GREENWORKS

PHILADELPHIA

2015 PROGRESS REPORT

CONTENTS

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Dear Friends,

2015 marks the end of both the Nutter Administration and the *Greenworks* implementation timeline. This document serves as both an annual update and a final report. We provide a snapshot of the work performed over the past year, along with cumulative metrics, narrative takeaways, notes on work that remains in process, and ideas for what could come next. Our intent is to share knowledge. Our hope is to provide a framework for an updated sustainability plan that will extend Philadelphia's commitments beyond 2015.

Greenworks launched in 2009 and serves as the City of Philadelphia's first comprehensive sustainability plan. Its drafting incorporated existing work within City government, referenced best practices, and brought in new ideas garnered from both City employees and external partners. The plan considers sustainability in the broadest terms through five overarching goals related to energy, environment, equity, economy, and engagement; 15 measurable targets; and more than 160 specific initiatives. After six years of implementation, we are proud to report we made progress toward all of the plan's overarching goals and began or completed work on nearly all initiatives. However, this great progress did not lead to meeting all 15 measurable targets. Here's the rundown:

- EXCEEDED: **Targets 6, 7, 8, and 12**
- MET: **Target 15**
- CAME CLOSE: **Targets 4 and 5**
- TRENDING IN THE RIGHT DIRECTION: **Targets 9, 10, 11, and 13**
- DID NOT MEET: **Targets 1, 2, 3, and 14**

What does this mean? With strong baseline data, improved tracking systems, and experience under our belts, we will need to take a new look at how to set ambitious but achievable goals going forward. How can we measure progress in the most meaningful way? The current framework doesn't fully recognize the interconnectedness of outcomes; a future plan may want to take a systems approach and acknowledge that sustainability work often meets multiple goals simultaneously. Another important lesson learned is that not all initiatives roll up into a number. Work that supports sustainable goals but doesn't necessarily have impressive quantitative outcomes can be important nonetheless.

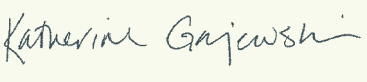
Regardless of not hitting all our marks, *Greenworks* has been an incredible shared success. The plan was in response to an advocacy effort, which created a base of support from day one. The breadth of issues it encompasses provides opportunities for many to connect to it, distributing leadership and benefits. The Mayor and City Council sharing this agenda was and will remain essential. Having champions across City government was critical, as was having stakeholders outside of government pushing us and advancing work of their own. This special confluence of circumstances allowed us to hit the ground running, activate work on a wide variety of topics, and ultimately position Philadelphia as a leader in urban sustainability.

Greenworks provided us with a tremendous learning experience, but long-term sustainability work has just begun. Looking forward, we will have to go well beyond low-hanging fruit and increasingly take actions that drive large-scale impacts. The challenges and rewards of becoming a more livable, equitable, and vibrant city will both grow.

We are so proud of the work that we accomplished together and are optimistic that we set the foundation for a next generation of leadership, arguably the most important outcome of all. Thank you.

Sincerely,

Michael A. Nutter
MAYOR



Katherine Gajewski
DIRECTOR OF SUSTAINABILITY

SUMMARY OF TARGETS

Over six years of implementation, the Mayor's Office of Sustainability has collected the best available data on all *Greenworks* targets. As shown in the chart below, most but not all annual data are complete and available within six to 12 months after the end of a given year. Data on most *Greenworks* targets are available annually, but some, such as the clean economy survey and citywide greenhouse gas inventory, are resource intensive to collect and analyze, and therefore available less frequently.

TARGET		BASELINE YEAR	BASELINE	CURRENT YEAR	CURRENT
1	Lower City Government Energy Consumption by 30 Percent	2008	3.77 Trillion BTUs	2014	3.97 Trillion BTUs (6% increase)
2	Reduce Citywide Building Energy Consumption by 10 Percent	2006	122.06 Trillion BTUs	2014	145.65 Trillion BTUs (19% increase)
3	Retrofit 15 Percent of Housing Stock with Insulation, Air Sealing, and Cool Roofs	2008	0 Homes Retrofitted	2014	16,283 Homes Retrofitted
4	Purchase and Generate 20 Percent of Electricity Used in Philadelphia from Alternative Energy Sources	2008	2.5% Alternative Energy	2014	15.2% Alternative Energy
5	Reduce Greenhouse Gas Emissions by 20 Percent				
	MUNICIPAL	1990	596,829 t CO_2e	2013	507,871 t CO_2e (15% decrease)
	CITYWIDE	1990	21.06 Million t CO_2e	2012	20.89 Million t CO_2e (1% decrease)
6	Improve Air Quality toward Attainment of Federal Standards	2008	20 Unhealthy AQI Days	2014	6 Unhealthy AQI Days
7	Divert 70 Percent of Solid Waste from Landfill	2008	53% Waste Diverted from Landfill	2013	73% Waste Diverted from Landfill
8	Manage Stormwater to Meet Federal Standards	2011	0 New Greened Acres	2015	581 New Greened Acres
9	Provide Walkable Access to Park and Recreation Resources for All Philadelphians	2008	10,300 Acres of Open Space	2014	10,457 Acres of Open Space
10	Provide Walkable Access to Affordable, Healthy Food for All Philadelphians	2008	230 Markets, Gardens, and Farms	2014	343 Markets, Gardens, and Farms
11	Increase Tree Coverage Toward 30 Percent in All Neighborhoods by 2025	2008	0 New Trees	2014	120,388 New Trees
12	Reduce Vehicle Miles Traveled by 10 Percent	2005	5.96 Billion Vehicle Miles Traveled	2013	5.26 Billion Vehicle Miles Traveled (12% decrease)
13	Increase the State of Good Repair in Resilient Infrastructure	2008	73% in State of Good Repair	2014	75% in State of Good Repair
14	Increase the Size of the Regional Clean Economy by 25 Percent				
	GREEN GOODS AND SERVICES	2012	27% of Workplaces	2012	27% of Workplaces
	GREEN TECHNOLOGIES AND PRACTICES	2012	53% of Workplaces	2012	53% of Workplaces

2015 GOAL	2009	2010	2011	2012	2013	2014	2015
2.64 Trillion BTUs	3.78	3.60	3.58	3.50	3.84	3.97	
109.85 Trillion BTUs		139.64	138.61	129.36	136.89	145.65	
84,400 Homes Retrofitted	550	2,300	7,877	9,131	11,669	16,283	
20% Alternative Energy		9.0%	12.2%	14.0%	14.8%	15.2%	
477,463 t CO_2e	525,353	505,234	494,709	500,918	507,871		
16.85 Million t CO_2e		21.59		20.89			
10 Unhealthy AQI Days	5	25	14	21	6	6	
70% Waste Diverted from Landfill	65%	72%	77%	73%	73%		
450 New Greened Acres			0	13.9	314	323	581 (through April 2015)
10,800 Acres of Open Space			10,400	10,433	10,442	10,457	
316 Markets, Gardens, and Farms		259	283	314	340	343	
300,000 New Trees		40,000	63,126	89,287	100,000	120,388	
5.36 Billion Vehicle Miles Traveled	5.68	5.52	5.34	5.45	5.26		
80% in State of Good Repair			77%	77%	77%	75%	
33% of Workplaces				27%			
66% of Workplaces				53%			

GOAL:

PHILADELPHIA REDUCES ITS VULNERABILITY TO RISING ENERGY PRICES

energy

SECTION ONE

ENERGY

DURING THE DEVELOPMENT of *Greenworks* in 2008, energy prices were at an all-time high, and the plan assumed that energy prices would continue to rise, increasing demand for energy efficiency and clean energy solutions. Instead, volatile energy prices over the past seven years were one of many external factors influencing energy use, including extreme hot and cold temperatures, population and economic growth, and new construction. Many of these factors are beyond the City's direct control, and others are desirable outcomes that will require additional, more aggressive efficiency investments to decouple from increasing energy use. Recognizing where opportunities for local government to influence energy outcomes are limited, Philadelphia will continue to push for strong state and federal policies, which will be necessary to reach aspirational energy use reduction goals.

Before *Greenworks*, the City did not regularly track or report energy use. Establishing systems to store and analyze both historic and current use data was an essential starting point for energy use reduction. The City reestablished an Energy Office to lead work managing both energy supply and demand within City government. City Council passed a set of policies focused on promoting energy efficiency in the private sector, which the Mayor's Office of Sustainability (MOS) implements.

Despite these important efforts, energy use in Philadelphia increased between 2008 and 2014. Going forward, MOS will use data collected and lessons learned over the course of *Greenworks* to understand how external factors, including those discussed above, drive energy use. Future energy reduction policies and goals need to account for those factors and recognize that efficiency improvements take time to design and implement.

← The Department of Commerce and the Streets Department converted existing streetlights along the commercial corridor at Germantown Avenue and Erie Avenue to brighter, more efficient LED bulbs.

TARGET 1

Lower City Government Energy Consumption by 30 Percent

METRICS

Adjusted *Greenworks* Baseline (FY 2008)	3.77	Trillion BTUs
Current (FY 2014)	3.97	Trillion BTUs
2015 Target	2.64	Trillion BTUs

CONTEXT AND HISTORY

With more than 600 buildings and 2,000 utility accounts, City government is the single-largest real estate holder, energy user, and emitter of carbon dioxide in Philadelphia. Efficiency upgrades and cost-effective investment in alternative energy generation represent opportunities to reduce both the City's environmental impact and operating costs.

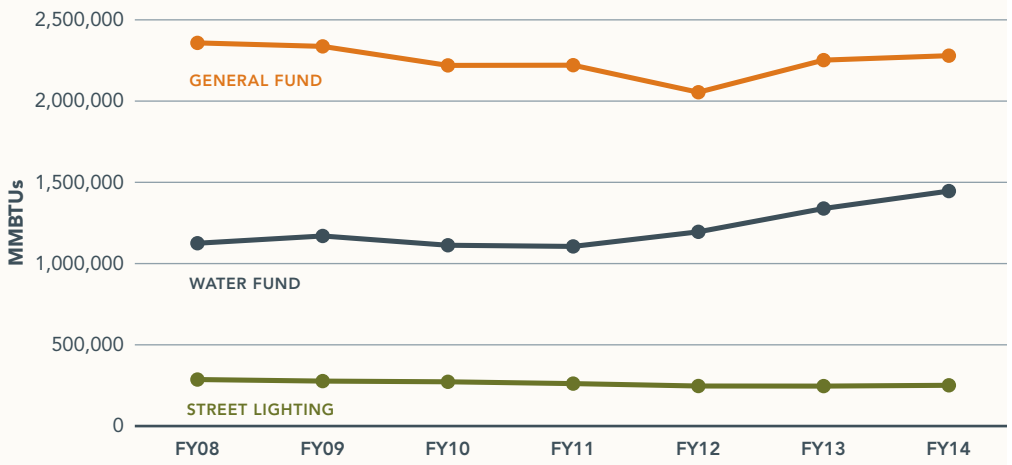
WHAT HAPPENED

Between 2008 and 2014, Philadelphia City government energy use increased nearly six percent. While together the General Fund and street lighting have reduced use by more than four percent, the Water Fund has increased usage 12 percent, largely at its new Biosolids Recycling Center, which turns biosolids from wastewater into fertilizer. Despite this overall increase in energy use, the City has taken important steps to facilitate future efficiency projects. The City now uses sophisticated utility-management software for both current and historic data. This updated infrastructure is essential, as accurate and accessible data support nearly all aspects of the City's energy program.

The 25 largest City-owned buildings within the General Fund account for 60 percent of its energy usage. To achieve serious reductions, energy efficiency upgrades need to be made in these big buildings. The City's most ambitious effort to date to reduce energy usage in its facilities was the guaranteed energy savings project in its four largest downtown office buildings, including City Hall, completed in early 2015. While data showing the full impact of the energy savings won't be available until 2016, the project saved $1.9 million in utility costs during the construction period alone. The Energy Efficiency Fund, an internal grantmaking program, supports departments completing energy-saving projects within their facilities.

Through these projects, the City has a better understanding of how to plan for and implement energy efficiency improvements (see Key Takeaways). This knowledge will be invaluable as Philadelphia considers future energy efficiency projects and policies for both the municipally owned building stock and facilities citywide.

Municipal Energy Use by Fund



BY THE NUMBERS

Install New Lighting

REPLACED 85,000 LED TRAFFIC SIGNALS

- 4,924 GHG Reduced (MT CO_2e)
- 9,274 MWh Reduced
- 31,641 MMBTU Reduced (Electricity Only)

LIGHTING UPGRADES AT SIX RECREATION CENTERS

- 263 GHG Reduced (MT CO_2e)
- 347 MWh Reduced
- 1,184 MMBTU Reduced (Electricity Only)

Develop Energy Load/Demand Management Practices

- 63 GHG Reduced (MT CO_2e)
- 83 MWh Reduced
- 283 MMBTU Reduced (Electricity Only)

City Car Management Plan

REDUCED CITY FLEET BY 542 CARS SINCE 2003

- 10,780 GHG Reduced (MT CO_2e)
- 136,393 MMBTU Reduced (Not Including Electricity)

Quadplex Guaranteed Energy Savings Project

- 5,419 GHG Reduced (MT CO_2e)
- 10,224 MWh Reduced
- 34,884 MMBTU Reduced (Electricity Only)
- 21,229 MMBTU Reduced (Not Including Electricity)

Energy Efficiency Capital Improvements

- 1,456 GHG Reduced (MT CO_2e)
- 2,744 MWh Reduced
- 9,363 MMBTU Reduced (Electricity Only)
- 6,715 MMBTU Reduced (Not Including Electricity)

PHOTOS BY MOS

SUCCESS STORY

Guaranteed Energy Savings Project

Pennsylvania's Guaranteed Energy Savings Act (GESA) enables municipalities to enter into energy performance contracts, which fund energy efficiency work with the resulting energy savings.

In October 2012 the City started construction on its first GESA project, which focused on energy conservation measures (ECMs) including lighting upgrades, weatherization, building controls, and building systems upgrades for its four largest office buildings, including City Hall. Among the most notable of these ECMs was the upgrade of the iconic City Hall clock tower lighting; a switch to LED bulbs is projected to save $10,000 in annual energy costs.

Work on the four buildings was completed in early 2015, and the Energy Office is now monitoring these projects to ensure cost and energy savings are realized. Through the end of 2014, the project has saved nearly $1.9 million and received more than $500,000 in rebates from PECO's *Smart Ideas* program. The Energy Office is considering options for future large-scale guaranteed energy savings projects, possibly including the Philadelphia Museum of Art and the Philadelphia Prison System.

KEY TAKEAWAYS

- **Data tracking is essential to good decision making.** Through the course of the Nutter Administration, the City has established systems to collect data about its buildings and energy use, including the EPA Portfolio Manager tool, the City's utility data-management system, and a new asset-management tool. These systems allow the City to base decisions on historic energy and facilities data.
- **Energy sources are not created equal.** Target 1 was set based on absolute energy use across all fuel types: electricity, gas, steam, and fuel oil. But each of these fuel types emits greenhouse gases at different rates, and the City should prioritize low-emitting fuels when considering future projects and metrics.
- **Large-scale energy efficiency projects take time.** The City began work on a retrofit of its four largest downtown office buildings in 2011. While the project realized cost and energy savings throughout construction, the full impact of this work will not be reflected in total municipal energy consumption until 2016. The City and partners should continue to undertake large-scale efficiency projects despite long implementation timelines.

LOOKING FORWARD

- **Normalize energy data for weather.** Weather is among the biggest drivers of energy usage citywide, and extreme weather can obscure gains in energy efficiency. Through the City's new utility data-management system, the Energy Office can track and understand this relationship.
- **Strategically manage energy procurement and usage.** Through its pilots of utility cost-sharing with City departments and building operator training for municipal employees, the Energy Office is working to ensure that smart energy management is a core value for the City of Philadelphia.
- **Consider the lifetime costs of assets.** The City's current capital budgeting process prioritizes options with the lowest up-front costs. Forecasting lifecycle costs to account for the full cost of operations will be a necessary shift that will help the City save money on both energy and maintenance in the long term.

TARGET 2

Reduce Citywide Building Energy Consumption by 10 Percent

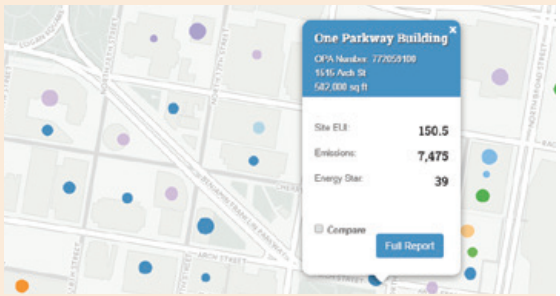
METRICS

Adjusted *Greenworks* Baseline (2006)	122.06	Trillion BTUs
Current (2014)	145.65	Trillion BTUs
2015 Target	109.85	Trillion BTUs

CONTEXT AND HISTORY

Buildings account for 60 percent of citywide greenhouse gas emissions. Increasing building efficiency not only reduces Philadelphia's carbon footprint, but also drives air quality improvements and offers huge potential savings. If all underperforming large commercial buildings in Philadelphia installed upgrades to decrease their energy use to that of an average building, owners could collectively save $100 million in annual utility costs.

Though the magnitude of potential savings is compelling, energy usage citywide remains high. Although the City cannot control energy markets or trends, it plays—and will need to continue to play—an important role setting citywide energy-use goals, monitoring data, and assisting building owners in making investments in energy efficiency.



The benchmarking data visualization tool (http://visualization.phillybuildingbenchmarking.com) provides access to energy data on commercial buildings citywide.

WHAT HAPPENED

To raise awareness of energy usage patterns and help private building owners better understand the performance of their buildings, the Mayor's Office of Sustainability (MOS) worked with City Council to pass an energy benchmarking and disclosure law, which requires 2,000 of the city's biggest buildings (50,000 square feet and larger) to report and disclose energy and water usage annually. This energy usage data, normalized for facility size and type, provide building owners with information on how their performance ranks among local and national peers. More information on the program, including an in-depth summary of Year Two reporting, is available at www.phila.gov/benchmarking. In 2015 the law expanded to encompass an additional 800 large multi-family facilities that will begin mandatory reporting in 2016.

Despite utility programs, American Reinvestment and Recovery Act funded investments, and policy changes that supported efficiency work, Philadelphia's energy usage failed to meet the aggressive *Greenworks* reduction target of 10 percent, instead increasing 19 percent between 2006 and 2014. This is due in part to extreme weather in both summer and winter months over multiple years, which stressed both individual building systems and the regional grid. Climate projections for Philadelphia indicate the remainder of the 21st century will be hotter and wetter and include both more heat waves and a steady number of freeze-thaw cycles (see Target 13). To reduce energy use citywide while extreme weather patterns continue, energy efficiency will have to become the norm, not the exception, and serious work will be required to accomplish this change.

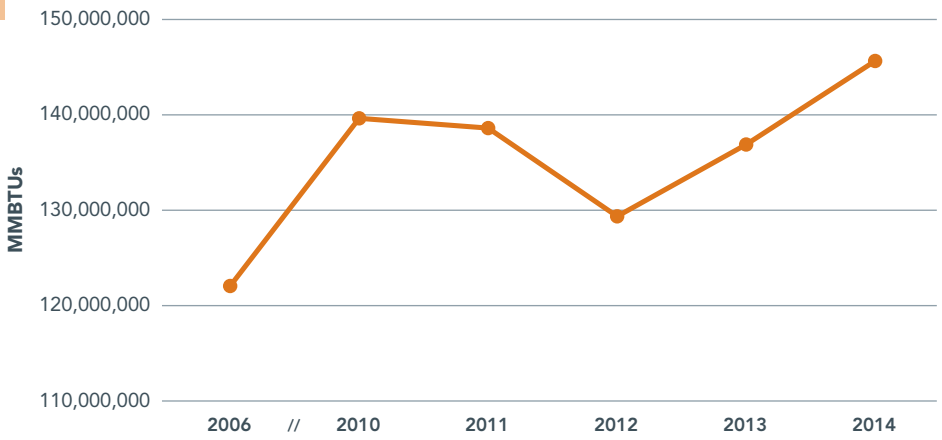
SUCCESS STORY

Energy Reduction Race at 2301 Chestnut Street

In 2014 Mayor Nutter challenged Philadelphia's largest buildings to reduce their energy use five percent over the next year. More than 40 buildings are participating in the *Energy Reduction Race*, which builds on the City's energy benchmarking program by offering free building operator training and opportunities for recognition.

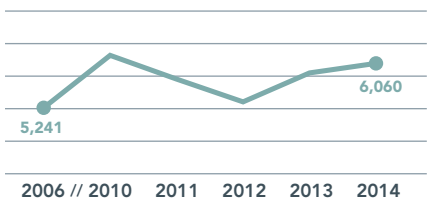
One facility active in the competition is Jacobs Global Building Design at 2301 Chestnut Street. The 100,000-square foot building currently earns an above-average 71 on the one to 100 ENERGY STAR efficiency scale, but Sustainability Director Jonathan Weiss sees the Energy Reduction Race as an opportunity to increase energy savings. "The Race is helping raise the profile of energy efficiency among our staff," Weiss says, pointing to energy-efficient boilers, a revamped elevator schedule, and a daylight harvesting system as projects his building will pursue to meet the Mayor's challenge.

Citywide Energy Usage

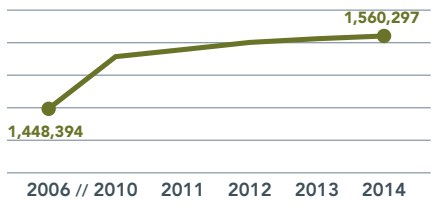


Building energy usage citywide increased in the past two years, reversing a post-recession downward trend during the first few years of *Greenworks* implementation. This correlates with upticks in population and job growth, new development, and more extreme summers and winters, and demonstrates the need to make further progress in the energy efficiency of Philadelphia's building stock.

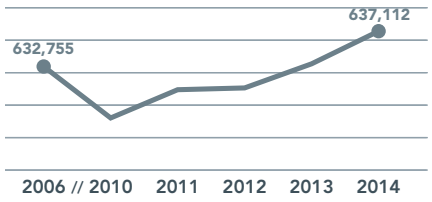
Hours Requiring Heating or Cooling



Philadelphia Population

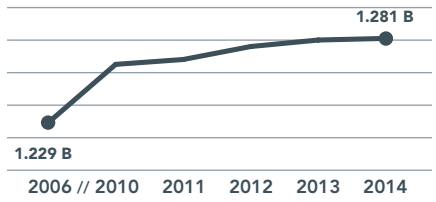


Jobs in Philadelphia



Citywide Development

Total Square Footage (in Billions)



KEY TAKEAWAYS

- **Building rating systems are achieving market penetration.** During the last six years, buildings in Philadelphia have increased their participation in LEED and ENERGY STAR-certification programs, demonstrating that these rating systems have helped building owners engage with energy efficiency.
- **Utility partnerships are critical.** Building owners must have regular and reliable access to energy data to understand how their facilities perform. PECO, Philadelphia Gas Works, Philadelphia Water, and Veolia are key partners in delivering this information to owners and operators.
- **Normalizing citywide energy use is challenging.** Unlike Target 1, weather-normalized citywide energy data are not obtainable with current data constraints. Weather is not the only driver of energy use: population growth, building construction, and a growing economy are all net positives for Philadelphia that can increase energy consumption.

LOOKING FORWARD

- **Plan for economic growth decoupled from rising energy use.** As shown in the charts above, citywide energy use has grown as the economy has rebounded from the Great Recession. Strategic economic development and high-performing new buildings that incorporate smart energy planning will allow Philadelphia to make strides in energy efficiency even as the city grows.
- **Translate energy data into action.** Building owners in Philadelphia have a number of options for energy efficiency project funding, including utility incentives and the *EnergyWorks* commercial loan fund for non-residential buildings. MOS is committed to using benchmarking data to inform building owners about the opportunities available to invest in the efficiency of their properties to increase demand for energy retrofits.
- **Update Philadelphia's building energy codes.** Pennsylvania is currently two code cycles behind the International Code Council's standard. Through action at the state level or a new, Philadelphia-specific code, the City must ensure new buildings are meeting international metrics and that inspectors can plan for a stable and predictable code update schedule.

TARGET 3

Retrofit 15 Percent of Housing Stock with Insulation, Air Sealing, and Cool Roofs

METRICS

***Greenworks* Baseline (2008)**	0	Homes Retrofitted
Current (2014)	16,283	Homes Retrofitted
2015 Target	84,400	Homes Retrofitted

Current figure includes only publicly funded retrofits

CONTEXT AND HISTORY

Home energy efficiency can result in immediate paybacks, both in utility savings and increased comfort. Philadelphians have a high level of interest in these outcomes, but converting interest into action has been—and continues to be—difficult. Federal funding for energy efficiency has historically focused on supporting the Weatherization Assistance Program to assist low-income homeowners. While the program is critically important, its funding has been limited, which in turn limits the number of families served. Federal funding through the American Reinvestment and Recovery Act (ARRA) supported the development of new programs and expansion of existing ones between 2009 and 2014. While ARRA support increased the pace of retrofits and allowed energy efficiency programs to learn important lessons, the one-time nature of the funding created challenges and inherent limitations.

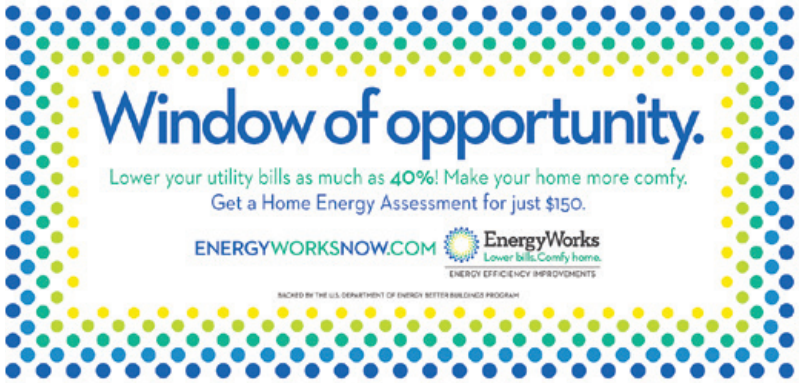
During the same period, Pennsylvania Act 129 established new requirements for electric distribution companies to establish energy efficiency and conservation plans, resulting in the establishment of PECO's *Smart Ideas* offerings. Though not mandated by the Pennsylvania Public Utility Commission, PGW launched a program of its own: *EnergySense*. The combination of ARRA funding and utility programming supported an increase in retrofits, but one that is unsustainable going forward unless new resources are identified.

WHAT HAPPENED

Between 2008 and 2014, at least 16,283 homes in Philadelphia underwent an energy retrofit. This number includes only publicly funded retrofits, the only data consistently available. Going forward, developing means to reliably and consistently assess privately funded activity would allow an understanding of the entire retrofit landscape. To date there has not been a defensible method to account for this segment of the market.

EnergyWorks, a program that supported the growth of the energy efficiency market in Greater Philadelphia by offering a comprehensive suite of services for home and business owners, demonstrated that considerable demand for energy efficiency upgrades exists, and that homeowners who can afford to pay for retrofits are willing to do so. By streamlining program components, offering affordable financing, and using effective marketing campaigns to reach customers, *EnergyWorks* proved a successful model. The program made 2,592 loans across the five-county region (425 in Philadelphia), leveraging $4.6 million in federal funds and more than $20 million in private investments.

In addition to individual homeowners, institutional owners of housing units can play an important role in upgrading energy efficiency. In 2014 the Philadelphia Housing Authority (PHA) committed to joining the U.S. Department of Energy's *Better Buildings Challenge*, which encourages large property owners to commit to reducing their energy usage 20 percent over 10 years.



The *EnergyWorks* residential program, which ended in 2014, included a successful citywide energy-efficiency marketing campaign, generating leads that directly resulted in home assessments and retrofits.

BY THE NUMBERS

***EnergyWorks* Residential Retrofits**
(468 HOUSES)
- 1,014 GHG Reduced (MT CO_2e)
- 1,208 MWh Reduced
- 4,123 MMBTU Reduced (Electricity Only)
- 7,017 MMBTU Reduced (Not Including Electricity)

ECA Residential Retrofits
(3,027 HOUSES)
- 6,556 GHG Reduced (MT CO_2e)
- 7,815 MWh Reduced
- 26,665 MMBTU Reduced (Electricity Only)
- 45,387 MMBTU Reduced (Not Including Electricity)

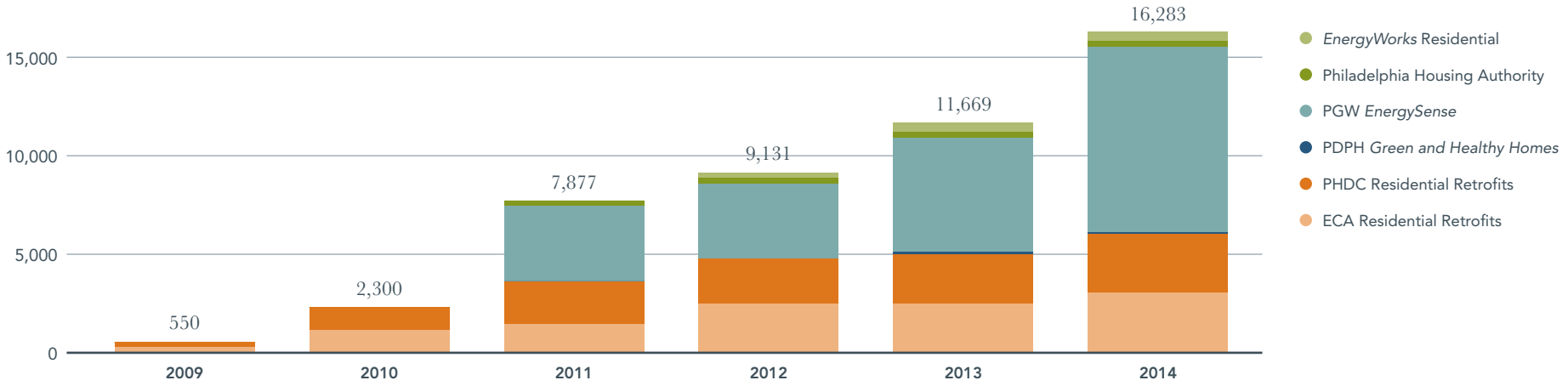
PDPH Green and Healthy Homes
(99 HOUSES)
- 214 GHG Reduced (MT CO_2e)
- 256 MWh Reduced
- 872 MMBTU Reduced (Electricity Only)
- 1,484 MMBTU Reduced (Not Including Electricity)

PHDC Residential Retrofits
(2,994 HOUSES)
- 6,484 GHG Reduced (MT CO_2e)
- 7,730 MWh Reduced
- 26,374 MMBTU Reduced (Electricity Only)
- 44,893 MMBTU Reduced (Not Including Electricity)

PGW *EnergySense* (9,395 HOUSES)
- 20,347 GHG Reduced (MT CO_2e)
- 24,256 MWh Reduced
- 82,760 MMBTU Reduced (Electricity Only)
- 140,871 MMBTU Reduced (Not Including Electricity)

PHA (300 HOUSES)
- 650 GHG Reduced (MT CO_2e)
- 775 MWh Reduced
- 2,643 MMBTU Reduced (Electricity Only)
- 4,498 MMBTU Reduced (Not Including Electricity)

Total Homes Retrofitted



KEY TAKEAWAYS

- **Uncertainty in federal and state funding has slowed market transformation.** Through the American Recovery and Reinvestment Act, the City of Philadelphia and its partners retrofitted thousands of homes as part of the *EnergyWorks* residential program. Post-stimulus, the City has been unable to continue this pace despite considerable need among homeowners.
- **Leveraging stretches limited dollars.** Government funding for residential retrofits is limited. Growing the middle-income retrofit market and increasing homeowner contributions toward projects will be key in driving home efficiency at a large scale.
- **Not all retrofits are created equal.** Each homeowner undertaking a retrofit is taking an important step toward improving efficiency, but energy savings vary significantly among different upgrades. Where data are available, tracking both energy savings and number of projects completed would provide a better understanding of retrofit market penetration and the resulting energy use reductions.

LOOKING FORWARD

- **Affordable housing can be efficient housing.** The PHA is participating in the U.S. Department of Energy's *Better Building Challenge*, and the Pennsylvania Housing Finance Agency recently updated its selection criteria to prioritize projects meeting the stringent Passive House requirement. Ensuring the efficiency of Philadelphia's affordable housing stock will protect low-income residents from higher utility costs, create more comfortable living environments, and help meet long-term energy use reduction goals.
- **Better data for apartments and condos will drive action.** In 2015 City Council passed an amendment to the energy benchmarking law to include multi-family buildings. Publicly available energy efficiency metrics for apartments and condos will allow potential buyers and tenants to consider energy use before committing to a home, and the benchmarking program will help building owners better understand system upgrade opportunities in their facilities.
- **Ongoing funding for energy-efficient homes is necessary.** Lessons learned from *EnergyWorks* indicate that a reliable funding stream for a consistent, long-term, one-stop-shop, residential energy efficiency program would catalyze the local market for home energy retrofits and increase the clean economy jobs required to complete them.

TARGET 4

Purchase and Generate 20 Percent of Electricity Used in Philadelphia from Alternative Energy Sources

METRICS

***Greenworks* Baseline (2008)**	2.5%	Alternative Energy
Current (2014)	15.2%	Alternative Energy
2015 Target	20%	Alternative Energy

CONTEXT AND HISTORY

In 2008, during *Greenworks* drafting, many anticipated that the U.S. Congress would place a price on carbon emissions, which would in turn support large-scale renewable energy investment. Despite a pause in federal appetite to price carbon and challenging shifts in Pennsylvania energy policies, Philadelphia made good progress in the deployment of renewable energy over the past six years.

Deregulation of Pennsylvania's utility market in 2011 expanded the options for residents and businesses seeking to purchase from green energy suppliers. However, the market for solar energy credits in the state has fallen significantly from 2011 highs, stalling large-scale projects at the local level.

WHAT HAPPENED

Beginning in 2009, the City of Philadelphia purchased 20 percent of its total annual energy through national wind renewable energy credits (RECs). In 2014 the City shifted its purchasing strategy from national to state RECs, focusing City dollars on supporting local projects. While local RECs are more expensive, the Energy Office is committed to using Philadelphia's buying power on the REC market to spur the growth of renewable energy close to home.

Renewable energy generation increased dramatically in 2014 as Philadelphia Water (PWD)'s biogas cogeneration plant came online. This plant, which converts a former waste product at PWD's Northeast Water Pollution Control Plant into electricity, is realizing both environmental and economic benefits: during the January 2014 polar vortex, the plant generated electricity valued at $621,000, around 12 percent of what the City paid for electricity in total that month.

The City has also worked to support the growth of renewable energy among private developers. The Mayor's Office of Sustainability released a guidebook for solar developers in 2010 outlining a streamlined permitting process for new projects, and changes to the zoning code in 2012 made small wind energy systems permissible by right in many areas around the city.

PHOTO COURTESY OF SOLAR STATES

BY THE NUMBERS

250 KW Solar Array Installed at SE Pollution Control Plant
- 182 GHG Reduced (MT CO_2e)
- 343 Renewable MWh Generated

Citywide On-Site Generation
- 14,681 GHG Reduced (MT CO_2e)
- 27,700 Renewable MWh Generated

Renewable Energy Credits (City of Philadelphia) – 6,800 MWh
- 3,604 GHG Reduced (MT CO_2e)
- 6,800 Renewable MWh Generated

Renewable Energy Credits (Rest of City) – 594,108 MWh
- 314,877 GHG Reduced (MT CO_2e)
- 594,108 Renewable MWh Generated

PHOTO BY MOS

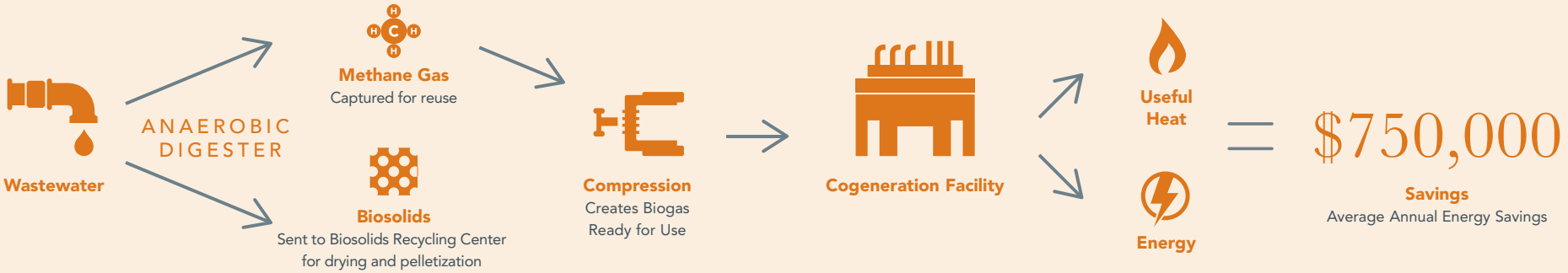
Sheridan Street Housing's solar water heating panels and the rooftop-mounted solar photovoltaic (PV) array at Temple University's Edberg-Olson Football Facility demonstrate the value of renewable energy from affordable housing to public universities.

← Solar States installed 450 solar PV panels on the roof of the Crane Arts building in Kensington.

SUCCESS STORY

Biogas Cogeneration at Northeast Water Pollution Control Plant

Philadelphia Water's biogas cogeneration plant at the Northeast Water Pollution Control Plant creates more than 43 million kWh of energy each year. This innovative system saves customers money and reduces Philadelphia's carbon footprint.



KEY TAKEAWAYS

- **Renewable energy projects can take many different forms.** Significant jumps in renewable generation in Philadelphia have come not through solar arrays alone, but also through projects like the PWD's biogas cogeneration plant at its Northeast Water Pollution Control Plant.
- **Consistent federal and state policy is essential.** The local market for renewable energy is challenged by uncertainty in renewable (particularly solar) energy credits and policy. A predictable, long-term, clean-energy policy and competitive market signals from Washington and Harrisburg are essential to build a robust, lasting market for renewable energy in Philadelphia.
- **Local REC purchasing is an opportunity for collective impact.** In 2014 the City modified its REC purchasing program to focus on credits generated in-state. Buying local credits is more expensive, but can help ensure a reliable market for renewable energy in Pennsylvania. The City can work with institutional and private-sector partners to adopt a similar policy and amplify this effect.

LOOKING FORWARD

- **Advocate for state policies supporting renewable energy.** The City will continue to advocate for Philadelphia's clean energy priorities at the state level as Governor Tom Wolf considers the implementation plan for the U.S. Environmental Protection Agency's *Clean Power Plan* and changes to the existing Act 129 energy conservation plan, which expires in May 2016.
- **Support PWD's utilitywide strategic energy plan.** PWD's energy plan sets aggressive alternative generation and energy conservation goals. While PWD's operations and generation opportunities are unique among City agencies, the plan models a progressive, aggressive approach to energy for other departments in Philadelphia and municipally owned utilities nationwide.
- **Integrate energy planning into the development process.** Currently, Philadelphia's development review process does not consider the long-term energy resilience of new construction. Prioritizing projects that integrate on-site energy production will better position the city to meet future climate mitigation and adaptation goals.

TARGET 1: **Lower City Government Energy Consumption by 30 Percent**

	INITIATIVE	PROGRESS 2015
COMPLETED	**Adopt Integrated Utility Bill Management System**	The City's utility management database includes advanced features to monitor, track, and report energy usage. The Energy Office is working to automate data transfer into Portfolio Manager, an online energy benchmarking tool with advanced savings and project tracking features. — **LOOKING FORWARD →** The Energy Office will work to improve energy-efficiency project tracking within the system and to integrate weather normalization data into project analysis. The database includes a public-facing platform, which the Energy Office hopes to deploy to increase public understanding of utility costs and opportunities for energy efficiency in City-owned facilities.
	Apply for All Available Utility Rebates	The Mayor's Office of Sustainability (MOS) is applying for rebates through Phase II of the PECO Act 129 *Smart Ideas* program, and will continue to pursue all available utility funding. To date the City has recovered $6.8 million in rebates from PECO's programs. — **LOOKING FORWARD →** The Pennsylvania Public Utilities Commission is currently developing Phase III of the Act 129 program. The City is participating in stakeholder sessions throughout this process.
	Benchmark Large City Facilities	Energy performance metrics for municipal facilities from 2011 to 2013 are available at www.opendataphilly.org. The Energy Office will continue to report energy usage of City-owned facilities as part of the citywide benchmarking initiative.
	City Car Management Plan	The proposed FY 2016 budget for the Office of Fleet Management includes $8 million for replacement of aged vehicles, including older, large specialty vehicles. These replacements will increase the fuel efficiency of the fleet.
	Develop Energy Load/ Demand Management Practices	The City continues to participate in PJM's Demand Response program. In summer 2014, 19 City facilities reduced their collective energy usage by 12.7 MW during the test event. City facilities also participated in peak load reduction programs. — **LOOKING FORWARD →** The future of PJM's Emergency Demand Response program is currently uncertain pending a decision in the federal court system. Regardless of the outcome, the City will continue to participate in load management programs to better manage its energy costs.
	Establish Energy Efficiency Fund	MOS established the City's Energy Efficiency Fund in 2010. Since that time, the program has committed funding of approximately $2.5 million dollars to a variety of projects at City facilities with expected annual savings of more than $480,000. — **LOOKING FORWARD →** The Fund has been an effective mechanism for leveraging capital investments to improve energy efficiency in City-owned buildings, and should continue into the next administration.
	Establish Facilities Task Force	The Facilities Task Force completed its report in fall 2013, providing a series of actionable recommendations to the City. The Office of Innovation and Technology (OIT) is currently in the process of procuring a citywide asset management system, one of the key recommendations from the Task Force's report. — **LOOKING FORWARD →** The City is considering adopting the Task Force's recommendation to establish a Utility Review Board to consider all new requests to add accounts to the City's existing energy and water commitments.
	Five-year Strategic Energy Plan (Philadelphia Water)	Philadelphia Water (PWD) released a utilitywide strategic energy plan and updates project-specific plans annually.
COMPLETED	**Implement Preventative Maintenance Plan**	In 2014 and 2015, the Department of Public Property provided preventative maintenance services to more than 100 City facilities. Other City departments are exploring similar programs.
	Install New Outdoor Lighting	Through the Energy Efficiency Fund, MOS and the Streets Department are installing new exterior LED lighting at sanitation yards in summer 2015. The City is also working to install LED lighting around the Pennsylvania Convention Center. — **LOOKING FORWARD →** MOS continues to explore new opportunities for efficient outdoor lighting at various types of City facilities.
	LEED Legislation for City Buildings	LEED Silver is required for all new construction and building retrofits. Several new projects are underway, including the Center for Law Enforcement and Public Health at 4601 Market Street and the new Police Academy facility. — **LOOKING FORWARD →** Since the majority of major building projects done by the City are retrofits of existing facilities, the LEED requirement represents an opportunity to ensure the long-term energy efficiency of City buildings as other critical repairs are made.
	Pilot Department Energy Conservation Incentives	The Energy Office is conducting an energy incentive pilot program with five City departments. Through the pilot, departments are eligible to receive a portion of the energy savings that their facilities generate. The Energy Office plans to run a second pilot in FY 2016. — **LOOKING FORWARD →** The Energy Office is evaluating the success of these incentives and will use the results of the pilots to inform future decisions.
	Re-establish Municipal Energy Office	The Nutter Administration has incorporated an energy office into MOS and the Mayor's Office of Transportation and Utilities. The office works on energy conservation and supply-side strategies that reduce energy costs. — **LOOKING FORWARD →** A future mayoral administration could consider dedicating a separate line item to the Energy Office, ensuring stability of funding and independence within City government.
	Upgrade Energy Efficiency of Vending Machines	Vending machines at Triplex buildings, City Hall, recreation centers, and other City facilities have been either retrofitted or replaced to increase energy efficiency. The City's current RFP requires new vending machines to be ENERGY STAR labeled.
IN PROGRESS	**Create Green Information Technology Plan**	MOS and OIT continue to work on implementing green IT strategies. Recent work has produced policies regarding computer power management, IT purchasing, and remanufactured toner cartridge purchasing. — **LOOKING FORWARD →** OIT is developing a proposal for the procurement and implementation of a centralized printing system for the City of Philadelphia.
	Encourage Conservation Among Employees	MOS and the Energy Office conducted outreach and education on energy conservation at more than 150 Fire Department and Philadelphia Parks & Recreation facilities.
	Energy-Efficient Capital Investments	The City's first guaranteed energy savings project at the Triplex and City Hall was completed in 2015, realizing $1.9 million in utility cost savings during construction alone. MOS continues to pursue additional projects as part of the Energy Efficiency Fund. — **LOOKING FORWARD →** The City is in the process of accepting bids for a combined heat and power plant at the Center for Law Enforcement and Public Health at 4601 Market Street, and is considering a guaranteed energy savings project at the Philadelphia Museum of Art.

IN PROGRESS

Green Building Training for City Employees	MOS and the Energy Office held building operator training for municipal employees and participants in the citywide *Energy Reduction Race* in June 2015. — **LOOKING FORWARD →** The Energy Office may expand building operator training to additional employees in the future.
Identify Less Expensive and Alternative Energy Sources	The City continues to purchase electricity, natural gas, and vehicle fuel with a strategic wholesale approach. — **LOOKING FORWARD →** City should evaluate long-term power purchase agreements with either renewable resources or conventional systems to secure long-term price stability.
Implement Capital Budget Energy Guidelines	In FY 2014 the Office of Budget and Program Evaluation piloted a return on investment analysis for capital projects in several departments. The pilot identified the incremental capital and operating costs associated with each project as well as any operational savings, incremental revenue, or outside capital funding generated. — **LOOKING FORWARD →** Starting in FY 2016, the City plans to conduct this analysis for all new capital projects.
Include Energy Conservation in Future Building Maintenance Contracts	Through guaranteed energy savings projects, the Energy Office is engaged with maintenance contractors to ensure the efficient operations of City-owned buildings.
Investigate Conversion of City Buildings from Steam Loop to Natural Gas	The City and the Philadelphia Museum of Art conducted an investment grade audit for a combined heat and power plant and are evaluating next steps.
Pilot AMI with City Buildings	PECO is in the final stages of installing smart meters in municipal buildings. — **LOOKING FORWARD →** The Energy Office will work to integrate real-time data into monitoring and analysis through its existing utility data management software.
Pilot an Integrated Design Project	MOS worked with the Penn State Consortium for Building Energy Innovation to identify improvements to building controls and lighting systems at Health Center #5.
Remote Building Operations	As new building control systems are installed in City buildings, the Energy Office has integrated them with IT infrastructure for remote operations. This allows remote troubleshooting of building systems, increased accountability, and improved energy performance. — **LOOKING FORWARD →** The Energy Office is remotely monitoring building control systems to ensure expected savings are being realized.
Use City Buildings to Test Emerging Energy Efficiency Technologies Where Feasible	MOS meets regularly with product manufacturers and entrepreneurs to keep track of new technology trends and their applicability to City facilities.
Use Future Energy Costs to Help Inform Building Acquisition/ Expansion Decisions	The City is considering the Facilities Task Force's recommendation to include energy costs in lease language when procuring new office space.

TARGET 2: **Reduce Citywide Building Energy Consumption by 10 Percent**

COMPLETED

INITIATIVE	PROGRESS 2015
Create a Revolving Loan Fund for Commercial and Industrial Energy Efficiency Retrofits	*EnergyWorks* has closed a total of nine commercial loans, seven of which are in Philadelphia. $18.859 million in loans leveraged more than $215 million in other funds for these projects. Remaining loan funds will support a final round of projects currently under review and anticipated to close in 2015. — **LOOKING FORWARD →** *EnergyWorks* is a revolving loan fund. As loan repayments revolve back, funds will be aggregated for future lending. A consistent challenge has been the lack of a strong pipeline; without demand for financing, capital cannot be raised. The City will increasingly focus on turning awareness of energy efficiency opportunities into action. The City will work with its lending partners, the Philadelphia Industrial Development Corporation and The Reinvestment Fund, to assess market demand and whether there is sufficient demand to support a capital raise for continued lending.
Create an Energy Authority	The Philadelphia Energy Authority (PEA), established in 2011, is playing a key role in the City's guaranteed energy savings project and the construction of the Center for Law Enforcement and Public Health at 4601 Market Street. — **LOOKING FORWARD →** The City and the PEA will continue to work together to develop long-term energy projects.
Develop a Citywide Energy-Efficiency Marketing Campaign	The *EnergyWorks* residential program ended in 2014. The program's marketing successfully generated leads that directly led to assessments and retrofits. Over three years, *EnergyWorks* deployed and collected data on a series of campaigns. After data showed a correlation between extreme weather events and program activity, *EnergyWorks* began syncing media to go live during extreme hot or cold weather days. The strongest campaign matched targeted messaging and time-sensitive offers to create a sense of urgency. — **LOOKING FORWARD →** If new funding becomes available to support a future phase of energy efficiency marketing, the City intends to build on lessons learned from *EnergyWorks*. Keeping the City involved will be important, as *EnergyWorks* data showed that customers respond positively to the reassurance provided by a government-backed program.
Develop Cool Roof Code	In May 2010 a law requiring all new construction and major renovation projects with low-sloped roofs to install ENERGY STAR-certified cool roofs was added to the building code. The Department of Licenses & Inspections now distributes ENERGY STAR Cool Roof information to contractors during the permit process.
Establish Power Purchase Pools for Small Businesses	*Philly Buying Power*, a City-endorsed program, aggregates small- and medium-size businesses into large electricity-buying pools that can attract lower rates than businesses can find on their own. — **LOOKING FORWARD →** Through Pennsylvania's deregulated energy market, there will continue to be opportunities for large-scale purchasing of energy, including renewable-focused strategies.
Explore Energy Benchmarking and Reporting for Large Commercial Buildings	In spring 2014 MOS launched a data visualization tool (visualization.phillybuildingbenchmarking.com) to allow building owners and operators easy access to publicly disclosed data on commercial buildings citywide. More information on the program is available at www.phila.gov/benchmarking. — **LOOKING FORWARD →** The third year of energy benchmarking reporting will be completed in June 2015, and data will be publicly disclosed in the fall. City Council passed an amendment to the benchmarking law to include large multi-family buildings in future reporting years.

**Continued on next page.*

TARGET 2: Reduce Citywide Building Energy Consumption by 10 Percent

(Continued)

COMPLETED	**Grant Floor-Area Ratio Bonuses**	The new zoning code adopted in August 2012 offers density bonuses on a sliding scale for development projects that receive LEED Gold or Platinum certification.
COMPLETED	**Pursue Competitive Energy Efficiency and Conservation Block Grant through U.S. Department of Energy**	The City, in coordination with the Metropolitan Caucus and program partners, received a competitive $25 million Better Buildings grant to support the development of the *EnergyWorks* program. The residential side of this program is now closed, while the commercial program will continue through 2015. — **LOOKING FORWARD →** With the experience and lessons learned through *EnergyWorks*, the City is in a strong position to apply for future funding opportunities.
IN PROGRESS	**Consider Adoption of Green Building Code**	The City integrated additional green building practices into the updated zoning code and solar installation regulations. City efforts continue to promote statewide adoption of energy efficient building standards, which are necessary to maintain progress on local goals to reduce energy consumption, energy cost savings, and improved air quality. — **LOOKING FORWARD →** Governor Tom Wolf has stated his intention to bring Pennsylvania's building energy codes up to the latest standard promoted by the International Code Council.
IN PROGRESS	**Install Advanced Metering Infrastructure**	Through the Smart Future Greater Philadelphia project, funded by the U.S. Department of Energy and PECO, PECO is installing 600,000 smart meters and a meter data-management system in the Philadelphia region. — **LOOKING FORWARD →** As one of the first cities in the United States with smart meter infrastructure, Philadelphia has an opportunity to work with PECO to develop a comprehensive strategy for helping building owners understand how interval-level data can be used to identify opportunities for energy savings in their homes and businesses.
FUTURE	**Develop Energy-Efficiency Building Guidelines**	The City continues to provide green building training for building inspectors and City planning staff. MOS has also worked with the Philadelphia Redevelopment Authority (PRA) and the Office of Housing and Community Development (OHCD) to promote energy efficiency and sustainable design.

TARGET 3: Retrofit 15 Percent of Housing Stock with Insulation, Air Sealing, and Cool Roofs

	INITIATIVE	PROGRESS 2015
COMPLETED	**Explore Financing Options to Further Help Residents Access Capital for Retrofits**	PECO *Smart Ideas* and PGW *EnergySense* offer a variety of financing options for residential energy efficiency projects. — **LOOKING FORWARD →** The City will continue to support PECO *Smart Ideas* and PGW *EnergySense* by publicizing the utility programs. Continued state funding of the *Keystone Help* loan program is critical to continue access to capital for retrofits.
IN PROGRESS	**Build Energy Efficiency Guidelines/ Requirements into Public and Low-Income Housing**	MOS is collaborating with OHCD, PRA, and the Philadelphia Housing Authority to adopt green building standards for all affordable housing projects in the city. — **LOOKING FORWARD →** The Pennsylvania Housing Finance Agency recently added an incentive in the selection criteria for affordable housing projects seeking funding to build to the Passive House energy efficiency standard.
IN PROGRESS	**Expand Current Low-Income Housing Weatherization Efforts**	Since 2008 funding for the Weatherization Assistance Program from both the Commonwealth and federal government has decreased nearly 40 percent, which has reduced weatherization program capacity. — **LOOKING FORWARD →** The City will strategically leverage limited state and federal funding with additional support from other sources including utility and healthy homes programs.
IN PROGRESS	**Expand Scope of PGW's Weatherization Program and Increase Size**	In 2011 PGW launched *EnergySense*, a portfolio of six energy efficiency programs available to residential, commercial, and industrial customers. As of December 2014, *EnergySense* has weatherized nearly 9,400 homes and provided more than 2,300 rebates and grants to homeowners and businesses for natural gas conservation measures ranging from new high-efficiency heating equipment, to whole-building upgrades.
IN PROGRESS	**Promote Green and Healthy Homes**	Since being selected as one of the 15 sites in the country participating in the Green and Healthy Homes Initiative (GHHI), the Philadelphia Department of Public Health has combined energy efficiency with lead abatement and indoor air-quality improvements to enhance the well-being of children living in economically challenged neighborhoods.

TARGET 4: Purchase and Generate 20 Percent of Electricity Used in Philadelphia from Alternative Energy Sources

COMPLETED

INITIATIVE	PROGRESS 2015
Create Biogas Cogeneration Facility at Northeast Water Pollution Control Plant	Philadelphia Water (PWD) completed construction on its 5.6 megawatt biogas cogeneration system at the Northeast Water Pollution Control Plant. The system produces 85 percent of the electricity and all of the heating used on-site.
Explore Vertical Axis Wind Turbines	The new zoning code adopted in August 2012 allows small wind energy systems as an accessory use in all districts and allows wind energy equipment to encroach limited distances above building height limits.
Install Geothermal Systems	The City has installed geothermal systems at the Police SWAT building, a recreation center, and a former incinerator facility along the Delaware River. — **LOOKING FORWARD →** After successful installation of geothermal at a recreation center, Philadelphia Parks & Recreation is installing a geothermal system at a playground facility.
Join EPA *Green Power Communities* Program	The City of Philadelphia continues to support and promote the EPA *Green Power Communities* program. Large institutions, small businesses, and residents also participate by purchasing renewable energy credits. — **LOOKING FORWARD →** As the City of Philadelphia transitions its Renewable Energy Credit (REC) purchasing to more-expensive local projects, its ranking among the Green Power Communities will likely drop. The City believes purchasing local RECs has important long-term benefits for renewable energy growth in the region, and will encourage institutional partners to adopt similar policies.
Recycle Deicing Fluid	Philadelphia International Airport (PHL) sends deicing fluid directly to anaerobic digesters at the PWD Southeast Water Pollution Control plant. Starting in the 2013-14 winter season, PHL collected residual deicing fluid from the commuter aircraft deicing area as well as the main aircraft deicing facility. PHL also eliminated urea-based deicing products used on runway and taxiway pavement areas to reduce water pollution and algae growth in surrounding waterways.
Write a Guide for Solar Development	MOS updated the *Guidebook for Solar Photovoltaic Projects* in March 2011 and released the *Guidebook for Solar Water Heating Projects* in December 2011. The City continues to work with PECO and solar developers to ensure that existing policies and processes are up-to-date.
Report Solar Financing Options	The City is considering participating in a U.S. Department of Energy (DOE)'s *Solar Market Pathways* program, which includes financial mechanisms for encouraging solar such as community solar and Solarize.

IN PROGRESS

Purchase Alternative Energy Credits for at Least 20 Percent of Municipal Electricity Use	The Energy Office has transitioned to purchasing higher-impact, but also more expensive local RECs. The Energy Office expects that the long-term impact of providing a stable market for renewable energy projects in Pennsylvania will provide greater value than purchasing the lowest-price RECs generated elsewhere. — **LOOKING FORWARD →** The Energy Office will continue to investigate opportunities for scaling up renewable energy generation and purchasing, particularly within the City of Philadelphia.
Reduce Regulatory Barriers to Solar Installation	The City has worked to eliminate zoning and permitting barriers to solar installation. Regulatory barriers remain at the state level, and the City continues to advocate for policy reform.
Support Passage of State Legislation to Revitalize SAEC Market	State legislation to reinvigorate the Solar Alternative Energy Credit market has stalled. — **LOOKING FORWARD →** The Pennsylvania budget proposed by Governor Wolf in 2015 includes $50 million to re-launch the *PA Sunshine Solar* program that provides rebates on qualifying solar projects.

FUTURE

Educate Energy Purchasers on Benefits of Local Alternative Energy Credits	To support the growth of the local alternative energy industry, the City switched from purchasing national to Pennsylvania wind RECs. Several energy providers also offer local credits through www.papowerswitch.com.
Explore Ways to Capture Water at Fairmount Park and Flat Rock Dams	New design of Flat Rock Dam is underway and includes space to accommodate a potential hydroelectric project.
Promote Renewable Power Purchase Agreements for Public Buildings	The renewable energy market in Pennsylvania currently does not support renewable power purchase agreements. — **LOOKING FORWARD →** The City remains prepared to develop renewable power purchase agreement projects when the market improves.

GOAL:

PHILADELPHIA REDUCES ITS ENVIRONMENTAL FOOTPRINT

environment

SECTION TWO

ENVIRONMENT

ENVIRONMENTAL STEWARDSHIP is core to *Greenworks*. The Environment section focuses on three areas of particular concern: greenhouse gas emissions, air quality, and the waste stream. Since 2009 Philadelphia has made progress in all three of these areas. Citywide carbon emissions are down more than nine percent from a 2006 baseline, thanks in part to more efficient buildings and vehicles. Those efficiencies are also evident in the air we breathe. In 2014 Philadelphia met or exceeded the federal standard for air quality on 359 of 365 days for the second year in a row. With leadership from the Streets Department, Philadelphia continues to exceed the *Greenworks* target for waste diversion through recycling and waste-to-energy processing.

Despite considerable progress, continued work toward these goals is essential. Air quality remains a critical issue. Six unhealthy Air Quality Index days are six too many. After a period of rapid growth, residential recycling rates have plateaued. The next phase of waste management needs to focus on keeping the recycling stream clean and reducing the amount of waste produced. To align with the scale of emissions world leaders and scientists are calling for, Philadelphia will need to go well beyond current greenhouse gas mitigation efforts and develop plans to achieve deeper reductions. With continued commitment, Philadelphia can demonstrate that environmental stewardship is a cornerstone of a healthy, growing, and vibrant city.

← The University City District runs the Dirt Factory, a community composting facility that combines yard waste and food scraps produced by neighborhood residents and businesses to generate compost. The Dirt Factory distributes compost to residents and community gardens and helps keep waste out of landfills.

TARGET 5

Reduce Greenhouse Gas Emissions by 20 Percent

METRICS

— Municipal —

1990 Baseline	596,829 t CO_2e
2006 Baseline	557,170 t CO_2e
Current (2013)	507,871 t CO_2e
2015 Target	477,463 t CO_2e

— Citywide —

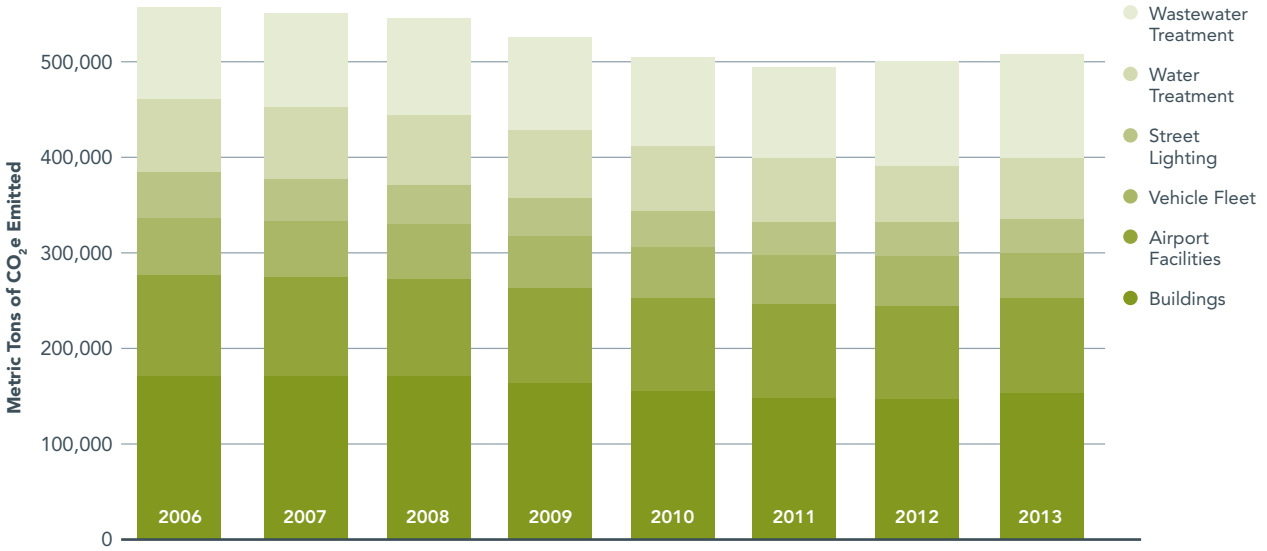
Adjusted *Greenworks* Baseline (1990)	21.06 Million t CO_2e
2006 Baseline	22.84 Million t CO_2e
Current (2012)	20.89 Million t CO_2e
2015 Target	16.85 Million t CO_2e

CONTEXT AND HISTORY

The urgency of climate change and the importance of coordinated national and international responses have only grown since *Greenworks* was released. The current political stalemate on climate issues at the federal level underscores the criticality of local greenhouse gas tracking, planning, and action.

The Mayor's Office of Sustainability (MOS) has maintained robust greenhouse gas inventories for several years, and now has reliable data on emissions by sector for both municipal operations and Philadelphia as a whole. Buildings account for 60 percent of citywide emissions, demonstrating the value of the energy efficiency goals included in Targets 1 and 2. With this data in hand, MOS is working with Drexel University to understand potential scenarios for how Philadelphia could achieve deep reductions in carbon emissions over the coming decades.

Municipal Emissions by Sector



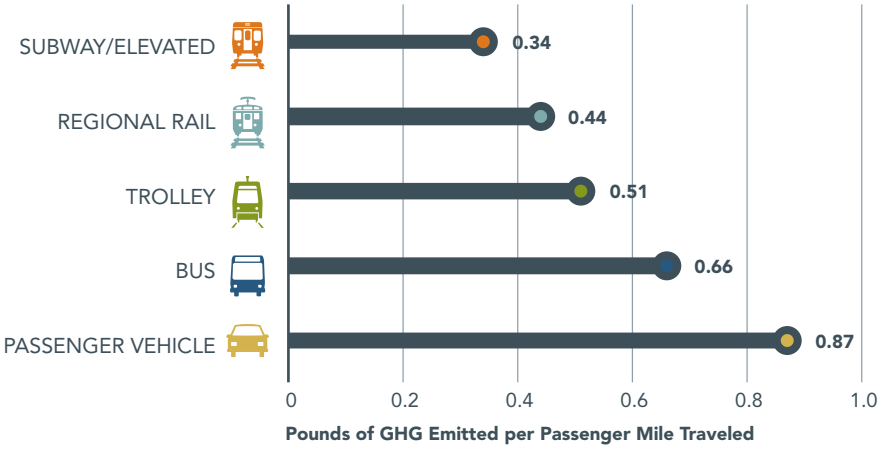
WHAT HAPPENED

Data to complete a 2015 greenhouse gas inventory will not be available until fall 2016, but even without final data on the *Greenworks* carbon emissions reduction goal, we can draw lessons from existing trends. The emissions reductions achieved thus far came primarily from changes in the generation of electricity supplied to our regional grid. Driven by both regulatory and market mechanisms, electricity generators have begun to retire carbon-intensive coal plants in favor of cleaner-burning natural gas plants and, to a lesser extent, emissions-free renewable energy sources.

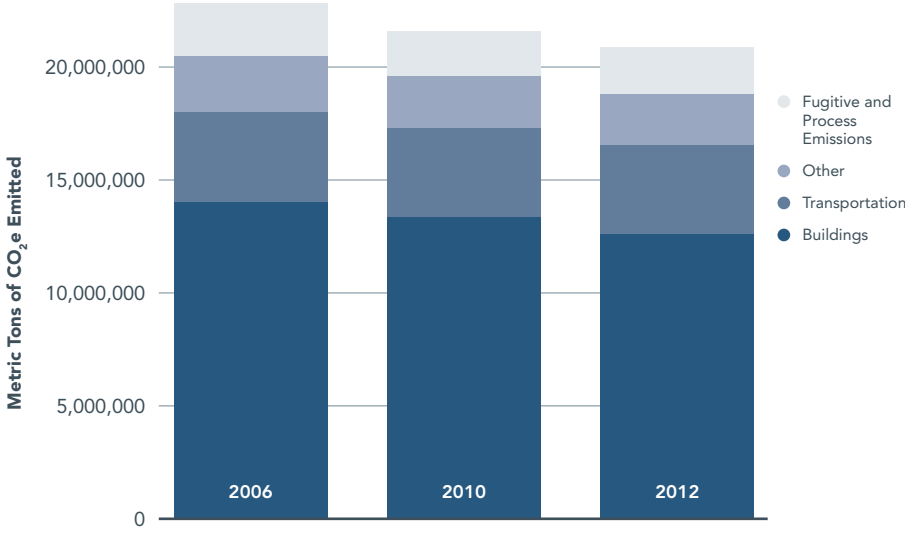
Local initiatives focused on improving energy efficiency in buildings have played an important role in greenhouse gas reductions. Emissions from buildings owned and operated by the City of Philadelphia declined 12 percent between 2006 and 2013, driven by large retrofit projects like the guaranteed energy savings project in the City's downtown office buildings and smaller upgrades paid for by the City's Energy Efficiency Fund.

The City of Philadelphia has also strengthened its commitment to greenhouse gas emissions reporting. Improving on its original 2007 inventory, under *Greenworks* the City developed a robust, replicable strategy for cataloguing the scope and sources of Philadelphia's carbon footprint. In 2014 the City began using ICLEI's ClearPath tool, which is emerging as an international standard for reporting carbon emissions.

Greenhouse Gas Emissions by Transportation Mode in 2014



Citywide Emissions by Sector



KEY TAKEAWAYS

- **Regularly measuring emissions is a resource-intensive commitment.** Dedicated staff, a consistent reporting schedule, and a standard process aligned with established protocols are necessary to understand emissions trends and track reduction commitments.
- **Buildings are the primary source of Philadelphia's emissions.** Buildings accounted for 60 percent of citywide emissions in the 2012 inventory, with the 1,900 largest commercial buildings in the city alone making up 15 percent of citywide emissions. Improving the efficiency of these facilities (see Target 2) is Philadelphia's greatest opportunity to reduce carbon emissions.
- **Cities are taking the lead on climate action.** Last year, Mayor Nutter joined Mayors Annise Parker of Houston and Eric Garcetti of Los Angeles to launch the Mayors' National Climate Action Agenda. Cities recognize that aligning local efforts with state and federal laws and international agreements will be essential to achieving necessary emission reductions.

LOOKING FORWARD

- **Set aggressive but achievable 2025 and 2050 greenhouse gas reduction goals.** Building on our scenario work with Drexel University, the City will identify aggressive but achievable near-term and long-term goals toward an 80 percent reduction in carbon emissions by 2050.
- **Consider lifecycle energy costs and carbon emissions of City purchases.** The City of Philadelphia can lead by example by incorporating lifecycle energy costs and carbon emissions into City capital planning and procurement.
- **Solidify the role of cities in implementation of the Clean Power Plan.** The City of Philadelphia supports the U.S. Environmental Protection Agency allowing states to use decreased demand resulting from energy efficiency to meet carbon pollution reduction requirements. The City anticipates that local-level work will provide important efficiency contributions.

TARGET 6

Improve Air Quality Toward Attainment of Federal Standards

METRICS

***Greenworks* Baseline (2008)**	20 Unhealthy AQI Days
Current (2014)	6 Unhealthy AQI Days
2015 Target	10 Unhealthy AQI Days

CONTEXT AND HISTORY

Like other large industrial centers, Philadelphia continues to work to mitigate its legacy of air pollution. Under *Greenworks* Philadelphia has made tremendous strides in achieving compliance with the federal Clean Air Act, reducing unhealthy Air Quality Index (AQI) days to just six in each of the last two years, down from 20 in 2008.

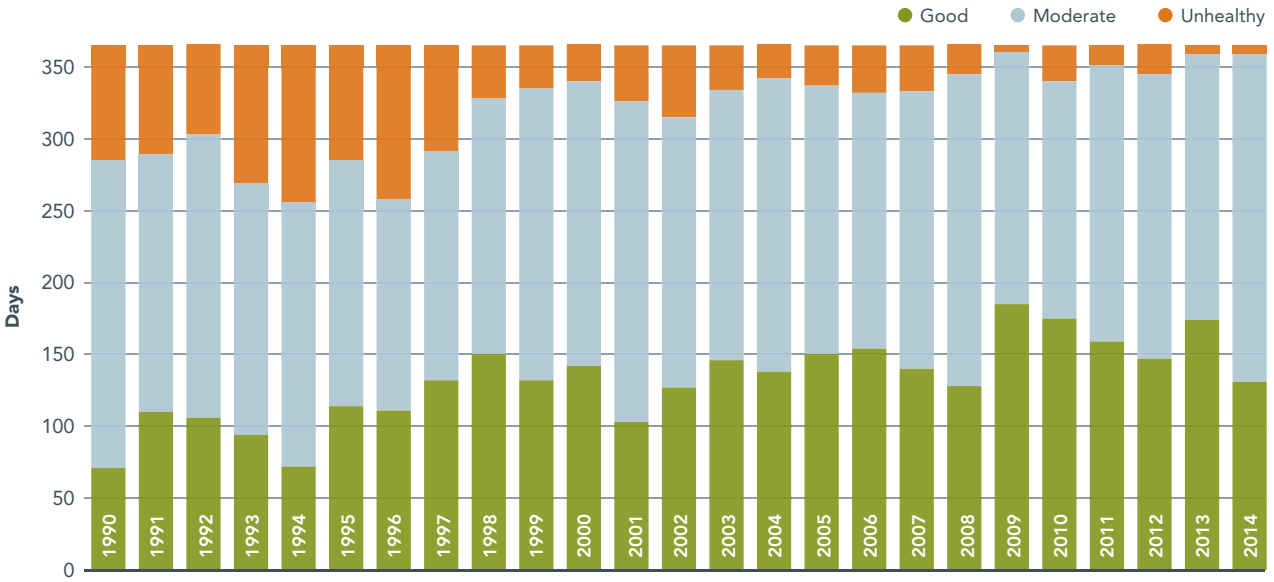
The City has achieved these gains even as the U.S. Environmental Protection Agency (EPA) implemented more stringent requirements for sulfur dioxide emissions in 2010. The EPA is currently finalizing new standards for ozone levels, which will require additional action by the City to meet its requirements under the Clean Air Act and ensure the health of all Philadelphians.

BY THE NUMBERS

Purchase Biodiesel for Use in City Fleet
- 1,062 GHG Reduced (MT CO_2e)

Purchase Hybrid Buses (SEPTA Purchased 472)
- 12,798 GHG Reduced (MT CO_2e)
- 173,046 MMBTU Reduced (Not Including Electricity)

Air Quality in Philadelphia



Standardized by 2012 EPA breakpoints, Philadelphia experienced a record low number of unhealthy AQI days for two consecutive years.

WHAT HAPPENED

Both federal and local government actions have helped improve Philadelphia's air quality. Aggressive national fuel-economy standards for cars and trucks have had real impact, reducing emissions from vehicles nationwide by 25 percent over the past seven years. Under *Greenworks*, the City reduced the number of vehicles in its fleet, replacing hundreds of employee vehicles with car share accounts. SEPTA has reduced local vehicle emissions by purchasing only cleaner-burning hybrid buses, which by 2016 will account for more than half of its fleet, and Indego, Philadelphia's new bike share program, is expected to improve traffic congestion and reduce air pollution from mobile sources in Philadelphia.

Record-low prices for natural gas and incentives from Philadelphia Gas Works have led many owners to convert their buildings' systems from fuel oil to gas, resulting in significant improvements to air quality. Energy benchmarking data (see Target 2) shows that less than 12 percent of Philadelphia's 1,900 largest commercial buildings still use fuel oil for on-site heat generation, and in 2014 Philadelphia mandated a reduction in the sulfur content of fuel oil to reduce sulfur dioxide and particulate emissions from buildings.

SUCCESS STORY

Village Green Project Brings Air Quality Down to Earth

The City of Philadelphia's Air Management Services (AMS) division manages air monitoring stations in neighborhoods around the city, measuring air quality and weather conditions in real time and providing live data online at www.phila.gov/aqi. Thanks to a partnership with the EPA, one of these stations is visible and accessible to the public for the first time.

Introduced in April 2015, the new Village Green Station, located in Independence National Historical Park, measures two key air pollutants, ozone and particulate matter, on a minute-by-minute basis. AMS posts the data online at http://villagegreen.airnowtech.org/welcome. The station is mounted on a park bench and powered by a battery charged with on-site wind and solar generators. Village Green is a tangible, accessible reminder of how the City and the EPA value monitoring and safeguarding Philadelphia's air quality.

KEY TAKEAWAYS

- **Philadelphia must continue to support state and federal action.** Because air pollution can travel long distances, much of the pollution in Philadelphia originates outside our city, sometimes from several states away. The City must continue to work with our state, federal, and regional partners to improve air quality.
- **Educating Philadelphians about air quality is important.** When residents understand public health implications of air quality and sources of air pollution, they are more likely to change their behaviors, whether reducing unnecessary idling or avoiding outdoor activities on days with high ozone or particulate matter. The City will continue to urge residents to check air quality forecasts and take action on days when air pollution is forecast to be high.

LOOKING FORWARD

- **Consider air quality in economic development and planning decisions.** When considering which industries are desirable to attract to Philadelphia, policymakers should address air quality implications, and large-scale planning decisions should account for public health and environmental justice outcomes.
- **Continue working toward attainment of Clean Air Act standards.** Philadelphia has made huge strides in improving air quality, but because an improved understanding of the health risks associated with even low levels of some pollutants has led the federal government to make standards stricter, Philadelphia is still in nonattainment for ozone and fine particles. Under the new, lowered particulate standard, Philadelphia has begun experiencing unhealthy Air Quality Index days during the winter season, a rarity under the old standard. The City will continue working diligently to meet attainment goals and protect public health.

TARGET 7

Divert 70 Percent of Solid Waste From Landfill

METRICS

***Greenworks* Baseline (2008)**	53%	Waste Diverted from Landfill
Current (2013)	73%	Waste Diverted from Landfill
2015 Target	70%	Waste Diverted from Landfill

CONTEXT AND HISTORY

2009 marked an important turning point for waste diversion in Philadelphia. That January, the City moved to a single-stream recycling program. This shift was both practical and symbolic, reducing the effort required by residents to recycle, increasing waste diversion from landfill, and making the Nutter Administration's commitment to sustainability visible citywide. Through public education, recycling at marquee events, the *Recycling Rewards* program, and on-street recycling collection in Big Bellies, Philadelphia has made strides in making recycling easy and accessible.

BY THE NUMBERS

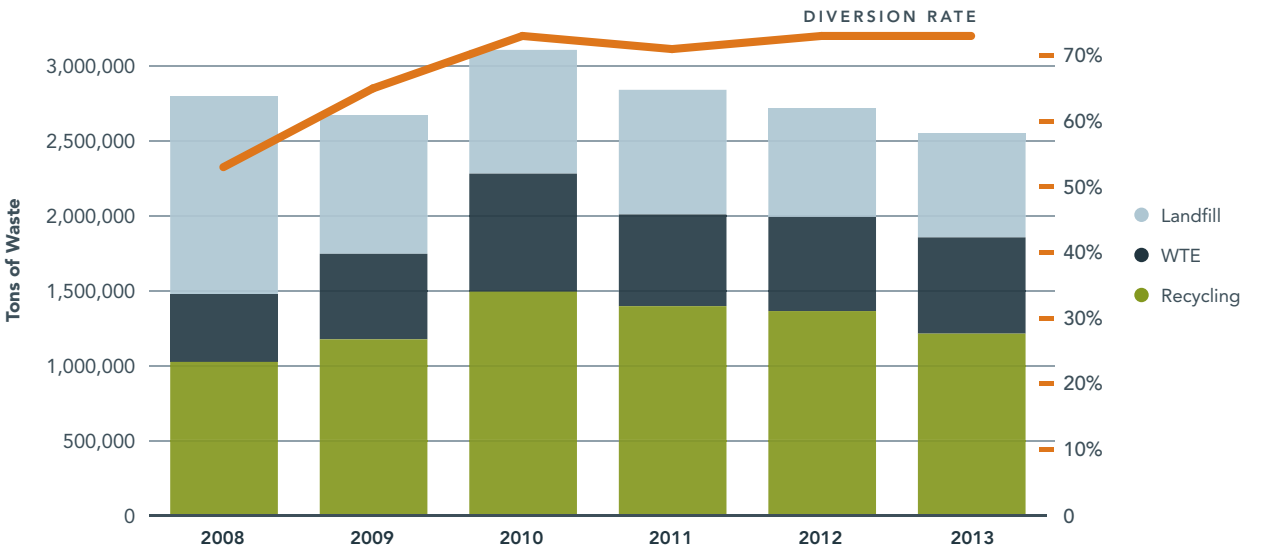
City Collected Curbside Recycling (126,263 TONS)
- 289,222 GHG Reduced (MT CO_2e)
- 75,758 Waste Diverted from Landfills (tons)

Privately Collected Recycling (717,692 TONS)
- 2,739,949 GHG Reduced (MT CO_2e)
- 717,692 Waste Diverted from Landfills (tons)

Electronic Waste Recycling (331 TONS)
- 762 GHG Reduced (MT CO_2e)
- 331 Waste Diverted from Landfills (tons)

C&D Recycling (369,814 TONS)
- 262,568 GHG Reduced (MT CO_2e)
- 369,814 Waste Diverted from Landfills (tons)

Waste Generation and Diversion



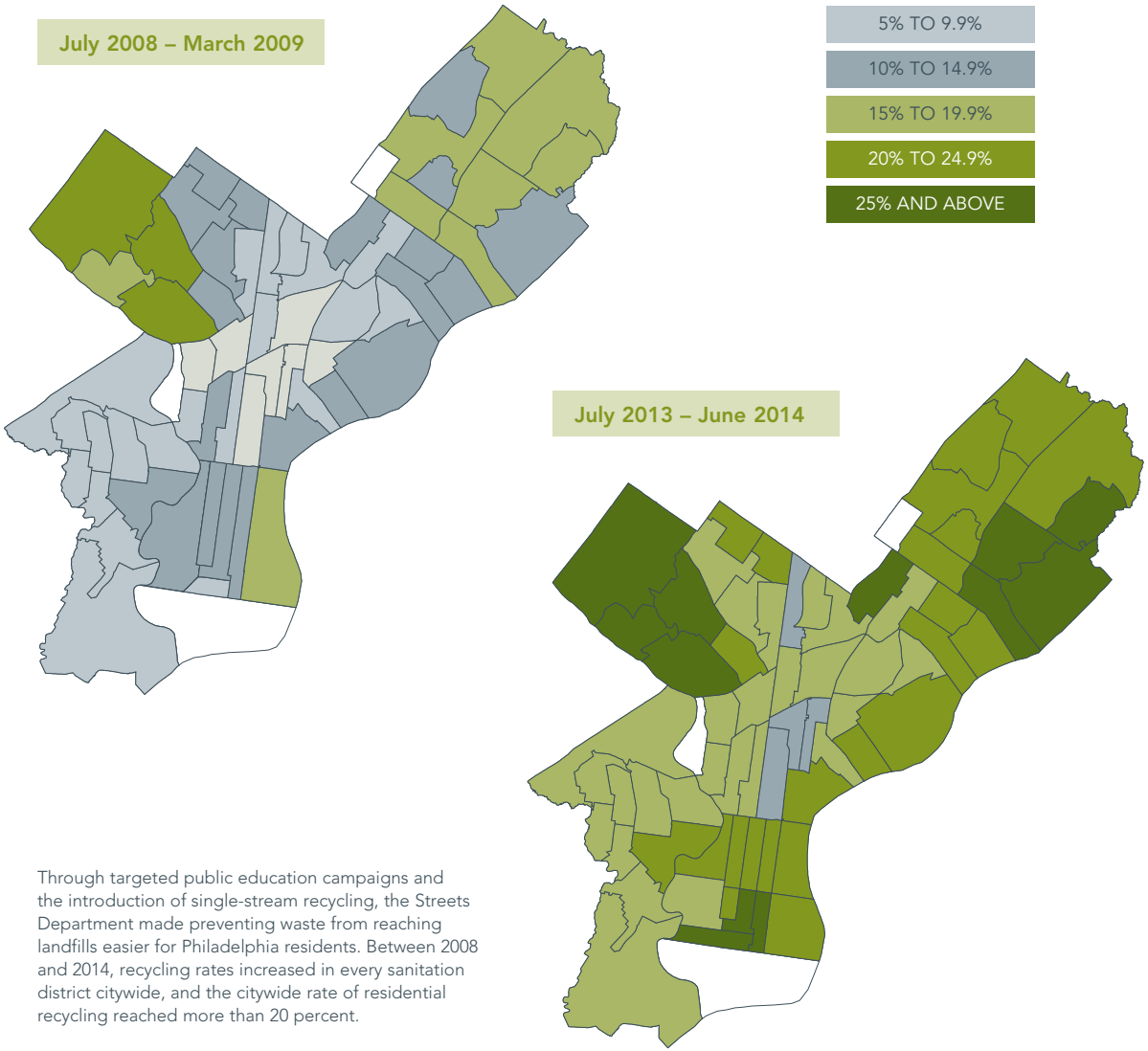
WHAT HAPPENED

Between 2008 and 2014, residential recycling rates increased from eight percent to more than 20 percent. As shown in the maps on the opposite page, these gains occurred citywide, encouraged by education campaigns like the Streets Department's *I'm Behind Recycling* and *UnLitter Us* programs.

Diversion rates across other sectors of the waste stream also increased under *Greenworks*. Developers and contractors recycled more than 90 percent of construction and demolition waste in 2013, the highest rate on record. Commercial recycling is at an all-time high, and in 2014 the Streets Department released the *Business Recycling Toolkit* in an effort to make the process even easier for Philadelphia's business owners and to increase compliance and diversion. Also, starting in 2013 the Streets Department began diverting all municipally collected waste from landfill through a combination of recycling and waste-to-energy (WTE) practices.

St. Hubert's Catholic School hosted an electronics recycling and hard drive shredding event, where community members dropped outdated computers and other electronics for responsible recycling.

PHILADELPHIA RECYCLING DIVERSION RATES



Through targeted public education campaigns and the introduction of single-stream recycling, the Streets Department made preventing waste from reaching landfills easier for Philadelphia residents. Between 2008 and 2014, recycling rates increased in every sanitation district citywide, and the citywide rate of residential recycling reached more than 20 percent.

KEY TAKEAWAYS

- **Behavior can change.** Philadelphia's dramatic uptick in curbside recycling rates shows that with good planning and support, behavior can change in a relatively short period of time across a large population.
- **Recycling engages residents with sustainability.** Waste diversion is a visible, regular, citywide demonstration of the value of sustainability.
- **Public outreach needs to be engaging and ongoing.** Under the Nutter Administration, recycling has become ubiquitous in Philadelphia through the Streets Department's lively, relatable advertising campaigns and high-profile diversion programs like *Waste Watchers*, which encourages runners and spectators to recycle and compost during the Philadelphia Marathon, Broad Street Run, and other large public events.

LOOKING FORWARD

- **Reduce waste generated in Philadelphia.** Residential and overall waste generation decreased modestly between 2008 and 2013. The City will encourage more aggressive waste reduction.
- **Explore opportunities to divert organic materials from the waste stream.** The City of Philadelphia will conduct an organics recycling feasibility study in 2015.
- **Aggressively address persistent litter problems.** Learning from recent progress in recycling behavior change, the City will lead a major, systematic push to support litter prevention and mitigation.

TARGET 5: **Reduce Greenhouse Gas Emissions by 20 Percent**

COMPLETED

INITIATIVE	PROGRESS 2015
Advocate for Federal Climate Policy	The White House State, Local, and Tribal Leaders Task Force On Climate Preparedness and Resilience, in which Mayor Nutter participated, released its report in December 2014. The White House and federal agencies have already acted upon a number of its recommendations. In December 2014 Mayor Nutter joined with Mayors Garcetti (LA) and Parker (Houston) to launch the Mayor's National Climate Change Agenda. The Agenda is a mayor-to-mayor effort to bring together leading mayors to highlight local progress on climate, demonstrate the essential link between commitment and action, and advocate for both federal legislation and international cooperation. — **LOOKING FORWARD →** Mayor Nutter will work with fellow mayors and partners to ensure that cities have a seat at the table and play a direct role in supporting an international agreement at COP21 negotiations in December 2015. Philadelphia will also advance a coordinated communications imitative to tell the stories of climate action at the local level in communities across the country.
Annually Report GHG Emissions and Climate Adaptation/Mitigation Strategies Through Carbon Disclosure Project	In 2015 the Mayor's Office of Sustainability (MOS) participated in the *Carbon Disclosure Project* for the third consecutive year. — **LOOKING FORWARD →** The City of Philadelphia remains committed to reporting greenhouse gas emissions and climate action strategies through the *Carbon Disclosure Project* and other platforms.
Conduct Community Greenhouse Gas Inventory Every Two Years	MOS released a citywide greenhouse gas inventory for 2012 (the most recent data available) in spring 2015. The inventory report and data are available at www.phila.gov/green. — **LOOKING FORWARD →** MOS will continue to work with utility partners, the Philadelphia City Planning Commission, Air Management Services, and the Delaware Valley Regional Planning Commission to update the citywide greenhouse gas inventory.
Conduct Greenhouse Gas Inventory for Philadelphia International Airport	Philadelphia International Airport (PHL) updated its greenhouse gas emissions inventory using 2013 data. Compared to 2006, the 2013 inventory shows an overall emissions reduction of approximately two percent. — **LOOKING FORWARD →** PHL is planning to update its greenhouse gas inventory regularly to allow for continued improvements in the identification, quantification, and management of emissions and associated energy usage.
Maintain Greenhouse Gas Emissions Inventory for Municipal Government	MOS released a municipal greenhouse gas inventory for 2013 (the most recent data available) in spring 2015. The inventory report and data are available at www.phila.gov/green. — **LOOKING FORWARD →** MOS and the Energy Office will update municipal greenhouse gas inventories annually.

TARGET 6: **Improve Air Quality Toward Attainment of Federal Standards**

COMPLETED

IN PROGRESS

INITIATIVE	PROGRESS 2015
Airport Green Plan	PHL's recycling program has been expanded to include SEPTA train platforms and Terminal A West. In addition to diversion through recycling, solid waste generated by the Department of Aviation is diverted from landfills by being processed as waste-to-energy or into other fuel products. — **LOOKING FORWARD →** Recycling services will be provided in the new Terminal F LEED Silver certified baggage claim building that will be completed in 2015. Lighting and other energy efficiency improvements are being completed throughout the terminal complex and airfield. PHL's concessions program is considering options for food waste diversion.
Develop a Compressed Natural Gas Facility	In September 2014 VNG Inc. installed a CNG filling station in Philadelphia's East Falls neighborhood.
Develop Green Ports Plan	In 2010 the Delaware River Port Authority completed the *Green Ports Initiative* report, which establishes energy efficiency, environmental management, procurement, waste, and water recommendations and metrics for the agency.
Increase the City Fleet's Gas Mileage	The FY 2016 budget for the Office of Fleet Management includes $8 million for replacement of aged vehicles, which will increase the fuel efficiency of the fleet.
Purchase Hybrid Diesel Buses	In FY 2014 SEPTA began to receive delivery of a new fleet of 40-foot and 60-foot hybrid-electric buses to replace aging diesel buses. — **LOOKING FORWARD →** By the end of 2016, more than half of SEPTA's bus fleet will be hybrid-electric.
Retrofit Diesel Vehicles	The Office of Fleet Management has replaced filters on all diesel fleet vehicles. As a result of Executive Order 1-07, all diesel non-road vehicles used in public works projects of over $1 million must install diesel retrofits to reduce particulate matter emissions by at least 20 percent.
Congestion Reduction	The Mayor's Office of Transportation and Utilities continues to optimize traffic flow on key corridors by re-timing traffic signals.
Consider the Creation of Demand Pricing Schemes for Parking	The Philadelphia Parking Authority (PPA) sets different prices for parking on major commercial corridors depending on the day of the week and time of day. The selected prices and time limits aim to maintain approximately 80 percent parking occupancy, which reduces circling by vehicles searching for parking and in turn reduces congestion and emissions from automobiles. — **LOOKING FORWARD →** The City should consider conducting a comprehensive parking study with PPA to better understand existing parking assets and demand, and to evaluate the impacts of current and potential future policies.
Facilitate Use of Electric Vehicles	The Streets Department issued regulations allowing Philadelphia residents who own or lease an electric vehicle to apply for a reserved electric vehicle parking space on the street in front of their residence. — **LOOKING FORWARD →** The City will continue to work with partners, including the Delaware Valley Regional Planning Commission and PECO, to understand the City's appropriate role in promoting alternative fuel vehicle adoption.
Increase Parking Options for Bicycles and Motor Scooters	PPA established new parking zones to accommodate motorcycles and scooters in the area between Arch and Locust, and Broad and the Schuylkill River.

IN PROGRESS

Increase the Number of Hybrid or Compressed Natural Gas Taxis	Major medallion owners continue to add alternative fuel vehicles to their fleets.
Increase the Use of Biodiesel Fuel in the City Fleet	All diesel vehicles in the City fleet currently run on biodiesel. — **LOOKING FORWARD →** The City should consider increasing the biodiesel percentage in the fuel blend purchased.

TARGET 7: **Divert 70 Percent of Solid Waste From Landfill**

COMPLETED

INITIATIVE	PROGRESS 2015
Construction and Demolition (C&D) Waste Management Program	Of the more than 390,000 tons of C&D waste generated by the commercial sector in 2013, 94 percent was recycled.
Continue Event Recycling	The 2014 Philadelphia Marathon recycled or composted 88 percent of the 11 tons of waste generated. SCA event recycling bins continue to be utilized. More than 935 *Waste Watchers* volunteers supported event recycling in 2014 and 2015.
Develop an Incentive-based Recycling Plan	As part the *Recycling Rewards* program, the Streets Department and Recyclebank implemented *Hunting Park Recycles* in 2013, a targeted neighborhood initiative to improve recycling rates. Beginning in 2014, *Recycling Rewards* members can use points for additional discounts in the newly launched *Recyclebank* marketplace.
Expand Plastics Recycling	The City is emphasizing "recycling right" messaging, with a focus on keeping non-recyclable plastics (such as plastic bags) out of curbside recycling bins.
Expand Recycling at Transit Stations	Through FY 2014 SEPTA's solid waste diversion rate improved to 14 percent, up from 13.6 percent in 2013 and 11.6 percent in 2012. SEPTA's consistent improvements can be credited to employee engagement and an expanded internal recycling program at maintenance facilities and depots that now includes wood and industrial hard plastics. — **LOOKING FORWARD →** In FY 2015 SEPTA will focus on improving the recycling program at passenger stations by modifying the placement and design of recycling bins.
Increase Residential Recycling Tonnages	A record 127,700 tons of recyclables were collected in FY 2014. The Streets Department's new *Get Behind Recycling* campaign focuses on transit ads. Philadelphia is also participating in Recyclebycity.com, a national web-based and interactive tool to help residents better understand recycling services in their city. — **LOOKING FORWARD →** The Streets Department will continue to prioritize outreach through upgrades to its recycling website, expanded coordination efforts with civic partners, and new multi-lingual recycling materials.
Place More Public Records, Plans, and Documents Online	In FY 2014 64 percent of the submissions received by the Records Department were recorded electronically, and 89 percent of employees filed financial disclosure statements electronically. The department also received all campaign finance submissions electronically. — **LOOKING FORWARD →** The Records Department has set goals to increase e-recording to two-thirds of all submissions and to increase the rate of electronic financial disclosure statements to 94 percent.

COMPLETED

Promote Stakeholder Engagement	The Solid Waste and Recycling Advisory Committee (SWRAC) continues to meet monthly. SWRAC members participated in two facilitated visioning sessions during 2014. Philadelphia Food Policy Advisory Council (FPAC) members convened the Zero Waste Subcommittee in October 2013 after identifying food waste reduction as a gap in FPAC's programming. The subcommittee developed a white paper which includes recommendations on how to support surplus food recovery, food waste minimization, and composting. — **LOOKING FORWARD →** SWRAC will continue to provide input as the drafting of the Solid Waste Management Plan wraps up.

IN PROGRESS

Anti Littering and Recycling Campaign	The 2015 *Philly Spring Cleanup* event featured a record 723 projects and 14,460 volunteers. Just under 840,000 pounds of litter, 3,320 pounds of recyclables and 9,960 pounds of organic materials were collected. Volunteers also removed 53.8 tons of tires from City parks and open spaces.
Continue/Expand Public Space Recycling	The Streets Department has wrapped its Big Belly Containers with Get Behind Recycling branding throughout the city. — **LOOKING FORWARD →** Recycling services will soon be added to additional parks and recreation centers, including Vernon Park and Happy Hollow Recreational Center.
Enhance Electronics Recycling	2013 electronics recycling totaled 661,320 pounds, a 32 percent increase over the previous year. The City hosts eight electronic waste recycling events per year and operates three permanent drop-off centers. Many community partners also offer opportunities to recycle electronics, including events sponsored by civic organizations, and drop-off services at electronics retailers and office supply stores.
Include Sustainability Criteria in Solid Waste Contracts	All City-collected waste is currently being delivered to waste-to-energy plants. The Waste Management Spec Fuel Plant began processing 100 to 400 tons per day of City-collected trash in May 2014.
Increase Oversight of Recycling in Commercial Buildings	The Streets Department has promoted the *Business Recycling Toolkit* through various organizations including the Building Owners and Managers Association (BOMA), Sustainable Business Network (SBN), the Commerce Department, and business improvement districts. — **LOOKING FORWARD →** In 2015 the Streets Department is working to conduct additional outreach to business organizations and develop new promotional materials focused on this sector. The Streets Department will also begin a campaign focused on recycling in multi-family facilities.
Increase Recycling at City Facilities	The Streets Department has produced a comprehensive government recycling guide for City office managers to guide implementation and maintenance of successful recycling programs. In spring 2015 Philadelphia Parks & Recreation conducted training for front-line maintenance staff in its recreational facilities, including instruction on recycling processes. — **LOOKING FORWARD →** The City is planning recycling program expansions for the Free Library network and the Philadelphia School District.
Institute Sustainable Procurement Policy	The Procurement Department and MOS are partnering to examine contracts up for renewal or bid and to identify opportunities to add more sustainable requirements. — **LOOKING FORWARD →** The Urban Sustainability Directors Network (USDN) is in the process of developing a *Sustainable Procurement Playbook for Cities*, which will identify best practices for sustainable procurement opportunities in leading cities around the United States. MOS and the Procurement Department look forward to learning from this process moving forward.
Promote Composting	The Streets Department delivered testimony at City Council hearings on organics recycling and composting in November 2014 and February 2015. Vacuum collections of leaves resumed in fall of 2014, recovering 2,000 tons of organic material. — **LOOKING FORWARD →** Philadelphia will be conducting an organics recycling feasibility study in 2015.

GOAL:

PHILADELPHIA DELIVERS MORE EQUITABLE ACCESS TO HEALTHY NEIGHBORHOODS

equity

SECTION THREE

EQUITY

EQUITY IS INTEGRAL TO SUSTAINABILITY. The majority of original *Greenworks* goals focused on making Philadelphia more equitable by ensuring that current decisions do not unfairly burden future generations. The equity section also sought to identify areas of the city with limited access to the benefits of sustainability policies, such as the ability to walk to open space, and focus interventions in those underserved neighborhoods.

As *Greenworks* implementation progressed, the Mayor's Office of Sustainability (MOS) joined peer cities through the Urban Sustainability Directors Network to review first-generation sustainability planning and understand emerging lessons from cities working to implement sustainability with a deep commitment to equity. This work led MOS to expand our equity focus beyond fair geographic distribution of benefits and burdens and to recognize that equitable sustainability planning sometimes requires interventions tailored specifically to improve outcomes for historically marginalized groups. Before the launch of Indego, Philadelphia's new bike share system, the City, along with the Bicycle Coalition of Greater Philadelphia, sought and received grant funding to learn from residents in low-income communities how to build a system that would serve their needs.

Opportunities to deepen the equity work begun in *Greenworks* include explicitly identifying historically underprivileged groups and recognizing the historical, cultural, and institutional dynamics and structures that resulted in current inequities when making policies attempting to promote equity.

TARGET 8

Manage Stormwater to Meet Federal Standards

METRICS

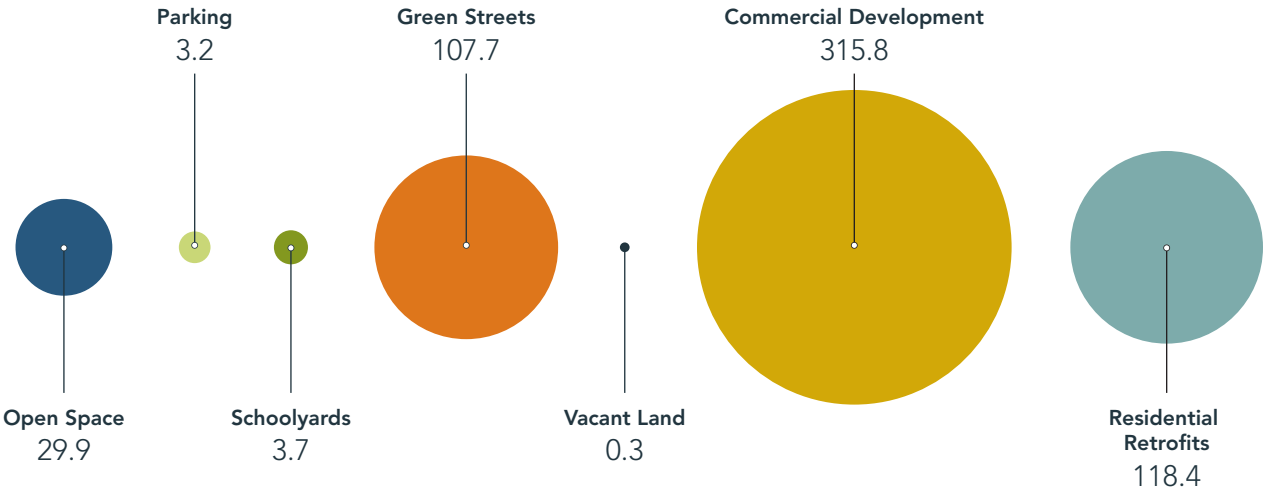
***Greenworks* Baseline (2011)**	0 New Greened Acres
Current (2015)	581 New Greened Acres
2015 Target	450 New Greened Acres

CONTEXT AND HISTORY

Philadelphia Water (PWD) is responsible for providing integrated drinking water, wastewater, and stormwater services. Philadelphia reached a major milestone toward meeting the *Greenworks* stormwater goal in 2012 when it became the first municipality in the United States to comply with Clean Water Act regulations primarily through the use of green stormwater infrastructure (GSI). In addition to capturing stormwater where it falls and managing it before it flows to treatment plants, GSI provides additional benefits throughout the city, including local economic development, community investment, and recreation opportunities.

PHOTO COURTESY OF PHILADELPHIA WATER

Greened Acres by Program



WHAT HAPPENED

Since adopting *Green City, Clean Waters*, Philadelphia's Combined Sewer Overflow Long Term Control Plan, PWD and private partners have installed GSI that manages the first inch of stormwater for more than 581 acres, putting PWD well ahead of its goal to install 450 new greened acres by 2015.

Green City, Clean Waters relies on both public and private investment. PWD installed and manages more than a quarter of the current 581 greened acres, while private development and retrofits account for the remainder. To advance development of projects and to incentivize projects by private landowners, PWD offers a robust set of programs to help install GSI. *Rain Check* offers homeowners a free rain barrel or cost sharing for installation of a downspout planter, rain garden, or porous paving. The *Stormwater Management Incentives Program* (SMIP), established in 2012, provides stormwater grants directly to non-residential property owners who want to construct stormwater retrofit projects. The *Greened Acre Retrofit Program* (GARP), created in 2014, provides stormwater grants to contractors, companies, or project aggregators to build large-scale stormwater retrofit projects across multiple properties. Together, SMIP and GARP have created 298 greened acres.

← The University of Pennsylvania Law School's Golkin Hall boasts a green roof that not only provides attractive gathering space but also manages stormwater.

SUCCESS STORY

Philadelphians Maintain Green Stormwater Infrastructure through *Soak It Up Adoption Program*

Philadelphia Water's *Soak It Up Adoption Program* provides grants to civic organizations to help maintain the beauty and functionality of GSI in Philadelphia's neighborhoods. Adoptees assume responsibilities including weekly maintenance visits, reporting, and community engagement at one or more GSI sites.

During the first two rounds of the program, 12 groups managed 38 GSI sites that are home to more than 100 stormwater management practices. *Soak It Up* adoptees collected more than 3,100 pounds of trash from GSI in 2014 alone.

In October 2014 *Soak It Up* adoption partner East Falls Development Corporation joined forces with PWD's Green Infrastructure Maintenance Team to replant stormwater bumpouts on Queen Lane.

PHOTO COURTESY OF PHILADELPHIA WATER

KEY TAKEAWAYS

- **Maintenance lessons inform design standards.** PWD has learned valuable design and maintenance lessons from its first rounds of GSI installations, and it shared many of these in the first edition of the *Green Stormwater Infrastructure Maintenance Manual* released in June 2014.
- **A mix of public and private projects is necessary.** To meet regulatory requirements, the pace of GSI installation in Philadelphia will be fast. Both public projects owned and maintained by PWD and private projects PWD regulates or incentivizes are critical for *Green City, Clean Waters* to proceed at scale.

LOOKING FORWARD

- **Institutionalize best practice sharing.** In 2015 PWD and partners received funding to convene stormwater utilities and partners from around the country in Philadelphia to connect practitioners, exchange information about GSI implementation, and develop shared strategies to advance the field.
- **Connect residents to GSI projects.** Stormwater management will transform the city over the coming decades. Strong public support for the program will be critical to its success.
- **Expand partnership programs.** PWD has completed groundwork to incorporate GSI into green schoolyard renovations and to use GSI to stabilize City-owned vacant lots. Expanding these programs and identifying new partnership opportunities will help unlock additional triple-bottom-line benefits.

TARGET 9

Provide Walkable Access to Park and Recreation Resources for All Philadelphians

METRICS

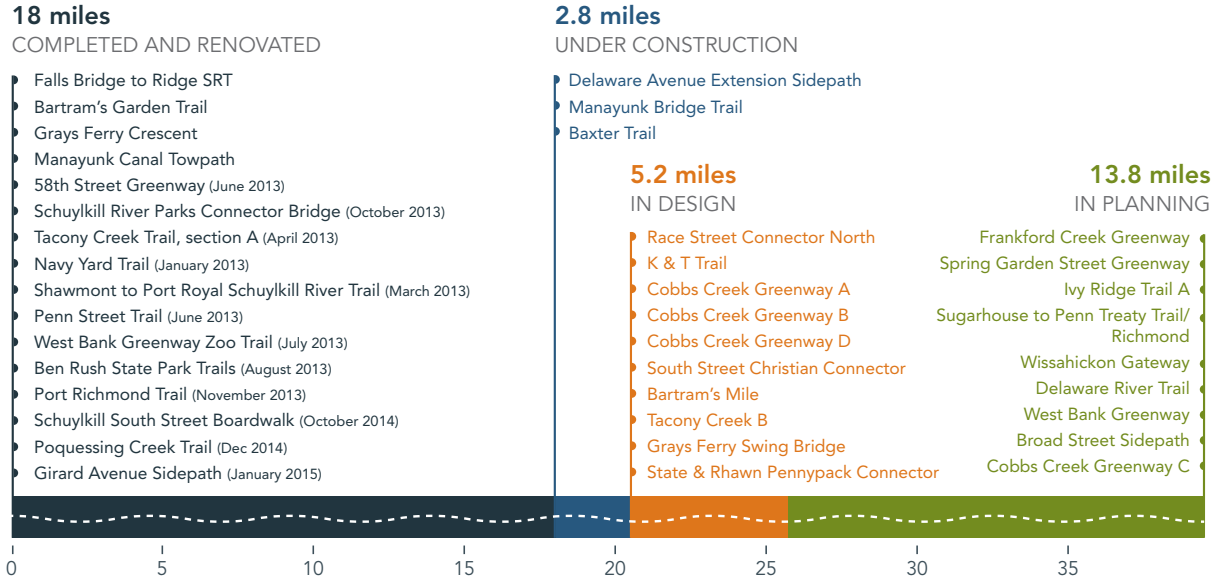
***Greenworks* Baseline (2008)**	10,300	Acres of Open Space
Current (2014)	10,457	Acres of Open Space
2015 Target	10,800	Acres of Open Space

CONTEXT AND HISTORY

Greenworks framed its open space goal around improving access. This led to a new approach that mapped gaps and prioritized investment in underserved areas of the city. Philadelphia Parks & Recreation's (PPR) *Green2015* report, published in December 2010, found that while 88 percent of residents lived within a half-mile walk of publicly accessible open space, more than 200,000 Philadelphians lacked this access. In response *Greenworks* expanded its open space access goal to providing walkable access to park and recreation resources for all Philadelphians. *Green2015* also found that Philadelphians living beyond a half-mile walk of open space were concentrated in five dense residential neighborhoods, where the City subsequently focused its greening and open space efforts.

PHOTO COURTESY OF THE TOOKANY/TACONY-FRANKFORD WATERSHED PARTNERSHIP

Philadelphia Trail Progress Since 2011



WHAT HAPPENED

In 2010 PPR and the Philadelphia City Planning Commission (PCPC) partnered with PennPraxis to complete *Green2015*, a plan to help the City achieve the open space access goals of *Greenworks*. PPR is partnering with the Trust for Public Land and Philadelphia Water (PWD) to green schoolyards and recreation centers in the five priority neighborhoods identified in *Green2015*. The first 10 sites, five PPR recreation centers and five elementary schools, will be completed during 2015 and early 2016.

In 2015 the Knight Foundation and William Penn Foundation announced an $11 million investment, *Reimagining the Civic Commons*. The Fairmount Park Conservancy, in collaboration with five project leaders, will coordinate the project, which will reinvent and connect five public places as a network of civic assets to advance economic opportunity, encourage residents to become more engaged in shaping their communities, and begin to level the playing field between more affluent communities and those in need.

PCPC, PPR, and the Mayor's Office of Transportation and Utilities continue to implement the *Philadelphia Trail Master Plan* by coordinating City agencies with external partners in support of a Philadelphia trail network offering connectivity, safety, opportunities for physical fitness, and open space.

← Children from North Philadelphia and Lower Northeast Philadelphia enjoy improvements to Tacony Creek Park made by partners including Philadelphia Parks & Recreation, Philadelphia Water, and the Tookany/Tacony-Frankford Watershed Partnership.

In addition to strategic investments in trails and underserved neighborhoods, projects at Dilworth Park (pictured here), The Oval, the Schuylkill River Trail, and the Delaware River waterfront have upgraded some of Philadelphia's most highly used public spaces.

The *Parks for People–Philadelphia* initiative upgraded the William Dick Elementary schoolyard with new shade trees, a new play system, a turf field, a track, and a rain garden to manage stormwater.

KEY TAKEAWAYS

- **A strong vision helps focus resources.** With improving access as a shared value, priorities set in *Greenworks* and *Green2015* helped attract philanthropic and nonprofit resources to invest strategically in underserved neighborhoods.
- **Shop in your own closet.** Neighborhoods with limited access to open space are often also densely developed. In these cases, upgrading existing, publicly owned assets such as recreation centers and schoolyards and expanding hours can help provide needed green space.
- **Collaboration is key.** Cooperation among City departments, community groups, nonprofits, and foundations makes the most of limited resources and ensures that each project provides as many co-benefits as possible.

LOOKING FORWARD

- **Continue improving connections and corridors.** Increasing the number and quality of connections among neighborhoods, parks, and trails helps as many Philadelphians as possible access existing amenities.
- **Expand on successes.** The City is interested in expanding the successful *Parks for People* partnership to improve additional schools and recreation centers in underserved communities.
- **Preserve and upgrade existing parks.** PPR would like to continue its neighborhood park revitalization work begun at Vernon Park, Wissinoming Park, Stinger Park, Fotterall Square, and Carroll Park in 2015. PPR will also continue its research to understand what forest restoration and management practices to adopt as the climate in Philadelphia becomes hotter and wetter.

TARGET 10

Provide Walkable Access to Affordable, Healthy Food for All Philadelphians

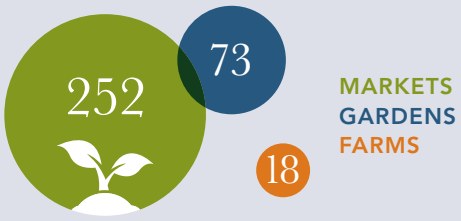
METRICS

***Greenworks* Baseline (2008)**	230	Markets, Gardens, and Farms
Current (2014)	343	Markets, Gardens, and Farms
2015 Target	316	Markets, Gardens, and Farms

CONTEXT AND HISTORY

Access to food is a basic human right, but historically some Philadelphia neighborhoods have lacked adequate food resources. *Greenworks* originally aimed to bring local food within a 10-minute walk of 75 percent of residents. The Philadelphia Department of Public Health found that between 2010 and 2012 an increase in farmers markets and healthy corner stores, among other factors, decreased the percentage of Philadelphians living in high-poverty neighborhoods with low-to-no walkable access to healthy-food retailers from 25 percent to 20 percent. Based on these findings and with encouragement from the Philadelphia Food Policy Advisory Council, *Greenworks* expanded its food access goal to providing walkable access to affordable, healthy food for all Philadelphians.

Markets, Gardens, and Farms in Philadelphia



WHAT HAPPENED

The Philadelphia Department of Public Health (PDPH's) *Get Healthy Philly* program created eight new farmers markets in underserved neighborhoods and 669 new healthy corner stores. In June 2014, in partnership with PDPH, the Food Trust launched cooking demonstrations at seven farmers markets. The more than 2,000 people who participated in these cooking demonstrations each received $6 worth of Philly Food Bucks, incentive coupons that allow SNAP recipients to purchase an additional $2 worth of fresh fruits and vegetables for every $5 in SNAP benefits they spend at a participating market site. Shoppers redeemed 72 percent of the Philly Food Bucks handed out after demonstrations.

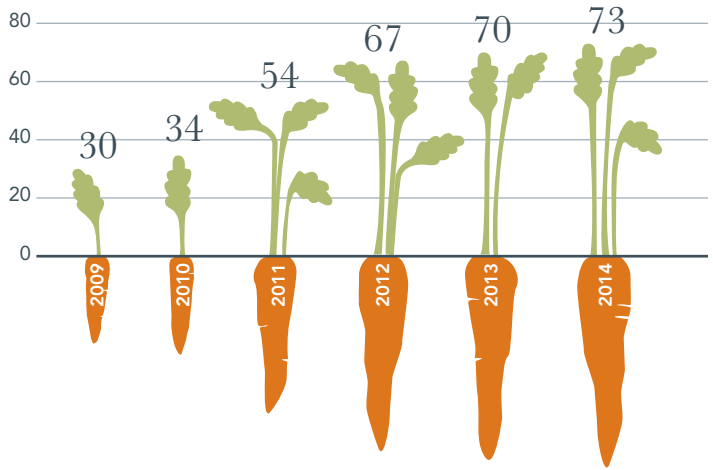
Since 2009 the City and the Philadelphia Industrial Development Corporation have supported and helped finance the creation of five new grocery stores, two food co-ops, and one shared commercial kitchen. The City also provided financing for renovation of the Reading Terminal Market, the largest single-location redeemer of SNAP benefits in Pennsylvania.

City agencies continue to support urban agriculture. Philadelphia Parks & Recreation's *Farm Philly* program expanded food production on City land to include 30 Junior Farmers gardens, 18 community gardens, nine orchards, and a food forest during the 2015 growing season. In December 2014 City Council approved the *Philadelphia Land Bank Strategic Plan & Disposition Policies*. One of the plan's seven goals is to reinforce open space initiatives and urban agriculture.

↓ Youth participating in the Philadelphia Parks & Recreation *Farm Philly* Junior Farmers program at Capitolo Playground get hands-on experience growing food.


PHOTO COURTESY OF PHILADELPHIA PARKS & RECREATION

Philadelphia Farmers Markets



SUCCESS STORY

Philly Food Finder Guides

The Philadelphia Food Policy Advisory Council's (FPAC) Anti-Hunger Subcommittee identified the need for a comprehensive toolkit that Philadelphia residents could use to find food resources available in their neighborhoods. Over the past two years, the subcommittee, in collaboration with the Greater Philadelphia Coalition Against Hunger and University of Pennsylvania student group Hack4Impact, made this resource a reality.

Philly Food Finder is a guide that Philadelphia residents can use to find soup kitchens, food pantries, meals for seniors, low-cost groceries, and farmers markets in their neighborhoods. Philly Food Finder is available as on online, interactive, and mobile-friendly map at www.PhillyFoodFinder.org. Printed guides will be available in 2015.

The Philadelphia Department of Public Health created Philly Food Bucks to promote spending food stamp benefits at farmers markets. In 2014 PDPH markets reported $81,576 in Food Bucks redemptions.

KEY TAKEAWAYS

- **Food policy responsibilities are spread throughout City government.** Policies and regulations that influence food access come from many agencies. Thoughtful food policy development and implementation require high-level coordination.
- **Access is complex.** Being able to access food requires not only geographic proximity, but also affordability, cultural appropriateness, and sometimes preparation equipment and knowledge.
- **Gardens, markets, and farms are not adequate measures of food access.** Accurately measuring food access is complicated, and while supporting the creation of farmers markets, gardens, and farms is important and increases access, those three food resources are not an adequate proxy for food access overall.

LOOKING FORWARD

- **Establish a new access measure and monitor it regularly.** Partners including PDPH, academics, and FPAC should agree on a methodology to measure food access and commit to regularly updating the information.
- **Expand access to public benefits.** Through the Mayor's Office of Community Empowerment and Opportunity's *Shared Prosperity* plan, the City is working to decrease the number of Philadelphians qualified for SNAP, but increase the percentage of qualified residents who enroll.

TARGET 11

Increase Tree Coverage Toward 30 Percent in All Neighborhoods by 2025

METRICS

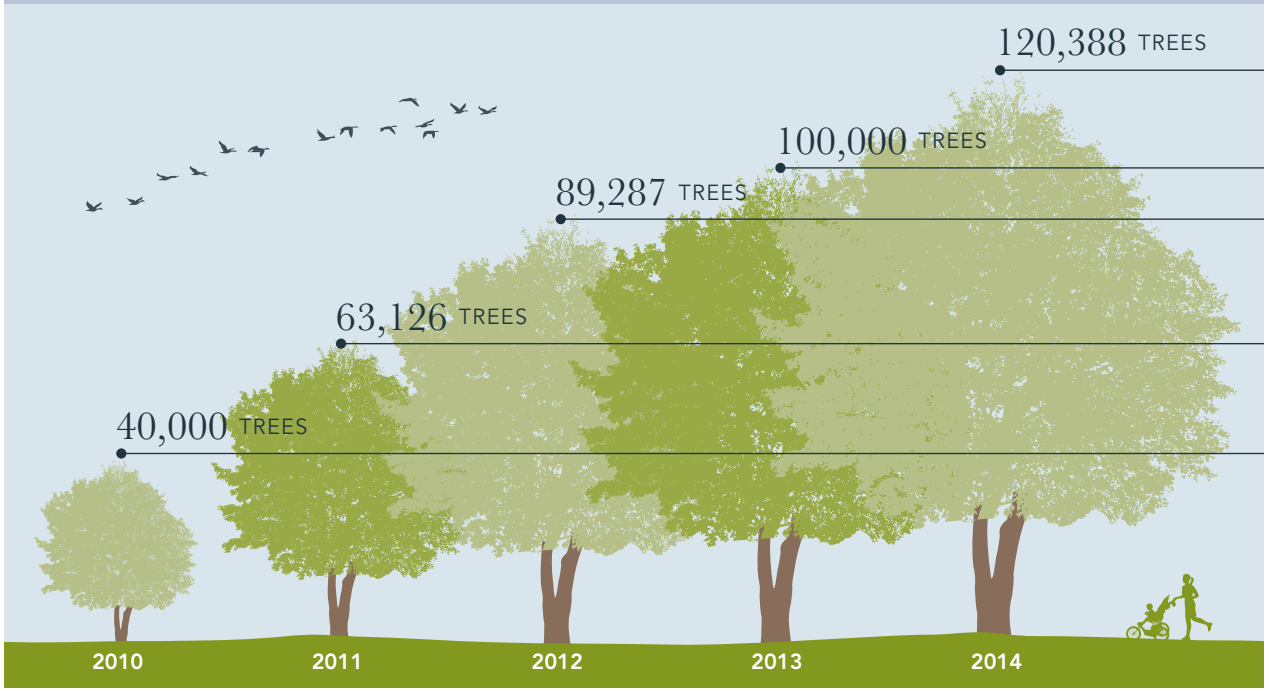
***Greenworks* Baseline (2008)**	0 New Trees
Current (2014)	120,388 New Trees
2015 Target	300,000 New Trees

CONTEXT AND HISTORY

When *Greenworks* was established, the best data available estimated Philadelphia's tree canopy at 16 percent. With this in mind, the plan set an aggressive but potentially achievable interim goal of planting 300,000 trees by 2015 as a steppingstone toward 30 percent canopy by 2025.

In 2010 Philadelphia Parks & Recreation (PPR) worked with academic and federal partners to use 2008 LIDAR data to analyze Philadelphia's tree canopy. The study found that Philadelphia had 20 percent tree canopy and identified areas of the city with the highest potential for tree planting, one of which was private residential properties. These findings guided the City's tree planting efforts and the creation of PPR's *TreePhilly* program, a citizen engagement program that connects Philadelphians to the resources they need to plant and care for trees, and to grow Philadelphia's urban forest.

Cumulative Trees Planted Since 2010



WHAT HAPPENED

In spring 2012 *TreePhilly* began offering its yard tree giveaway program, and through spring 2015 *TreePhilly* has given away 13,000 free trees to Philadelphia residents to plant in their yards or at other private properties like schools and faith-based institutions. In 2014 PPR expanded *TreePhilly* to offer community yard tree giveaway grants. This program provides small grants to local community groups to host yard tree giveaways. *TreePhilly* provides the trees, education, and event support, and community groups connect with residents who are interested in tree planting in their yards and invested in their neighborhoods. From fall 2014 through spring 2015, 14 community groups will participate in the program.

Meeting the *Greenworks* goal of 30 percent tree canopy also requires careful stewardship of existing trees. In 2014 PPR completed an Emerald Ash Borer Management Plan, which anticipates the arrival of the emerald ash borer, an insect pest that is expected to kill all ash trees in Philadelphia, which total six percent of the tree canopy. Over the next 10 years, PPR expects to proactively remove 5,000 ash trees, treat 1,000 trees to preserve them through the infestation, and replant at least 2,000 trees to replace canopy lost from removals.

SUCCESS STORY

TreeKeepers Maintain Parks and Learn Job Skills

Philadelphia Parks & Recreation's (PPR) TreeKeepers maintain trees and green spaces in neighborhood parks, playgrounds, and recreation centers. Launched in 2011, this seasonal maintenance crew prunes trees, removes dead trees and invasive species, plants new trees on public property, and helps to maintain stormwater planters at PPR properties across the city.

The TreeKeepers crew also serves as a work development program. An entry-level position for individuals interested in landscape management, the TreeKeepers program is committed to supporting ex-offenders in securing meaningful work and successfully re-entering the community. The program provides training and education on arboriculture methods and green space maintenance and actively works to support crew members in pursuing careers.

From 2011 through 2014, the TreeKeepers worked at more than 160 individual PPR sites, pruning more than 10,000 trees. In 2013 the TreeKeepers removed more than 110 tons of organic debris during a seven-month work season, and in 2014 they removed 107 tons in only six months.

PHOTO COURTESY OF THE TREEKEEPERS

KEY TAKEAWAYS

- **Successful establishment of new trees is necessary to increase canopy.** PPR renewed focus on survival during the first two years after planting to ensure that every tree planted increases canopy in the long run.
- **Despite a slow start, 30 percent canopy by 2025 is possible.** While the higher baseline canopy established by the 2008 LIDAR study means fewer than 300,000 new trees by 2015 were necessary to reach 30 percent canopy by 2025, we need to increase the pace of planting to reach the goal.
- **Tree pits and private land offer Philadelphia's best tree planting opportunities.** Continued focus on planting opportunities in street tree pits and privately owned land will be key to reaching the canopy goal.

LOOKING FORWARD

- **Gather more data on existing conditions to deploy limited resources strategically.** A sophisticated asset management system would allow PPR to conduct a citywide street tree inventory to identify all potential planting locations and expand the hazard tree inventory which informs proactive tree removals and strategic replantings.
- **Regularly assess existing canopy.** The City should regularly update the LIDAR canopy assessment to track progress and reevaluate target areas for intervention.
- **Hire an urban forester for the City of Philadelphia.** An urban forester would help PPR understand the urban forest in the context of the larger urban ecosystem, ensure that the City meets its canopy coverage goals, develop best management practices to assure that the forest is maintained in good health, and be the primary advocate for Philadelphia's trees.

PHILADELPHIA FOOD POLICY ADVISORY COUNCIL

In 2011 Mayor Nutter convened the Food Policy Advisory Council (FPAC) to advise the City of Philadelphia on how to develop responsible policies that improve access for residents to culturally appropriate, nutritionally sound, and affordable food that is grown locally through environmentally sustainable practices. In 2014 and 2015, FPAC focused on hunger prevention, local food procurement, vacant land, food waste reduction, and ensuring food policy work continues through the transition of mayoral administrations in 2016.

+ A Philadelphia Food Policy Road Map

FPAC members created a food policy platform, *A Philadelphia Food Policy Road Map*. The document outlines:

- 20 facts about the Philadelphia food system,
- 10 challenges and opportunities facing the Philadelphia food system, and
- Recommendations to support the food system and improve the health of all Philadelphians.

While working on the policy platform, FPAC members decided to host a mayoral candidate forum to raise these issues with Philadelphians and their future leaders in the same room. On Sunday, April 12, FPAC hosted the Philadelphia Food Policy and the Next Mayor Forum at the Philly Farm and Food Fest. Six mayoral candidates discussed their views on food policy in Philadelphia, expressed support for the FPAC Road Map, and responded to questions about recommendations from the policy platform.

+ Soil Assessment Grant from the U.S. Environmental Protection Agency

The FPAC Vacant Land Subcommittee convened a Soil Safety Working Group during summer 2014 to help FPAC develop informed advice about how to grow food safely in Philadelphia's urban soils. One of the resulting recommendations was that the City apply for federal funding to help assess possible soil contamination on City-owned vacant lots with potential to support agriculture projects.

With encouragement and support from FPAC, the Philadelphia Redevelopment Authority (PRA), in partnership with the Mayor's Office of Sustainability, Philadelphia Parks & Recreation's Farm Philly Program, and Philadelphia Water applied for and received a community-wide Brownfields Assessment Grant for hazardous substances to determine whether City-owned sites with redevelopment potential for community gardens, urban agriculture, and/or green stormwater infrastructure require remediation. In May 2015 the EPA awarded PRA $200,000 to assess sites that meet the partnership's criteria for urban agriculture and/or green stormwater infrastructure development.

TARGET 8: **Manage Stormwater to Meet Federal Standards**

COMPLETED

INITIATIVE	PROGRESS 2015
Create Green Streets	Philadelphia Water (PWD) has expanded its green streets partnerships, developing collaborative projects with partner agencies such as the Streets Department, the Pennsylvania Department of Transportation (PennDOT), and SEPTA. PWD created memoranda of understanding for green street implementation with the Streets Department and SEPTA, and developed new partnerships with PennDOT. PWD continues to develop projects that support multiple objectives such as a complete and green street project in development for Yorktown where, with grant support from the Commonwealth, PWD is investing in bike lanes, transit shelters, and additional green infrastructure in the heart of North Philly.
Develop Sustainable Stormwater Management Plan	The *Green City, Clean Waters Implementation and Adaptive Management Plan*, the first deliverable of the City's Consent Order and Agreement with the Commonwealth of Pennsylvania, was formally accepted by the Pennsylvania Department of Environmental Protection (PADEP) on November 15, 2012. — **LOOKING FORWARD →** In October 2016 PWD will submit to PADEP and the U.S. Environmental Protection Agency an update to the *Implementation and Adaptive Management Plan* entitled the *Evaluation and Adaptation Plan*, which will feature program enhancements based on lessons learned in the first five years of implementing the program.
Expand the Rain Barrel Program	PWD used to have two different programs, *Rain Barrel* and *Rain Check*. Now all residential tools are a part of one program, called *Rain Check*. Rain barrels are still free, and a total of 1,500 barrels were distributed and installed in FY 2015 for a cumulative total of more than 5,800. Since 2012 PWD has assessed more than 650 residential properties for stormwater management potential and shared in the installation cost of more than 170 stormwater management tools (downspout planters, rain gardens, and permeable pavement) on private residences. — **LOOKING FORWARD →** In April 2015 PWD opened the *Rain Check* program to any resident living in Philadelphia, not just the combined sewer area. As a result, the Department anticipates an increase in participation and installations through *Rain Check*.
Implement New Stormwater Fees & Credits	As of July 1, 2013, all commercial and industrial PWD customers are paying a stormwater fee fully based on parcel size and impervious area. Many customers continue to take advantage of PWD's credits program, and interest in the Stormwater Management Incentives Program (SMIP) and Greened Acre Retrofit Program (GARP) grants continues to grow. To date, PWD has approved 40 SMIP grant applications and one GARP application (16 total properties), and a total of approximately 85 impervious acres have been managed citywide.
Increase the Number of Green Roofs	Seventeen additional green roofs have been constructed, bringing the current total to 111 (24.4 acres). — **LOOKING FORWARD →** An additional 20.5 acres of green roofs are either under construction or planned at 64 sites around the city.
Maintain Recent Stormwater Regulatory Changes	Since 2006 PWD approved more than 2,800 acres of development under the Stormwater Regulations, including 360 acres as part of 73 approvals to date in FY 2015. — **LOOKING FORWARD →** PWD will implement enhancements to the Regulations effective July 1, 2015.
Offer Incentives to Property Owners who Build Green Stormwater Infrastructure	Non-residential PWD customers, Business Improvement District (BID)s, Neighborhood Improvement Districts, and Special Services Districts are eligible for grant funding (SMIP & GARP), which offers green stormwater infrastructure implementation grants. To date, 56 properties have been awarded grant funding, and three BIDs are engaged in stormwater planning studies through the SMIP BID grant program. Residents are eligible for PWD's *Rain Check* program, which shares costs of residential landscape improvements that help manage stormwater runoff and beautify homes.

COMPLETED

IN PROGRESS

Create New Tidal/ Non-Tidal Wetlands Along Delaware and Schuylkill Rivers	In 2013 PWD completed a comprehensive study of its entire stormwater system to assess feasibility of stormwater treatment wetlands. The study screened each stormwater outfall's potential for a wetland retrofit. In total, 394 storm-sewersheds were assessed and rated for their wetland creation potential. — **LOOKING FORWARD →** PWD is continuing to monitor the long-term effectiveness of the constructed stormwater wetlands and conducting maintenance as needed. The stormwater outfall screening study is helping PWD plan and prioritize future stormwater management projects across the City.
Control Pollution and Trash on the Rivers	In FY 2015 PWD continued its aggressive strategy of debris and floatables removal on the Delaware River and tidal Schuylkill River. During this period, PWD removed 11 tons of trash from this area with an additional 0.6 tons removed from the non-tidal portion of the Schuylkill River between Fairmount Dam and Flatrock Dam.
Green Surface Parking Lots	As of spring 2015, PWD has approved 217 porous pavement projects, totaling 84 acres.
Improve Stormwater Management at City Airport Facilities	Construction is ongoing for the Terminal F Baggage Claim project, including installation of bioretention basins and porous concrete. Construction of bioretention basins and porous pavement at the Rental Car Facilities Expansion project and many stormwater improvements at existing rental car facility properties are complete. — **LOOKING FORWARD →** The first phase of PHL's Capacity Enhancement Program, proposing new and realigned taxiways, was reviewed for stormwater compliance in 2014, and construction will be completed in 2015.
Restore Waterways	PWD completed construction of the Indian Creek Daylighting project in partnership with the U.S. Army Corps of Engineers. The project resulted in 750 feet of daylighted stream channel and 1,300 feet of restored stream, which will reduce combined sewer overflow volume. PWD also continued designing and permitting stream restoration and dam removal projects in the Cobbs, Tacony, Pennypack, and Wissahickon watersheds. In total, these projects will result in more than four miles of stream restoration. — **LOOKING FORWARD →** PWD is planning projects in the Cobbs, Tacony, Wissahickon, and Pennypack watersheds. The stream restoration projects in planning include restoring approximately 6,500 feet of the Tacony Creek main stem, 9,000 feet of the Cobbs Creek main stem, and 2,200 feet of the Gorgas Run tributary to Wissahickon Creek. The Gorgas Run project is going to be bid during summer 2015. Three dam removal projects are being designed including the Woodland Dam in the Cobbs watershed, the Boulevard Dam on Pennypack Creek, and the Juniata Dam on Tacony Creek. These dams are slated to be removed within the next two years.

TARGET 9: Provide Walkable Access to Park and Recreation Resources for All Philadelphians

	INITIATIVE	PROGRESS 2015
COMPLETED	**Develop Parkland and Open Space Connections Along the City's Creeks and Rivers**	In fall 2014 the Schuylkill River Development Corporation (SRDC) and City of Philadelphia opened the Schuylkill River Boardwalk, which parallels the eastern shore of the river from Locust St. to the South Street Bridge. Philadelphia Parks & Recreation (PPR) is leading the development of the new Bartram's Mile segment of Schuylkill Banks, which will run along the west bank of the Schuylkill River between Grays Ferry Avenue and 58th St. Design and construction will be completed in 2015. The Delaware River Waterfront Corporation (DRWC) continues to implement parks projects along the Delaware River, including the return of the Spruce Street Harbor Park in 2015 after a very successful 2014 season. — **LOOKING FORWARD →** SRDC and PPR will continue the Schuylkill River Trail further south, and DRWC and the Delaware River City Corp. will continue revitalization of the Delaware River waterfront. PPR plans to explore new opportunities for vacant riverfront development with additional partners like the Philadelphia Industrial Development Corporation.
	Explore the Use of Innovative Financing for Open Space Development	PPR is partnering with Philadelphia Water (PWD) and the Trust for Public Land (TPL) on the *Parks for People* program to create new green play spaces in underserved neighborhoods. 10 sites, five PPR recreation centers and five School District of Philadelphia elementary schools, will be designed and constructed by early 2016. — **LOOKING FORWARD →** The City is interested in expanding the successful *Parks for People* partnership model to improve additional schools and recreation centers in underserved communities. As the program expands, the City will look for opportunities for programmatic and community stewardship partnerships.
	Increase Stability of Fairmount Park Ecosystem	PPR's Urban Forestry and Ecosystem Management Division is implementing the *Parkland Forest Management Framework* using a "novel ecosystem" approach that is strongly influenced by climate change projections developed by MOS. — **LOOKING FORWARD →** PPR's Emerald Ash Borer Management Plan anticipates the arrival of the emerald ash borer, an insect pest that is expected to kill all ash trees in the City of Philadelphia, which account for six percent of the total canopy. Over the next 10 years, PPR expects to proactively remove 5,000 ash trees, treat 1,000 trees to preserve them through the infestation, and replant at least 2,000 trees to replace removed ash trees.
	Prioritize New Green Space Creation Within Low-Served Neighborhoods	In addition to *Parks for People*, which focuses on areas of need identified by PPR's *Green2015* open space plan, PPR is revitalizing five parks in or near the *Green2015* priority areas: Vernon Park, Wissinoming Park, Stinger Park, Fotterall Square, and Carroll Park. — **LOOKING FORWARD →** PPR is interested in expanding both *Parks for People* and the park revitalization models.
IN PROGRESS	**Create a Corridor Network Connecting Parks, Neighborhoods, and Trails Citywide**	The Philadelphia City Planning Commission and PPR released the *Philadelphia Trail Plan Update* in December 2014. The update defines priorities for future trail development in Philadelphia and updates the priority analysis to reflect changes in projects since the original plan. Since 2011, 26 miles of trails have been constructed, are under construction, or have been designed. — **LOOKING FORWARD →** The Philadelphia Trail Committee will set funding goals and continue to develop strategies for phasing and matching trail design and construction projects as new funding sources become available. The Committee will also explore additional criteria for prioritization to reflect the health and economic impacts of trails, and incorporate ongoing outside projects, such as bike share station locations and on-road bicycle facilities, into prioritization.

TARGET 10: Provide Walkable Access to Affordable, Healthy Food for All Philadelphians

	INITIATIVE	PROGRESS 2015
COMPLETED	**Encourage Distribution of Healthy Food in Neighborhood Stores**	Through a partnership between the Philadelphia Department of Public Health (PDPH) and the Food Trust, 669 corner stores were recruited to participate in the Healthy Corner Store Initiative.
	Establish Food Policy Advisory Council	Mayor Nutter appointed the Food Policy Advisory Council (FPAC) in 2011. In 2014 and 2015 FPAC held a food policy forum for mayoral candidates, published the *Philly Food Finder* guides, and educated Philadelphians about how to access land for food growing. — **LOOKING FORWARD →** FPAC members are committed to continuing their work in the next administration.
	Expand the Number of Neighborhood Farmers Markets	During the 2014 season, 73 farmers markets operated in Philadelphia, the highest number since the *Greenworks* baseline year of 2008. City Council passed legislation eliminating license fees and streamlining requirements for farmers markets. — **LOOKING FORWARD →** The City will continue to explore financing opportunities to establish new farmers markets in underserved neighborhoods.
	Include Fresh Food Market Incentives in Zoning Code	The new zoning code adopted in August 2012 provides floor area, building height, and parking requirement reduction incentives for fresh food markets to locate in a variety of zoning districts. — **LOOKING FORWARD →** The City will educate developers about zoning incentives.
	Integrate Anti-Hunger Efforts into Food and Urban Agriculture Goals	PDPH created Philly Food Bucks to promote spending food stamp benefits at farmers markets. In 2014, PDPH markets reported $81,576 in Food Bucks redemptions and $50,166 in SNAP sales. FPAC created neighborhood-specific *Philly Food Finder* guides, available at www.phillyfoodfinder.org. — **LOOKING FORWARD →** FPAC will begin distributing hard copies of the *Philly Food Finder* guides in 2015.
	Publicize Local Food-Source Efforts	In April 2015 FPAC hosted the Philadelphia Food Policy and the Next Mayor Forum at the fourth Philly Farm & Food Fest, a day of eating and hands-on learning about the regional food system hosted by Fair Food Philly and the Pennsylvania Association for Sustainable Agriculture.
	Support Expansion of Food Co-ops	The City continues to support the South Philly Co-op's real estate search and the creation of the Kensington Community Food Co-op's first store. The Philadelphia Industrial Development Corporation (PIDC) provided 19 percent of the capital for the expansion of Mariposa Food Co-op, which opened its new location in March 2012.
	Update Food Business Guide	The *Guide to Opening a Mobile Food Business in the City of Philadelphia* was released in 2015 joining the *Guide to Opening a Stationary Food Business in the City of Philadelphia* from 2013. PDPH posts all necessary information for new food businesses at www.phila.gov/health/foodprotection/NewFoodBusinesses.html.
IN PROGRESS	**Foster Commercial Farming**	The Philadelphia Land Bank strategic plan includes identifying opportunities for larger-scale food production as a priority.
	Foster School-Based Efforts	PDPH ran a school meal competition to create student-designed breakfast and lunch items, provided water jets and water marketing materials to 13 school cafeterias, and began work to increase the nutrition and appeal of food served by charter, private, and parochial school systems.

IN PROGRESS

Leverage Vacant Land	One of the priorities of the Philadelphia Land Bank strategic plan is to preserve existing community gardens and identify opportunities for food production. — **LOOKING FORWARD →** The FPAC Vacant Land Subcommittee is working with the City to streamline and standardize the process for obtaining access to publicly owned land for food production.
Provide Technical Assistance to Community Gardeners and Urban Farmers	PPR's Community Gardens Network builds communication and skill sharing among gardens while creating a larger sense of community. FarmPhilly staff provide technical assistance and pathways to resources.
Support Green Kitchen Development	PDPH, the Commerce Department, and PIDC supported the creation of the Enterprise Center CDC's Center for Culinary Enterprises, a shared-use culinary business center.

TARGET 11: Increase Tree Coverage Toward 30 Percent in All Neighborhoods by 2025

COMPLETED

INITIATIVE	PROGRESS 2015
Change Street Tree Rules Involving Property-Owner Permission	PPR has developed a program to work with community groups to use the opt-out process along with community outreach to plan and implement larger street tree plantings along commercial corridors.
Create Urban Tree Forest Management Program	Eight of 16 pilot projects identified in the *Parkland Forest Management Framework* are underway or completed. Restoration work on three large-scale projects has begun, with initial clearing and fencing to be complete by June 2015. A group of citizen volunteers has been trained on the basics of land management and will assist with site monitoring, research, and restoration. — **LOOKING FORWARD →** During FY 2016, planting in the experimental plots will begin, along with monitoring for adaptive management. Experiments will include planting more southern species to anticipate climatic changes to forest conditions, and dense planting of native groundcovers to reduce invasive plants.
Decrease the Cost of Tree Planting	The *TreePhilly* program continues to give free trees to homeowners to plant on private property and for volunteers to plant on park property. As of fall 2014, TreePhilly has distributed 12,700 trees.
Establish Citywide Public Tree Planting Campaign	*TreePhilly* continues to reach out to new and unexpected audiences through social media and partnerships (like Arbrew Day with Yards Brewing Company) to raise awareness of the benefits of trees and the importance of the urban forest, and to encourage tree planting in Philadelphia. — **LOOKING FORWARD →** PPR plans to create an Urban Forester position. The Urban Forester will ensure that the City meets canopy goals, develop best forest management practices, and will be the primary advocate for Philadelphia's trees, serving as spokesperson and expert on both a political and community level.
Establish Seasonal Tree Maintenance Associate Program	From 2011 through 2014, TreeKeepers worked at more than 160 individual PPR sites, pruning more than 10,000 trees. In 2013 TreeKeepers removed more than 110 tons of organic debris during a seven-month work season, and in 2014, they removed 107 tons in only six months. — **LOOKING FORWARD →** TreeKeepers will expand with four additional positions as part of the PPR's workforce development effort.
Initiate City-Based Growing	Greenland Nursery continues to produce an average of 10,000 plants per year, as well as manage plant material from other sources.
Launch Local Carbon Offset Market	Through a partnership among the City, the U.S. Forest Service, and Fairmount Park Conservancy, the *Erase Your Trace* website launched in spring 2009. The tool allows for the purchase of carbon offsets that benefit local tree planting efforts. — **LOOKING FORWARD →** Through participation in the Mayor's National Climate Change Agenda, Philadelphia will join partners to explore whether and how cities can overcome current structural barriers to participate in existing carbon offset markets.
Provide Incentives for Preserving Large Caliper Trees	The new zoning code adopted in August 2012 provides credits for preserving existing trees in §14-705(1). Developers are adhering to Heritage Tree regulations.
Revise the Zoning Code Regarding Trees for Surface Parking Lots	The new zoning code adopted in August 2012 requires any surface parking area located within 20 feet of any public street to include trees.

IN PROGRESS

Fully Stock Street Trees Adjacent to All City Facilities	PPR is partnering with other City departments and large landowners including SEPTA, the School District of Philadelphia, the Philadelphia Fire Department, and the Philadelphia Prison System to plant street trees and interior trees in neighborhoods with low tree canopy coverage.
Green the Schools	The Trust for Public Land is leading Parks for People-Philadelphia, a partnership among PPR, Philadelphia Water, and the School District of Philadelphia to green schoolyards.
Prioritize Tree Planting in Low-Canopy, High-Crime Districts	PPR launched the Community Yard Tree Giveaway Grant program to empower community groups to host their own yard tree giveaways, and to get more trees into neighborhoods with low tree canopy.
Strengthen and Increase Public-Private Maintenance Partnerships	TreeKeepers partners with local groups on beautification projects and proper tree maintenance.
Target Empty Tree Pits	PPR is attempting to replant in all pits as soon as a tree is removed. — **LOOKING FORWARD →** PPR plans to create a comprehensive asset management system for trees and conduct a citywide street tree inventory to identify all potential planting locations.

GOAL:

PHILADELPHIA CREATES A COMPETITIVE ADVANTAGE FROM SUSTAINABILITY

economy

SECTION FOUR

ECONOMY

PHILADELPHIA'S ACCESS TO clean water and fertile farmland, walkable neighborhoods, and robust public transportation systems give the city a competitive advantage as businesses and residents increasingly seek quality-of-life amenities. To maintain and increase these advantages, Philadelphia can invest in preserving and improving resilient infrastructure, train workers in sustainability as a core competency, and analyze and report the economic impact of local sustainability work.

The City of Philadelphia is examining climate projections to understand local climate vulnerabilities and adaptation opportunities. By undertaking this work, the City will be better positioned to help businesses with similar planning efforts and maintain continuity of operations as the climate changes and the frequency of extreme weather increases. Proactively preparing for a hotter, wetter future will not only increase Philadelphia's ability to bounce back from extreme events, but also help attract residents and business investments.

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← Revolution Recovery is a local construction and demolition recycling company committed to providing sustainable services at a cost less than traditional landfill disposal.

TARGET 12

Reduce Vehicle Miles Traveled by 10 Percent

METRICS

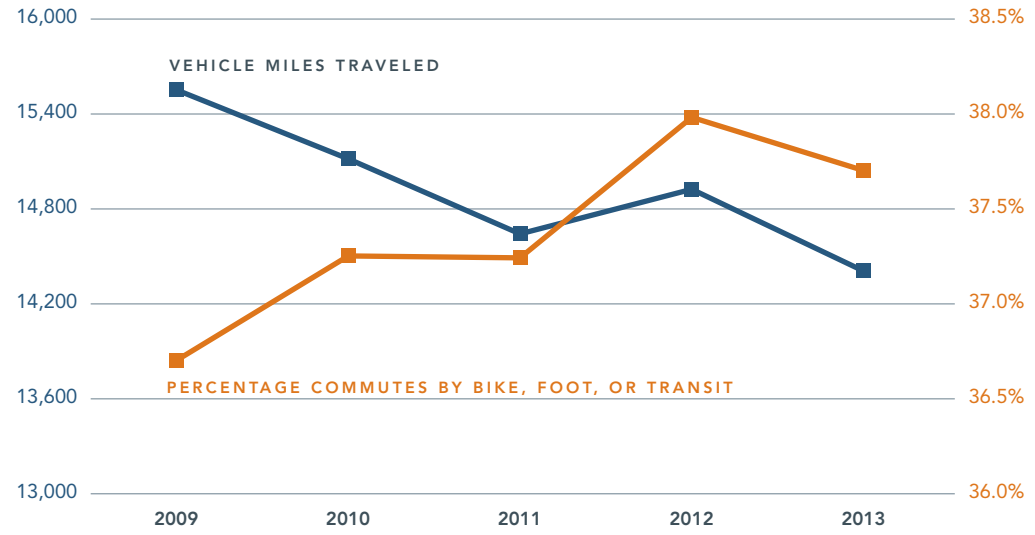
Adjusted *Greenworks* Baseline (2005)	5.96	Billion Vehicle Miles Traveled
Current (2013)	5.26	Billion Vehicle Miles Traveled
2015 Target	5.36	Billion Vehicle Miles Traveled

CONTEXT AND HISTORY

Among Philadelphia's most valuable assets are walkable neighborhoods and a transit network that allow riders easy access to employment hubs within the city and throughout the region. Even with recent growth, vehicle miles traveled (VMT) are trending down. The City and its partners will need to continue to provide and improve transportation infrastructure and services that allow all Philadelphians flexible transit-mode choices while ensuring that pedestrians, bicyclists, and motorists remain safe on our streets and sidewalks.

In 2014 SEPTA added new 40-foot and 60-foot hybrid-electric buses to its fleet to replace aging diesel buses. By the end of 2016, more than half of SEPTA's bus fleet will be hybrid-electric.

Vehicle Miles Traveled and Alternative Mode Share



WHAT HAPPENED

After a modest uptick in vehicle miles traveled in 2012, Philadelphians traveled 5.26 billion miles in 2013, the fewest in more than 20 years, and a 12 percent reduction from the 2005 *Greenworks* baseline. This reduction came even as Philadelphia's economy improved and population grew. Residents and businesses are moving to Philadelphia, but smart land use planning and sustained investment in alternate transportation modes have helped ensure this growth is not leading to more cars on the road.

To continue this decoupling of increased automobile use and economic growth, the growth in bicycle and pedestrian infrastructure over the past several years will need to continue. The new Schuylkill Boardwalk, linking the South Street Bridge to the Schuylkill River Trail, eases bicycle and pedestrian commutes for West Philadelphia residents. The 58th Street Greenway completed a gap in the on-road bicycle network in an area of Southwest Philadelphia with a concentration of zero-vehicle households and a high rate of pedestrian commuting. The Indego bike share system (see sidebar) provides commuters an entirely new transit option for getting around Philadelphia.

Continuing to expand access to existing transit modes will also be critical. Through American Recovery and Reinvestment Act (ARRA) grants and dedicated funding from the Act 89 transportation bill, SEPTA has made progress clearing its backlog of maintenance and repair projects and later this year will roll out SEPTA Key, bringing contactless fare-card payment to its riders for the first time.

SUCCESS STORY

Indego Is Helping All Philadelphians Share the Road

On a cool spring afternoon in April 2015, Mayor Michael Nutter led a crowd of 300 bicyclists down the Benjamin Franklin Parkway for the maiden ride of Indego, Philadelphia's first bike share system. Sponsored by Independence Blue Cross and managed by the Mayor's Office of Transportation and Utilities (MOTU), Indego rolled out with 500 bikes at more than 60 stations across the city.

Philadelphians took nearly 50,000 trips on Indego during its first month of operation. The City is committed to ensuring the system is accessible to all Philadelphians, providing the first cash-payment option for a bike share system in the United States and siting one-third of Indego stations in low-income neighborhoods.

KEY TAKEAWAYS

- **Highly visible projects encourage mode shifts.** MOTU has prioritized low-cost, high-visibility projects like separated bike lanes and expanded stop bars in crosswalks to raise awareness of sharing the road across all transportation modes.
- **Increasing transit ridership is helping to reduce VMT.** SEPTA's investment in new hybrid buses and regional rail trains is supporting and accommodating a growing ridership, making transit more comfortable for riders and better for the environment.
- **Sustained funding is critical to complete large projects.** One-time ARRA funding and the transportation authorization from Harrisburg have allowed the City, SEPTA, and other stakeholders to complete major projects. Continued funding from the federal and state governments will be critical to maintain and expand transportation systems.

LOOKING FORWARD

- **Plan for equity in service expansion.** Indego's commitment to providing a cash-only option for riders has opened bike share to thousands of Philadelphians without reliable access to credit. With the arrival of SEPTA Key, Philadelphia will demonstrate that new transit technology improves service for all residents.
- **Prioritize bicycle and pedestrian safety.** Advocates are calling for Philadelphia to join cities around the world adopting a Vision Zero platform, committing to eliminate pedestrian and bicyclist road fatalities.
- **As Philadelphia's economy grows, people will travel more.** Continuing to focus on making transit, bike, and pedestrian travel feasible and convenient as economic activity increases in the city will help further the uptick in non-vehicle mode share.

TARGET 13

Increase the State of Good Repair in Resilient Infrastructure

METRICS

***Greenworks* Baseline (2008)**	73% of Assets in a State of Good Repair
Current (2014)	75% of Assets in a State of Good Repair
2015 Target	80% of Assets in a State of Good Repair

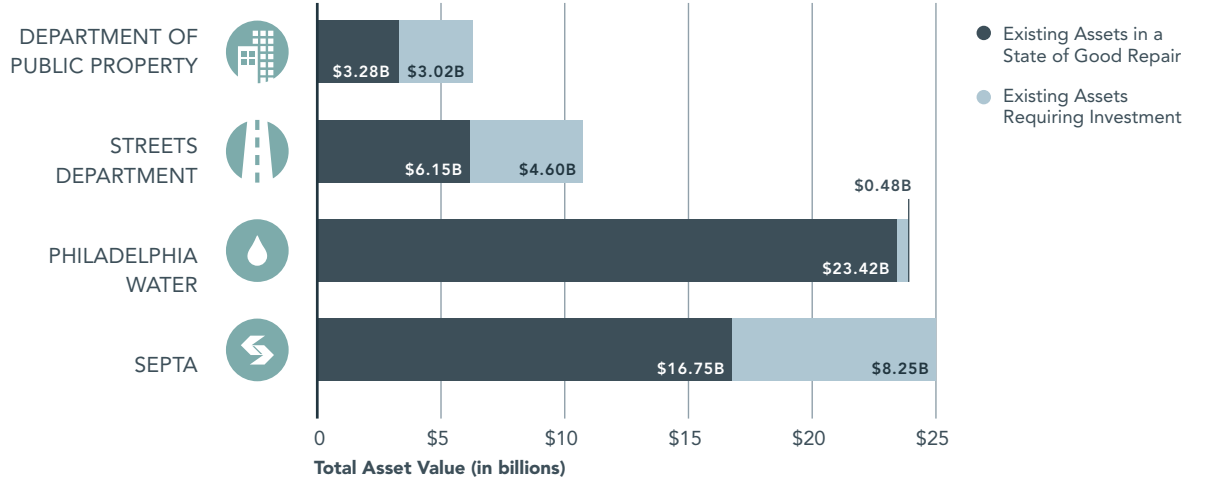
CONTEXT AND HISTORY

Much of Philadelphia's infrastructure was built decades ago. The city's roads, bridges, water mains, and public transit routes are vital to residents and businesses, and ensuring these assets remain safe and reliable as they age is challenging.

To help cities around the country meet this challenge, Congress passed the American Recovery and Reinvestment Act of 2009 (ARRA), which included significant funding to improve the state of America's infrastructure. Even with Philadelphia's success attracting a large share of competitive ARRA grant funds over the past five years, work remains to improve Philadelphia's infrastructure, particularly in response to the changing climate.

PHOTO COURTESY OF SEPTA

State of Good Repair in Resilient Infrastructure



WHAT HAPPENED

Greenworks set a goal that 80 percent of infrastructure managed by four agencies—the Streets Department, the Department of Public Property, Philadelphia Water, and SEPTA—be maintained in a state of good repair (SOGR). Across these four agencies, SOGR increased from 73 to 75 percent between 2008 and 2014.

To improve tracking of City-owned infrastructure, the Office of Innovation and Technology is leading an effort to procure city-wide asset-management software. This system would standardize asset data across City departments, provide better information on the state of infrastructure to both operators and policymakers, and allow the City to make informed decisions about repair and replacement.

In 2012 the Mayor's Office of Sustainability (MOS) expanded *Greenworks* Target 13, recognizing that to make Philadelphia truly resilient, the City will need not only to meet current SOGR targets, but also to consider what changes will be necessary to continue providing services and managing infrastructure as Philadelphia's climate becomes hotter and wetter. MOS convened a Climate Adaptation Working Group with participants from City agencies that will need to adapt to the changing climate. The Working Group is helping MOS plan to reduce Philadelphia's climate vulnerability and identify opportunities for adaptation across City departments. Working with consultants from ICF International, MOS published *Useful Climate Science for Philadelphia* outlining local climate projections for precipitation, temperature, and sea-level rise; discussed these projections with partners in City agencies, departments, and authorities; and plans to release a first Philadelphia climate adaptation plan, focused on municipal government, in summer 2015.

← Part of SEPTA's Rebuilding for the Future plan is the Right-of-Way & Track Program, which is completing work to ensure a state of good repair and improve travel conditions.

SUCCESS STORY

SEPTA Is Rebuilding for the Future


PHOTO COURTESY OF SEPTA

In September 2014 SEPTA received $87 million in grants through the U.S. Federal Transit Administration (FTA) Emergency Relief Program and Disaster Relief Appropriations. The funds will go toward projects designed to improve the transit system's resilience to severe weather events including rail infrastructure improvements, slope and shoreline hardening, and power-system reliability upgrades.


PHOTO COURTESY OF SEPTA

KEY TAKEAWAYS

- **Defining state of good repair is challenging.** *Greenworks* defined good repair as "when no backlog of needs exists and no component is beyond its useful life," but good baseline data was difficult to find, and no standard definition or methodology to normalize good repair across infrastructure types exists.
- **City governments are the first responders to the harms of climate change.** Municipalities plow roads, manage stormwater, and provide emergency services during storms. Building on years of experience responding to extreme weather, cities are leading efforts to prepare for climate change.
- **Resilient cities recognize interdependencies.** Even systems in 100 percent SOGR are only as resilient as the weakest external support on which they rely. Good resiliency planning requires looking beyond systems cities directly control to include all interdependent services such as utilities, transportation, and fuel supply.

LOOKING FORWARD

- **Federal guidance may help standardize good repair measurement.** As required by the federal MAP-21 transportation bill passed in 2012, FTA is formulating a new framework for measuring SOGR. The framework will become a requirement for agencies seeking funding through FTA, and may be helpful in formulating future Philadelphia metrics.
- **The City will establish internal asset-management systems and coordinate tracking efforts with external infrastructure managers.** Sophisticated systems for tracking assets and maintenance are necessary for accurate SOGR measurement.
- **The City of Philadelphia will release a climate adaptation plan.** In summer 2015 the City will report on its current climate vulnerabilities, the potential costs of doing nothing to address these vulnerabilities, and options for how to prepare the City for projected changes in climate.

TARGET 14

Increase the Size of the Regional Clean Economy by 25 Percent

METRICS

Producing Green Goods and Services

27%	9.3%
Workplaces	Employees

Using Green Technologies and Practices

53%	5.5%
Workplaces	Employees

CONTEXT AND HISTORY

When the green jobs movement began in the early 2000s, a variety of suggested definitions for green jobs surfaced. *Greenworks* defined a green job as "a well-paid, career-track opportunity that contributes directly to preserving or enhancing the environment." But as difficulties with measurement became apparent and understanding of sustainability-related employment became more nuanced, the Mayor's Office of Sustainability (MOS) followed the lead of the U.S. Bureau of Labor Statistics (BLS) and began tracking a broader set of sustainable jobs and employers, often called the clean economy. The clean economy includes not only full-time green jobs, but also organizations that use green technologies, and employees who spend part of their time making green products, providing green services, and using green technologies.

Until the release of *The Clean Economy in the Philadelphia Region* report in 2014, research on the clean economy by numerous groups contained useful general results and methodologies, but lacked detailed information on geography, industry, and specific clean economy practices in Greater Philadelphia.

Most Common Green Goods and Services in Greater Philadelphia

Recycling | Pollution Mitigation | Education and Training

WHAT HAPPENED

To establish replicable methodology and better understand the size of the clean economy in Greater Philadelphia, MOS and Philadelphia Works worked with a consultant to administer a regional workforce survey on the number of workers and types of businesses participating in the clean economy in Philadelphia and the surrounding four counties.

Approximately half of the surveys focused on green goods and services and half focused on green technologies and practices, as defined by BLS. The survey found workplaces using green technologies and practices are predominantly focused on energy efficiency and waste reduction, while the most common green goods and services in the region are recycling, reuse, and waste reduction. Complete survey results are outlined in *The Clean Economy in the Philadelphia Region*, available at www.phila.gov/green.

Despite the 2007 to 2009 recession, Philadelphia's clean economy shows signs of strength. Strong clusters of sustainable businesses, for example energy-focused companies at The Navy Yard, have attracted new companies interested in co-locating near similarly focused businesses. Employers considering where to locate or expand their businesses have cited an interest in locating near the quality-of-life amenities Philadelphia offers, because these perks are becoming necessary to attract and retain top talent. Philadelphia can continue to focus on our sustainable business clusters and quality-of-life amenities to attract new clean economy businesses.

PHOTO COURTESY OF PHILADELPHIA WATER

PowerCorpsPHL is an AmeriCorps program designed to support Philadelphia's environmental stewardship, youth violence prevention, and workforce development priorities. Corps members serving with Philadelphia Water (PWD) increase capacity to maintain the city's green stormwater infrastructure.

In Philadelphia and the surrounding four counties, 16 percent of workplaces, including Waste Management's Material Recovery Facility in Northeast Philadelphia, provide recycling and waste reduction services.

KEY TAKEAWAYS

- **Philadelphia has a strong green services sector.** The most common green goods and services provided in Greater Philadelphia are recycling, pollution mitigation, and education and training, which all fall into the services sector.
- **Sustainability practices are becoming more common.** Businesses categorized by BLS as "not green" participated in the clean economy at higher rates than businesses categorized as "green." This suggests that participation in the clean economy is becoming common even among businesses that do not self-identify as sustainable.
- **Traditional jobs have expanded to include green responsibilities.** A large percentage of clean economy workers do not devote the majority of their time to green tasks.

LOOKING FORWARD

- **Future research should include the public sector.** Information on clean economy participation by public agencies like SEPTA and PWD would help workforce organizations make more informed clean economy decisions. Any future survey efforts should include this sector.
- **A new approach to collecting clean economy data is necessary.** Collecting workforce data is expensive, and replicating the survey will require additional resources. A potential solution to minimize expense is to incorporate questions about the clean economy into existing workforce data-collection efforts.
- **Identify specific sectors to target for growth.** Capitalize on long-term, green stormwater infrastructure investments resulting from *Green City, Clean Waters* to support local business and job opportunities.

TARGET 12: **Reduce Vehicle Miles Traveled by 10 Percent**

	INITIATIVE	PROGRESS 2015
COMPLETED	**Build an East-West Bicycle Corridor**	Bicycle counts more than doubled on the Spruce and Pine Street East-West corridor, which connects to other Center City destinations via buffered bike lanes and the South Street Bridge.
COMPLETED	**Create Bike Parking Stations**	Since June 2012 the Mayor's Office of Transportation and Utilities (MOTU) has installed 10 bike parking corrals in high-demand areas.
COMPLETED	**Develop a Pedestrian and Bicycle Master Plan**	Philadelphia Parks & Recreation partnered with the Delaware Valley Regional Planning Commission and the William Penn Foundation to install automated bicycle counters at six trail locations in the city. These counters will aid in future planning efforts by improving understanding of where and when bicyclists ride.
COMPLETED	**Develop More Off-Road Bike Trails**	The Delaware River Waterfront Corporation is working to complete 11 miles of trails along the North Delaware waterfront in the next two years. The nine-mile Cobbs Creek Connector trail, currently in design, will connect West Philadelphia, the Heinz Wildlife Refuge, and the Delaware River.
COMPLETED	**Expand the Number of Bike Racks**	The Streets Department has updated bicycle parking regulations in the city, making the process of applying for a bike rack permit more predictable and timely. MOTU partnered with the Office of Arts, Culture and Creative Economy to commission and install 12 individual bike racks designed through a national arts competition. — **LOOKING FORWARD →** The City of Philadelphia will work with the Central Philadelphia Transportation Management Association to improve bike parking maintenance and operations in Center City.
COMPLETED	**Explore the Creation of a Bike Share Program**	Philadelphia launched the Indego bike share service in April 2015 with 60 stations and 500 bikes. By July 1, 2015, the system will include 71 stations and 700 bicycles. Philadelphia is the first city to launch a bike share system with a cash-payment option in place for all users, which allows even those without bank accounts or credit cards to access the system. — **LOOKING FORWARD →** The City will work with Indego operators to promote bike share use within neighborhoods surrounding Center City. This program will include members of the Better Bike Share Partnership, which aims to reduce social and economic barriers to the use of bike share. Partners include the Bicycle Coalition of Greater Philadelphia, the Mural Arts Program, the National Association of City Transportation Officials, and People for Bikes.
COMPLETED	**Implement Airport Bicycle Access Plan**	PHL completed a Center City-to-airport bicycle access plan in 2009.
IN PROGRESS	**Design and Implement Complete Streets**	Following the publication of the *Complete Streets Handbook* and passage of a City Council bill to implement a Complete Streets Policy in 2012, MOTU and its partners have begun implementating several Complete Streets projects.
IN PROGRESS	**Develop New Fare Card Technologies**	SEPTA continues to work with its vendor, Xerox, on the testing and implementation of system-wide fare payment modernization. — **LOOKING FORWARD →** SEPTA plans to begin using SEPTA Key, the new fare payment system, on buses, subway and elevated trains, and trolley routes in 2015, and on Regional Rail in 2016.
IN PROGRESS	**Ensure Sustained Transit Funding**	In addition to funds from Act 89, SEPTA is receiving $87 million in grants through the Federal Transit Administration (FTA) Emergency Relief Program and Disaster Relief Appropriations to assist in improving the resilience of capital assets to the impacts of climate change. These funds will be invested in critical infrastructure to protect the transit system from extreme weather events in the future. — **LOOKING FORWARD →** SEPTA will be seeking additional opportunities to augment its capital investment program to close the remaining gap between funding availability and need, primarily through federal transportation reauthorization and creative strategies to extend the impact of capital funds.
IN PROGRESS	**Further Improve Service and Safety**	SEPTA's Five-Year Strategic Business Plan for 2015 through 2019 established five key performance indicators (KPI) for safety and security: passenger incidents per 100,000 miles; vehicle incidents per 100,000 miles; station incidents per one million passenger trips; lost time per 200,000 employee work hours; and non-lost time per 200,000 employee work hours. — **LOOKING FORWARD →** SEPTA will track each of its five safety and security KPI on a monthly basis through a new approach to performance management, "SEPTA Stat." SEPTA will publish results annually.
IN PROGRESS	**Invest in Current Transit Infrastructure**	SEPTA's *Rebuilding for the Future* program (septa.org/rebuilding), funded by Pennsylvania Act 89, will focus on state of good repair and vehicle replacement to reduce a $5 billion backlog of capital need. Act 89 closed a portion of the gap between funding availability and need. Critical investments are underway to core infrastructure (bridges, track, substations, etc.) to ensure a safe and reliable transit system. — **LOOKING FORWARD →** SEPTA's *Rebuilding for the Future* program will continue to invest in state of good repair and vehicle replacement for the coming years.
IN PROGRESS	**Make Transit-Oriented Development Investments**	SEPTA is working to spur neighborhood development through transit investments such as the renovation of the bus loop at 23rd and Venango. — **LOOKING FORWARD →** SEPTA will continue to partner with local developers and community partners to integrate the regional transit network with land use and development plans.
IN PROGRESS	**Plan for an Expanded System**	SEPTA is holding public meetings to identify a Locally Preferred Alternative for the King of Prussia Rail extension and will complete a Draft Environmental Impact Statement in 2015. — **LOOKING FORWARD →** SEPTA and the Pennsylvania Department of Transportation have started work on Phase 2 of a Broad Street Subway Extension Feasibility Study. The study will examine potential alternative alignments, as well as potential ridership, engineering issues, and order of magnitude costs.
IN PROGRESS	**Reduce Parking Ratios for Buildings with Designated Bike and Car Share Spots**	The new zoning code adopted in August 2012 establishes new parking maximums to prevent oversupply of parking and requires dedicated vanpool, carpool, and hybrid vehicle parking in large commercial parking lots.
IN PROGRESS	**Upgrade Commercial Corridors**	The Department of Commerce *ReStore Streetscape Enhancements and Storefront Improvement Program* provides funding to revitalize commercial corridors.

TARGET 13: Increase the State of Good Repair in Resilient Infrastructure

IN PROGRESS

INITIATIVE	PROGRESS 2015
Develop Climate Adaptation Plan	The Mayor's Office of Sustainability (MOS) worked with City departments that will need to adapt to warmer, wetter weather to understand the City of Philadelphia's vulnerabilities to climate change and to identify opportunities to prepare for these changes. — **LOOKING FORWARD →** In summer 2015 MOS will release a report outlining climate risks to the City of Philadelphia and potential actions City government could implement to prepare for climate change.
Acknowledge Climate Change in Infrastructure Planning	SEPTA received $87 million in grants through FTA's Emergency Relief Program and Disaster Relief Appropriations, seed funding a Climate Resilience Program that will assist in hardening critical infrastructure to the impacts of extreme weather. — **LOOKING FORWARD →** Both SEPTA and the City of Philadelphia will continue to consider best available climate projections and to incorporate climate adaptation planning into capital, operating, and maintenance programs.
Improve Road Maintenance and Upgrade Bridges	The Philadelphia Streets Department filled more than 32,000 potholes in 2015. Streets completed the demolition of the Willow Grove Avenue Bridge in March 2015, and expects to complete reconstruction by December 2015.
Invest in Public Property Management Systems	The Office of Innovation and Technology issued an RFP for an integrated work order asset-management software in April 2015. — **LOOKING FORWARD →** The new asset-management system will centralize data across departments and inform capital investment decisions.

TARGET 14: Increase the Size of the Regional Clean Economy by 25 Percent

COMPLETED / IN PROGRESS

INITIATIVE	PROGRESS 2015
Conduct a Market Analysis	MOS, with Philadelphia Works and the Reed Group, conducted a regional clean economy and employment survey and published *The Clean Economy in the Philadelphia Region* in 2014.
Create a Green Economy Stakeholder Task Force	The Sustainable Business Network of Greater Philadelphia convened the Green Economy Task Force in 2008. The Task Force completed its work in 2011.
Create a Regional Green Jobs Training Center	The Energy Coordinating Agency (ECA)'s John S. and James L. Knight Green Jobs Training Center, opened in 2010, serves the city by offering courses related to the clean economy. In May 2014 ECA received an Environmental Workforce Development and Job Training grant from the U.S. Environmental Protection Agency to help train local residents for environmental remediation jobs.
Support and Connect Energy Research and Academia	MOS is working with Drexel University to understand potential scenarios for how Philadelphia could achieve deep reductions in carbon emissions over the coming decades. MOS is also working with the University of Pennsylvania to use energy benchmarking data to identify opportunities for energy efficiency in privately owned buildings.
Conduct Regional Clean Economy Survey Every Two Years	MOS published *The Clean Economy in the Philadelphia Region* in 2014. — **LOOKING FORWARD →** The U.S. Bureau of Labor Statistics discontinued its tracking of the clean economy, and the City will reconsider the utility of tracking clean economy data outside the context of wider employment trends.
Make Strategic Programmatic Investments to Increase Market Demand	*EnergyWorks* and Philadelphia Gas Works' *EnergySense* program increase demand in the energy efficiency sector by streamlining financing, technical assistance, and quality assurance for homeowners and commercial building owners. Through Philadelphia's energy benchmarking program, MOS is connecting commercial building owners with available incentives through local utilities to improve the efficiency of their facilities.
Raise Awareness About the Clean Economy	Mayor Nutter, City officials, and partners continue to highlight the economic and workforce development opportunities and the outcomes of initiatives and investments in the Philadelphia region.
Re-brand Philadelphia for Business Development Efforts	In 2013, the Department of Commerce and PIDC launched *StartUp PHL*, a collaborative effort to strengthen the entrepreneurial environment in Philadelphia.

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GOAL:

PHILADELPHIANS UNITE TO BUILD A SUSTAINABLE FUTURE

engagement

PHOTO COURTESY OF FAIRMOUNT PARK CONSERVANCY

SECTION FIVE

ENGAGEMENT

PUBLIC SUPPORT AND ADVOCACY are what led to the creation of *Greenworks*, and they are what will determine how sustainability is prioritized in the future.

Greenworks provided a central, comprehensive approach to sustainability planning in Philadelphia over the past seven years. Serving as an umbrella under which a wide variety of sustainability work fell, the shared plan proved incredibly effective in elevating issues and bringing together partners within and beyond City government. Notable successes include:

- Annual reporting on projects, progress, and outcomes,
- Providing a central brand,
- Positioning the City and partners for funding,
- Breaking down silos among separate but connected issues and agencies,
- Creating common vision and goals, and
- Making sustainability a permanent responsibility of Philadelphia government.

We've all learned a lot along the way. Yet despite tremendous progress, work to advance sustainability in Philadelphia is far from complete. After six years of implementation and tracking outcomes, the Mayor's Office of Sustainability asked our partners to look back with us on our shared successes, identify challenges and things we would do differently, and think about what the next phase of sustainability will look like in Philadelphia.

← The Fairmount Park Conservancy and Philadelphia Parks & Recreation have completed Phase I of the Hunting Park Revitalization Project, which invested $4.5 million in capital projects and programs, including a 60-plot community garden. To encourage positive use of the new amenities, the Conservancy has launched critical programs focused around healthy eating, active living, and violence prevention.

What We've Heard


PHOTO BY SOPHIE SARKAR

PHOTO BY MOS


PHOTO BY MOS

The Mayor's Office of Sustainability has been soliciting and cataloguing feedback from partners both inside and outside of government in anticipation of developing an updated sustainability plan in 2016. Across issues and constituencies, two recurring themes have consistently emerged:

- Go bigger in pursuit of transformational changes.
- Go deeper at the neighborhood level and make sustainability more relevant and connected to the daily lives of Philadelphians.

Below is a summary of what we've heard about how to shape and focus this work going forward. Suggestions have clustered around process improvements, enhanced engagement, and more meaningful measurement.

PROCESS

- Continue to integrate sustainability into City government's core functions and systems.
- *Greenworks*' short-term implementation timeline was important to build urgency, but deep changes will take time and will require long-term planning and goals.
- Strategically group and prioritize initiatives into programmatic themes to increase impact.
- Acknowledge and address fundamental challenges including: poverty, schools, housing, and quality-of-life issues.
- Explicitly assign responsibility for goals to departments and agencies to drive ownership and accountability.
- Consider setting more local-scale (e.g. neighborhood- or district-specific) goals and priorities within a citywide plan.
- Tie work more strongly to the *Greenworks* brand so that the public can increasingly identify outcomes with the plan.

ENGAGEMENT

- Expand the City's role as a convener to deepen relationships and collaboration with a wide array of stakeholders.
- Invite more and different voices to provide input on priorities and guidance on implementation.
- Understand and address barriers to community participation in sustainability work.
- Increase private sector engagement and foster business leadership.
- Develop closer relationships with schools, both K-12 and higher education.
- Prioritize high-visibility projects to generate greater public awareness.

MEASUREMENT

- Measuring and reporting progress is important, but numbers should be relatable and understandable.
- Include more metrics and goals that City-led action can directly influence.
- Compare Philadelphia against national trends to contextualize progress.
- In additional to quantitative, long-term, big-picture goals, establish intermediate milestones and qualitative indicators of progress.
- Develop more accessible methods of reporting progress. Consider transitioning away from annual reporting to a less intensive, more frequent approach.
- Create and regularly update an online dashboard to show work complete and underway in real time.

PHOTO BY THE FOOD TR...

PHOTO BY CUSP PHILADELPHIA

PHOTO BY MOS

Ideas for Future Work

PHOTO BY SOLAR STATES

PHOTO BY GEARING UP

PHOTO BY MEDLOW FOR VISIT PHILADELPHIA

Here are some specific recommendations partners shared for future sustainability work in Philadelphia.

ENERGY

- Develop both municipal and citywide energy master plans.
- Create specific energy-use targets for residential and commercial building sectors.
- Explicitly address resiliency to climate change in energy planning.
- Increase incentives for City departments to reduce energy use.
- Work with state, federal, and utility partners to align energy policies.
- Share weather-normalized data to contextualize the relationship between weather and energy use.
- Advocate at the state level to ensure that new construction in Philadelphia meets the most up-to-date building energy codes.
- Consider incorporating energy use analysis into the development review process to encourage early-stage energy planning.
- Provide ongoing training opportunities for development review, planning, and building management employees.
- Work with large institutions in the city to purchase local renewable energy credits that help make close-to-home renewable projects more viable.

ENVIRONMENT

- Set both mid- and long-term greenhouse gas reduction goals, and encourage City Council to adopt them.
- Connect air quality to public and personal health outcomes.
- Expand waste management strategies to include both diversion and reduction.
- Develop a strategy to reduce the amount of organics, both food and yard waste, in the waste stream.
- Keep the recycling stream clean through improved public education about what is recyclable.
- Include goals to reduce litter and short dumping.
- Require the City to complete life-cycle cost and environmental impact analyses of planned work and investments.
- Reduce the use of single-use bags and containers.
- Update the City's vehicle fleet to reduce fuel use, air pollution, and greenhouse gas emissions.

ECONOMY

- Measure and communicate the economic impact of sustainability initiatives and investments, where feasible.
- Increase the City's focus on clean economy workforce development, partnering with both the School District of Philadelphia and the Community College of Philadelphia.
- Identify clean economy industries where Philadelphia is uniquely positioned for growth.
- Market Philadelphia to new businesses as a climate-resilient location.
- Ensure safety of all Philadelphians across all transportation modes.
- Evaluate parking policies and density incentives.
- Streamline permitting and regulations to allow businesses to install bike parking.
- Build on successful Complete Streets policies to increase coordination among City departments, developers, and funders.

EQUITY

- Make sustainability priorities culturally relevant for all Philadelphians.
- Use plain language and translate relevant information into multiple languages.
- Introduce voluntary challenges and incentives for residents to make sustainability goals relatable.
- Connect with residents through their faith communities.
- Prepare vulnerable residents, neighborhoods, and infrastructure for increased frequency of extreme weather as the climate changes.
- Continue to support *Green City, Clean Waters*, and expand public engagement efforts.
- Fund and prioritize tree maintenance in addition to tree planting.
- Continue to support flooding outreach and interagency coordination through the Citywide Flood Risk Management Task Force.
- Appoint a food policy director who is empowered to work with staff across agencies.

TARGET 15: **Philadelphians Unite to Build a Sustainable Future**

COMPLETED

INITIATIVE	PROGRESS 2015
Develop Social Marketing and Public Education Campaigns	Each month, the Mayor's Office of Sustainability (MOS) sends an electronic newsletter to more than 11,000 subscribers. MOS continues to use Twitter, Facebook, Wordpress, and www.phila.gov/green as outreach tools.
Publish Annual Report	MOS released this *Greenworks 2015 Progress Report* in June 2015.
Reach Out to Stakeholders	MOS solicited feedback for the *Greenworks 2015 Progress Report* from a variety of stakeholders through in-person engagement sessions, an online survey, and an open house.
Regularly Update Website	MOS updated the resources page of its website in 2014 to catalogue the numerous reports developed during *Greenworks* implementation.
Use Data to Measure Results	The *Greenworks 2015 Progress Report* includes data for each target and measures trends over time.

THE CITY OF PHILADELPHIA

MAYOR'S OFFICE OF SUSTAINABILITY

GREENWORKS

PHILADELPHIA

www.phila.gov/green

The Mayor's Office of Sustainability is grateful for the leadership and support of City of Philadelphia departments and agencies, quasi-City agencies, and authorities who worked to advance *Greenworks* goals, including:

City of Philadelphia Law Department
Department of Human Services
Department of Public Property
Department of Records
Energy Office
Free Library of Philadelphia
Licenses & Inspections
Managing Director's Office
Mayor's Office
Mayor's Office of Civic Engagement and Volunteer Services
Mayor's Office of Transportation and Utilities
Mural Arts
Office of Community Empowerment and Opportunity
Office of Emergency Management
Office of Fleet Management
Office of Housing and Community Development
Office of Innovation and Technology
Office of the City Representative
Office of the Director of Finance
Philadelphia City Council
Philadelphia City Planning Commission
Philadelphia Department of Commerce
Philadelphia Department of Public Health
Philadelphia Department of Revenue
Philadelphia Energy Authority
Philadelphia Fire Department
Philadelphia Gas Works
Philadelphia Historical Commission
Philadelphia Housing Authority
Philadelphia Housing Development Corporation
Philadelphia Industrial Development Corporation
Philadelphia International Airport
Philadelphia Land Bank
Philadelphia Parking Authority
Philadelphia Parks & Recreation
Philadelphia Police Department
Philadelphia Prison System
Philadelphia Redevelopment Authority
Philadelphia Streets Department
Philadelphia Water
Procurement Department
Southeastern Pennsylvania Transportation Authority