

Green Stormwater Infrastructure in Philadelphia

Amy Liu, AICP
August 10, 2021



Amended

Green City, Clean Waters

The City of Philadelphia's Program for Combined Sewer Overflow Control
Program Summary

Amended by the Philadelphia Water Department
June 1, 2011



Green City, Clean Waters seeks to protect and enhance Philadelphia's watersheds by managing stormwater with green stormwater infrastructure (GSI)

- 25-year program
- Goals are approximately 10,000 greened acres and 85% overflow reduction
- Provide triple bottom line benefits to our communities

Meet State and Federal Compliance

2009 Long Term Control Plan
Update

2011 Consent Order & Agreement

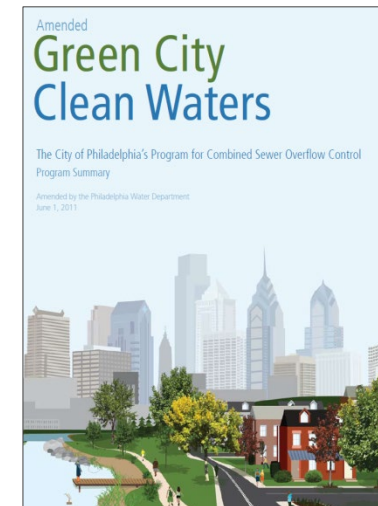
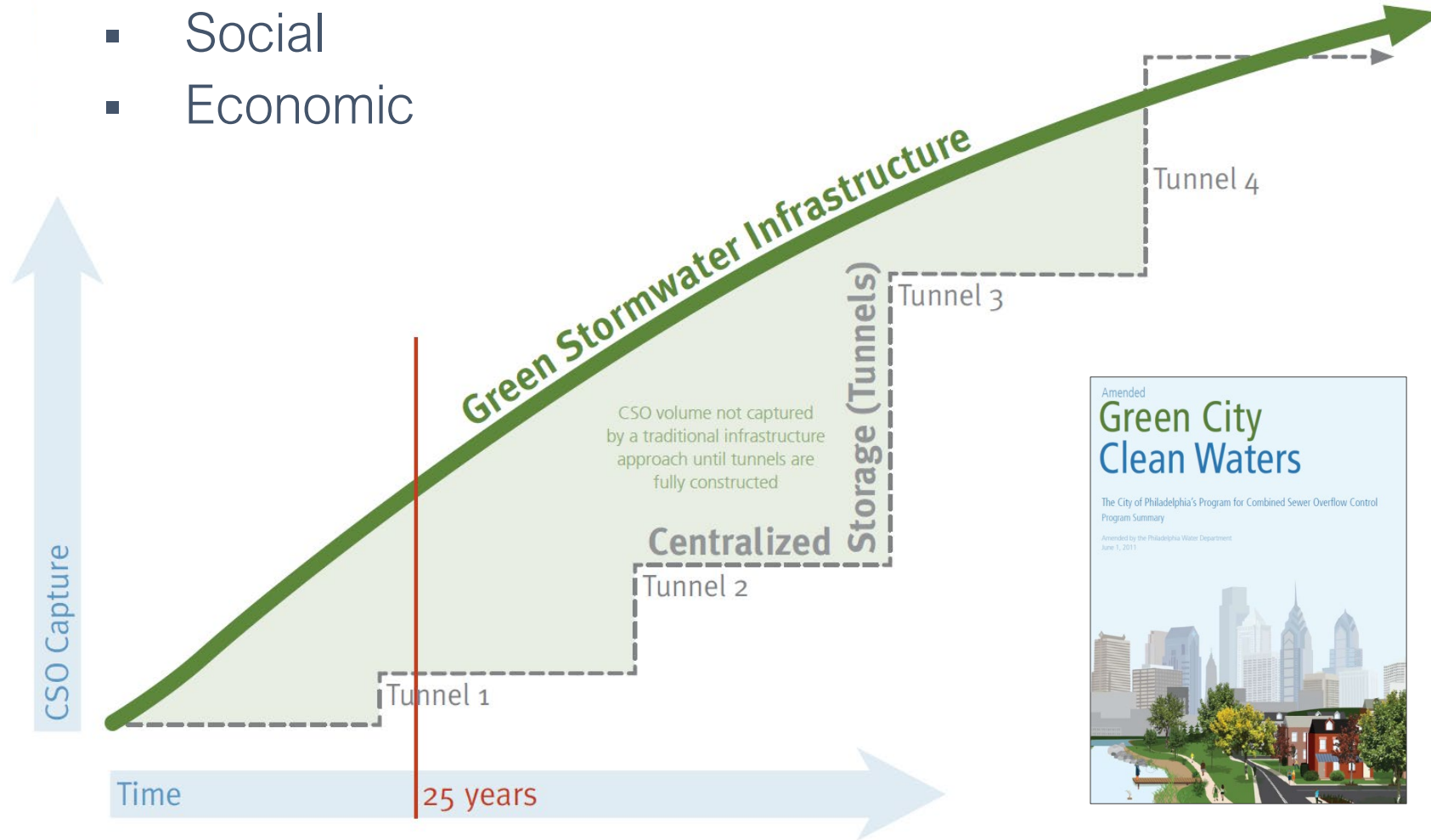
- Clean Water Act
- Enacted by PA Dept of Environmental Protection (DEP)
- Evaluation Plans every 5 years



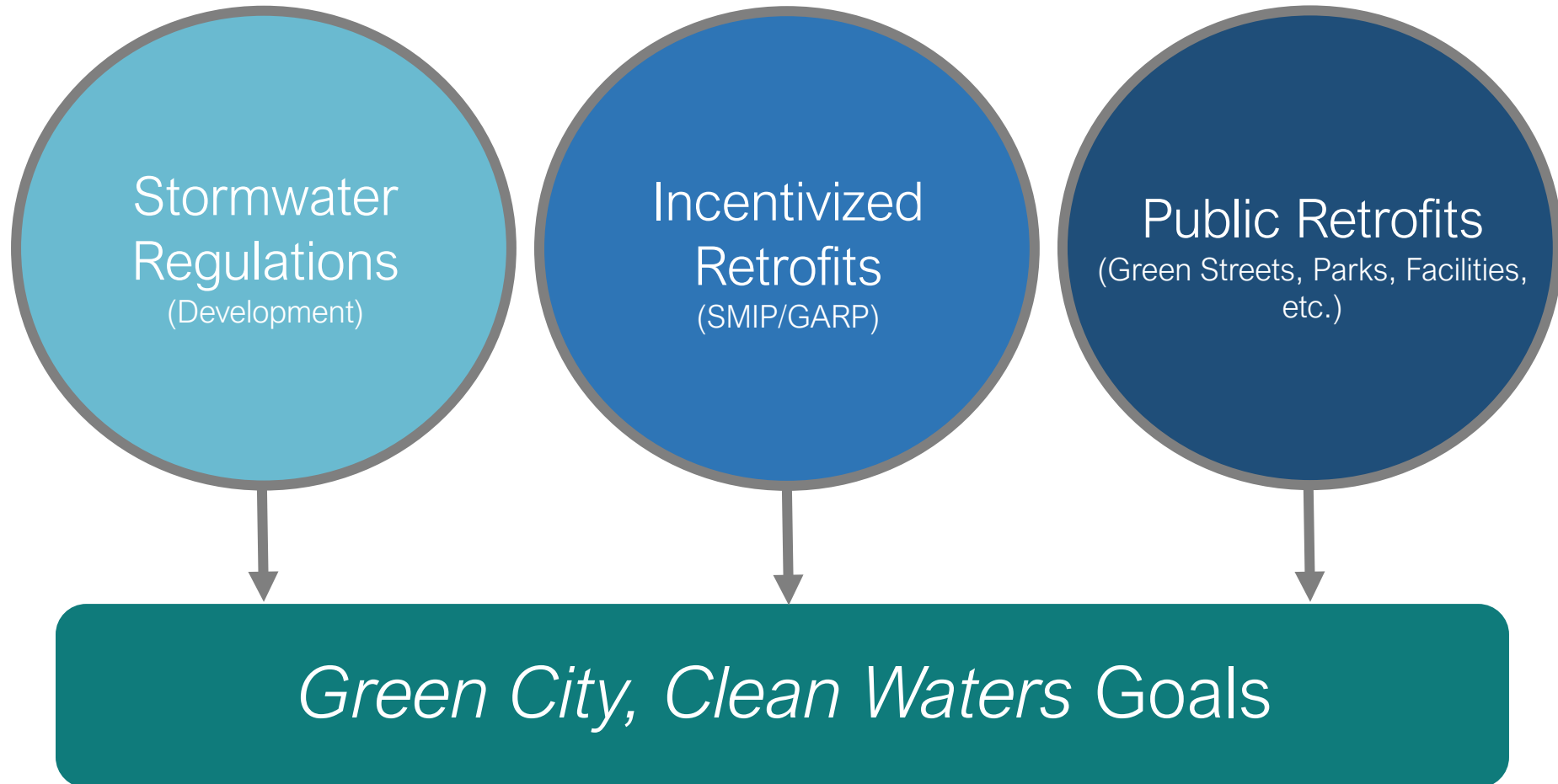
Howard Neukrug (clockwise from left), city water commissioner; U.S. Rep. Allyson Y. Schwartz; Rina Cutler, deputy mayor for transportation; Lisa Jackson, EPA administrator; and Mayor Nutter join in the official approval of "Green City, Clean Waters." MICHAEL S. WIRTZ / Staff Photographer

Triple Bottom Line Benefits

- Environmental
- Social
- Economic



How is GSI built in Philly?



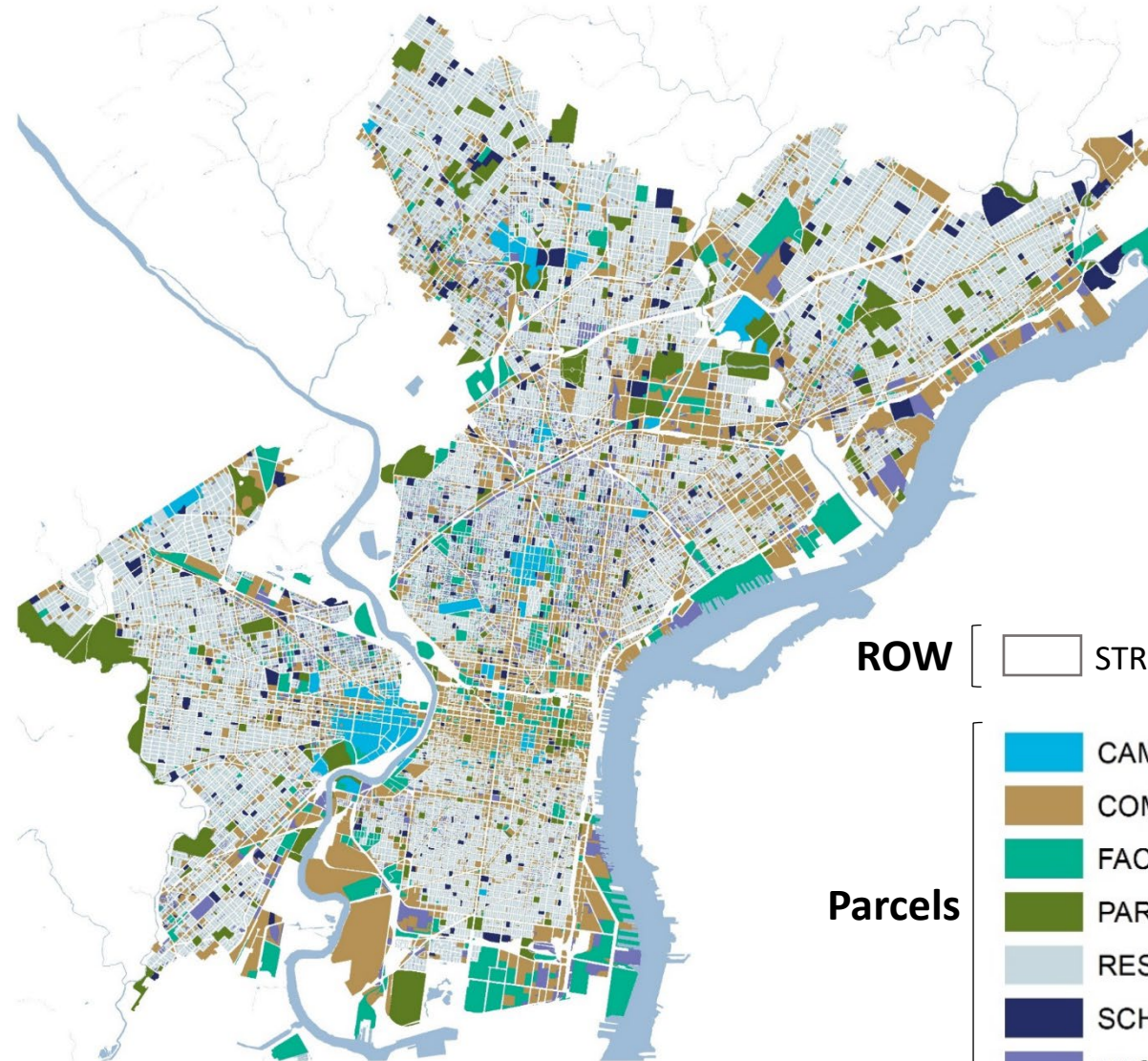
Intersecting **WHERE** and **HOW**

	Public Retrofits	Incentives	Regulations
Streets	✓	<input type="checkbox"/>	<input type="checkbox"/>
Parks	✓		✓
Commercial		✓	✓
Facilities	✓	✓	✓
Schools	<input type="checkbox"/>	✓	✓
Vacant Land	✓		✓
Campuses	✓	✓	✓
Residential	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Progress to Date

	Existing Conditions in the CSS			Progress to Date Acres by Pipeline**			Progress to Date Acres	Accessible Acres by Pipeline			Accessible Acres	Accessible Acres Total	% Progress Toward Accessible Acres	
	Total Area (acres)	Impervious Area (acres)	Number of Parcels	Redevelopment*	Public Retrofits	Incentivized Retrofits	On-Site & Off-Site	Redevelopment	Public Retrofits	Incentivized Retrofits	On-Site & Off-Site			
Streets	13,005	11,742*	none	18	968	4	986	39	2,243 - 2,651		2,282 - 2,690	2,350 - 2,758	42% 36%	
Off-Site DA							4		68***		68			
Parks	1,679	322	806	27	37	7	71	63	44 - 91	7	114 - 160	736 - 1,136	32% 21%	
Off-Site DA							161		592 - 945	31	623 - 975			
Commercial	7,330	6,059	34,550	219		394	613	480		1,809 - 2,429	2,289 - 2,909	2,448 - 3,258	26% 19%	
Off-Site DA										159 - 349	159 - 349			
Facilities	1,933	1,381	5,896	81	3	86	170	180	0 - 146	39 - 280	219 - 606	223 - 909	78% 19%	
Off-Site DA							3		0 - 282	4 - 21	4 - 303			
Schools	1,223	863	777	64		35	98	142	0 - 281	31 - 226	173 - 453	173 - 817	60% 13%	
Off-Site DA									0 - 364	0 - 86	0 - 364			
Vacant	2,011	712	37,568	26	2	33	60	54	0 - 11		54 - 65	54 - 404	-****	
Off-Site DA							18		0 - 339		0 - 339			
Campuses	891	619	720	121		16	137	269	7	0 - 143	276 - 420	285 - 495	48% 28%	
Off-Site DA									9	0 - 67	9 - 76			
Residential	12,208	8,736	362,360	31			31	66			66	66	66	47%
Total	40,281	30,434		588	1,193	607	2,387	1,292	2,963 - 5,193	2,080 - 3,639		6,334 - 9,843	38% 24%	
				Progress to Date Acres by Pipeline				Accessible Acres by Pipeline						
Share of IA				1.9%	3.9%	1.9%	7.7%	4.2%	9.7% - 17%	6.8% - 11.9%		20.8% - 32.3%		

WHERE can GSI be built?

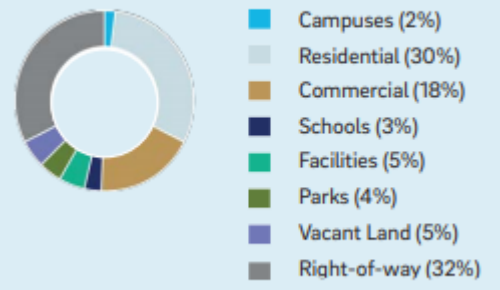


ROW [] STREETS

Parcels []

- CAMPUS
- COMMERCIAL_INDUSTRIAL
- FACILITY
- PARK
- RESIDENTIAL
- SCHOOL
- VACANT

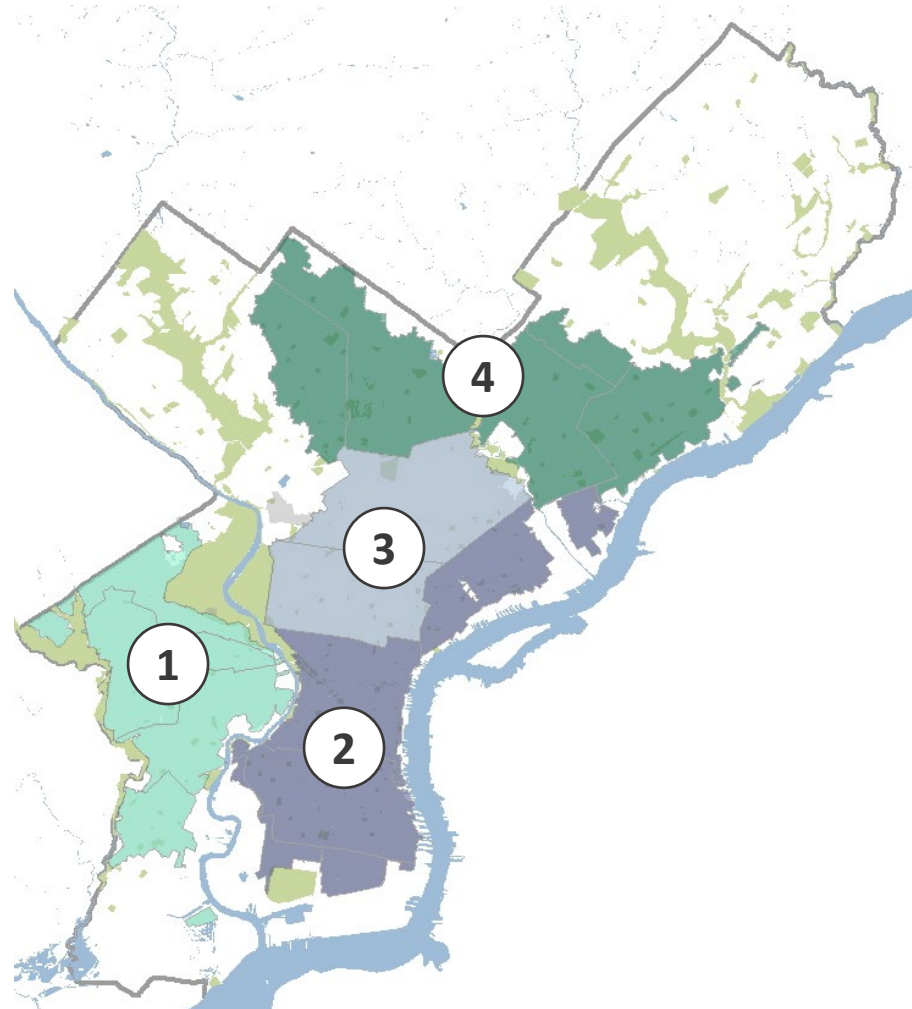
Total Area in the CSS by Program



Public Retrofits

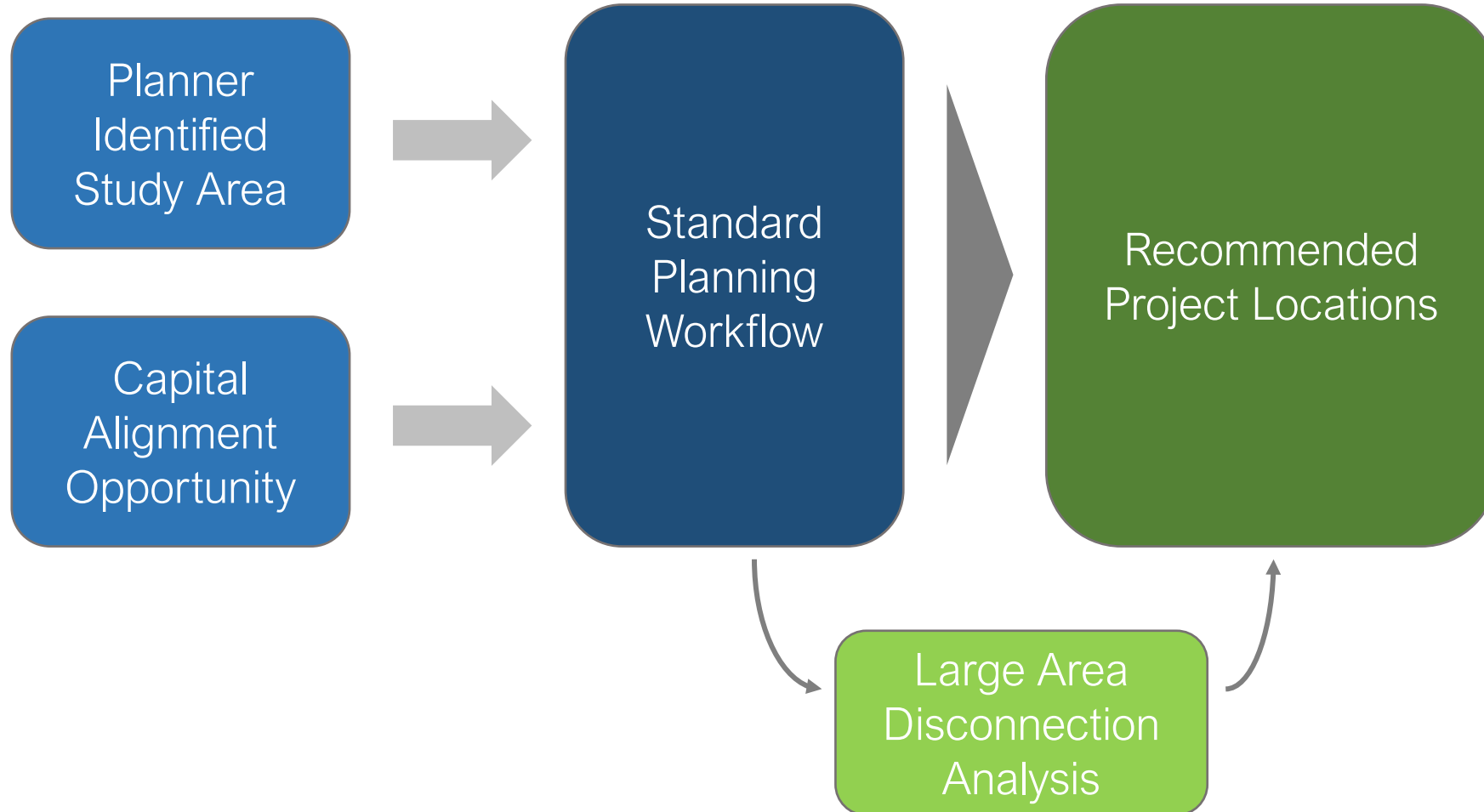
> Planning Approach

- District Planners
- Site Analysis Team
- Partnership Specialists
- Program Development
- Public Affairs Staff



Public Retrofits

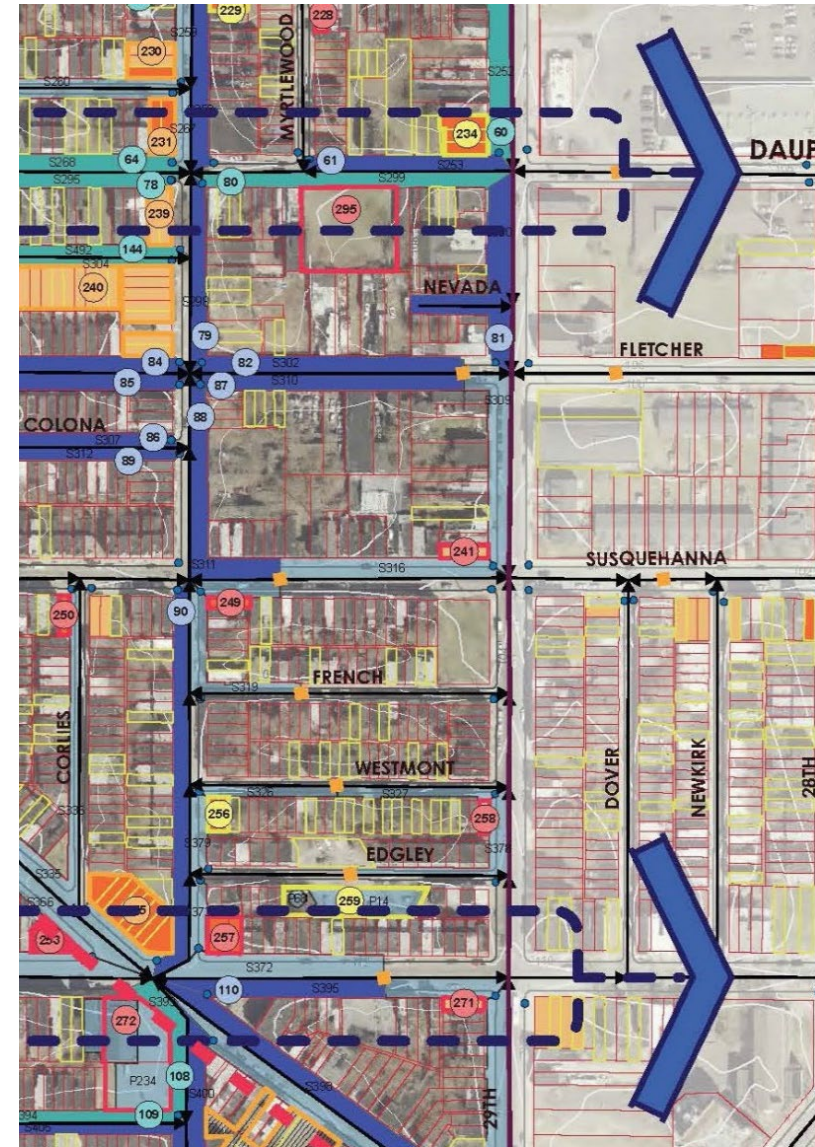
> Project Identification



Public Retrofits

> Planning Goals

- Maximize Drainage Capture
- Consider Site Context
- Coordinate With Partners
 - City Council
 - City Agencies
 - Community Organizations
 - Private Property Owners
- Balance PWD's objectives with community needs



Workflow Processes



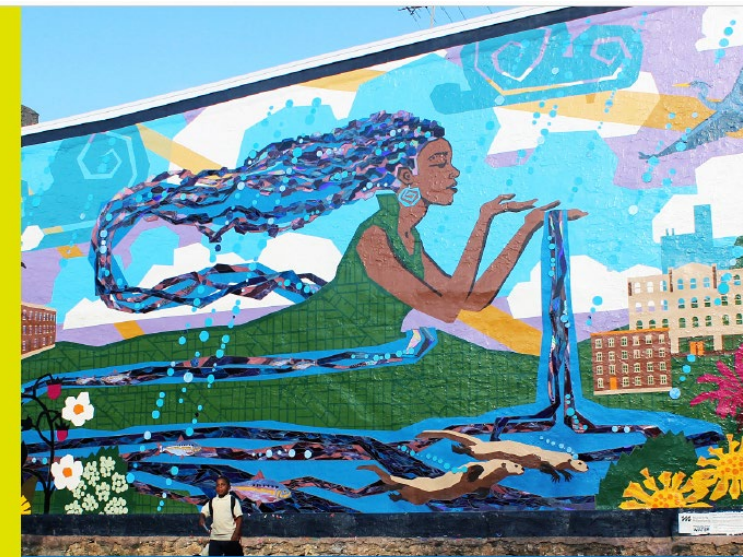
Green Stormwater Infrastructure **Planning & Design Manual**

Version 2.0 April 2018



Maintenance Agreement for Green Stormwater Infrastructure on City Property

December 2020



Green Stormwater Infrastructure Strategic Implementation Plan

August 2018



City of Philadelphia Green Streets Design Manual



Green Stormwater Infrastructure Landscape Design Guidebook

Version 4.0 April 2020



Development

> Stormwater Regulations

City Code allows PWD to establish stormwater regulations

Enacted in 2006

Development projects with 15,000 SF disturbance

Stormwater Management Requirements

Water Quality: volume, rate, and pollutant reduction

Channel Protection

Flood Control

Public Health and Safety Rate

Erosion and Sediment Control

Stormwater review **aligns with City development process**

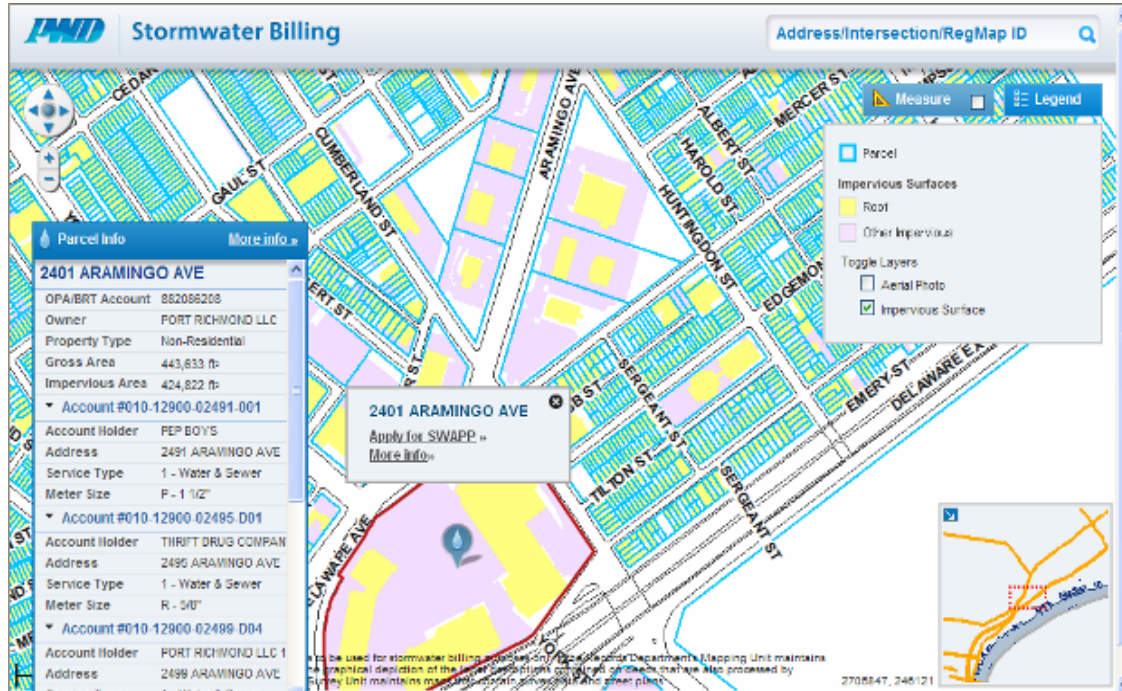


588 Acres
Complete

1,292 Acre
Target

Incentives

> Stormwater Fees



- 💧 Non-residential properties receive a GA/IA specific fee
- 💧 Residential properties receive a flat fee based on average GA/IA
- 💧 Parcel-based fees phased in over 4 years to graduate impact
- 💧 Non-residential properties can reduce their fee by up to 80% by managing stormwater on site

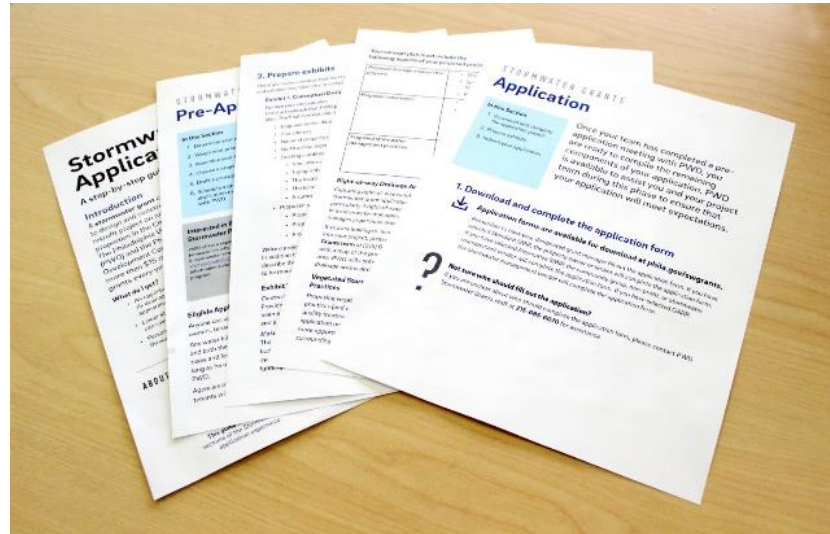
	Rate
Gross Area	\$0.70 / 500 sq.ft.
Impervious Area	\$5.30 / 500 sq.ft.

607 Acres
Complete

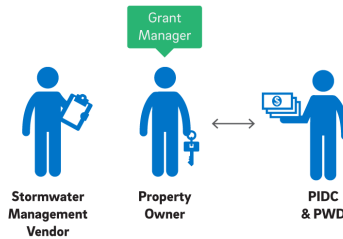
2,080 Acre
Target

Incentives

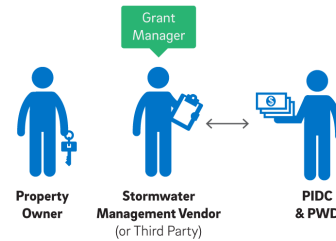
> Stormwater Grants



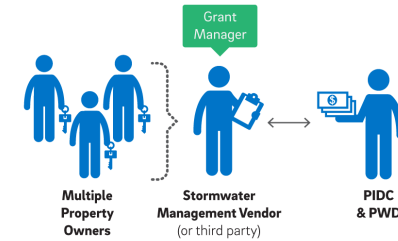
S PROJECT MODEL:
SMIP (Stormwater Management Incentives Program)



A PROJECT MODEL:
Alternative SMIP



G PROJECT MODEL:
GARP (Greened Acre Retrofit Program)



607 Acres
Complete

2,080 Acre
Target



BEFORE

Parkside Edge



rain gardens, swale

Parkside Edge



BEFORE

American Street



bioswales, trenches, bumpouts

American Street