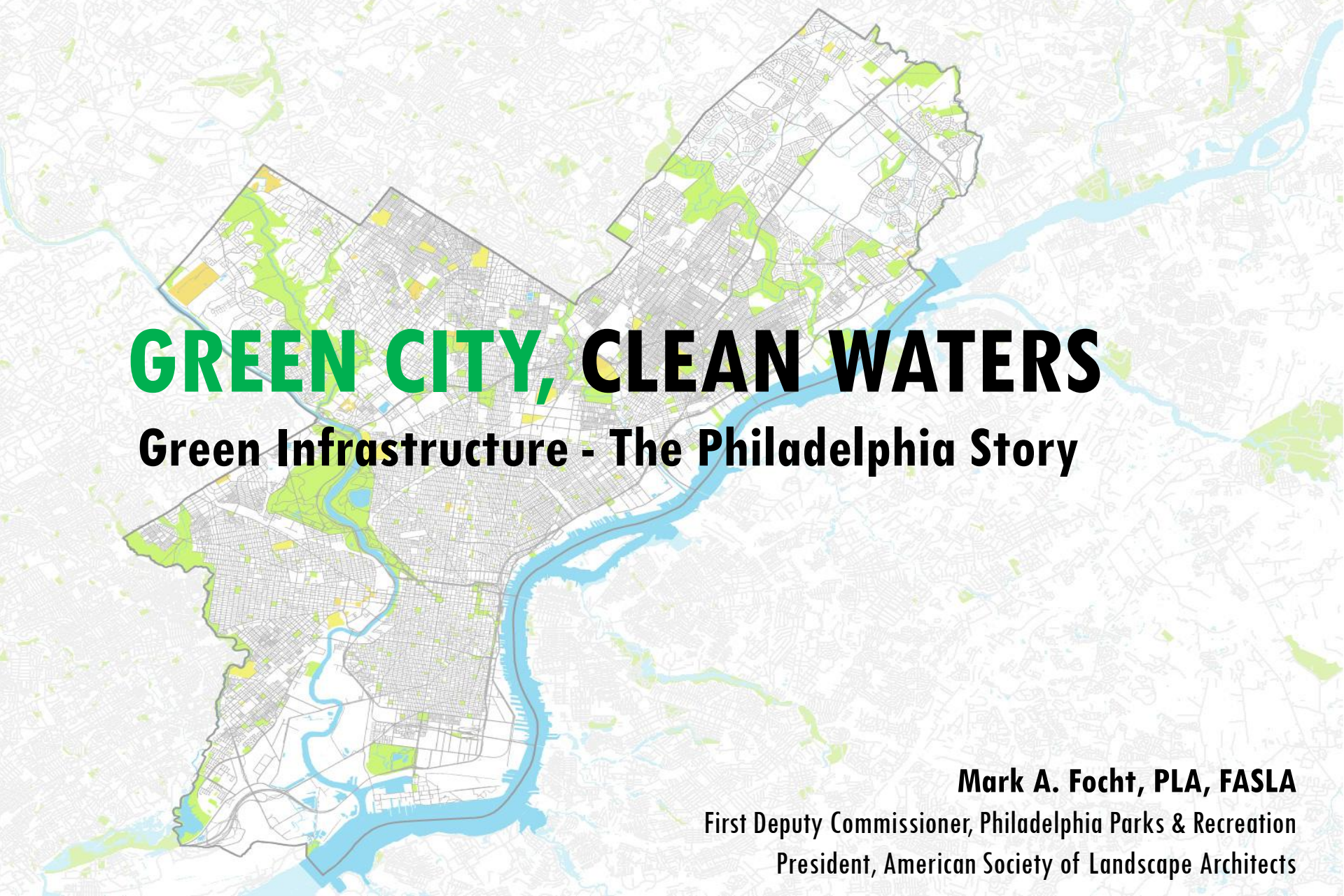


GREEN CITY, CLEAN WATERS

Green Infrastructure - The Philadelphia Story

Mark A. Focht, PLA, FASLA
First Deputy Commissioner, Philadelphia Parks & Recreation
President, American Society of Landscape Architects

THE COST OF GREEN INFRASTRUCTURE:
CHEAPER THAN WE THOUGHT

AMERICAN SOCIETY OF
LANDSCAPE ARCHITECTS

Philadelphia, PA

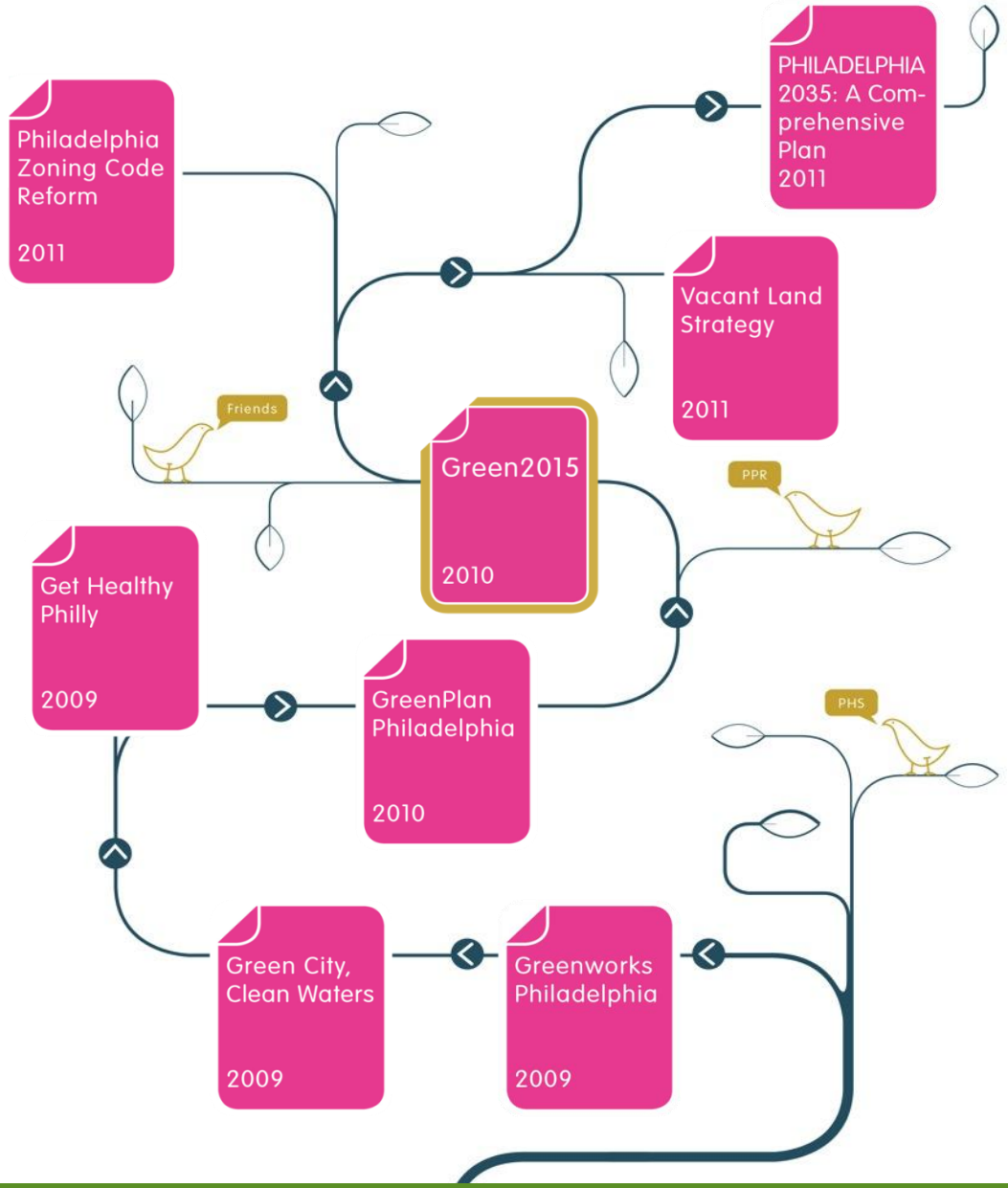
Land Area:
135 sq. mi.

Annual Rainfall:
42 inches

Population:
1,526,000 (2010)

Median Income:
$37,090 (USD, 2008)

Persons Below Poverty Level:
23.8% (2008)



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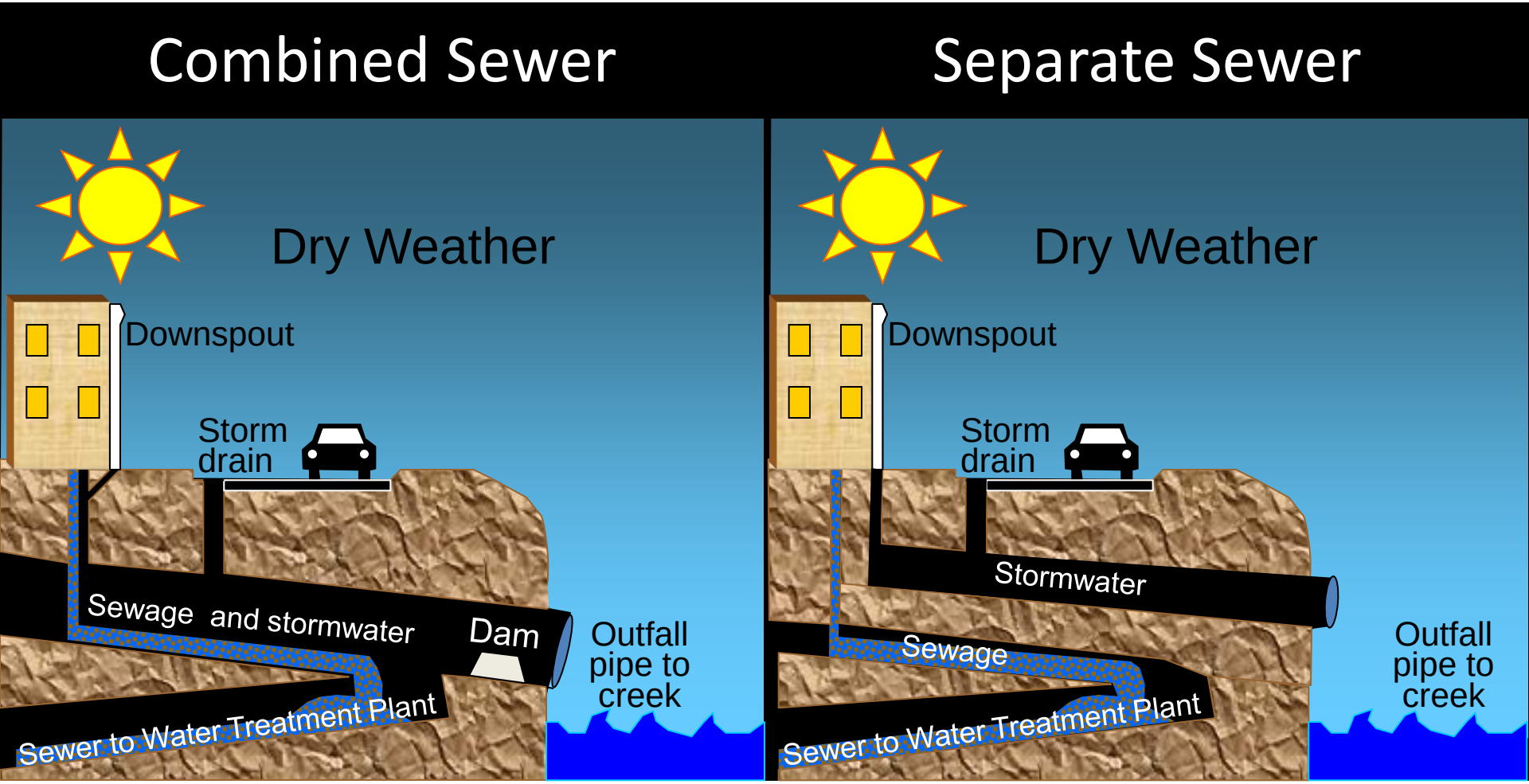
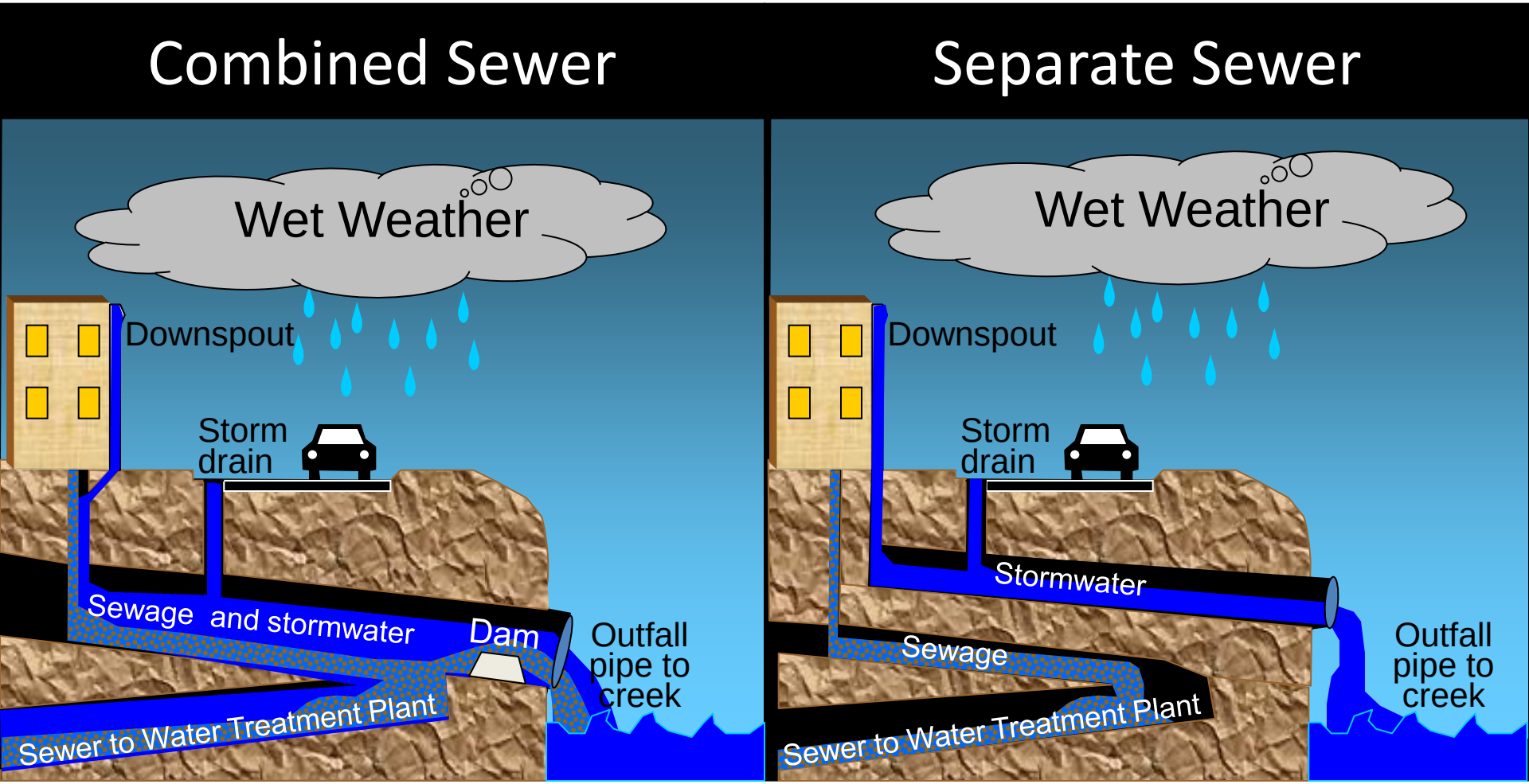
TYPES OF SEWERS IN PHILADELPHIA



60% of Philadelphia

40% of Philadelphia

TYPES OF SEWERS IN PHILADELPHIA



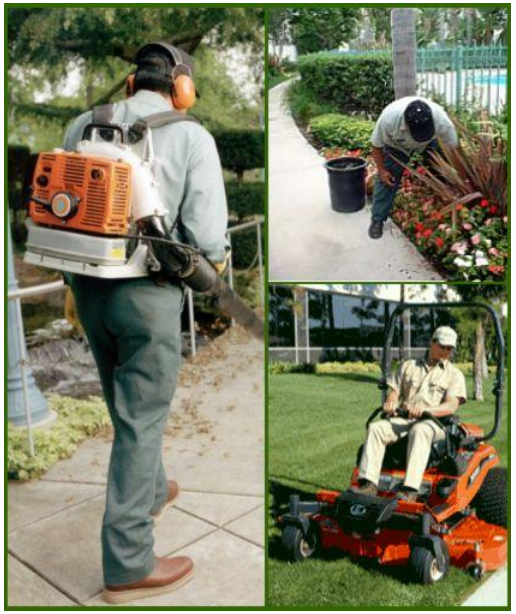
60% of Philadelphia

40% of Philadelphia

Choosing the Right Investment with Limited Funding

TRIPLE BOTTOM LINE BENEFITS

Economic/Environmental/Social



Economic Benefits

- Property Values
- Job Creation
- City Competitiveness

Environmental Benefits

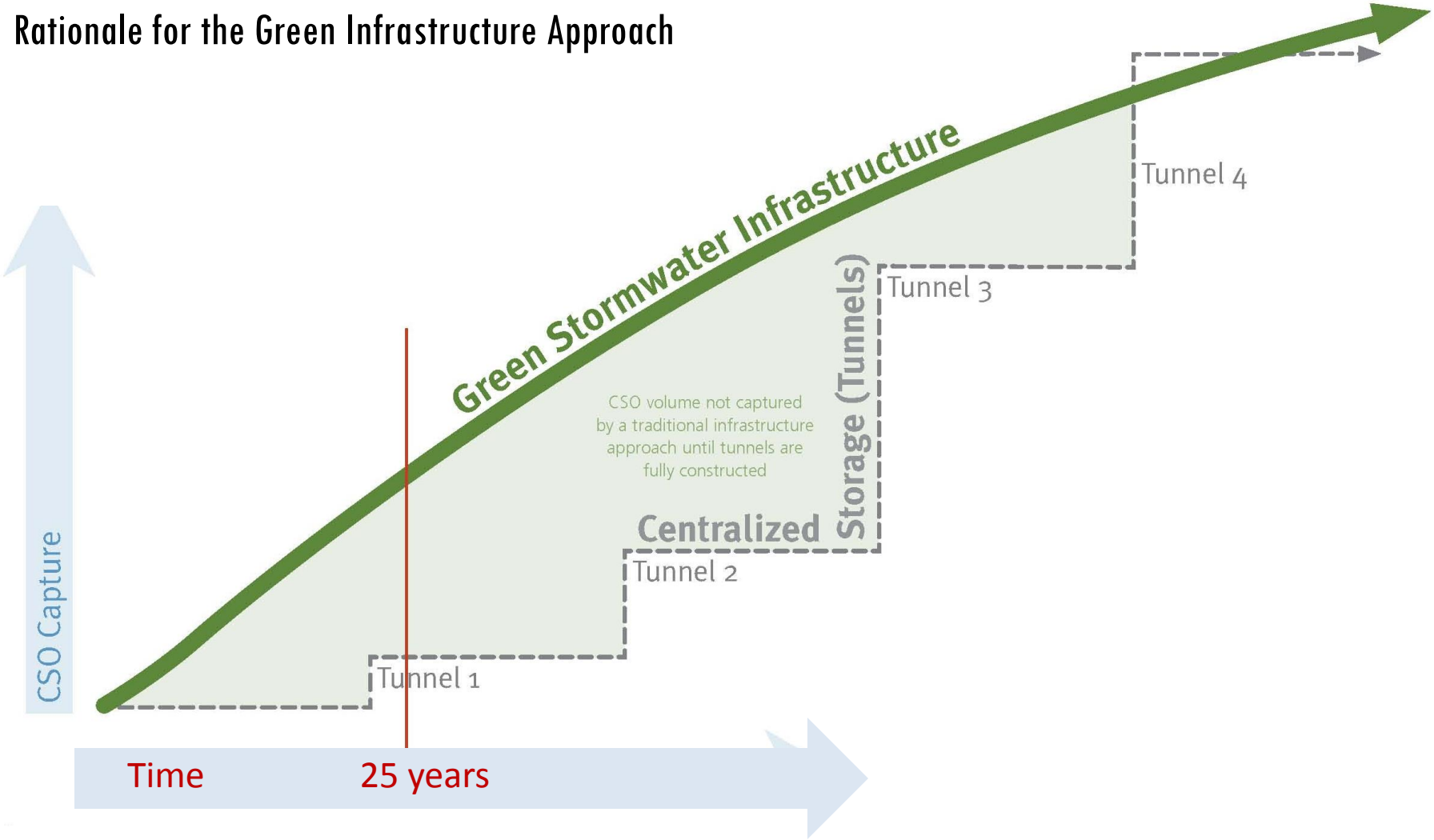
- Fishable, Swimmable
- Habitat Enhancement
- Air Quality
- Energy Savings
- Carbon Footprint

Social Benefits

- Recreation
- Aesthetics
- Public Health
- Equity

AN UNCONVENTIONAL PATH

Rationale for the Green Infrastructure Approach



GREEN CITY, CLEAN WATERS

- Maintain and upgrade the infrastructure network
- Advance City-wide Sustainability Programs
- Improve public health / quality of life
  - greening our neighborhoods,
- Transform river and stream corridors
  - restoring our waterfronts,
  - improving our outdoor recreation spaces, and
- Preserve and restore aquatic habitat
- Maximize return on every dollar spent

"[Philadelphia] has earned a place as a national and global leader on sustainable innovation and clean water protection."

Lisa Jackson, EPA Administrator

April 10, 2012: The U.S. EPA and the City of Philadelphia joined in a partnership to advance green infrastructure for urban wet weather pollution control. This partnership demonstrates EPA's strong support for sustainable storm water management yielding multiple benefits for community livability and other urban environment improvements.

June 1, 2011 → **25-year Program** → **June 1, 2036**

GREEN CITY, CLEAN WATERS

Green Stormwater Infrastructure

$800 million

Wet Weather Treatment Plant Upgrades

$200 million

Adaptive Management

$200 million

WHAT IS A "GREENED ACRE"?

Rationale for the Green Infrastructure Approach

Greened Acre (GA) =
one acre-inch = 27,158 gallons

- One Greened Acre is equivalent to 1 inch of managed stormwater from 1 acre of impervious drainage area, or 27,158 gallons of stormwater.

$$GA = IC * Wd$$

Impervious cover

Water Depth

GREEN STORMWATER GOALS

25-Year Implementation of Green City, Clean Waters

Year	Greened Acres	Square Miles	% Impervious cover removed
5	750	1	3%
10	2,100	3	8%
15	3,800	6	14%
20	6,400	10	23%
25	9,600	15	34%

THE COST OF GREEN INFRASTRUCTURE: CHEAPER THAN WE THOUGHT

AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS

THE COST OF GREEN INFRASTRUCTURE: CHEAPER THAN WE THOUGHT

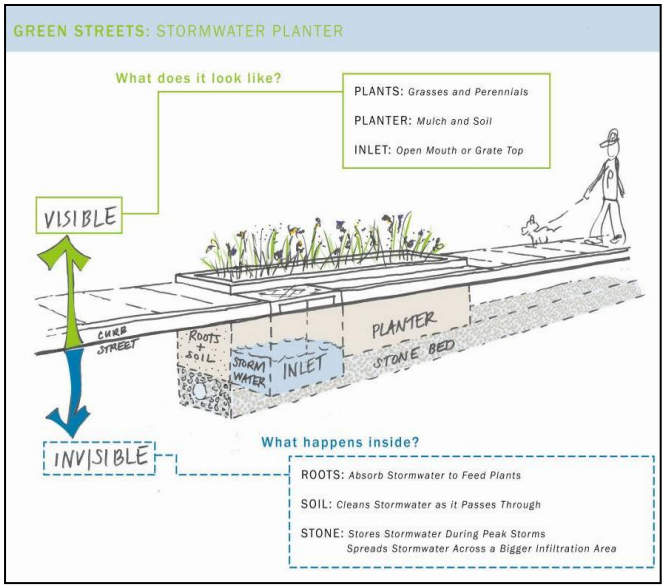
AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS

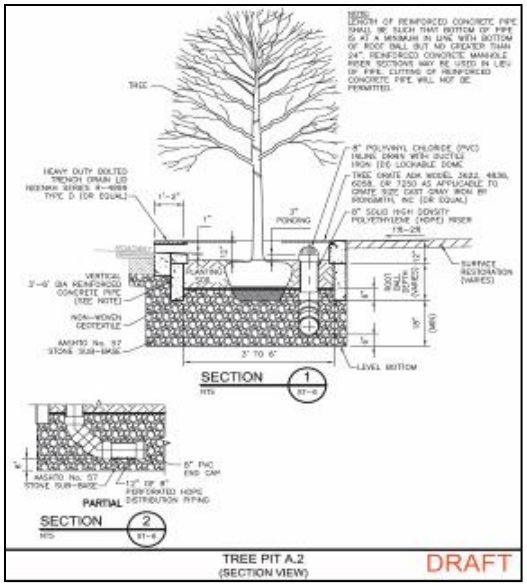
9,600 IMPERVIOUS ACRES CONVERTED TO 'GREENED ACRES'

- **PWD Initiated:** invest in creating green stormwater infrastructure
- **Public Works:** standardize green infrastructure for all city projects
- **Private:** apply strong stormwater regulations for development; new stormwater billing structure rewards LID practices

PUBLIC WORKS: GREEN STREETS DESIGN MANUAL

- Collaboration between:
  - Mayor's Office of Transportation &Utilities
  - Philadelphia Water Dept
  - Streets Dept
- Development of standards and specifications for green street components
- Allows Green Stormwater Infrastructure to follow Streets and Sewer work





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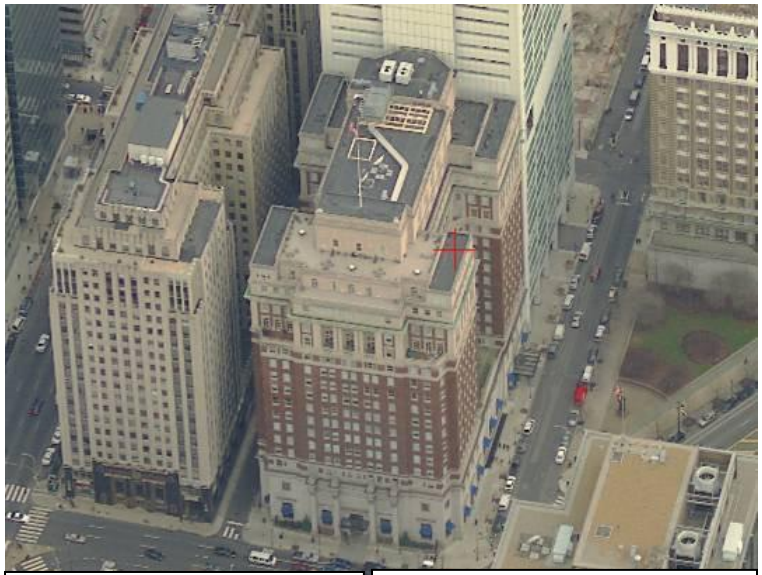
PRIVATE GSI: PARCEL-BASED STORMWATER BILLING

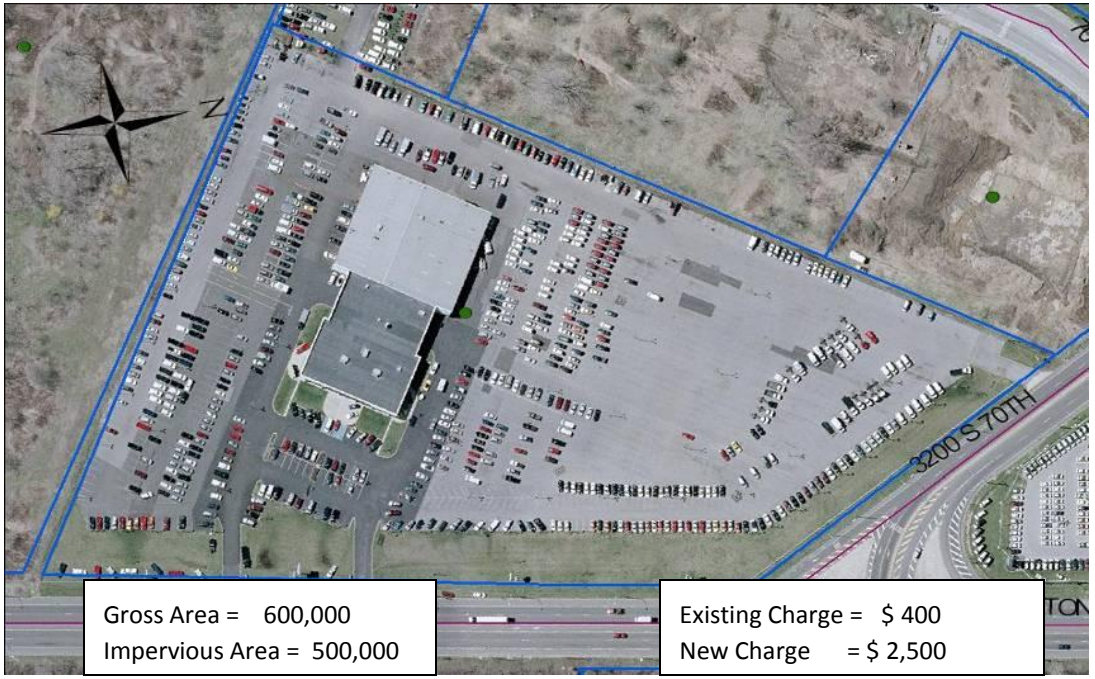
Financial Incentive for Better Stormwater Management

- Shift from a meter-based charge for stormwater to a parcel-based stormwater charge
- Credit system available for managing stormwater
- Top 500 impacted parcels in the combined sewer area make up 12.3% of total impervious area



Gross Area = 24,000
Impervious Area = 24,000

Existing Charge = $ 4,700
New Charge = $ 120



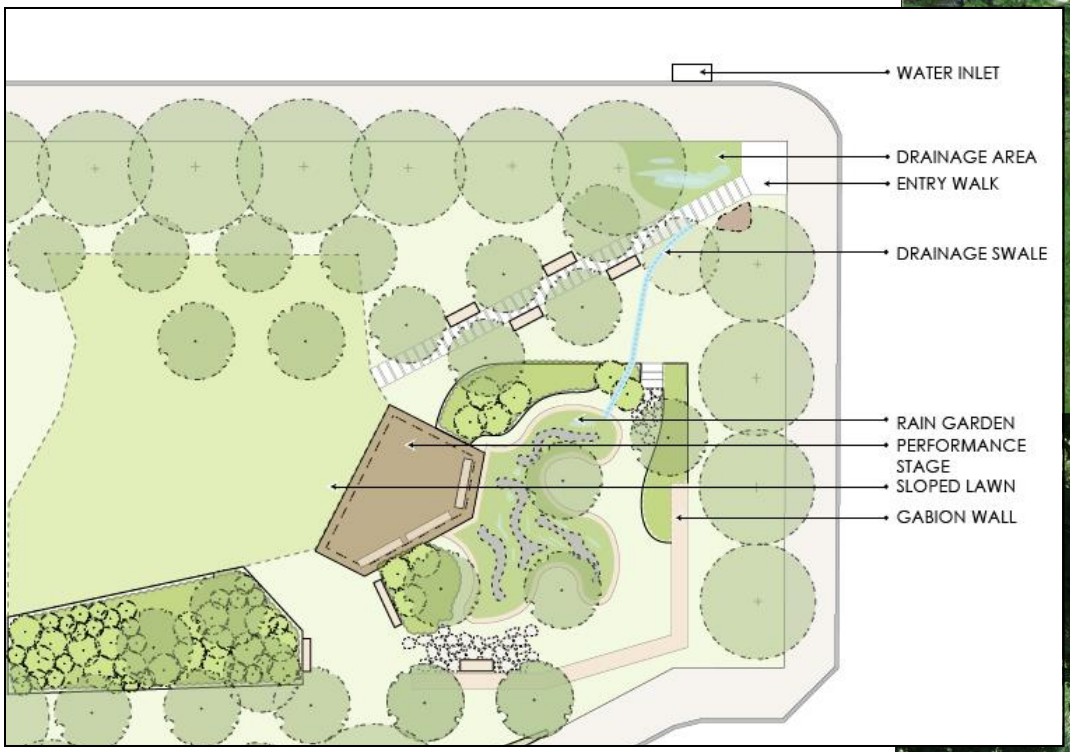
Gross Area = 600,000
Impervious Area = 500,000

Existing Charge = $ 400
New Charge = $ 2,500

STORMWATER MANAGEMENT INCENTIVE PROGRAM

- Stormwater Credit program – to award a mix of grant and loan
  - modeled after the successful New York City Green Infrastructure Grant Program.
- To qualify, projects must cost effectively capture and retain the first one inch of rainfall or greater on the property
- Projects will be ranked higher during the review and selection process based on:
  - feasibility,
  - visibility, and
  - the ability of the project to manage public runoff in addition to on-site runoff.
- Grantees will receive the credits as long as they maintain the SMPs in good working condition.

Green Public Open Space



Green Public Facilities
Columbus Square

Green Public Facilities
Herron Playground

THE COST OF GREEN INFRASTRUCTURE: CHEAPER THAN WE THOUGHT

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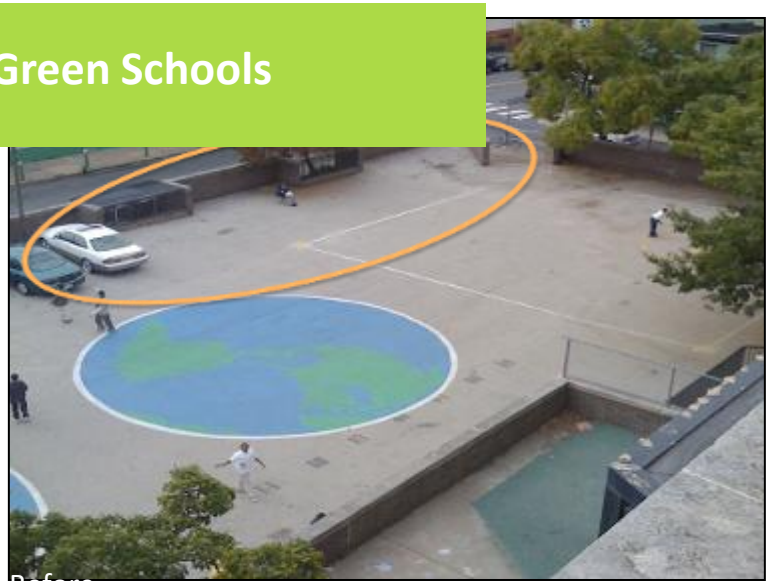
Green Schools



Greenfield Elementary
Center City

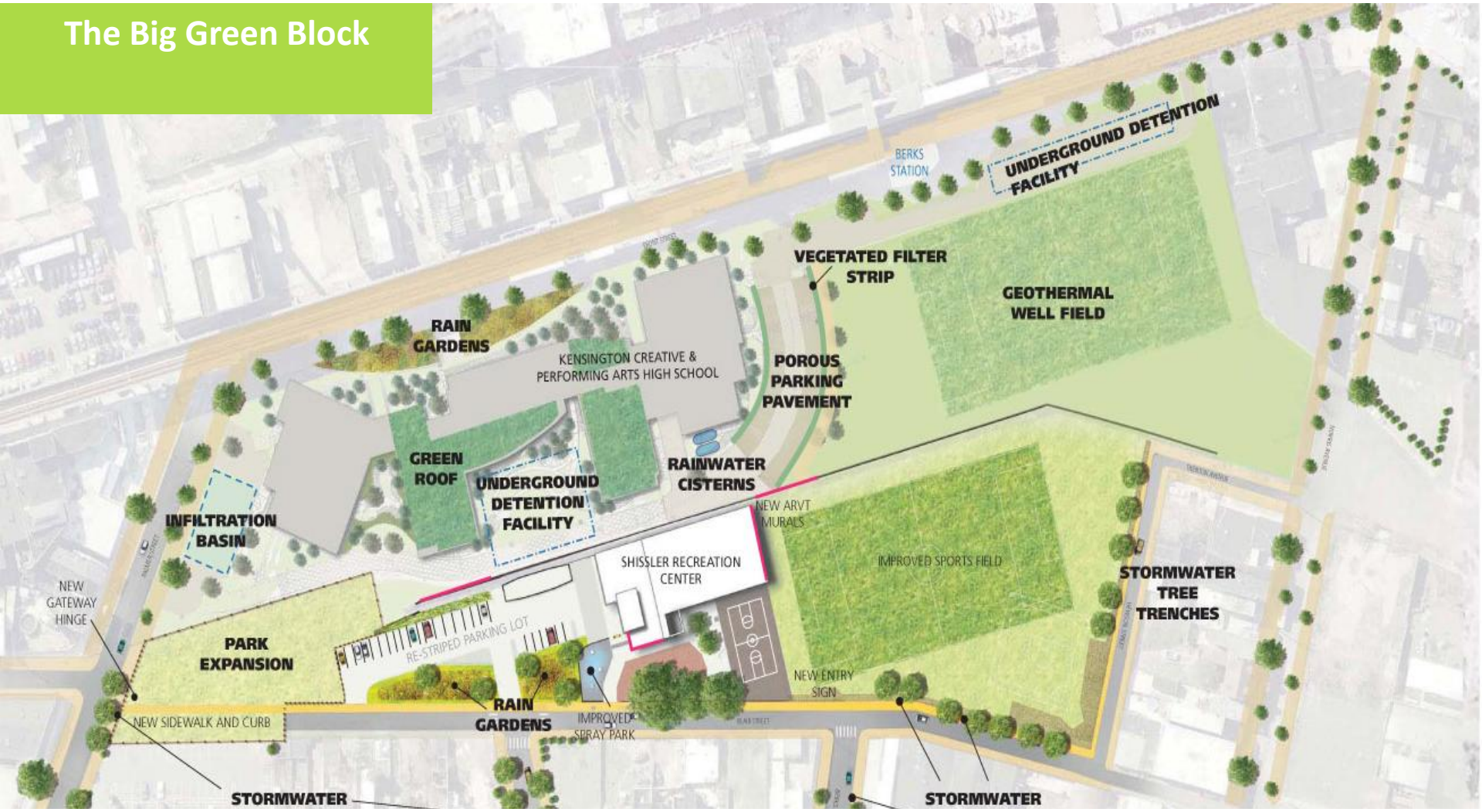
Wissahickon Charter
East Falls

Green Homes Pilot Project

THE COST OF GREEN INFRASTRUCTURE: CHEAPER THAN WE THOUGHT

AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS

The Big Green Block



Project Partners: Kensington Creative + Performing Arts High School, Philadelphia Water Department, Department of Parks and Recreation, Philadelphia Streets Department, Pennsylvania Horticultural Society, New Kensington CDC, Mural Arts, SEPTA

The Big Green Block
New Kensington H.S.

Photo by Paul Rider

THE COST OF GREEN INFRASTRUCTURE: CHEAPER THAN WE THOUGHT

AMERICAN SOCIETY OF LANDSCAPE ARCHITECTS

The Big Green Block
Shissler Rec Center

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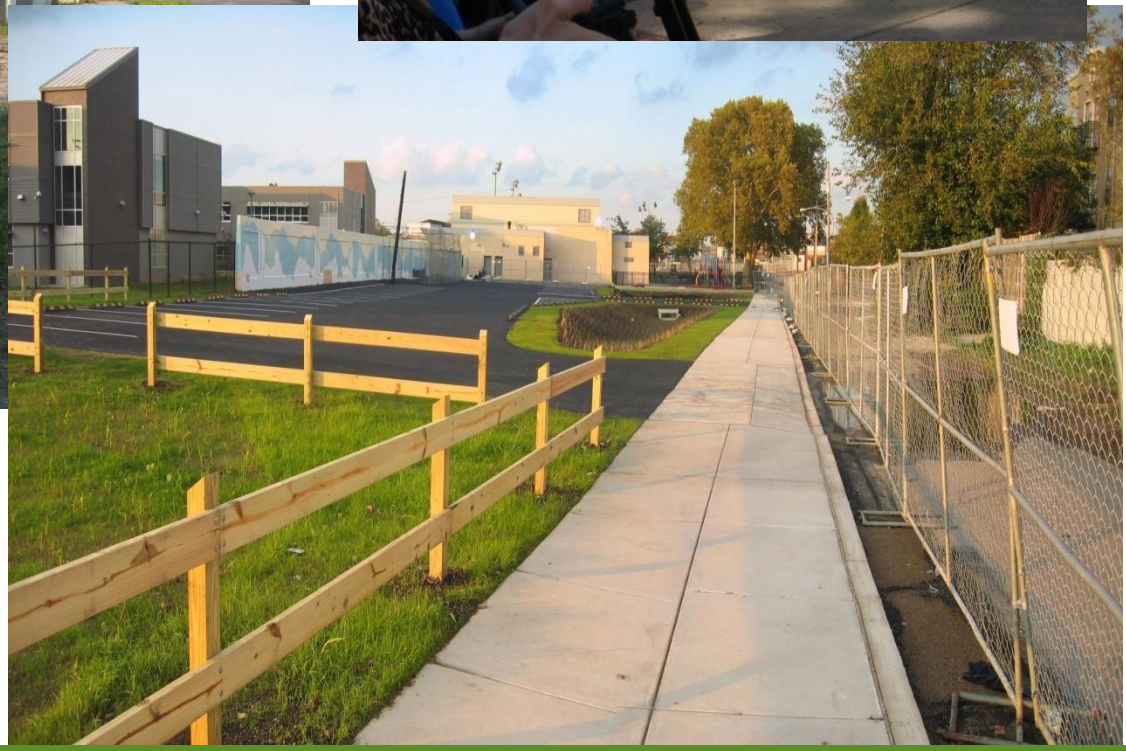
The Big Green Block
Shissler Rec Center



THE COST OF GREEN INFRASTRUCTURE: CHEAPER THAN WE THOUGHT

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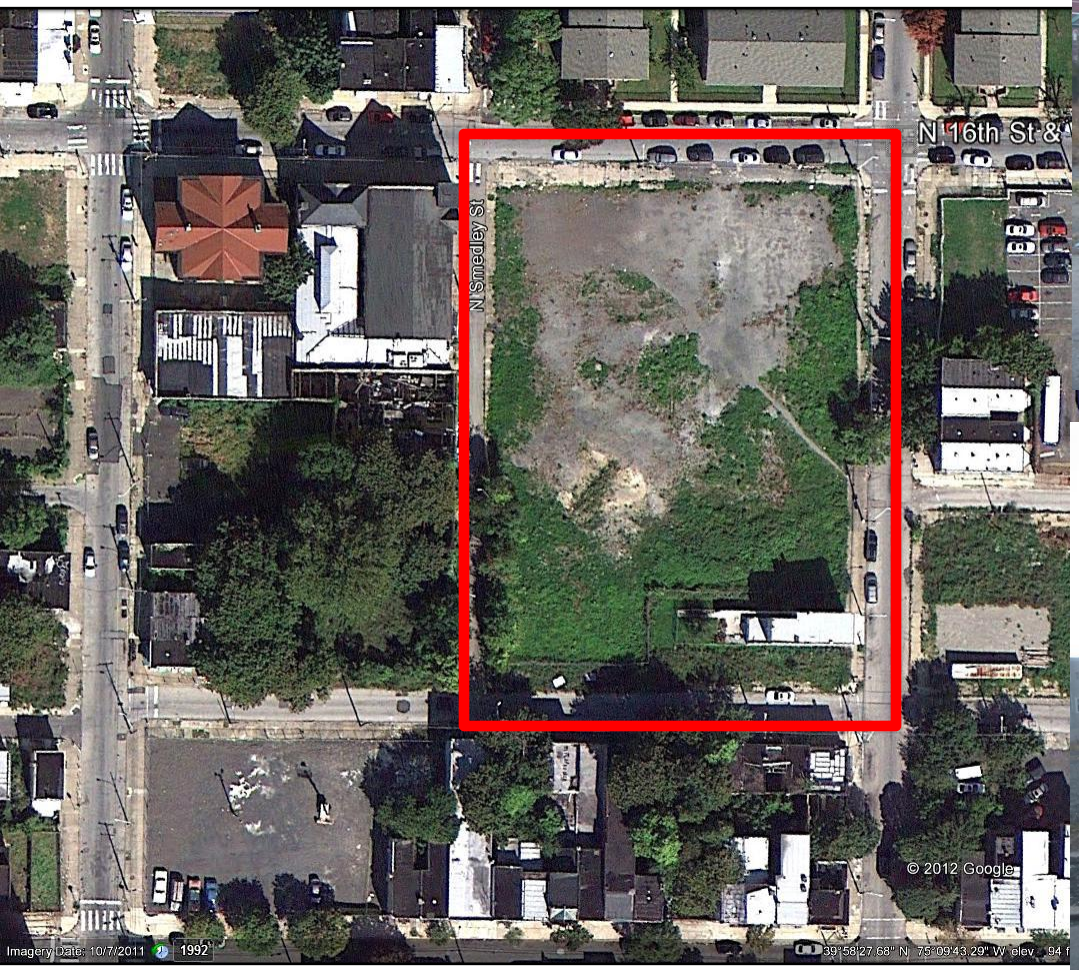
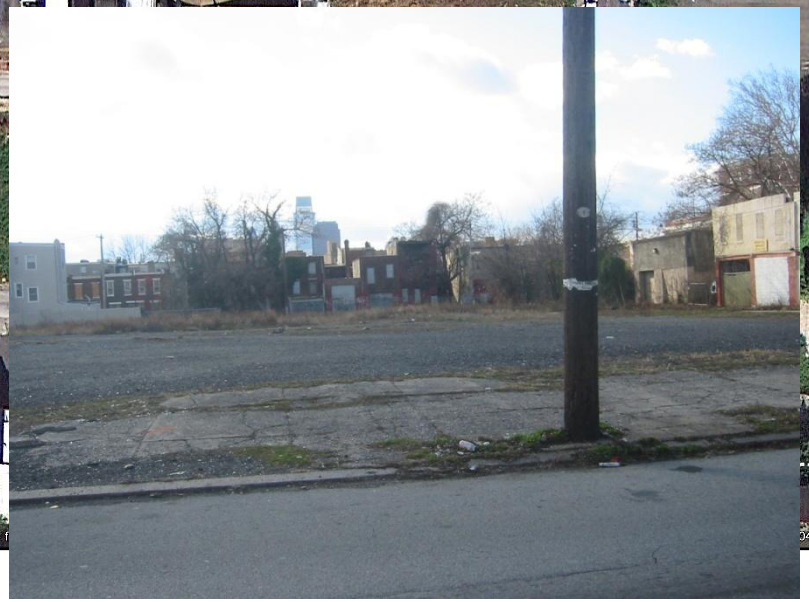
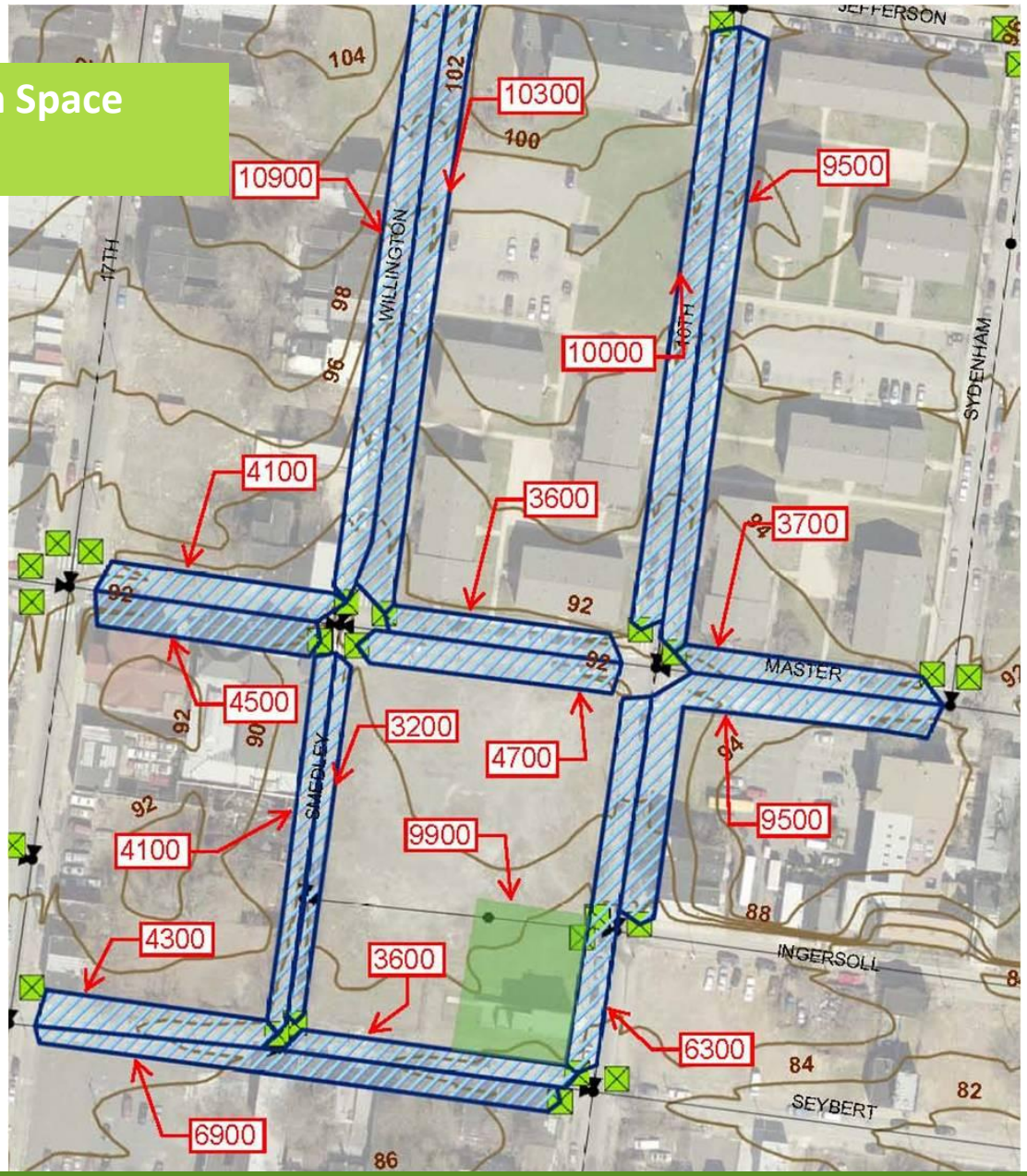
Green Homes / Green Public Open Space
Ingersoll Homes & Park





Green Homes / Green Public Open Space
Ingersoll Homes & Park

Can achieve approximately **two 'Greened Acres'** by re-directing surface and sub-surface drainage to Ingersoll Park.



Green Homes / Green Public Open Space
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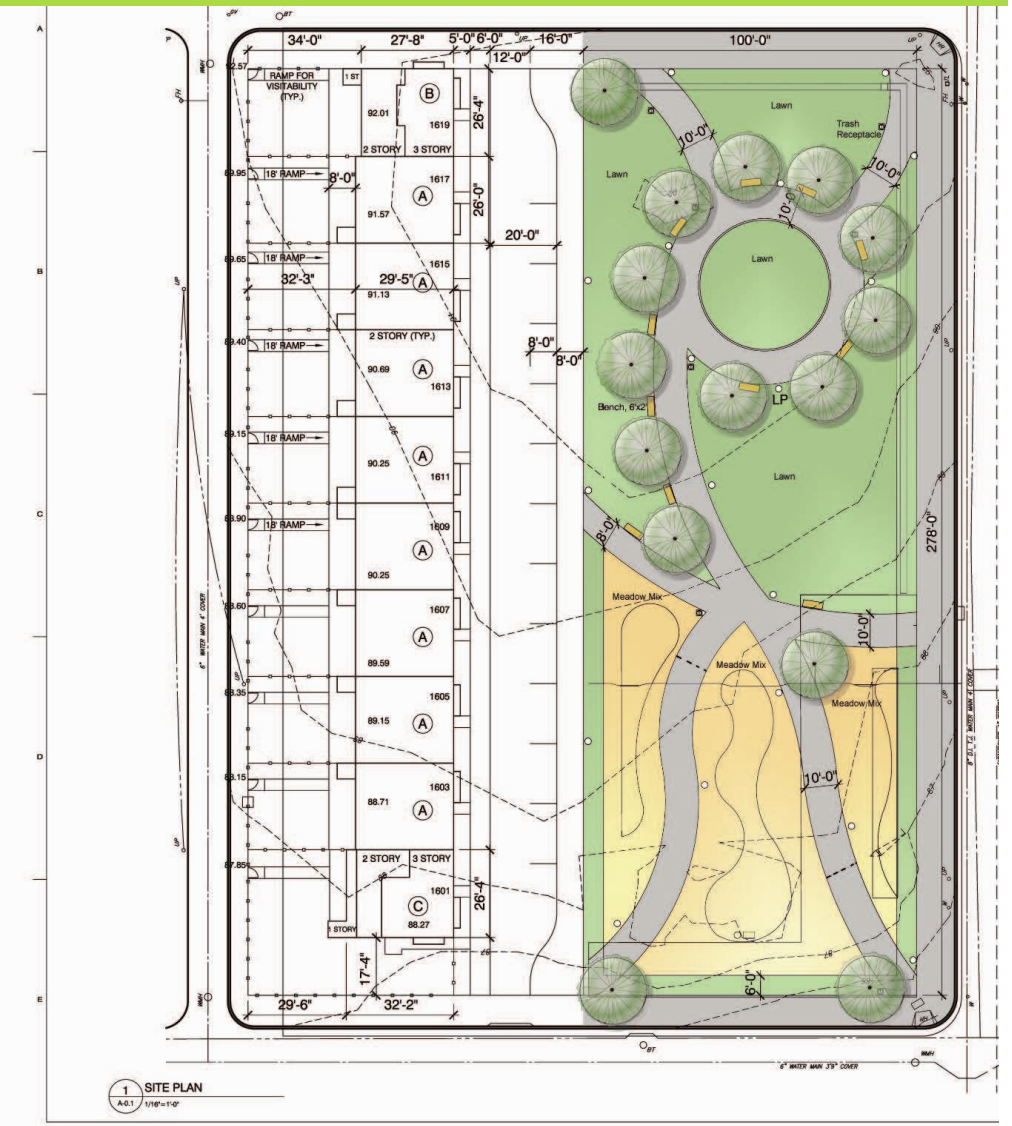

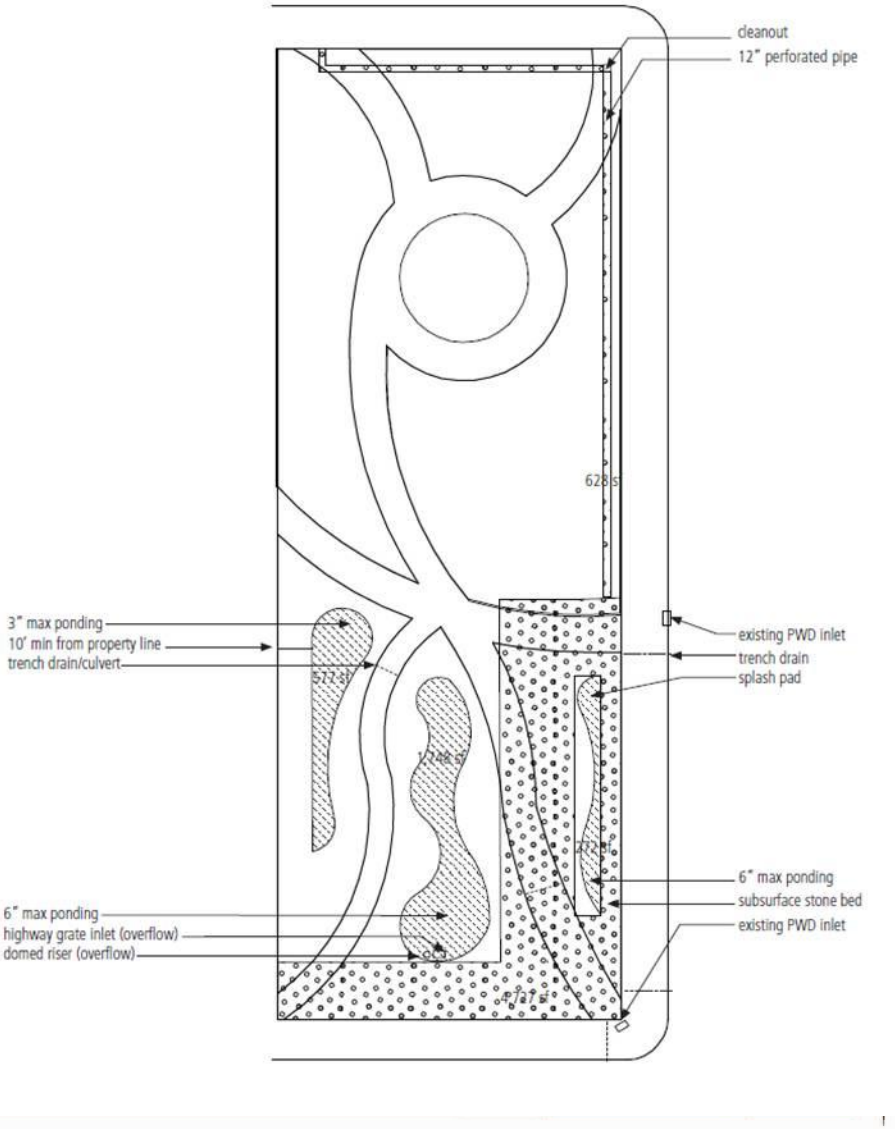

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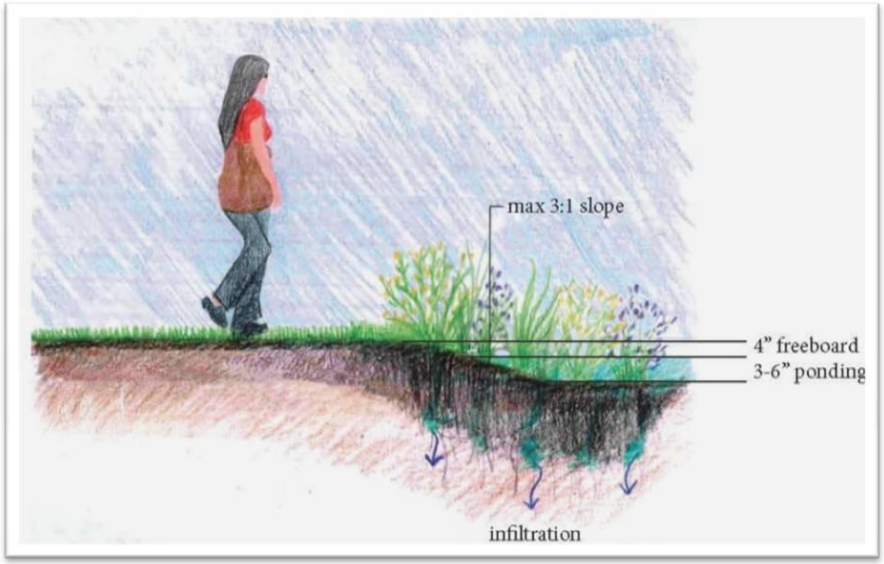
Green Homes / Green Public Open Space
Ingersoll Homes & Park

Stormmwater management, native grasses (Portland, OR)



Native grasses used in park (Seattle)

GREEN CITY, CLEAN WATERS

LESSONS LEARNED:

- Importance of city-wide planning frameworks
- Strong mayoral commitment
- Increased resources
- Concurrent policy efforts
- New partnerships and shared agendas across city agencies
- Commitment to equity and sustainable investment
- Community support

TRIPLE BOTTOM LINE BENEFITS

Economic Benefits

- Annually, **250 people** are expected to be employed in green jobs.
- Increase of up to **$390 million** in property values near parks and green areas over the next 45 years.

Social Benefits

- Increase of up to **10% more** visits to Parks & Recreation sites.
- Reduction of up to **140 fatalities** caused by excessive heat over the next 45 years.
- Up to **1-2 avoided** premature deaths, **20 avoided** deaths from asthma and up to **250 fewer** missed school or work days.

Environmental Benefits

- Up to **1.5 billion lbs.** of carbon dioxide emission avoided or absorbed, equivalent to removing close to **3400 vehicles** from roadways each year.
- Up to **$8.5 million** in water quality and habitat improvements over 40 years.

ASLA Green Infrastructure Case Studies

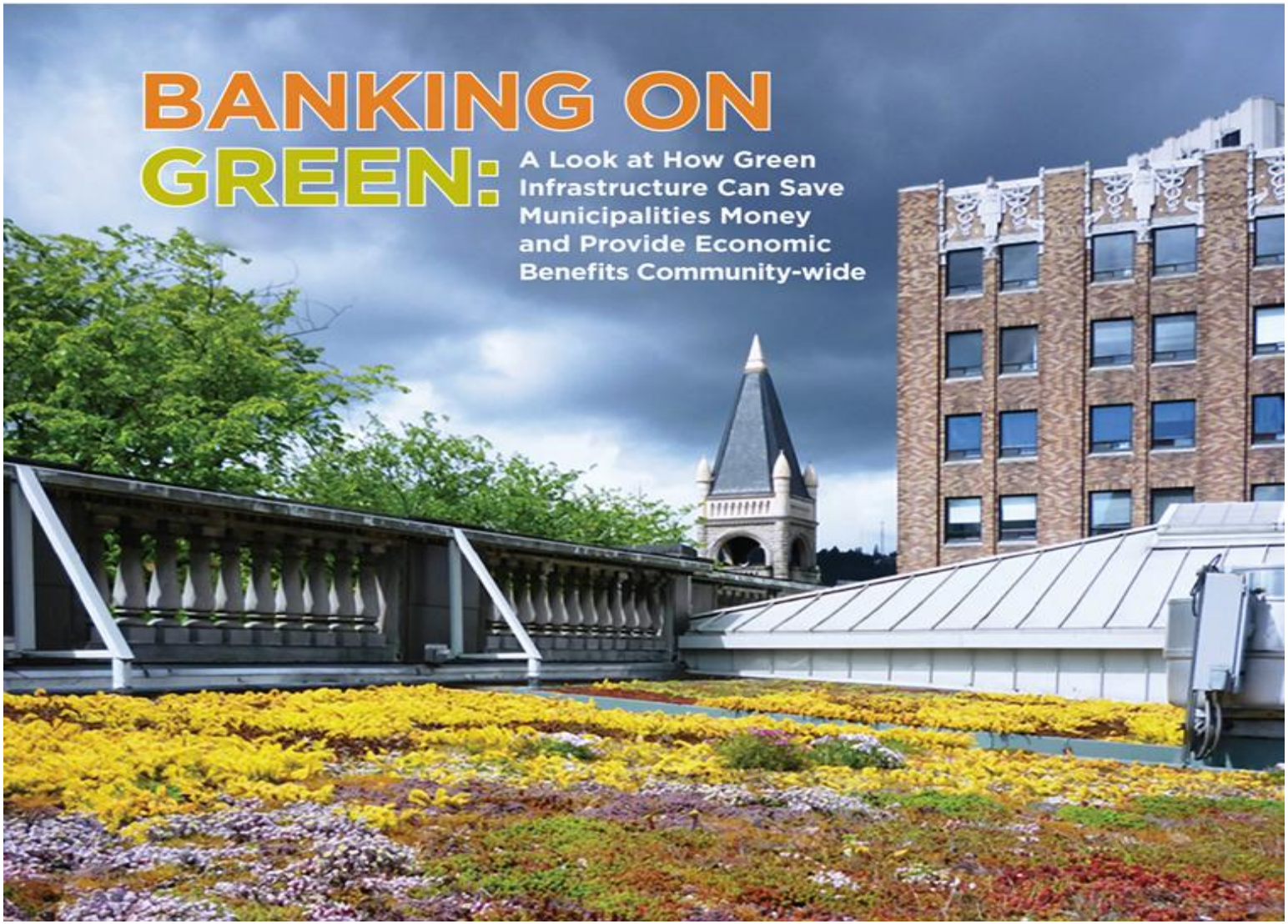
- Water & Stormwater Management

The Green Infrastructure for Clean Water Act

(H.R. 2030, S. 1115)

- Implementation Grants
- Technical Assistance (model codes, BMPs)
- Regional Centers of Excellence

View all Stormwater Case Studies by State →



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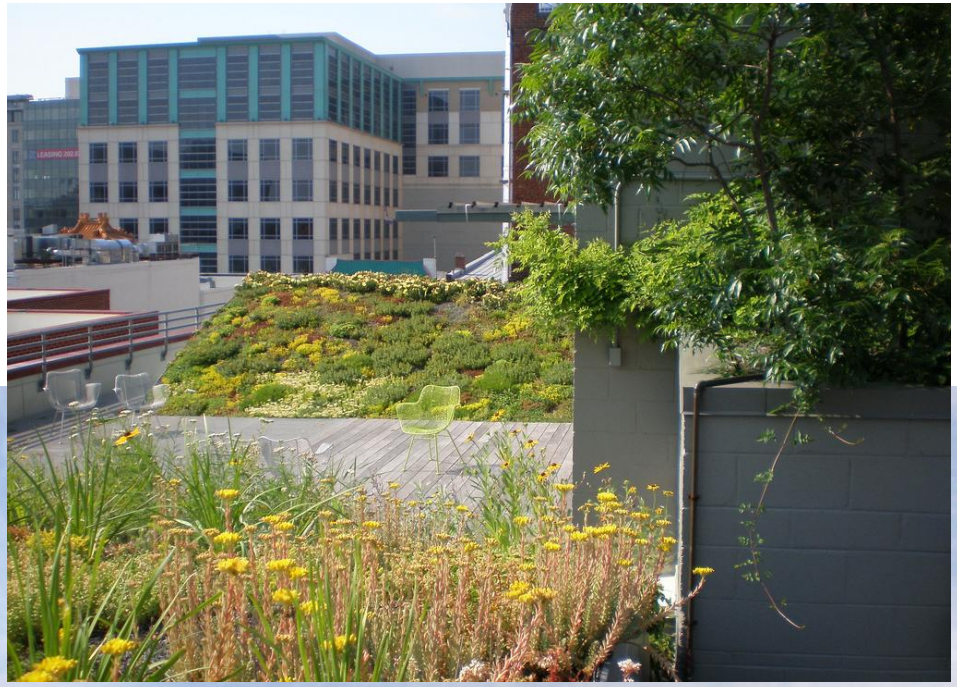
ASLA Headquarters Award-Winning Green Roof

Washington, DC



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