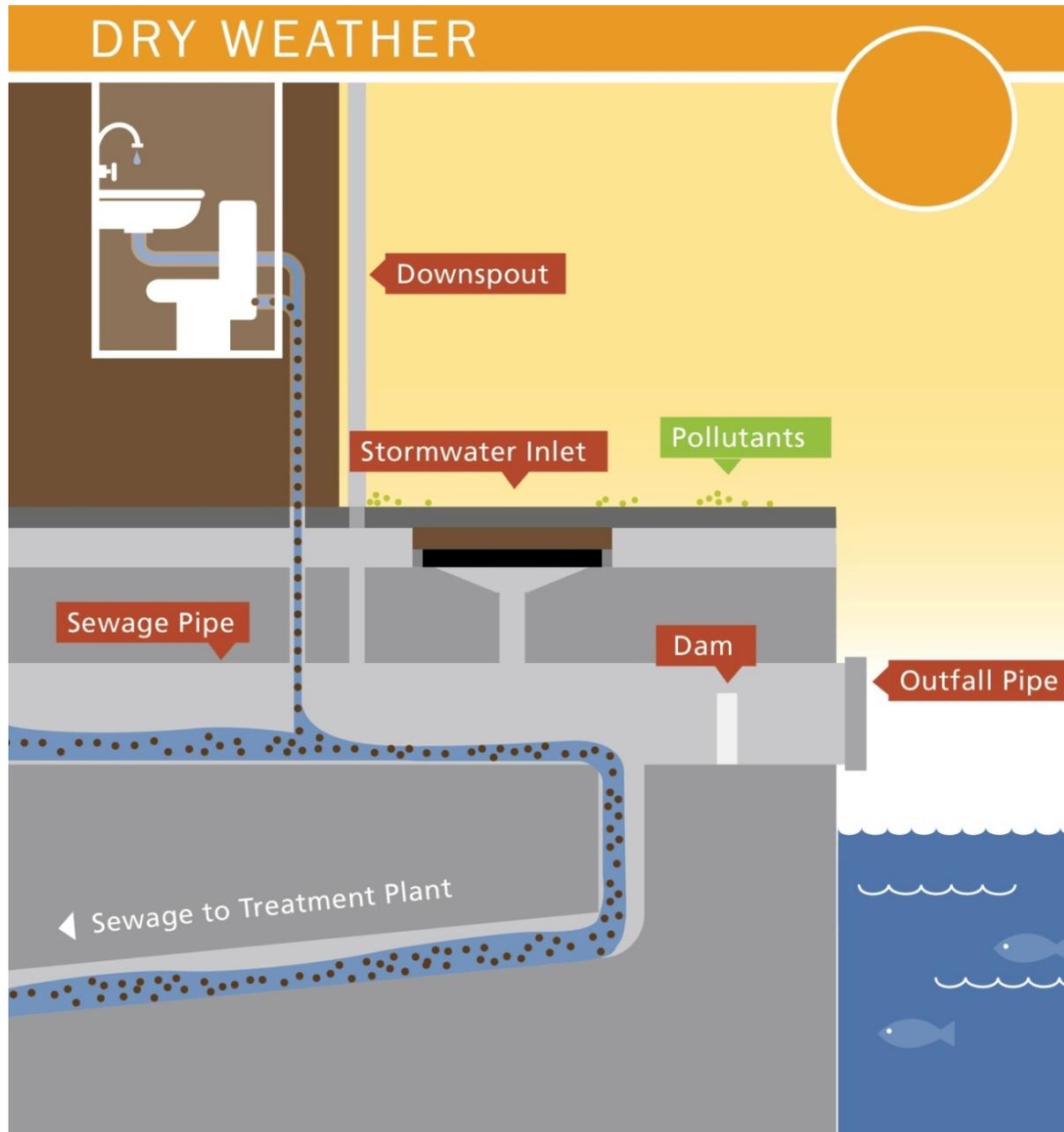


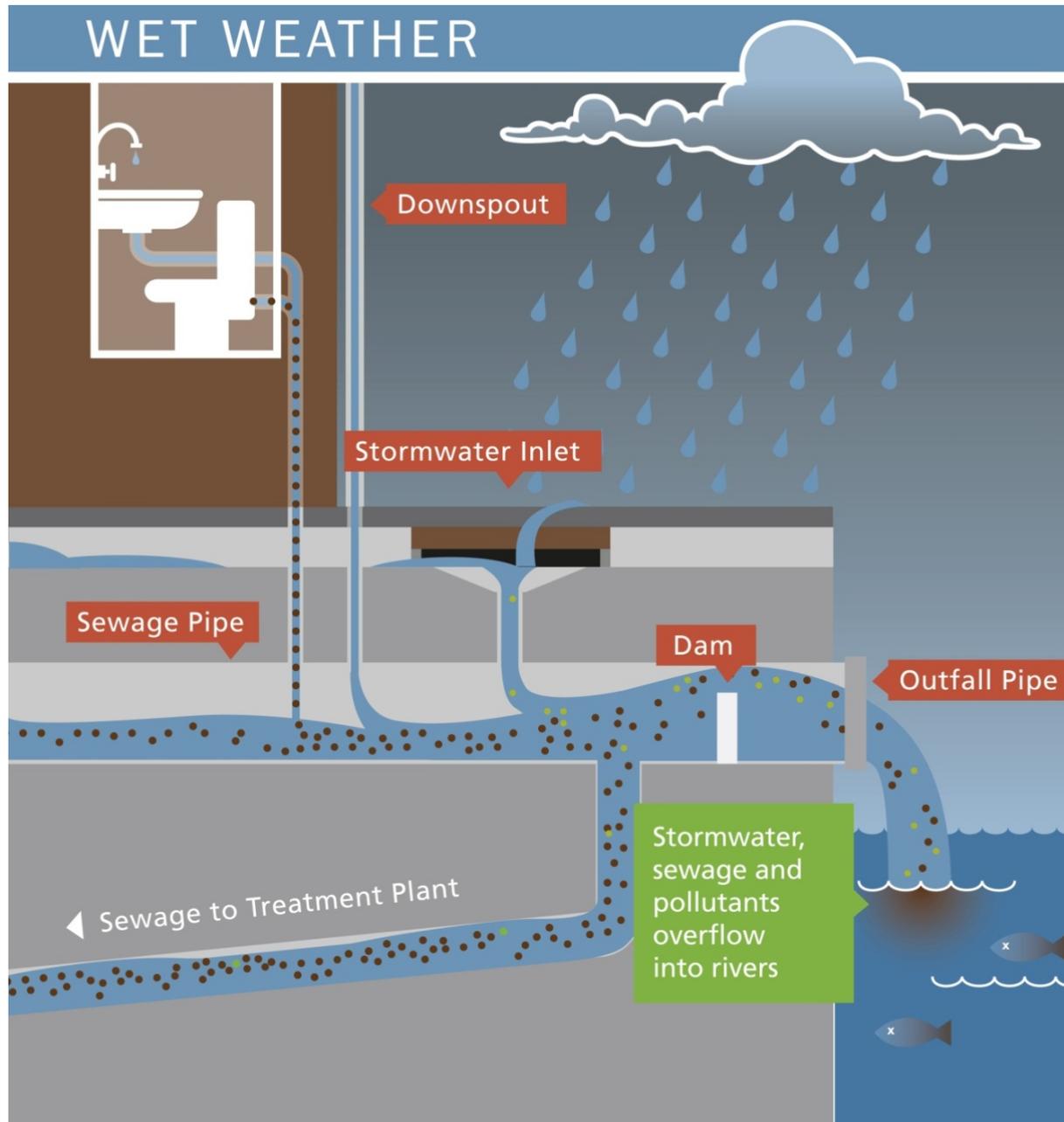
# GREEN CITY, CLEAN WATERS: Green Schoolyards for Stormwater Management



# HOW COMBINED SEWER SYSTEMS WORK...AND SOMETIMES DON'T



# HOW COMBINED SEWER SYSTEMS WORK...AND SOMETIMES DON'T



# COMBINED SEWER OVERFLOW REDUCTIONS

## 1994 Combined Sewer Overflow Policy

- Clean Water Act regulation
- Control Discharges from CSOs

## 2009 Long Term Control Plan Update

- **FIRST** in the nation to focus primarily on green infrastructure
- **National Model** for improving water quality in streams and rivers

## 2011 Consent Order & Agreement

- U.S. EPA and PA DEP
- Greening 34% of impervious surface citywide
- Must meet 5 year goals and 25 year program completion
- EPA fines if targets not met



Howard Neukrug (clockwise from left), city water commissioner; U.S. Rep. Allyson Y. Schwartz; Rina Cutler, deputy mayor for transportation; Lisa Jackson, EPA administrator; and Mayor Nutter join in the official approval of "Green City, Clean Waters." MICHAEL S. WIRTZ / Staff Photographer

## Green City Clean Waters

The City of Philadelphia's Program for Combined Sewer Overflow Control  
A Long Term Control Plan Update

Submitted by the Philadelphia Water Department  
September 1, 2009



### Philadelphia's 25-year Green Stormwater Infrastructure program

- ✓ Reduce citywide sewer overflow pollution by 85%
- ✓ \$2.4 billion vs. \$9 billion for underground storage tanks
- ✓ Manage stormwater in the most cost-effective manner
- ✓ Construct green infrastructure on public city lands
- ✓ Mandate stormwater management of new development and redevelopment
- ✓ Upgrade treatment plants

# WHAT IS STORMWATER MANAGEMENT?

## Traditional “Gray” Stormwater Infrastructure



## Land-Based “Green” Stormwater Infrastructure



On the surface • Immediate & Incremental • Neighborhood based

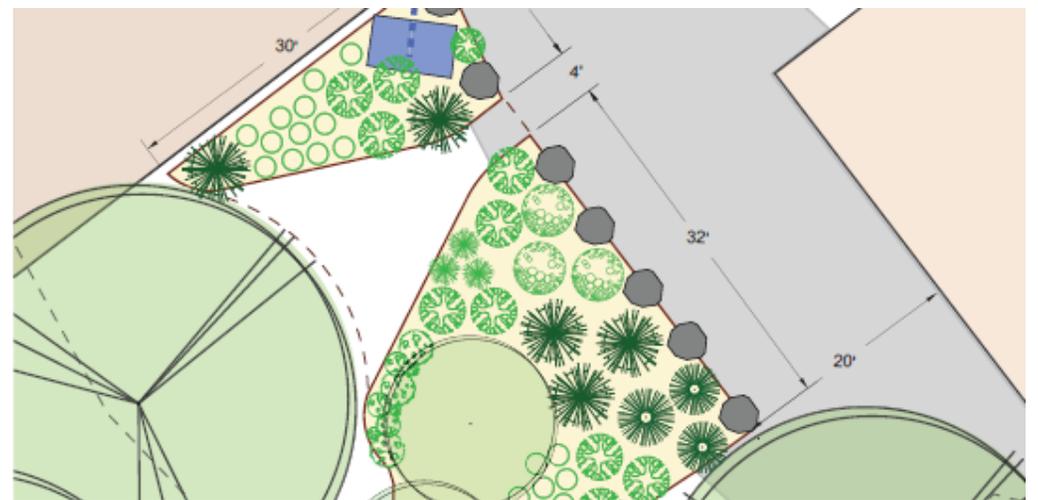
# WHAT IS GREEN STORMWATER INFRASTRUCTURE?

## Green Stormwater Infrastructure:

- ✓ Capture stormwater at its source
- ✓ Allows water to filter through soil and infiltrate back into groundwater aquifers
- ✓ Allows evapotranspiration through vegetation
- ✓ Provides overflow to the City stormwater system
- ✓ Surface and subsurface features
- ✓ Reduces the need for underground “grey” infrastructure



# WHAT IS GREEN STORMWATER INFRASTRUCTURE?



# PHILADELPHIA'S GREEN CITY CLEAN WATERS PROGRAM: 2011-Present



## Public Programs

- Green Streets
- Parks and Recreation Centers
- Vacant Lots
- City Facilities
- Green Schools
- Public Partners: SEPTA, Temple, PECO, PGW



## Private Lands

- Private Development Regulations
- Private Property Retrofit Grants
- Green Homes [Raincheck]
- Private Partners: UPenn, Drexel, DRWC

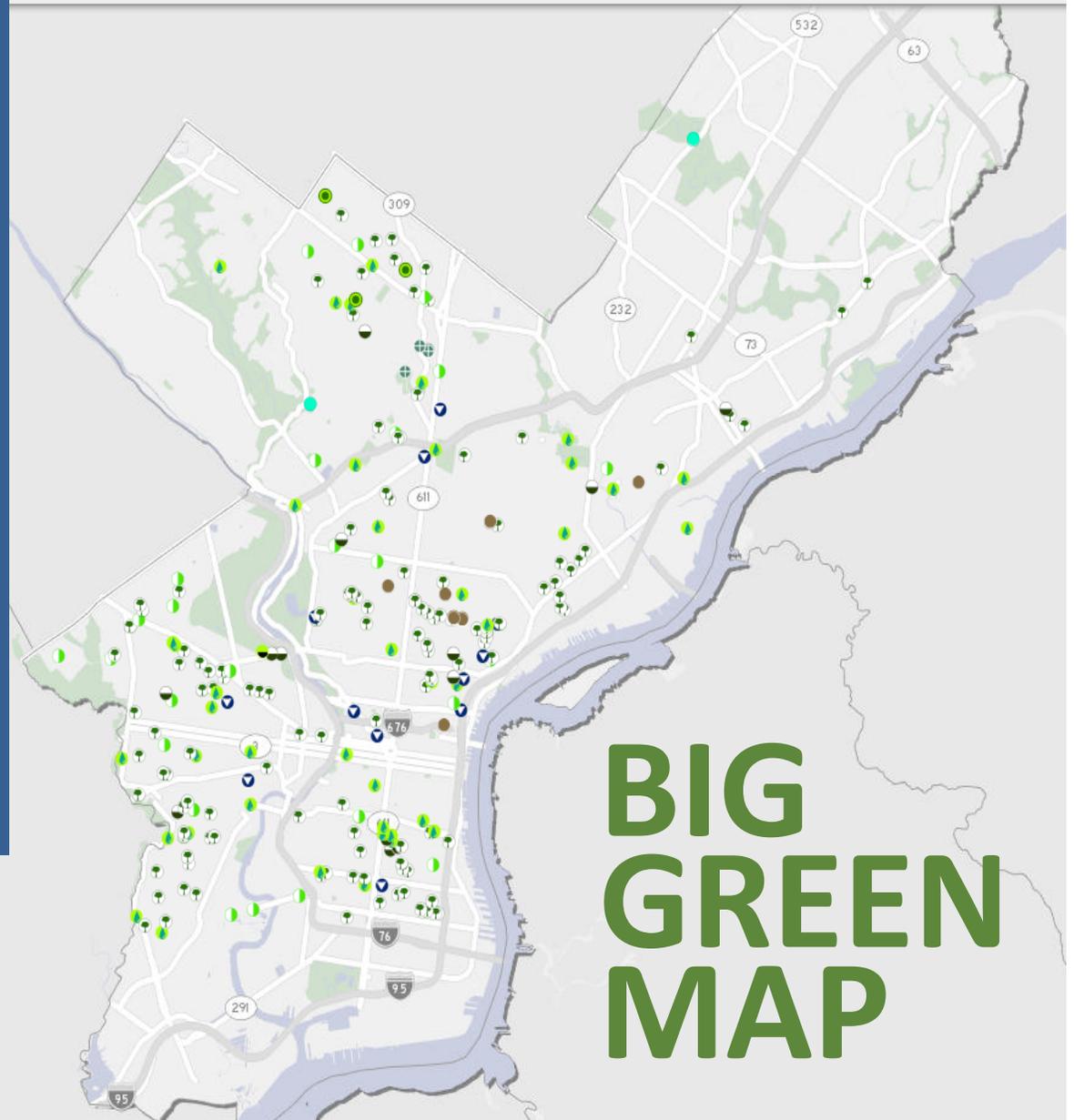
# PHILADELPHIA'S GREEN CITY CLEAN WATERS PROGRAM: 2011-Present

- 342 Stormwater Tree Trenches
- 38 Stormwater Planters
- 45 Stormwater Bumpouts
- 101 Rain Gardens
- 5 Stormwater Basins
- 112 Infiltration/Storage Trenches
- 37 Porous Paving Projects
- 23 Swales
- 2 Stormwater Wetlands
- 33 Downspout planters

= 743 Green Infrastructure systems in Design, Construction or Complete

2015: 110 Sites Complete

2036: 9,000 Greened Acres



# PHILADELPHIA'S GREEN CITY CLEAN WATERS PROGRAM: 2011-Present



## Public Programs

- Green Streets
- Parks and Recreation Centers
- Vacant Lots
- City Facilities
- **Green Schools**
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# GREEN SCHOOLS PROGRAM

**1,000 Acres of  
impervious  
surface in the  
Combined  
Sewer System**



District Schools: 214  
Number of K-12 Students: 131,362



Charter Schools: 86  
Number of Students: 60,774

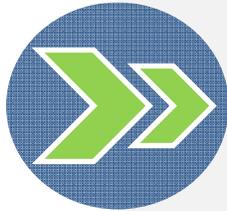


Catholic Schools: 50 +

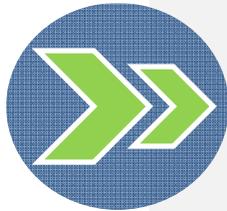


Private Schools: 80+

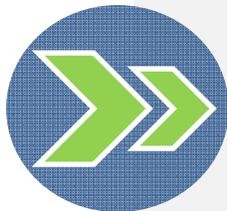
## PWD GREEN SCHOOLS GOALS



Develop long term partnership with the School District of Philadelphia

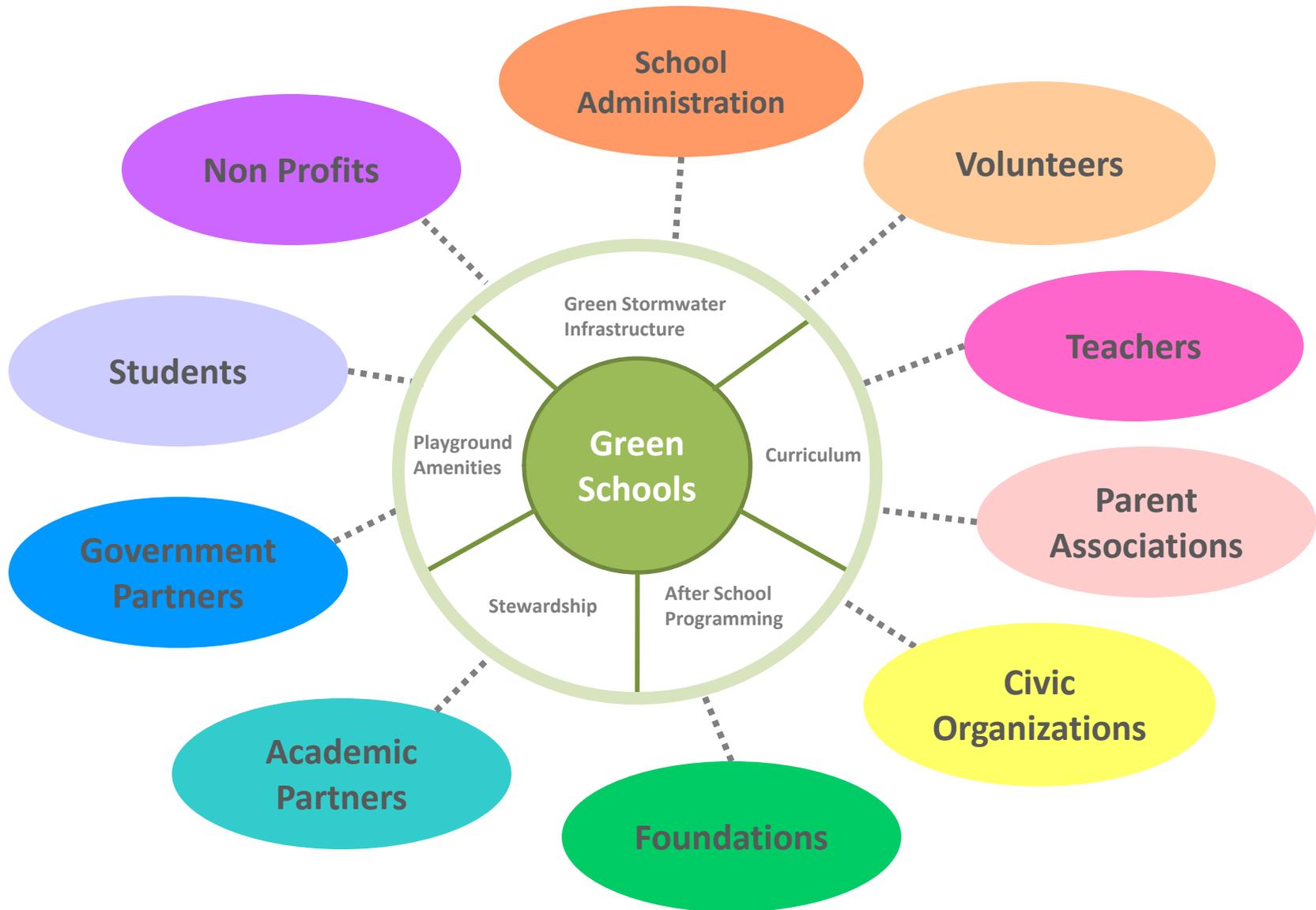


Develop incentives and legal agreements to partner with all school types

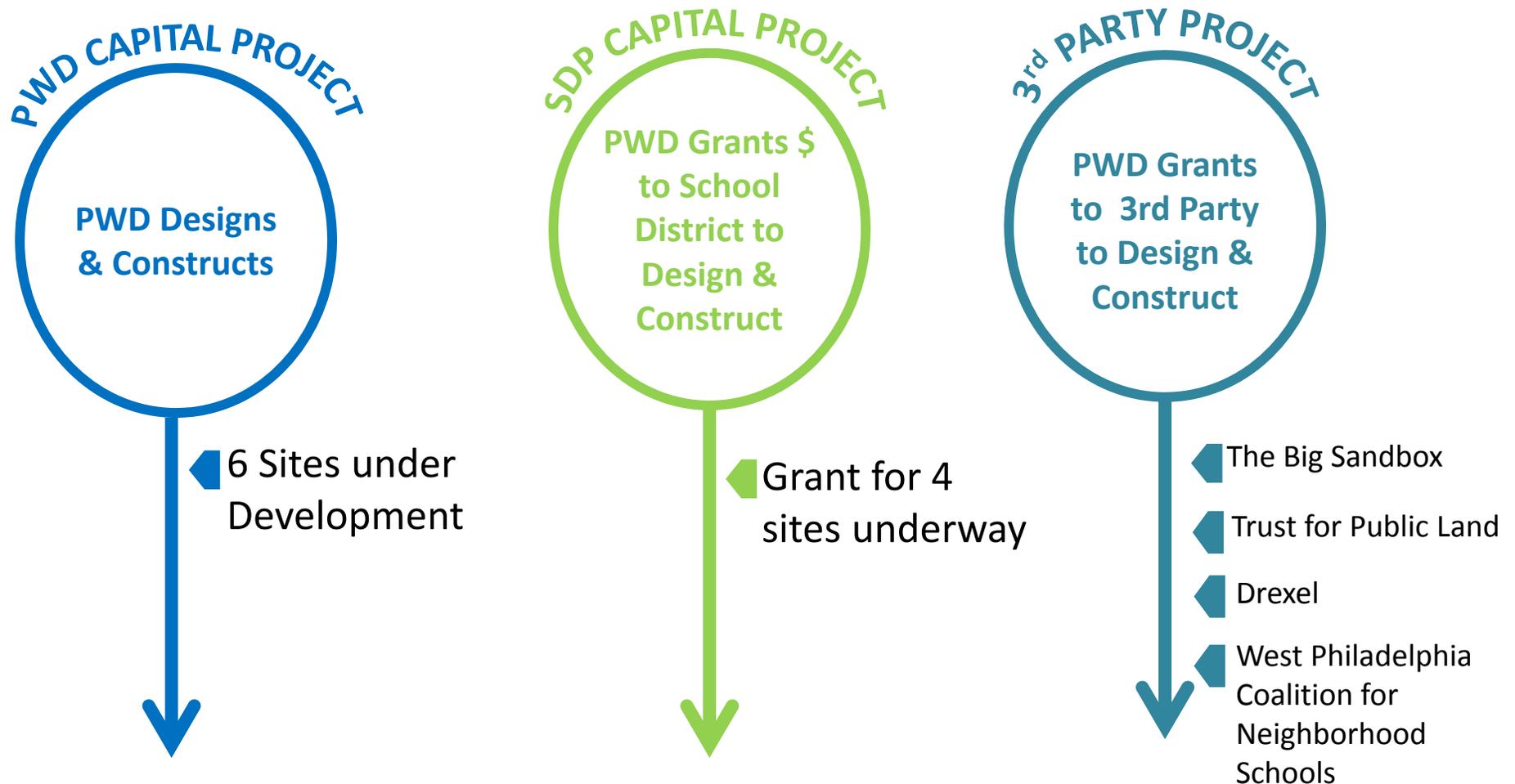


Implement **550** Green Acres, on a mix of public, private, catholic and charter schools

# GREEN SCHOOLS: PROJECT STAKEHOLDERS



# GREEN SCHOOLS: 3 PARTNERSHIP MODELS



**School District of Philadelphia  
Green Schoolyard Projects**

# GREEN SCHOOLS PROGRAM

## Resources:

1. Schoolyard Master Plans
2. Transforming Schoolyards Design Guide
3. Stormwater Management Incentives Program for Schools Guide
4. Philadelphia Green Schools Alliance
5. Educational Programming
  - Fairmount Waterworks Curriculum
  - greenSTEM Monitoring



# GREEN SCHOOLS MASTER PLANS



# GREEN SCHOOLS MASTER PLANS

**COMMUNITY DESIGN  
COLLABORATIVE**



# GREEN SCHOOLS DESIGN GUIDE

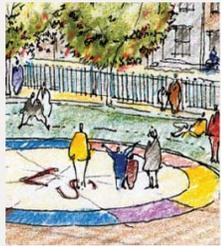


COLLABORATIVE DESIGN GUIDES

[No. 1]



## Transforming Philadelphia's Schoolyards



Partnership with Community Design Collaborative and  
Philadelphia School District

[www.cdesignc.org/schoolyards](http://www.cdesignc.org/schoolyards)

# GREEN SCHOOLS DESIGN GUIDE

## *Section 1*

---

# Schoolyard Stories

.....  
Leading with community-driven change:

**HENRY C. LEA SCHOOL**

.....

Orchestrating incremental improvements:

**COOK-WISSAHICKON SCHOOL**

.....

Building a strong team of stakeholders:

**ALBERT M. GREENFIELD SCHOOL**

.....

## *Section 2*

---

# Steps to a Green Schoolyard

.....  
**ORGANIZE**

.....

**CONNECT THE CLASSROOM**

.....

**MAKE A (CONCEPTUAL) PLAN**

.....

**FIND THE FUNDING**

.....

**IMPLEMENT YOUR PLAN**

.....

**STEWARD YOUR SUCCESS**

.....

## *Section 3*

---

# Design Elements

.....  
Support **ACTIVE PLAY**

.....

Green the **LANDSCAPE**

.....

Manage **STORMWATER**

.....

Introduce **LEARNING TOOLS**

.....

Nurture **SOCIAL ACTIVITIES**

.....

Create **GATHERING SPACES**

.....

Enhance the **SITE**

.....

Menu of **DESIGN ELEMENTS**

.....

## Capacity Building Guidance | Design Elements

### *Section 2*

# Steps to a Green Schoolyard

The Collaborative invites you, as members of a school community, to use this guide as a springboard to envision the future for your own schoolyard. Designers, too, can refer to the guide as they work with school community clients and partners.

Transforming schoolyards takes vision, tenacity, attention to the details, and imagination. Here are some of the steps you'll encounter along the way. The schools and communities who've already succeeded with schoolyard improvements tell us again and again: the work you do in the early stages will sustain you over the duration of the project, and beyond.

Although this guide outlines a sequence of steps that are appropriate for schoolyard greening initiatives, you will learn as you go that there are often lots of starts and stops. You may overlap or repeat several steps as your project takes shape.



# GREEN SCHOOLS GRANT GUIDELINES

- ***UNDER DEVELOPMENT***
- Stormwater Management Incentive Program [SMIP] grants partners funds based on the amount of stormwater managed for green schoolyard projects
- Target audience: School Principals, School Associations
- Outlines coordination process with PWD and Philadelphia School District to develop green schools utilizing PWD grant funds

**SMIP GRANTS**  
STORMWATER MANAGEMENT INCENTIVE PROGRAM  
FOR  
**SCHOOLS**



## GREEN SCHOOLS ALLIANCE

- Initiated 2014
- Partnership of schools and community organizations to transform Philadelphia Schoolyards
- Host meetings and webinars for schools interested in greening
- Collective fundraising efforts, multi-school grant applications
- Spearheaded by The Big Sandbox, non-profit fundraising partner



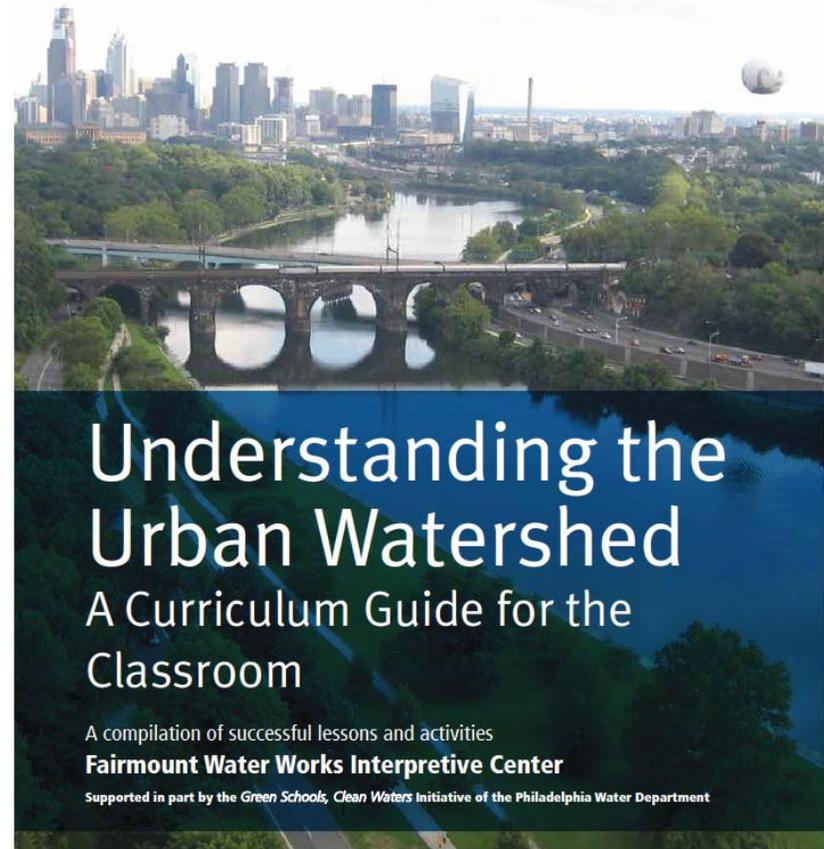
[www.pgsaplay.org](http://www.pgsaplay.org)



# GREEN SCHOOLS EDUCATIONAL PROGRAMMING



## FAIRMOUNT WATER WORKS



### Understanding the Urban Watershed A Curriculum Guide for the Classroom

A compilation of successful lessons and activities  
**Fairmount Water Works Interpretive Center**  
Supported in part by the *Green Schools, Clean Waters* Initiative of the Philadelphia Water Department

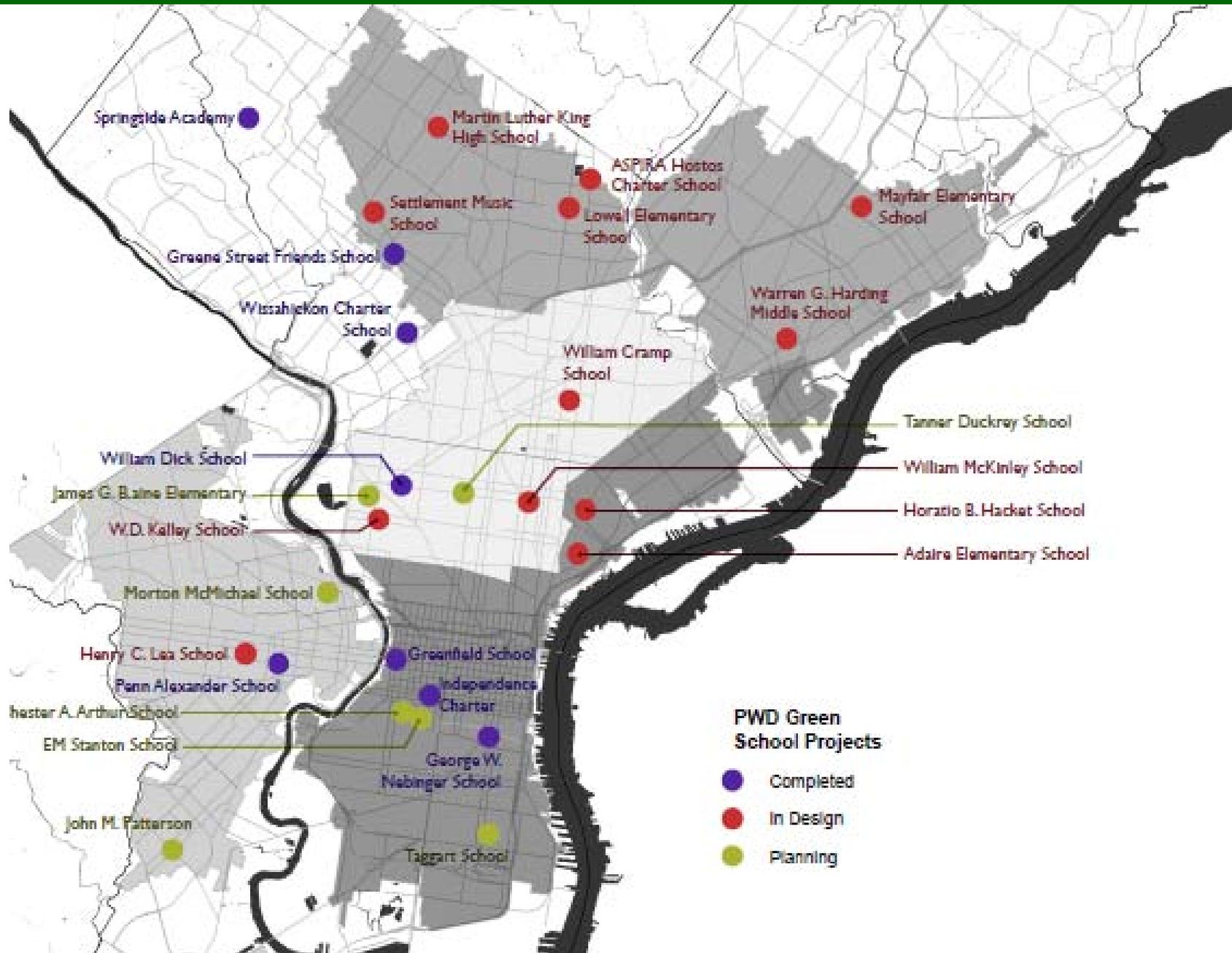
# GREEN SCHOOLS PROJECTS

## 2015 METRICS:

- 8 Schools **Complete**
- 12 Schools in **Design**
- 7 Schools in **Planning**
- 5 Schools participating in **greenSTEM**
- 9 Schools working with **Fairmount Water Works** developing the **Urban Watershed Curriculum for Middle Years**
- 50+ schools utilizing **Urban Watershed Curriculum Guidelines**



# GREEN SCHOOLS PROJECTS



GREEN SCHOOLS PROJECTS

# George Nebinger School



## GREEN SCHOOLS PROJECTS

# George Nebinger School – 2013



## GREEN SCHOOLS PROJECTS

# William Dick School



# GREEN SCHOOLS PROJECTS

## William Dick School – 2014



## GREEN SCHOOLS PROJECTS

# Henry C. Lea School



# GREEN SCHOOLS PROJECTS

## Henry C. Lea School – 2014



# Henry C. Lea School – 2014



## GREEN SCHOOLS PROJECTS

# Henry C. Lea School – 2016



*Rendering: SALT Design Studio*

# Greenfield School – 2011



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