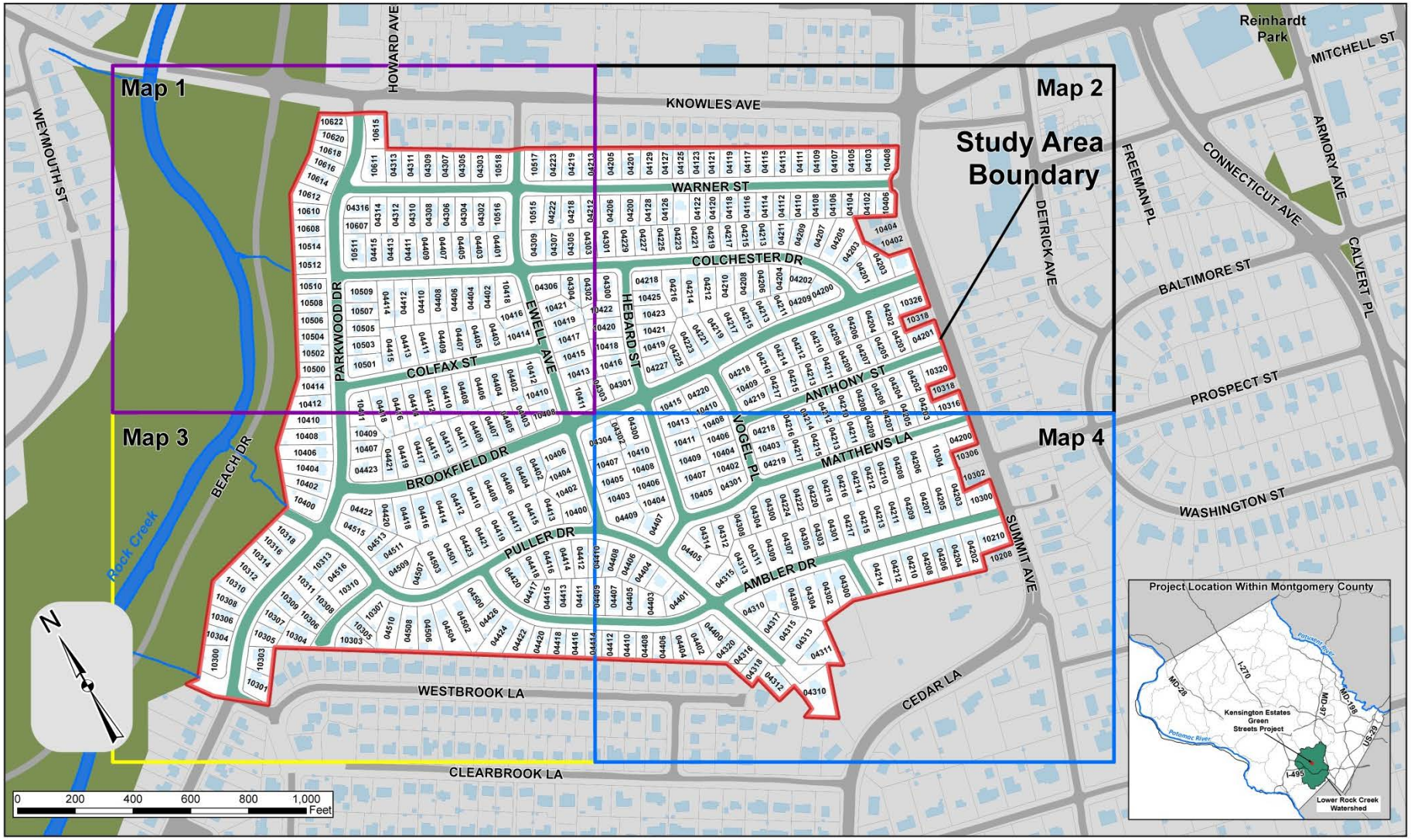
Constraints that we Consider:

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

Proposed Practices:

- 160 Facilities Total
  - 22 Bioretention
  - 11 Bioswale
  - 98 Rain Garden (includes 13 curb extensions)
  - 28 Tree Box Filters
  - 1 Pavement Removal/Rain Garden
- 98% total impervious area treated

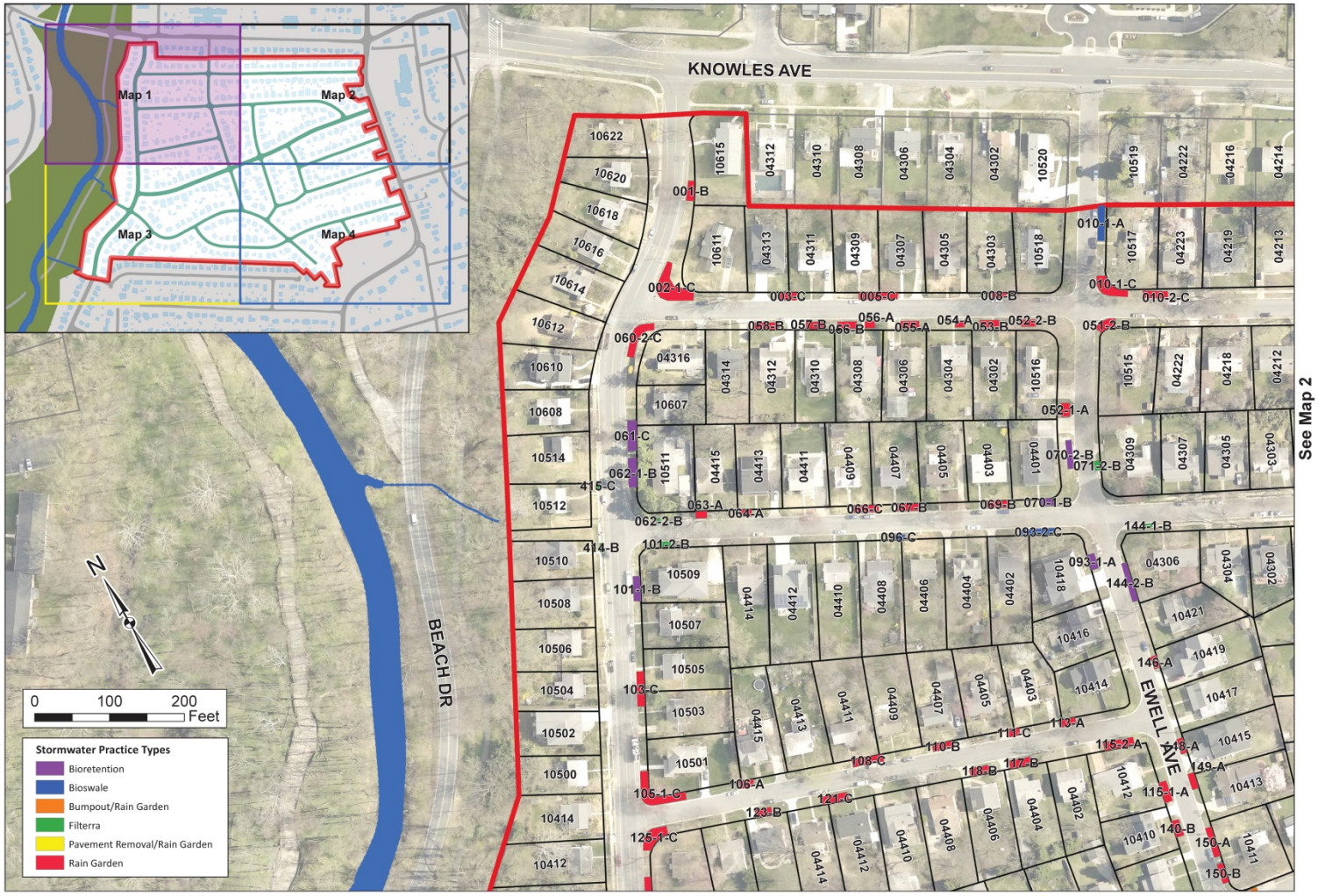
Green Streets in Kensington Estates



Green Streets in Kensington Estates

Kensington Estates Green Streets Project

Preliminary Design - Location Map 1



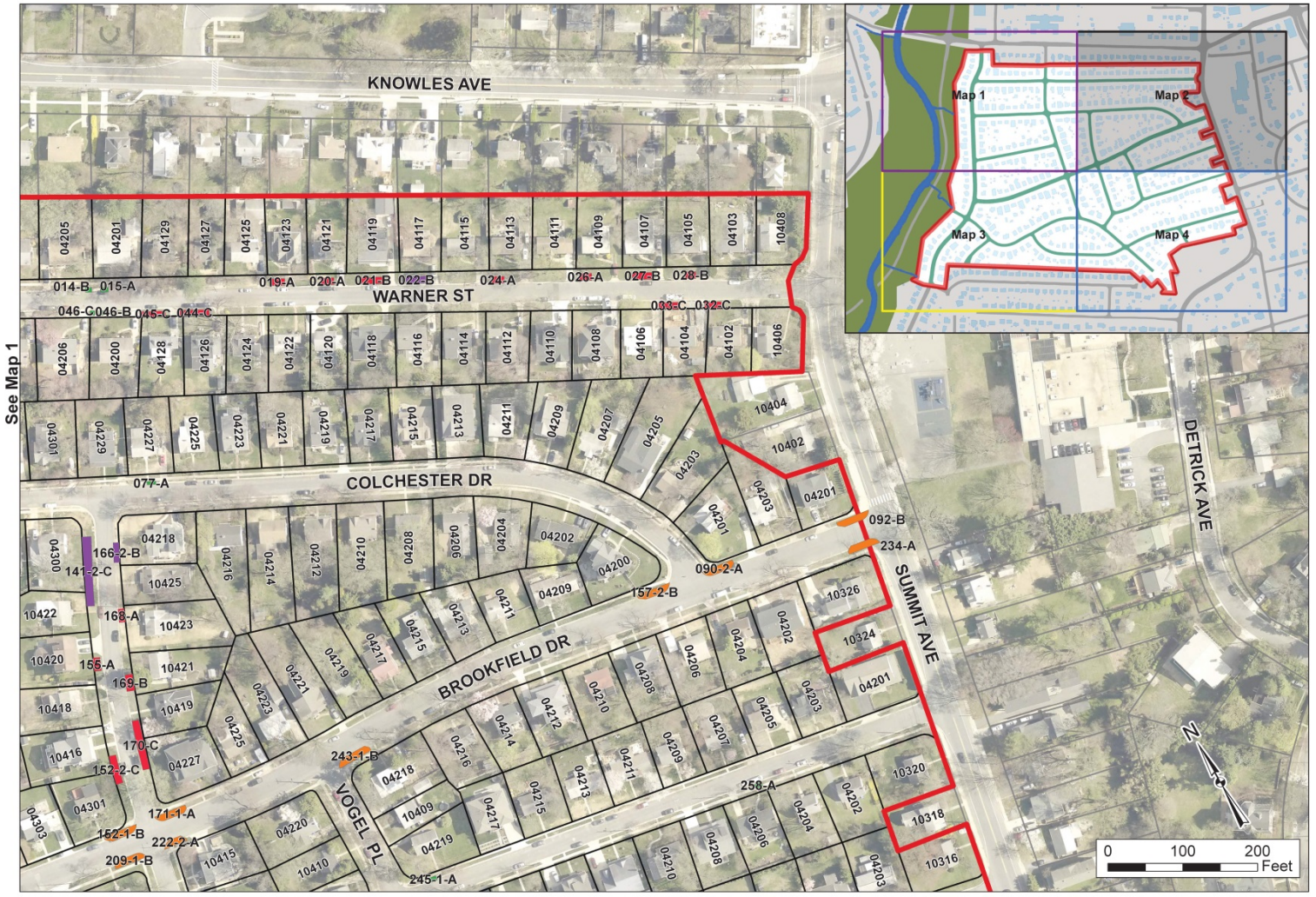
ID #	Stormwater Practice Proposed
001-B	Rain Garden
002-1-C	Rain Garden
003-C	Rain Garden
005-C	Rain Garden
008-B	Rain Garden
010-1-A	Bioswale
010-1-C	Rain Garden
010-2-C	Rain Garden
051-2-B	Rain Garden
052-1-A	Rain Garden
052-2-B	Rain Garden
053-B	Rain Garden
054-A	Rain Garden
055-A	Rain Garden
056-A	Rain Garden
056-B	Rain Garden
057-B	Rain Garden
058-B	Rain Garden
060-2-C	Rain Garden
061-C	Bioretention
062-1-B	Bioretention
062-2-B	Filterra
063-A	Rain Garden
064-A	Rain Garden
066-C	Rain Garden
067-B	Rain Garden
069-B	Rain Garden
070-1-B	Bioretention
070-2-B	Bioretention
071-2-B	Filterra
093-1-A	Bioretention
093-2-C	Bioswale
096-C	Bioswale
101-1-B	Bioretention
101-2-B	Filterra
103-C	Rain Garden
105-1-C	Rain Garden
106-A	Rain Garden
108-C	Rain Garden
110-B	Rain Garden
111-C	Rain Garden
113-A	Rain Garden
115-1-A	Rain Garden
115-2-A	Rain Garden
117-B	Rain Garden
118-B	Rain Garden
121-C	Rain Garden
123-B	Rain Garden
125-1-A	Rain Garden
125-1-C	Rain Garden
140-B	Rain Garden
144-1-B	Filterra
144-2-B	Bioretention
146-A	Rain Garden
148-A	Rain Garden
149-A	Rain Garden
150-A	Rain Garden
150-B	Rain Garden
150-2-A	Bumpout/Rain Garden
414-B	Filterra
415-C	Filterra

Date: 3/28/2016

Green Streets in Kensington Estates

Kensington Estates Green Streets Project

Preliminary Design - Location Map 2



ID #	Stormwater Practice Proposed
014-B	Filterra
015-A	Filterra
019-A	Rain Garden
020-A	Rain Garden
021-B	Rain Garden
022-B	Bioretention
024-A	Rain Garden
026-A	Rain Garden
027-B	Rain Garden
028-B	Rain Garden
032-C	Rain Garden
033-C	Rain Garden
044-C	Rain Garden
045-C	Rain Garden
046-B	Filterra
046-C	Filterra
077-A	Filterra
090-2-A	Bumpout/Rain Garden
092-B	Bumpout/Rain Garden
141-2-C	Bioretention
152-1-B	Bumpout/Rain Garden
152-2-C	Rain Garden
155-A	Rain Garden
157-2-B	Bumpout/Rain Garden
166-2-B	Bioretention
168-A	Rain Garden
169-B	Rain Garden
170-C	Rain Garden
171-1-A	Bumpout/Rain Garden
209-1-B	Bumpout/Rain Garden
222-2-A	Bumpout/Rain Garden
234-A	Bumpout/Rain Garden
243-1-B	Bumpout/Rain Garden
258-A	Filterra

Stormwater Practice Types

- Bioretention
- Bioswale
- Bumpout/Rain Garden
- Filterra
- Pavement Removal/Rain Garden
- Rain Garden

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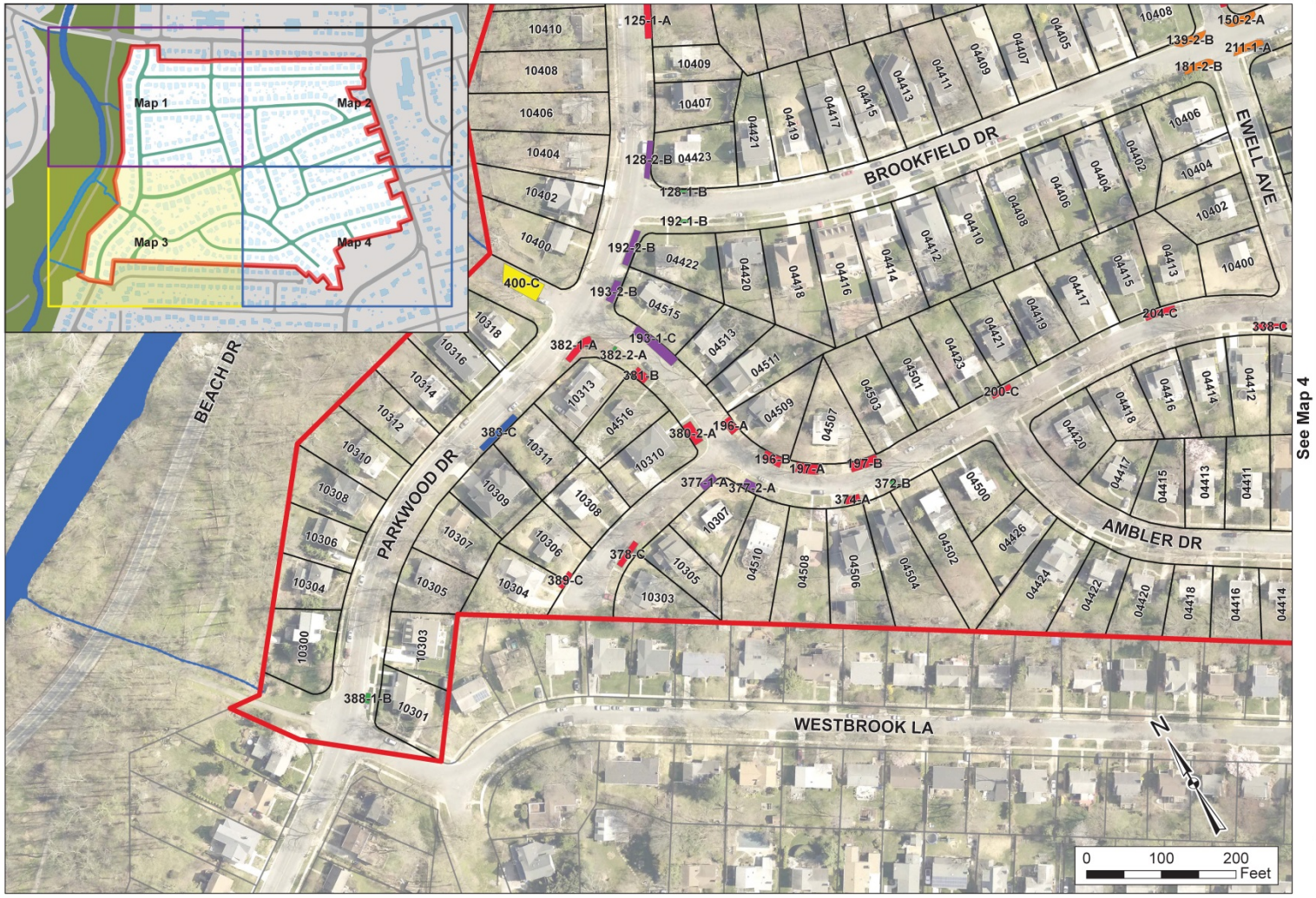
Green Streets in Kensington Estates

Kensington Estates Green Streets Project

Preliminary Design - Location Map 3



ID #	Stormwater Practice Proposed
125-1-A	Rain Garden
128-1-B	Filterra
128-2-B	Bioretention
139-2-B	Bumpout/Rain Garden
150-2-A	Bumpout/Rain Garden
181-2-B	Bumpout/Rain Garden
192-1-B	Filterra
192-2-B	Bioretention
193-2-B	Bioretention
193-1-C	Bioretention
196-A	Rain Garden
196-B	Rain Garden
197-A	Rain Garden
197-B	Rain Garden
200-C	Rain Garden
204-C	Rain Garden
211-1-A	Bumpout/Rain Garden
338-C	Rain Garden
372-B	Filterra
374-A	Rain Garden
377-1-A	Bioretention
377-2-A	Bioretention
378-C	Rain Garden
380-2-A	Rain Garden
381-B	Rain Garden
382-1-A	Rain Garden
382-2-A	Filterra
383-C	Bioswale
388-1-B	Filterra
389-C	Rain Garden
400-C	Pavement Removal/ Rain Garden

Stormwater Practice Types

- Bioretention
- Bioswale
- Bumpout/Rain Garden
- Filterra
- Pavement Removal/Rain Garden
- Rain Garden

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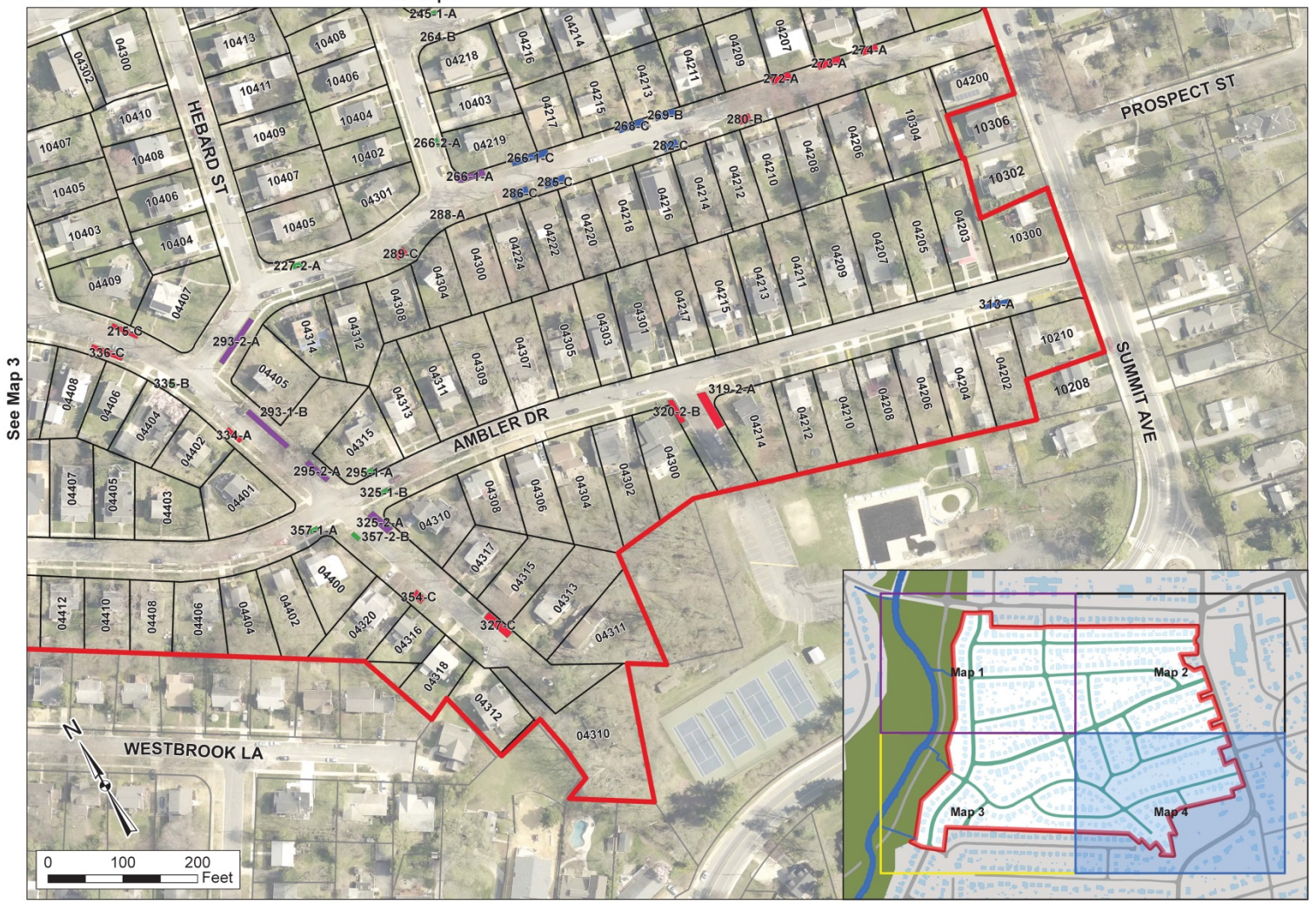
Green Streets in Kensington Estates

Kensington Estates Green Streets Project

Preliminary Design - Location Map 4



ID #	Stormwater Practice Proposed
215-C	Rain Garden
227-2-A	Filterra
245-1-A	Filterra
264-B	Filterra
266-1-A	Bioretention
266-1-C	Bioswale
266-2-A	Filterra
268-C	Bioswale
269-B	Bioswale
272-A	Rain Garden
273-A	Rain Garden
274-A	Rain Garden
280-B	Rain Garden
282-C	Bioswale
285-C	Bioswale
286-C	Bioswale
288-A	Filterra
289-C	Rain Garden
293-1-B	Bioretention
293-2-A	Bioretention
295-1-A	Filterra
295-2-A	Bioretention
313-A	Bioswale
319-2-A	Rain Garden
320-2-B	Rain Garden
325-1-B	Filterra
325-2-A	Bioretention
327-C	Rain Garden
334-A	Rain Garden
335-B	Filterra
336-C	Rain Garden
354-C	Rain Garden
357-1-A	Filterra
357-2-B	Filterra

Stormwater Practice Types

- Bioretention
- Bioswale
- Bumpout/Rain Garden
- Filterra
- Pavement Removal/Rain Garden
- Rain Garden

Date: 3/28/2016

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Community Involvement

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

Green Streets in Kensington Estates

Public Events and Project Schedule (Tentative)

We are here

Event	Date / Time	Location
Preliminary Site Assessment	February 2016	
Public Meeting	April 12, 2016	Kensington Library Kensington, MD
Draft Designs	Fall 2016	
Community Walk	Winter/Spring 2016	TBD
Final Designs	Spring 2017	
Construction	Fall 2017/Winter 2018	Entire Project

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:

Zainab Nejati

240-499-8531 Zainab.Nejati@montgomerycountymd.gov

Projects Webpage: www.montgomerycountymd.gov/watershedrestoration