

GreenPlan Philadelphia

Our Guide to Achieving Vibrant and Sustainable Urban Places

2010

Prepared for the City of Philadelphia

by Wallace Roberts & Todd

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City of Philadelphia

Pennsylvania Department of Conservation and Natural Resources

William Penn Foundation

United States Forest Service

PECO, An Exelon Company

GREENPLAN PHILADELPHIA AT A GLANCE

Welcome to *GreenPlan Philadelphia*, our guide to achieving vibrant and sustainable urban places!

GreenPlan Philadelphia takes an innovative approach to open space planning that goes well beyond that of a typical open space plan. Many cities plan for open space by focusing on specific elements, such as parks or streets, or on specific issues, like recreation or circulation. Rather than emphasizing just one set of networks or issues, *GreenPlan Philadelphia* offers an integrated methodology, using an inclusive range of considerations—environmental, economic, and social—to maximize the benefits of City efforts. Enhancement of our open space is critical to Philadelphia's future. The "green infrastructure" outlined in this plan will contribute to meeting the city's contemporary challenges in a wide variety of ways.

The approach and recommendations are driven by the input of thousands of Philadelphians who participated in a wide range of civic forums.

ELEMENTS/PLACES

Green Places are made up of elements that are the building blocks of the spaces that surround us outside. These individual elements, when successfully combined, make effective urban places that reduce pollution, build value, and enhance quality of life.

Elements of Green Places

-  Trees
-  Stormwater Management Tools
-  Meadows
-  Trails and Bikeways
-  Wetlands
-  Urban Agriculture and Community Gardens
-  High Performance Surfaces
-  Renewable Energy

Green Places

-  Parks and Recreation Spaces
-  Green Schoolyards
-  Vacant Land Opportunities
-  Waterfronts
-  Green Streets
-  Green Development
-  Plazas and Auxiliary Spaces
-  Rail and Utility Corridors

TARGETS/RECOMMENDATIONS

GreenPlan Philadelphia sets over 30 ambitious but attainable targets, with supporting recommendations for incorporating open space planning into the agenda for both private development and public works using the elements and places with an organizational framework.

sample targets

- Achieve at least 30% tree cover in every neighborhood.
- Increase park space to ten acres of parkland per thousand residents.
- Green 100 additional schoolyards through the Campus Parks program.
- Create a citywide network of 1,400 miles of green streets.
- Ensure that there is a trail within a half mile of all residents.

OPPORTUNITIES

In order to reach the plan's targets and recommendations, Philadelphia will need to grow its open space network. *GreenPlan Philadelphia* identifies a large number of opportunities to help achieve this.

sample opportunities



NETWORK OF BENEFITS

GreenPlan Philadelphia makes the case for a comprehensive open space system, describing its essential functions and irreplaceable network of environmental, economic, and quality-of-life benefits.

This network of benefits becomes a common language used throughout the plan.

ENVIRONMENT	ECONOMICS	QUALITY OF LIFE
Clean Air	Efficient Energy Use	Fresh, Local Produce
Healthy Watersheds	Valuable Properties	Convenient Recreation Access
Robust Habitat	Productive Land Use	Healthy Residents
Hospitable Climate	Competitive Economy	Strong, Safe Neighborhoods

INDICATORS

The network of benefits provides a framework to track and clearly communicate progress in achieving targets and recommendations.

sample indicators

Robust Habitat

acres of managed meadow 318  520

Productive Land Use

percentage of lots and structures not vacant 90  95

Fresh, Local Produce

number of urban agriculture businesses 14  24

OBJECTIVES

Also tied to the network of benefits is a set of objectives that help the City receive the most benefits from its investments. These objectives encourage a strategic and transparent decision-making process in selecting the appropriate opportunities for investment.

sample objectives

Healthy Watersheds

- The project improves water quality through managing stormwater with green infrastructure techniques.

Competitive Economy

- The project creates a major tourist destination, enhances the landscape of an existing tourist destination, or enhances tourism routes.

Convenient Recreation Access

- At least 25% of the project site is within an area currently underserved by parks and recreation.

FUNDING, MANAGEMENT & OPERATIONS, MAINTENANCE

GreenPlan Philadelphia sets broad targets and select recommendations for funding, management, operations, and maintenance of open space. These recommendations are for both immediate use and consideration in the development of subsequent plans that focus in more detail upon these areas of concern.

sample targets

Institutionalize *GreenPlan Philadelphia* within city government.

Regularly measure and update the progress of *GreenPlan Philadelphia*. Revise targets and goals as circumstances warrant.

Increase private funding participation to achieve 30 percent of funding for *GreenPlan Philadelphia* initiatives through non-governmental sources.

Create broad citizen and interest-group understanding of *GreenPlan Philadelphia*, the City's green-performance objectives, and the opportunities available in the city's diverse open-space resources.



CITY OF PHILADELPHIA

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MICHAEL A. NUTTER
Mayor

I am pleased to present GreenPlan Philadelphia: Our Guide to Achieving Vibrant and Sustainable Urban Places!

GreenPlan Philadelphia takes an innovative approach to open space planning that goes well beyond that of a typical open space plan. The Plan offers an integrated approach, using an inclusive range of considerations – Environment, Economics and Quality of Life – to maximize its results. GreenPlan Philadelphia is built on an innovative, collaborative planning process involving thousands of citizens, 11 key partner organizations and 14 City departments.

GreenPlan Philadelphia sets over 30 ambitious but attainable targets, with supporting recommendations, for incorporating open space planning into both private development and public works. Imagine Philadelphia with trees covering 30% of the city, hundreds of acres of new open space, a 10 minute walk from your home to a park or recreation area, a trail within one half mile, opportunities for commercial urban agriculture, green schoolyards and streets which are shaded and naturally handle stormwater. These are all part of GreenPlan Philadelphia.

Imagine cleaner air, healthy watersheds, efficient energy use, increased property values, healthy residents, fresh, local produce and strong, safe neighborhoods. These are all part of GreenPlan Philadelphia.

The Plan includes a robust framework for decision making both within and outside of government and provides measures geared towards sustainability and accountability. This makes GreenPlan Philadelphia a unique document which supports a collaborative approach to the green investments made by the City and our partners.

GreenPlan Philadelphia serves as the open space and greening component of two documents key to my administration – GreenWorks Philadelphia, our sustainable framework published in 2009, and Philadelphia-2035, the City's comprehensive plan now in the works. I am very proud of our goal to make Philadelphia America's greenest city. GreenPlan Philadelphia will play an important role in helping all of us achieve this goal. I hope that you enjoy reading the Plan and will join us in this important work.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael A. Nutter", with a long horizontal flourish extending to the right.

Michael A. Nutter
Mayor



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Welcome to *GreenPlan Philadelphia*, our guide to achieving vibrant and sustainable urban places! *GreenPlan Philadelphia* takes an innovative approach to open space planning that goes well beyond that of a typical open space plan. Many cities plan for open space by focusing on specific elements, like parks or streets, or on specific issues, like recreation or circulation. Rather than emphasizing just one set of networks or issues, *GreenPlan Philadelphia* addresses a range of environmental, economic, and quality-of-life considerations to maximize the benefits of City efforts. Enhancement of our open space is critical to Philadelphia's future. The "green infrastructure" outlined in this plan will contribute to meeting the city's contemporary challenges.

GreenPlan Philadelphia starts by making the case for a comprehensive open space system, citing the essential functions and irreplaceable network of environmental, economic, and quality-of-life benefits a well-formed and well-maintained open space system provides. This network of benefits becomes a common language used throughout the plan—one that provides a basis for a transparent decision-making process for City investments and indicators for evaluating the City's progress. *GreenPlan Philadelphia* addresses the equitable and effective position of open space resources across the city, and it identifies a comprehensive set of opportunities to enhance open space networks such as parks, trails, and green streets. Specific targets, recommendations, and indicators are identified throughout the plan and will be key to the successful implementation of *GreenPlan Philadelphia's* vision.

RENEWING PHILADELPHIA'S LEGACY

Over 300 years ago, William Penn looked at the sliver of land between the Delaware and Schuylkill Rivers and dreamt of building a new kind of city. He envisioned a vibrant urban place, connected by grand and intimate parks. He envisioned lush open spaces that would create a distinct sense of place while sustaining the city's natural resources, promoting economic growth, and providing a high quality of life. Anchored by five public squares, the original plan for Philadelphia included green spaces for the pleasure and health of the city's residents.

While Philadelphia's destiny was indeed to become a new kind of city, it was not the one William Penn envisioned. With the Industrial Revolution, Philadelphia became a big, bustling, and wealthy city. In the process, Philadelphia lost its legacy of green infrastructure. In place of tree-lined streets, the city became defined by rigid, largely tree-less row house blocks.

GreenPlan Philadelphia seeks to reconnect the city with its original legacy of green, interconnected open spaces. We envision rivers lined with vibrant development and necklaced with greenways, trails, and natural preserves—places that nurture wildlife and restore fish as they clean the air we breathe and the water we drink. We envision

tree-lined streets, planted sidewalks, and multi-modal boulevards where bikes, cars, and all forms of transportation combine to save energy, increase property values, and safely move Philadelphians from place to beautiful place. We envision parks, large and small, that serve to unite communities, foster pride, and ensure safety, while providing the means for active, healthy lifestyles.

WHY GREENPLAN PHILADELPHIA?

Too often, opportunities to create and maintain quality open space in the city have been squandered. Threatened by private development pressure and hindered by a lack of public funding, open space has not been a priority.

GreenPlan Philadelphia reflects an evolving appreciation that naturally-functioning systems confer immense day-to-day value. The key lies in understanding how to take advantage of natural processes so the city can receive the multi-functional benefits they provide. After establishing the benefits open space provides, *GreenPlan Philadelphia* goes on to describe a framework for incorporating open space planning into the agenda for both private development and public works. *GreenPlan Philadelphia's* purpose is to outline the connections between open space benefits and larger city goals in a way that helps the City to invest in the most effective infrastructure strategies. Even a modest investment can bring significant returns.

GreenPlan Philadelphia is designed to inspire dreams of beautiful, functional places and to help them become reality. Among the biggest priorities are: ensuring public access to natural amenities like waterfronts, developing a strategy to make good use of vacant land, and rebalancing the distribution of open space resources. It offers an overarching plan to best take advantage of the opportunities open space presents to improve the quality of life for all Philadelphians.

A South Philadelphia oasis. FDR Park provides recreation space and ecological function amid parking lots and tank farms.



WHAT IS *GREENPLAN PHILADELPHIA*?

GreenPlan Philadelphia is the City's first unified vision for its parks, recreation spaces, and natural open spaces. "Open space" can be a vague and abstract term, especially in Philadelphia, where a planted brick pedestrian path between row houses, a forgotten, weed-choked plot of land, and the forested grandeur of Fairmount Park all fall under the canopy of open space. *GreenPlan Philadelphia's* vision of open space is expansive: it encompasses public and private spaces, vacant and vibrant spaces, secluded and expansive spaces. It incorporates almost everything found between buildings: hard infrastructure, vacant and underutilized land, productive private land, and green networks of parks, parkways, rivers, streams, wetlands, and forests. Using the entire city as a canvas, *GreenPlan Philadelphia* pulls together many modest undertakings to create a large-scale transformation.

This plan sets the agenda for the development, maintenance, and use of parks and open spaces in the city. It weaves these key resources into an integrated web of actions to build environmental sustainability, economic vibrancy, and overall livability.

GreenPlan Philadelphia is an overall guide rather than a specific implementation plan. It proposes a framework to streamline park maintenance but is not itself a maintenance plan. It proposes many tactics that apply at the neighborhood level, but it is not a neighborhood plan. Similarly, while it proposes many measures that will benefit, among other things, public health and transportation systems, it is neither a public health plan nor a transportation plan. *GreenPlan Philadelphia* highlights the connections between seemingly separate issues and demonstrates the multiple benefits to be gained from investment in open space.

Linking to efforts underway and anticipated within the city as well as efforts at the regional, state, and federal levels, *GreenPlan Philadelphia* strives to inform and coordinate these ongoing initiatives with data, targets, and recommendations. Drawing on national examples, it highlights best practices that recognize the values and desires of Philadelphians. Additionally, *GreenPlan Philadelphia* opens a dialogue with private, governmental, and institutional owners to coordinate use of best practices.

WHO IS *GREENPLAN PHILADELPHIA* FOR?

GreenPlan Philadelphia is for everyone interested in creating a better future for Philadelphia. It is a resource for local government, spelling out the role of various City agencies. It is for businesses, fostering partnerships to help create wealth and attract valued talent to the region. It is for citizens, providing a framework to help focus the efforts of advocates for a greener city. It is for the many for-profit and nonprofit groups that partner with the City to manage open space, adopt parks, plant trees, or involve youth. It is for property owners of all types and scales: commercial, governmental, institutional, and private. *GreenPlan Philadelphia* asks all of us to participate in realizing a greener, more sustainable city.

GreenPlan Philadelphia assigns performance targets and recommendations to specific City agencies. By adopting the Plan, agencies agree to adopt its targets as their own. While not generally prescriptive for private and institutional landowners, *GreenPlan Philadelphia* encourages private actions that work in concert with public actions. Ultimately, *GreenPlan Philadelphia* sets up a framework that should result in the most efficient and effective expenditure of time and money on open space.

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THE GENESIS OF *GREENPLAN PHILADELPHIA*

The seeds of *GreenPlan Philadelphia* took root with the Open Space Planning Group, a joint task force comprised of representatives from City departments and non-governmental organizations that began meeting in 2001 under the auspices of the Office of the Managing Director. The city's open spaces were vulnerable to residential and commercial development. When development resulted, it often occurred without consideration for the community's need for quality open spaces. A comprehensive open-space plan was needed to enhance and maintain existing parks and to plan for the acquisition of new parks and open spaces for communities in need.

Funding for parks and open space from public and private sources was also decreasing. In a competitive fund-raising environment, funding organizations—whether agencies, foundations, or other sponsors—stipulated that projects under consideration should support the goals and recommendations of a comprehensive, citywide strategic plan for open space. As the initial step toward developing such a plan, the Open Space Planning Group began conducting regular meetings to coordinate the activities of several City departments and agencies concerned with open space, parks, and recreation.

In 2005, the City Planning Commission completed an open-space pilot study funded by the Pennsylvania Urban and Community Forestry Council. That fall, the Open Space Planning Group applied for and received a planning grant from the Pennsylvania Department of Conservation and Natural Resources (DCNR). With the findings of the pilot study and project funding in hand, work on *GreenPlan Philadelphia* began in January 2006.

The development of a comprehensive open-space plan required broad representation from City departments and non-government organizations. A Steering Committee with representatives from fourteen City departments and agencies and eleven non-government organizations assembled under the auspices of the Office of the Managing Director. An eight-member Management Group—comprised of representatives from six City departments that work extensively with projects and issues related to greening, open space, and recreation—led this broad effort. The Management Group provided strategic direction and guided the work of the Steering Committee and eight working groups, each tasked with researching best practices and gathering data around a specific discipline, such as economic development and environmental issues.

RESIDENTS SPEAK OUT

The Management Group also reached out to the public through a variety of forums to ensure that community needs and concerns were well-represented. Engaging residents was one of the core processes in the development of *GreenPlan Philadelphia*. With the assistance of the Pennsylvania Horticultural Society (PHS), and the planning consultants from Wallace Roberts & Todd after they were engaged, the City aggressively sought community input from all city neighborhoods—and from the widest possible range of residents. *GreenPlan Philadelphia's* civic-engagement efforts included special topic forums, partner sessions, a plan website, digital and paper surveys, informational neighborhood toolkits, features in newspapers, speaking engagements, and community meetings.

More than 2,000 residents attended 18 community meetings, and several hundred more attended speaking engagements by City staff and project team members. Special-topic forums, including the Business Leadership Dialogue, Rivers Forum, Tree Canopy Forum, and Youth Summit, attracted even more community members.

During public meetings, residents identified many priority actions, among them:

- Provide new open space
- Provide new greenways (and link them)
- Plant more trees
- Improve riverfronts and access
- Enhance bicycle access
- Enhance pedestrian access
- Change planning policies on new development (to promote provision of open space and use of green-development strategies)
- Improve hard surfaces and structures (traffic calming, greening, improving furnishings)
- Change planning policies on open space (to provide for equitable access, ecological function, and future open-space needs)
- Use innovative approaches for enhancements
- Improve natural landscapes and plantings

Via surveys, citizens mentioned themes such as maintenance and lighting of parks. Citizen concerns and recommendations were documented in PHS's *GreenPlan Philadelphia Community Engagement Report* from October 2007.

PLAN DEVELOPMENT

After evaluating responses to a request for proposals at the end of 2006, the City selected a consultant team led by Wallace Roberts & Todd, LLC (WRT) to develop the plan's approach, documents, and presentations. The WRT team began work in March 2007, collaborating throughout the next year and a half with the *GreenPlan Philadelphia* Management Group. As a result of a robust planning process, *GreenPlan Philadelphia* offers the city a strategic, innovative, and community-embracing strategy to significantly transform and revitalize Philadelphia.

Engaging the public. Joanne Dahme of the Water Department and Mami Hara of Wallace Roberts & Todd (above) and GreenPlan Philadelphia Management Group members Eva Gladstein and Robert Allen (below) answer questions about *GreenPlan Philadelphia* and gather feedback from residents of West Philadelphia.



Pennsylvania Horticultural Society



Pennsylvania Horticultural Society



PennPraxis, WRT

Realizing the Delaware's potential.

A Civic Vision for the Central Delaware
set in motion an ambitious and far-reaching
effort to reclaim a long-neglected waterfront
resource.

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LOCAL INITIATIVES

In the last few years, Philadelphia has experienced a burst of planning activity. The Sustainability Working Group, an inter-agency effort to promote, coordinate, and monitor sustainability performance, developed a *Local Action Plan for Climate Change* that lists 28 actions to reduce carbon emissions. The City also joined the Large Cities Climate Leadership Group of the Clinton Climate Initiative to develop plans and policies to reduce greenhouse gas emissions.

The Philadelphia Water Department recently introduced state-of-the-art stormwater management regulations that apply to developments disturbing 15,000 square feet or more of land. The regulations require developers to manage stormwater on site and encourage low-impact development techniques.

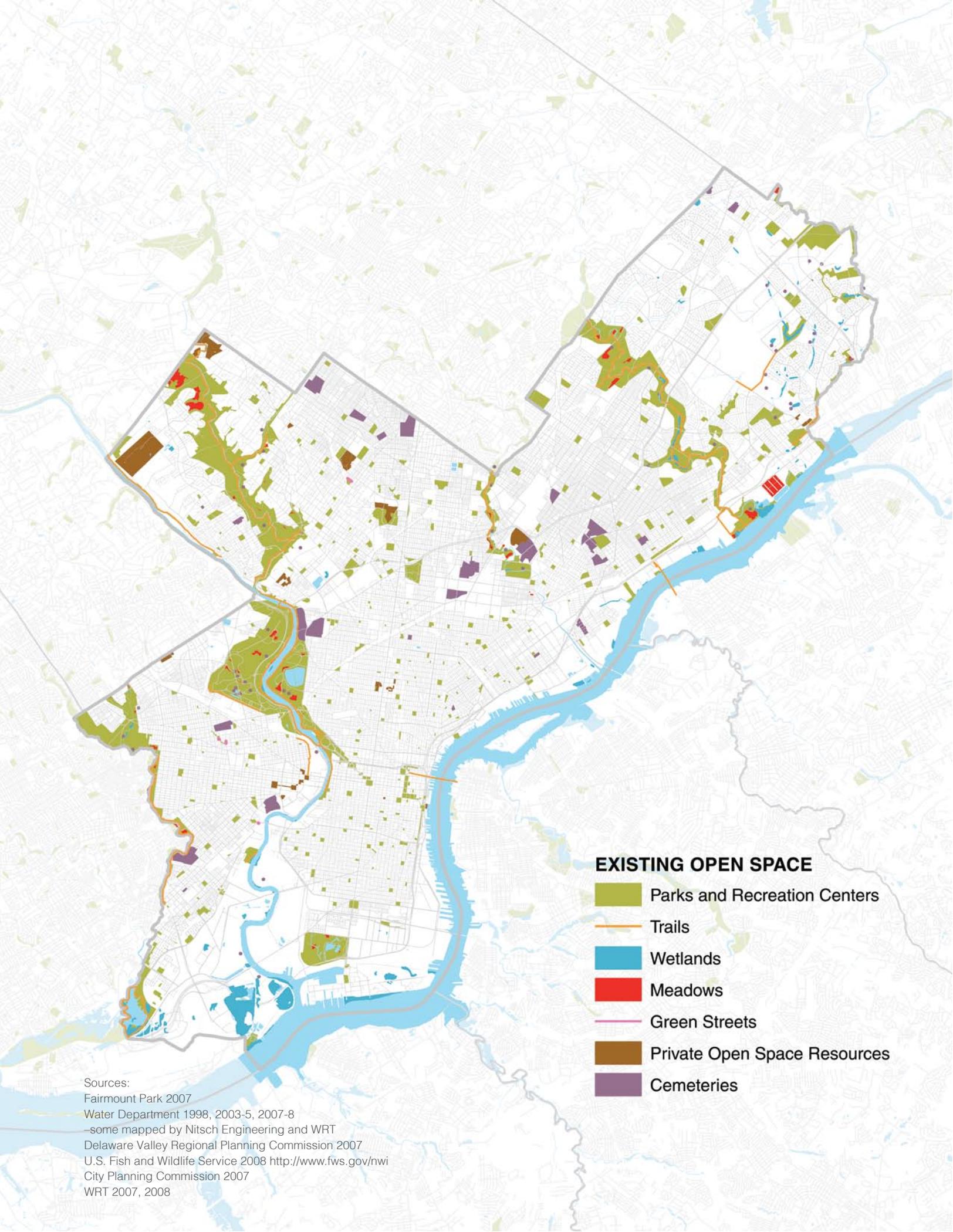
On October 12, 2006, a Mayoral executive order invited PennPraxis to lead a citizen-driven, open, and transparent planning process for the Delaware River waterfront to create a civic vision for development along the river from Allegheny Avenue to Oregon Avenue. The year-long planning process, which involved thousands of citizens and experts, resulted in a long-term plan, formally introduced in November 2007. The plan calls for an extension of the existing street grid to connect with waterfront parks, trails, and new development. In November 2009, the Delaware River Waterfront Corporation selected a consultant to turn the civic vision into a waterfront master plan.

The real estate boom generated new interest in neighborhood planning. The City Planning Commission and local civic organizations produced a number of new neighborhood plans.

It has been 50 years since the City Planning Commission produced a comprehensive plan for the city. Through "Imagine Philadelphia: Laying the Foundation", the City Planning Commission took the first steps towards a new plan. A comprehensive plan is now underway. In August 2009, the City's Office of Sustainability completed *Greenworks Philadelphia*, a comprehensive sustainability framework for the city. *GreenPlan Philadelphia* will become an important component of both comprehensive plans.

In May 2007, nearly 80% of Philadelphia voters approved a ballot question that established a Zoning Code Commission. The Commission is currently drafting the new code and projects that it will send the new code to City Council by fall 2010.

Given the timing of *GreenPlan Philadelphia*, an unprecedented opportunity exists for the Zoning Code Commission to incorporate sustainability practices and new requirements for open space into the new code and into other related regulations, principles, and guidelines.



EXISTING OPEN SPACE

-  Parks and Recreation Centers
-  Trails
-  Wetlands
-  Meadows
-  Green Streets
-  Private Open Space Resources
-  Cemeteries

Sources:
Fairmount Park 2007
Water Department 1998, 2003-5, 2007-8
some mapped by Nitsch Engineering and WRT
Delaware Valley Regional Planning Commission 2007
U.S. Fish and Wildlife Service 2008 <http://www.fws.gov/nwi>
City Planning Commission 2007
WRT 2007, 2008

A HISTORY OF INNOVATION

Philadelphia's current open space system consists of both developed and undeveloped lands with a range of uses and zoning. It is owned and managed by multiple public and private entities, including the city, state, and federal governments; quasi-public agencies; nonprofit organizations, universities, and other private owners and operators.

The landscape of the municipal park system was first shaped by efforts in the 18th century to protect the Schuylkill River. In the late 1700s, epidemics of yellow fever, then considered a water-borne disease, compelled the City to begin purchasing land in the Schuylkill watershed to curtail water pollution. Citizens supported the land acquisitions along the river but also advocated for more accessible, dispersed parks throughout the city. As a result, Fairmount Park now consists of 9,200 acres across Philadelphia and beyond the city's boundaries.

DIVERSE OWNERSHIP

The largest of Philadelphia's parks and natural areas are still concentrated around waterways. These include watershed parks, such as Wissahickon Valley Park and Pennypack Park. In addition, 142 neighborhood parks and squares serve neighborhoods across the city along with 160 recreation centers and playgrounds. These municipally-controlled parks, playing fields, off-road trails, and natural resource areas account for roughly 10,300 acres, or 12% of the land in Philadelphia.

The federal and state governments also control significant conservation and recreational sites. Federal resources include the John Heinz National Wildlife Refuge at Tinicum and Independence National Historical Park. Benjamin Rush is the only state park inside the city's boundaries.

Institutions and private entities own large open spaces that include golf courses, sports clubs, stadiums, schools, college and university campuses, nature reserves, arboretums, and a zoo. Many private spaces, in particular landscaped areas on university campuses, are accessible to the public year-round free of charge, while others are accessible with a fee.

Other categories of space encompassed by *GreenPlan Philadelphia* include cemeteries, vacant and undeveloped lots, streets, and the easements and rights-of-way controlled by various public agencies, utilities, and corporations. Together, these account for roughly 0.6% of the city's land.

Mapping Philadelphia's open space system (facing page). The majority of the city's open space is comprised of publicly controlled parks and recreation centers. Within and outside these parks and recreation centers are trails, wetlands, meadows, and green streets. Supplementing this system are privately-owned open spaces like university campuses and cemeteries.

REGIONAL CONSIDERATIONS

Philadelphia is the heart of a large metropolitan region, and since the natural environment does not recognize political boundaries, *GreenPlan Philadelphia* encourages collaboration with surrounding areas. The best efforts within city limits to improve water quality, for example, will founder without a region-wide commitment to similar targets. The City can do much to improve air quality and help its residents drive less, but low-density settlement patterns outside the city undercut those efforts if driving continues to grow and only a small minority of people can access Philadelphia by means other than a car. Urban agriculture within the city will be stymied if efforts to preserve close-in agricultural land outside the city fail. The region's diversity of natural environments cannot thrive without a concerted effort by cities, counties, and even states. Regional government agencies and a regional caucus of county leaders exist, but a deeper level of cooperation can be achieved, and a greater commitment to regional environmental health should be a priority. Environmentally sustainable policies improve the region's livability and competitiveness.

Among the region's essential resources are its rivers—which are sources of drinking water and shelter a rich diversity of fish and wildlife. Rivers function as a regional system, which means that no one county can do alone what is required. Recently, the Philadelphia Water Department's Office of Watersheds created a hydrologic model to understand the potential impact of growth in the municipalities upstream of Philadelphia. The model indicated that water quality of streams and rivers is significantly at risk if the current low-density development model continues with its high dependence on roads and parking lots. A regional approach is necessary to protect the rivers, recognizing that activities upstream affect conditions downstream.



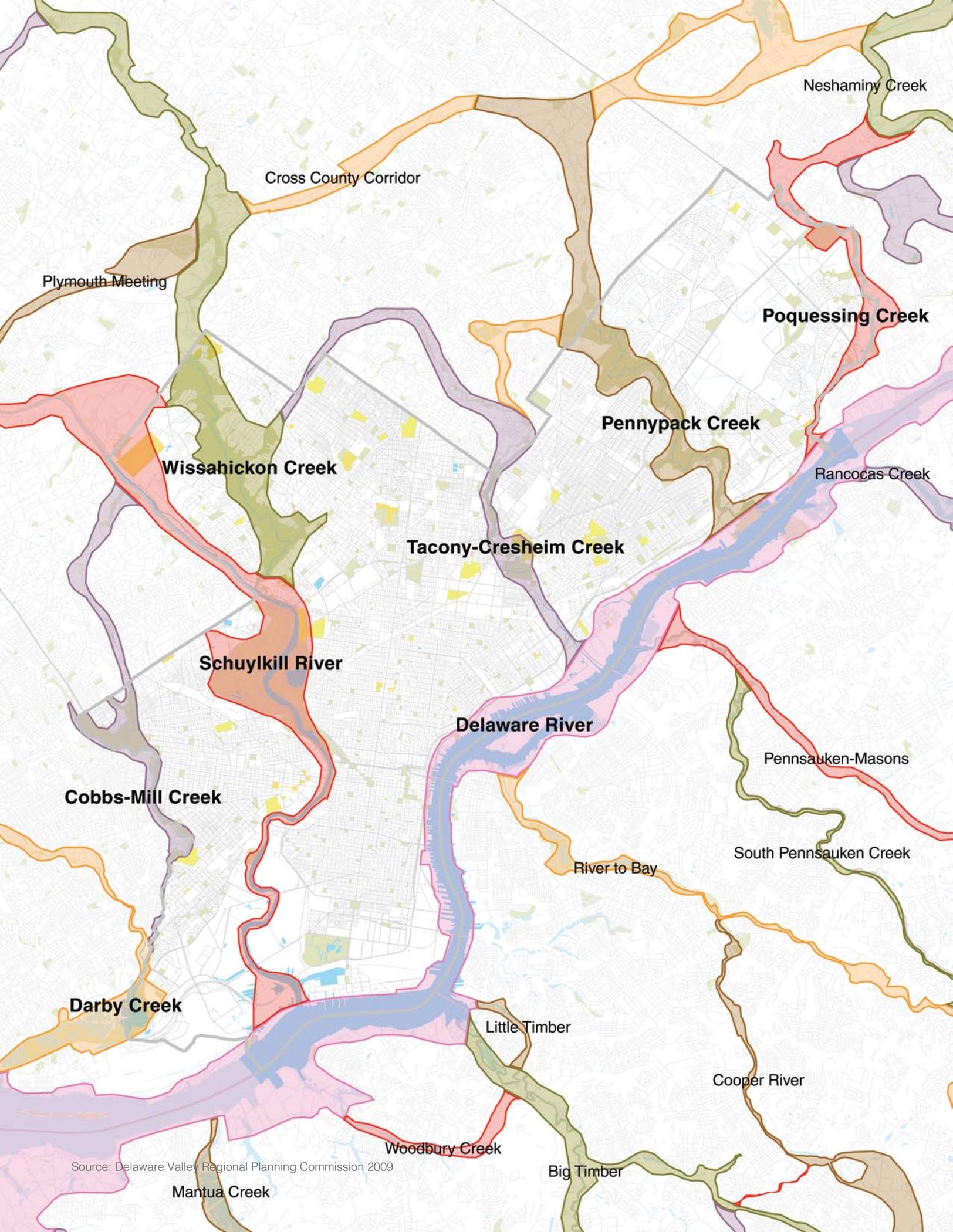
Andrew Dobshinsky, WRT

The Water Department has established regional partnerships with adjacent counties and municipalities in the region's seven watersheds (Delaware, Schuylkill, Darby-Cobbs, Wissahickon, Tookany/Tacony-Frankford, Pennypack, and Poquessing). Within the Schuylkill watershed, this partnership formed the Schuylkill Action Network. It is a coalition of regulators, utilities, watershed organizations, land trusts, and other organizations that coordinates protection and preservation of land along the Schuylkill River that has been identified as critical to water quality and is highly susceptible to development. Other similar, though smaller-scale, partnerships are underway.

Coordinating park and trails development, linking park systems, preserving undeveloped land, and maintaining farmland close to Philadelphia are all important to city and regional health. Large tracts along the Delaware River, both in and beyond the city, offer enormous potential to extend these systems, to preserve drinking-water quality, to create recreational opportunities, and to host environmentally-sensitive, high-value development. The river is rich with history and meaning, and its stories could be told in a more compelling way to resonate with the community. The lower Delaware, including the Philadelphia riverfront, could become part of the Delaware & Lehigh National Heritage Corridor, for example, but the work of establishing this designation has yet to begin.

Protecting the Schuylkill River. As a participant in the Schuylkill River Action Network, the Water Department collaborates on the protection of a regional resource that is critical to water quality and highly susceptible to development.





Neshaminy Creek

Cross County Corridor

Plymouth Meeting

Poquessing Creek

Wissahickon Creek

Pennypack Creek

Rancocas Creek

Tacony-Cresheim Creek

Schuylkill River

Delaware River

Pennsauken-Masons

Cobbs-Mill Creek

South Pennsauken Creek

River to Bay

Darby Creek

Little Timber

Cooper River

Woodbury Creek

Big Timber

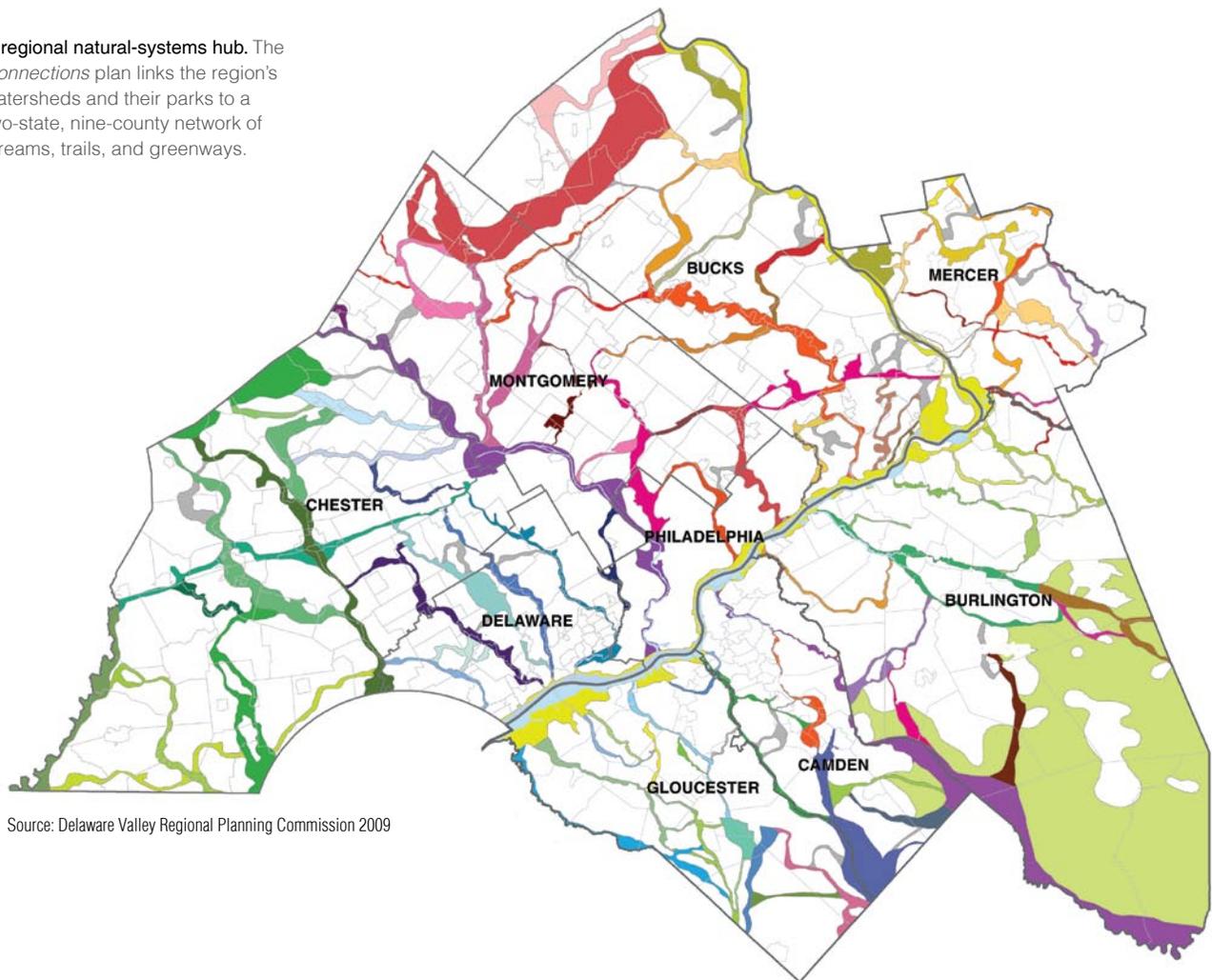
Source: Delaware Valley Regional Planning Commission 2009

Mantua Creek

CONNECTIONS: *The Regional Plan for a Sustainable Future*

In 2009, the Delaware Valley Regional Planning Commission (DVRPC) developed a long-range plan for the nine-county, bi-state region it covers to the year 2035. The open space framework developed in its report, *Connections: The Regional Plan for a Sustainable Future*, outlines a web of resources aligned with riparian corridors, major historic and cultural corridors, and trail opportunities. *GreenPlan Philadelphia* recommendations align with those in the plan.

A regional natural-systems hub. The *Connections* plan links the region's watersheds and their parks to a two-state, nine-county network of streams, trails, and greenways.



Source: Delaware Valley Regional Planning Commission 2009



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RISING DEMAND

In Philadelphia, more residents than ever use parks. According to the 2006 *Mayor's Report on Citizen Services*, the percentages of households who visited Fairmount Park or a neighborhood park once a month or more were 42.4% and 50%, respectively.

GreenPlan Philadelphia has tuned its recommendations to accommodate changing preferences. In the United States, walking is the most popular recreational activity, with more than 82.5% of people walking for pleasure.¹ This number is growing steadily. An ever-growing range of team sports remain perennially popular. Bicycling, running, visiting nature centers and historic sites, canoeing, birding, and many other activities are drawing greater interest, while participation remains stable in other categories, like sailing and rowing.

Despite the upward trends, Philadelphia children don't play enough outdoors. Too many spend too much time indoors.² The alarming health impacts of an increasingly sedentary lifestyle include an obesity epidemic from which even children are not exempt.³ Though the number of children involved in organized team sports is at an all-time high, few children have the time or opportunity to explore nature.⁴ Numerous recommendations in *GreenPlan Philadelphia* strive to help children play more, access nature, and become active participants in creating a greener city.

Finally, outdoor travel is the fastest-growing segment of tourism. Weekend travel is becoming more popular, while longer trips are declining. A survey by the Greater Philadelphia Tourism Marketing Corporation found that the top five outdoor activities for residents and out-of-town visitors included walking, visiting historic landmarks or historic sites, jogging and rollerblading, biking, and picnics or cookouts.⁵

Urban Wilderness. Some parts of Wissahickon Valley Park offer nature in an almost primordial state, as at the Native American statue. *GreenPlan Philadelphia* recommendations will bring such experiences to many more children.

RISING AWARENESS

As we face a future with less oil, diminishing supplies of clean water, rising temperatures, and rising sea levels, an environmental strategy to meet the challenges of today and tomorrow has never been more urgent. A growing segment of the population has a profound sense of social and environmental responsibility. Their purchasing power is driving demand for more energy-efficient products, recycled materials, ecotourism, organic foods, and green-building practices.

Recognizing these challenges and citizen commitment, more than 700 mayors, including Mayor Michael Nutter, have signed the Mayors Climate Protection Agreement. The Mayor also developed *Greenworks Philadelphia*, a city-wide sustainability strategy, of which *GreenPlan Philadelphia* forms a key part.

The U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) building-rating system has gained wide acceptance among owners and municipalities, including Philadelphia, where the City's new construction and renovation projects of 10,000 or more square feet must be designed to meet, at a minimum, LEED Silver certification. In many ways, *GreenPlan Philadelphia* parallels LEED in the context of urban landscape, permitting an approach consistent with national trends, yet customized to Philadelphia's unique circumstances.



Philadelphia Million Solar Roofs Community Partnership

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GREEN MOMENTUM

METHOD

HOW TO USE *GREENPLAN PHILADELPHIA*

To begin, *GreenPlan Philadelphia* provides a basis for understanding the wide range of benefits associated with effectively planned and managed open spaces. The benefits are grouped into environment, economy, and quality of life. Having established this framework, *GreenPlan Philadelphia* goes on to describe the individual elements that combine to make effective urban open spaces. Then, *GreenPlan Philadelphia* describes the different places that can be called open spaces, referencing their component elements. Each element and place has a set of targets and recommendations to provide guidance in improving the city's open space network. While each individual element or place may seem small, many incremental commitments and modest investments add up to large-scale transformation.

After describing the wide range of targets and recommendations associated with physical infrastructure, *GreenPlan Philadelphia* also points out opportunities to streamline management practices, offers a list of existing projects and opportunities, and provides a checklist to help evaluate the quality of new projects and opportunities that are sure to arise in the future.

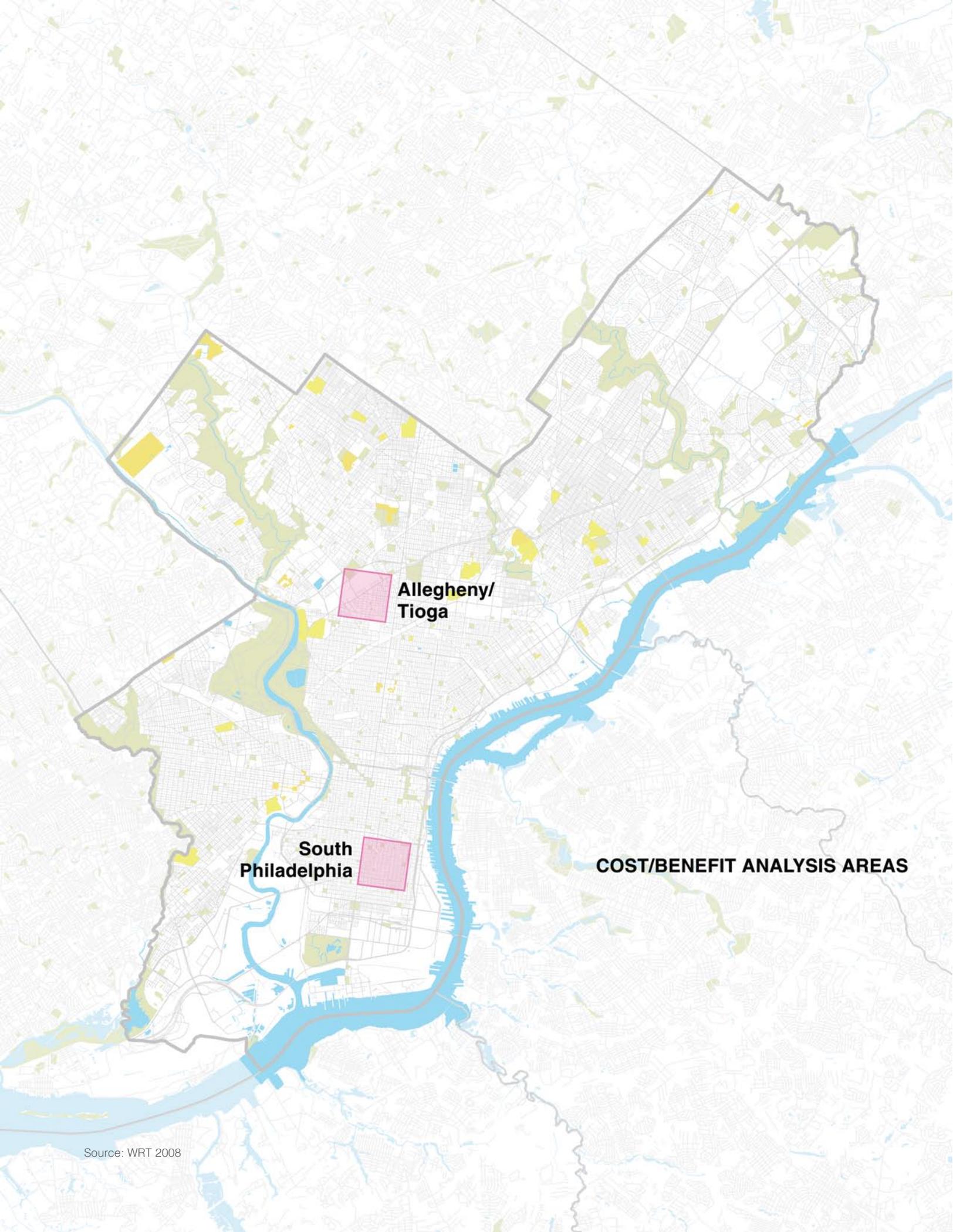
A **Network of Benefits** incorporates *GreenPlan Philadelphia* into the broader well-being of the city, helping decision makers to understand the recommendations in the context of larger goals, priorities, and commitments. While a few *GreenPlan Philadelphia* recommendations can make a discernible difference in themselves, most combine with other recommendations to build value incrementally, a multi-focal approach yielding a network of benefits.

The Benefits Matrix summarizes the complex cause and effect relationships to help decision makers set priorities. While some benefits are easily quantifiable, others, while no less important, are harder to track. *GreenPlan Philadelphia* takes care to account for both quantifiable and more elusive qualitative benefits.

Each of the three broad categories—environment, economy, and quality of life—are broken down into more cohesive and distinct component parts. Environmental benefits incorporate air and water quality, as well as the health of natural ecosystems. Economic benefits account for energy efficiency, gains in regional competitiveness, and the benefits of complementary land uses. Quality of life benefits include contributions to transportation and public health systems as well as the enjoyment, safety, and pride of local residents.

Elements of Green Places are the building blocks of the spaces that surround us and our buildings. The plan considers trees, meadows, and wetlands as well as urban agriculture and community gardens. Walkways and bikeways combine to form trails that provide connections across the city. Stormwater management tools, high-performance surfaces, and renewable energy improve the performance of an open space, harnessing and re-directing natural energy flows.

Green building leadership. The trellises on the Cusano Environmental Education Center at the John Heinz National Wildlife Refuge save energy by shading glass. It is one of many measures that are recognized in LEED certification.



**Allegheny/
Tioga**

**South
Philadelphia**

COST/BENEFIT ANALYSIS AREAS

Before creating any of the targets or recommendations, we evaluated whether or not greening measures could be cost effective. Our research provided a resounding “yes.”

We selected two representative square-mile sample areas in Philadelphia that contain different types and amounts of land uses—one in Allegheny/Tioga and one in South Philadelphia. Then, we reviewed the most current information on the quantifiable costs and benefits of each type of green element. The types of costs included installation and annual maintenance. The types of benefits included annual energy savings, savings on maintenance, stormwater capture, pollution mitigation, and others. Next, we looked at the actual areas available to implement the green elements. For example, for green roofs, we calculated how many square feet of roof exist within both square-mile study areas and then examined the impact of installing green roofs over 25% of the total available roof area.

The benefits are only calculated in terms of the square-mile study areas. While direct extrapolation is not possible, Philadelphia’s land area encompasses 135 square miles.

Please note that the greatest benefit for some of the green elements, such as tree planting or green roofs, is in terms of enhanced property values. This value is only realized at the time of sale, so it called out separately as a one-time benefit.

Green Places are what results from the successful combination of multiple elements that come together to reduce pollution, build value, and enhance quality of life. Places include parks and recreation spaces, park-like schoolyards, and green streets. There are also specific sections on waterfronts, vacant land opportunities, green development, plazas and auxiliary spaces, and rail and utility corridors.

Management and Operations is aimed at helping the City more effectively manage its outdoor resources. *GreenPlan Philadelphia* proposes means by which agencies can coordinate their efforts to get more for less. It points out largely administrative measures that can contribute to streamlining the management and maintenance of the city’s parks, playgrounds, and other open spaces. Additionally, *GreenPlan Philadelphia* offers an array of private development incentives aimed at aligning the goals of public and private investment toward an overall sustainable strategy. The recommendations seek to enhance relationships with for-profit and nonprofit partners and volunteers, focusing particularly on encouraging a more active citizenry. It proposes an outreach program, bolstered by a general growth in environmental awareness, to help agencies, partners, and citizens understand *GreenPlan Philadelphia* and the role they can play in making Philadelphia America’s greenest city. Finally, this section offers a menu of funding options.

Determining the cost effectiveness of green elements (facing page).

GreenPlan Philadelphia evaluates the cost effectiveness of greening measures by using the most current information on the quantifiable costs and benefits of each green element and determining how each green element could be applied to two representative square-mile sample areas in Philadelphia. With rapidly rising costs of energy and stormwater management, the importance of implementing green measures—and the margin of their benefits—will surely increase for most green elements.

Projects and Opportunities take *GreenPlan Philadelphia* from the ideal to the real. The Management Group and the many stakeholders who participated in the creation of *GreenPlan Philadelphia* helped identify more than 600 project opportunities that would help advance *GreenPlan Philadelphia* objectives. Some are already at some stage of design or construction readiness, while many others remain to be prioritized in future planning at the community level. *GreenPlan Philadelphia* provides the context within which new planning initiatives can take root.

Objectives for Open Space Projects is a simple checklist that decision makers, investors, and other funders can use to set priorities, allocate funding, and design projects to maximize benefits. It can preclude complex regulatory regimes or elaborate incentive systems. Developers, advocates, and neighborhood groups can also use the objectives to align their projects with *GreenPlan Philadelphia* targets and recommendations.



NETWORK OF BENEFITS

Overview

Environment

Economy

Quality of Life

NETWORK OF BENEFITS

OVERVIEW

ENVIRONMENT

ECONOMY

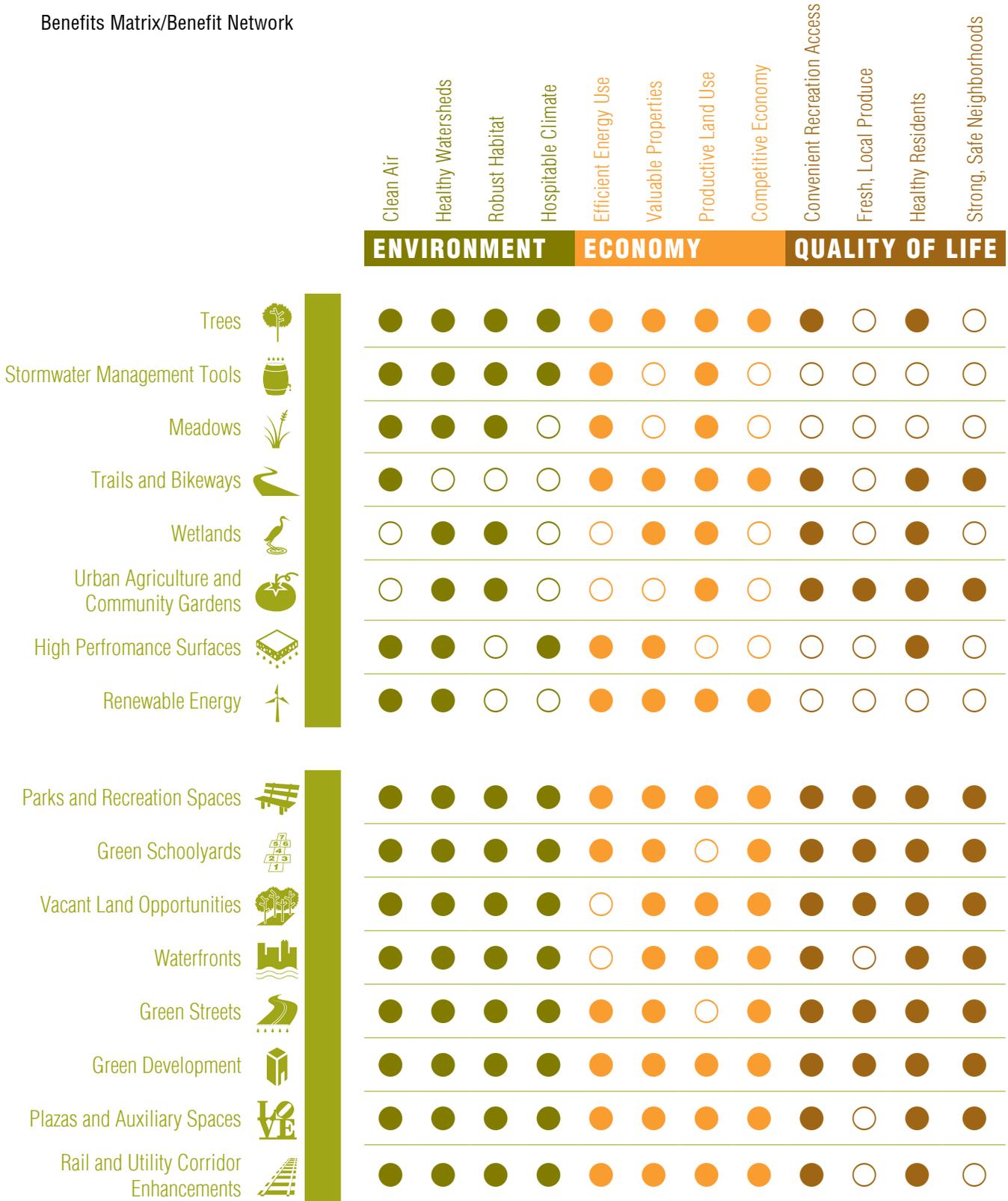
QUALITY OF LIFE

In a world where the sky appears to be getting a little bluer and the streams a little cleaner, a world where the City of Philadelphia, after having scraped off a few layers of grime, is already a much more livable place than it was 40 years ago, the need for *GreenPlan Philadelphia* may not seem immediately apparent. After all, clean air and water have been a cornerstone of public policy for over 40 years. Having already enacted significant environmental protection policies, the City has made great strides in becoming the vibrant, active, beautiful place that *GreenPlan Philadelphia* envisions.

Today, the environment's influences on health and well being can seem far more abstract and, as a consequence, less urgent. While the most obvious and visible threats have been significantly reduced—neighborhoods once clouded by smoke now enjoy clear skies, and waters once murky have now become places to bike along and boat upon—there is still much work to be done. Mitigating pollution will continue to be an important consideration, but the challenge of today is not simply mitigating threats. The challenge now is gaining the most benefits from a well-managed environmental infrastructure, benefits not limited strictly to environmental health but economic and social health as well. An effective environmental infrastructure strategy can be the key to minimizing overall infrastructure costs while also maximizing benefits. An understanding of the wide range of benefits associated with green infrastructure investments is essential to effective public policy in the 21st century. Establishing a way of identifying all the benefits associated with a particular action, while also keeping in mind their associated costs, will give decision makers a framework for both setting priorities and making decisions.

The triad of environment, economy, and quality of life is the basis of *GreenPlan Philadelphia's* network of benefits, developed specifically for Philadelphia to establish a common language for sustainable open space and to measure our progress toward achieving a greener, more sustainable city.

Benefits Matrix/Benefit Network



NETWORK OF BENEFITS

OVERVIEW

ENVIRONMENT

ECONOMY

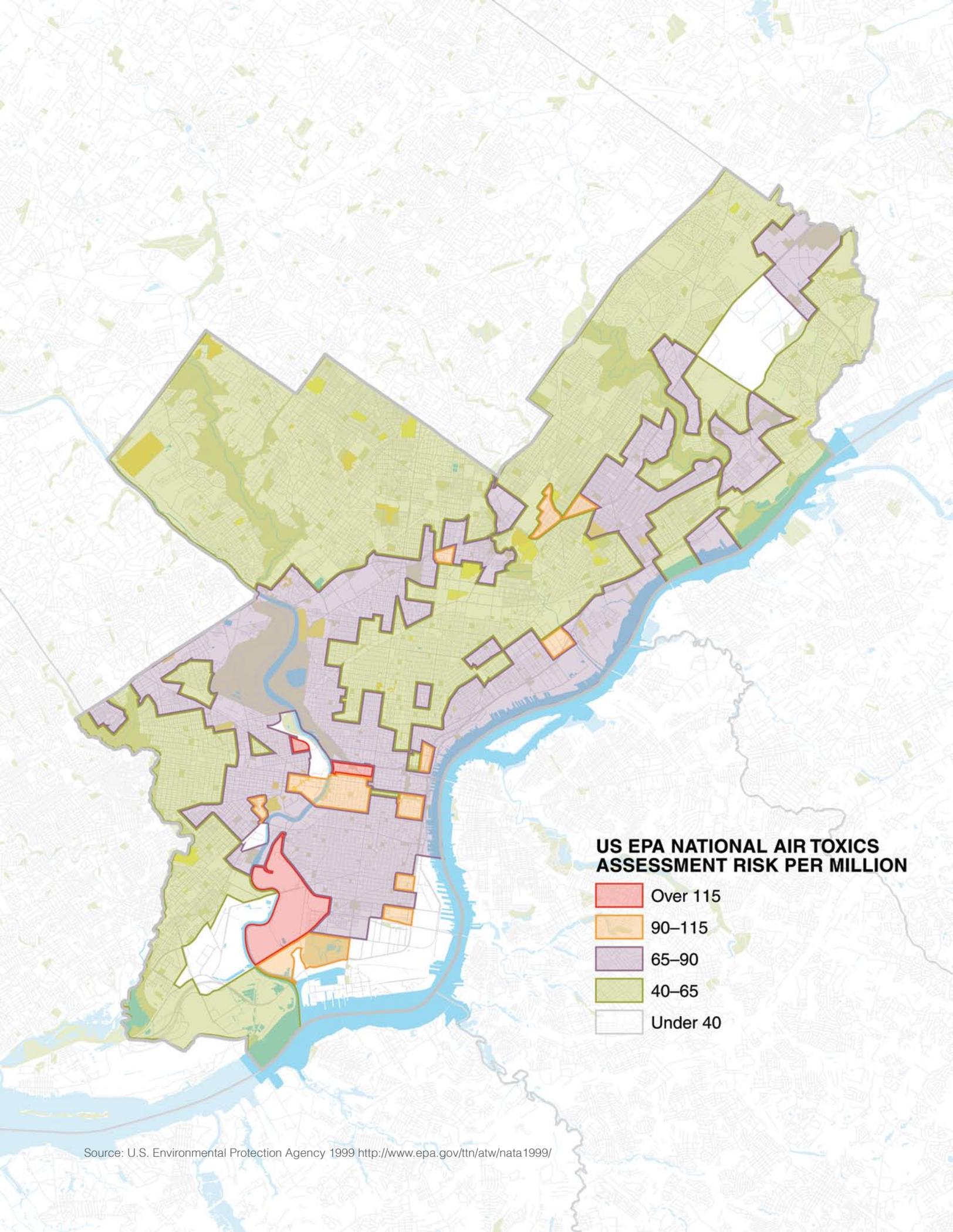
QUALITY OF LIFE

Prior to European settlement, naturally-occurring streams, ponds, forests, and wetlands formed a resilient ecosystem that absorbed floodwaters, cleaned the air, moderated temperatures, and offered plentiful habitat for a wide range of local and migrating species. As Philadelphia grew, it altered, fragmented, and eroded these natural systems, replacing streams with pipes and forests with buildings and paved surfaces.

Over the last three decades, the world has learned that we need not replace nature with engineered systems to suit our urban needs. Restoring natural-system function can alleviate the need for additional traditional infrastructure that is built to perform similar functions—treatment plants, pumping stations, flood-control structures, and combined sanitary sewer and stormwater drainage systems, to name a few.

The city possesses a “green infrastructure”—parks, trees, wetlands, meadows, and a variety of other natural habitats. These serve many of the same functions as the conventional “grey infrastructure” of pipes, drains, and air conditioning, while also providing numerous other advantages. Trees clear the air; planted areas reduce flooding; marshes filter pollutants. Natural systems can often perform these needed tasks at lower cost, while hosting wildlife, boosting real-estate values, and providing enjoyment. Natural systems are already part of such engineered infrastructures as the city’s drinking water supply, energy grid, stormwater management, and transportation systems. *GreenPlan Philadelphia* helps to further integrate natural processes into urban infrastructure.

Though Philadelphia today looks little like the “green country town” envisioned by William Penn in 1683, *GreenPlan Philadelphia* borrows time-honored ideas he had in mind, using trees to shade streets and pleasant park squares to offer recreation and respite. *GreenPlan Philadelphia* encourages bringing natural-functioning systems—and their benefits—to every corner of the city. Through a coordinated effort, relatively modest investments can work together to create large-scale enhancements.



**US EPA NATIONAL AIR TOXICS
ASSESSMENT RISK PER MILLION**

- Over 115
- 90-115
- 65-90
- 40-65
- Under 40

Source: U.S. Environmental Protection Agency 1999 <http://www.epa.gov/ttn/atw/nata1999/>

CLEAN AIR

days per year when Air Quality Index is
100 or below (good or moderate) 354  365

Philadelphia has made enormous strides in reducing pollution since the early 1960s, but the air we breathe remains a significant health risk and an expensive urban problem. Poor air quality is associated with higher rates of death, hospitalization, and complications from cardiovascular disease, including heart attacks and heart failure. In addition, a lack of clean air predicts impaired lung function and higher rates of respiratory illness, including asthma, in both children and adults. Currently, Philadelphia is in compliance with the National Ambient Air Quality Standards for four of six regulated pollutants but remains out of compliance for ozone and fine particulate matter, telling us that the cumulative cancer risk from toxic substances in the Philadelphia air remains unacceptably high.

Pollutants enter the air through evaporation (as gasoline does), mechanical means (such as automobile tire wear), and the burning of fossil fuels (such as coal in electricity production, oil for heating homes, or gasoline for operating cars). The production of fossil fuels and their combustion are responsible for hundreds of premature deaths, thousands of asthma attacks, and tens of thousands of missed days of work in the region each year.⁶ In addition, polluting acid, smog, and ozone increase the need to clean and repair buildings and install costly infrastructure.

A particular air quality concern today is the emission of greenhouse gases (GHGs). GHGs trap radiant heat from the sun that would otherwise be reflected back into space, causing average temperatures to rise over time. Burning fossil fuels increases atmospheric carbon dioxide (CO₂)—the gas that is responsible for about 60% of global-warming effects. As a participant in the Mayors' Climate Protection Agreement, and to meet one of the targets of *Greenworks Philadelphia*, the City has committed to reduce GHG levels to 20% below 1990 levels by 2015, primarily through CO₂ reduction.

GreenPlan Philadelphia addresses clean air in several respects. Vegetation, especially healthy shade trees, moderates air pollution by lowering air temperatures, reducing building energy use, and directly removing gaseous and particulate pollution either through absorption or retention.⁷ High performance surfaces seek to reduce energy use, which reduces pollutants and GHGs from oil-burning furnaces and coal-powered electric-generating facilities. Trails and bikeways get us out of cars, improving our health while keeping the air cleaner. Renewable energy supplements our energy production with less-polluting alternatives.

Assessing air quality (facing page).
The U.S. Environmental Protection Agency's National Air Toxics Assessment relates air pollution to cancer risk. The higher the number, the worse air quality is and the greater the risk of cancer from air pollutants.



Wissahickon

Pennypack

Poquessing

Tookany/
Tacony-
Frankford

Delaware
Direct

Schuylkill

Darby-
Cobbs

Delaware
Direct

WATERSHEDS

HEALTHY WATERSHEDS

Watersheds are land areas that drain to streams, lakes, and ponds, which in turn feed into rivers. The city has several fresh-water watersheds: Darby-Cobbs, Wissahickon, Tookany/Tacony-Frankford, Pennypack, and Poquessing. The Schuylkill and Delaware Direct watersheds are mixed fresh and salt water, since ocean tides affect both.

Within naturally-functioning watersheds, most rainwater filters into plant roots and soils. The forests that would cover most of Philadelphia in its natural state would slow the runoff of rain as it dripped from branches to the ground, where it would carry nutrients into the soil and recharge underground aquifers. Water-loving trees, shrubs, or wetlands would line natural stream banks. They would filter water further, shelter diverse species of animals, and provide conditions for aquatic life and fish to flourish. Through a variety of means, stream bank wetlands and vegetation would reduce the frequency and severity of stream flooding by holding it back and releasing it slowly.

Today, with more than half of Philadelphia’s land area either paved or covered with buildings, very little optimally functioning landscape remains. The City over time has replaced naturally occurring water systems with an engineered system that uses drains, pipes, culverts, and retention basins to manage stormwater. Most streams in Philadelphia either run in culverts underground or flow in man-made structures intended to channel water, like bulkheads or riprap made of boulders.

Our engineered watersheds and drainage systems are not designed to duplicate all the functions of the natural systems they replace. Instead, they are designed to move water as quickly as possible through the system, often bypassing opportunities to both nourish biological communities and recharge groundwater supplies. This approach regards stormwater as a liability rather than a resource, which accounts, at least in part, for many of the city’s water problems.

The Water Department has undertaken the task of assessing the quality and health of the watersheds, with a focus on not only meeting federal clean-water standards, but also understanding how the city’s current approach to stormwater management compares with more naturally functioning systems.

To determine the overall health of the city’s non-tidal watersheds, *GreenPlan Philadelphia* identifies four key indicators: biological health, chemical health, infiltration, and storm events. Metrics for each indicator were normalized on a scale from 1 to 10 with the reference conditions being a 10. The closer the score is to 10, the healthier the stream.

Biological Health

Biological Health



Measuring water quality (facing page). The Water Department measures the quality of water in each of the city’s watersheds. The Delaware Direct and lower Schuylkill watersheds are tidal. The others are entirely freshwater systems.

The Water Department assessed the biological health of the city’s watersheds by comparing the biological communities that they support—like small insects, other invertebrates, and fish—to more natural watersheds that have not been impaired by urbanization. If a watershed exhibited a variety of living things in natural balance, the score was high. If there were few types of living things found, or the community was very unbalanced, the score was low. No watershed scored higher than 5.00, indicating that all are impaired. The Tookany/Tacony-Frankford watershed is currently in the poorest condition.

Chemical Health

Cobbs	5.71	<div style="width: 57.1%;"></div>	10
Pennypack	3.86	<div style="width: 38.6%;"></div>	10
Poquessing	5.43	<div style="width: 54.3%;"></div>	10
Tacony-Frankford	4.39	<div style="width: 43.9%;"></div>	10
Wissahickon	5.6	<div style="width: 56%;"></div>	10

The Water Department analyzed dissolved oxygen, which fish and other aquatic life require to breathe; fecal coliform bacteria, which indicates contamination with sewage and an increased likelihood of other disease-causing microbial creatures; and phosphorous, which comes from home laundries, industrial uses, and fertilizers. Phosphates and fertilizers can lead to excess oxygen absorption (called eutrophication) that hurts survival of fish and other aquatic species. The results indicate that the chemical health of all the watersheds is impaired, with three scoring just over 5.00. The Pennypack and Tookany/ Tacony-Frankford watersheds have the most impaired chemical health.

Ongoing pollution control has had the greatest success with “point sources.” Water dumped by a factory into a waterway is an example of a point source. The state and federal governments strictly regulate point sources, and they are controlled effectively. “Nonpoint” pollution originates from many sources at variable times. For example, an automobile that leaks transmission fluid onto the street, which then flows into the storm-sewer system, is a nonpoint source. These sources are much harder to control because there are so many of them and they are so diffuse. Philadelphia’s water-quality problems come mostly from non-point sources of pollution.

Expanding the city’s green infrastructure.

Even narrow streets can play a vital role in the city’s green infrastructure. Plantings in sidewalks and along open lot edges can cool structures and retain stormwater.



Adam Krom, WRT

Encroaching on Frankford Creek.

The shrub and tree-lined far shore of Frankford Creek filters runoff from the paved areas beyond and lets it infiltrate into the soil. The natural shoreline helps regulate stream fluctuations and nurtures fish and birds. The bare near shore permits soil and harmful chemicals to run directly into the stream.



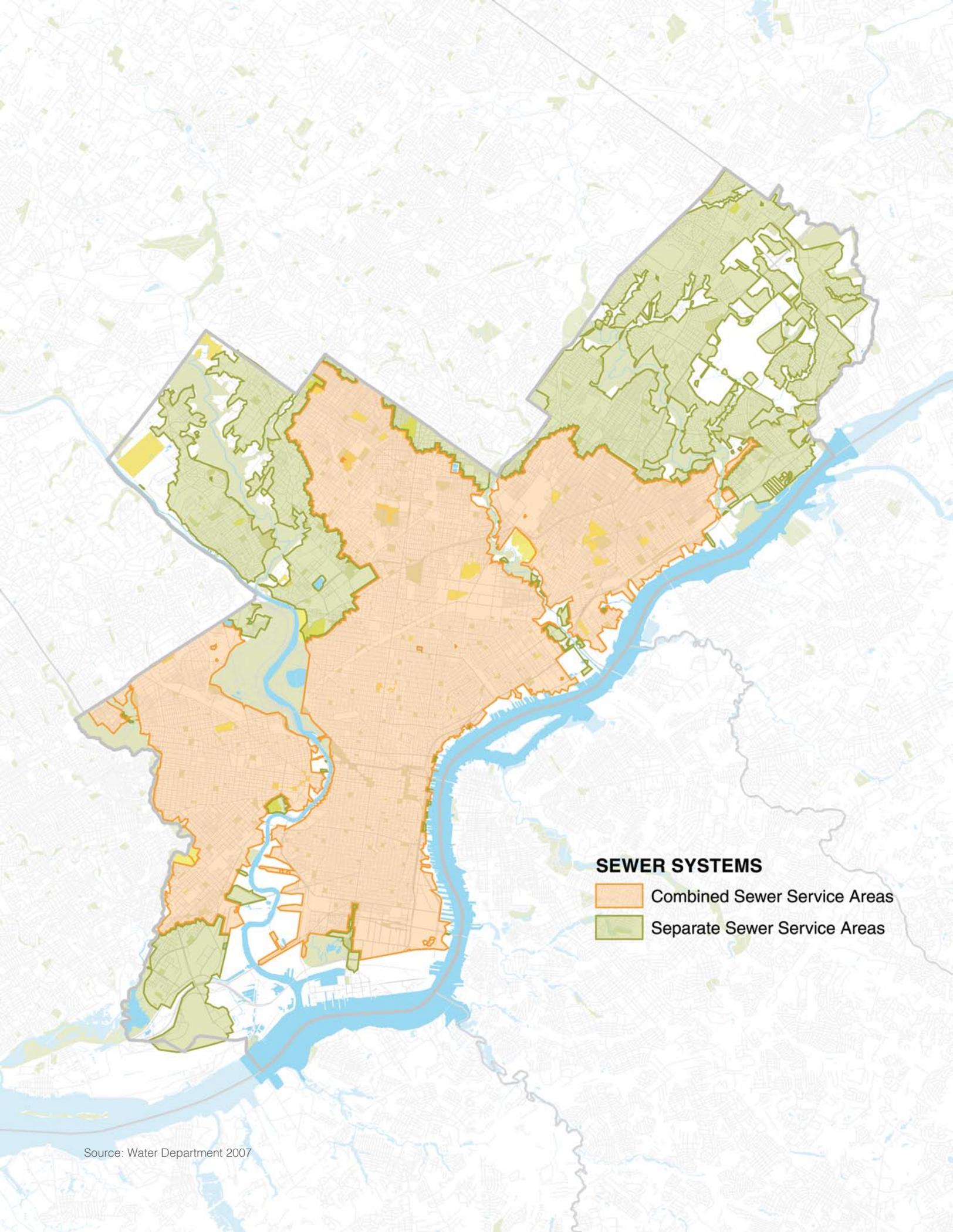
Jennifer Martel, WRT

Infiltration

Cobbs	2.65	<div style="width: 26.5%;"></div>	10
Pennypack	4.99	<div style="width: 49.9%;"></div>	10
Poquessing	2.03	<div style="width: 20.3%;"></div>	10
Tacony-Frankford	1.34	<div style="width: 13.4%;"></div>	10
Wissahickon	5.22	<div style="width: 52.2%;"></div>	10

Infiltration, the absorption of rainwater into soils, is critical to water quality and storm-water management. Maintaining an adequate and consistent base flow is critical. This indicator compared the base flow (dry weather flow) to what might be expected based on the size of the watershed. The Water Department's analysis shows that all five of the city's watersheds have low rates of infiltration. The Tookany/Tacony-Frankford watershed registers the lowest rate.





SEWER SYSTEMS

-  Combined Sewer Service Areas
-  Separate Sewer Service Areas

Source: Water Department 2007

Storm Events

Cobbs	2.62		10
Pennypack	4.99		10
Poquessing	2		10
Tacony-Frankford	1.18		10
Wissahickon	5.63		10

Another indication of infiltration compares storm flow to the daily mean flow. A watershed with poor infiltration will have a lower base flow, but higher rates of flow in the event of a storm. This “feast or famine” situation is typical of urban areas and tends to exacerbate the effects of non-point pollution. By contrast, a watershed with high amounts of infiltration will maintain a more steady flow rate, will have more life forms present, and will suffer less from nonpoint pollution, erosion, and flooding. Based on the Water Department’s findings, the Tookany/Tacony-Frankford, Poquessing, and Darby-Cobbs watersheds experience dramatic swings in stream flow during dry and wet weather conditions.

Considering the poor performance of the city’s watersheds, *GreenPlan Philadelphia* proposes a new approach to stormwater management, one that more closely resembles a naturally-functioning watershed.

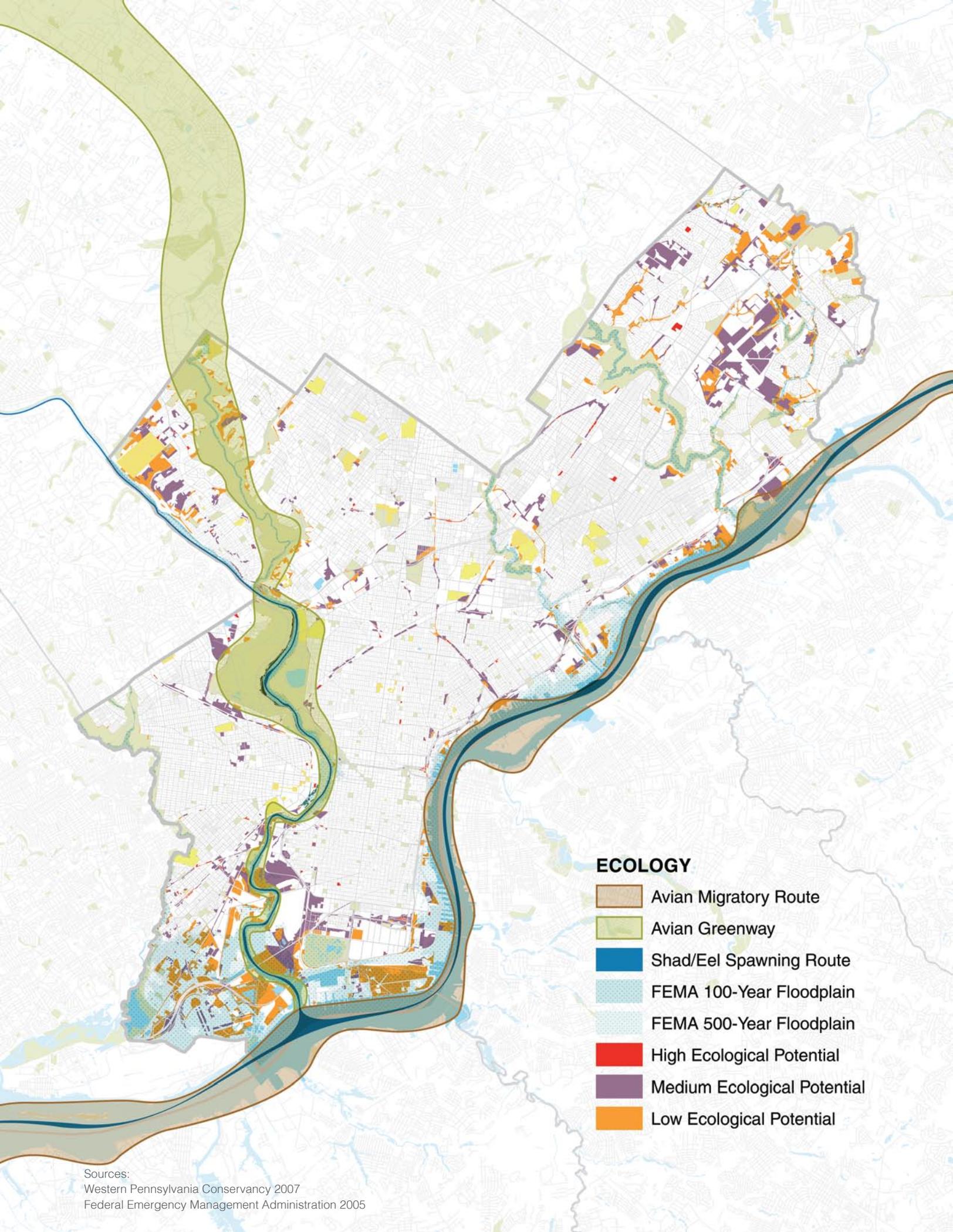
In Philadelphia, there are two distinct sewer systems, with very different effects on watershed health. One sewer system has separate pipes for wastewater and stormwater. The other is a combined sewer system, where pipes for wastewater and stormwater are shared. Both rely heavily on grey infrastructure to move water as quickly as possible through the system.

During dry weather, both systems perform similarly, collecting and conveying wastewater to a water pollution control plant for treatment. During storm events, however, these systems perform differently. In a separate system, stormwater is never treated and is piped directly into the city’s waterways carrying with it the nonpoint pollution that had built up since the last storm. In contrast, combined systems pipe both stormwater and wastewater to treatment plants. While this would seemingly result in the best water quality, the sewers and treatment plants have a maximum capacity. When this capacity is exceeded during heavy rains, untreated water overflows directly into waterways—an event called a combined sewer overflow (CSO)—resulting in the pollution of waterways with not only untreated stormwater but untreated raw sewage as well. These are severe, if short-term pollution events, but they are responsible in significant part for the fact that Philadelphia’s rivers do not meet Federal clean-water standards.

In addition to chemical health challenges, there are also biological health consequences to the current approach to stormwater management. In wet conditions, paved surfaces, culverted streams, and bulkheaded waterway increase the flow and concentration of water movement, causing erosion and destroying habitats. In dry conditions, because it has already been piped away, water is not available to nourish biological activity. Starved of water, stream temperatures rise, as does the intensity of pollution, all of which affects the biological health of streams.

Recently enacted Water Department standards seek to slow or even prevent the flow of stormwater into the sewer system. By managing the first inch of rainfall before it reaches the sewer system, the ultimate goal is to improve the health of the watershed in both biological and chemical terms. Diverting the first inch of precipitation would alleviate the CSO events from most storms. The first inch is also particularly critical since most of the non-point pollution is contained in that first inch of runoff.

Two sewer systems (facing page). Combined sewer systems exceed treatment-plant capacity during storms, dumping raw sewage into area rivers. Separate systems are less vulnerable.



ECOLOGY

- Avian Migratory Route
- Avian Greenway
- Shad/Eel Spawning Route
- FEMA 100-Year Floodplain
- FEMA 500-Year Floodplain
- High Ecological Potential
- Medium Ecological Potential
- Low Ecological Potential

Sources:
Western Pennsylvania Conservancy 2007
Federal Emergency Management Administration 2005

Managing the first inch of rainfall means minimizing impermeable surfaces so that rainwater can infiltrate soils rather than run off. Stormwater management tools like rain gardens or swales that manage stormwater where it falls also reduce burdens on the sewer system. Some stormwater management tools temporarily detain water until the sewer system can handle it. These elements should be planted with filtering vegetation that cleans water before it flows out.



Many *GreenPlan Philadelphia* recommendations propose to greatly expand pervious surfaces, enlarge treed and vegetated areas, and improve the natural functioning of streamside and waterside ecologies. These measures will improve infiltration as well as filter and slow runoff, which may reduce burdens on the stormwater system and help to maintain an adequate and consistent base flow in streams. According to an analysis prepared by the Trust for Public Land for *GreenPlan Philadelphia*, the city receives between \$40 million and \$60 million every year in stormwater management benefits from such “ecological services” of the current park system, even though the drainage systems have not been optimized to improve water quality.

As an alternative to high-cost, high-maintenance engineered systems, *GreenPlan Philadelphia* proposes to take advantage of parks and open space to aid water quality and watershed health through natural means. This approach will not only improve the efficiency and effectiveness of the city’s sewer systems but also offer recreational and ecological advantages.

ROBUST HABITAT

Natural elements, like trees, meadows, and wetlands are the focus of many *GreenPlan Philadelphia* recommendations because they are such key aspects of a naturally functioning green infrastructure. It is important to remember that meadows and wetlands are also habitats, discreet natural systems with distinct natural functions that are home to diverse communities of plants and animals. Many habitats—freshwater wetlands and salt marshes, for example, as well as a variety of forests—remain intact in the city, even if often degraded.

At first glance, it may seem that a city as dense and built up as Philadelphia neither possesses many natural habitats of interest nor needs them. It’s true that urban development has severely diminished the quantity, quality, and resilience of natural habitats, yet Philadelphia possesses many areas of significant environmental value.

Planting projects can make Philadelphia’s natural systems work better if undertaken to strengthen the stock of native plants and trees. Non-native plants—whether weeds, shrubs, or trees—often turn invasive, displacing native species and breaking down the intricate network of ecological relationships that make natural landscapes valuable. Invasives have often been introduced for well-meaning purposes, and then spread uncontrollably. Some “hitchhike” from elsewhere on trucks, planes, or ships. Invasives are a significant problem in Philadelphia’s parks and in unintended open spaces, as they are in most urbanized areas, and can require persistence to check.

There are many functional and cost advantages of retaining and restoring natural systems, but nature also deserves our attention because in tiny ways and large ones it contributes to our well-being. From a squirrel scurrying up a street tree to a majestic great blue heron winging its slow way along the Schuylkill, nature delights us and reminds us that there is a world much larger than ourselves. It is one on which we depend, one that long predated us, and one that does not exist solely for our casual exploitation.

Natural Philadelphia (facing page). The Delaware and Schuylkill Rivers are already important habitat corridors through the city. The areas shown as having ecological potential represent places that may help improve water quality, habitat, and connectivity.

A Natural Heritage Inventory of Philadelphia County, Pennsylvania, prepared by the Western Pennsylvania Conservancy as part of the Pennsylvania Natural Heritage Program, helped map areas that support species of special concern, including exemplary natural communities and broad expanses of intact natural ecosystems. This inventory provides baseline information to inform development so that preservation of Philadelphia's native biodiversity can be enhanced.

The Conservancy's analysis took into account the degree to which a surveyed site functioned naturally, its proximity to rivers and streams, whether is of sufficient size to be useful habitat, and how it connects to the existing open-space network. There are currently 29 areas of known or potential ecological significance in Philadelphia.⁸

Many *GreenPlan Philadelphia* recommendations can be applied to key sites the Conservancy has mapped and help make natural systems within the city more resilient. Wetlands, meadows, and other elements can considerably expand valuable habitats identified by the Conservancy and others. New and upgraded parks, playgrounds, schoolyards, and community gardens—even small ones—can host a wide variety of useful plants, birds, and small mammals. Green streets and trails create networks not just for people but also for migrating birds, pollinating bees, and breeze-borne seeds.



Providing habitat in Philadelphia. The John Heinz National Wildlife Refuge at Tinicum is a valuable habitat area within the city.

HOSPITABLE CLIMATE

Like most U.S. cities, Philadelphia experiences an urban heat island effect, which is characterized by higher air and surface temperatures in urban areas compared to surrounding rural areas. The city's air temperature can be several degrees warmer than surrounding areas. The urban heat island effect is caused by both the lack of vegetation and the abundance of non-reflective surfaces. Vegetation helps to control temperatures through shading and transpiration. Pavement and buildings contribute to heat gain by absorbing and radiating heat from the sun throughout the day. Where non-vegetated surfaces are required, cool surfaces are a good alternative. Cool surfaces encompass materials that are both highly reflective and highly emissive. This means that they absorb very little energy by reflecting solar radiation, and whatever energy they do absorb is quickly emitted. In all, the design and choices of materials for buildings and their surroundings can improve air quality and reduce the urban heat island effect.

NETWORK OF BENEFITS

OVERVIEW

ENVIRONMENT

ECONOMY

QUALITY OF LIFE

Open space can make a quantifiable contribution to the city's economy by improving project marketability and neighborhood appeal. The strongest and most direct effect is on real-estate values. Parks, playgrounds, bikeways, planted streets, green streets, and restored wetlands and stream banks are among many *GreenPlan Philadelphia* measures that will directly add to property values and add development appeal to vacant or underused land parcels. Because most measures apply to public and private lands, there is an opportunity to coordinate public and private efforts to achieve mutual benefits.

"Cities are using parks systems as problem solvers to help drive competitive advantage and the urban economic bottom line," Will Rogers, the President of the Trust for Public Land, has said. "But Parks still do what they have always done—provide the beautiful and healthy places that can help make and keep their cities lovable."⁹

GreenPlan Philadelphia keeps this perspective throughout.

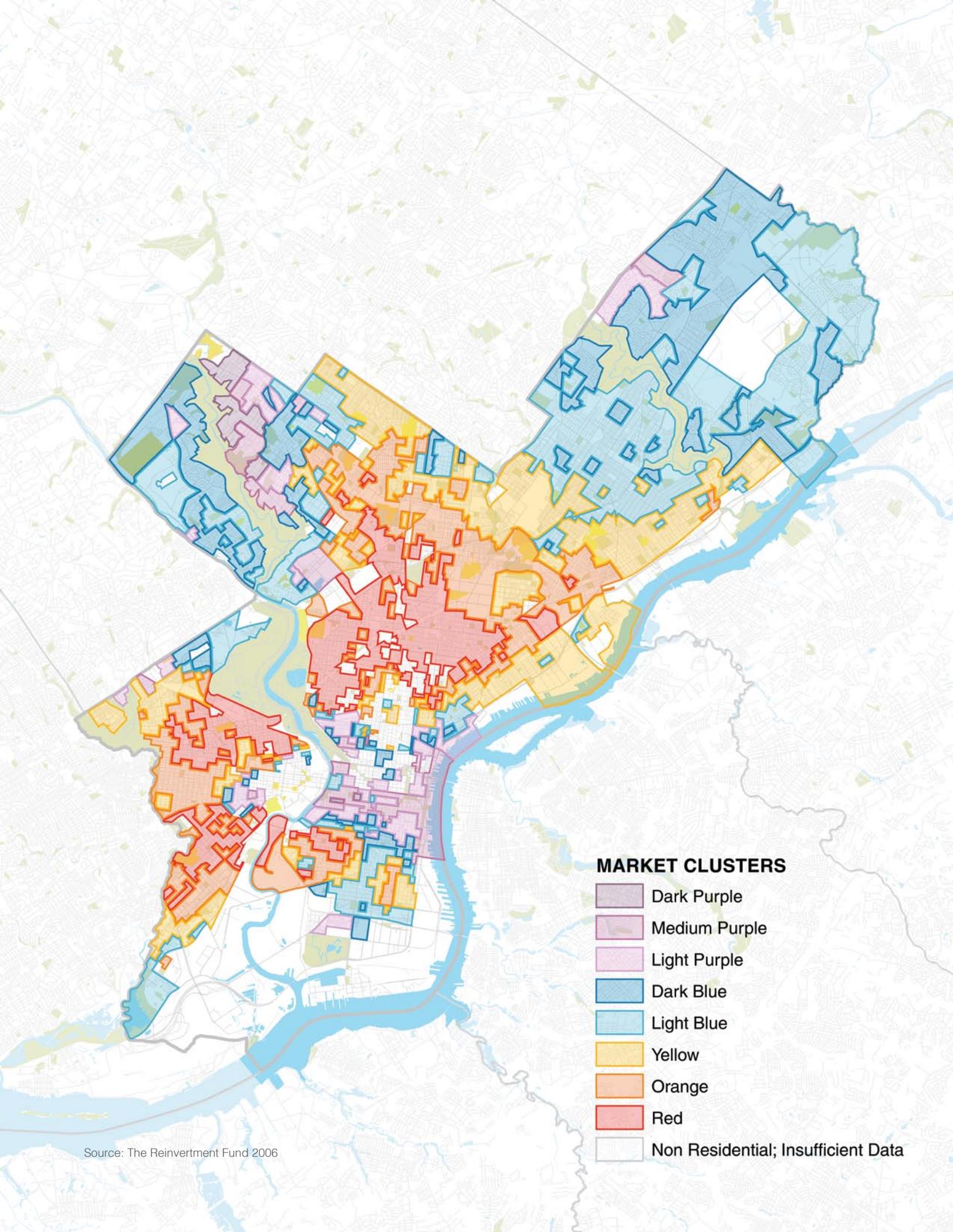
EFFICIENT ENERGY USE

Many *GreenPlan Philadelphia* recommendations work in tandem with other efforts to help increase energy efficiency and reduce consumption. Tree and high performance surface recommendations aim to block heat gain or prevent heat loss, thereby reducing energy requirements, usually at modest cost. Orienting freestanding buildings to make the most of seasonal sun, shade, and breezes requires almost no investment and delivers benefits for the life of the structure. Trails, bikeways, and green streets can help get people out of vehicles, reducing energy invested in transportation.

COMPETITIVE ECONOMY

In an era when businesses and individuals are becoming more and more footloose, urban amenities boost competitiveness because highly-sought talent increasingly chooses to live in communities offering a diversity of environments, recreational possibilities, and cultural offerings. Business follows talent. Philadelphia, which has benefited from this trend, continues to create more choices for residents. The Schuylkill Banks project is a highly-visible example, as are efforts to transform waterfronts by the Delaware River Waterfront Corporation, the Delaware River City Corporation, the planned Lardner's Point Park and Penn Treaty Park revitalizations, and the new Race Street Park at the foot of the Benjamin Franklin Bridge.

Philadelphia has long been known for its neighborhoods of unique historic value, the strength and diversity of its cultural institutions, and the power of its research-based universities—and these have proven to be talent magnets. However, the City has



MARKET CLUSTERS

- Dark Purple
- Medium Purple
- Light Purple
- Dark Blue
- Light Blue
- Yellow
- Orange
- Red
- Non Residential; Insufficient Data

Source: The Reinvestment Fund 2006

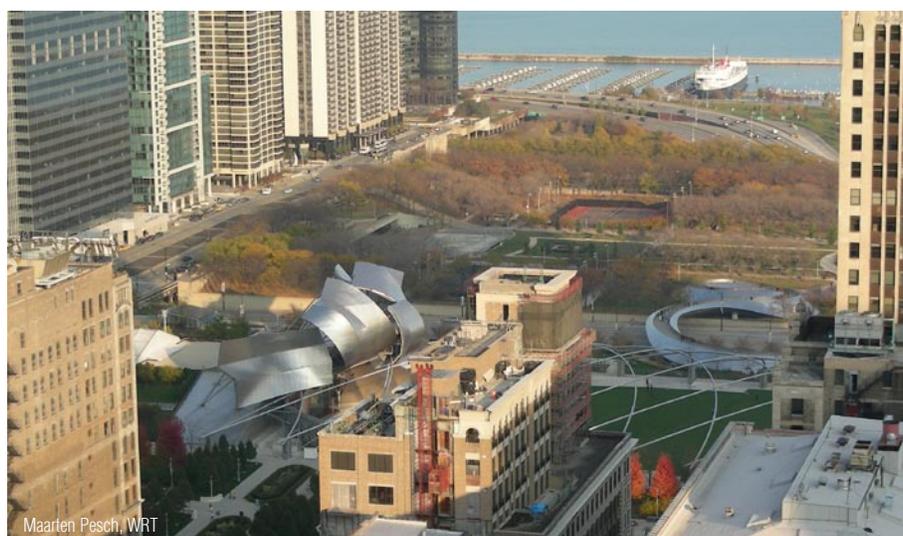
not yet measured whether the city's impressive park infrastructure influences corporate decisions to locate here. There is little information on park visitation and on what percentage of park visitors come from out of town beyond what can be gleaned from visitor spending.

GreenPlan Philadelphia provides numerous strategies to leverage the great resource of Fairmount Park into an integrated citywide network of recreation spaces and natural amenities. *GreenPlan Philadelphia* recommendations, building on earlier planning efforts, can catalyze business location beyond Center City—along the riverfronts, for example, which are proven development magnets in other cities. In pulling the city's amenities into a network, many more locations become more appealing, and the linkage of pioneering sites to established business locations and sought-after neighborhoods becomes clear through the provision of dedicated transit lanes, green streets, and bikeways.

Carefully conceived, magnetic signature projects can enhance a city's image worldwide. (Some are identified in the Projects and Opportunities section.) In Chicago, Mayor Richard M. Daley spurred private investment through the creation of Millennium Park.

Learning from other cities.

Through the creation of Millennium Park, a signature project, Chicago mayor Richard M. Daley spurred a broad range of additional private development.



Tourism

Green streets, bikeways, and park trails are among the many ways tourist experiences can be enhanced and extended beyond the historic core. Pleasing linkages to visitor attractions found within parks and in outlying neighborhoods can boost patronage and convey to visitors the wealth of Philadelphia possibilities that deserve repeat visits. Based on data collected by the Philadelphia Convention and Visitors Bureau, the *GreenPlan Philadelphia* team estimates that the city receives between \$20 million and \$40 million in income each year from out-of-town park visitor spending.¹⁰ The city has barely tapped the potential greatness of the city's riverfronts, either for visitors or for locals.

Opportunity Costs

One of the key purposes of the Network of Benefits is to help decision makers identify opportunity costs. Conventional cost/benefit analyses look narrowly at a given problem and proposed solution. Opportunity costs—that is costs avoided by taking a certain action—are often overlooked when relevant broader contexts are missing in the analysis. A streamside landscape restored to natural function can often perform the same erosion-control function as a bulkhead, for example. Unlike a bulkhead, that riparian landscape can slow the passage of water, reducing the risk of downstream flooding. It can host a wide variety of plant and animal species, and it is appealing to look at and visit, making

Analyzing housing market value (facing page). In 2006, under contract with the City, The Reinvestment Fund performed its Market Value Analysis in Philadelphia. The resulting market clusters, each represented by a different color, are meant to show areas in the city with similar housing market and population characteristics. Colors go from red, for areas with high distress and vacancies, to shades of blue and purple, for areas with strong markets and property values.

communities more vital and attractive. A restored riparian landscape therefore precludes the costs of building higher floodwalls, maintaining environmental resilience, and providing an amenity to the local community by other means.

Flipping the equation, a given development may sacrifice various natural values. A valid cost/benefit analysis must take into account the cost of replacing the natural functions lost to development, which can range from the loss of valued species to flood control. That analysis may uncover unanticipated costs, such as for insurance in flood-prone zones. Those costs may indicate that the design of the development needs to be altered or that the nature of the development is unsuited to the site.

Although it cannot anticipate costs for given actions, targets, and recommendations, *GreenPlan Philadelphia* attempts to qualitatively identify opportunity costs, which can be considerable.

VALUABLE PROPERTIES

In a variety of ways, *GreenPlan Philadelphia* recommendations help prioritize land uses, inform updates to zoning and other land-use regulations, and add value at modest cost to existing land uses. It proposes numerous means for identifying lands that are ecologically valuable. These lands may or may not be on the tax rolls, but restoring natural function adds economic value in a variety of ways, especially to their local communities. Green development recommendations, for example, help decision makers recognize the potential for economic development that is compatible with ecological values. This is especially true of waterfronts. Green streets and improvements to rail and utility corridors offer the potential for multiple uses that add value to adjacent parcels. Tree planting programs, bikeways, greener schoolyards, and better maintained parks make neighborhoods more appealing, which makes Philadelphia more compelling as a place to relocate or start a business. The many recommendations that apply to vacant land make Philadelphia literally greener, while adding economic value and development appeal.

Parks are popular. Support for parks and open-space recreational facilities is overwhelming among *GreenPlan Philadelphia* stakeholders and among citizens who participated in the citizen-engagement process. The appreciation for parks translates into higher value for properties close to parks and similar natural amenities. Some 30 studies nationwide have shown the effect. A Philadelphia study conducted by the Wharton School at the University of Pennsylvania found that Philadelphia homes in close proximity to new tree plantings showed a rise in valuation of 9%.¹¹

People do not value all parks equally, however. Well-maintained parks with a variety of landscapes, trees, trails, meadows, and gardens are markedly valuable. Parks comprising only trees and grass, especially if they are unattractively designed or poorly maintained, add only marginally to values. Parks that look dangerous or that attract gangs or rowdy teenagers may actually reduce nearby property values.

The Trust for Public Land analyzed the aggregate values of all residential properties within 500 feet of every park at least one acre in size. Proximity to parks alone adds some \$688 million of property value, which translates into a direct annual boost in receipts by the City in the form of real-estate taxes of \$18 million.¹² Better parks maintenance and attention to design could boost this figure considerably.

Many *GreenPlan Philadelphia* recommendations propose a wide variety of improvements to parks, playgrounds, and streets that will affect property values in the same way that well-maintained parks do.

Many cities strategically link park and other public-space redevelopment with new private mixed-use development, so that both enhance each other. Modest ecological restorations, such as in the valuable riparian environments along the Schuylkill and Delaware Rivers, can leverage considerable development of both brownfields (polluted industrial land) and greyfields (developed land no longer used) by replacing landscapes of ruin and abandonment with corridors of greenery and chattering birds. Naturally-functioning improvements can sustain themselves with minimal maintenance. New and restored parks attract private sector investment by transforming neglected real estate along park boundaries into valuable development opportunities.

Even low-cost street-tree-planting efforts and sidewalks reconfigured for natural drainage can add appeal because they make neighborhood stability visible. They create confidence in the city's capacity to maintain streets and enhance private and community efforts to improve neighborhoods.

Value-added parks. Rittenhouse Square is not only a neighborhood amenity, it is also one of Philadelphia's most marketable addresses. The park is a key reason the neighborhood remains sought after.



© Kyle Walton

Enhancing competitiveness. Trails and open space (Kelly Drive) are amenities that improve quality of life, appeal to visitors, and attract a talented workforce.



Pennsylvania Horticultural Society

PRODUCTIVE LAND USE

GreenPlan Philadelphia builds on the substantial progress already made in halting decline in communities with high numbers of empty parcels. The City's Green City Strategy has stabilized over 4,200 parcels, more than 6 million square feet of vacant land, with new topsoil and grass seed. New trees and fencing enhance these sites. Another 2,500 parcels, amounting to 3 million square feet of vacant land, undergo routine cleaning and mowing by community-based organizations under the community LandCare program of the Green City Strategy. The Office of the Managing Director also sends out crews to regularly clean vacant lots throughout the city on a rotating basis.

These interim efforts have made a significant impact. In virtually all cases, stabilization of vacant land causes short dumping to stop. This has helped reverse neighborhood decline. A Wharton School study showed that an untended vacant lot reduced adjacent home values by 20%.¹¹ Homes next to stabilized and improved lots were 17% more valuable. A survey of neighbors and businesses in the American Street neighborhood in eastern North Philadelphia reported that the neighborhood felt more cared for through the stabilization of vacant lots. Private owners successfully market properties in neighborhoods where vacant land is maintained.

An entire chapter is devoted to vacant land in *GreenPlan Philadelphia*, but numerous aspects of the plan address this extraordinarily serious problem. It recommends that vacant parcels (both public and private) be analyzed for their potential to be repurposed as parks, playgrounds, facilities for active recreation, expansions for schoolyards, and urban farms. Some tracts could prove ideal for the extension of bikeway networks. Others may develop considerable ecological value as part of meadow or forest systems or aid stormwater retention with "rain gardens." All of these actions would add to community-development appeal, increase local real estate values, and aid neighborhood stability.

Garden city. Community gardens, such as the Waverly Street Gardens managed by the Washington Square West Civic Association (below), build neighborhood appeal and local pride.



Ayako Okutani, WRT

NETWORK OF BENEFITS

OVERVIEW

ENVIRONMENT

ECONOMY

QUALITY OF LIFE

A good quality of life is essential to a city's success. But, the qualities that contribute to a good quality of life can be hard to pin down analytically and objectively. Certainly parks and recreation spaces make urban life pleasurable and meaningful, but several other measures of well-being are included in the Network of Benefits. These measures capture important outcomes that *GreenPlan Philadelphia* can help realize, even if they are not directly addressed by a given action.

FRESH, LOCAL PRODUCE

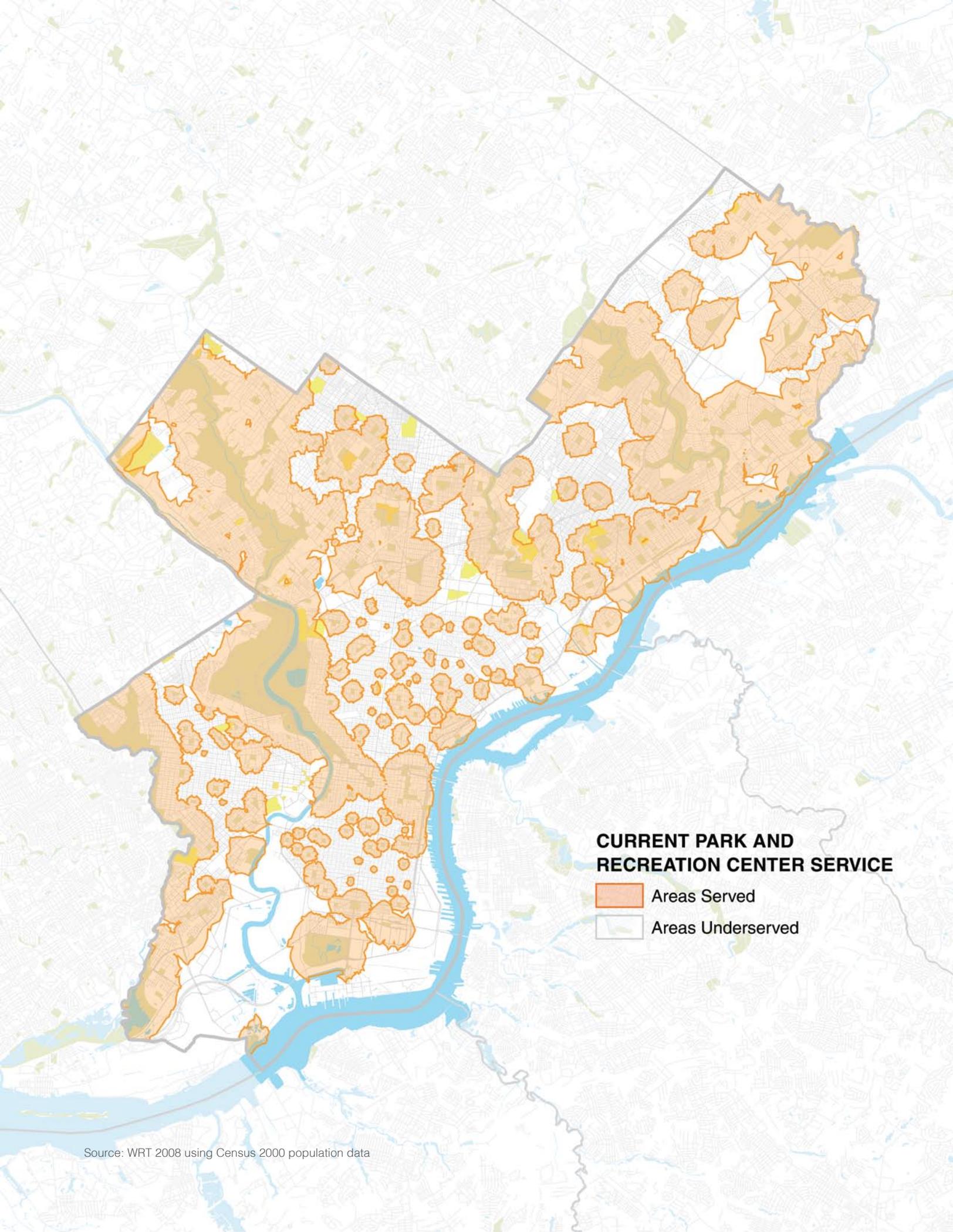
GreenPlan Philadelphia helps people develop healthier lifestyles in a wide variety of ways. The many Philadelphia families on tight household budgets tend to resort to high-calorie fast foods and starch-heavy, fat-laden, highly-processed prepared foods because they are less expensive and more readily available. Unfortunately, many health issues begin with high rates of obesity and diabetes. Garden plots, urban agriculture, concessions and vendors of fresh food, and access to farmers' markets are all means to bring the freshest, healthiest, and most appealing foods to communities that often lack affordable, quality fresh food in local supermarkets and corner stores.

There are innumerable opportunities to expand access throughout the city, by increasing both production and retail. Innovative retail opportunities include the creation and expansion of cooperatives, mobile vending, retail display and storage elements for fresh food, and greater distribution of farmers' markets.

CONVENIENT RECREATION ACCESS

Recreation is among the primary uses of public open space and so is core to *GreenPlan Philadelphia's* mission. For this reason, parks, playgrounds, and schoolyards are a focus of the plan. Expanded and better-maintained recreation facilities enjoy wide support among citizens and other stakeholders. And they enjoy wide use. In 2006, about a third of all residents participated in some kind of neighborhood recreation center program run by the Department of Recreation.¹³

Among the many ways *GreenPlan Philadelphia* supports expanded recreation is by proposing recreation uses for waterfronts, vacant land, and rail and utility corridors. Recreation is also made intrinsic to private developments, public squares, and other landscaped spaces. Networking together the city's most ecologically valuable forests, wetlands, meadows, and other habitats also adds running, hiking, biking, boating, and wildlife watching.



CURRENT PARK AND RECREATION CENTER SERVICE

-  Areas Served
-  Areas Underserved

Source: WRT 2008 using Census 2000 population data

A common way to represent the amount of park and recreation facilities is by the number of acres per thousand residents. Currently, Philadelphia has 7.1 acres of park and recreation facilities per thousand residents, considerably lower than such peer cities as Washington and Boston, but higher than New York and Chicago. Park acreage tends to be far lower per capita than in newer, less dense cities.

It is easy to regard recreation space as purely a budget cost to the city, since most activities are offered free of charge. Recreation creates economic value in a variety of ways, some of them detailed in sections above: making the city more appealing as a location for business and residences, enhancing public health.

Recreational amenities have a real economic value to residents, which can be determined by how much the consumer would pay for a similar experience in a commercial facility. Tallying the annual number of park visits and activities Philadelphians engage in, the Trust for Public Land's Center for Park Excellence estimated that the park and recreation system offers a direct use value of approximately \$1.1 billion each year (\$2 per resident per day).

GreenPlan Philadelphia recommendations will not fulfill expectations if a great number of people cannot access the city's amenities. Many recommendations support the goal of bringing parks and other recreational opportunities closer to citizens and making it easier for Philadelphians to get around, especially using alternatives to the automobile.

Right now many of the city's open-space resources are very inequitably distributed. More than 90% of Philadelphians currently live within a half mile (or 10-minute walk) of a park or recreation facility. However, the capacity of these facilities, in general, is inadequate to serve the number of people who use them. A *GreenPlan Philadelphia* analysis determined that only 58% of Philadelphians are adequately served. *GreenPlan Philadelphia* recommendations improve recreational access by identifying communities that need more park and recreation facilities and prioritizing those neighborhoods for improvements.

Much of the park system was acquired and built around creeks, such as the Wissahickon. Historically, these lands were protected from development to safeguard the city's sources of drinking water: the Schuylkill and Delaware Rivers. While these large parks continue to be among the most ecologically valuable tracts in the city, they also provide access to natural environments for many Philadelphians.

Assessing park and recreation access (facing page). *GreenPlan Philadelphia* evaluated how well parks serve neighborhoods by mapping areas whether parks were within a half mile of residents and whether parks served too many people. Only 58% of Philadelphians are well served today.

Providing value through direct uses. The availability of facilities for recreational activities such as skateboarding enhances the value of FDR Park in South Philadelphia.



GreenPlan Philadelphia has identified means by which these large parks can expand, but their value also grows as they link-up with restored riverside environments and parcels that naturally filter stormwater and retain floodwaters—all of which also offer recreational benefits. This is how *GreenPlan Philadelphia* recommendations targeting one issue can address additional needs.

Philadelphia's riverfronts could be world-class amenities, but they are now largely inaccessible to citizens. There are few trails or promenades and only 10 access points for small-boat launching into the Delaware and Schuylkill Rivers. *GreenPlan Philadelphia* trail and green development chapters augment waterfront recommendations to help create streamside environments that are both appealing and accessible. Bikeways, for example, by opening waterfronts now largely obscured from view, can catalyze investments that create redevelopment appeal and then integrate themselves into private development as it occurs. The success of the Schuylkill Banks project is evidence that trails are among the most desirable open space elements today. Separated from traffic and connected to many areas of the city, this trail provides a pleasant experience and a commuting conduit.

GreenPlan Philadelphia is not a transportation plan, but it offers many transportation benefits and helps make mobility improvements both possible and better integrated into the city's fabric. Tree, green street, and high performance surface recommendations all will improve the safety and attractiveness of Philadelphia streets for walking to schools, jobs, and local businesses. Philadelphia's existing trails are concentrated mostly in the large watershed parks. It is therefore not surprising that only 12% of Philadelphians currently live within a half mile of a major trail system.

Currently, Philadelphia's trail system is fragmented into eleven independent systems. *GreenPlan Philadelphia* proposes an integrated walking trail and bikeway system that should multiply its value, both within the city and in the region, through connections to outlying systems.

The city's on-street bicycle network complements the trail system and provides access to open space. Today, Philadelphia has almost 200 miles of bike lanes, but few are physically separated from traffic. Though they are now largely oriented to recreation, bikeways as they grow could safely and efficiently serve many more Philadelphians for many more purposes. Bicycling is a very-low-cost transportation alternative, and Philadelphia's relatively narrow and low-traffic streets, combined with its high density and generally-flat topography, can permit a major shift in travel mode from autos to bikes.

Green street improvements prepare the way for improvements in trolley and bus operational speed and efficiency. Rail corridor improvements will make the SEPTA system more appealing to use and improve the appearance of the city for Amtrak commuters.

Access also includes the provision of facilities that are appropriate for a wide range of age groups spread throughout the city. *GreenPlan Philadelphia* urges the use of census data to prioritize park, recreation, and other open-space facilities to serve neighborhoods as they have evolved demographically. Neighborhoods with high populations of older adults may spur the addition of new facilities or programs, for example. Neighborhoods with great numbers of children may need more play equipment.

Children are among the most active users of parks, but families with small children cannot walk as far to get to a playground. Currently, only 12% of Philadelphians live within a quarter mile of a City owned recreation space with playground equipment.

HEALTHY RESIDENTS

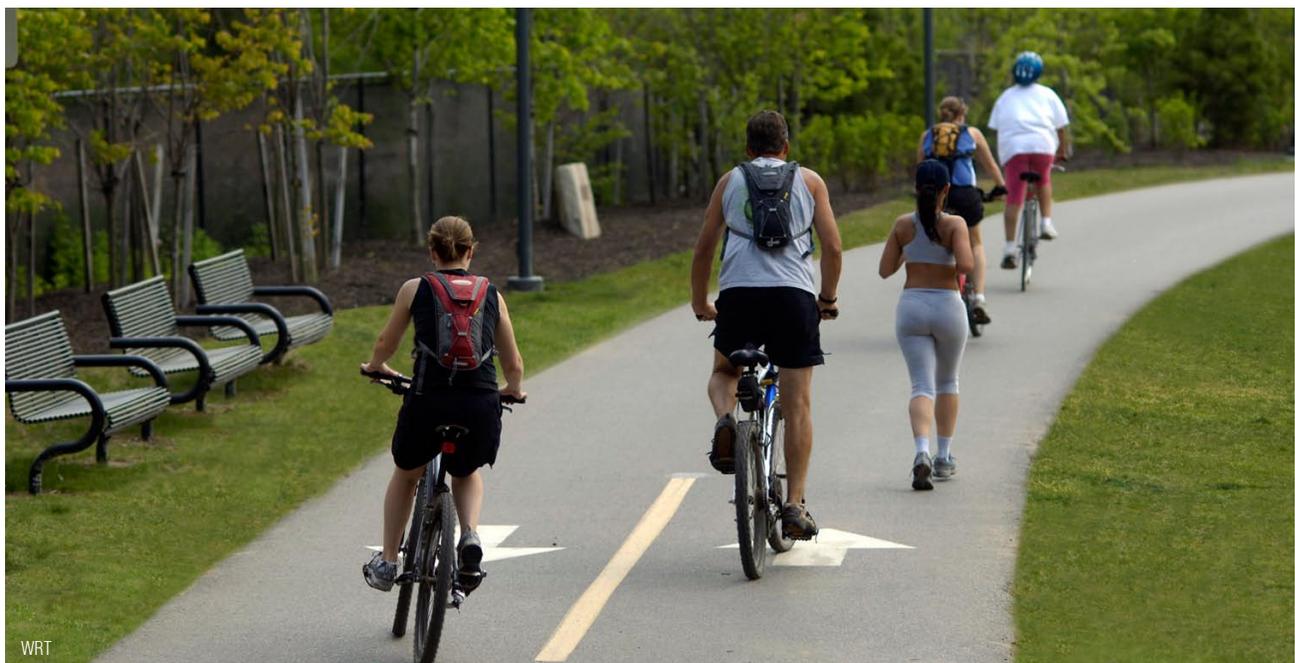
Many *GreenPlan Philadelphia* recommendations help improve public health by promoting clean air and healthy watersheds, while others promote healthy lifestyles.

Robert Wood Johnson Foundation Health and Society Scholars at the Leonard Davis Institute at the University of Pennsylvania compiled existing scientific evidence to quantify the relationship between open space and health for *GreenPlan Philadelphia*. The scholars found evidence that green space can benefit physical, mental, and social health. Much of the evidence comes from observational studies that confirm the widely-held presumption that open space is correlated with health-enhancing behaviors, such as physical activity. While these studies cannot prove that proximity to recreational amenities causes people to exercise more, thereby aiding health, the results strongly suggest that recreational space enhances the health of urban residents as well as neighborhoods.

There is a growing body of research that correlates a city's walkability with better health.¹⁴ People tend to be less obese who walk while doing everyday tasks, whether or not they engage in a specific exercise regimen. *GreenPlan Philadelphia*, by making streets and sidewalks more attractive and safer, optimizes the city's already legendary walkability. Bikeways close to most Philadelphians' homes will multiply the effect.

Research also demonstrates the public-health benefits of greener schoolyards, tree planting, and vegetated streets. Exposure to natural environments improves the mental health of urban residents.¹⁵ Research shows that windows that look out to nature, as opposed to views of concrete and asphalt, promote recovery of hospital patients, reduce stress, and decrease mental fatigue (which contributes to aggression). For children, studies link improvements in attention-deficit hyperactivity disorder with play spaces planted with trees and vegetation. Students who can see green spaces tend to concentrate better. Lower rates of depression occur in high quality urban neighborhoods that include green space. In Philadelphia, regular interactions with nature could result in 13,000 fewer cases of such mood disorders as depression—disorders that are among the most common health conditions facing our society today.¹⁵

Improving public health. Trail recommendations capitalize on the popularity of bikeways like the Schuylkill Banks, proposing to extend the system throughout the city.



A low level of physical activity is a strong predictor of obesity, heart attack, stroke, and diabetes. More urban residents exercise when they have ready access to appealing, well-equipped park and recreation facilities. Just as parks only add to real-estate values when they are well-designed and well-used for a variety of purposes, parks that are not well-equipped, well-maintained, and designed with safety in mind do not attract recreational use. Parks that are well-connected to bikeways and park-system trails are even better. These facilities diversify uses of both, which makes them more welcoming and appreciated.

To generally quantify the economic value of using parks for exercise, *GreenPlan Philadelphia* used the Trust for Public Land's Parks Health Benefits Calculator. It applies an estimate of the additional health care costs incurred by people who do not exercise. Philadelphia's open space system currently saves the city an estimated \$69 million annually (\$46 per Philadelphian).

STRONG, SAFE NEIGHBORHOODS

Cities, for all their concrete and brick, succeed as webs of human relationships: economic, social, and cultural. Cities grow by weaving these networks of relationships into larger and more intricate webs. When circumstances sever those relationships, or they are permitted to atrophy, cities decline. Neighborhoods are the building blocks of cities, and they thrive as they enrich their human interactions. Think of the way places of worship, schools, neighborhood associations, and friends of park groups create ties that bind. Neighborhoods are made of sociable sidewalks, playgrounds that mingle young families, civic and cultural institutions that engage everyone, civic groups that volunteer and advocate, political parties that unite the like-minded, and businesses that involve themselves in the communities they serve.

Recognizing schools as neighborhood amenities. Greening more schoolyards, like the Elverson School can help kids enjoy exercise and learn about nature, while improving the surrounding neighborhood.



At the core of healthy neighborhoods are personal safety and the perception of safety. The extensive research literature on crime prevention through environmental design (CPTED) demonstrates the way design and maintenance of streets, playgrounds, parks, and other public facilities directly influences crime.^{16,17,18} Facilities that experience higher crime are typically unattractive, poorly lit, and designed so that passersby can't notice inappropriate behavior. A children's playground close to the street and surrounding houses will feel safer than one set far from the street and obscured by trees or other structures.

GreenPlan Philadelphia recommendations include a focus on CPTED as well as other measures intended to aid community policing and reduce the perception of neighborhood vulnerability to crime. One of these is to avoid design that is overtly fortified, especially with excessive use of bars, heavy impenetrable doors, and razor wire. Facilities so intimidating are clear signals of a high crime rate and therefore become more vulnerable to additional crime. Residents avoid them, which makes the library bristling with bars and chain link a more likely crime target.

Research also shows that perpetrators look for indicators of vulnerability to crime and select neighborhoods where crime is harder to detect and where escape is less likely to be noticed. Streets with few people outdoors, with windows barred and shades pulled down, look vulnerable. Streets that show care, where people watch from windows or hang out on stoops, are victimized far less often.

Community-police tactics that have done so much to bring down crime in Philadelphia and many other cities rely in part on keeping vandalism in check and prosecuting petty crimes, which tend to leave perpetrators of more serious crime exposed. Poorly-maintained public facilities undercut these efforts and become crime magnets. Worse, they convey a sense that the City has "given up" on a community, which is a clear signal to criminals to proceed. City facilities in poor condition also discourage nearby private owners from keeping buildings in good condition, free of vandalism.

GreenPlan Philadelphia is not an anti-crime blueprint. But, many recommendations will help neighborhoods fight crime by making cleaner, brighter streets and facilities that will help neighborhoods build the social capital that make criminals feel unwelcome. Citizens have overwhelmingly expressed their dissatisfaction with the state of maintenance of many public facilities, which is why maintenance has become a focus of *GreenPlan Philadelphia*. Because capital and maintenance funds are so limited, *GreenPlan Philadelphia* recommends prioritizing resources to target neighborhoods where crime correlates with poorly-designed and poorly-maintained facilities. Finding suitable public uses for vacant land will remove land that otherwise may shelter criminals or attract vandals. Sidewalk improvements pursuant to tree-planting, trail, and green street recommendations invite more people to enjoy and use streets, which multiplies the value of police presence many-fold.

Strengthening neighborhoods goes well beyond crime fighting. Parks strengthen the urban human web, for which noted urbanist Jane Jacobs coined the term "social capital." From playgrounds to sports fields to park benches to chessboards to swimming pools to ice skating rinks to flower gardens, parks offer opportunities for people of all ages to communicate, compete, interact, learn, and grow.

GreenPlan Philadelphia encourages volunteers, sponsorships, and partnerships—all means by which people can get involved in making their neighborhoods safer and more livable. Volunteerism, of course, makes City resources go further. When people get together to plant trees or adopt a playground, they leave physical evidence of their commitment that signals progress. Getting involved is a neighborhood-boosting activity all by

itself, since it taps peoples' commitment and collective wisdom. It helps build leaders. It makes people feel safe—which usually becomes a self-fulfilling prophecy.

Garden plots directly reduce crime and boost neighborhood esteem by bringing people together to do something both useful and pleasurable, putting eyes on the street and increasing the perception of stability and safety.

GreenPlan Philadelphia, in making neighborhoods more attractive and in integrating open-space amenities throughout the city, strengthens neighborhoods. Urban planners and economists are getting better at measuring the effect, but most people know a strong, committed neighborhood when they see it. Evidence of care and commitment is visible all around, whether a few thousand dollars or many hundreds of thousands of dollars have been spent.

To quantify a proxy for social capital, *GreenPlan Philadelphia* totaled the amount of time and money that residents donate to their parks in the form of financial contributions made to park foundations, conservancies, and friends of parks organizations in the city. The team added in all the hours of volunteer time donated to park organizations, concluding that gifts of money and hours totaled a value of between \$5 million and \$10 million. This is certainly the tip of the volunteerism iceberg.

Since the value of peoples' attachment to their city or neighborhood is hard to measure, the usefulness of local pride is easy to overlook. And yet pride—love of the city, pride in living in it—is a fundamental basis for stability and growth. Local pride got New York City through 9/11. The bond people feel for New Orleans is the chief means by which the city has been able to spur recovery after the massive tragedy of Hurricane Katrina. People who had not lived in the city for decades returned to help, then returned again and again. New Orleanians speak wonderingly of volunteers who came to help out for a few weeks, and who have returned often or stayed for years.

Philadelphia's local pride is enviable, playing out in city-scaled events like the Mummers Parade and neighborhood street fairs and festivals. Pride is what encourages people to stay in Philadelphia, generation after generation.

GreenPlan Philadelphia nurtures local pride by touching half the city's streets, as well as every park, playground, and schoolyard. Planting trees, rebuilding streets into green streets, bringing bicycles into every neighborhood, making school playgrounds verdant play spaces ... many individual *GreenPlan Philadelphia*-inspired actions may be humble, but they give people something to point to that speaks to progress, solidarity, and the commitment of many, rather than just a few. Taken together, these actions will make our neighborhoods stronger and safer and transform our city.



ELEMENTS OF GREEN PLACES

Trees

Stormwater Management Tools

Meadows

Trails and Bikeways

Wetlands

Urban Agriculture and Community Gardens

High Performance Surfaces

Renewable Energy



TREE COVER

- #% Currently Exceeding 30% Target
- #% Currently Below 30% Target

Source: USGS (http://www.mrlc.gov/multizone_download.php?zone=13) 2001



ELEMENTS OF GREEN PLACES

TREES

STORMWATER MANAGEMENT TOOLS

MEADOWS

TRAILS AND BIKEWAYS

WETLANDS

URBAN AGRICULTURE AND

COMMUNITY GARDENS

HIGH PERFORMANCE

SURFACES

RENEWABLE ENERGY

ENVIRONMENT

- Clean Air
- Healthy Watersheds
- Robust Habitat
- Hospitable Climate

ECONOMICS

- Efficient Energy Use
- Valuable Properties
- Productive Land Use
- Competitive Economy

QUALITY OF LIFE

- Fresh, Local Produce
- Convenient Recreation Access
- Healthy Residents
- Strong, Safe Neighborhoods

VISION: A Forested City

A sidewalk, speckled with patches of shadow and light. The light shifts gently as the summer breeze moves through the branches of the tree canopy above. The same street, without trees, is hot, glaring, and uncomfortable. The urban forest brings life to city streets and makes the city a more pleasant place to be.

DEFINITION

In *GreenPlan Philadelphia*, the focus is not so much on individual trees but the overall effects of all the trees in the city. Consequently, “trees” and “urban forest” are frequently used interchangeably. “Urban forest” refers to the entirety of a city’s tree stock, irrespective of setting or ownership. The amount of urban forest a city has is often measured in terms of tree cover or percentage of city with tree canopy over it.

BENEFITS

Trees have many benefits both functional and aesthetic. One very basic benefit is the widely shared opinion that trees make neighborhoods look better and more cared for. The benefit to property values is real and measurable, an estimated \$500 million, according to a 2006 study by the University of Pennsylvania’s Wharton School.¹¹ A better-looking neighborhood tends to foster local pride, evidenced by the enthusiasm of citizens who participated in *GreenPlan Philadelphia’s* development as they spoke up for more trees.

Streets with trees, being more attractive, attract more use. As a consequence, it is more likely that suspicious activity will be noticed. Research by the Human Environment Research Laboratory at the University of Illinois found that apartment buildings surrounded by trees and greenery are dramatically safer than buildings devoid of planting, suffering 52 percent fewer crimes overall and 56 percent fewer violent crimes.¹⁹ Safer, more appealing streets, in turn, encourage others to invest effort in improving conditions, which induces a “virtuous” improvement spiral.

Carefully-placed trees also provide a multitude of direct functional benefits, traffic safety being one. Drivers perceive tree-lined streets as narrower and tend to reduce speed. Tree-planting strips establish a buffer between sidewalks and auto lanes.

Achieving 30% tree cover in every neighborhood (facing page). *GreenPlan Philadelphia* sets a target to rebalance the inequitable distribution of tree cover and achieve 30% tree cover in every neighborhood. The green represents current tree cover in each neighborhood.

Safe, appealing streets encourage walking, which, in turn, has health benefits. A California study found that tree-lined streets within a half mile of schools were among the factors that encourage more students to walk to school.

Trees also remove pollution from the air, reducing the presence of ozone and small particulates that increase asthma attacks and impair breathing for people with lung problems.⁷ A calculation prepared for *GreenPlan Philadelphia* indicates that the city receives between \$500,000 and \$1.5 million in air pollution management benefits each year from the trees in the current park system.

Trees reduce local flooding by absorbing rainwater through roots and leaves and retaining runoff in surrounding soils. Currently, the city's sewer system cannot handle all the rain and runoff from very large storms fast enough, with the result that raw sewage overflows into streams and rivers. Planting more trees is an effective technique toward reducing stormwater runoff. An addition of almost half to the city's forested stock would make a real difference without having to spend hundreds of millions of dollars to add treatment plants.

Trees also help us to keep cool in the summer. By shading building and paved surfaces they can prevent heat gain and can even actively cool the air through a process called transpiration. There can be as much as an eight-degree difference in the temperature of a hot, un-shaded parking lot and a tree-shrouded urban square, according to research in the Environmental Studies Program at the University of Pennsylvania.²⁰ Eight degrees is significant, but the perceived difference in comfort can be even greater.

The city's forests, concentrated mainly in the holdings of Fairmount Park, offer all the advantages of trees planted in streets and yards but in an even more diverse and intense way. Within natural-functioning ecosystems, they nurture a wide variety of plants and animals. The greater the diversity of life, the more resilient a region's ecology becomes. Migrating and nesting birds find refuge in forests. Forests shelter streams and river edges, so that fish and other aquatic life thrive. They hold soils in place, naturally cleaning water and aiding flood control. Forests are a recreational resource for walkers and bikers and are invaluable for educating children who may have little access to the natural world about ecological processes.

BASELINE

Today, Philadelphia's urban forest is in decline. A study by the U.S. Forest Service Northeast Research Station assessed that Philadelphia has 2.1 million trees, with a canopy that covers 15.7% of the city, among the least tree cover of similarly dense cities.⁷

Trees provide measurable benefits that can be translated directly into dollar values. With room for improvement, trees have the potential to add significant value to the Philadelphia economy. The U.S. Forest Service study described the following measurable benefits of Philadelphia's current urban forest.

Pollution removal.....	802 tons per year	\$3.9 million per year
Carbon storage.....	530,000 tons	\$9.8 million
Carbon sequestration.....	16,100 tons per year	\$297,000 per year
Building energy reduction.....		\$1.2 million per year
Avoided carbon emissions.....		\$14,400 per year
Structural value.....	replacing 2.1 million trees.....	\$1.8 billion

Cost/Benefit Analysis Trees

• Allegheny West/ Tioga

30% canopy (+62,883 trees)

ANNUAL COSTS

CAPITAL/O&M (AVG. OVER 40 YRS)

Planting	-\$7.50/tree	-\$471,623
Admin/Inspection/Outreach	-\$2.50/tree	-\$157,208
Pruning	-\$7.65/tree	-\$481,055
Removal/Disposal	-\$4.29/tree	-\$269,768
Infrastructure Repair	-\$3.24/tree	-\$203,741
Clean Up	-\$0.36/tree	-\$22,638
Liability & Legal	-\$0.35/tree	-\$22,009
-		\$ 1,507,601

ANNUAL BENEFITS

AIR QUALITY

Carbon Dioxide (CO ₂) Removal	0.0075 lbs/tree × \$128/lb	\$55,901
Ozone (O ₃) Removal	6.55 lbs/tree × \$0.34962/lb	\$133,348
Nitrogen Dioxide (NO ₂) Removal	6.55 lbs/tree × \$0.32977/lb	\$125,778
Sulfur Dioxide (SO ₂) Removal	1.91 lbs/tree × \$0.60209/lb	\$66,965
Particulate Matter (PM ₁₀) Removal	0.56 lb/tree × \$2.3036/lb	\$75,118
+		\$ 457,111

HEALTHY WATERSHEDS

Stormwater Volume Reduction	2566 gal/tree × \$0.0099/gal	\$1,479,060
+		\$ 1,479,060

HOSPITABLE CLIMATE

Carbon Sequestration	10.8 lbs/tree × \$0.0092593/lb	\$5,823
+		\$ 5,823

EFFICIENT ENERGY USE

Electricity Savings (75% of trees)	63 kWh/tree × \$0.15/kWh	\$412,710
Natural Gas Savings (25% of trees)	332 kbtu/tree × \$0.0135/kbtu	\$65,248
+		\$ 477,958

NET ANNUAL BENEFIT

+	\$ 912,351
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ONE-TIME BENEFIT

HOSPITABLE CLIMATE

Carbon Storage	172 lbs/tree × \$0.0092442/lb	\$92,587
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VALUABLE PROPERTIES

Property Value (5% increase)	\$ 30,866,770
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**Cost/Benefit Analysis
Trees**

• **South Philadelphia**
30% canopy (+61,439 trees)

ANNUAL COSTS

CAPITAL/O&M (AVG. OVER 40 YRS)

Planting	-	\$7.50/tree	-	\$460,793
Admin/Inspection/Outreach	-	\$2.50/tree	-	\$153,598
Pruning	-	\$7.65/tree	-	\$470,008
Removal/Disposal	-	\$4.29/tree	-	\$263,573
Infrastructure Repair	-	\$3.24/tree	-	\$199,062
Clean Up	-	\$0.36/tree	-	\$22,118
Liability & Legal	-	\$0.35/tree	-	\$21,504
-			+	\$ 1,590,656

ANNUAL BENEFITS

CLEAN AIR

Carbon Dioxide (CO2) Removal	0.0075 lbs/tree × \$128/lb	\$58,981	
Ozone (O3) Removal	6.55 lbs/tree × \$0.34962/lb	\$140,695	
Nitrogen Dioxide (NO2) Removal	6.55 lbs/tree × \$0.32977/lb	\$132,707	
Sulfur Dioxide (SO2) Removal	1.91 lbs/tree × \$0.60209/lb	\$70,655	
Particulate Matter (PM10) Removal	0.56 lb/tree × \$2.3036/lb	\$79,256	
+			\$ 482,294

HEALTHY WATERSHEDS

Stormwater Volume Reduction	2566 gal/tree × \$0.0099/gal	\$1,560,543	
+			\$ 1,560,543

HOSPITABLE CLIMATE

Carbon Sequestration	10.8 lbs/tree × \$0.0092593/lb	\$6,144	
+			\$ 6,144

EFFICIENT ENERGY USE

Electricity Savings (75% of trees)	63 kWh/tree × \$0.15/kWh	\$435,447	
Natural Gas Savings (25% of trees)	332 kbtu/tree × \$0.0135/kbtu	\$68,842	
+			\$ 504,289

NET ANNUAL BENEFIT

+			\$ 962,614
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ONE-TIME BENEFIT

HOSPITABLE CLIMATE

Carbon Storage	172 lbs/tree × \$0.0092442/lb	\$97,688	
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VALUABLE PROPERTIES

Property Value (5% increase)			
+			\$ 122,975,102

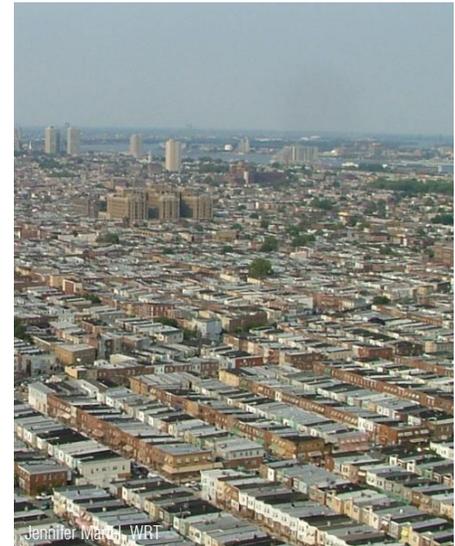
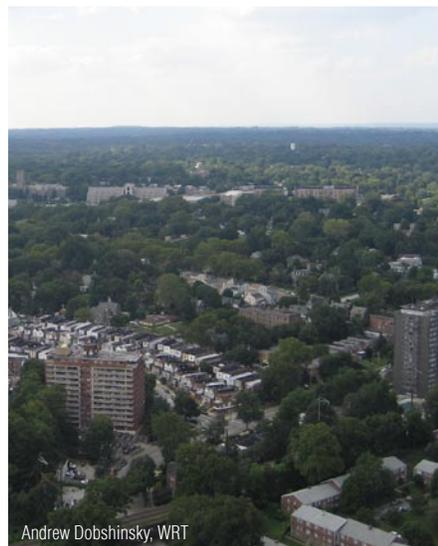
A few other factors also set Philadelphia's tree population apart from comparable cities. One is that Philadelphia has such a young tree population. Over 57% of the trees are less than 6 inches in diameter.⁷ Industry guidelines suggest that the ideal age distribution is 20% young trees (6 inches or less in diameter), 60% mature trees (6–24 inches in diameter), and 20% over mature trees (greater than 24 inches in diameter). Over time, as trees mature, the benefits they offer continue to increase. Protecting young trees so that they reach maturity should be a priority.

Also, unlike many other cities, the majority of Philadelphia's trees are located in the public realm. Approximately 1.2 million of the city's 2.1 million trees (57%) are under the direct management of Fairmount Park. Usually in urban and suburban areas, the majority of trees are found on residential properties. In Philadelphia, the predominance of row houses, which account for three quarters of the housing stock, limits planting on private property. In many cases, the only available space for tree planting is at the curb.

The street-tree population dropped from an estimated 325,000 trees in 1976 to 134,000 today. A study by American Forests estimated that Philadelphia lost 1,638 acres of tree cover between 1985 and 2001.²¹ Over the past 20 years, the amount of street-tree planting in Philadelphia has been minimal, with only 600 to 800 trees planted by Fairmount Park and fewer than 1,500 street trees planted annually, far fewer than the estimated number of trees lost.

Tree coverage also varies widely: from a low of 1.8 percent in South Philadelphia, where row houses are the predominant housing type, to a high of more than 38 percent in Germantown and Chestnut Hill, where single family detached houses are common. Especially in neighborhoods with few plantable areas, Philadelphia needs a better system to maximize street tree planting. It was clear from the public outreach process that many citizens in Philadelphia understand the benefits of trees and want more trees in their neighborhoods.

In addition to trees in parks and along streets, the city's existing natural forests also need to be considered. Lack of maintenance has meant that many parts of the forest are subject to ravages by deer and other pests. Invasive plants have impaired the forests' natural function. Soil erosion has undermined forest edges.



Varied levels of tree cover. Few trees are visible when looking at South Philadelphia (above right) as compared to the more substantial tree cover in Wynfield in West Philadelphia (above left).

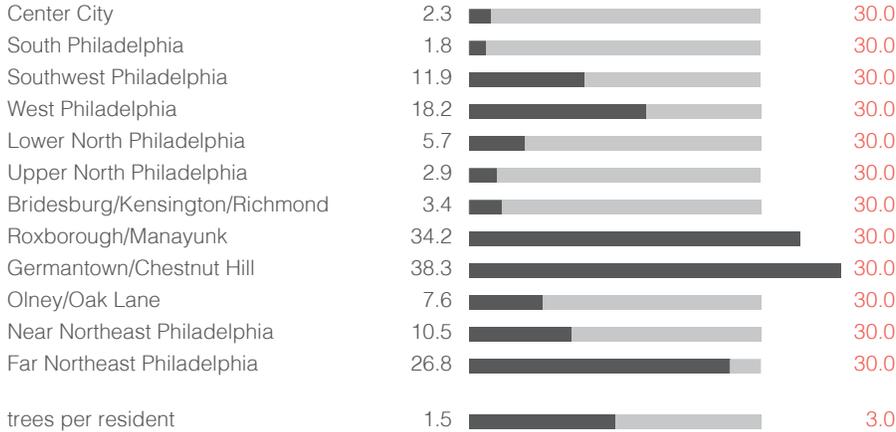
TARGET

Achieve at least 30 percent tree cover in every neighborhood.

Responsible Agency: Fairmount Park

Partners: Pennsylvania Horticultural Society, TreeVitalize, UC Green, community associations, corporate and institutional partners, citizens

percent tree canopy by planning analysis section

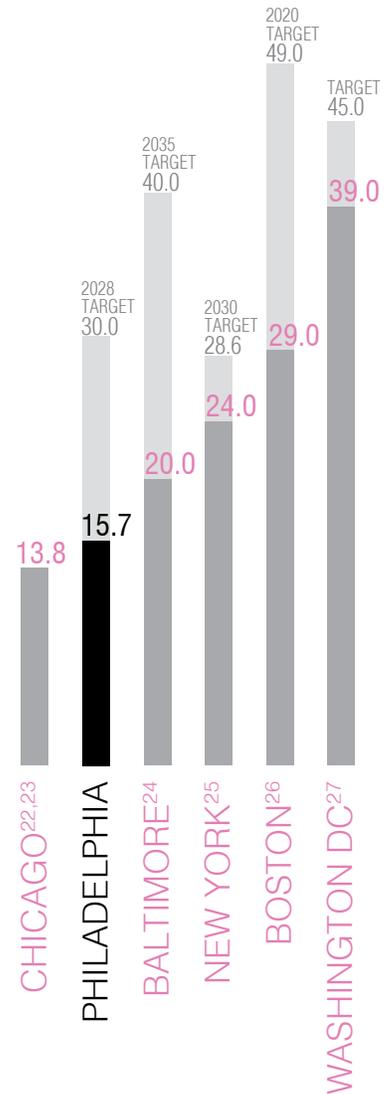


Planting one million trees will bring Philadelphia to 30 percent tree cover in all neighborhoods, which is enough to confer real benefits in terms of air quality, runoff control, health effects, and urban well being.

Philadelphia's Land Area	3,763,584,000 sf	86,400 acres
Existing 15.7% Tree Cover	626,749,202 sf	14,335 acres
Additional Tree Cover to Reach 30% in Each PAS	604,386,477 sf	13,874 acres
Average sf of Crown Per Tree	608 sf	
Number of Trees Needed to Reach 30% Tree Cover	994,875 trees	

This target is well below that is such peer cities as Baltimore and Boston, and below the 40 percent coverage recommended in a Delaware Valley study by American Forests.²¹ Because of the wide disparity in tree cover, efforts should be focused on neighborhoods with the fewest trees. Many lacking in tree cover also tend to be less wealthy. Since trees are a palpable emblem of renewal, tree planting in these neighborhoods will add substantially to property values and the neighborhoods' sense of well-being.

Percent Tree Cover



© Robert Y. Lee

“My street evidently used to be well-shaded with large, established trees (before my move here 18 months ago). But, many were cut down, I’ve heard, because they interfered with power and phone lines. Maybe this program could recommend a policy in which trees that need to be removed for such safety reasons are replaced with better-located saplings. There are lots of places near me where trees could safely have been replanted, adding value to our properties and enhancing the neighborhood.”

GreenPlan Philadelphia
civic engagement participant
from West Philadelphia



David Witham, WRT

Working with utility companies.

Selecting low canopy trees for sidewalks with powerlines and large canopy trees for sidewalks without powerlines will reduce utility conflicts. For existing trees, it is necessary for utilities and private entities to adhere to the city’s standards for maintenance and care.

KEY RECOMMENDATION 🌳

Develop tree maintenance and planting standards.

Responsible Agency: Fairmount Park
Partner: Pennsylvania Horticultural Society

Because mature trees and forests offer the greatest environmental benefits, establishing maintenance standards to nurture the city’s youngest and most fragile trees into maturity is an important priority. Less than half of Philadelphia’s current tree inventory is mature, so ensuring existing tree stock survives to maturity develops benefits at low cost. Maintenance includes standards for pruning, watering, and pest control.

From a design standpoint, fast-growing but short-lived trees should be avoided in favor of trees most likely to mature and live for decades in urban conditions. Since young trees are most likely to die in their first two years, tree-planting standards must include early tree care and watering guidance. Tree planting standards will derive the greatest benefits by specifying large planting areas with closely-spaced trees in combination with rain gardens, bioswales, pervious pavements, and other measures that slow and filter rainwater runoff.

A particularly noteworthy threat to trees, both young and old, is potential conflict with utility lines. *GreenPlan Philadelphia* recommends adoption of the American National Standards Institute (ANSI) standards for tree pruning and utility line clearance. Fairmount Park should partner with local utility companies to coordinate guidelines for branch and root pruning to augment tree health while avoiding damage to pipes and overhead lines.

Additionally, tree planting and maintenance standards must recognize the impact of climate change. Trees will likely have to tolerate warmer average temperatures, drier conditions, and pests associated with warmer climates. Over the next 20 years, Philadelphia may become two hardiness zones warmer. (Hardiness zones are defined by the U.S. Department of Agriculture [USDA].)

Developing an urban forest management plan (facing page). A comprehensive GIS-based urban forest management plan, including a complete inventory of the city’s existing trees, will allow the city to consider the effects of climate change and target planting, maintenance, outreach, and education.







Fully stocking the city's streets with trees. With 55 trees per mile, Philadelphia's streets are currently only 31% stocked. Tremendous opportunities exist to plant additional trees and reach the plan's goals of 30% tree cover and 100% stocking of streets with trees. This illustration shows potential improvements at Lehigh Avenue.



KEY RECOMMENDATION 🌳

Fully stock the city's streets with trees.

Responsible Agency: Fairmount Park

Partners: Pennsylvania Horticultural Society, TreeVitalize, community development corporations, community associations



Reaching the one-million-tree target means planting 329,000 new street trees. At an average of 55 trees per mile of street, Philadelphia has only 31 percent of its potential street-tree cover now. (The ANSI standard is 180 trees for every mile of street.)

Total Length of Streets	2,575 miles
Average Planting Density at 100% Stocking	180 trees per mile
Desired Street Tree Population	463,000 trees
Existing Street Tree Population	134,000 trees
# Trees Needed to Achieve 100% Stocking.....	329,500 new trees over 20 years
	16,475 new trees per year

Philadelphia has fewer trees per mile of street than many peer cities. The City should establish a street-tree-planting program to meet these goals. It should also lead by example, fully stocking all streets adjacent to City facilities, and require that all agencies maintain those trees.

RECOMMENDATION

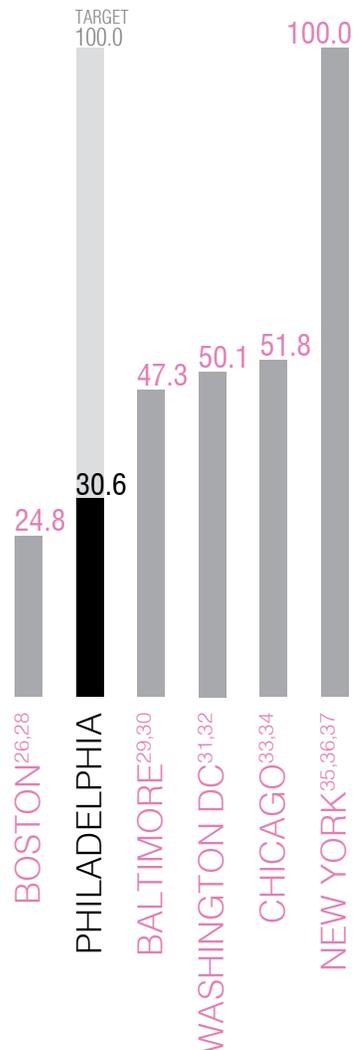
Streamline and prioritize street-tree request procedures.

Responsible Agency: Fairmount Park

Partners: Pennsylvania Horticultural Society, TreeVitalize

Long lead times and labor-intensive outreach discourage many community organizations from organizing tree-planting projects. The City should streamline the procedure by supplying tree-planting and maintenance information on a website and by providing tree-request features online and via the 311 service-request system. Fairmount Park should prioritize requests to focus limited resources on underserved neighborhoods and on requests by civic groups because group efforts often attract matching funding from foundations and homeowners. Individuals should be encouraged to join community organizations or form them.

Percent Stocking of Street Trees



Planting trees just about everywhere possible (facing page). To reach the goal of 30% tree cover, it will be necessary to plant trees along streets wherever possible. Even narrow streets can support additional trees.

**BEST PRACTICE:
TREE-FRIENDLY CODE**

Charlotte-Mecklenburg Code, Charlotte, North Carolina

Chapter 21 of the Charlotte-Mecklenburg code calls out the benefits of trees and creates requirements for tree preservation, protection, and planting on public and private property. It also creates incentives for developers and property owners to preserve trees on their sites. The ordinance creates citywide requirements for tree surveys, tree-protection plans, the preservation of existing trees, and the planting of new trees. It also stipulates requirements for the maintenance and protection of trees on both public and private property. The requirements are triggered by applications for construction and building permits and for land-use or zoning changes, regardless of parcel size.

Reference: Charlotte-Mecklenburg Code, Chapter 21, http://library.municode.com/HTML/19970/level2/PII_C21.html

**BEST PRACTICE:
PARTNERSHIPS**

Green Seattle Initiative, Seattle, Washington

The city of Seattle made a commitment to maintain and restore the city’s urban forest and partnered with the Cascade Land Conservancy to form the Green Seattle Partnership. The main goal of this partnership is to restore 2,500 acres of forested parkland to native-like conditions by 2024. The economic value of this program is estimated at \$2.5 million a year.

Reference: <http://www.greenseattle.org>

Tree-planting permissions are slowed because all property owners in a targeted area are now asked whether they wish to participate. The Pennsylvania Horticultural Society is now testing an “opt out” system, which requires responses only from those not wanting to participate. If successful, this program should be a requirement for all tree-planting programs. It should speed up planting at lower cost.

RECOMMENDATION

Amend the building and zoning codes to encourage tree planting. Enact an ordinance to require private-property tree planting and maintenance.

Responsible Agencies: Fairmount Park, City Planning Commission
Partner: Commerce Department, Zoning Code Commission

To reach the city’s tree-cover goals, *GreenPlan Philadelphia* recommends the following changes to relevant sections of the Zoning Code and Building Code.

Incorporate ANSI tree-planting and maintenance standards by reference. Require street-tree planting in all development to meet the ANSI standard of 180 trees per street mile. Require escrow fees in building permits sufficient to cover the full cost of tree planting and maintenance until established. Set higher fines for failing to plant required trees and for removing trees without permission. Establish planting requirements for parking lots, including percent of area shaded and tree density. Establish planting requirements for new private development, taking into consideration the size of the development and what it can contribute to tree cover.

To assure appropriate levels of tree supply and maintenance on private property, enact a tree-protection and replacement ordinance that spells out owners’ requirements for tree cover, tree maintenance, and tree replacement. Offer owners, builders, and developers the option to pay a qualified nonprofit organization to undertake required tree planting and early maintenance. To aid areas of minimal means, establish a fund dedicated to tree planting and maintenance to be financed by fines and fees related to building permitting and tree-planting requests.

KEY RECOMMENDATION 🌳

Restore the city’s forests, and increase forested land to 7,200 acres.

Responsible Agency: Fairmount Park
Partners: Pennsylvania Horticultural Society, TreeVitalize



Park forests should be reinforced by closing gaps where trees have died, re-establishing forest edges damaged by erosion and pests, and restoring a naturally functioning understory ravaged by deer. Establishing a monitoring program will aid the general health of forests and reduce maintenance needs. The program should assess health, track tree mortality, track potentially devastating pests and diseases, and monitor natural-reforestation progress.

Current Forested Land	6,746 acres
Desired Forested Land	7,200 acres
Difference	454 acres
Average Planting Density	300 per acre
Number of Trees and Shrubs Needed to Achieve 7,200 acres	136,200 trees

RECOMMENDATION

Create an urban forest management system.

Responsible Agency: Fairmount Park

Currently the City lacks two critical tools needed to augment and maintain its forests and trees: a street-tree inventory and a digitized tree-information management system. A tree inventory, with the Philadelphia urban forest study prepared by the U.S. Forest Service, will assist in prioritizing the planting and management of trees to assist under-served neighborhoods and to deploy City resources efficiently. The management system can track service requests, work orders, and contracting. It can usefully pinpoint areas where tree roots may be responsible for sewage or drainage backups. The systems will also provide information useful in assessing and improving tree planting and maintenance practices. Ongoing monitoring of tree hardiness will permit Philadelphia to select species tolerant of conditions induced by global warming.

TARGET

Support tree planting and stewardship within the city's communities.

Responsible Agencies: Mayor's Office of Sustainability, Fairmount Park
Partners: Pennsylvania Horticultural Society, UC Green, TreeVitalize

The city can meet the one-million-tree target by better harnessing the city's enormous enthusiasm for trees and by making cost-sharing by the City and private partners simpler and more efficient. Strengthening partnerships also will allow the tree-planting effort to tap additional sources of funds beyond taxpayer support.

KEY RECOMMENDATION 🌳

Use financial incentives to encourage tree planting by private owners.

Responsible Agency: Mayor's Office of Sustainability
Partner: Office of the Director of Finance

Private owners can be encouraged to plant trees through tax or fee incentives (in the case of large owners or developers) or through modest subsidies (in the case of homeowners). The City can also establish a means to permit citizens and other donors to donate trees to the city. Fairmount Park already encourages donations, but the minimum \$500 per tree should be reduced to widen the program's appeal. Donors may also be encouraged by various forms of recognition, like plaques. Businesses and individuals can offset carbon emissions that contribute to global warming by purchasing trees and supporting tree maintenance.

KEY RECOMMENDATION 🌳

Strengthen and increase the number of partnerships with civic and donor organizations.

Responsible Agencies: Mayor's Office of Sustainability, Fairmount Park
Partner: Office of Philanthropic Relations

Formal agreements with organizations like the Pennsylvania Horticultural Society and UC Green can support education, outreach, and fundraising to augment the City's tree-planting efforts. These long term partners can also help the City identify new funding and partnership opportunities in foundations, civic organizations, and neighborhood organizations. Fairmount Park's program for forested parks offers a useful model that can be extended to street-tree-planting efforts. Dedicated community foresters can support community tree-planting projects.



Increasing the role of volunteers in tree planting. Creating and promoting volunteer planting opportunities will further increase awareness and stewardship.

“More trees ... some sections and corridors are almost desert-like! [We] need to educate people on the value of trees.”

GreenPlan Philadelphia
civic engagement participant
from South Philadelphia

BEST PRACTICE:
CORPORATE VOLUNTEER PROGRAM

New York Restoration Project (NYRP),
New York, NY

Approximately five years ago, NYRP developed a corporate volunteer program through which employees from New York City-based companies could work alongside field crews to clean up neglected parks or community gardens. Corporations can select projects that fit their interests and pick additional services to make the experience more enjoyable such as transportation, food, educational tours, and team-building activities. To deliver these additional services, NYRP requests a financial contribution of \$30-\$100 per person from participating companies. In 2007, this program included over 50 projects, involved more than 1,500 volunteers from 30 corporations, and earned approximately \$200,000. Equally important, the corporate volunteer program has given NYRP the opportunity to develop and grow relationships with corporations.

Reference: http://actrees.org/site/stories/corporate_volunteer_program.php

KEY RECOMMENDATION 🌳

Increase the understanding of the value of trees, and expand the role of volunteers through education.

Responsible Agency: Fairmount Park
Partners: Pennsylvania Horticultural Society, TreeVitalize, UC Green Morris Arboretum, Awbury Arboretum

In many ways, the City could greatly increase its tree-planting efforts through expanded partnerships with civic and service organizations like City Year, Greater Philadelphia Cares, and Americorps. Citywide community service events, like the Martin Luther King Day of Service, are opportunities to educate citizens about trees, to encourage them to plant and maintain trees, and to join community efforts to plant more trees.

The many educational programs already sponsored by Fairmount Park, the Pennsylvania Horticultural Society, and the Morris Arboretum, among others, can include tree planting and maintenance. The Pennsylvania Horticultural Society's Tree Tender program can be greatly extended through these partner organizations. Schools and universities are also underused venues for such environmental education and outreach. Corporate volunteer programs can enlist locally-based companies in tree planting and education.

KEY RECOMMENDATION 🌳

Build the City's capacity to manage its tree-planting goals across agencies and in concert with public and civic interests

Responsible Agencies: Mayor's Office of Sustainability, Fairmount Park
Partners: City departments and agencies

Meeting the City's tree-planting goals requires extending incentives, planning standards, and expertise throughout City agencies. It means developing the capacity to integrate relevant programs, to reach out to communities, and to engage private and civic interests in financing and meeting tree-planting goals.

RECOMMENDATION

Require all public agencies to maintain trees on their sites and identify opportunities for additional tree planting.

Responsible Agency: Department of Public Property
Partners: Mayor's Office of Sustainability, Fairmount Park

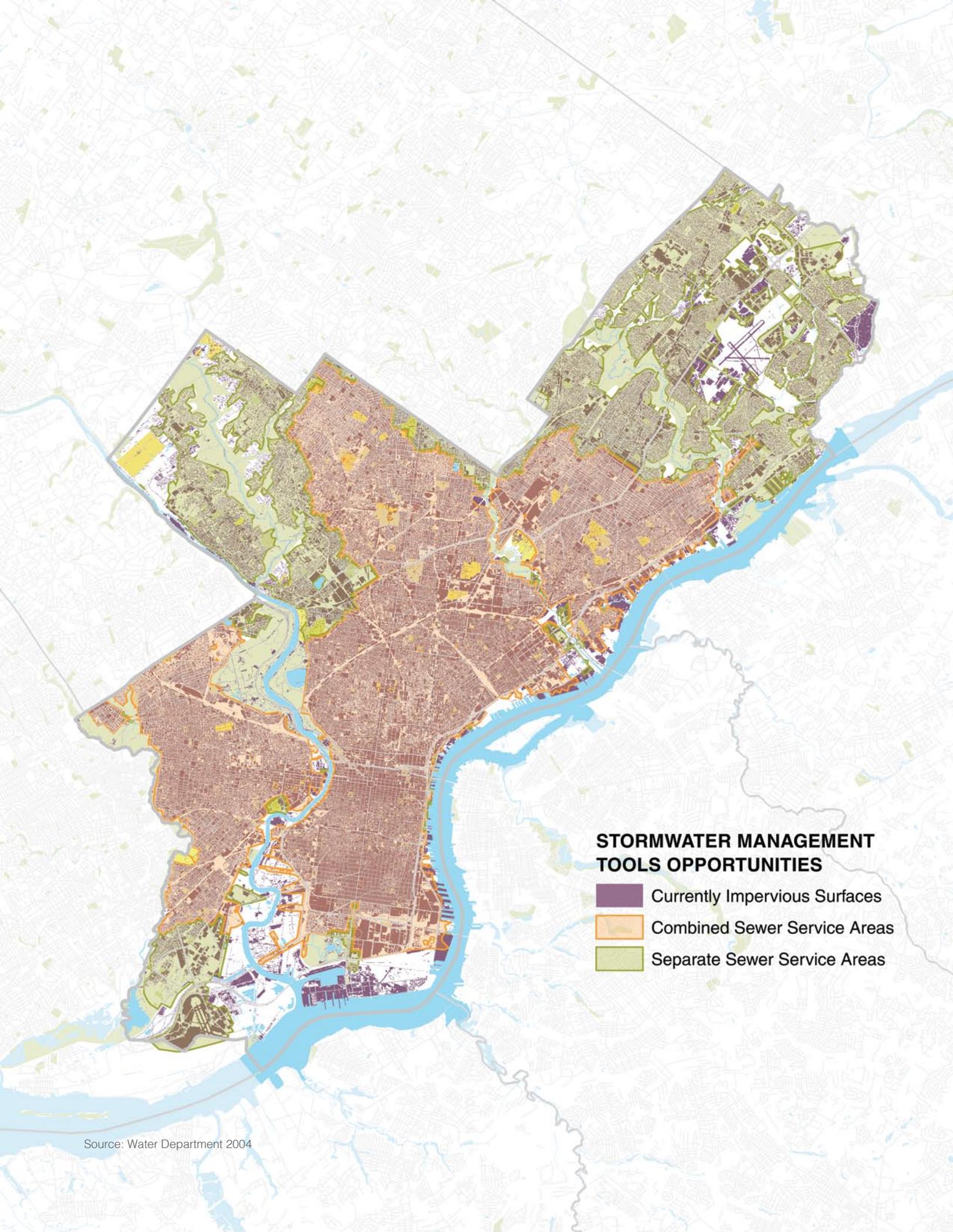
GreenPlan Philadelphia recommends that all agencies adopt the planting and maintenance standards of the plan and requests that each agency inventory sites for tree-planting opportunities. This action considerably extends the value of tree planting on streets and in parks, and by private entities. City staff and facility users will also receive the benefits of tree planting.

RECOMMENDATION

Develop agreements between the City and partner government agencies to designate Fairmount Park as their tree-management agency.

Responsible Agencies: Mayor's Office of Sustainability, Fairmount Park
Partners: Office of the Managing Director, School District of Philadelphia, Philadelphia Housing Authority

The School District of Philadelphia and the Philadelphia Housing Authority are among the largest public landowners and are therefore responsible for a significant population of trees. Because they lack staff arborists and other maintenance resources, their tree and forest resources are often neglected. Since Fairmount Park is well qualified to take on these tasks, a memorandum of agreement could provide these agencies with Fairmount Park's tree-management expertise on a fee basis.



Source: Water Department 2004



ELEMENTS OF GREEN PLACES

TREES

STORMWATER MANAGEMENT TOOLS

MEADOWS

TRAILS AND BIKEWAYS

WETLANDS

URBAN AGRICULTURE AND

COMMUNITY GARDENS

HIGH PERFORMANCE

SURFACES

RENEWABLE ENERGY

ENVIRONMENT	ECONOMICS	QUALITY OF LIFE
● Clean Air	● Efficient Energy Use	○ Fresh, Local Produce
● Healthy Watersheds	○ Valuable Properties	○ Convenient Recreation Access
● Robust Habitat	● Productive Land Use	○ Healthy Residents
● Hospitable Climate	○ Competitive Economy	○ Strong, Safe Neighborhoods

VISION: [Using Rainwater for a Healthier City](#)

Our city streets, roofs, parks, and other landscapes can help reduce flooding, ensure cleaner water, recharge our water supplies, and provide many other important services, all while performing the traditional functions we expect them to. For example, streets are the connective tissue of the city and much more than simply a place for cars to go. Streets are a place for people to move—be it in a car, on a bike, or on foot. They are also the zone of movement for utilities and services, electricity, data, gas, and drinking water. With careful design, they can also be a place for natural processes and services to take place. Stormwater management tools help to bring natural services into the city, helping to make city streets and other landscapes more vibrant and healthy places to be.

DEFINITION

Where it's not possible to convert an impervious surface to either a vegetated area or a pervious hardscape, another approach is to provide water storage or a water retention area (typically filled with plant material), where the surfaces would drain to and hold the water long enough for it to evaporate into the air, percolate into the ground, absorb into the roots of plants, or simply slow the passage of water into the sewer system.

These elements include stormwater tree trenches, stormwater wetlands, bump-outs, stormwater planters, cisterns, rain barrels, rain gardens, and flow-through planters.

BENEFITS

Stormwater management tools slow or prevent stormwater from entering storm drains. Overburdened storm drains result in flash flooding events that cause both environmental and property damage. Preventing flash floods and the pollution and erosion that result are an important objective for improving the overall quality of the Philadelphia landscape.

Instead of regarding stormwater as a waste material to be sent away as quickly as possible, the city should treat stormwater as a resource. Stormwater management tools often include plant material. These planted areas live off the stormwater they are helping to manage and introduce a welcome addition of greenery into the city landscape, creating a sense of beauty and a connection to nature. They can provide habitat for birds and

other animals, and create opportunities to plant trees and reap all the benefits that trees provide. Additionally, in a dry spell, the stored rain water can be a resource for watering lawns or for other non-potable uses.

BASELINE

The City has just begun to design and implement street enhancements that support greening. Just a few have been built, but several are underway.

TARGET

Expand the use of stormwater management tools to help meet the city's stormwater reduction target of managing the first inch of rainwater to reduce burdens on the sewer system.

Responsible Agencies: Water Department, Department of Streets
Partners: Fairmount Park, Department of Recreation, School District of Philadelphia

percent of city not managing
first inch of rainfall 52  37

This target extends the Water Department's land-based and low-impact development programs to integrate them more effectively into related *GreenPlan Philadelphia* initiatives. The Water Department seeks to manage the first inch of rainwater through retention and infiltration techniques, slowing and even preventing stormwater from entering the city sewer system. Means of retention include vegetated basins, rain gardens, or swales. An additional benefit of these techniques is that they filter out soils and pollution before they enter the sewage system. Natural drainage will reduce sewer system impacts for up to 80 percent of storms. This target and the recommendations that support it tie closely to those in other chapters meeting the goal of diverting storm runoff from an overburdened sewage-treatment system.

The most cost-effective use of pervious surfaces is in neighborhoods served by combined sanitary and storm sewers. During severe rainstorms, these drainage systems can overflow, dumping untreated sewage into streams and rivers. Working with the Water Department, the City may set priorities for the recommendations below to achieve the greatest stormwater reductions where the problems today are worst.

RECOMMENDATION

Develop natural retention systems for stormwater, including enhancing the natural function of ditches, streams, and culverts.

Responsible Agency: Water Department
Partners: Department of Streets, Fairmount Park, Department of Recreation

Encourage City agencies and private owners to convert hard surfaces to permeable planted ones, especially in areas subject to flooding. Update zoning regulations or incentives to encourage the use of permeable parking surfaces in conjunction with the use of planted areas to assist infiltration and slow runoff. A coordinated effort of the Water Department and the Department of Streets would identify underutilized paved areas that could be converted to vegetated areas, swales, or other pervious surfaces. Green streets initiatives and tree-planting programs can help maximize pervious surfaces in streetscapes.

Cost/Benefit Analysis Cisterns

• Allegheny West/
Tioga

20% of buildings with cisterns
(+189 187-gallon cisterns)

ANNUAL COSTS

CAPITAL/O&M (AVG. OVER 10 YRS)

Unit Cost	
- \$18.70/cistern	-\$3,534
Potable Water Savings for Consumer	
19,755 gal/cistern × 0.0029/gal	\$10,953
+	\$ 7,419

ANNUAL BENEFITS

HEALTHY WATERSHEDS

Stormwater Volume Reduction	
19,755 gal/cistern × \$0.0099/gal	\$37,206
+	\$ 37,206

NET ANNUAL BENEFIT

+	\$ 44,624
----------	------------------

Cost/Benefit Analysis Cisterns

• South Philadelphia

20% of buildings with cisterns
(+321 187-gallon cisterns)

ANNUAL COSTS

CAPITAL/O&M (AVG. OVER 10 YRS)

Unit Cost	
- \$18.70/cistern	-\$6,003
Potable Water Savings for Consumer	
19,755 gal/cistern × 0.0029/gal	\$18,359
+	\$ 12,356

ANNUAL BENEFITS

HEALTHY WATERSHEDS

Stormwater Volume Reduction	
19,755 gal/cistern × \$0.0099/gal	\$62,362
+	\$ 62,362

NET ANNUAL BENEFIT

+	\$ 74,718
----------	------------------

“[I’d like to see] stormwater management in [my] park, ecological restoration. Maintain natural resources.”

GreenPlan Philadelphia
civic engagement participant
from Far Northeast Philadelphia

Reusing rain water. By connecting a rain barrel to a downspout, property owners can both help reduce the amount of stormwater that inundates the city’s sewer system and reduce the amount of potable water that is needed for outdoor uses, like watering lawns and plants.

The Water Department could broaden its Backyard Buffer Program, which now encourages homeowners who live along streams to create vegetated borders. The City can encourage the planting of similar filtering buffers along all streams and require retention basins to be constructed or upgraded to improve drainage performance with naturally functioning vegetation. Naturally functioning drainage channels could replace flood-prone impermeable channelized ditches and culverts. These improvements can chain existing ponds, wetlands, and streams to form naturally functioning drainage networks.

Pollution-reduction capital grants and mitigation programs offer sources of funding. Mitigation programs are designed to underwrite the construction of new wetlands or other useful habitats to make up for those destroyed in the process of capital projects, like the expansion of the Philadelphia International Airport or a highway project.

KEY RECOMMENDATION 🏡

Develop building, land-use, and development standards to improve environmental performance of urban spaces.

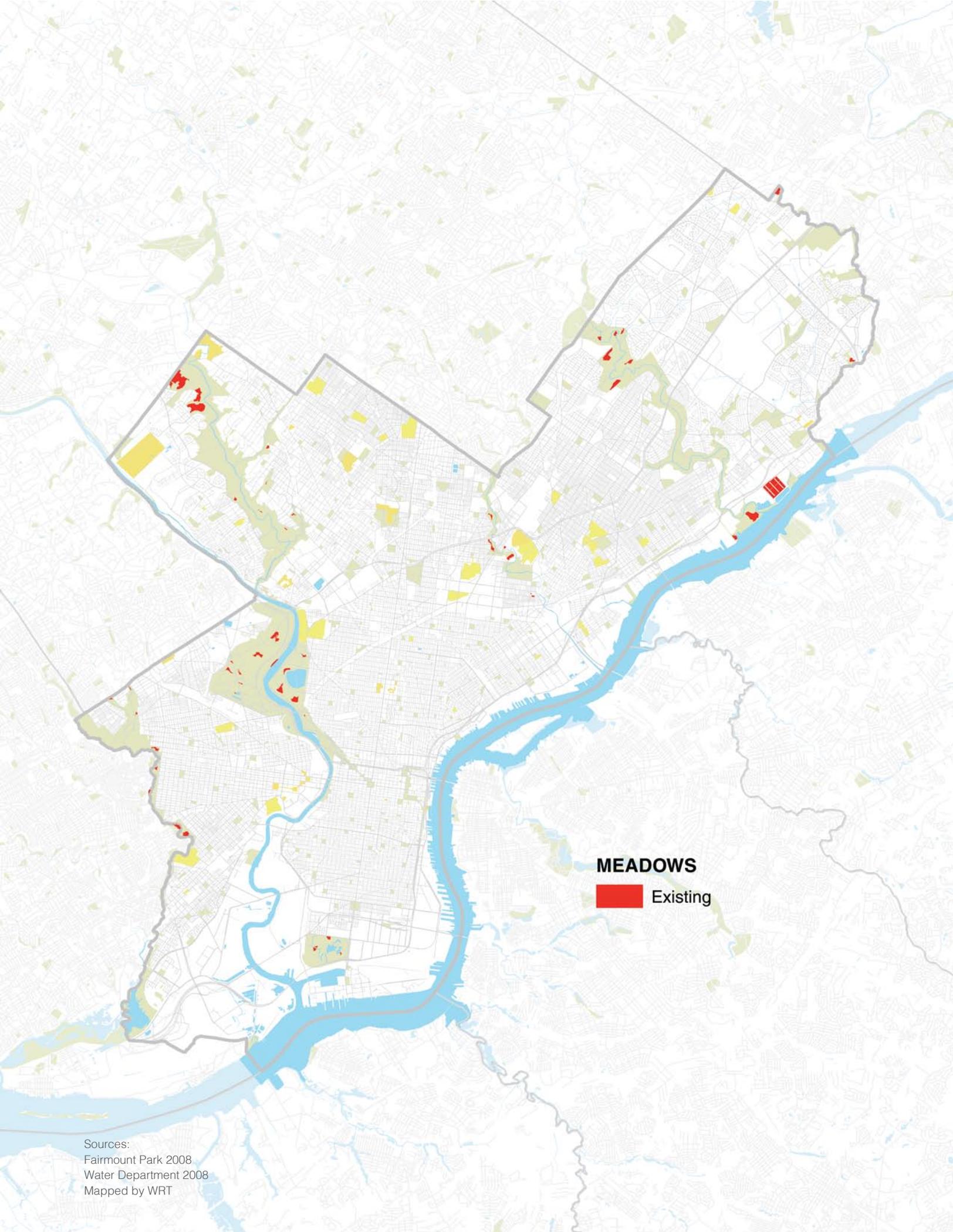
Responsible Agency: City Planning Commission
Partners: Delaware Valley Green Building Council, Energy Coordinating Agency, Pennsylvania Environmental Council

Water Storage: Cisterns and Rain Barrels

Cisterns are receptacles for collecting and storing rainwater. Rain gutters from rooftops typically channel runoff to tanks that can range in capacity from a few gallons to thousands of cubic yards. Homeowners can connect downspouts to rain barrels. The stored water can be used for many tasks that do not require potable water. Among them are site maintenance, watering plants, flushing toilets, and running washing machines.

The primary benefits of cisterns and rain barrels are to reduce the unnecessary use of drinking water and to reduce burdens on storm sewers. Clean water supplies have become punishingly expensive to develop. The costs of treating and filtering drinking water are rising. Using captured rainwater when drinking-quality water is not needed can have a significant benefit for both water supply and water quality. The Water Department has pioneered the use of rain barrels, offering them to anyone willing to take a class on how to use and install them. Philadelphia’s School of the Future uses cisterns, using the collected water for uses like flushing toilets.





MEADOWS

 Existing

Sources:
Fairmount Park 2008
Water Department 2008
Mapped by WRT



ELEMENTS OF GREEN PLACES

TREES

STORMWATER MANAGEMENT TOOLS

MEADOWS

TRAILS AND BIKEWAYS

WETLANDS

URBAN AGRICULTURE AND

COMMUNITY GARDENS

HIGH PERFORMANCE

SURFACES

RENEWABLE ENERGY

ENVIRONMENT

- Clean Air
- Healthy Watersheds
- Robust Habitat
- Hospitable Climate

ECONOMICS

- Efficient Energy Use
- Valuable Properties
- Productive Land Use
- Competitive Economy

QUALITY OF LIFE

- Fresh, Local Produce
- Convenient Recreation Access
- Healthy Residents
- Strong, Safe Neighborhoods

VISION: Ecological Diversity

Visitors to Fairmount Park’s Wissahickon Valley Park can walk through the shaded forest trail into a breathtaking open landscape high above the valley known as the Andorra Meadows. The meadows attract a variety of plants and birds not found in the forests of the valley. In the summer, goldenrod and asters provide a sea of yellow punctuated by monarch butterflies. In the evening, visitors can see the fields come alive with the sparkling light of thousands of fireflies.

DEFINITION

Meadows are fields where grassland vegetation, native grasses, and herbaceous flowering plants predominate. In southeastern Pennsylvania, meadows occur naturally as breaks in the forest due to blight, insect damage, or fires and on lands that are saturated, periodically flooded, or geologically unable to support a forest. Though many meadows naturally revert to mature forest within decades, they add ecological diversity to our region, which makes our natural systems more appealing and resilient.

BENEFITS

When compared with manicured lawns, meadows offer a wide variety of advantages. Where manicured lawns require artificial supplies of water and nutrients, a mature meadow naturally maintains its integrity. Where a manicured lawn requires protection from invasive species of plants and insects, meadows are treasure troves of biodiversity where variety is a benefit to—not a detraction from—its beauty and function. Where manicured lawns tend to suffer a reduction in soil nutrients over time, meadows will preserve and enhance soil quality and filter out pollutants rather than emitting them. Where a manicured lawn may reduce the flow of stormwater as compared to impervious surfaces, meadows are an even more effective alternative. Where a manicured lawn requires periodic mowing to maintain visual appeal, a mature meadow has a more sublime and everlasting aesthetic appeal that requires little time and energy to maintain.

While manicured lawns certainly have their place as sites for active recreation, an open field to play Frisbee or lawn games for instance, there are many instances where they are inappropriately maintained at great cost with little benefit. Where open space is not

Mapping existing meadows (facing page). Meadows provide a remarkable range of environmental and economic benefits. For example, public and private land managers can often realize savings on maintenance and energy costs when meadows replace lawns. Fairmount Park and the Water Department are among the public agencies creating meadow areas.

programmed for an active use, allowing for a more natural landscape to take root will yield significant savings on maintenance and energy costs and reduce carbon emissions generated by lawn care.

In addition to all the practical benefits of replacing lawns with meadows, not to be undervalued are the opportunities meadows afford residents of the city to stay connected with the beauty and tranquility of a natural landscape.

BASELINE

For these reasons, over the last several years, Fairmount Park and the Water Department have replaced lawn areas that are adjacent to water bodies or located in underused sections of parks with meadows. Although limited at times in their ability to create meadows due to current public perception, experience suggests that well-maintained borders or mowed edges around meadows combined with public education about their benefits help to gain acceptance. One successful example is in Wissahickon Valley Park.

There are currently 318 acres of managed meadow in the city. Considerable opportunities exist for many more acres of meadow within Fairmount Park lands and in the new parks proposed in this plan. There is also significant potential for other city facilities and private property owners to replace existing lawns or paving with meadow plantings.

Developing meadows where existing lawns support little use. Fairmount Park developed the Emlen Meadow in an area of little use to cut down on lawn maintenance.



Fairmount Park

“I’d like to see more native grasses/native plant/habitats, like the demonstration garden at 43rd [Street] & Chester Avenues. I’d like to see parks combined with a concern for birds and wildlife—not just people.”

GreenPlan Philadelphia
civic engagement participant
from West Philadelphia

“It is very important to remember that an open space should include natural areas... to allow birds and other pollinators to survive because if they do not survive, neither do we.”

GreenPlan Philadelphia
civic engagement participant
from Lower North Philadelphia

TARGET

Improve existing meadows, and create 220 acres of new meadows.

Responsible Agency: Fairmount Park

acres of managed meadows 318  520

Fairmount Park surveyed the watershed parks to determine that an additional 202 acres of managed meadows could be created in unused areas and adjoining bodies of water in park land.

KEY RECOMMENDATION

Develop new meadows on suitable underutilized publicly-owned lawns and open space.

Responsible Agency: Fairmount Park

Potential sites for managed meadows include underutilized lawns in parks and other public places—like highway rights-of-way or public building campuses—with conditions similar to those in wild lands where meadows would naturally develop. They should be linked to related ecosystems, including bodies of water and natural habitats. Design features, such as mown paths that encourage recreational use, and interpretative signs can help make meadows appealing to communities. While managed meadows can be visually appealing, the way the plantings are chosen and how they relate to adjacent properties is an important consideration.

KEY RECOMMENDATION

Support the creation and stewardship of meadows by private owners.

Responsible Agencies: Fairmount Park, Water Department

Partners: Pennsylvania Horticultural Society, Pennsylvania Environmental Council

Managed meadows are suitable for larger residential and institutional properties, such as school campuses, cemeteries, and large-scale development sites. Private properties of several acres adjoining existing natural landscapes, bodies of water, and park land offer great potential to use meadows to extend views, expand natural habitats, and protect nearby creeks and rivers from stormwater inundation.

Private property owners can be motivated to create meadows for their low maintenance, ecological benefits, and visual appeal, especially where they help to transition a property from a manicured to a natural landscape setting. To encourage a wider implementation of meadows, property owners should be given financial incentives to create managed meadows. For example, a credit against water bills could be issued for the stormwater retention properties of a meadow landscape.

Achieving acceptance and appreciation for meadows is a challenge that could be met with educational programs provided at the community level. Fairmount Park’s Wissahickon Environmental Center currently offers programs throughout the year that focus on teaching the environmental benefits and interpreting the life of meadows. In partnership with the Water Department and the Pennsylvania Horticultural Society, these programs could be expanded in scope and reach to provide training on how to create and enjoy a managed meadow throughout the city.





Incorporating meadows into the city's open space system. Meadows can provide visual interest and access to naturalized plants, in relief to urban paving and lawns.



TRAILS

- Opportunities
- Current Projects
- Existing

Sources:
Department of Technology 2001
Fairmount Park 2008
Mapped by WRT
WRT 2008



ELEMENTS OF GREEN PLACES

TREES

STORMWATER MANAGEMENT TOOLS

MEADOWS

TRAILS AND BIKEWAYS

WETLANDS

URBAN AGRICULTURE AND

COMMUNITY GARDENS

HIGH PERFORMANCE

SURFACES

RENEWABLE ENERGY

ENVIRONMENT

- Clean Air
- Healthy Watersheds
- Robust Habitat
- Hospitable Climate

ECONOMICS

- Efficient Energy Use
- Valuable Properties
- Productive Land Use
- Competitive Economy

QUALITY OF LIFE

- Fresh, Local Produce
- Convenient Recreation Access
- Healthy Residents
- Strong, Safe Neighborhoods

VISION: Expanding Choices and Connectivity

Automobiles are a symbol of freedom for many people, but for an increasing number of Philadelphians, bicycles are replacing cars as the freedom machine of choice. Philadelphia, with its compact neighborhoods and dense network of streets, provides reasonable conditions under which a bicycle, or even a good pair of walking shoes, may effectively replace the automobile as the principle mode of transportation.

DEFINITION

Trails are paths designed for non-automobile uses, including walking, running, and bicycling. When located in a street right-of-way, a trail consists of a bike path that is physically separated from automobiles with a safe sidewalk for pedestrian use.

It is important to note the difference between trails as defined in this plan and on-street bicycle lanes. *GreenPlan Philadelphia* advocates an enhanced trail system comprised of off-street paths or physically-separated bike paths in the street right-of-way. On-street bicycle lanes are critical and may connect to and supplement the trail system, but additional on-street bicycle lanes are not a complete substitute for trails, which provide a safer, more user-friendly mode of transportation and recreation.

BENEFITS

A trail system is an essential component of an overall strategy for urban sustainability and open space. Many cities are constructing a connected system of trails because it is such a sought-after recreational amenity. Trails have wide-ranging benefits and meet multiple policy goals by providing recreational opportunities, transportation alternatives, and improved public health.³⁸

Increased bicycling promotes physical fitness and can help combat the obesity epidemic that is becoming a public health crisis. Bicycles also provide mobility for populations who cannot or do not wish to drive—especially children—as well as those without access to automobiles. Increased use of bicycles can reduce the number of cars on the road, relieving congestion and parking crunches and reducing pollution emitted by cars. At the same time, increased use of bicycles reduces energy requirements—especially the

Ensuring that there is a trail within a half mile of all residents (facing page). *GreenPlan Philadelphia* sets a target to develop a more complete, connected trail system so that there is a trail within a half mile of all residents. Opportunities represent physically separated trails within street rights-of-way as well as off-street trails.

A detailed map and list of current trails projects can be found on page 211. A detailed map and list of opportunities for trails can be found on page 215.

need for oil—and allows families to redirect money to other needs, which in turn helps to keep the local economy strong.

Bicyclists are major users of large urban parks. Establishing trails that create connections among seemingly disconnected parks can result in a more widely-used park system.

EXISTING CONDITIONS

Philadelphia can be a challenging city for pedestrians and bicyclists. Many factors make walking and bicycling difficult or unsafe. Sidewalks on many streets are undersized, making pedestrians feel uncomfortable walking next to fast-moving automobile traffic. On narrow streets, cars attempt to pass bicycles without adequate separation. To navigate the city's often circuitous network of one-way streets, many cyclists ride on sidewalks or against traffic. Adding to these challenges are frequent stop signs on local streets, which prevent bicyclists from sustaining an efficient speed. Most energy expended while riding occurs when accelerating from a stop. On larger streets, fast-moving traffic creates conflict with lower-speed pedestrians and bicycles. The sense of danger is heightened with reports of fatal crashes in the news media. For commuters, a lack of bicycle parking makes bicycling inconvenient, and the city's hot, humid summer months necessitate facilities where bicyclists can freshen up. Addressing all of these challenges requires a coordinated approach to developing a trail network and special facilities needed by bicyclists.

While walking and bicycling are often lumped together in planning, they are very distinct modes of transportation. Pedestrians travel at an average speed of two miles per hour, while bicycles average between 10 and 20 mph in an urban setting. When given proper infrastructure designed for effective bicycling, a bicyclist can travel the city with dispatch, while creating minimal environmental impacts. Therefore, planning for the trail system must serve two distinct user groups with different physical design requirements. The City Planning Commission is currently preparing a citywide pedestrian and bicycle plan.



Maneuvering crowded streets. Pedestrians and cyclists must compete with automobiles in shared rights-of-way, making walking and bicycling difficult or unsafe.

“[We need to] take cycling/alternate transportation seriously; enable cyclists to commute [by creating] dedicated bike trails.”

GreenPlan Philadelphia
civic engagement participant
from Germantown/Chestnut Hill

**BEST PRACTICE:
LOCAL PLANNING OF INTERIM
TRAILS**

Delaware River Trail, Philadelphia, PA

The transformation of the Delaware waterfront is in its early stages. One primary aspect is a continuous trail along the river, which will form a crucial link in the East Coast Greenway, a bicycle trail extending from Maine to Florida. The Delaware River Trail is likely to be realized in sections. On the northern end, a trail from the Betsy Ross Bridge to the mouth of the Pennypack is already in advanced planning and construction. On the southern end, the Center City District is exploring the creation of an “interim early action” bicycle trail between Pier 70 and the Ben Franklin Bridge. This trail would be a fast-track project using inexpensive or donated materials to open a temporary trail on the waterfront that would eventually be replaced with a more refined greenway. The most challenging stretch may lie between the Ben Franklin Bridge and the Betsy Ross Bridge, where right-of-way is limited. Despite these obstacles, someday soon the Delaware River may rival the Schuylkill River as a major trail corridor for the region.

TARGET

Ensure that there is a trail within a half mile of all residents.

Responsible Agency: Mayor’s Office of Transportation and Utilities
Partner: City Planning Commission



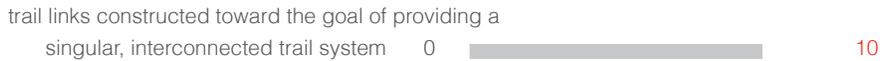
Trail planning involves both open space and transportation planning, with the goal of providing an attractive travel alternative for the full range of purposes, including shopping, school, recreation, and commuting trips. This plan proposes an integrated bicycle network composed of trails—both off street and in the street right-of-way. The network would span rail corridors, parks, greenways, and streets, knitting together the city’s neighborhoods and parks. An established trail system of over 200 miles of trails would make the network a more visible and feasible option for a variety of trips and users.

A half mile is recognized as the longest distance that pedestrians and bicyclists are inclined to travel regularly to reach a trail. Distances beyond a half mile tend to limit or prohibit regular use.

TARGET

Connect independent trail systems in a comprehensive citywide system.

Responsible Agency: Mayor’s Office of Transportation and Utilities
Partner: City Planning Commission



When trails are connected together into a network that reaches many destinations, bicycling and walking become more attractive travel options. Conversely, trails that remain isolated segments receive far less use and have little transportation benefit.

KEY RECOMMENDATION

Collaborate with communities outside of Philadelphia to build regional trail connections.

Responsible Agencies: City Planning Commission, Fairmount Park

Philadelphia relies heavily on residents of neighboring communities who commute into the city for employment and entertainment. Connecting the city’s trail system to a larger network of interconnected regional trails makes the option of commuting by bicycle more feasible and attractive. A regional trail network also supports tourism, adds variety and distance to recreational trails, and facilitates the sharing of resources.





Constructing new trails along infrequently used rail corridors. The train tracks adjacent to Lehigh Avenue occupy only a fraction of the rail corridor in which it is located. The rest of the land in this corridor could be transformed into park space that includes east-west trails that would connect residents to the Delaware River.

KEY RECOMMENDATION 

Enhance the off-street trail network by constructing new trails in parks, inactive or infrequently used rail corridors, utility rights-of-way, and easements.

Responsible Agency: Fairmount Park

Throughout the city, numerous opportunities exist to expand the off-street trail network. Rail corridors are often ideal bicycle routes because they offer gentle grades and separation from traffic.

Philadelphia has numerous rail corridors, both active and abandoned, that have the potential to host trails. Trails along these corridors would provide shortcuts and higher-speed bicycle routes. Ideally, the rail corridors would allow for separate bicycle and pedestrian paths to provide maximum safety and efficiency for both modes of travel.

Abandoned and inactive rail corridors present an obvious opportunity for implementation as rail trails. Active rail corridors are more challenging, but there are numerous examples of trails that share the right-of-way with trains. In such cases, best practices in safety should be used, such as fencing the railroad right-of-way.

RECOMMENDATION

Create a trails master plan for Philadelphia that is tied to the Transportation Improvement Program (TIP).

Responsible Agency: City Planning Commission

As required by federal law, the Transportation Improvement Program comprises the regionally agreed-upon list of priority projects. It includes all projects for which federal funds are anticipated as well as non-federally-funded projects of regional significance. The projects are multi-modal and include bicycle, pedestrian, and freight-related projects as well as innovative air quality projects and more traditional highway and public transit projects.

RECOMMENDATION

Review and revise trail standards to create a comprehensive family of standards for both on-road and off-road trails.

Responsible Agency: Department of Public Property
Partner: City Planning Commission

TARGET

Supplement the proposed trail system with 300 miles of on-street interconnected bicycle lanes.

Responsible Agencies: Mayor's Office of Transportation and Utilities, Department of Streets

miles of bicycle lanes 196  300

Since most residents of the city have to ride on the street in order to reach their destinations, an on-street network is essential to a comprehensive trail system. Planning for on-street bicycle routes can be coordinated with streetscape improvements, stormwater management, and traffic calming. The city's 196 miles of on-street bicycle lanes are an important component of a complete bicycle network but should not be seen as a substitute for physically separated on-street bicycle trails or off-street trails.

KEY RECOMMENDATION 

Where possible, separate bicycle and pedestrian paths to maximize safety and efficiency.

Responsible Agency: Fairmount Park
Partner: City Planning Commission

“Develop railroad right of ways as trails and green spaces.”

GreenPlan Philadelphia
civic engagement participant
from Manayunk/Roxborough

“Link neighborhoods to open space by trails, bike lanes, greenways, [and] walking paths.”

GreenPlan Philadelphia
civic engagement participant
from Lower North Philadelphia

KEY RECOMMENDATION 

Narrow or remove car lanes on heavily-traveled bicycle routes to reduce and lower the speed of traffic and improve safety for all transportation modes, especially bicycles.

Responsible Agency: Department of Streets
Partner: City Planning Commission

KEY RECOMMENDATION 

Design protected bicycle lanes that help prevent blockage from illegally-parked cars and other obstructions.

Responsible Agency: Department of Streets
Partner: City Planning Commission



David Witham, WRT

Walking alongside the Manayunk Canal. The Manayunk Canal's towpath is a walking and biking trail that allows users to learn about the city's industrial history and ecological diversity.

KEY RECOMMENDATION 

Improve signs and markings for bicycle routes.

Responsible Agency: Department of Streets

KEY RECOMMENDATION 

Develop bicycle stations at key commuter nodes.

Responsible Agency: Mayor's Office of Transportation and Utilities

Bicycle stations offer amenities for bicycle commuters such as secure bicycle parking, lockers, changing facilities, showers, information, bike rentals, and basic maintenance.

KEY RECOMMENDATION 

Implement street closures to create urban bicycle routes. Begin on a limited basis (few streets, short period of time, weekends), and expand to more streets and longer periods over time as capacity to manage increases.

Responsible Agency: Department of Streets

Bogotá, Colombia popularized the idea of creating temporary Sunday bicycle routes by closing certain streets, similar to the weekend closure of Martin Luther King Jr. Drive in Philadelphia. Such a program is ideal for Philadelphia because it brings bike routes into the neighborhoods and creates a tourist draw for the city. These temporary closures should not be considered replacements for green streets with separated trails, but they can be implemented more rapidly as interim measures.

KEY RECOMMENDATION 

Evaluate existing bridges for pedestrian and bicycle safety, and identify potential improvements.

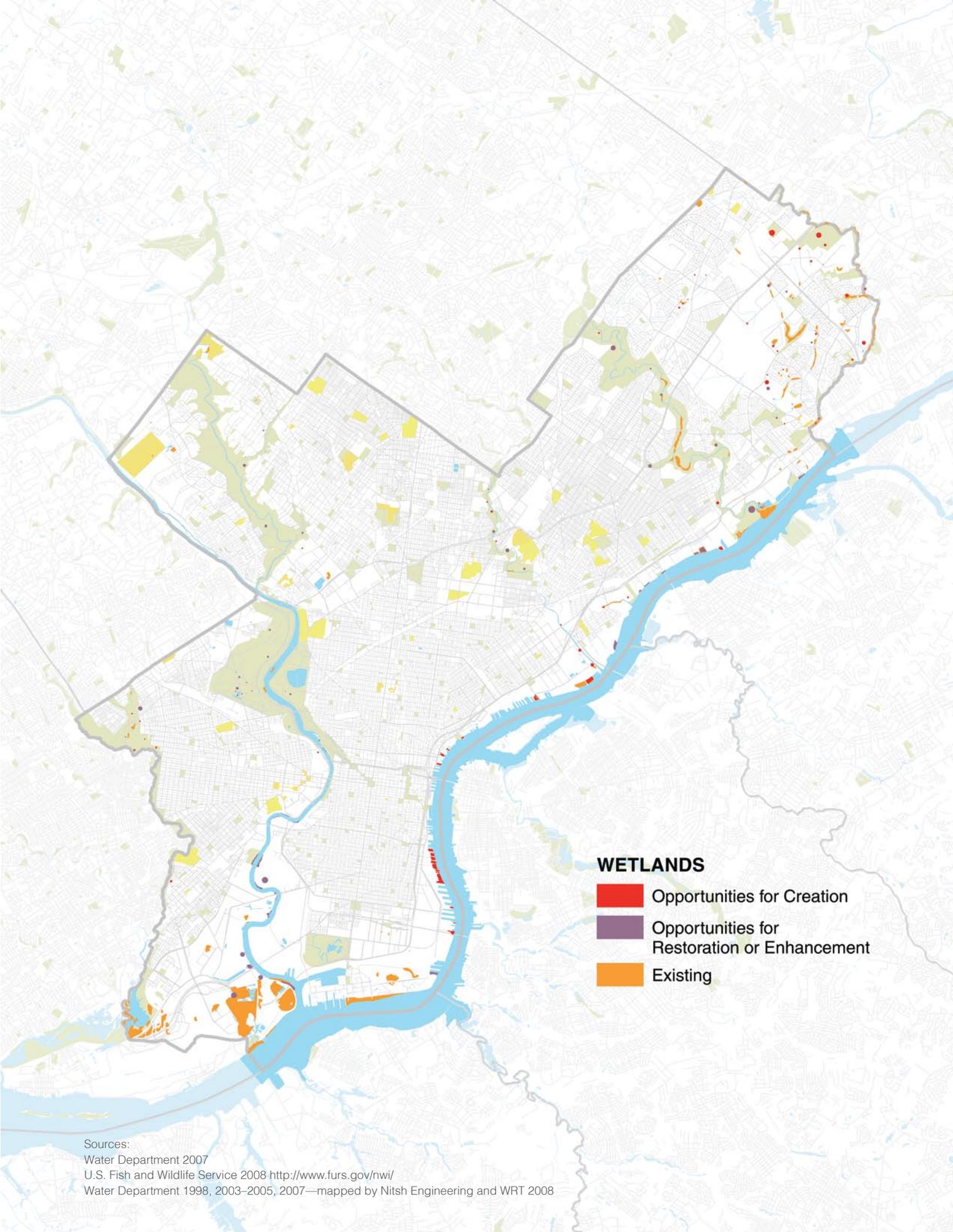
Responsible Agency: Department of Streets

Many important trail routes utilize or are planned to utilize existing bridges. Many of these bridges will need infrastructure changes to accommodate bicycles properly.

KEY RECOMMENDATION 

Incorporate on-street trail improvements into green street projects that address stormwater, streetscape, pedestrian, bicycle, and traffic calming functions. Ensure projects are coordinated with planned street work as scheduled by city and state agencies.

Responsible Agencies: Department of Streets, Water Department
Partner: City Planning Commission



WETLANDS

-  Opportunities for Creation
-  Opportunities for Restoration or Enhancement
-  Existing

Sources:
Water Department 2007
U.S. Fish and Wildlife Service 2008 <http://www.furs.gov/nwi/>
Water Department 1998, 2003–2005, 2007—mapped by Nitsh Engineering and WRT 2008

ELEMENTS OF GREEN PLACES

- TREES
- STORMWATER MANAGEMENT TOOLS
- MEADOWS
- TRAILS AND BIKEWAYS



WETLANDS

- URBAN AGRICULTURE AND COMMUNITY GARDENS
- HIGH PERFORMANCE SURFACES
- RENEWABLE ENERGY

ENVIRONMENT	ECONOMICS	QUALITY OF LIFE
○ Clean Air	○ Efficient Energy Use	○ Fresh, Local Produce
● Healthy Watersheds	● Valuable Properties	● Convenient Recreation Access
● Robust Habitat	● Productive Land Use	● Healthy Residents
○ Hospitable Climate	○ Competitive Economy	○ Strong, Safe Neighborhoods

VISION: A Resilient City with Clean Water

For most of us, wetlands are a mysterious tangle of grasses, an inaccessible even foreboding place. An elevated walkway, a viewing platform, a canoe excursion, or even a vista onto swaying marsh grasses can change this impression. Walking through a wetland, the amount and variety of biological life that exists there is striking. Birds, insects of all varieties, amphibians, and small mammals live in close proximity. The glimpse into the workings of nature that a stroll through a wetland area provides can be a rich and rewarding experience.

DEFINITION

Wetlands are areas where the frequent and prolonged presence of water at or near the soil surface drives the types of soil formation, plant growth, and fish and wildlife communities that inhabit them. Swamps, marshes, and bogs are well-recognized types of wetlands.³⁸

BENEFITS

Wetlands are a cornerstone of stormwater management, environmental education, and biodiversity. Maintaining a wide variety of species is crucial to helping maintain and preserve the ecological resilience of a region. While this fact alone may be reason enough to justify the preservation and expansion of wetlands, when considered from a multi-disciplinary perspective, the value of wetlands becomes even more pronounced.

In addition to the ecological services they are able to provide, wetlands afford educational and recreational opportunities. In some cases, natural and man-made wetlands can be used at a higher intensity through the addition of boardwalks for bicycling and walking. Benches and signage that provide ecological interpretation can also enhance the visitor experience. As a park-like element providing quality-of-life benefits, wetlands can also increase the value of nearby properties.

Finally, from an economic perspective, wetlands are an integral part of an often less expensive and more effective alternative to industrialized approaches to stormwater management. Long undervalued, wetlands provide a wide variety of services, such as

Creating, restoring, and enhancing wetlands (facing page). *GreenPlan Philadelphia* sets a target to create 200 acres of new or improved stream banks and wetlands. Numerous opportunities exist along both tidal and non-tidal rivers to create, restore, and enhance wetlands in the city.

A detailed map and list of opportunities for wetlands can be found on page 227.

protecting and improving water quality, promoting the infiltration of storm water, maintaining surface water flow during dry periods, and storing floodwaters, thereby moderating the effects of flooding and ultimately reducing the amount of rain that needs to be handled by the sewer system. All things considered, wetlands can reduce or even eliminate the need to build additional sewer system capacity.

Wetlands should be considered an integral part of any stormwater management strategy. Employing natural processes to contain and filter stormwater is not only a cost-effective strategy in its own right, but it also provides the ecological, recreational, and educational services that a more industrialized approach would not.

BASELINE

Two hundred years ago, a vast wetland or tidal marsh covered 15 to 20 square miles of southern Philadelphia. Today about one-third square mile of tidal marsh remains—a remnant of Tinicum Marsh at the John Heinz National Wildlife Refuge at the southern-most border of the City. In addition to this remnant, there are small patches of mudflats along the rivers and ponds and seep springs scattered around the city.

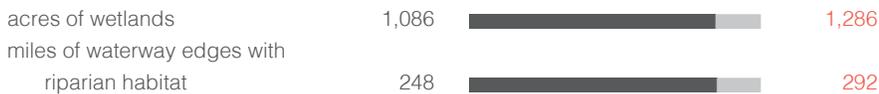
The Water Department identifies and evaluates wetlands and riparian areas within Philadelphia as well as outside of the city. This information assists in developing and implementing projects to protect, enhance, and expand wetland systems. Most recently, the Water Department created a wetlands registry for the Delaware River that identifies 327 possible wetland creation or enhancement projects that could be funded by the City, by private funders, or as development mitigation projects.

In Pennsylvania, the tidal wetlands of the Delaware and Schuylkill Rivers are rare and valuable ecological resources. As the Water Department study indicates, there is enormous potential for more wetlands. Successful wetland restoration projects, such as the recently completed grassy wetland at Pennypack on the Delaware, demonstrate the possibilities.

TARGET

Create 200 acres of new or improved urban stream banks and tidal/non-tidal wetlands.

Responsible Agency: Water Department
Partners: Fairmount Park, Delaware River Waterfront Corporation, Schuylkill River Development Corporation



Building upon the work of the Water Department, *GreenPlan Philadelphia* combines the wetland creation opportunities across the city’s watersheds. The 200-acre target above represents a portion of the opportunities for enhancement, restoration, and creation listed by watershed in the following table and on the map at the beginning of this chapter.

Existing and Proposed Acres of Wetland by Watershed

	Cobbs	Delaware	Pennypack	Poquessing	Schuylkill	Tookany/ Tacony- Frankford	Wissahickon	Total
Existing	95.0	250.3	81.7	163.2	471.4	13.4	11.0	1086.0
Opportunities for Enhancement/Restoration	5.3	24.8	23.7	15.1	67.2	6.0	7.0	149.1
Opportunities for Creation	5.0	61.3	7.4	36.7		12.6		123.0
Total	105.3	336.4	112.8	215.0	538.6	32.0	18.0	1358.1

“Vacant lots ... should include duck ponds and other small green eco-environments, that are studied as a required part of the science curriculum for elementary and middle school students attending the Philadelphia public schools.”

GreenPlan Philadelphia
civic engagement participant
from West Philadelphia



Creating new tidal wetlands. The Water Department has started work to create new wetlands near the mouth of the Mingo Creek at the Schuylkill River. The temporary barriers allow the vegetation time to take root.

A Natural Heritage Inventory of Philadelphia County, Pennsylvania also identified potential priority wetlands projects. Some of these sites include the Columbia Yacht Club, the wetland zone at the Philadelphia Navy Yard, the Philadelphia Northeast Airport, and the Army Corps of Engineers' dredging spoil yard.⁸

The targeted acres of wetlands represent a substantial portion, but not all of the identified opportunities, to be achieved by 2028.

KEY RECOMMENDATION 

Develop an equitable system for trading environmental credits for wetland mitigation.

Responsible Agency: Water Department
Partners: Department of Commerce, City Planning Commission

Development projects sometimes negatively impact wetlands and waterways, even after great care has been taken in the design of the projects. These cases call for compensatory mitigation—in other words, the creation of new wetlands, which are called mitigation banks—as determined by the Army Corps of Engineers and the Pennsylvania Department of Environmental Protection.

Under the proposed system, City agencies, private and publicly held corporations, and nonprofit organizations can create wetlands to gain environmental credits. These credits can then be sold in whole or in part to developers or property owners in need of mitigation projects. Some agreements also require the purchaser to provide for the long-term maintenance of the site.

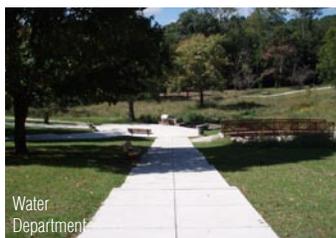
RECOMMENDATION

Implement Philadelphia's new Wetland Registry Program.

Responsible Agency: Water Department
Partners: Department of Commerce, Pennsylvania Environmental Council

The Water Department's projects could be expanded to develop wetlands more aggressively. An important step is to identify which areas are best suited for the City and its partners to develop and which are best suited as mitigation projects for development. The City could have projects ready for wetland construction or stream restoration so that when a developer is required to provide compensatory mitigation, project sites are available.

The significance of and high return on investment for tidal wetlands as identified in the Wetlands Registry indicate that these projects should be accomplished, in general, by government agencies and their partners. Private development mitigation projects could focus on freshwater wetland creation along streams due to the level of investment most likely required in implementing these critical features. Using this strategy, the City could reap the most benefit with available public dollars, while exacting equitable trades for the environmental impacts of development.

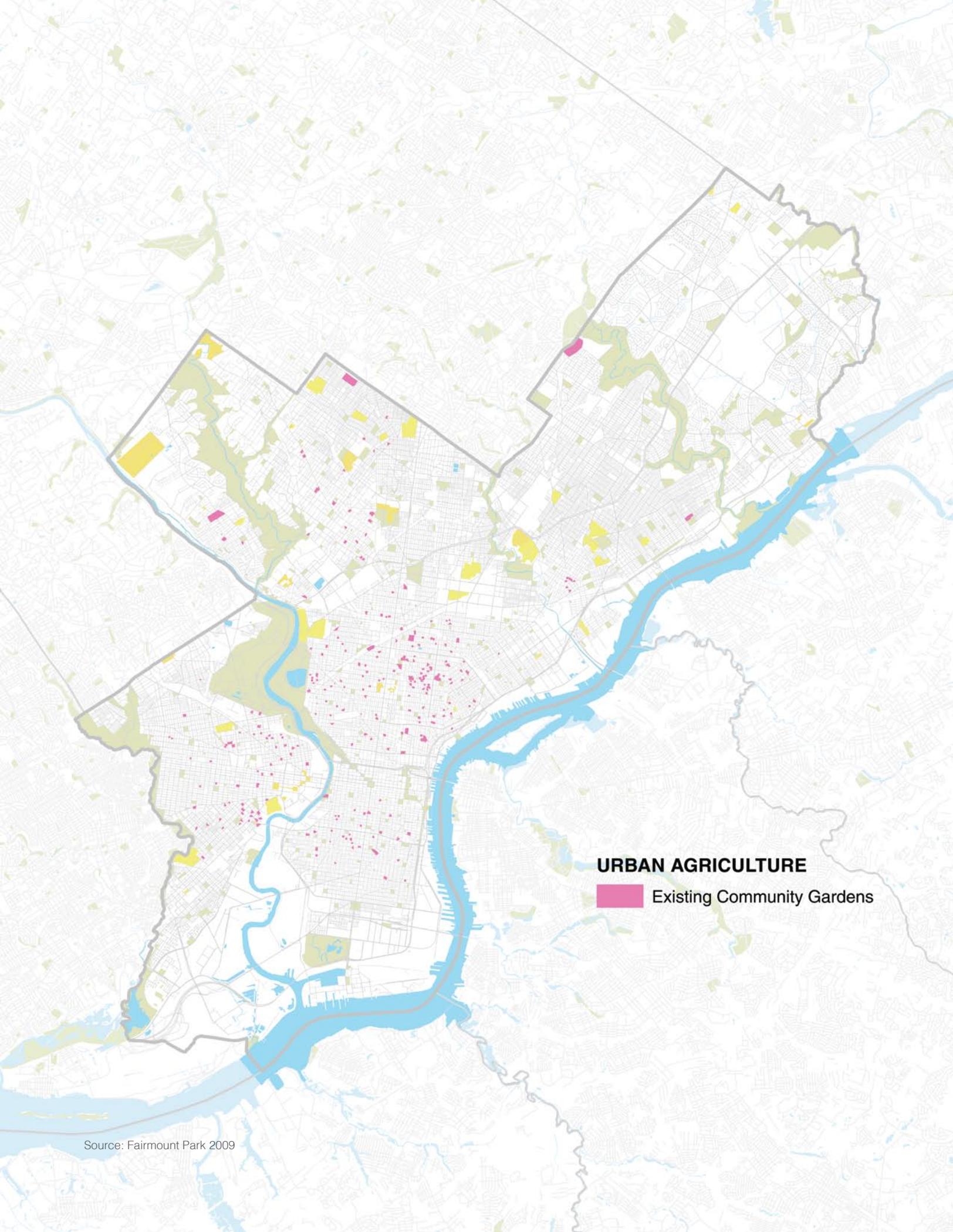


Creating new non-tidal wetlands.
The Water Department's redesigned Saylor Grove is the first stormwater treatment wetland in the city. It naturally cleanses water and helps to filter out contaminants from stormwater runoff before it enters our waterways.

 **BEST PRACTICE:**
WETLANDS REGISTRY

Philadelphia Water Department, Philadelphia, PA

Recently, the Water Department debuted a wetlands registry that identifies 327 possible wetland creation or enhancement projects that could be funded by the city, by private funders, or as mitigation projects.



URBAN AGRICULTURE

 Existing Community Gardens

Source: Fairmount Park 2009

ELEMENTS OF GREEN PLACES

- TREES
- STORMWATER MANAGEMENT TOOLS
- MEADOWS
- TRAILS AND BIKEWAYS
- WETLANDS



URBAN AGRICULTURE AND COMMUNITY GARDENS

- HIGH PERFORMANCE SURFACES
- RENEWABLE ENERGY

ENVIRONMENT	ECONOMICS	QUALITY OF LIFE
○ Clean Air	○ Efficient Energy Use	● Fresh, Local Produce
● Healthy Watersheds	○ Valuable Properties	● Convenient Recreation Access
● Robust Habitat	● Productive Land Use	● Healthy Residents
○ Hospitable Climate	○ Competitive Economy	● Strong, Safe Neighborhoods

VISION: Expanding Access to Fresh Food

Imagine a city that is able to grow a significant amount of its fruits and vegetables, where people in all neighborhoods have access to fresh food and interest in supporting its growth—significantly increasing the city’s resilience, health, and cohesion. This vision is shared by a growing number of Philadelphians who are developing innovative and effective fresh food access programs in finance, growing, distribution, and retail. The retail infrastructure for fresh food is growing. Key signature retail venues such as the Italian Market and Reading Terminal Market are enhancing their offerings, and a wide network of farmers’ markets is expanding throughout the city. There is enormous energy and desire for achieving the city’s potential for urban agriculture and for the city’s urban agriculture “infrastructure” to grow.

DEFINITION

Urban agriculture can take many forms, ranging from an entrepreneurial urban farm to a rooftop community garden. It can be for-profit or nonprofit. It can take place inside greenhouses or outside in the open air. In addition to planting in soil, growing techniques include hydroponics and aquaculture. Such techniques may utilize unorthodox structures such as unused shipping containers and abandoned pools to support the growth mediums. Broadly defined, urban agriculture is the growing of crops, trees, shrubs, flowers, or other varieties of plants within a densely developed area.

BENEFITS

Many neighborhoods in Philadelphia lack a supermarket, or any means to purchase fresh produce. For many Philadelphians, the food most conveniently and affordably available to them comes from either convenience stores or fast food restaurants. A healthier and often less expensive alternative would be to cook from scratch with basic ingredients. For many, however, a lack of access to fresh food preempts this choice. Empowering more residents of Philadelphia to choose home-cooking will yield not only the obvious health and cost-saving benefits, but will also yield more subtle quality-of-life benefits.

that come when a family or community shares a home-cooked meal. Localized urban agriculture can help to provide Philadelphians better access to fresh foods and provide more nutrient-dense foods at lower prices.

Additionally, urban agriculture puts otherwise vacant land to good use, removing the stigma of an unkempt vacant lot and providing instead a gathering place for neighbors to meet and get to know each other.

BASELINE

Philadelphia's high inventory of vacant land makes urban agriculture especially relevant to open space planning for the city. Many large parcels of vacant, industrial land could provide excellent opportunities for large-scale urban agriculture projects.

Existing urban agriculture projects in Philadelphia vary greatly in size and location, from small community gardens to larger commercial efforts like Mill Creek Farm, a nonprofit farm organization located in West Philadelphia. Community gardens can be found in the heart of the city's neighborhoods and in parks like Benjamin Rush State Park. Estimates of existing community gardens range from 300 to 400 gardens. Only a small percentage of these gardens are land-trusted by the Neighborhood Gardens Association/ A Philadelphia Land Trust. In addition, the Pennsylvania Horticultural Society, with city gardeners, has completed 23 community garden projects that include new gardens or improvements to established community gardens.

The Penn State Cooperative Extension in Philadelphia County and the Philadelphia Urban Farm Network (PUFN) report that there are approximately 14 existing entrepreneurial urban farms in Philadelphia and that there is significant unmet demand for urban agriculture, both by farmers seeking sites and by consumers.

TARGET

Promote the creation of commercial urban agriculture projects that are profitable and environmentally responsible, beginning with a goal of 10 projects within the first five years.

Responsible Agency: Fairmount Park

number of urban agriculture businesses 14  24

Urban agriculture can form a foundation for long-term economic development and open space planning. As recommended in *Farming in Philadelphia: Feasibility Analysis and Next Steps*, it is feasible to establish 10 commercial urban agriculture projects in Philadelphia within a span of five years.³⁹

Gardening in the middle of the city. Residents tend small plots of land in the Spring Gardens just north of Center City.



© Robert Y. Lee



BEST PRACTICE:

ENTREPRENEURIAL URBAN AGRICULTURE

Greensgrow Farms, Philadelphia, PA

Greensgrow Farms is located in Philadelphia's New Kensington neighborhood on a previously vacant lot. In the summer of 1998, owners Mary Corboy and Tom Sereduk transformed the former galvanized steel plant and Environmental Protection Agency clean-up site into a three-quarter-acre specialty hydroponic lettuce farm. The business now produces a range of vegetables and flowers and supports a retail center for organic food and live plants. The business is profitable and provides employment opportunities for six seasonal employees and five full-time employees.

Reference: <http://www.greengrow.org>



KEY RECOMMENDATION 🍅

In coordination with the Zoning Code Commission, designate urban agriculture as a permissible use in districts as appropriate.

Responsible Agencies: City Planning Commission, Zoning Code Commission
Partners: Fairmount Park, Department of Recreation, Pennsylvania Horticultural Society

For the city to benefit from the potential of widespread urban agriculture, remove the barriers to implementation and legitimize urban agriculture within the city’s zoning code.

KEY RECOMMENDATION 🍅

Where appropriate, promote the use of vacant land and parkland for urban agriculture, including both community gardens and business enterprises.

Responsible Agencies: Fairmount Park, Department of Recreation
Partners: Mayor’s Office of Sustainability, Philadelphia Redevelopment Authority, Pennsylvania Horticultural Society

A small number of catalytic urban agriculture projects in strategic locations throughout the city can generate enough public interest and build momentum for the conversion of vacant land into viable open space.

RECOMMENDATION

Where feasible, assemble vacant land to support the development of accessible open space, including commercial enterprises such as tree farms that can provide skills training and employment in the agricultural trades.

Responsible Agencies: Fairmount Park, Department of Recreation
Partners: Mayor’s Office of Sustainability, Philadelphia Redevelopment Authority, Pennsylvania Horticultural Society

A lack of site control is often one of the biggest barriers to urban agriculture. A land bank can serve as a powerful tool in acquiring and packaging land for urban agricultural use. Coordinate the efforts of groups, agencies, and authorities—such as the Neighborhood Gardens Association, the City Planning Commission, the Redevelopment Authority, and the Philadelphia Industrial Development Corporation—in the necessary planning, acquisition, conversion, financing, and development consultation of land bank opportunities.

RECOMMENDATION

Create and maintain a geospatial database of community gardens, rooftop gardens, ad hoc urban farms, and other ongoing urban agriculture projects in Philadelphia, with descriptive attributes.

Responsible Agencies: City Planning Commission, Fairmount Park, Department of Recreation

Compiling, analyzing, and mapping comprehensive data on existing urban agriculture in Philadelphia would provide an invaluable tool for understanding trends and monitoring benefits. Mapping would reveal patterns of successful projects and determine the level of farming activity. In order to create this data source, funding sources for urban agriculture projects should require an ongoing inventory. These inventories would provide pertinent information including physical location, site characteristics, production, size of gardening community, supporting organizations, and, if applicable, produce recipients.

RECOMMENDATION

Provide financial incentives to promote urban agriculture.

Responsible Agency: Department of Commerce
Partners: Fairmount Park, Department of Recreation

Using the enormous success of Philadelphia’s 10-year tax abatements and associated building boom as a model, financial incentives for urban agriculture in the city can spur a spate of private investment in open space development.

“I would like to see more community garden spaces... we should use as much available space as possible to plant native/edible fruit and nut trees and edible perennials.”

GreenPlan Philadelphia
civic engagement participant
from Southwest Philadelphia

BEST PRACTICE:
ORGANIC COMMUNITY GARDENING

P-Patch Program, Seattle, Washington

The Department of Neighborhoods’ P-Patch Program provides organic community garden space for residents of 70 Seattle neighborhoods, with an emphasis on low-income and immigrant populations as well as youth. The community-based program encompasses community gardening, market gardening, youth gardening, and food policy in the city of Seattle. P-Patch’s community gardens offer 2,500 plots and serve more than 6,000 urban gardeners on 23 acres of land. These gardeners supply 7–10 tons of fresh organic produce to Seattle food banks each year. The gardens are maintained by community members who commit annual volunteer hours.

Reference: <http://www.cityofseattle.net/neighborhoods/ppatch/>

Buying locally grown food. Customers peruse the herb section at Greensgrow Farms in North Philadelphia.



http://www.greengrow.org/gallery/main.php?g2_itemId=247

**“FRUITS! VEGETABLES!
PLANTS AND FLOWERS!
I’d like to be able to
go out with my children
to choose and buy fresh
fruits and veggies near
my house.”**

*GreenPlan Philadelphia
civic engagement participant
from Lower North Philadelphia*

KEY RECOMMENDATION 🍅

Educate the public about urban agriculture, and advocate it as an important community and economic development tool.

Responsible Agency: Fairmount Park, Department of Recreation
Partners: Pennsylvania Horticultural Society, advocacy organizations

A local advocacy group can bring urban agriculture into the public spotlight. This group should include existing local organizations that work with the planning and operation of community gardens and entrepreneurial urban farms, such as DVRPC, the Neighborhood Gardens Association (NGA), PUFN, and the Philly Orchard Project.

RECOMMENDATION

Promote local and national commercial urban agriculture efforts, including farmers markets, “buy local,” and other advocacy campaigns.

Responsible Agency: Fairmount Park, Department of Recreation
Partners: Mayor’s Office of Sustainability, advocacy organizations

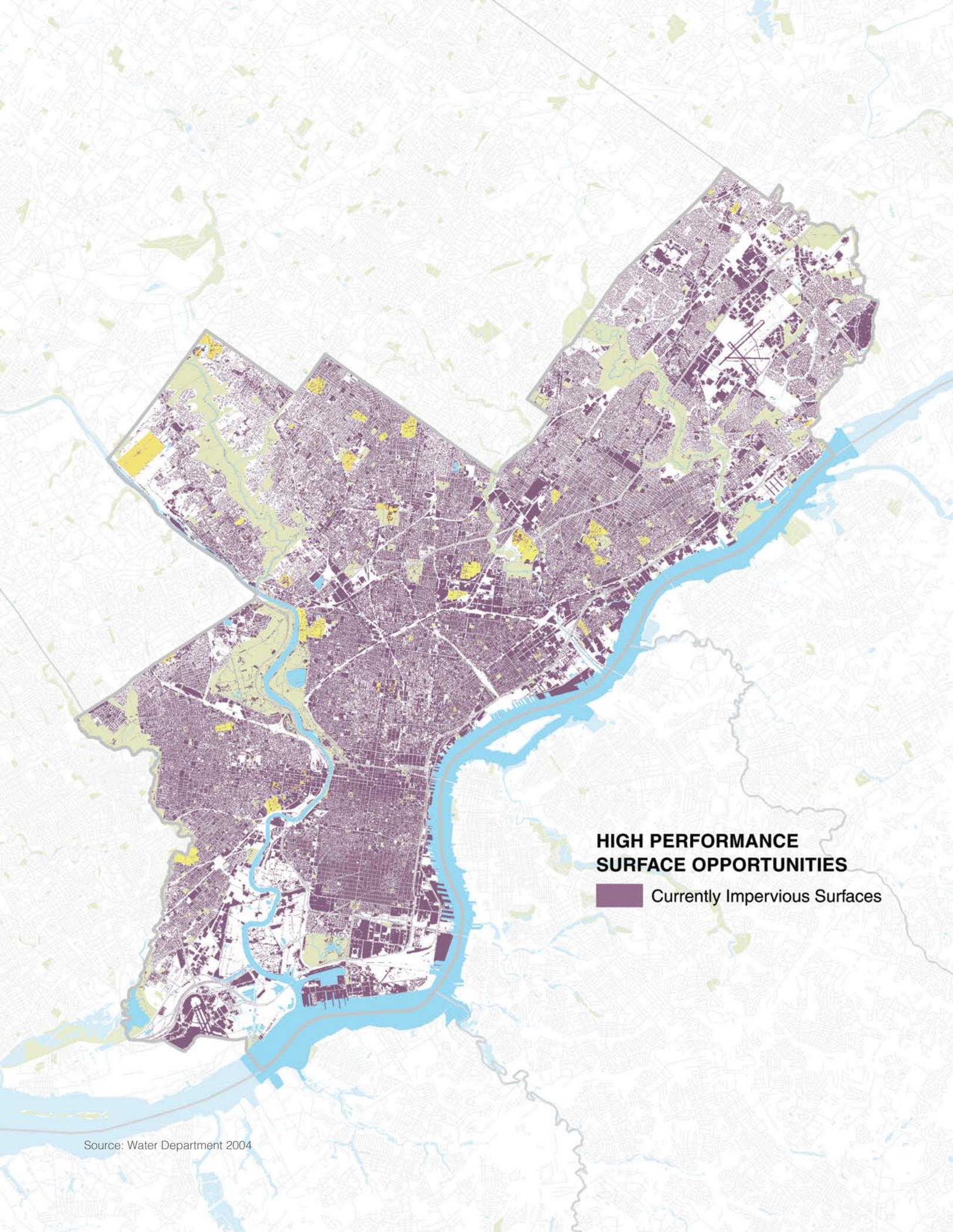
Spurring the demand for urban agriculture products such as locally-grown produce and flowers can, over time, increase the supply of urban farms.

RECOMMENDATION

Work with schools in the city and community organizations to offer classes and hands-on experience in urban agriculture.

Responsible Agency: Fairmount Park, Department of Recreation
Partners: School District of Philadelphia, advocacy organizations

Community gardens and urban agriculture businesses provide many educational opportunities. Through participation, members of the community can learn about the food cycle, the value of fresh food, and horticultural and agricultural skills on a recreational—or even professional—level. Currently, there are two high schools in Philadelphia that provide a focus on agriculture education: W. B. Saul High School of Agricultural Sciences in Upper Roxborough and Abraham Lincoln High School in Northeast Philadelphia.



**HIGH PERFORMANCE
SURFACE OPPORTUNITIES**

Currently Impervious Surfaces

Source: Water Department 2004

ELEMENTS OF GREEN PLACES

- TREES
- STORMWATER MANAGEMENT TOOLS
- MEADOWS
- TRAILS AND BIKEWAYS
- WETLANDS
- URBAN AGRICULTURE AND COMMUNITY GARDENS



HIGH PERFORMANCE SURFACES

RENEWABLE ENERGY

ENVIRONMENT	ECONOMICS	QUALITY OF LIFE
● Clean Air	● Efficient Energy Use	○ Fresh, Local Produce
● Healthy Watersheds	● Valuable Properties	○ Convenient Recreation Access
○ Robust Habitat	○ Productive Land Use	● Healthy Residents
● Hospitable Climate	○ Competitive Economy	○ Strong, Safe Neighborhoods

VISION: More Function, Comfort, and Beauty

Until recently, performance criteria for a construction material often did not include environmental considerations. With sturdiness and durability being the chief concerns, urban areas became more and more covered with hard and impervious surfaces. Sturdy, yes, but these surfaces also contributed to urban pollution and discomfort, not to mention the loss of the aesthetic value of the vegetated areas they often replaced. While sturdiness and durability remain important considerations, environmental performance characteristics are also important performance considerations. Surface materials should be carefully selected to contribute to the functionality, comfort, and beauty of the urban environment.

DEFINITION

High performance surfaces are designed to mitigate stormwater runoff and urban heat island effects that are associated with conventional paving methods. They are designed to replace conventional paving systems with the added benefit of being pervious, “cool,” or both. Pervious surfaces allow some amount of water to filter through them rather than cascade over them. “Cool” surfaces absorb less solar energy and are generally made of reflective materials, typically with lighter colors. The reflectivity of a surface is reported as a percentage, called its albedo. A perfectly reflective surface would have an albedo of 1, a completely absorptive one would have an albedo of 0. When hard surfaces are necessary, the most desirable alternatives meet both of these definitions.

Recognizing the opportunities for pervious and cool surfaces (facing page). Most roads, sidewalks, and buildings absorb unwanted heat and are impermeable to storm runoff. Over time, reflective surfaces can noticeably cool the city, while pavements that hold stormwater or permit its infiltration into soils will reduce burdens on the sewer system.

BENEFITS

Pervious Surfaces

Aside from the large watershed parks, Philadelphia is a city of mostly hard, structural surfaces: streets, walkways, paving, and buildings. Almost every drop of rain that falls on these surfaces drains into the city’s sewer systems, carrying with it soils and pollutants. In a natural environment, 90% of rainwater infiltrates the ground and 10% runs off the surface.⁴⁰ In Philadelphia, more than half of the rainwater runs off the surface. During a heavy storm, the load on the city’s sewer systems can exceed their capacity. When



WRT



Jennifer Martel, WRT

Naturally cooling and draining a small street. Pavements and plantings along a narrow street in South Philadelphia can cool the street and improve its appearance while below-grade gravel layers and filtration channels infiltrate water into soils rather than conveying it to the sewer system.

the amount of rainfall surpasses the capacity of the sewer system, often referred to as a “flash flood,” untreated stormwater—combined with untreated human sewage in combined sewer areas—spills directly into streams and rivers, causing erosion and local flooding. Combined sewer overflows are the chief reason water quality around Philadelphia does not meet current federal clean-water standards.

Rather than build costly new treatment facilities, *GreenPlan Philadelphia’s* recommendations, pursuant to the Water Department’s goals, focus on capturing and managing as much stormwater as possible where it hits the ground before reaching the sewer system, treating it instead through the natural filtration of soils, wetlands, and plantings. Pervious surfaces play a critical role in this strategy. Where design considerations demand a smooth and durable surface, pervious surfaces offer an alternative to more conventional alternatives. A number of pervious paving options are marketed today that function like conventional materials while also permitting infiltration—including pervious concrete, pervious asphalt, and unit pavers with built-in air spaces that allow water to run through.

Demonstrating how pervious paving works. Instead of water running off, water poured on the paving filters through it to recharge groundwater.



Water Department



Water Department

Cool Surfaces

On a hot day, anyone who has stepped with bare feet from a light-colored sidewalk to a dark, newly paved street is reminded how much of an effect color has on how heat is absorbed. With a heritage of coal-tar roofs, asphalt streets, red brick walls, and concrete sidewalks, Philadelphia suffers from what is called the urban heat island effect, whereby the temperature in the city is several degrees warmer than the surrounding countryside. With direct exposure, these surfaces absorb heat from the sun, continuously radiating it back into the surroundings. The effect is especially noticeable at night when you can feel a wall or street emitting the heat collected from long sun exposure during the day. Since cool surfaces do not absorb as much heat from sunlight, instead reflecting it immediately back into the atmosphere not as heat but as light, they can help to reduce the urban heat island effect.

Since cooler surface temperatures translate into cooler air temperatures, cool surfaces help to make summer conditions outdoors more comfortable. Additionally, cool surfaces help reduce the cooling loads for interior spaces. When people don't use as much air conditioning, it reduces energy use and costs, not to mention the heat thrown off by mechanical cooling equipment. The benefits result in lower air pollution (since power plants aren't working as hard) and lower, more comfortable outdoor and indoor air temperature across the city.

Two birds with one stone

A vegetated area is a superior example of a surface that is both permeable and cool. However, since a vegetated surface possesses no structural properties, in an urban setting it is not always appropriate to convert existing paved surfaces to a vegetated material. (Situations where it might be appropriate to replace a paved area with more natural vegetation are discussed in more detail in the trees, wetlands, and meadows chapters.) Where a degree of structural stability of a surface material is desirable, high performance surfaces are a good option. While a permeable, light-colored surface is not yet available that would be appropriate for high-volume roadways, excellent candidates for conversion to high performance surfaces include paved medians, road shoulders, parking lanes, overflow car parking, and lightly-used courtyards and plazas. Because permeable paving systems are often available in a high-albedo coloring or coating, it is often possible to improve stormwater infiltration while reducing the urban heat island effect.

In addition to paved surfaces, high performance surfaces can be used on the walls and rooftops of buildings. One approach is similar to that for paved surfaces, using high albedo exterior finishes to prevent solar heat gain both inside and outside the building. One prominent example of this technique is the use of a white roofing membrane instead of a dark one. Roofs are a particularly important surface to consider, since roofs tend to receive more direct angles of solar radiation than walls. High albedo wall finishes should also be considered, and where design considerations may demand a darker exterior wall finish, shading devices should be considered.

For building envelopes, vegetated surfaces are also an option. Typical examples are green roofs and green walls. In addition to providing insulation and reflecting heat, green roofs and walls cool the air through a process called transpiration. Another added benefit of green roofs is their positive effect on stormwater runoff, both slowing the rate of runoff and even preventing it by taking up water into the root systems of plants.

Cost/Benefit Analysis Green Roofs

Allegheny West/ Tioga

25% green roofs
(+approx 2 million sq ft)

ANNUAL COSTS

CAPITAL/O&M (AVG. OVER 30 YRS)

Installation	
- \$0.33/sq ft	-\$677,755
Maintenance	
- \$0.03/sq ft	-\$67,775
Rebate	
\$0.29/sq ft	\$596,424
-	\$ 149,106

ANNUAL BENEFITS

CLEAN AIR

Particulate Matter (PM10) Removal	
0.044 lb/sq ft × \$2.31/lb	\$207,393
+	\$ 207,393

HEALTHY WATERSHEDS

Stormwater Volume Reduction	
11.43 gal/sq ft × \$0.0099/gal	\$230,106
+	\$ 230,106

EFFICIENT ENERGY USE

Electricity Savings	
0.39 kWh/sq ft × \$0.176/kWh	\$118,336
+	\$ 118,336

NET ANNUAL BENEFIT

+	\$ 406,728
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ONE-TIME BENEFIT

VALUABLE PROPERTIES

Property Value (5% increase)	
+	\$ 9,442,480

“[The City should provide] subsidies or tax breaks for residential green roof installation and [require] mandatory green roof installation for all City recreation facilities.”

*GreenPlan Philadelphia
civic engagement participant
from Lower North Philadelphia*

**Cost/Benefit Analysis
Green Roofs**

• **South Philadelphia**
25% green roofs
(+approx 3 million sq ft)

ANNUAL COSTS

CAPITAL/O&M (AVG. OVER 30 YRS)

Installation		
- \$0.33/sq ft		-\$1,027,561
Maintenance		
- \$0.03/sq ft		-\$102,756
Rebate		
\$0.29/sq ft		\$904,254
-		\$226,063

ANNUAL BENEFITS

CLEAN AIR

Particulate Matter (PM ₁₀) Removal		
0.044 lb/sq ft × \$2.31/lb		\$314,434
+		\$314,434

HEALTHY WATERSHEDS

Stormwater Volume Reduction		
11.43 gal/sq ft × \$0.0099/gal		\$348,869
+		\$348,869

EFFICIENT ENERGY USE

Electricity Savings		
0.39 kWh/sq ft × \$0.176/kWh		\$179,412
+		\$179,412

NET ANNUAL BENEFIT

+ \$ 616,651

ONE-TIME BENEFIT

VALUABLE PROPERTIES

Property Value (5% increase)		
+		\$ 48,783,589

Reducing PECO's energy usage. A green roof on PECO's headquarters in Center City manages stormwater and keeps the building cooler, reducing the need for air conditioning.

Green Roofs

acres of green roof

4



67

Green roofs, also referred to as vegetated roofs or eco-roofs, are roofing systems designed with a layer of vegetation that covers an otherwise conventional flat or pitched roof. They offer insulating value and absorb rain, reducing runoff that otherwise must be handled by the sewer system. Planted roofs filter out some airborne pollutants and reflect heat, which reduces the heat island effect. Their visual and energy-saving appeal adds to property value. Building green roofs (or adding them to existing structures) can be more costly than traditional roofs, but their economic benefits can outweigh the additional up-front costs.

From bottom to top, green roof systems usually comprise a waterproof and root-resistant membrane, a drainage system, a filter cloth, a lightweight growing medium, and plants. The roofing systems may be modular and pre-planted or installed separately in layers.

Green Walls

Green walls use trellises or frameworks to support plantings so that they shade walls that are otherwise excessively heated by the sun. Sometimes called “green facades” or “living walls,” they can be made of tensioned metal wires mounted on exterior walls that support climbing vines, or frameworks that hold planting containers. The leaves shade walls from the sun, reducing warm-weather wall-surface temperatures by as much as 50%. The plantings’ shading effect grows with the amount of wall area protected; it need not be thick or dense.⁴² The mounting system may need to hold the plant layer away from the building’s exterior wall so that roots or tendrils don’t damage bricks or mortar. The air space also helps avoid the development of mildew and creates an insulating airspace that is useful in winter should the trellis be planted with evergreen vines. Reducing surface wind chill by 75% can reduce heating demand up to 25%.⁴³

Green walls require almost no ground area while offering numerous additional benefits. They protect walls from very heavy rainfall, hail, and ultraviolet-light damage. They absorb some rainfall and slowly release the rest into the ground or into drains. The plantings absorb noise and CO₂ emissions. They trap dust, capture pollutants, and help to decrease the heat-island effect. They add cover and provide nest sites for birds.



BASELINE

Philadelphia has 18 square miles of paving in its streets alone, most of which is comprised of conventional asphalt. Conventional asphalt has a very low reflectivity, which absorbs a great deal of heat. Streets alone contribute substantially to the urban heat island effect. Today's street paving is largely impervious, which adds enormous loads to the stormwater system. About 25 square miles of the city is roofed, and much of that is dark, with low reflectivity. A very small percentage of roofs can absorb or retain stormwater. In total, 52% of the city is impervious, with streets and roofs accounting for 62% of that area.

Conventional asphalt pavement is relatively dark, with an albedo of about 0.05–0.10 (1.0 being most reflective). As asphalt streets weather, they actually become as much as 50% more reflective.⁴¹ White concrete is considerably more reflective when new, with an albedo of about 0.70–0.80, but darkens somewhat as it weathers to 0.40–0.60—but is still many times more reflective than aged asphalt.⁴¹

Only a few years ago, green roofs were deemed a pioneering technology, but today they are finding widespread application. PECO installed a green roof on its Center City headquarters, and the Free Library's Central Library unveiled one of its own in late 2008. In 2007, the City adopted a Green Roofs Tax Credit for businesses, a measure that acts as a starting point for a more comprehensive approach to energy conservation and natural stormwater control. Up to 25% of all costs attributable to creating planted roofs that insulate and absorb rain can be applied to reduce the applicant's Business Privilege Tax liabilities (capped at \$100,000). City Council is considering a green-roof initiative that would include municipal buildings, affordable housing, and assistance for homeowners. The Water Department now offers expedited permit review for building projects that use green roofs, pervious surfaces, and other tactics that manage stormwater to minimize the amount that enters the sewer system.

Though there are few baseline measures related to the recommendations in this section, building-element measures offer impressive performance-improvement potential. Citizens involved in the early stages of *GreenPlan Philadelphia* also voiced an intense desire for technical, educational, and financial assistance to build green roofs and install rain barrels. Today, green roofs cover only four acres in a city where rooftops constitute approximately 18% of Philadelphia's land area, or about 25 square miles.

“Change paving materials of alleys to encourage green and help stormwater.”

GreenPlan Philadelphia civic engagement participant from Upper North Philadelphia



Incorporating the use of pervious materials into the design of City facilities. The Water Department installed pervious asphalt at basketball courts at Mill Creek Recreation Center, at 48th and Brown Streets. Although it performs like a conventional playing surface, it permits water to soak rather than linger on the courts.



TARGET

Expand the use of pervious surfaces to help meet the city's stormwater reduction target of managing the first inch of rainwater to reduce burdens on the sewer system.

Responsible Agencies: Water Department, Department of Streets
Partners: Fairmount Park, Department of Recreation, School District of Philadelphia

This target extends the Water Department's land-based and low-impact development programs to integrate them more effectively into related *GreenPlan Philadelphia* initiatives. The Water Department seeks to manage the first inch of rainwater through retention and infiltration techniques, slowing and preventing stormwater from entering the city sewer system. Pervious surfaces play an important role in any stormwater management system. Additional elements of such a system include vegetated basins, rain gardens, and swales described in further detail in the stormwater management tools chapter. This target and the recommendations that support it tie closely to those in other chapters meeting the goal of diverting storm runoff from an overburdened sewage-treatment system.

It is most cost-effective to use pervious surfaces in neighborhoods served by combined sanitary and storm sewer systems. These drainage systems are the most likely to overflow during severe rainstorms, dumping untreated sewage into streams and rivers. Through the Water Department, the City may set priorities for the recommendations below to achieve the greatest stormwater reductions where the problems today are worst.

RECOMMENDATION

Convert impervious paving to pervious paving wherever possible.

Responsible Agency: Water Department
Partners: Department of Streets, Fairmount Park, Department of Recreation

In areas subject to combined sewer overflow events, the City should analyze the potential for replacing impermeable surfaces with permeable ones. Depending on traffic or performance criteria, these surfaces could be permeable asphalt or concrete, paving systems that incorporate gaps to permit the passage of water, or conventional surfaces that incorporate planted areas. The City should continue to assess permeable paving products to determine short- and long-term performance so that the most cost-effective surfaces are matched to the paving function.

Encourage City agencies and private owners to convert hard surfaces to permeable ones, especially in areas subject to flooding. Update zoning regulations or incentives to encourage the use of permeable parking surfaces in conjunction with the use of planted areas to assist infiltration and slow runoff. Pollution-reduction capital grants and mitigation programs offer sources of funding.

KEY RECOMMENDATION

Develop building, land-use, and development standards to improve environmental performance of urban spaces.

Responsible Agency: City Planning Commission
Partners: Delaware Valley Green Building Council, Energy Coordinating Agency, Pennsylvania Environmental Council

BEST PRACTICE: ASSESSING THE POTENTIAL OF URBAN ROOFTOPS

Bay Localize, Oakland, CA

Bay Localize worked with several partners to study a quarter-mile area in the Eastlake District of Oakland. The study identified 10 common building types within the area, noting their structural integrity and characteristics. They then developed a set of conceptual retrofits for each building type to accommodate heavy gardens and estimated unit costs for the retrofits.

Reference: <http://baylocalize.org>

BEST PRACTICE: GREEN ROOF INCENTIVES

Portland, OR

Portland created a series of incentives to encourage the development of green roofs. Developers can earn up to three square feet of additional floor area for each square foot of green roof. Currently, Portland also has a Green Investment Fund for residents and commercial developers. The money comes from a partnership with the nonprofit Energy Trust of Oregon.

Reference: <http://www.portlandonline.com/bps/index.cfm?c=ecbbd&a=bbehci>

TARGET

Expand the use of heat-reflective surfaces to reduce urban heat island effects.

Responsible Agencies: Department of Streets, Mayor's Office of Sustainability
Partners: Department of Public Property, Delaware Valley Green Building Council

Changing the surface performance of roofs, sidewalks, and streets is the key to realizing this target. Cool—that is, highly reflective—roofing materials are widely available and cost little or nothing more than absorptive materials. Pervious paving materials may exact an upfront additional cost, but some are evolving to achieve better performance at lower cost.

BEST PRACTICE: MODELING THE IMPACT OF COOL SURFACES

Research Simulation, Los Angeles, CA

A meteorological simulation in Los Angeles evaluated benefits of reflective paving. Researchers estimated that a 35% reduction in the amount of sunlight absorbed by all pavement in the city would reduce peak temperatures by about 1°F on a hot August day.

Reference: M. Pomerantz, B. Pon, H. Akbari, S.-C. Chang. Lawrence Berkeley National Laboratory, Berkeley, California. April 2000. "The Effect of Pavements' Temperatures on Air Temperatures in Large Cities."

<http://eetd.lbl.gov/HeatIsland/PUBS/2000/43442rep.pdf>

KEY RECOMMENDATION

Establish pilot projects to assess the use of cool street and sidewalk paving materials and techniques that could be adopted citywide.

Responsible Agency: Department of Streets
Partner: Department of Public Property

GreenPlan Philadelphia recommends that street construction programs that have high potential to reduce heat island effects be used to prototype cool surface products and techniques. Densely-built neighborhoods with a high level of pedestrian traffic would likely be good candidates. A variety of design tactics could be tested to determine which perform at the highest level for upfront cost, ongoing maintenance, and longevity. These include testing pavements of various levels of reflectivity, comparing reflective pavements with a mix of other "cool" techniques, like plantings, shading with trees, or incorporating higher percentages of vegetated areas. Testing could also evaluate techniques that realize both pervious and cool surface benefits.

Studies show that cooler pavements can last longer because their internal temperatures fluctuate through a narrower temperature range, which may permit the use of less costly binders. A surface that expands and contracts less in response to temperature change could reduce the kind of cracking that leads to potholes and delamination of the road surface. Surfaces with higher reflectance can improve night vision, thereby improving safety and reducing reliance on lighting and signs.⁴⁴ It may prove more cost-effective to use a more reflective topping layer bound to a conventional base layer.⁴⁵

RECOMMENDATION

Encourage use of cool surfaces.

Responsible Agencies: Department of Licenses and Inspections, Department of Streets
Partner: Delaware Valley Green Building Council

The City could establish minimum reflectance standards for roofing in the building code and for the use of reflective surfaces in sidewalks and onsite parking, plazas, courtyards, and walkways. Trees, reflective shading devices, and vegetated areas offering cool effects and permeable-surface advantages could augment or replace reflective paving.



Encouraging green building elements.
An illustration of a neighborhood in South Philadelphia shows the potential for retrofitting row homes with green roofs, green walls, and cisterns.





Maximum wind energy potential from West-Northwest between November and April

Maximum solar energy potential from Southeast in summer with solar panel at a 70° angle

Maximum solar energy potential from South in winter with solar panel at a 25° elevation

RENEWABLE ENERGY OPPORTUNITIES

Sources:

Gaisma 2008 <http://www.gaisma.com/en/location/philadelphia-pennsylvania.html>—illustrated by WRT

U.S. Department of Agriculture Natural Resources Conservation Service 1961–1990 <http://www.wcc.nrcs.usda.gov/climate/windrose.html>—illustrated by WRT

ELEMENTS OF GREEN PLACES

- TREES
- STORMWATER MANAGEMENT TOOLS
- MEADOWS
- TRAILS AND BIKEWAYS
- WETLANDS
- URBAN AGRICULTURE AND COMMUNITY GARDENS
- HIGH PERFORMANCE SURFACES



RENEWABLE ENERGY

ENVIRONMENT	ECONOMICS	QUALITY OF LIFE
● Clean Air	● Efficient Energy Use	○ Fresh, Local Produce
● Healthy Watersheds	● Valuable Properties	○ Convenient Recreation Access
○ Robust Habitat	● Productive Land Use	○ Healthy Residents
○ Hospitable Climate	● Competitive Economy	○ Strong, Safe Neighborhoods

VISION: Increased Independence, Environmental Stewardship, and Jobs

Fossil fuels are an amazingly versatile and powerful resource, but their over-use threatens the integrity of both the local environment and global climate conditions. Additionally, since they are a non-renewable energy source, the more we use them the more expensive they become. In contrast, renewable energy sources, thanks to economies of scale, become more affordable the more we use them, without as many undesirable pollution and climate change side effects.

DEFINITION

Renewable energy is generated by harnessing the inherent energy in resources—such as wind, sunlight, or water—that are not depleted in quantity or quality through the generation process.

BENEFITS

Like energy conservation, using renewable, clean energy is part of sound environmental practice. Renewable energy produces fewer harmful air and water pollutants as by-products than conventional energy sources. Renewable energy can help the city reduce its greenhouse-gas emissions since a considerable percentage of the city’s power is generated by burning coal, a heavy emitter of greenhouse gasses. A reduction in pollutants enhances the environmental benefits provided by trees and other vegetation. Air and water pollutants alter the metabolism of trees, which reduces their ability to filter air and water and absorb pollutants from the soil.

For private property owners, installing smaller scale renewable energy systems, such as photovoltaic panels, not only reduces energy consumption and lowers utility bills, it can also increase property value. In addition, excess energy generated through the production of renewable energy can be sold to utility companies for a credit through net metering.

Getting the most from renewable energy sources (facing page). By orienting solar and wind systems correctly, they can capture the maximum energy from the sun and wind. During the winter in Philadelphia, the sun typically shines at an elevation of 25° from the south.* During the summer, the sun typically shines at an elevation of 70° from the southeast.*





Using the city's public resources to reduce nonrenewable energy use. Public facilities, like train stations, are prime sites for photovoltaic cells or other renewable energy harnessing devices and greening measures. Installing such devices would help the city meet renewable energy goals.

BASELINE

Greenworks Philadelphia provides a comprehensive view of the City’s alternative energy strategies and objectives. Open spaces can support and advance those objectives by hosting solar-panel arrays, wind-energy installations, and geothermal heating and cooling systems.

The City is studying the feasibility of using public open space to build larger scale renewable energy systems. Several projects are in varying stages of development. The Water Department is evaluating larger solar installations at three of its facilities. The Philadelphia Industrial Development Corporation is working with a partner on the development of a photovoltaic system at the Navy Yard that will produce enough clean energy to power about 200 homes. Fairmount Park is also exploring the possibility of collaborating with a partner to utilize a remote area of the park to construct a similar system that would provide revenue to reinvest in park programs and improvements.

In addition to open space resources, examples also already exist where the City has increased its use of renewable energy technology in the renovation and construction of City buildings. The Police Forensic Science Center was constructed with a solar-electric energy system, and hot water at the Riverside Correctional Facility is produced by solar power. Fairmount Park installed a geothermal heating and cooling system during the restoration of Blue Bell Tavern, an 18th century historic property in Cobbs Creek Park.

There are many opportunities to continue to increase the renewable energy resources of the city. As one example, the city’s parks, recreation centers, and regional rail stations have over eight million square feet of roof area suitable for solar panels and/or green roofs. Green roofs and solar panels can be used concurrently, enhancing each other’s efficiency. Green roofs help cool ambient temperatures and allow solar panels to operate more effectively in hot weather. Solar panels shade green roof vegetation and slow evaporation, making it less likely that the vegetation will dry out.

TARGET

Use open space resources to meet Philadelphia’s renewable energy requirements and reduce dependence on fossil fuels.

Responsible Agency: Mayor’s Office of Sustainability
Partners: Department of Public Property, PECO

Greenworks Philadelphia calls for substantially reducing the city government’s building energy consumption and increasing its purchase and/or generation of electricity from renewable sources to 20% by 2015. Installing renewable energy systems in City buildings demonstrates the financial and engineering viability of the technology. By increasing its use of renewable clean energy, city government leads by example and provides momentum for advocacy groups and other partners seeking to reduce the city’s dependence on non-renewable sources of energy. By reducing pollutants, the City advances the clean water programs of the Water Department and Department of Public Health’s air quality initiatives.

“[We should have our] parks powered by solar energy.”

GreenPlan Philadelphia
civic engagement participant
from South Philadelphia

Cost/Benefit Analysis Solar Energy

• Allegheny West/
Tioga

50% of buildings with solar panels
(+945,000 sq ft)

ANNUAL COSTS

CAPITAL/O&M (AVG. OVER 25 YRS)

Installation		
	-\$0.40/sq ft	-\$378,000
Federal Residential Energy Credits	\$0.04/sq ft	\$37,800
Federal Grant	\$0.22/sq ft	\$204,611
-		\$135,589

ANNUAL BENEFITS

CLEAN AIR

Carbon Dioxide (CO2) Reduction		
	1.34 lbs/sq ft × \$0.0075/lb	\$9,504
Sulfur Dioxide (SO2) Reduction		
	0.005 lbs/sq ft × \$1.91/lb	\$9,025
+		\$18,529

EFFICIENT ENERGY USE

Electricity Savings		
	1 kWh/sq ft × \$0.176/kWh	\$166,320
+		\$166,320

NET ANNUAL BENEFIT

+		\$ 49,260
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“Buildings in parks [should be] as energy efficient as possible.”

GreenPlan Philadelphia
civic engagement participant
from South Philadelphia

**Cost/Benefit Analysis
Solar Energy**

• **South Philadelphia**
50% of buildings with solar panels
(+1.6 million sq ft)

ANNUAL COSTS

CAPITAL/O&M (AVG. OVER 25 YRS)

Installation	
- \$0.40/sq ft	-\$642,800
Federal Residential Energy Credits	
\$0.04/sq ft	\$64,280
Federal Grant	
\$0.22/sq ft	\$347,948
-	\$230,572

ANNUAL BENEFITS

AIR QUALITY

Carbon Dioxide (CO ₂) Reduction	
1.34 lbs/sq ft × \$0.0075/lb	\$16,162
Sulfur Dioxide (SO ₂) Reduction	
0.005 lbs/sq ft × \$1.91/lb	\$15,347
+	\$31,509

ENERGY CONSUMPTION

Electricity Savings	
1 kWh/sq ft × \$0.176/kWh	\$282,832
+	\$282,832

NET ANNUAL BENEFIT

+	\$ 83,769
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**BEST PRACTICE:
IMPLEMENTATION OF
RENEWABLE ENERGY**

Friends Center, Philadelphia, PA

Friends Center is taking a sustainable approach to its current facility upgrades. Although the project incorporates many aspects of green building—including the reuse of existing structures, choosing environmentally-friendly materials, and adding reflective and green roofs—it’s getting a lot of attention for its use of renewable energy. Friends Center is incorporating solar arrays, purchasing wind energy, and will be the first location in Pennsylvania to create deep-standing column wells for geothermal heat exchange.

Reference: UJMN Architects + Designers, <http://www.ujmn.com/news.php>

KEY RECOMMENDATION ↑

Establish renewable-energy systems, such as solar, geothermal, and wind power, at publicly-owned open space sites.

Responsible Agency: Mayor’s Office of Sustainability
Partner: Department of Public Property

In comprehensively evaluating the potential to create more renewable-energy sites, the City should consider remote and underutilized park areas and spaces surrounding public buildings. Many of the City’s largest open spaces sit atop some of the highest elevations in the city and are potential sites for wind power. Potential sites must be selected with concern for protecting the integrity of landscapes, historic structures, and areas of ecological value, such as natural habitats.

RECOMMENDATION

Partner with others to produce renewable energy at publicly-owned facilities.

Responsible Agency: Mayor’s Office of Sustainability
Partners: Department of Public Property, U.S. Department of Energy, Pennsylvania Department of Environmental Protection, private investors

The federal and state governments and private investors are potential sources of funding and expertise in the development of clean renewable energy systems on publicly-owned land. Private investors offer opportunities to structure joint ventures in which capital resources are pooled and energy production or profits are shared. Partnerships of this kind could benefit the City by providing clean, renewable energy at a stable price over the long useful life of the system.

Philadelphia is one of a select group of cities in a partnership with the U.S. Department of Energy called the Solar America Cities. These cities across the country have committed to accelerating the adoption of solar energy technologies at the local level. The City’s program, Solar City Partnership, is managed under the auspices of the Mayor’s Office of Sustainability. Solar City brought together a group of public and private stakeholder organizations to develop a comprehensive solar energy implementation plan for the City.

RECOMMENDATION

Determine the financial feasibility of purchasing and/or producing renewable energy to power publicly-owned facilities.

Responsible Agency: Mayor’s Office of Sustainability
Partners: Office of the Director of Finance, Department of Public Property

The economic viability of renewable energy installations should be calculated on a basis that amortizes the cost of the installation over its useful life. A total-return analysis not only measures direct paybacks from fuel costs saved but includes consideration of the multiple benefits conferred by renewable energy installations. These include a comparison of long term maintenance and capital replacement costs, of the financial value of air quality benefits, and of grants and other incentives provided by the state and federal governments. Unlike private property owners who may not have a long-term interest in their properties, the City can consider a long time horizon to recoup installation costs.



GREEN PLACES

Parks and Recreation Spaces

Green Schoolyards

Vacant Land Opportunities

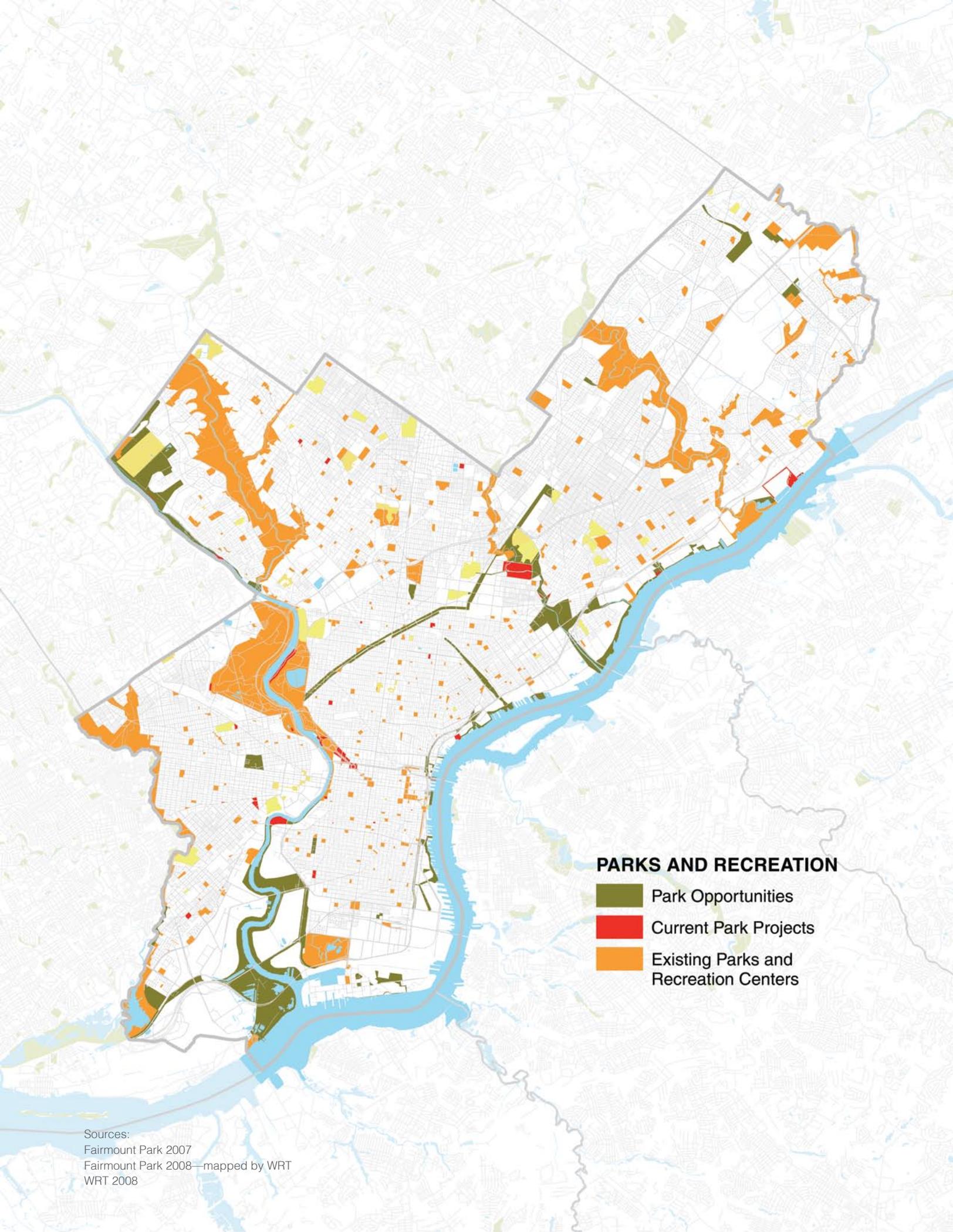
Waterfronts

Green Streets

Green Development

Plazas and Auxiliary Spaces

Rail and Utility Corridor Enhancements



PARKS AND RECREATION

-  Park Opportunities
-  Current Park Projects
-  Existing Parks and Recreation Centers

Sources:
Fairmount Park 2007
Fairmount Park 2008—mapped by WRT
WRT 2008



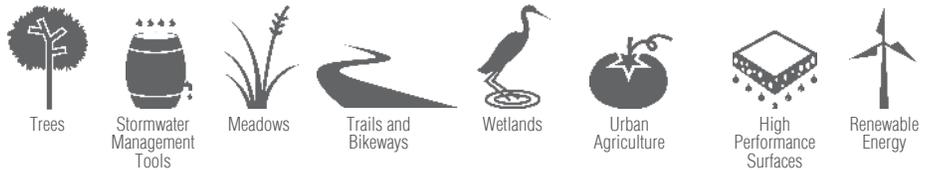
GREEN PLACES

PARKS AND RECREATION SPACES

- GREEN SCHOOLYARDS
- VACANT LAND OPPORTUNITIES
- WATERFRONTS
- GREEN STREETS
- GREEN DEVELOPMENT
- PLAZAS AND AUXILIARY SPACES
- RAIL AND UTILITY CORRIDOR ENHANCEMENTS

ENVIRONMENT	ECONOMICS	QUALITY OF LIFE
● Clean Air	● Efficient Energy Use	● Fresh, Local Produce
● Healthy Watersheds	● Valuable Properties	● Convenient Recreation Access
● Robust Habitat	● Productive Land Use	● Healthy Residents
● Hospitable Climate	● Competitive Economy	● Strong, Safe Neighborhoods

Parks and recreation spaces can include the following **elements of green places**:



VISION: Vibrant and Accessible Recreation Across the City

A drive up the Benjamin Franklin Parkway, a bike ride along Kelly Drive, a stroll through nearly-primeval forest along Pennypack Creek, a restful hour in Rittenhouse Square, time with the kids in Malcolm X Park. With their quality, history, and diversity, Philadelphia's parks are an enduring amenity for residents and visitors.

BENEFITS

Parks are places to exercise and to relax, to let off steam and to seek solace in nature, to enjoy family and friends and to compete in team sports. The trees and forests in the city's parks filter the air. Park soils absorb rainwater and recharge the water supply. Park streams and wetlands slow the flow of stormwater into overburdened sewers and rivers. The diverse habitats within parks nurture a startling number of plant and animal species. Parks increase the value of real estate and play a central role in tourism. Their quality encourages people and businesses to locate near them. In all, a healthy, growing park system is critical to Philadelphia's success.

A 2008 economic study by the Trust for Public Land for the Philadelphia Parks Alliance documents the \$1.2 billion in economic value the city derives from its parks every year.

Removal of air pollution by vegetation	\$1.5 million
Reduction in the cost of managing urban stormwater	\$5.9 million
Tax revenue from increased residential property value.....	\$18.1 million
Direct use value (between \$2 and \$2.40 per resident per day)	\$1.1 billion
Assistance in promoting human health (between \$47 per resident per year)	\$69.4 million
Income from out-of-town park visitor spending (tourists)	\$40.3 million
Tax revenue from increased tourism value.....	\$5.2 million
Stimulation of community cohesion	\$5.0–10.0 million
TOTAL	\$1.2 billion

Mapping parks (facing page). To reap the full range of benefits parks can provide, we will need to care for and enhance our network of parks.

A detailed map and list of current parks and recreation spaces projects can be found on page 211. A detailed map and list of opportunities for parks and recreation spaces can be found on page 213.

BASELINE

Ball fields, playgrounds, and recreation centers as well as parks enjoy wide support and take heavy use. Currently, Philadelphia has a total of 10,296 acres of park and recreation land under the following ownership:

Fairmount Park (within city boundaries)	8,257 acres
Department of Recreation	1,413 acres
National Park Service/Federal	336 acres
Pennsylvania DCNR Bureau of State Parks	290 acres

Philadelphia's average of 7.1 acres of park and recreational land for every 1,000 people is comparable to cities of similar density. This number cannot be the only measure for guiding the type and location of parkland. While some neighborhoods are served with an abundance and diversity of parkland, others are considerably underserved. The chart below breaks down parkland by neighborhood.⁴⁶

Center City	122 acres	49,895 people	2.44 acres/1,000
South Philadelphia	488 acres	155,728 people	3.13 acres/1,000
Southwest Philadelphia	590 acres	75,742 people	7.78 acres/1,000
West Philadelphia	2,152 acres	209,104 people	10.29 acres/1,000
Lower North Philadelphia	760 acres	125,638 people	6.05 acres/1,000
Upper North Philadelphia	151 acres	93,758 people	1.61 acres/1,000
Bridesburg/Kensington/Richmond	133 acres	94,575 people	1.41 acres/1,000
Manayunk/Roxborough	405 acres	41,543 people	9.74 acres/1,000
Germantown/Chestnut Hill	1,992 acres	100,171 people	19.88 acres/1,000
Olney/Oak Lane	326 acres	171,407 people	1.90 acres/1,000
Near Northeast Philadelphia	579 acres	241,816 people	2.39 acres/1,000
Far Northeast Philadelphia	2,598 acres	158,172 people	16.43 acres/1,000

Benjamin Rush State Park, on the far northeastern edge of the city, is the only state park within Philadelphia. As a consequence of the state's historic focus on large wild-lands parks, areas of statewide significance within the city have not yet been acquired or developed. Philadelphians have only 8.1 square feet of State parkland per person, versus the state average of 938.9 square feet. *GreenPlan Philadelphia* identifies a number of opportunities for greater State participation, including, for example, local legs of the East Coast Greenway.

TARGET

Increase park space to ten acres of parkland per thousand residents.

Responsible Agencies: Fairmount Park, Department of Recreation
 Partner: Pennsylvania Department of Conservation and Natural Resources

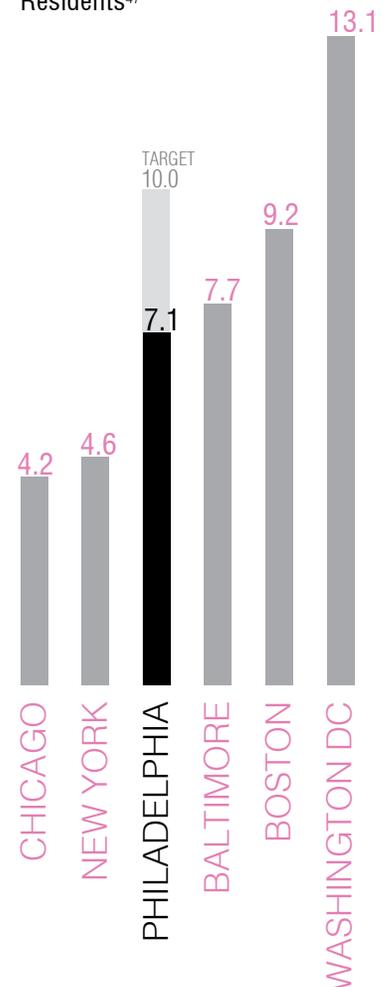


Based on the current population, 10 acres of parkland for every 1,000 citizens would require a total of about 15,000 acres, an increase of 4,200 acres. The target would put Philadelphia in line with the goals of many peer cities and is reasonably attainable. The added acreage was computed on the basis of park-acquisition opportunities—spelled out in the Projects and Opportunities section—combined with the acres needed to upgrade access to park and recreation facilities in underserved neighborhoods.

“I live where I do [in Chestnut Hill], even though it is more expensive and less convenient, because I need the green space.”

GreenPlan Philadelphia
 civic engagement participant
 from Germantown/Chestnut Hill

Total Parkland per Thousand Residents⁴⁷





Discovering the Wissahickon.

A family walks along a trail through Wissahickon Park.

BEST PRACTICE:

SIGNATURE PARK INVESTMENT

Millennium Park, Chicago, Illinois

Some parks are so important and loved that they are intrinsic to the city's very identity, as the Benjamin Franklin Parkway and Fairmount Park are in Philadelphia. A sunken railyard at a busy edge of Chicago's downtown became Millennium Park in 2004. Anchored by its outdoor concert stage designed by Frank Gehry, an underground stage theater, outdoor art exhibitions and gardens, it pulls together Grant Park on Lake Michigan and the Art Institute of Chicago with pedestrian bridges designed by Gehry and Renzo Piano. \$160 million in private contributions leveraged a \$270 million investment by the city (in the form of \$175 million in construction bonds amortized by parking garage revenues and \$95 million in tax-increment-financing bonds). It is estimated that the park will generate \$1.6 billion in direct economic benefit to hotels, restaurants, and retailers over a 10-year period after the opening date and increase the value of residential real estate surrounding the park by \$1.4 billion.

Reference: As described in the Millennium Park Economic Impact Study. April 2005.

KEY RECOMMENDATION

Acquire and develop new parks to form an integrated interconnected system of parks, trails, and habitats.

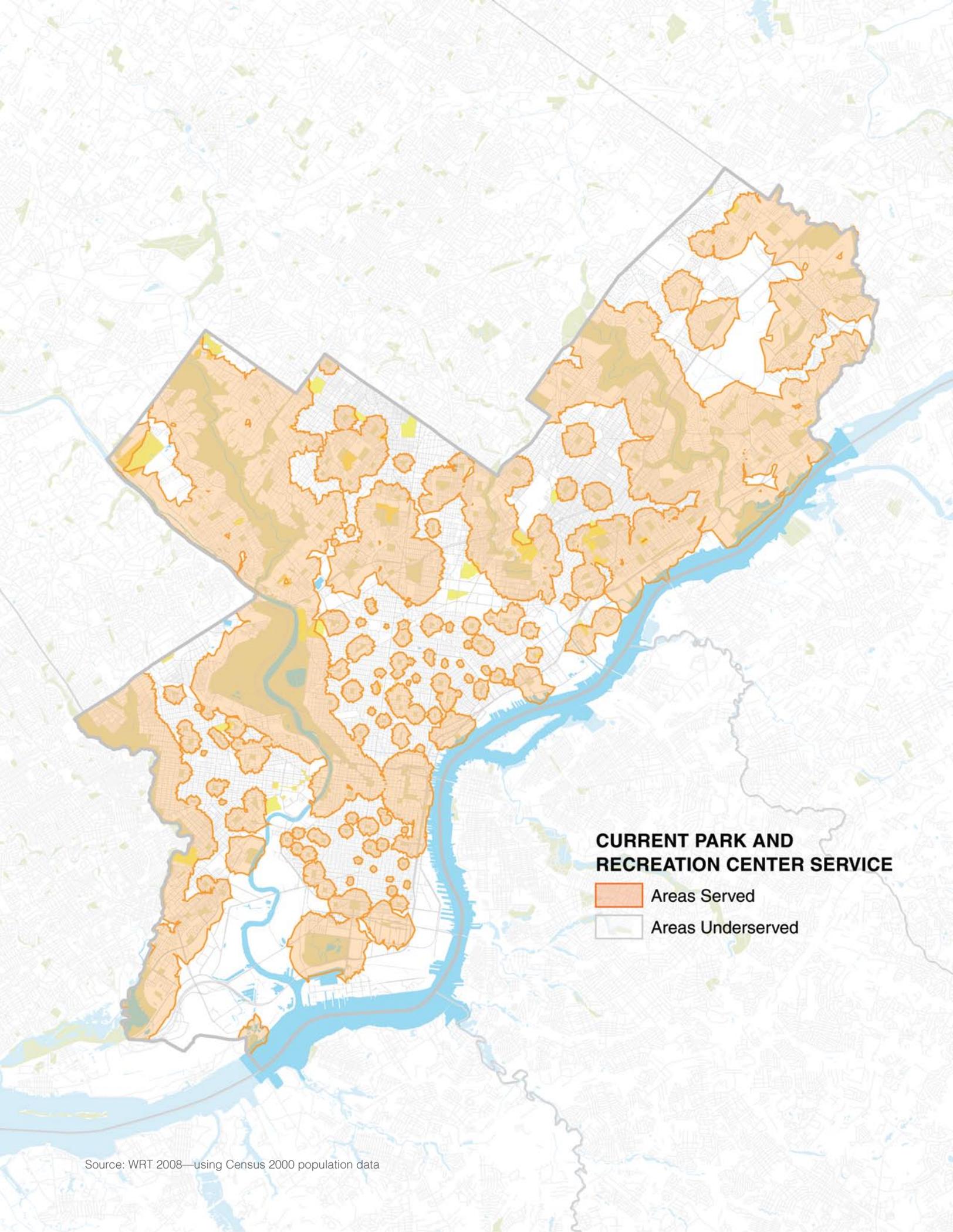
Responsible Agencies: Fairmount Park, Department of Recreation

Partners: Pennsylvania Department of Conservation and Natural Resources

In park acquisitions, prioritize sites that can extend existing parkland and habitat networks, link to waterfronts and trail networks, and take advantage of rail corridors and utility rights of way. Consider how the required natural buffer between developments and stream edges can be designed to support riparian animal and plant communities while providing the benefits of parks. Provide frequent access points to waterfronts across large tracts to meet river-access targets.

The uppermost and lowermost Philadelphia reaches of the Schuylkill River offer the potential to extend Fairmount Park trails and parklands and the Schuylkill River trail as changes in land uses permit. Along the Delaware River, *GreenPlan Philadelphia* endorses the approaches developed in the Civic Vision for the Central Delaware and the North Delaware Riverfront Greenway plans.

Some park opportunities have the potential to become signature projects—that is, serving the local public while creating an attraction so magnetic that it attracts visitors from within and beyond the city, and becomes an iconic, symbolic element of the city. While most of the potential for such magnetic projects are in or near Center City, the riverfronts offer signature project potential, as do the plazas around City Hall and the Reading Viaduct. The Projects and Opportunities chapter includes descriptions of several signature project opportunities.



CURRENT PARK AND RECREATION CENTER SERVICE

-  Areas Served
-  Areas Underserved

Source: WRT 2008—using Census 2000 population data

**BEST PRACTICE:
STATE PARK**

Liberty State Park, Jersey City, NJ

Liberty State Park is located on the New York Harbor, directly across from the Statue of Liberty. The 1,122 acre site has played a significant role in its region—and country's—history. It was once a major waterfront industrial area with an extensive freight and passenger transportation network. The site includes the Central Railroad of New Jersey Terminal (CRRNJ), the train station through which immigrants entered the United States from Ellis Island.

Today, Liberty State Park plays a different, but still important role in the New York Harbor area. The extensive brownfields left by industry and dumping have been transformed with the development of Liberty State Park, operated and maintained by the New Jersey Division of Parks and Forestry. Extensive remediation has made way for over 5 million visitors per year who come to enjoy the sweeping arc of the waterfront promenade, interpretive areas, hundreds of acres of recreation and views into naturalized habitat areas. Enhancement of Liberty State Park has been ongoing since its opening in 1976.

Source: <http://www.libertystatepark.com>



Making parks accessible (facing page). The areas of the city best-served by parks and recreation centers are within half a mile of a facility and that facility is large enough to serve the number of people who live nearby. *GreenPlan Philadelphia* proposes directing investments toward under-served communities.

TARGET**Ensure that all residents are adequately served by parks and recreation centers.**

Responsible Agencies: City Planning Commission, Fairmount Park, Department of Recreation
Partner: Pennsylvania Department of Conservation and Natural Resources

percentage of residents adequately served by parks
and recreation centers

58  100

GreenPlan Philadelphia describes a number of ways to identify underserved areas, so that these may be prioritized for larger and improved facilities. Residents living farther than half a mile from a park or playground are considered underserved. Additionally, parks serving over 500 people per acre of park within the half mile radius are considered over-burdened. Using such measures identified that the highest priority areas for additional parkland are in the Bridesburg, Kensington, Richmond, Upper North Philadelphia, Olney, and Oak Lane neighborhoods. The highest levels of need were identified in certain areas along the central Delaware waterfront. As maintenance-needs inventories are updated, the facilities most in need of maintenance could be correlated with facilities in the least-served neighborhoods, which would identify parks most in need of attention. Considering park facilities in terms of crime statistics would also help identify facilities that require maintenance or redesign to reduce the incidence of crime and to encourage use and local “ownership,” as a deterrent to crime.

KEY RECOMMENDATION 

Assess opportunities to create new federal, state, and city parks within the city.

Responsible Agencies: Fairmount Park, Department of Recreation
Partners: City Planning Commission, Pennsylvania Department of Conservation and Natural Resources

GreenPlan Philadelphia has identified many park opportunities and recommends that the City evaluate acquisition alternatives, including outright purchase, land trades, bartering, and partnerships (in which park acquisition and development is coordinated with private or institutional development, both as a source of funds and as a means to create greater value by combining City and other resources).

The City should comprehensively evaluate park acquisition opportunities that further state and federal interests so that funding and management can be shared. Such parcels may contain historical or environmental resources of national or state significance. They may offer the potential to extend regional or multi-state networks, like wetlands, flood-control systems, pollution-control systems, drinking-water sources, and riparian and estuarine environments to nurture local and migrating species. Parks, trails, and heritage corridors of regional, state, and federal interest may also be linked together. A few examples include linking the city's historic core to riverfronts of historic value, and linking the location of the birth of American independence in the city to the location of sacrifices required for that birth in Valley Forge.

RECOMMENDATION

Update service analysis for major recreation amenities.

Responsible Agencies: Fairmount Park, Department of Recreation
Partners: City Planning Commission

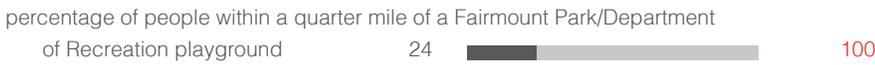


Update the status of service in combined facilities to look for opportunities to make the best use of both park lands and recreation facilities. Identify redundant facilities and functions, and shift resources to under-served sites. Additionally, evaluate facilities to take into account the city’s changing demographics. Some examples include additional play spaces in neighborhoods with a great number of families, or senior-related programs in neighborhoods with a great number of seniors.

RECOMMENDATION

Identify new opportunities for playgrounds and ball fields.

Responsible Agencies: Department of Recreation, Fairmount Park
Partners: City Planning Commission, School District of Philadelphia



While *GreenPlan Philadelphia* has identified many opportunities for park acquisition, a finer-grain, neighborhood-level analysis should be conducted to identify opportunities for playgrounds and ball fields. Smaller properties may be best suited for recreational amenities, particularly in underserved neighborhoods, while large parcels may be best suited for the creation of natural parks. Pocket parks can be designed to support both passive and active recreational uses. When evaluating sites the following should be considered: proximity to schools (to extend the value of schoolyards), proximity to rivers, streams, and existing parks (where park growth can relieve overcrowded facilities), and ease of access (near bus lines, bikeways, but separated from heavily trafficked streets). Playgrounds and ball fields may, at low-cost, be carved out of underused public parcels or campuses. Prioritize locations that offer easy access to families with small children and older adults.

RECOMMENDATION

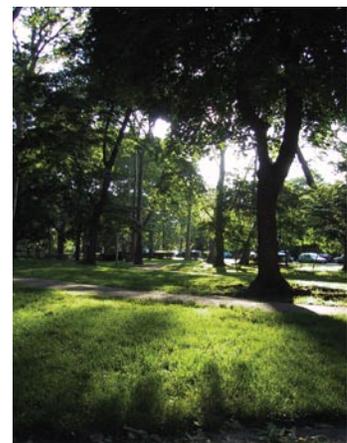
Support neighborhood-level plans that are consistent with *GreenPlan Philadelphia* by, among other things, assembling and acquiring land for open space.

Responsible Agency: City Planning Commission
Partners: community development corporations, community associations, business improvement districts

Though the Projects and Opportunities section identifies many park opportunities, *GreenPlan Philadelphia* has not attempted to assemble every neighborhood-level opportunity. In setting out a broad, citywide vision, *GreenPlan Philadelphia’s* targets and recommendations become useful means to inform finer-grained planning at the level of individual neighborhoods. Such opportunities may include parcels of vacant land or underused public lands. Identifying and setting aside those lands with the greatest park potential should be an ongoing effort for public official and private citizens alike.



Hosting Richmond events. Like many parks and open spaces in the city, Campbell Square is used as a venue for neighborhood events.



Finding shade in West Philadelphia. Clark Park is one of only a few large, shaded parks in West Philadelphia.



© Robert Y. Lee

BEST PRACTICE: WORKFORCE ATTRACTION

Boeing, Chicago Illinois

In 2001, the Boeing Company announced the location of its new corporate headquarters after a heated three-way battle among Chicago, Dallas, and Denver. In choosing Chicago, Boeing officials cited, among other reasons, the city's quality of life, including the city's recreational opportunities, its urban life downtown, and amenities such as parks. According to Dallas' park director, "The Boeing relocation had a profound effect on people's attitudes towards the quality of life in our city." Dallas subsequently identified potential downtown park spaces, passed a ballot measure for funding, and redefined its vision of itself as a more livable and green city.

Reference: Paul Sherer. "Why America Needs More City Parks & Open Space."

Prepared for Trust for Public Land. 2003. <http://www.tpl.org>

RECOMMENDATION

Coordinate park and recreation-facility development to help achieve relevant goals for *GreenPlan Philadelphia* Elements of Green Places.

Responsible Agencies: Fairmount Park, Department of Recreation

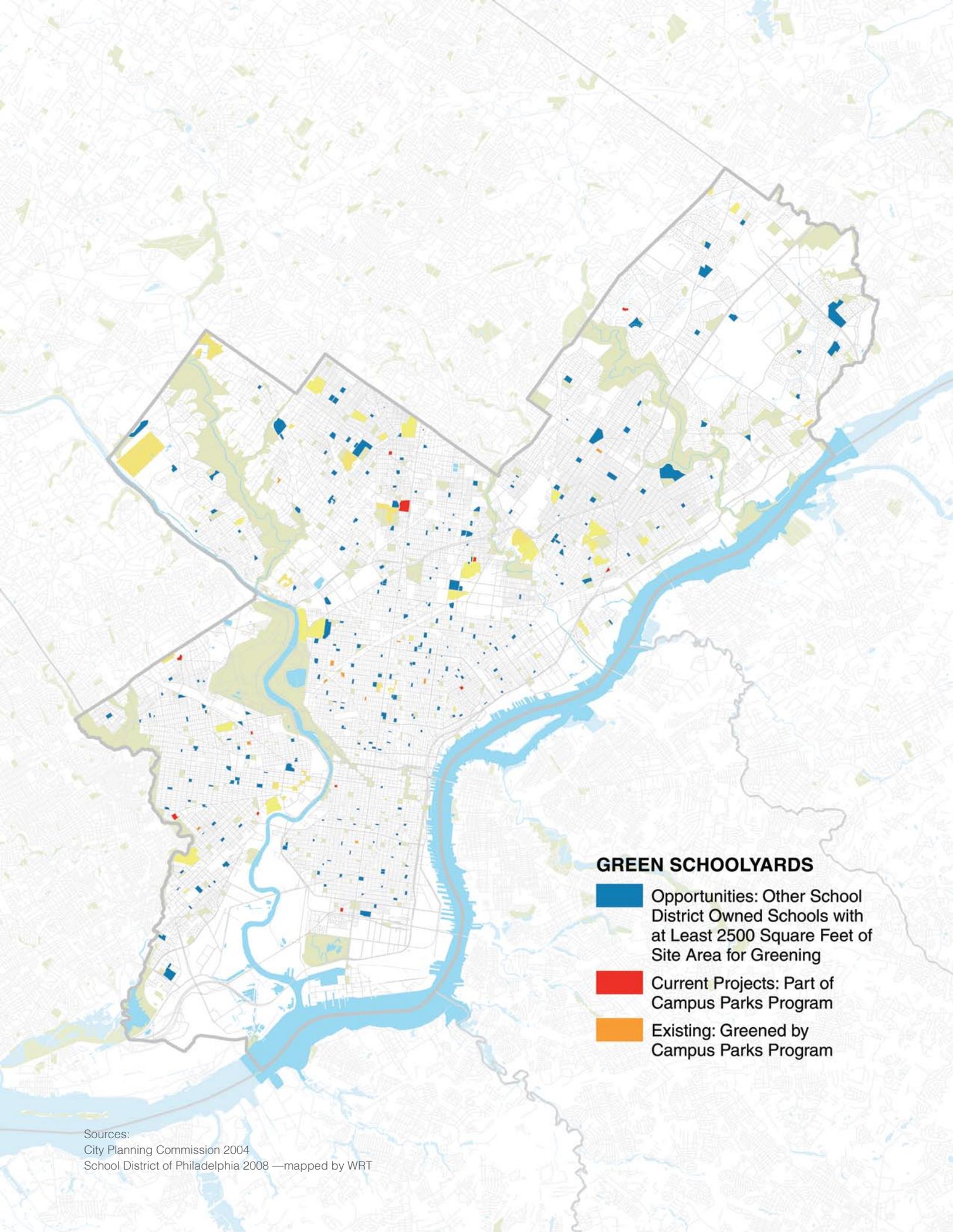
Partners: City Planning Commission, Pennsylvania Horticultural Society, community associations

Evaluate park acquisition, development, and design to further the targets and recommendations in other chapters:

- to advance tree-planting goals and urban-forest development;
- to create new meadows, where circumstances permit;
- to create or enhance wetlands that further drainage, infiltration, and flood-protection goals as well as increase recreation opportunities;
- to extend trail and bikeway systems; and
- to incorporate building-element and pervious-surface standards into facility design.

"South Philly rowhouses don't have much in the way of backyards, so we need well-kept public spaces, pocket parks and the like. If there were small, community-supported parks like Gold Star Park scattered throughout the area, it would be a much [more] pleasant place to live!"

GreenPlan Philadelphia civic engagement participant from South Philadelphia



GREEN SCHOOLYARDS

-  Opportunities: Other School District Owned Schools with at Least 2500 Square Feet of Site Area for Greening
-  Current Projects: Part of Campus Parks Program
-  Existing: Greened by Campus Parks Program

Sources:
City Planning Commission 2004
School District of Philadelphia 2008 —mapped by WRT



GREEN PLACES

PARKS AND RECREATION SPACES

GREEN SCHOOLYARDS

VACANT LAND OPPORTUNITIES

WATERFRONTS

GREEN STREETS

GREEN DEVELOPMENT

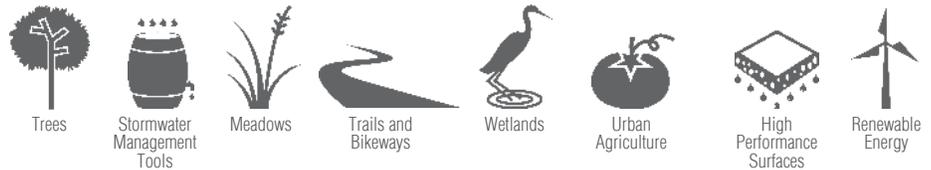
PLAZAS AND AUXILIARY SPACES

RAIL AND UTILITY CORRIDOR

ENHANCEMENTS

ENVIRONMENT	ECONOMICS	QUALITY OF LIFE
● Clean Air	● Efficient Energy Use	● Fresh, Local Produce
● Healthy Watersheds	● Valuable Properties	● Convenient Recreation Access
● Robust Habitat	○ Productive Land Use	● Healthy Residents
● Hospitable Climate	● Competitive Economy	● Strong, Safe Neighborhoods

Green schoolyards can include the following **elements of green places**:



“We can put gardens on the roof tops of these schools and let the children care for them. We can get the cars off the grounds and put grass in its place. There is so much that can be done to improve the quality of our schools environment.”

GreenPlan Philadelphia
civic engagement participant
from Center City

VISION: Teaching Nature

Where a school child’s play space has typically become a hard, flat plane of asphalt surrounded by a high chain link fence, imagine an alternative: park-like yards, with trees and other plants, even a rain garden that children can enjoy while learning about nature. Green schoolyards can make outdoor exercise and play both more appealing and more stimulating. A playground that includes natural features becomes an outdoor classroom, a way to make nature less mysterious and introduce children to more diverse recreational opportunities, helping to nurture the next generation of stewards for Philadelphia’s landscapes.

BENEFITS

The 281 schools and 305 schoolyard sites and ball fields covering 1,060 acres are a valuable resource for both schools and communities, and they have an enormous impact on community well-being. With attractive playgrounds, schools become more appealing neighbors, inviting to children and parents alike. Everyone has an interest in attractive schools, even if they don’t have children. Measures as simple as a few trees and a better play space can be serve as low-cost ways to engage the surrounding community. Linking campus improvements to networks of parks, trails, and other open spaces enhances the value and potential both to serve children and to act as a recreational resource for the neighborhood. When outfitted with surfaces that retain water, filter pollutants, and naturally release rainwater, school sites can help reduce flooding from storms and improve water quality. Serving these larger public purposes can also broaden available funding resources.

BASELINE

Many schoolyards comprise only asphalt and fencing even though the Philadelphia Home Rule Charter has long envisioned a coordinated effort between the School

Mapping green schoolyards (facing page). Our schoolyards offer tremendous opportunity to provide recreation and planted areas where they are most needed.

A detailed map and list of current green schoolyards projects can be found on page 211. A detailed map and list of opportunities for green schoolyards can be found on page 221.

“By [greening] school grounds, we are... improving the quality of life of our children and future residents.”

GreenPlan Philadelphia civic engagement participant from Center City

Undertaking greening initiatives at school sites. This illustration imagines the type of transformations possible to create functional and enjoyable green schoolyards.





Jennifer Martel, WRT



District of Philadelphia and Fairmount Park. The Campus Parks Initiative began to change these conditions in 2004. Eleven school campuses have so far benefited from the program, which has added trees, environmental features, and more diverse recreational opportunities. Advocacy groups and volunteers have extended the City's limited resources to realize the projects. The School District of Philadelphia, the Pennsylvania Horticultural Society, the Water Department, and community-based organizations partnered to undertake projects including playground upgrades and mural paintings involving students at McKinley, C.W. Henry, and Norris S. Barratt Middle School campuses. The 2006 High School of the Future, with its park campus and green roof, is a model for integrating green elements into school design.

The City and the School District of Philadelphia have not formally cooperated to link sites and resources to create schoolyards that are more park-like. Legal barriers, liability questions, and limited resources have slowed growth of the Campus Parks program and limited the cooperative development of well-designed, well-maintained open space that can serve recreational needs of both schools and neighborhoods. But, these are not insurmountable problems going forward.

TARGET

Green 100 additional schoolyards through the Campus Parks program.

Responsible Agency: Mayor's Office of Sustainability
Partners: School District of Philadelphia, Pennsylvania Horticultural Society, Fairmount Park, Department of Recreation, Water Department

number of schoolyards greened 11  111

Multiple benefits can be achieved by redesigning schoolyards to incorporate more natural amenities. By broadening schoolyard benefits, more constituencies become involved, which will encourage more volunteerism, more partnerships, and a greater diversity of funding sources than now exists.

KEY RECOMMENDATION

Develop partnerships among City agencies, advocates, and partners to facilitate the green-schoolyard development process and enhance funding.

Responsible Agency: Mayor's Office of Sustainability
Partners: School District of Philadelphia, Pennsylvania Horticultural Society, Fairmount Park, Department of Recreation, Water Department

A cooperative effort between the School District of Philadelphia, the Water Department, Fairmount Park, and the Recreation Department could identify learning, recreation, and fitness goals for children and unite them with park and recreation expertise to develop and maintain a wide range of campus recreational facilities and environmental-education programs. Park-like schoolyards could help draw the parks system into underserved neighborhoods. Schoolyards can become green extensions of bikeways and augment green streets, enhancing safe access to schools by bicycle and on foot in the process.

This effort needs to include the development of clear responsibilities for site ownership and management so that parks and schools can share space. Clear risk-management and maintenance procedures and responsibilities will reduce liability so that such sharing does not impose new legal risks and unnecessary financial burdens.

BEST PRACTICE: SCHOOLYARD PARTNERSHIPS

SPARK, Houston, Texas

Former city council member Eleanor Tinsley created the Houston School Park program (SPARK) in 1983 as a way to increase neighborhood park space. An agreement between the city, the Parks Board, and the school district formally established the nonprofit organization. It combines resources of the Department of Housing and Community Development, seven local school districts, Harris County, private funders, neighborhood groups, parent-teacher groups, and concerned citizens. More than 85 of the 180 SPARK parks have public-art installations. School art teachers propose and complete about half the projects. In some projects, schools recruit a local artist to work with the students and an architect.

Reference: <http://www.sparkpark.org>

BEST PRACTICE: TRANSFORMING SCHOOLYARDS

Learning Landscapes, Denver, Colorado

In Denver, a citywide parks master plan set a goal that no one should live farther than six “walkable” blocks from a park. The city, in partnership with the local campus of the University of Colorado, Denver Public Schools, and private foundations, started turning grounds covered largely in pea gravel into “learning landscapes.” Trees, gardens, artwork, themed play areas, and new playground equipment are being added to more than 200 elementary and middle school sites. The recreation spaces engage the whole community by being open to the public after school hours and on weekends. The schools tapped local bond funding and federal Community Development Block Grants.

Reference: <http://thunder1.cudenver.edu/cye/lla/home.html>

The Water Department has an interest in transforming the acres of impermeable schoolyards into water-absorbing and vegetated land that can reduce burdens on the city’s stormwater system. Schools thus become an opportunity to plant trees, extend naturally turfed and planted areas, and even accommodate habitat enhancements, where conditions permit. All of these, of course, offer more diverse play, fitness, and learning opportunities for children. These inter-agency partnerships also have the potential to enlarge funding sources for schoolyard improvements.

RECOMMENDATION

Enhance schoolyard greening efforts by incorporating relevant *GreenPlan Philadelphia* Elements of Green Places recommendations.

Responsible Agency: Mayor’s Office of Sustainability

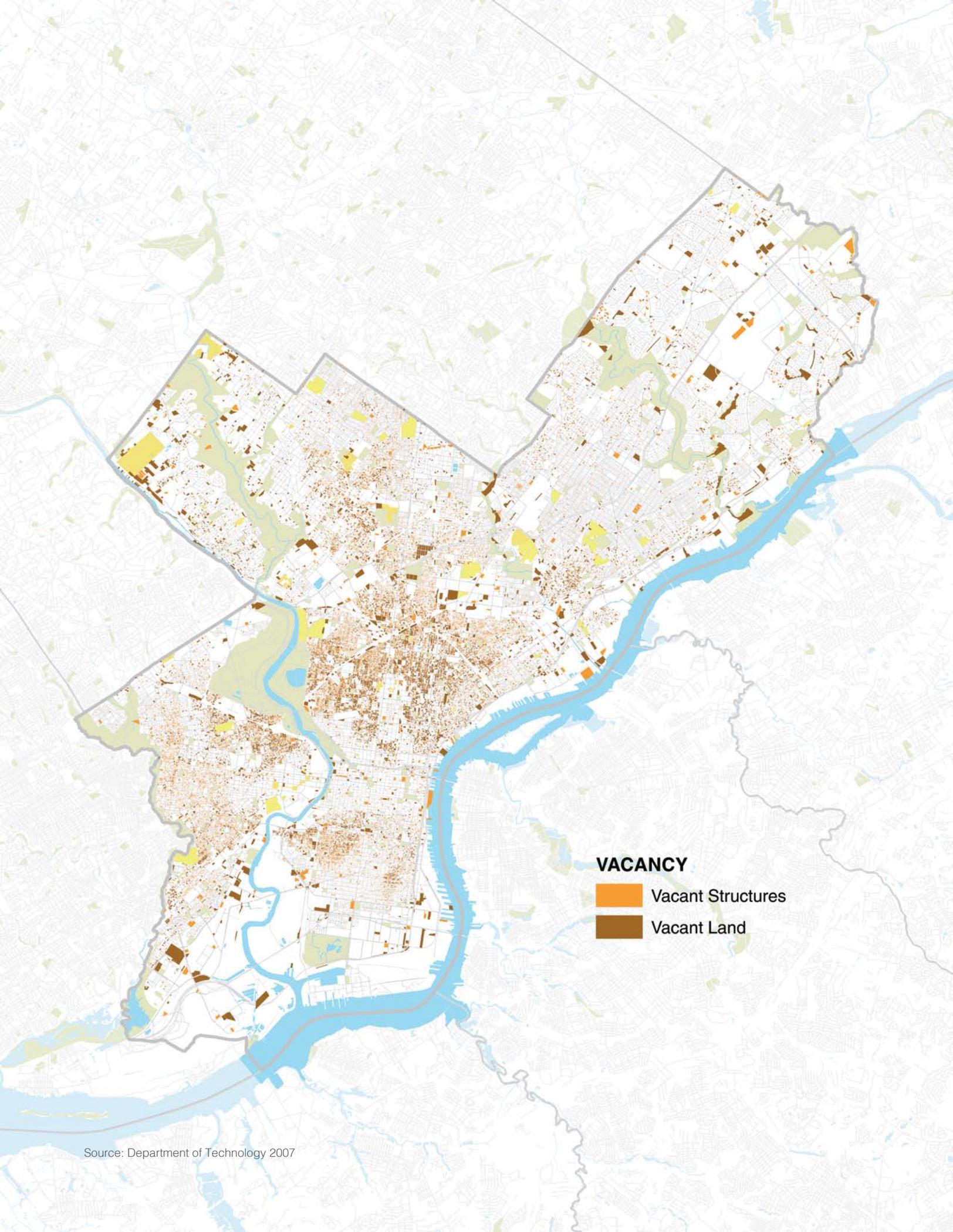
Partners: School District of Philadelphia, Pennsylvania Horticultural Society, Fairmount Park, Department of Recreation, Water Department

In the design of green schoolyards, apply relevant recommendations from other chapters:

- Stock trees in playgrounds and adjacent sidewalks. Use trees to shade play spaces and structures to reduce the urban heat island effect.
- Design structures to incorporate shading, sun access, natural ventilation, green roofs, and green walls.
- Use pervious and cool surfaces in the provision of play surfaces and landscaped areas.
- Where possible, link schoolyards to adjacent parks, bikeways, other trail systems, and green streets to assure safety of children who walk or bike to school.
- Where feasible, convert schoolyard space to augment the city’s habitats and naturally functioning landscapes, while doubling as teaching tools.
- Consider renewable-energy facilities where they can be incorporated as teaching tools.



State of the schoolyards. Many city schools, lacking even trees, are intimidating to children and dispiriting to neighbors.



VACANCY

-  Vacant Structures
-  Vacant Land

Source: Department of Technology 2007



GREEN PLACES

PARKS AND RECREATION SPACES

GREEN SCHOOLYARDS

VACANT LAND OPPORTUNITIES

WATERFRONTS

GREEN STREETS

GREEN DEVELOPMENT

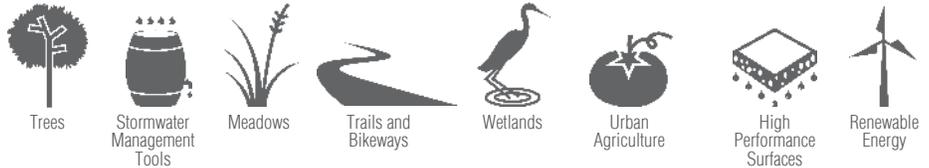
PLAZAS AND AUXILIARY SPACES

RAIL AND UTILITY CORRIDOR

ENHANCEMENTS

ENVIRONMENT	ECONOMICS	QUALITY OF LIFE
● Clean Air	○ Efficient Energy Use	● Fresh, Local Produce
● Healthy Watersheds	● Valuable Properties	● Convenient Recreation Access
● Robust Habitat	● Productive Land Use	● Healthy Residents
● Hospitable Climate	● Competitive Economy	● Strong, Safe Neighborhoods

Vacant land opportunities can include the following **elements of green places**:



VISION: From Abandoned to Appreciated

Litter-strewn lots, now a detriment to quality of life, can become vibrant, useful, and appealing open spaces. Empty parcels and abandoned structures can be productive again. Strategic, catalyzing actions can sometimes spur redevelopment in creative and unexpected ways.

BENEFITS

While it is clear that vacant land, when not cared for, has negative impacts on its surrounding, the lack of quality offers an opportunity for improvement. Since vacant land is prominent in neighborhoods most in need of attention, an effective strategy for generating value from vacant land can be an effective means of improving the quality of Philadelphia's neighborhoods.

BASELINE

Many of Philadelphia's neighborhoods are peppered with vacant lots, a result of 50 years of economic restructuring during which the city lost manufacturing jobs and population. The city's population, 2 million people in the 1950s, had declined by 2000 to 1.4 million. As of the 2000 census, 45 percent of the residential street segments in Philadelphia contained some kind of abandoned property, and 36% contained at least one vacant residential structure.⁴⁸ During that same year, the City conducted a field survey and identified an estimated 29,000 properties with vacant structures and 31,000 vacant lots, a total vacancy rate of over 10% of the city's 560,000 parcels.

Mapping vacancy (facing page). The city's Unified Lands Records System provides spatial information about vacant structures and land. The vacant land is composed mostly of small parcels disbursed unevenly across the city. South Philadelphia, West Philadelphia, North Philadelphia, Bridesburg, Kensington, Richmond, Olney, and Oak Lane suffer from the scourge of vacancy more so than other areas of the city.

A June 1995 City Planning Commission study summed up the problems abandonment causes. Vacant lots and derelict structures "adversely affect the quality of life in these neighborhoods by creating health and safety hazards, depressing property values, and

detering other private investment. The perceived loss of social control and the cycle of neighborhood decline that results from these properties often becomes a self-fulfilling prophecy.” The report concluded, “... a new vision of vacant urban land as an asset to be exploited must take hold.”⁴⁹

In 2001, the City began to acquire 7,000 vacant structures and lots for residential and commercial development. At the same time, it demolished approximately 6,000 dangerous homes. Thus, the number of vacant parcels has not significantly diminished since the 2000 field survey. Various private owners, public, and quasi-public agencies control these parcels.

While the extent of vacant land, when massed, is equivalent to the size of Center City, it is composed mostly of small parcels spread unevenly across the city. South Philadelphia, West Philadelphia, North Philadelphia, Bridesburg, Kensington, Richmond, Olney, and Oak Lane suffer from the scourge of vacancy more than do other areas. A high degree of vacancy particularly afflicts areas that were once hubs of manufacturing. Clusters of derelict vacant land lie alongside railroad lines and the rivers.

In addition to their detrimental effects on quality of life and the economy, Philadelphia’s vacant lots also pose environmental problems. A 1999-2000 report by the Philadelphia Urban Resources Partnership, the “Green Land Initiative,” described soils on vacant land as containing compacted (that is poorly draining) soils that are highly alkaline, which stunts growth.⁵⁰ Few trees grow, and natural vegetation is of poor quality. Lots that are not well maintained are prone to illegal trash dumping, some of which is toxic. People dump pollutants such as oil and antifreeze on vacant land. Rainwater carries these pollutants into the city’s sewer system, where they may be discharged untreated into waterways when storms are severe.

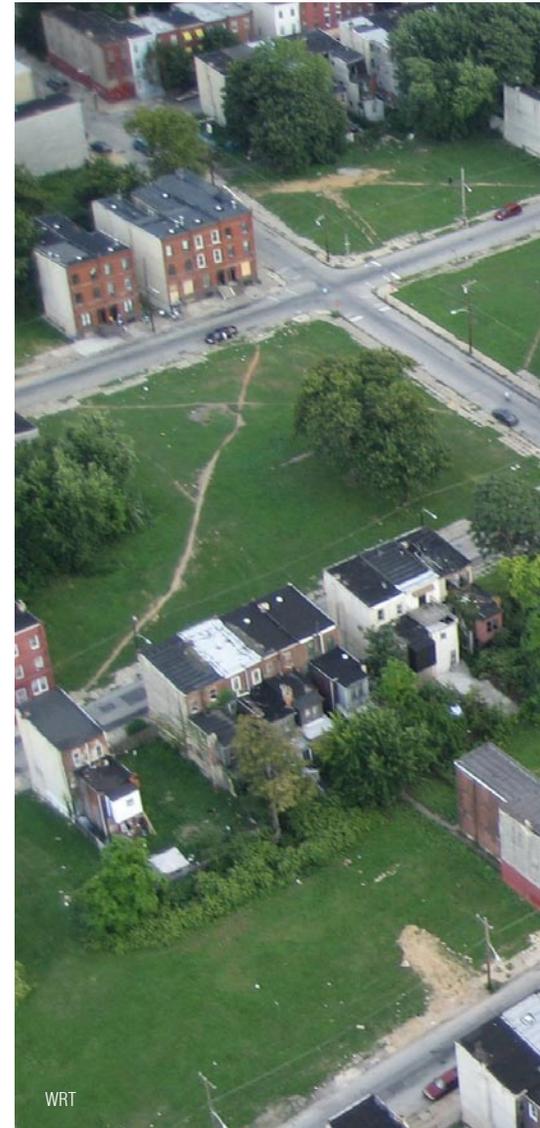
Since then, Philadelphia has stabilized almost a quarter of the vacant parcels in the city and transformed them from liabilities into assets. The Green City Strategy, in partnership with the Pennsylvania Horticultural Society, has invested over \$15 million to improve the physical appearance of more than 5,000 vacant-land parcels. The treatment includes removing debris from the site, grading and improving the soil, planting grass, and adding trees, shrubbery, and a signature fence. Nonprofit organizations help maintain an additional 2,600 lots by mowing grass and removing trash. Budget cuts reduced the scope of vacant-lot maintenance in 2009.

This interim treatment has made a significant impact. Neighbors augment the care of these lots by planting flowers, installing hammocks, and using them for picnics. In virtually all cases, stabilization of vacant land causes short-dumping to stop.

This chapter guides the repurposing of publicly and privately owned vacant land. It introduces a framework to consider re-use of a portion of vacant land for public facilities like parks, schoolyards, recreation centers, playgrounds, community gardens, and urban agriculture. Vacant land can augment urban connective tissue like bikeways and green streets. These public uses, aside from being valuable themselves, will enhance the private-development potential of remaining vacant land. This chapter also proposes actions aimed at adding development appeal to parcels regarded as having little investment value now.

Viewing vacancy as an opportunity.

An aerial view of a section of North Philadelphia reveals the large number of vacant lots in that part of the city. Some blocks are left with as few as a single remaining home.



TARGET

Reduce vacant land and structure abandonment from 10% to 5% of privately held parcels (60,000 to 28,000 parcels).

Responsible Agency: Deputy Mayor for Planning and Economic Development Partners: Philadelphia Redevelopment Authority, Department of Public Property, Philadelphia Housing Development Corporation, Philadelphia Industrial Development Corporation.

percentage of lots and structures

not vacant

90



95

The plan anticipates halving the number of parcels that are vacant or contain vacant structures. This reduction is achievable by strategically repurposing land in public and private hands for uses that both serve public purposes and catalyze private development. The city's current vacancy rate spurs greater decline because it is concentrated in certain once-dense and vibrant neighborhoods. They gradually lose the critical mass (in terms of density, appeal, and social cohesion) that makes them viable. A comprehensive approach to reducing vacancy in the hardest-hit neighborhoods will likely pay the greatest dividends. A five-percent vacancy rate, spread widely throughout the city, can be useful, since it can absorb new kinds of development the city does not possess.



KEY RECOMMENDATION 

Comprehensively analyze vacant land in public and private hands to identify parcels that can be repurposed to achieve GreenPlan Philadelphia targets and recommendations.

Responsible Agency: Deputy Mayor for Planning and Economic Development

Partners: Department of Public Property, Philadelphia Redevelopment Authority, Philadelphia Industrial Development Corporation, Philadelphia Housing Development Corporation

The City should set out criteria to analyze parcels held by public and private owners for reuse as parks, recreation centers, playgrounds, community gardens, and urban-agriculture sites. In addition, the public uses should be selected and designed to enhance redevelopment appeal for nearby vacant land slated for private use. Criteria should prioritize neighborhoods underserved by open-space facilities.

Vacant parcels contiguous to parks, wetlands, meadows, forests, and streams should be considered as potential additions to these open-space elements—especially if the vacant parcels are an acre in size or larger. Additions to parks and habitats are especially useful when they help pull together fragmented components to form resilient and diverse habitat systems within the city. Some vacant lots can be adapted to assist with the City’s stormwater management efforts—especially in neighborhoods that contribute to sewer overflows or are subject to flooding. Soils can be made more absorptive and shade trees planted. Berms and swales can retain runoff until flood dangers pass. Contiguous underutilized tracts can act as naturalized drainage buffers. In eastern North Philadelphia, for example, the Asociación de Puertorriqueños en Marcha (APM) has planned a “green buffer” along North 3rd Street that links vacant parcels to provide an open-space separation between the industrial and residential uses. Vacant parcels should be identified that can usefully augment existing schoolyards, especially in neighborhoods that are poorly served by outdoor play space. The City should identify sites for urban agriculture and garden plots according to criteria in the Urban Agriculture chapter.

Some parcels may usefully extend bikeways and trails or fill gaps to complete a comprehensive system. Green street upgrades can enhance neighborhoods where gaps occur in the street frontages due to the demolition of abandoned structures. Some large or contiguous vacant parcels may suitably host renewable energy facilities, including wind turbines or geothermal well fields. Renewable-energy facilities are most efficient when tied to a district steam, cogeneration plant, or similar local energy-distribution system. Vacant parcels should be prioritized for developments that offer multiple cooperative uses and develop multiple benefits, like playing fields that serve a nearby school and share space with a wind farm.

The Management and Operations section recommends that City agencies create standardized, transparent procedures for acquiring, managing, repurposing, and disposing of vacant land in both public and private ownership.

RECOMMENDATION

Target brownfields for redevelopment.

Responsible Agency: Deputy Mayor for Planning and Economic Development

Partners: Pennsylvania Department of Environmental Protection, Pennsylvania Department of Community and Economic Development, U.S. Environmental Protection Agency

Many otherwise desirable vacant parcels, especially large ones, once hosted industrial uses and are often presumed to be contaminated with industrial substances, whether or not an actual analysis of site conditions has been undertaken. The City should analyze formerly industrial vacant tracts, so that it can focus redevelopment efforts on those requiring little or no remediation. It should rationalize procedures to advance cleanups

“Use vacant land and other opportunities for improved stormwater management purposes.”

GreenPlan Philadelphia
civic engagement participant
from Germantown/Chestnut Hill.

of sites known to be unsuitable for redevelopment because of pollution (known as brownfields). The federal government tracks severely polluted properties as federal “superfund” sites, for example, which can tap federal expertise and cleanup grants.

The City should consider phytoremediation (plantings that break down pollutants) as well as natural retention and filtration to reduce the spread of contaminants. Though they may require several years of growth to produce results, these are proven interim measures that help restore brownfields awaiting new uses, and they cost little.

The “Industrial Market and Land Use Strategy” being prepared by the Philadelphia Industrial Development Corporation (PIDC) in partnership with the City may identify areas of vacant industrial land suitable for such *GreenPlan Philadelphia* uses as parks, habitat enhancement, urban agriculture, renewable energy, greenways, and trails. Further analysis, including the cost of any needed remediation, will help determine these sites’ suitability for such uses.

RECOMMENDATION

Invest in interim uses for vacant land that have the potential to enhance neighborhood appeal and development potential.

Responsible Agency: Department of Commerce.

Partners: Philadelphia Redevelopment Authority, Philadelphia Industrial Development Authority, Pennsylvania Horticultural Society

The City should encourage *GreenPlan Philadelphia* elements as interim uses to the degree that they do not disturb pollutants or interfere with remediation. The Redevelopment Authority, for example, has launched a pilot program to partner with farmers and urban agriculture groups to use city-owned open space for greenhouse and raised-bed farming on an interim basis for up to five years. These two types of farming can be used on brownfield sites without the need to clean soils of pollutants. The level of investment is modest, and reversible, so that redevelopment of the site for non-agricultural use does not pose an overwhelming burden on those who had been using it on an interim basis. The City should evaluate other interim vacant-land uses, such as pedestrian trails or ball fields that can be applied to vacant sites at similarly modest and reversible cost.

Because of the powerful stabilizing effect of the Green City Strategy in struggling neighborhoods, *GreenPlan Philadelphia* recommends continuing the grading, planting, and maintenance efforts applied to vacant parcels at levels prevailing before 2009 budget cuts. To lower costs, the City should explore methods to increase efficiency, develop broader volunteer and funding partnerships, and prioritize stabilization efforts to maximize impacts. Phytoremediation techniques may usefully improve soil conditions while requiring little maintenance and making sites look better.

Interim stormwater management measures permit vacant parcels to assist in meeting the City’s clean-water goals, while adding neighborhood appeal with trees and plantings. The Water Department’s Office of Watersheds has partnered with Philadelphia Green since 2003 to fit vacant lots with swales and berms that harness rainfall so that it can filter naturally back into the ground. As parcels find new uses, these measures can be incorporated or adapted to the new use.

“Plant more trees along streets, on vacant lots, and in parks.”

GreenPlan Philadelphia
civic engagement participant
from Lower North Philadelphia.



Schuylkill River

29 miles of waterfront (both banks)
11 miles (38%) publicly accessible

Delaware River

20 miles of waterfront
3 miles (15%) publicly accessible

WATERFRONTS

- Inaccessible Waterfront
- Publicly Accessible Waterfront

GREEN PLACES

PARKS AND RECREATION SPACES

GREEN SCHOOLYARDS

VACANT LAND OPPORTUNITIES

WATERFRONTS

GREEN STREETS

GREEN DEVELOPMENT

PLAZAS AND AUXILIARY SPACES

RAIL AND UTILITY CORRIDOR

ENHANCEMENTS



ENVIRONMENT

- Clean Air
- Healthy Watersheds
- Robust Habitat
- Hospitable Climate

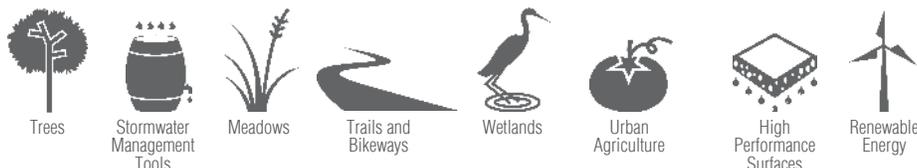
ECONOMICS

- Efficient Energy Use
- Valuable Properties
- Productive Land Use
- Competitive Economy

QUALITY OF LIFE

- Fresh, Local Produce
- Convenient Recreation Access
- Healthy Residents
- Strong, Safe Neighborhoods

Waterfronts can include the following **elements of green places**:



VISION: Allure of the Water's Edge

In a city like Philadelphia, with narrow streets sometimes bustling with activity, longer vistas can be hard to come by. Waterways are a break in the commotion, and the water's edge can be a quiet place to escape for a while to take in a long view, relax, contemplate, and even connect with nature. Those characteristics also make waterfronts especially attractive to development. Given a sensitive balance of support and guiding regulations, waterfronts can be places of contemplation, culture, and commerce.

BENEFITS

Though there are a combined 38 miles of riverfront along the Schuylkill and the Delaware Rivers, remarkably little of this waterfront is publicly accessible or realizes its development potential. The waterfronts could be transformative to the city as a whole, as they are enormously desirable development and recreation sites. One study estimated that the creation of a greenway on the northern Delaware—a modest investment—would generate between \$828 million and \$1.4 billion in private capital investment.⁵¹ Few other economic-development efforts can match such returns.

With many linear miles of riverfront just a stone's throw from neighborhoods lacking parks, the city's waterfronts offer especially alluring park and recreation opportunities. Waterways not only enrich the natural function and ecological diversity of the city but also provide open space amenities to nearby neighborhoods.

BASELINE

For a century, Philadelphia's waterfronts have been dominated by large-scale industry and port activity and cut off from the city by railroad lines, railroad yards, and freeways. In recent years, much of the industry has departed, leaving very large tracts vacant or

little used. Much of the land is not easily economically marketable because of industrial pollution and other site preparation costs. Waterfront parcels that would otherwise be valuable are isolated by poor connections to local neighborhoods and highways, in spite of their adjacency. Commercial hubs, like Center City, the research nexus at the city's hospitals and universities, and desirable residential neighborhoods also suffer from poor connections to much of the waterfront.

Along much of the Delaware, the elevated structure of I-95 forms either a literal physical barrier or a psychological one, with traffic, noise, and dark, menacing underpasses. Closer to the water, Delaware and Columbus Avenues are high-speed arterials that repel pedestrian access. Dozens of city streets that should extend all the way to the water end at the inland edge of large waterfront parcels. Consequently, much of the Delaware is invisible to passersby. While Fairmount Park offers access to much of the city's Schuylkill River frontage, railroad lines, rail yards, the Schuylkill Expressway, and large industrial tracts cut off the reaches below the park.

The great economic, recreational, and environmental potential of riverfronts has long been recognized, but the City has not been able to make the large capital investments necessary to make sites appealing to high-value commercial and residential development. Because most of the city's underused waterfront was formerly occupied by industry, polluted soils can be very difficult to clean up—especially near waterways that have to be protected from seepage. The capital costs of reconstructing water edges can be considerable. Many layers of regulations apply to water-edge developments. Under these circumstances, the City has accepted opportunistic development, like big-box retail, that does not take advantage of the rivers' unique recreational and economic opportunities.

Currently, a zoning overlay along much of the riverfront requires a minimum 50-foot-wide buffer to accommodate trails or greenways. *GreenPlan Philadelphia* recommends a wider minimum of 100 feet or wider where possible, to permit ecologically resilient streamside ecologies to flourish in combination with other uses. Much of Philadelphia's riverfront has been subject to significant recent planning efforts. The Tidal Schuylkill River Master Plan covers both banks of the river from the Philadelphia Waterworks to its confluence with the Delaware. An Action Plan for the Central Delaware and the North Delaware Riverfront Greenway Plan cover all but the southernmost stretches of the city's Delaware riverfront. The Delaware River Waterfront Corporation is already in the process of taking the Central Delaware Action Plan to the next phase of preparing a master plan. The Action Plan spurred development of Race Street Park at the foot of the Benjamin Franklin Bridge and a Center City District plan to create an early action trail along the Delaware. Although each of these waterfronts has unique challenges and possesses unique opportunities, the common goals of these efforts comprise providing greenways, trails, and parks; adding gateways and connectors from waterfront to neighborhoods; breaking-down physical barriers (highways, railways); naturalizing shorelines; and mixing uses.

This chapter's recommendations pave the way for high-value waterfront economic development that enhances natural functions and public access. *GreenPlan Philadelphia* does not fix a set distance from the water's edge as a "waterfront," but this chapter recognizes that many waterfront areas in the city are narrow swaths—occupied by a rail line or highway—backed by a strip of adjacent land (whether in public or private hands). Because they are so interrelated, this chapter concerns both the water's edge and the inland parcels or blocks immediately adjacent.



A Civic Vision for the Central Delaware PennPraxis, WRT

On some stretches of Schuylkill River, I-76 itself forms the river edge. Along other stretches of both rivers, land as deep as one-fourth mile from the river edge constitutes a single parcel in private ownership. The targets and recommendations address this wide variation in what can be deemed “waterfront,” without being prescriptive. It also focuses on access, which, in some places, extends the influence of waterfront actions even farther from the riverfront.

The targets and recommendations cover the two major riverfronts, rather than other waterways, which are covered under the High Performance Surfaces, Stormwater Management Tools, and Wetlands chapters.

TARGET

Develop parkland and open space connectors along the city’s riverfronts.

Responsible Agency: City Planning Commission
Partners: Delaware River Waterfront Corporation, Delaware River City Corporation, Schuylkill River Development Corporation, Pennsylvania Environmental Council, Pennsylvania Horticultural Society

GreenPlan Philadelphia identifies several opportunities for new large-scale parks that can make the most of areas of high environmental value, that are critical to having healthy watersheds, and that supply public access where it is most needed.

Developing parkland and open space along the city’s waterways.
A Civic Vision for the Central Delaware envisions open space along the Delaware River that performs both recreational and ecological functions.



KEY RECOMMENDATION **Upgrade existing riverfront parks, and develop key new ones.**

Responsible Agency: Fairmount Park

Partners: Delaware River Waterfront Corporation, Delaware River City Corporation, Schuylkill River Development Corporation, Pennsylvania Environmental Council, Pennsylvania Horticultural Society

Critical sites can be developed to combine the passive and active recreation of conventional parks with unique features possible only along the waterfront. Historic structures and those representing the city's port and industrial heritage can evocatively anchor parks. Most sites can host wetland, salt-marsh, or other streamside habitat preserves that animate the river with a primordial sense of place that's alive with fluttering wildfowl. These habitats also reduce pollution, aid flood control, and otherwise restore natural functions. Where possible, river edges should be developed with naturalized shorelines rather than bulkheaded or rip-rap edges, a concept that will be pioneered in the upgrading of Lardner's Point Park.⁵² Traditional "hard" river edges are costly, require maintenance, and have a limited lifespan. A naturalized edge may require more maintenance for a few seasons, but then should be largely self-sustaining. Also, eroded bulkheads and piers need not always be demolished. They often offer opportunities to create a hybrid of engineered and naturalized shoreline at low cost.

Existing parks can convey the waterfront's potential with improved maintenance and naturalizing upgrades. Park spaces along the Delaware and tidal Schuylkill deserve attention because they can be biologically rich and serve very large parts of the city that now have few park and recreation resources. The Water Department has constructed naturalized structures for controlling stormwater runoff in Fairmount Park. Much of its Schuylkill River frontage could serve more diverse ecological communities with a naturalized river buffer, in the process improving water quality, drawing more wildlife, and improving the park aesthetic experience.

KEY RECOMMENDATION **Link river parks with greenways and trails.**

Responsible Agency: Office of the Deputy Mayor for Transportation and Utilities, Fairmount Park

Partners: Delaware River Waterfront Corporation, Delaware River City Corporation, Schuylkill River Development Corporation, Pennsylvania Environmental Council

GreenPlan Philadelphia and other planning efforts have identified the potential to link almost all of the Philadelphia reaches of the Delaware and both banks of the Schuylkill River with trails and greenways. The Schuylkill Banks trail has shown how a bike and pedestrian path can succeed even when pinched between a railroad line and the river. *GreenPlan Philadelphia* recommends that the City link the chain of parks along the waterfront with greenways: natural buffers a minimum of 100-foot-wide wherever possible. This is a wide enough swath to create a variety of visitor experiences and permit the establishment of resilient riparian ecological communities, although the wider the buffer, the more ecological potential it presents.

In areas of high ecological potential mapped by both the Water Department and the Western Pennsylvania Conservancy's Natural Heritage Inventory described in the Network of Benefits, these buffers can be designed to focus on natural values and systems over human and economic ones. In areas of high development value, the buffer might take the form of an urban promenade integrated into an environmentally sensitive landscape design, so that both public use and economically valuable development can thrive. Carefully designed, ecosystems and urban systems can thrive in close proximity. A waterfront café, for example, can readily serve as an excellent spot to track a soaring osprey or a dozen shorebirds snacking in a bit of exposed tidal mudflat.

**BEST PRACTICE
WATERFRONT BROWNFIELDS
DEVELOPMENT**

False Creek, Vancouver, BC

Vancouver's False Creek waterfront area was the industrial heart of the city through 1950's. In the 1960's a plan to develop freeways through the area was defeated through well organized citizen opposition. Leaders of the opposition later facilitated major public involvement and co-design. The civic engagement process established public priorities for an accessible waterfront seawall; mixed-tenure, mixed-rate housing including market rate condominiums, co-ops, low-income housing and house boats; and a waterfront market. These plans were formalized in the 1970's, leading to successive stages of investment continuing into this decade. The result has been a vibrant, mixed use, mixed income, high density, destination and neighborhood.

http://en.wikipedia.org/wiki/False_Creek

Further investments and ecological enhancements are supported by municipal policy such as Vancouver's Blueways policies and guidelines which offer the "vision of a waterfront city where land and water combine to meet the environmental, cultural and economic needs of the City and its people in a sustainable, equitable, high quality manner". <http://vancouver.ca/engsvcs/streets/blueways/policies.htm>

The City should map desired greenway linkages even over private lands, since many large parcels, especially the tank-farm landscapes of the Lower Schuylkill, are likely to change in use in the foreseeable future. The Green Development chapter offers options to require or encourage the development of these linkages in concert with private development. Then, park and greenway development could be coordinated with new uses that will add to the Schuylkill River recreation trail as it is built out.

Even provisional trail development can play a major role in creating development interest in the extensive underutilized lands that line the city’s rivers. The City may seek low-cost, time-limited easements across private parcels to develop trails and greenways. Or it could seek conservation easements, which are permanent but confer significant tax advantages to the owner. When a development opportunity arises, the City then could coordinate the permanent establishment of trails and greenways in a way that simultaneously makes the most of the development opportunity and the public water edge.

“[There should be] equal and inclusive access to waterfront throughout the city.”

GreenPlan Philadelphia civic engagement participant from Manayunk/Roxborough.

TARGET

Create an average of two public river-access points per mile along the Delaware and Schuylkill Rivers.

Responsible Agency: City Planning Commission
 Partners: Delaware River Waterfront Corporation, Delaware River City Corporation, Schuylkill River Development Corporation, Pennsylvania Environmental Council

public river access points



In the *GreenPlan Philadelphia* civic-engagement process, Philadelphians overwhelmingly supported improved access to the waterfronts. Many opportunities for both waterfront parks and riverfront access have already been identified (and are shown in the Projects and Opportunities section). This target specifies a minimum of access points, but ideally every city street that runs perpendicular to the river would extend to the river edge.

KEY RECOMMENDATION

Create standards and incentives for public access to waterfront and waterside development.

Responsible Agencies: City Planning Commission, Department of Commerce
 Partners: Water Department, Delaware River Waterfront Corporation, Delaware River City Corporation, Schuylkill River Development Corporation, Pennsylvania Environmental Council

A comprehensive approach is needed to connect neighborhoods to waterfront amenities. Such an approach should take care to balance cost and benefits while keeping in mind that improved accessibility can catalyze high value private development on underused tracts. Existing access streets are excellent candidates for green street improvements, which would make water-edge amenities inviting and physically approachable. They would make walking, biking, and running safer and more appealing. Handsome street edges with architectural gateway elements could add development appeal to waterfront parcels, strengthen local identity, and reduce the enervating effect of elevated freeways and rail lines. Knitting waterfront parks and greenways into the city’s bike and trail network would attract more people and improve the development appeal of the waterfront. Mapping desirable public elements and amenities could facilitate the development of a community-benefits agreement, payments in lieu of taxes, or other fiscal devices and incentives when development opportunities arise. In this way, public amenities and private development could be seamlessly integrated.

Since improving access to the waterfront improves development appeal, cooperation with private land owners to extend existing streets through private waterfront parcels may be possible in many cases. In others, easements may be a better answer, and in some, condemnation will be necessary. Master plans or community-benefit agreements can assure public access without public ownership. Some linkages might be conceived as park or parkway corridors. Others might be publicly accessible private streets or pedestrian ways integrated into private developments.

KEY RECOMMENDATION

Create standards and incentives for private waterfront development.

Responsible Agencies: Department of Commerce, City Planning Commission

Design standards and regulatory and incentive schemes to spell out key public interests will aid the creation of high value private waterfront development. Zoning, urban-design plans, and incentive criteria could combine to spell out the goals and responsibilities of the City and of developers to deliver desired public elements and spell out how costs and benefits are distributed.

Urban design plans should describe the City's design standards for street extensions, greenways, trails, and bikeways. At the water's edge, they should spell out the public's entitlement in terms of access to beaches, boat launches, ferries, marinas, and other relevant aquatic activities.

The City should encourage a mix of uses as a means to enliven and diversify what can be large new neighborhoods, with uses that capitalize on the waterfront generally preferred. All uses should develop the unique potential of a waterfront location—views, for example, and access to walkways, bikeways, and nature—and draw the water amenity integrally into the development.

In sections of Philadelphia built before zoning regulations were enacted, manufacturing facilities often mixed with row-house development. Though noxious uses should be excluded from mixed-use developments, the historic mix of uses and scales enlivens many neighborhoods even today. The Philadelphia Industrial Development Corporation's "Industrial Market and Land Use Study" finds that the waterfront is still an important element among the 15 core industrial districts and corridors in Philadelphia. Many of today's industrial uses can gracefully mix with waterfront public amenities, especially when both are designed together. Structures that represent the city's port or industrial heritage, but are not readily adapted to contemporary use, can function inventively as design elements, art works, or art sites.

The design of landscapes, drives, and parking should enhance the unique natural function of waterfront sites. Programmed, ecologically sensitive landscape design can add economic as well as environmental value by signaling the uniqueness of the waterfront and teasing out the innate beauty of native flora—enhancements that set developments apart from the norm of trees and trimmed lawn.

“Make the waterfront more appealing with fishing, boating, chair rentals, bike paths, etc.”

GreenPlan Philadelphia
civic engagement participant
from Near Northeast Philadelphia.



Philadelphia's picturesque waterfront. Fairmount Park surrounds the Schuylkill River as it winds toward Center City.

Andrew Dobshinsky, WRT

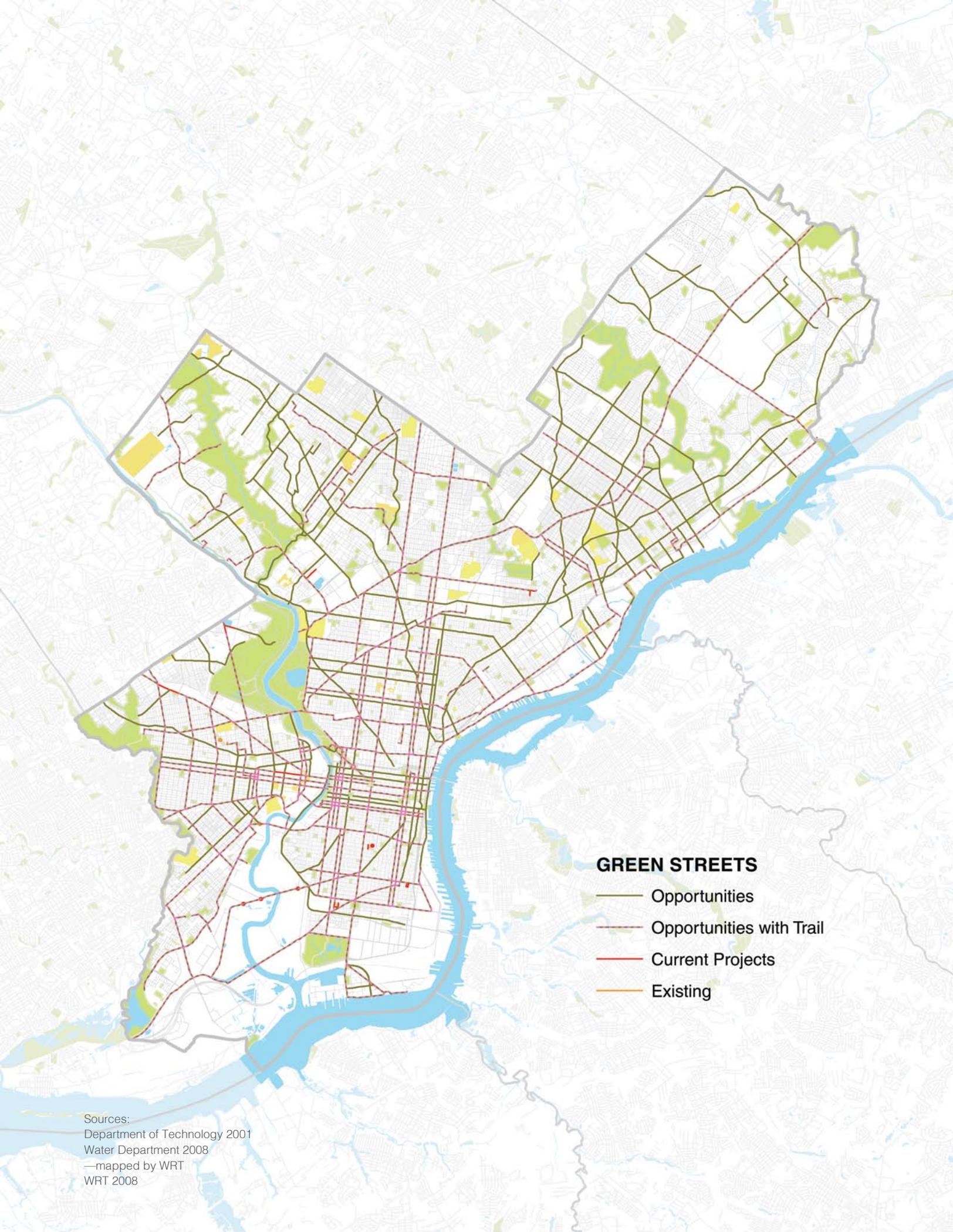
KEY RECOMMENDATION 🏛️

Coordinate waterfront development to help achieve relevant *GreenPlan Philadelphia* targets and recommendations.

Responsible Agencies: City Planning Commission, Department of Commerce
Partner: Water Department

- Aggressively use waterfront projects to meet tree-planting goals and extend other critical habitats, where conditions merit, such as meadows and wetlands. These goals can readily be advanced in parks, preserves, greenways, public-access links, and private developments at or near waterfronts.
- The City should require or encourage the establishment or maintenance of naturalized edges, preferring these to hard bulkheads.
- Standards for high performance surfaces and stormwater management tools should be observed in all projects adjacent to the rivers, or separated only by greenways, trails, rails, roads, or other public buffers.
- New public and private streets, and key existing streets, should be configured as green streets.





GREEN STREETS

- Opportunities
- Opportunities with Trail
- Current Projects
- Existing

Sources:
Department of Technology 2001
Water Department 2008
—mapped by WRT
WRT 2008

GREEN PLACES

PARKS AND RECREATION SPACES

GREEN SCHOOLYARDS

VACANT LAND OPPORTUNITIES

WATERFRONTS



GREEN STREETS

GREEN DEVELOPMENT

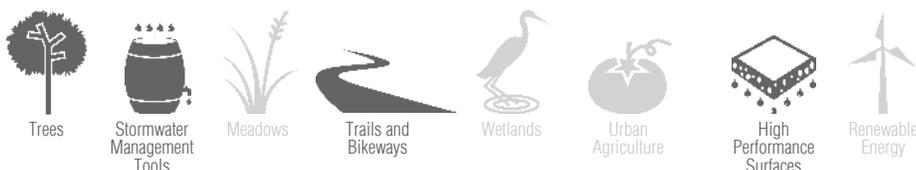
PLAZAS AND AUXILIARY SPACES

RAIL AND UTILITY CORRIDOR

ENHANCEMENTS

ENVIRONMENT	ECONOMICS	QUALITY OF LIFE
<ul style="list-style-type: none"> ● Clean Air ● Healthy Watersheds ● Robust Habitat ● Hospitable Climate 	<ul style="list-style-type: none"> ● Efficient Energy Use ● Valuable Properties ○ Productive Land Use ● Competitive Economy 	<ul style="list-style-type: none"> ● Fresh, Local Produce ● Convenient Recreation Access ● Healthy Residents ● Strong, Safe Neighborhoods

Green streets can include the following **elements of green places**:



VISION: Making Streets Work Harder

A street can be more than a slab of asphalt engineered purely to move cars as fast as possible. A narrow, treeless street lined with trinity houses in South Philadelphia can become a shaded place to stroll or play. A multi-lane commercial strip of signs and parking lots can become a lush, more appealing and efficient boulevard. Functionally, green streets manage storm runoff—a major step to cleaner water and healthy watersheds. They offer numerous environmental benefits, while safely and efficiently managing movement by pedestrians, transit, bicycles, and vehicles. Imagine a Philadelphia where the streets support safe movement for all modes, for all types of users—children, seniors, people with disabilities—a Philadelphia with streets that are complete and green. For *GreenPlan Philadelphia*, green streets are defined as streets that manage the first inch of rainfall within the right-of-way.

BENEFITS

Mapping green streets (facing page). We have set aggressive targets for the creation of green streets and have begun several pilot projects. The opportunities identified on this map indicate our commitment to implementing a comprehensive, interconnected system of green streets throughout the city and are only a portion of those we plan to create.

A detailed map and list of current green street projects can be found on page 211. A detailed map and list of opportunities for green streets can be found on page 217.

Reconfiguring streets to be green (also known as “complete”) adds a variety of features to achieve *GreenPlan Philadelphia* goals.

Because so much of the surface of the city is in streets—about 13 percent—reducing the amount of stormwater that runs off the streets and into the sewer system is an important objective of *GreenPlan Philadelphia*.

Many green-street features recommended in *GreenPlan Philadelphia* retain or slow the flow of runoff, allowing it to penetrate into soils and filtering it by natural means before it gets to streams and rivers. These features can dramatically reduce the amount of untreated sewage that flows into the rivers during a heavy rainfall. Because streetscapes can make an enormous difference in helping to meet the City’s regulatory requirement to reduce combined sewer overflows and improve water quality, the recommendations in this chapter describe ways to manage the first inch of rainfall.

Green street designs may incorporate swales—planted strips shaped into shallow, vegetation-covered ditches—that retain water for a period of time during a storm and allow soils rather than drains to absorb runoff. Porous pavements also allow water to recharge soils. (The High Performance Surfaces chapter describes these kinds of pavements, their benefits, and recommendations for their use.) Hardscaped medians and street edges can also be converted to planted strips to retain and absorb runoff. Street trees are a welcome amenity that aids flood control by intercepting rain, allowing it to drip slowly onto planting strips, or by returning moisture to the air through transpiration.

Green street design can more safely and efficiently accommodate travel by bus, by trolley, by bicycle, and by foot. Where parks or underused land lines a street, trails surrounded by natural vegetation can become green-street elements. Safe, appealing infrastructure for pedestrians, bicycles, and transit encourages greater use, helping shift travel-modes. Fewer auto miles translates to reduced traffic, fewer parking conflicts, reduced air pollution, less noise, and fewer auto-source pollutants running into the city's rivers.

Greenery is widely appealing to Philadelphians, but transforming the most hardscaped areas of the city with trees and street plantings can enormously add to the attractiveness of Philadelphia neighborhoods where investment has stagnated. Trees, planting, and pedestrian-friendly street design draw people out of their homes because streets feel safer and more appealing. As pleasant streets bring out more people, safety becomes a self-fulfilling prophecy, since well-loved streets experience less crime. Vegetated streets enhance home values. Improvements like tree and median planting can boost prices by as much as 28%.¹¹

BASELINE

The city's 2,775 miles of streets range in width from as narrow as 15 feet with a carriageway only eight feet wide to Roosevelt Boulevard and I-95, each of which has a maximum 400-foot-wide right-of-way. The 41 miles of Fairmount Park roads and park-like stretches of Roosevelt Boulevard already offer such green-street elements as planted medians and shoulders as well as walkways and bikeways separated from vehicles. The city's new stormwater management regulations, which encourage green-street and similar stormwater management tactics, only cover 1.23 square miles since they took effect in 2006—a small area of the city to date.

The Department of Streets (in the Office of the Deputy Mayor for Transportation and Utilities) and the Water Department are currently preparing design standards, including green-street elements, for street typologies that represent typical conditions in Philadelphia. The standards will include planting, stormwater retention, and drainage systems that meet Water Department criteria for diverting stormwater from the sewer system, especially in areas served by combined sewers.

A street's physical characteristics affect what green street features can be added. Wider rights-of-way, like the planted strips along some of the city's 260 miles of state and federal highways, offer opportunities to naturally drain stormwater runoff and incorporate bike lanes. Even some relatively narrow streets may be suited to planted medians or widened planted sidewalks, if these measures also slow speeding cars. Pervious pavements and subsurface infiltration trenches work best in narrow, low-traffic streets, which may offer limited space for planting strips and street trees. Other considerations are whether communities will support greening measures and the degree to which the City, neighborhoods, and adjacent property owners are able to maintain planted areas.

BEST PRACTICE: PLANNING, FUNDING, AND IMPLEMENTATION

Green Streets Program,
Portland, OR

In 2005, Portland's Bureau of Environmental Services launched a green streets program, that comprehensively incorporates ecological elements into public and private development. Any development in the right-of-way that is subject to stormwater management must meet green-street standards. Publicly-funded projects in the public right-of-way that do not manage stormwater must contribute 1% of their construction cost to a Green Street Fund. The program has also established goals and strategies for coordinated planning, funding, and implementation. An educational-outreach program helps city staff, developers, and the public understand the value of green streets and what the program's requirements entail. The educational materials describe approved elements and how they can be used: vegetated areas, grassy swales, curb extensions, rain gardens, and planted filter boxes.

Reference: <http://www.portlandonline.com/bes/>



TARGET

Create a citywide network of 1,400 miles of green streets.

Responsible Agency: Office of the Deputy Mayor for Transportation and Utilities
 Partners: Water Department, PennDOT, community development corporations

miles of streets that manage the first inch of rainfall 0.06  1,388

The target is ambitious since it would bring at least some green street elements to half of the city's street miles. However, including the installation of *GreenPlan Philadelphia* design elements with a variety of scheduled or ongoing maintenance and capital construction projects will speed the process at relatively modest overall cost.

KEY RECOMMENDATION

Identify and prioritize streets for green street upgrading.

Responsible Agencies: Office of the Deputy Mayor for Transportation and Utilities, Water Department
 Partners: PennDOT, community development corporations

Selecting green street alteration projects that best advance the Water Department's stormwater management goals will help meet a critical need, so close coordination between the Department of Streets and the Water Department will be necessary. Neighborhoods that have few planted areas and many impermeable surfaces offer the greatest stormwater reduction potential. South Philadelphia, eastern North Philadelphia, and Lower Northeast Philadelphia are some such areas. Efforts should also focus on neighborhoods served by combined sewers.

Envisioning a small green street.

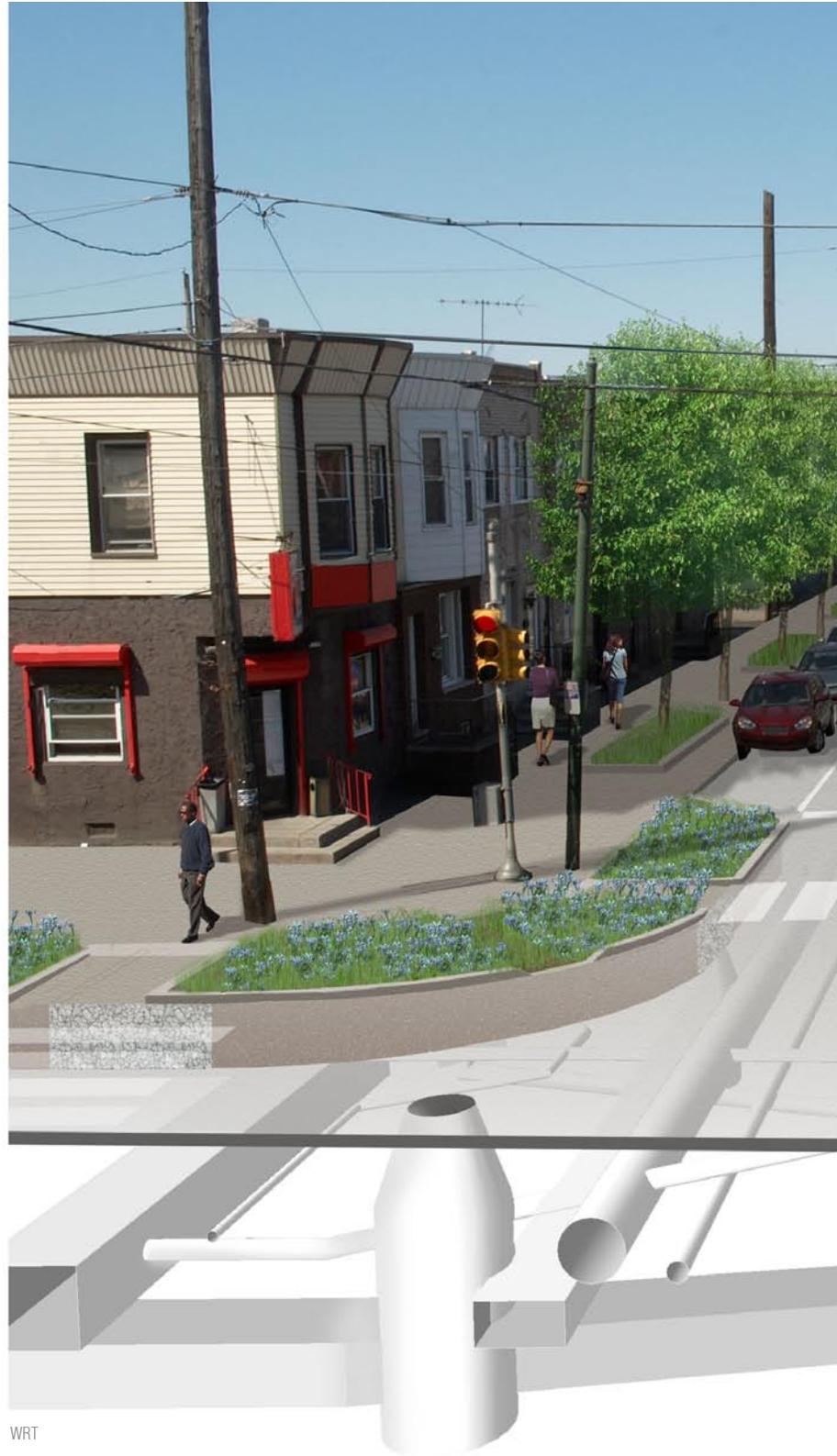
Narrow streets, such as Iseminger Street shown here, can accommodate green street elements such as planted, naturally draining curb extensions and poles that support climbing vines when there's no room for trees.



Paul Rider



WRT



Putting Snyder Avenue to work. Along a green street, rainfall will be directed into planting beds at street corners and into tree pits. This will help to reduce combined sewer overflows and improve water quality.



An integration of green-street alterations with several other kinds of streets projects will transform inefficient streets into high-performance streets quickly and at low cost. The Department of Streets spends more than \$27 million annually on a variety of improvements, from resurfacing to complete reconstruction, that can include green street elements or design tactics. Each year, the City reconstructs or provides trench restorations on about 26 miles of streets for water and sewer line replacements, and many of these projects provide opportunities to upgrade with green street enhancements. Streets impacted by the upcoming PennDOT I-95 reconstruction are also candidates for green street conversions. Tree planting, coordinated with utility or street work, can leverage a minor added investment into neighborhood appeal, higher real-estate values, and streets that are safer, not just greener.

Green-street measures can also leverage the value of initiatives by other City departments. To name a few: the creation of new parks and trails; the Commerce Department's Commercial Corridors Revitalization Initiative; cultural corridors, including improvements to individual cultural institutions; and street elements connected to construction at public-housing sites and affordable housing projects.

Planted medians can absorb water, while creating rights-of-way separated from general vehicle traffic. Coordinated with transit capital and operational plans, reserved trolley and bus lanes could be created to speed movement along fixed trackways and busy bus routes. Lanes for cyclists can be separated from vehicles and pedestrians by physical barriers, making travel faster and more appealing for cyclists and safer for all, although the merits of physically separated lanes are sometimes debated.

In streets and intersections with high incidence of vehicle/pedestrian accidents, green street tactics can constitute safety improvements. Naturally-draining medians offer safe havens for pedestrians crossing wide, busy streets, which can make walking to school or running errands safer, especially for children and slow-moving elderly pedestrians. Selective widening of sidewalks at corners and other street crossings, called bumpouts, makes crossing streets safer and adds space for water-absorbing plantings at the same time. Bumpouts calm traffic by narrowing streets and constricting speeds. Planting strips with swales reduce storm runoff while protecting people on sidewalks from passing vehicles. All of these tactics are especially useful near schools.

Lawns near park roads and parkways can easily accommodate walkways and bikeways. They can be reconfigured with swales and naturally planted retention basins. Planted, runoff-filtering buffers along streamside roads and highways are especially effective at keeping pollutants out of waterways.

Alleys and breezeways are often good candidates for green street upgrades. With low traffic volumes, almost the entire surface can be made permeable, lessening reliance on drains. Alleys in Philadelphia are very narrow service streets, faced primarily with back doors and garage doors. Breezeways are often little more than pathways. Some alleys and breezeways are public rights of way and others are owned by the abutting property owners, requiring negotiation to extend green street improvements consistently. The Recreation Department has over 100 lots and related breezeways in its property inventory. The Fairmount Park Strategic Plan recommended that these properties be sold or title transferred to community groups. They might best serve as neighborhood amenities adopted by the residents to provide appealing landscaped areas or community gardens integrated into the stormwater management system.

BEST PRACTICE: GUIDELINES

High Performance Infrastructure Guidelines, New York, NY

Produced by the Design Trust for Public Space in partnership with the New York City Department of Design and Construction (DDC), this detailed handbook describes practices for creating sustainable city streets, sidewalks, utilities, and urban landscaping. Part 1 describes precedents, and focuses on the benefits of building high-performance infrastructure. Part 2 describes current processes in the City of New York and outlines near- and long-term performance objectives. Part 3 specifies best practices for sustainable construction in the public right-of-way. The guidelines cover a wide range of maintenance and capital construction work, including minor roadbed work, street resurfacing, sewer or water-main rehabilitation, sidewalk construction, and major right-of-way construction and reconstruction.

Reference: http://www.designtrust.org/publications/publication_03hpig.html

**BEST PRACTICE:
GREEN STREET EDUCATION
AND IMPLEMENTATION**

Green Alley Program and Green Alley Handbook, Chicago, IL

Chicago's Department of Transportation recently launched a Green Alley program. It will replace 1,900 miles of existing roadbed with porous, permeable asphalt that uses ground-up tire rubber combined with regular asphalt mixes. Air space is 25% of the pavement volume, so it absorbs rainwater and filters it back into the ground. It reduces basement and street flooding because many alleys had no storm drains. The cost is comparable to that of ordinary concrete and is lower than the expense of extending the stormwater drainage system to unserved alleys. Maintenance expenses are also lower. Green Alley improvements also include energy-efficient street lights configured to light the street, not add to nighttime light pollution. Light-colored pavements reflect solar heat, reducing the Urban Heat Island Effect. By 2008 the city had completed 40 alley projects.

Reference: http://egov.cityofchicago.org/webportal/COCWebPortal/COC_EDITORIAL/GreenAlleyHandbook_Jan.pdf

Roosevelt Boulevard's Potential.

The medians and wide, tree-planted shoulders of Roosevelt Boulevard can accommodate enhanced, naturally draining landscaping, as well as trails for walking, running, and biking.

RECOMMENDATION

Devise standards and guidelines for green streets.

Responsible Agencies: Office of the Deputy Mayor for Transportation and Utilities, Water Department
Partners: Department of Public Property, PennDOT

Design guidelines and standards, coordinated with utility and street-engineering criteria, can hasten the integration of green street tactics at low cost. Applicable standards should be incorporated into building and zoning codes. They should incorporate other *GreenPlan Philadelphia* recommendations. The standards should recognize the range of city street types: commercial and residential, wide and narrow, busy and quiet.

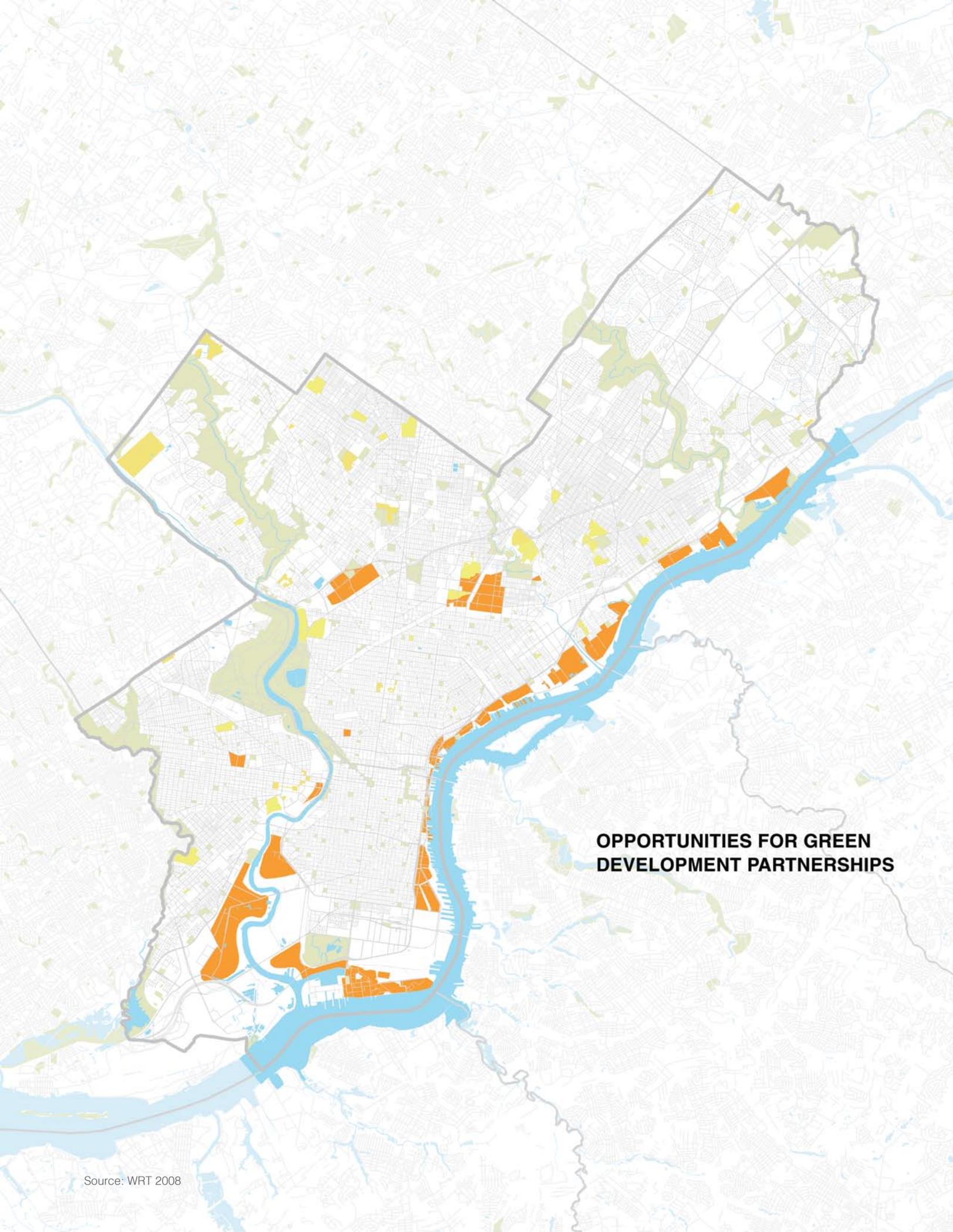
RECOMMENDATION

Coordinate green street planning and design standards with state and federal funding and standards-setting agencies.

Responsible Agency: Office of the Deputy Mayor for Transportation and Utilities
Partners: PennDOT, U.S. Federal Highway Administration

Since state and federal funding may be tied to specific design standards and criteria, the City should seek to link green street improvements to outside funder requirements. It should determine which projects within its green streets priorities could attract funding from regional, state, or federal agencies and tie green-street upgrades to state and federal road-improvement projects. Green-street design elements should be coordinated to match the best practices of these funders and operators. Federal Clean Water programs may usefully advance green-street stormwater diversion goals, for example. Outside agencies may also offer special incentives for designs that innovate to achieve improved environmental performance. Funding for transportation enhancements (that is, design elements that make communities more livable) may also be available for green street projects. Multi-modal transportation projects—such as green streets that accommodate trolleys, busses, and bikeways—may also attract new funding but be subject to design criteria that must be reconciled with green-street design standards.





**OPPORTUNITIES FOR GREEN
DEVELOPMENT PARTNERSHIPS**

Source: WRT 2008

GREEN PLACES

- PARKS AND RECREATION SPACES
- GREEN SCHOOLYARDS
- VACANT LAND OPPORTUNITIES
- WATERFRONTS
- GREEN STREETS

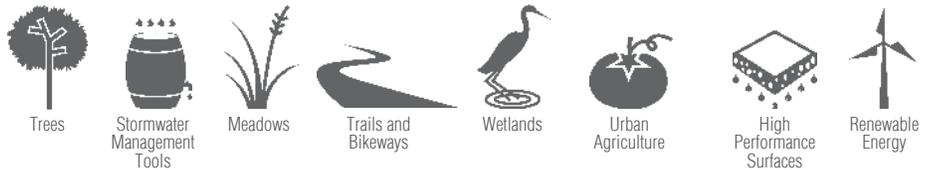


GREEN DEVELOPMENT

- PLAZAS AND AUXILIARY SPACES
- RAIL AND UTILITY CORRIDOR ENHANCEMENTS

ENVIRONMENT	ECONOMICS	QUALITY OF LIFE
<ul style="list-style-type: none"> ● Clean Air ● Healthy Watersheds ● Robust Habitat ● Hospitable Climate 	<ul style="list-style-type: none"> ○ Efficient Energy Use ● Valuable Properties ● Productive Land Use ● Competitive Economy 	<ul style="list-style-type: none"> ● Fresh, Local Produce ● Convenient Recreation Access ● Healthy Residents ● Strong, Safe Neighborhoods

Green development can include the following **elements of green places**:



VISION: Master Planning Sustainability

Philadelphia’s riversides can host marinas and handsome pedestrian promenades backed by outdoor cafes and shops, with apartments rising behind. Gardens can wrap Center City towers. Townhouses can embrace new parks. In every aspect of this vision, people populate the city’s streets, parks, waterfronts, and other open places and bring them to life.

BENEFITS

A well-used open space is tremendously more valuable than one that is little used. Partnering with private development is a good way to ensure the success and vibrancy of open space projects. Private development projects of substantial size are particularly valuable means by which the quality and marketability of real estate can be enhanced in tandem with values and actions that raise the city’s livability and environmental performance. With coordination, private development, large and small, can be a tremendous asset in meeting the objectives of *GreenPlan Philadelphia*.

Major development opportunities (facing page). The city has many large tracts where greening measures could contribute to marketability while improving the city’s green infrastructure. Areas near rivers offer special appeal when developed to enhance water uses, views, and recreation, along with public-access and habitat improvements.

A detailed map and list of opportunities for green development can be found on page 231.

BASELINE

Philadelphia, like most cities, has historically incorporated various environmental aspirations into codes for development, subdivision, zoning, and building, augmenting these with a variety of programs to save energy and reduce pollution. This process continues today with various ongoing initiatives.

The City participates in the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) program and requires major City projects to be LEED certified and seek a Silver rating. It offers a credit that reduces Business Privilege Taxes for developments that incorporate green roofs.

Greenworks Philadelphia includes an evaluation of other rating systems and model building codes, including the U.S. Department of Energy's Energy Star program, the green-building standards of the National Association of Homebuilders (NAHB), the International Code Council (ICC), and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). The City, with the Philadelphia Industrial Development Corporation (PIDC) is considering the applicability of LEED-ND (LEED for Neighborhood Development) at the Navy Yard, a program that may in the future be adopted as guidance for large-scale developments.

The City is also evaluating its property tax-abatement program and other development incentive programs to encourage green-development practice. The Water Department currently offers an expedited permit process for projects designed to meet its stormwater management standards. It is also changing its fee system to reward developments that integrate advanced stormwater management into their plans. The City may extend expedited permitting, refund permits, or cover additional costs for projects certified by third parties to meet LEED or other high-performance green-building standards.

GreenPlan Philadelphia has been completed at the same time that the City is embarked on a comprehensive series of initiatives under the umbrella of *Greenworks Philadelphia* to lower the environmental impact of everything it does. Because that work is not complete, and because techniques and technologies for achieving higher levels of environmental sustainability are rapidly evolving, this chapter sets out means to encourage high-quality real-estate development that is adaptable and consistent with the city's current direction and with nationwide trends. This chapter focuses on *GreenPlan Philadelphia* measures that can apply in a systematic and integrated way to private projects, private/public partnership projects, and institutional developments like hospital building or college campus extensions.

TARGET

Apply measures recommended in *GreenPlan Philadelphia* to large-scale master-planned private developments.

Responsible Agency: City Planning Commission

Partners: Department of Licenses and Inspections, Water Department, Department of Streets, Department of Commerce, Department of Public Health, Mayor's Office of Transportation and Utilities, Mayor's Office of Sustainability

Developments of significant size and impact can gracefully and efficiently incorporate *GreenPlan Philadelphia* measures when integrated through design at the earliest stages. The City should integrate *GreenPlan Philadelphia* measures as it further develops its Green Building Program as part of *Greenworks Philadelphia* implementation.

The master-planning process can be set up so that public and private investments, even if not shared in a public/private process, can mutually reinforce each other. Public/private partnerships require a master plan that enumerates public-benefit elements and who builds, pays for, and maintains them.

BEST PRACTICE:

PUBLIC-PRIVATE PARTNERSHIP

Pearl District, Portland, Oregon

In the 1990s, Hoyt Street Properties (HSP) purchased 50 acres of former rail yards in Portland's Pearl District. In return for the company's commitment to build residential units at a density of at least 130 units per acre, the city agreed to extend the street grid into vacant areas, support the extension of the Portland Streetcar, and build parks on land donated by HSP. The neighborhood is now among the city's most sought-after with three parks. Several streets, converted to green pedestrian lanes, lead from the parks, and extending a park feeling into every corner of the neighborhood.

Sources: <http://www.hoytliving.com>; http://www.cdrpc.org/New_Centers-web.pdf



Requiring large-scale development to incorporate best sustainability practices. The vision for the Central Delaware River displays the potential of large-scale development to create extraordinary amenity and high environmental performance along the city's neglected riverfronts.



KEY RECOMMENDATION

Develop criteria for the realization of *GreenPlan Philadelphia* recommendations in large, master-planned developments.

Responsible Agency: City Planning Commission

Partners: Department of Licenses and Inspections, Water Department, Department of Streets, Department of Commerce, Department of Public Health, Mayor's Office of Transportation and Utilities, Mayor's Office of Sustainability

While most *GreenPlan Philadelphia* targets and recommendations apply to private developments, some may need to be required or adapted for master-planned developments. Many measures help projects achieve higher LEED ratings. In evaluating the adoption of any green-building standard, the City should assess how it helps meet *GreenPlan Philadelphia* targets.

RECOMMENDATION

Refine development incentives to encourage inclusion of *GreenPlan Philadelphia* recommendations in large-scale private development.

Responsible Agencies: Commerce Department, City Planning Commission

Master-planned developments offer the opportunity to tailor the range of business-development incentives the City offers to the specific nature of the development and to the environmental potential of a given site or development plan. *GreenPlan Philadelphia* recommendations should be integrated into development incentives now under review as part of *Greenworks Philadelphia* implementation. The Management and Operations section contains a menu of possible incentives beyond those already under consideration, but some that may be particularly useful in master-planned developments include land write-downs, zoning incentives, and transfers of development rights (from underdeveloped “donating” sites to “receiving” sites seeking additional built area). The City could also offer incentives to encourage onsite renewable-energy projects.

“[We need to provide] incentives to businesses and developers to use sustainable practices: green roofs, rainwater reuse.”

GreenPlan Philadelphia
civic engagement participant
from Germantown/Chestnut Hill

The City may choose to negotiate exactions (a requirement to provide a community amenity) or impact fees (to offset burdens the development imposes on a neighborhood). Community Benefit Agreements can provide needed amenities in tandem with new development, especially when the development and the neighborhood will mutually benefit. Possible amenities that could be linked to development projects include urban agriculture projects, schoolyard upgrades, and the publicly-accessible provision of recreation fields, fitness centers, recreation centers, or additions to parklands.

The City may need to update its master-planning procedures to more efficiently encourage the full use of *GreenPlan Philadelphia* and *Greenworks Philadelphia* measures.

TARGET

Increase the use of integrated building-design measures that augment sustainability goals for open space, public space, and natural systems.

Responsible Agency: Mayor's Office of Sustainability

Partners: Delaware Valley Green Building Council, Energy Coordinating Agency, Pennsylvania Environmental Council

The measures recommended below are those now known to effectively improve environmental performance at acceptable cost. Rather than mandating specific tactics, *GreenPlan Philadelphia* recommends that the City either mandate or use incentives to achieve superior environmental performance. Projects that disturb more than 15,000 square feet of land already must prepare a stormwater management plan. Using combinations of tactics (green roofs combined with pervious-surface improvements, for example) can help meet Water Department requirements. Innovative energy standards of the American Society of Heating Refrigerating and Air-Conditioning Engineers [ASHRAE Standard 189] and the LEED rating system developed by the U.S. Green Building Council offer many paths to achieve a range of environmental-performance goals. By focusing on performance rather than tactics, building owners and designers can devise the combination of measures that most efficiently meet the City's target and their own needs at the same time.

The measures described below are neither prescriptive nor comprehensive, since research and product innovation is rapidly advancing. The mix and emphasis on given measures may need to change in the near future, and may require ongoing adjustment as techniques advance and efficiencies grow.

KEY RECOMMENDATION

Develop building, land-use, and development standards to improve environmental performance of urban spaces.

Responsible Agency: City Planning Commission

Partners: Delaware Valley Green Building Council, Energy Coordinating Agency, Pennsylvania Environmental Council

The following measures primarily reduce energy use, aid comfort, and harvest useful daylight.

BEST PRACTICE: SUSTAINABLE NEIGHBORHOOD DESIGN

Urban Kidney, Philadelphia, PA

The Urban Kidney project, a finalist in a recent international Royal Institute of British Architects competition, is a concept plan that demonstrates the potential of an integrated approach to green design for a neighborhood of 10,000 residents on the lower reaches of the Schuylkill River. The residential component features row-house neighborhoods oriented for optimal solar exposure and centered on community plazas. The street grid shifts to provide many public access points to the river. A new light-rail line would run to Center City, while traffic calming tactics, pedestrian mews, and green street designs encourage residents to walk and bike. Though densely built, the urban design includes ample naturally functioning park space as well as open space that hosts geothermal wells and wind turbines so that the neighborhood can be energy self-sufficient. Using green roofs, pervious paving materials, sewer mining, and cisterns, the neighborhood manages all of its stormwater runoff. The "kidney" metaphor underscores the intent to restore the river's natural flow, and natural filtering and life-supporting function.



**BEST PRACTICE:
MELVIN J. AND CLAIRE
LEVINE HALL**

Philadelphia, PA

The Melvin J. and Claire Levine Hall, at the University of Pennsylvania is an innovative local example of a careful use of a glass-clad corridor structure to keep an outdoor courtyard bright. The double-layered window-wall encloses a layer of air that acts like a thermal blanket so that the sun does not overheat the corridor in temperate seasons, nor does it lose too much heat in the winter.

Source: www.kierantimberlake.com



Andrew Dobshinsky, WRT

Shading

Shade trees, awnings, shutters, and porches keep summer heat off windows and building surfaces, increasing comfort and reducing energy use. Prior to the widespread adoption of air conditioning, these methods were traditionally used to make us feel cooler. Instead of rule-of-thumb approaches, today's computer-aided design software can optimize the arrangement of a porch or other device to maximize its shading potential. Trees planted along streets or in yards in front of eastern and western building exposures are especially useful for reducing unwanted solar heat. Fixed sun-breaking devices, often called brise soleils, can improve daylight quality in commercial and institutional buildings while saving energy. The Comcast Center in Center City uses trellises to shade its plaza, for example. Deciduous trees planted along southern exposures offer desirable shading in the summer but permit low winter sun to add free heat and welcome daylight to building interiors.

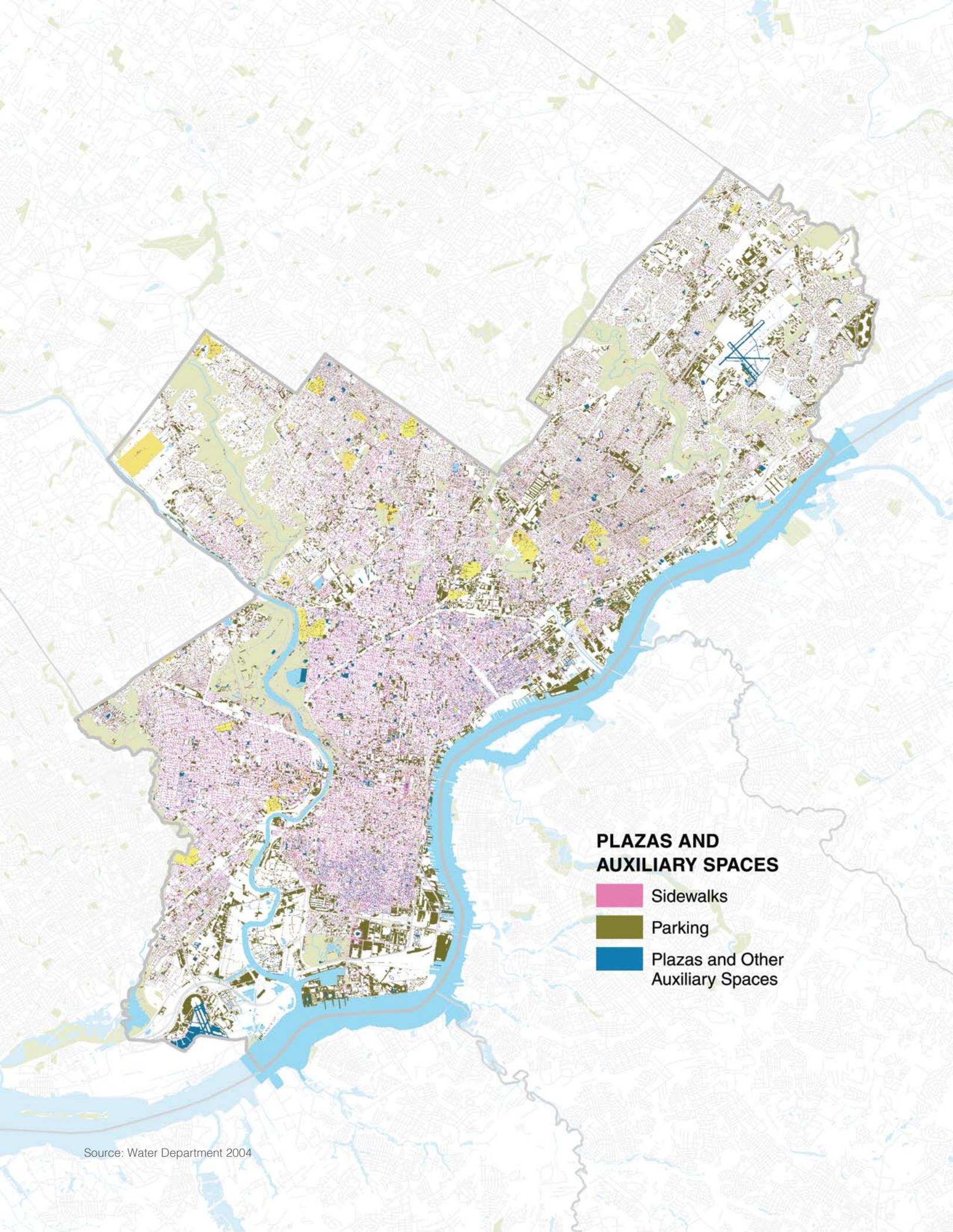
Building Orientation

The orientation of buildings has important consequences for both interior and exterior space. Carefully orienting a building on site can reduce unwanted solar heat and glare. The shape and form of structures can harvest prevailing breezes for natural cooling of both interior and exterior spaces. Buildings can deliver useful daylight to interior spaces, where it can replace electric lights, and to outdoor courtyards and play spaces, where it can make these spaces more attractive and usable. Optimized orientation requires modest additional effort at design phases but need not cost more to build. Lower operational costs and comfort benefits are realized immediately upon completion.

In Philadelphia, minimizing exposures on the east and west sides of buildings confers substantial energy-conservation benefits by cutting early morning and late-day sun. Interiors free of sun glare are also more comfortable. Buildings with glass areas oriented to the south can harvest heat from the low winter sun, but the resulting glare may need to be offset. North-facing glass offers pleasing, generally glare-free interior daylight for most of the year. However, North windows must be configured to resist winter heat loss.

Buildings can be oriented to capture and focus prevailing breezes, a source of free cooling, especially when sites are left open in the prevailing-wind direction. Windows, louvers, or shutters that open can be oriented toward the prevailing breeze. Buildings configured with many rooms having multiple exterior exposures cross-ventilate, but buildings also can cross-ventilate through the use of transoms, louvers, and transfer ducts (taking care not to bridge required fire separations).

Courtyards, plazas, and play spaces are usable most of the year when open toward the south. Those facing north, or are in shade through much of the day during cooler months, are less appealing. Outdoor spaces that do not receive breezes because buildings block them, are used less.



**PLAZAS AND
AUXILIARY SPACES**

-  Sidewalks
-  Parking
-  Plazas and Other
Auxiliary Spaces

Source: Water Department 2004

GREEN PLACES

- PARKS AND RECREATION SPACES
- GREEN SCHOOLYARDS
- VACANT LAND OPPORTUNITIES
- WATERFRONTS
- GREEN STREETS
- GREEN DEVELOPMENT

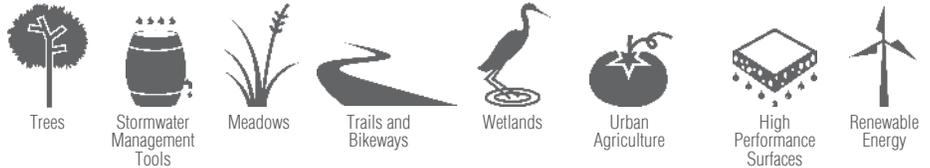


PLAZAS AND AUXILIARY SPACES

- RAIL AND UTILITY CORRIDOR ENHANCEMENTS

ENVIRONMENT	ECONOMICS	QUALITY OF LIFE
<ul style="list-style-type: none"> ● Clean Air ● Healthy Watersheds ● Robust Habitat ● Hospitable Climate 	<ul style="list-style-type: none"> ● Efficient Energy Use ● Valuable Properties ● Productive Land Use ● Competitive Economy 	<ul style="list-style-type: none"> ○ Fresh, Local Produce ● Convenient Recreation Access ● Healthy Residents ● Strong, Safe Neighborhoods

Plazas and auxiliary spaces can include the following **elements of green places**:



VISION: Greening Underfoot

The city’s five Center City squares defined a unique urban form for Philadelphia in the early years of its history. As the city has grown, public landscapes like the Benjamin Franklin Parkway, elegant public gardens, urbane tower plazas, and leafy college campuses have augmented William Penn’s original vision. The best of these are a daily source of delight to Philadelphians.

While there are examples of successful private open space, too often the open space in a privately developed parcel is nothing more than a patch of asphalt for cars to park on. This cannot be acceptable if we are to respect and achieve the spirit of Penn’s original vision for the city.

DEFINITION

The focus of this chapter is privately-owned landscapes that are (or ought to be) accessible to the public. Often this takes the form of a plaza adjacent to a large building like a skyscraper, or open space located within the bounds of a large development parcel. In general, this chapter applies to large-scale development projects. Of particular interest, because of their prominence, are the off-street parking areas, both surface and structured, that almost always accompany a development of significant size.

BENEFITS

The benefits of open space networks are not limited to public land. The rain that falls, the grass that grows, and the birds that sing do not care who owns the land. Well designed and maintained landscapes are valuable amenities to private as well as public land owners. A well-designed landscape can be a place for the gathering of people and fostering of community. However, more open space is not necessarily better. Too much open space spreads out buildings and decreases walkability. Large impervious

surfaces, like parking lots, exacerbate rather than solve stormwater management problems. Laws that require irrigation lead to consumption of valuable resources, where a more thoughtful design may have provided more value. Where an expansive open area might be uninviting, a more well-defined space may sometimes be more comfortable and more attractive to users. Often forgotten or taken for granted when developing a site, the design of landscapes should be an important consideration in any development project. It is important to do it right.

BASELINE

In the past, zoning ordinances, particularly parking requirements, have been an obstacle to quality urban environments, consuming valuable land, creating vast expanses of impervious surfaces, and creating eye-sores. With a better understanding of the benefits of mixed-use neighborhoods and shared-parking strategies, parking requirements can be drastically reduced in many cases, leaving more resources available to create higher-quality, higher-performing spaces.

Zoning primarily guides the requirements for the size of yards, courts, and parking, but usually does not touch on aspects of environmental performance. Planted buffers are required around some parking lots, but these are not tied to other environmental performance objectives. Projects that disturb more than 15,000 square feet of land area must comply with stormwater management regulations that require the management of the first inch of rainwater onsite to minimize runoff flowing into the sewer system. Water-retaining vegetated swales and retention basins, pervious surfaces, and planted areas are all ways to suitably manage water.

“Create regulations that require greening in parking lots.”

GreenPlan Philadelphia
civic engagement participant
from West Philadelphia

TARGET

Improve performance of plazas, sidewalks, and landscaped spaces pursuant to *GreenPlan Philadelphia* targets and recommendations.

Responsible Agency: City Planning Commission
Partners: Water Department, Department of Public Property, Department of Streets

This target is intended to encourage the design and adaptation of publicly accessible urban spaces consistent with related *GreenPlan Philadelphia* targets and recommendations. In this way, *GreenPlan Philadelphia* touches on every key open-space system, allowing them to work together to produce large effects through many modest, low-cost individual efforts. The spaces covered in this chapter, especially parking lots, have particular relevance to the stormwater management techniques spelled out in the High Performance Surfaces chapter, for example. The cool surface recommendations also allow these spaces to help reduce the urban heat island effect.

KEY RECOMMENDATION

Revise the zoning code to improve environmental performance of parking.

Responsible Agency: City Planning Commission
Partners: Water Department, Department of Public Property, Department of Streets

Parking areas, especially large ones, can be adapted to advance many environmental performance objectives. *GreenPlan Philadelphia* proposes the elimination of minimum parking requirements in zoning. In this way, building owners would have more flexibility in the accommodation of people arriving by vehicle, more flexibility in use of their land, and greater ability to focus the building and design orientation to ease access by those arriving on foot, by transit, or by bicycle. Encouraging people to switch to travel modes other than the auto offers numerous benefits, especially in a congested city like Philadelphia.

The City could encourage site arrangements that give priority to pedestrian access, with sheltered, secure bicycle racks and primary entrances placed near transit stops, if adjacent. Developments are more visible and appealing overall when buildings minimize or eliminate parking between the street and buildings. Buildings placed behind large swaths of parking feel intimidating to anyone arriving by any means other than an auto. If large frontages of parking are unavoidable, the site should include walkways between the street and the building entrance.

The Water Department has already taken steps to reduce the burden of large parking lots through its stormwater regulations and parcel-based billing practices, which discourage impervious surfaces. In addition to these regulations, the City could improve parking areas by requiring the use of reflective and pervious paving materials, tree planting minimums, and landscaped buffers between all parking lots and sidewalks.

KEY RECOMMENDATION

Establish design standards to improve environmental performance of parking, plazas, sidewalks, and landscape spaces.

Responsible Agency: City Planning Commission

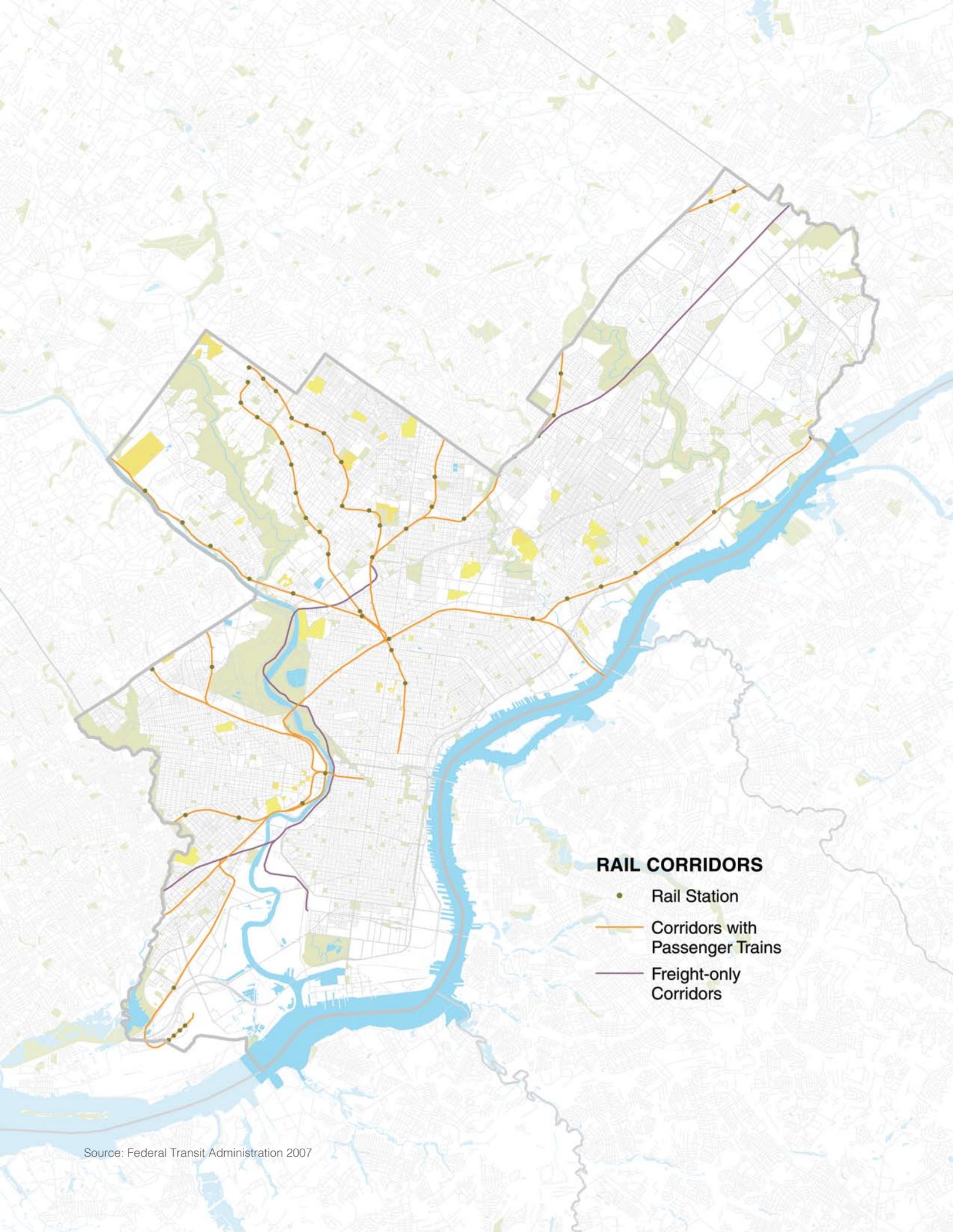
Partners: Water Department, Department of Public Property, Department of Streets

Design standards could be mandated through zoning or encouraged with incentives, like quicker approvals and abatements related to costs saved by the City.

- Design plazas, sidewalks, and landscaped spaces to advance tree-planting goals.
- Design plazas and sidewalks to incorporate high performance surface recommendations. Design landscaped spaces to minimize irrigation and maximize stormwater management potential.
- Where wetlands or meadows exist, enhance and extend landscapes if practical.
- Integrate access to trails and bikeways that adjoin or pass through outdoor spaces.
- Encourage landscaped spaces to extend adjacent parks and recreation facilities, when recreation can be enhanced.
- Design buildings around open spaces to harvest runoff, increase shading, and provide insulation. Orient them to passively heat and cool.
- Design sidewalks and plazas to meet green street criteria, where applicable.

Green parking. An employee parking lot at Philadelphia International Airport manages stormwater using swales.





RAIL CORRIDORS

- Rail Station
- Corridors with Passenger Trains
- Freight-only Corridors

Source: Federal Transit Administration 2007

GREEN PLACES

- PARKS AND RECREATION SPACES
- GREEN SCHOOLYARDS
- VACANT LAND OPPORTUNITIES
- WATERFRONTS
- GREEN STREETS
- GREEN DEVELOPMENT
- PLAZAS AND AUXILIARY SPACES



RAIL AND UTILITY CORRIDOR ENHANCEMENTS

ENVIRONMENT	ECONOMICS	QUALITY OF LIFE
● Clean Air	● Efficient Energy Use	○ Fresh, Local Produce
● Healthy Watersheds	● Valuable Properties	● Convenient Recreation Access
● Robust Habitat	● Productive Land Use	● Healthy Residents
● Hospitable Climate	● Competitive Economy	● Strong, Safe Neighborhoods

Rail and utility corridor enhancements can include the following **elements of green places**:



VISION: Pathways to Progress

In a city that built locomotives for decades and headquartered a railroad that spanned half a continent, it is not surprising that railroads, in ways subtle and dramatic, “built” Philadelphia. This history is celebrated in the grandeur of 30th Street Station and the elegant stone arches of the Columbia Railroad Bridge as it crosses the Schuylkill River. Rusting viaducts, trash-strewn rights-of-way, and dilapidated stations are regrettably also a part of Philadelphia’s often-neglected railroad legacy. Currently holding back neighborhoods by their poor state of maintenance, a rediscovery of the city’s forgotten infrastructure can breathe life back into surrounding neighborhoods.

BENEFITS

GreenPlan Philadelphia recognizes the potential in rail and utility corridors. Well maintained, they add value and appeal to neighborhoods. Many are also able to host multiple uses—for recreation, for access, and to enhance environmental sustainability in several ways.

BASELINE

Rail renaissance (facing page): With rail and utility corridors touching almost every neighborhood in the city, maintenance improvements and station enhancements can make a big difference. Contiguous strips of underused land offer great redevelopment potential.

A detailed map and list of opportunities for rail and utility corridor enhancements can be found on page 233.

Rail remains essential to Philadelphia’s commerce and mobility, with 93 miles of elevated, at-grade, and trenched rail corridors threading their way through all parts of the city. (This chapter does not cover subsurface rail or trolley tracks and other rails that share streets.) Philadelphia is a key node on the Northeast Corridor that runs between Washington and Boston—the most heavily traveled passenger-rail corridor in America and a key freight trunk line. More than 1,800 freight and commuter trains move through the Northeast Corridor system each weekday. More than 13 million riders traveled through the city via Amtrak during the 2008 fiscal year, with nearly 4 million boardings at 30th Street Station alone.⁵³ The Southeastern Pennsylvania Transportation Authority (SEPTA) operates a robust regional public transportation system, which includes

13 commuter-rail routes that run on partially grade-separated elevated or trenched rights-of-way serving the city and suburbs. About 120,000 passengers each weekday and 35.4 million annually use SEPTA to commute to work, to get to school, to go shopping, or to enjoy the city's cultural amenities.⁵⁴

Freight rail lines link the port with the rest of the continent and serve industry. Over decades, miles of freight track in Philadelphia have been torn up, leaving abandoned freight yards and rights-of-way much wider than current traffic requires. Increasing road congestion, however, has been driving more freight and passenger traffic to rails. In the short term, the antiquated state of rail maintenance limits freight and passenger growth, though a renewed desire for rail nationwide may lead to greater investment, especially along the congested Northeast Corridor.

The corridor lands are in a mix of public and private ownership. Amtrak, a federally chartered corporation, owns the Northeast Corridor. SEPTA trains operate over its own rails and over ones owned by Amtrak, CSX, and Norfolk Southern. Freight trains run over tracks owned by the freight companies and by Amtrak. Utilities own land but also lease utility corridors from City departments such as Fairmount Park and the Department of Public Property.

Among utility corridors, the most tantalizing opportunity is the East Park Reservoir, several sections of which are no longer used as drinking water sources. Parts of the West Basin already have been set aside as valuable wetland habitats, but extraordinary enhancement potential remains.

The state of rail and utility corridor maintenance is of significant public concern, an issue raised repeatedly during the public-engagement process. Many corridors slice through neighborhoods, isolating them from essential destinations as well as access to rivers, parks, and other amenities. The massive stone Reading Viaduct that runs north beginning a short distance from the former Reading Terminal shed, has not found a new use since it was abandoned in 1980s, for example, and now forms a seemingly impenetrable wall to Chinatown's growth.

Unkempt corridor edges lined with trash worsen conditions. Graffiti covers rusting bridges. Retaining walls crumble. Poorly maintained drainage structures back up to form stagnant ponds. Fences along trenched lines go unrepaired—a safety issue. Large parcels of vacant land lay adjacent to abandoned rail lines. Factories that once existed along freight lines have been torn down, leaving large linear swaths of dereliction.

During *GreenPlan Philadelphia* civic engagement, citizens deplored the poor state of maintenance of the 153 regional-rail stations as well as those served by the city's two subway/elevated rapid-transit lines, and the subway/surface trolley lines. Unappealingly designed and poorly lit and maintained stations suppress ridership. The air of dereliction fuels fear of crime, which drives away more passengers.

Maintenance is not only a local concern. With vistas of Center City, Fairmount Park, and the Schuylkill boathouses, Philadelphia gorgeously introduces itself to millions of visitors and potential visitors as Amtrak trains cross the Schuylkill. But many miles of track lined with abandonment and neglect mar this impression.

Philadelphia, among many other cities, has begun to identify the potential of abandoned corridors and the shared-use possibilities of those that continue to be active. A 2004 study estimated the cost to demolish the Reading viaduct at seven times the cost of turning it into a graceful planted promenade offering urban panoramas to pedestrians and bicyclists.⁵⁵ The study anticipated New York City's High Line Park, a derelict

“Right across the street from me is an empty lot. I think it belongs to the city or Amtrak because the Bridesburg train station is there. It would be nice to have some green around and some lights . . . but the trees are the best. They bring the country to the city and we in the city need this to make it better.”

GreenPlan Philadelphia
civic engagement participant
from Near Northeast Philadelphia

Rescuing rights of way. Better levels of maintenance and *GreenPlan Philadelphia* tactics can turn this image of dereliction into one of progress.

elevated rail track that reopened as a linear park in 2009, spurring more than 50 commercial and residential developments valued at up to \$5 billion.⁵⁶ The Schuylkill Banks Trail, which borders an active CSX line, demonstrates the beneficial coexistence of rails and people, even when space is tight. The combined efforts of the city and the private sector over the last 15 years transformed the landscape into a beautiful park and a 1.2-mile trail that attracts 14,000 weekly users who bike, stroll, and jog along the river.⁵⁷

TARGET

Upgrade cleanliness standards along utility and rail corridors and in passenger-rail facilities. Apply *GreenPlan Philadelphia* measures within rights-of-way.

Responsible Agency: Office of the Deputy Mayor for Transportation and Utilities

Partners: Amtrak, CSX, SEPTA, Norfolk Southern Pennsylvania Horticultural Society, community development corporations

Apparent indifference by distant corporations or cash-strapped government agencies discourages neighbors, who may join in with trash dumpers rather than try to stop them. On the other hand, basic maintenance can inspire neighborhoods that would otherwise see infrastructure corridors as impeding their progress. Neighbors inspired by the proactive commitment of corridor owners are much more likely to defend well-maintained structures from vandals and dumpers. Additionally, nearby residents will be more likely to support and participate in enhancement and maintenance efforts.



Cleaning and greening rail stations.

Modest improvements can make drab train stations more appealing and safer, including plantings along the tracks and around the station, new benches and information signs, ramps rather than stairs, and rooftop photovoltaic panels to supply power.





Cleaning and greening rail corridors. The Amtrak corridor through North Philadelphia is often lined with trash and is bounded by vacant and under-utilized land.



KEY RECOMMENDATION

Partner with railroads and utilities to devise and assure best-practice maintenance and cleanliness.

Responsible Agency: Office of the Deputy Mayor for Transportation and Utilities
Partners: Amtrak, CSX, SEPTA, Norfolk Southern, Pennsylvania Horticultural Society

The City should create formal agreements with rail and utility owners to set out the scope of critical maintenance and cleanliness standards. Safety is clearly the first priority: assuring maintenance of fences, railings, publicly accessible bridges, stairways, sidewalks and grade crossings. Drainage structures need to be maintained to prevent flooding, sewer overflows, and damage to structures. Standards to be developed include those for trash and graffiti removal along rights-of-way and regular painting of steel structures. Station maintenance should focus on cleanliness, good state of repair, and safety, with lighting and design elements evaluated and upgraded with safety in mind.

RECOMMENDATION

Establish design standards and shared uses to improve environmental performance of utility and rail corridors and of passenger-rail facilities.

Responsible Agency: Office of the Deputy Mayor for Transportation and Utilities
Partners: Amtrak, CSX, SEPTA, Norfolk Southern, Pennsylvania Horticultural Society

Beyond basic maintenance, *GreenPlan Philadelphia* recommendations in other chapters offer the opportunity to make both active and abandoned utility corridors more valuable and appealing.

- Stock corridors and stations to meet tree-planting goals and screen derelict land from view.
- Upgrade drainage facilities to divert runoff from the city's sewer system. Use pervious-surface tactics to retain stormwater, to infiltrate it into soils, or to release it into streams through filtering, naturally functioning buffers.
- Incorporate wetlands and meadow enhancements where applicable. Evaluate abandoned corridors for inclusion in the city's wetlands, parks, and habitat networks.
- Extend trails and bikeways, physically separated from active utility or rail facilities, where right-of-way conditions permit. Three large, linear opportunities stand out: the railroad corridor just north of Lehigh Avenue, from Kensington Avenue to the Delaware River; the abandoned rail line that cuts perpendicularly across Tacony Creek just downstream on Whitaker Avenue; and the long strip of land that runs on both sides of the Northeast Corridor rail line bordered by Glenwood and Sedgley avenues. All three have enormous potential as parks laced with trails and bikeways. These swaths cross many neighborhoods underserved by open-space facilities, and can connect neighborhoods to rail stations, commercial centers, and hospitals through a river-to-river greenway.
- In maintenance and upgrades, create additional welcoming and attractively-designed means to pass through or across corridors to enhance neighborhood-to-neighborhood connections. Extend access to adjacent parks, recreation facilities, and waterfronts, where possible.
- Design station upgrades to meet stormwater management tools and high performance surface recommendations.
- Where rights-of-way share streets, design to green street criteria.
- Inventory potential sites for renewable-energy facilities within corridors.





MANAGEMENT AND OPERATIONS

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Environmental Education and Outreach

Management and Maintenance

Measuring Progress

Funding

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While the successful implementation of Elements of Green Places and Green Places will dramatically improve the quality and function of the city's green infrastructure, that great potential cannot be realized without management and operational support from the City. These chapters spell out administrative issues and opportunities that help to build the City's capacity broadly, as well as specifically integrate high environmental performance into the City's operations and management culture.

Targets and recommendations in the Environmental Education and Outreach chapter advance broad environmental education and literacy. That chapter also suggests an outreach effort to re-engage citizens in the completed *GreenPlan Philadelphia* blueprint so that they can see how it responds to their concerns and be invited to assure its success.

The process of creating *GreenPlan Philadelphia* led to an unprecedented level of inter-agency collaboration, which continues in the work of the Mayor's Office of Sustainability and the interdepartmental GreenPlan Philadelphia Management Group, which oversee the implementation of plan recommendations. Governance recommendations seek to integrate high environmental performance in every aspect of the way the City does business. While *GreenPlan Philadelphia* is not a maintenance plan, the Maintenance and Maintenance chapter recommendations aim to set consistent standards and encourage sharing responsibilities to harvest efficiencies. They propose to prioritize maintenance to realize public-safety gains and to target the least-well-served areas of the city.

The Design Standards recommendations look to achieve not only essential baseline performance in facility design, but design that is inspiring, exceeds expectations, and adds appeal to neighborhoods. A wealth of volunteer and advocacy organizations already augment the work of the City in parks, at recreation centers, and in other open spaces by committing time, leadership, and money to building facilities and maintaining them for the benefit all Philadelphians. Partnerships and Volunteers recommendations build on that foundation to make partnership, advocacy, and volunteerism even more appealing and widespread.

Land Management recommendations focus on acquisition, management and disposal of City-owned land—essential to realizing *GreenPlan Philadelphia* objectives at a large scale. They include the standardization and simplification of procedures related to land ownership, especially vacant land, and expanding the use of land trusts as a vehicle to acquire or manage lands on behalf of the City.

The City cannot demonstrate that it has met objectives if it does not possess adequate data and the capacity to collect that information on a continuous basis and analyze it usefully. The Measuring Progress chapter asks that City agencies regularly assess progress and share accomplishments with citizens and advocates. It also asks the City to put

in place the data capacity to make such benchmarking meaningful. Recognizing the extraordinarily challenging funding environment and the ambitious goals of *GreenPlan Philadelphia*, the Funding chapter spells out procedures and methods to diversify and expand sources of funding for parks, open space, and other *GreenPlan Philadelphia*-related efforts.



Andrew Dobshinsky, WRT

Keeping parks pristine. Regular litter removal and trash pick-up keeps parks attractive and welcoming.

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Fairmount Park, the Department of Recreation, the Water Department, and their partners have been able to create enviable and effective programs to acquaint people with nature and its value. Every year these programs expose people, especially children, to a natural world they can feel, see, and touch. They help people engage with nature through volunteer tree-planting programs and enjoy nature as a healthy pastime. These education efforts only become more valuable and more useful in an era when environmental stewardship is essential to our wellbeing.

The hard-working green infrastructure that *GreenPlan Philadelphia* envisions cannot succeed without a citizenry that possesses a high level of environmental literacy. People need to understand the value of street trees if they are to plant and nurture them. They need to see why it is important to harvest rainwater from roofs and backyards. They need to knowledgeably evaluate government actions undertaken to advance the goals of *GreenPlan Philadelphia* and *Greenworks Philadelphia*.

This chapter describes a way to create an even more effective environmental-education effort and to coordinate it with a renewed civic-engagement process that helps people understand *GreenPlan Philadelphia*, how their interests fit into it, and how they can participate in realizing its goals.

ENVIRONMENTAL EDUCATION

TARGET

Use programs at parks and other public facilities to expand environmental-education opportunities.

Responsible Agency: Mayor's Office of Sustainability

Partners: Fairmount Park, School District of Philadelphia, Department of Recreation, Pennsylvania Horticultural Society, Friends of Park groups

Environmental education is part of the process of building well-being through parks and other public places. This target builds on successful environmental-education programs that now exist in parks and other City facilities. Though the City now has two environmental centers in Fairmount Park, the programs could also be offered in schools and in neighborhood recreation centers, where they can reach more children and families whose exposure to nature may be limited at home and constrained by funding limitations at school. The programs can augment those already in schools that build interest in parks and natural systems and encourage their use.

KEY RECOMMENDATION 📄

Facilitate collaboration between the City and the School District of Philadelphia to make the best use of resources in environmental education.

Responsible Agency: Mayor's Office of Sustainability

Partners: School District of Philadelphia, Fairmount Park, Department of Recreation, Water Department

The City intends to forge a closer relationship with the School District of Philadelphia to bring environmental-education resources that are readily available in the watershed parks to parts of the city farther from these invaluable resources. Joint development of Fairmount Park and school curricula related to ecology, plant and animal biology, and other natural processes could considerably stretch the resources of the schools, Fairmount Park, and the Department of Recreation.



Implementing the Campus Parks program. With a grant from the Eagles Youth partnership, students transform the blacktop in front of William McKinley School by planting trees and flowers as part of a teaching garden.

School and public programs that are primarily delivered at Fairmount Park environmental education centers could reach many more people in schools, libraries, and recreation centers throughout the city. The expansion of habitats envisioned by *GreenPlan Philadelphia* and growth in the Campus Parks initiative would offer the public more hands-on encounters with nature. In addition, volunteer maintenance programs, youth programs, and tree-planting programs undertaken by outside groups could be coordinated to make the most of limited resources. These projects build life skills while acquainting children and teenagers with natural processes.

Fairmount Park and the Department of Recreation could also foster a closer integration of programs offered by nonprofits, like the Audubon Society and the Pennsylvania Horticultural Society. Programs should also acquaint and involve students in the extension of the city's green infrastructure entailed by *GreenPlan Philadelphia* and *Greenworks Philadelphia*.

KEY RECOMMENDATION 📄

Build partnerships with the business community to expand cultural and environmental outreach programs.

Responsible Agencies: Mayor's Office of Sustainability, Fairmount Park

Partners: Department of Recreation, Mayor's Office of Arts, Culture and Creative Economy, Fairmount Park Conservancy, Office of Philanthropic Relations, School District of Philadelphia

Free and low-cost arts and culture programs are a key mission for Fairmount Park and the Department of Recreation. Concerts, movie nights, plays, puppeteers, performances,

festivals, and the Mural Arts Program not only make the city more enjoyable and livable, they diversify use of parks. They broaden the constituencies that advocate, support, and volunteer to maintain programs and parks. The City should encourage arts and parks agencies to collaborate to build financial support from private partners to expand the reach of these programs, especially to those parts of the city least served by parks and cultural facilities. Cultural programs are also opportunities to call attention to the value of parks so that both can be enriched. Programs might inventively call attention to nature through arts, since artists have often drawn inspiration and meaning from nature. In this way, a wider audience can come to understand *GreenPlan Philadelphia* goals and become aware of outreach efforts to broaden environmental literacy in the city.

KEY RECOMMENDATION

Expand youth programs and summer environmental employment programs for youth.

Responsible Agencies: Department of Recreation, Fairmount Park
Partners: Pennsylvania Horticultural Society, UC Green

Fairmount Park and the Department of Recreation host a number of programs that help teenagers develop a wide variety of life and work skills. The Pennsylvania Horticultural Society's Youth Environmental Stewardship (YES), YouthBuild, and AmeriCorps are existing successful youth programs. UC Green Corps is a successful summer employment program that could grow. Since their track records are proven, *GreenPlan Philadelphia* recommends that these programs be maintained and expanded. They are also useful in furthering the goals of the Plan by instilling a strong sense of environmental stewardship among citizens at a young age. Programs can be updated to focus on knowledge and skills that help people understand and nurture the city's growing green infrastructure. In this way, young people can graduate with an appreciation of nature and an acquaintance with its recreational possibilities. They are more likely to become Friends of Park advocates, volunteers, and stewards.

OUTREACH

GreenPlan Philadelphia is not environmental business as usual. This section spells out means by which the City can make the Plan an integral part of the way City agencies do their work. It lays out a way to broadly engage Philadelphians' interests and relate them to the aspirations, goals, and targets of *GreenPlan Philadelphia*—and, by extension, *Greenworks Philadelphia*.

TARGET

Create broad citizen and interest-group understanding of *GreenPlan Philadelphia*, the City's green-performance objectives, and the opportunities available in the city's diverse open-space resources.

Responsible Agency: Mayor's Office of Sustainability
Partners: Fairmount Park, Water Department, Department of Recreation, City Planning Commission, Department of Commerce

The outreach plan primarily re-engages those who participated in the preparation of *GreenPlan Philadelphia* so that they can see what it became and how their interests fit in. It is also a chance to convey the benefits of *GreenPlan Philadelphia*.

KEY RECOMMENDATION 📄

Renew the civic-engagement process to acquaint citizens with *GreenPlan Philadelphia*, and permit them to respond to its recommendations.

Responsible Agency: Mayor’s Office of Sustainability

Partners: City departments and agencies and the many community groups that helped to create *GreenPlan Philadelphia*

In public forums, in news-media outreach, and in neighborhood venues, the City should present programs on *GreenPlan Philadelphia* that show appreciation for earlier citizen participation and that help people understand the way *GreenPlan Philadelphia* advances environmental sustainability. The forums can connect citizens with parts of the Plan that concern them and permit them to respond. Agencies can take the responses into consideration as they implement the Plan’s recommendations.

These are also opportunities to educate citizens on how they can put *GreenPlan Philadelphia* recommendations into practice. Outreach events can speak to the value of open-space resources, of naturally functioning landscapes, and of *GreenPlan Philadelphia* aspects that reduce energy use and other environmental impacts. They can be forums for explaining how these resources will benefit citizens. Participants can also learn about the public-health benefits of *GreenPlan Philadelphia* recommendations and be urged to take advantage of parks, recreation centers, trails, and other resources to improve fitness.

KEY RECOMMENDATION 📄

Engage key advocacy and citizen-group partners so that they can understand and respond to *GreenPlan Philadelphia’s* relationship to their agendas.

Responsible Agency: Mayor’s Office of Sustainability

Partners: City departments and agencies and the many partner organizations that helped to create *GreenPlan Philadelphia*.

Advocates, activists, and volunteer groups are key *GreenPlan Philadelphia* constituencies. Special-topic forums, like those held during the first civic-engagement process, can help these groups understand how their input was used in *GreenPlan Philadelphia* and how it addresses their interests. In this way, implementation of the Plan can proceed in partnership and with advocates’ feedback in mind. These forums are also an opportunity to educate groups about the way *GreenPlan Philadelphia* approaches environmental sustainability and the means by which it will expand the city’s green infrastructure.

“I would like to see more cultural programming in the parks for adults and children—including live music and plays.”

GreenPlan Philadelphia civic engagement participant from Southwest Philadelphia



Events build stewardship. Bike Philly took over the Benjamin Franklin Parkway in 2007. Special events not only promote enjoyment of the city’s public assets, they promote stewardship of precious places.

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The development of *GreenPlan Philadelphia* required collaboration across city departments to create a plan that represents all their interests in a single City voice. By continuing to work collaboratively, the City will ensure that its efforts are focused, synthesized, and put to the best use. Relationships should continue to be expanded to include other authorities and agencies that have not yet participated in *GreenPlan Philadelphia*.

The recommendations that follow focus on administrative governance. However, to be successful, city administration must collaborate with the elected officials who are responsible for approving capital funding and who have considerable influence over the projects that get implemented in their districts. Having *GreenPlan Philadelphia's* unified vision, explicit recommendations, and project objectives will support budget requests necessary to implement the plan.

Today, leaders across City departments share a commitment to a unified vision for the city's open space and green infrastructure. *GreenPlan Philadelphia* recommends integrating the concepts of sustainable open space into each of these departments to capitalize on this buy-in.

TARGET

Institutionalize *GreenPlan Philadelphia* within city government.

Responsible Agency: Mayor's Office of Sustainability

Partners: All *GreenPlan Philadelphia*-related departments

KEY RECOMMENDATION

Require that *GreenPlan Philadelphia*-related departments formally adopt *GreenPlan Philadelphia* and, in their missions, commit to pursuing its goals.

Responsible Agency: Mayor's Office of Sustainability

Partners: All *GreenPlan Philadelphia*-related departments

KEY RECOMMENDATION

Require that *GreenPlan Philadelphia*-related departments dedicate staff to integrate the plan's recommendations into daily operations, coordinate interdepartmental efforts, and manage relations with external partners.

Responsible Agency: Mayor's Office of Sustainability

Partners: All *GreenPlan Philadelphia*-related departments

KEY RECOMMENDATION

Create a Sustainable Open Space Coordinator position in the City Planning Commission to coordinate the implementation of *GreenPlan Philadelphia*.

Responsible Agency: City Planning Commission

KEY RECOMMENDATION

Require the heads of *GreenPlan Philadelphia*-related departments to meet regularly to guide policies and programs, coordinate funding priorities, prioritize and advance projects, and monitor progress towards meeting the plan's targets.

Responsible Agency: Mayor's Office of Sustainability
Partners: All *GreenPlan Philadelphia*-related departments

Adopting *GreenPlan Philadelphia* is more than just a statement of intent. By adopting the Plan, each department will agree to incorporate the plan's strategies and recommendations into its daily work. This will require staff at all levels within a department to be aware of and make a commitment to implementing this vision.

MAINTENANCE

Improving maintenance and state of repair at City park and recreation facilities is a top priority of citizens. This section offers guidance in the development of more efficient maintenance programs and procedures.

TARGET

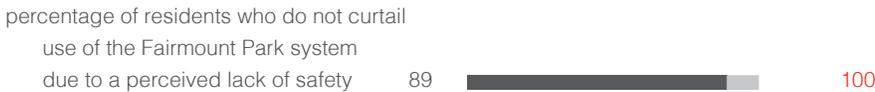
Implement rigorous maintenance practices to provide safe, high-quality, sustainable public open space.

Responsible Agencies: Fairmount Park, Department of Recreation, School District of Philadelphia
Partners: Department of Public Property, Friends of Parks groups, community associations, Pennsylvania Horticultural Society

KEY RECOMMENDATION

Improve users' sense of safety in all public open space.

Responsible Agency: Office of the Deputy Mayor for Public Safety
Partners: Department of Public Property, Fairmount Park, Department of Recreation, School District of Philadelphia



The design and maintenance of parks, playgrounds, and other recreational facilities has a great deal to do with both the perception and reality of safety. In responding to complaints and evaluating maintenance, the City needs to remedy states of repair that repel public use, so that facilities do not become refuges for illegal activity. Improved maintenance—like improved lighting or pruning of overgrown vegetation and trees to open clear lines of sight—encourages greater use and volunteer stewardship, which tend to drive out criminal activity.

Encouraging the formation and growth of Friends of Parks groups will augment the City's maintenance efforts and create a safety-enhancing presence. The Parks Revitalization Program created by the Pennsylvania Horticultural Society and the Department of Recreation is a model deserving wider emulation. A dedicated group of community volunteers, for example, returned Carroll Park to broad community use.

Likewise, the formation and growth of Town Watch patrols can improve surveillance at night when the presence of people using facilities is lower.

Best Practice:
MAINTENANCE
Park Maintenance Standards, San Francisco, CA

San Francisco's Recreation and Park Department (RPD) evaluates each of the city's parks twice a year. Staff members, including horticultural supervisors, structural maintenance supervisors, and managers, make unannounced visits, inspecting the parks using the *San Francisco Park Maintenance Standards Manual*. Working with citizens and park advocates, RPD and the city controller's office developed the standards to define the desired conditions of park features. The city uses the standards not only to evaluate site conditions, but to set goals, reconcile existing conditions with available resources, and prioritize maintenance activities and resources.

Reference: http://www.parks.sfgov.org/site/recpark_page.asp?id=37737



Andrew Dobshinsky, WRT

Improving maintenance: Rittenhouse Square is a well-maintained public square, but bringing consistent maintenance standards to the whole city will build commitment and usage of parks.

Best Practice:**EVALUATING SITES**

Parks Inspection Program,
New York, NY

The Department of Parks and Recreation's Park Inspection Program provides "frequent, random, and detailed inspections" of New York City's parks and playgrounds, which create detailed but time-efficient pictures of park conditions. Trained inspectors use handheld computers and digital cameras to conduct nearly 5,000 inspections each year. They assess up to 16 features encompassing three categories—cleanliness, landscape elements, and structural features. Each feature, and ultimately each park, is rated as either acceptable or unacceptable. Administrators use the information gathered to target problem areas and deploy limited resources more effectively. Initially, inspection reports were done three times per year. The current system generates 24 biweekly summary reports each year.

Reference: http://www.nycgovparks.org/sub_about/parks_numbers/pip.html

KEY RECOMMENDATION 

Establish maintenance standards for parks, recreation, and other public open-space facilities.

Responsible Agencies: Fairmount Park, Department of Recreation

Partners: Department of Public Property, School District of Philadelphia, Philadelphia Housing Authority, Pennsylvania Horticultural Society

Establish minimum maintenance standards for parks, recreation, and other public open-space facilities, and create a handbook to guide maintenance staff and contractors. Make the standards available to citizens and Friends of Parks groups, through outreach and the City's website, so that people may benchmark city efforts and call attention to facilities that fall short.

Standards should be established for landscaped areas (lawns, trees, planting beds), recreation sites (ball fields, outdoor courts, children's play equipment), site furnishings (benches, lighting, trash receptacles), structures (recreation centers, historic park houses), hardscapes (sidewalks, parking lots, public squares), and bikeways and pedestrian trails.

Agencies should perform regularly-scheduled evaluations of park and recreation site maintenance and rate facilities against minimum standards established by the handbook. Citizens, through the 311 system, should be able to rate levels of maintenance and alert relevant agencies to conditions that need to be remedied.

RECOMMENDATION

Evaluate current maintenance practices to identify opportunities to share management responsibilities for efficiency.

Responsible Agencies: Fairmount Park, Department of Recreation

Partners: Department of Public Property, School District of Philadelphia, Philadelphia Housing Authority, other affiliated agencies .

Given stringent budget limitations and a high level of participation in parks and recreation facility maintenance by Friends of Parks groups and other volunteers, City agencies must coordinate resources and responsibilities to improve efficiency among City agencies and private partners.

Maintenance contracts offer a significant opportunity to reduce costs. Interagency cooperation would enable the City to take advantage of economies of scale by bidding out maintenance contracts for parallel tasks, such as lawn mowing. Similar cooperation could create efficiencies in tasks performed by City staff, such as tree maintenance, playing field restoration projects, litter pick-up, and maintenance of plantings.

KEY RECOMMENDATION 

Develop an electronic, location-based common asset management system.

Responsible Agency: Department of Technology

Partner: All City departments and agencies that either own or manage properties or infrastructure

An asset-management system based on Geographic Information Systems (GIS) could enhance the City's 311 call center. Connected to 311, maintenance calls would be logged into the Park and Recreation work order system for follow up. The work orders would be mapped to deliver the requests to relevant service areas for quicker response. Such a system would allow for more efficient use of staff resources, provide greater accountability, and improve follow-up with citizens and Friends of Parks groups.

DESIGN STANDARDS

Updating the City's design standards and integrating *GreenPlan Philadelphia* recommendations into them is key to the delivery of high-quality, efficient landscapes and structures. Essential baseline performance should be required, and the City should encourage design that is inspiring, exceeds performance expectations, and enhances neighborhoods.

TARGET

Achieve excellence in environmental design.

Responsible Agencies: City of Planning Commission, Department of Public Property
Partners: Fairmount Park, Department of Recreation, Water Department, School District of Philadelphia, Mayor's Office of Sustainability

Design excellence goes beyond meeting basic program needs at lowest first cost. Well-designed facilities meet those needs while creating meaningful, inspiring, and innovative additions to neighborhoods. High-performance design considers life-cycle costs because the City must own and operate facilities on very limited maintenance budgets. Systems and finishes suited to commercial projects with short expected lives are therefore not appropriate to City projects, where funds are not available to replace major building components and systems on lifecycles of about seven years, which is average for many products and components. Design standards should take into account the City's efforts to consistently and effectively incorporate lifecycle analysis into capital projects.

RECOMMENDATION

Update design standards for capital projects.

Responsible Agencies: Department of Public Property, and City Planning Commission
Partners: Fairmount Park, Department of Recreation, Water Department, School District of Philadelphia, Mayor's Office of Sustainability

Because several agencies build and maintain facilities on behalf of the City, design standards vary in consistency and in the level of quality they seek in completed work. Targets and recommendations in *GreenPlan Philadelphia* set a variety of performance minimums that act in much the same way design standards do, so standards and *GreenPlan Philadelphia* measures should be carefully integrated with each other. Certain measures, like those for high performance surfaces, can be incorporated into design standards and applied to all projects. In updating current standards, agencies should share best practices and strive for consistency so that contractors and vendors can supply the desired level of quality in a predictable and therefore cost-effective way. Sharing standards lowers upfront construction costs and ongoing maintenance by focusing on vendors and builders with proven capacity and performance. The City's standards should apply to partners the City has contracted with to build and maintain facilities.

Because the City is evaluating many green-building design rating systems, like LEED and Energy Star, key preferred standards could be written into or referenced in the City's design standards. Aligning City standards with those of widely used benchmarks like LEED assures the City access to proven, widely available high-performance technologies.



Best Practice:

ASSURING DESIGN EXCELLENCE

CityDesign, Seattle, Washington

Established in 1999, CityDesign is the city's in-house urban design studio, created to support design excellence in public and private projects. As a creative catalyst, CityDesign promotes coordination and collaboration among city departments, developers, property owners, educational institutions, and the community. It works closely with Seattle's Design Commission, neighborhood design-review boards and the Planning Commission, among other agencies. It provides urban-design leadership, project review, public outreach, development assistance, and education. In 2004, CityDesign became part of the Planning Division at the Department of Planning and Development, combining its work with the long-term planning and land-use policy teams.

Reference: <http://www.seattle.gov/dpd/Planning/CityDesign>

“[We need] better maintenance of city parks and, in fact, of all public spaces in the city, which too often looks like a poor third-world city rather than a leading American city.”

GreenPlan Philadelphia
civic engagement participant
from South Philadelphia

RECOMMENDATION

Include evaluation of compliance with *GreenPlan Philadelphia* in any design-review entities established by the City.

Responsible Agency: City Planning Commission

Partners: Mayor's Office of Sustainability, Philadelphia Chapter of the American Institute of Architects

The City Planning Commission is in the process of establishing a design-review board that would evaluate the design and performance aspects of key public and private projects. Generally, such boards consider a range of issues including scale and form, materials, siting, and urban context. Designs that demonstrate superior integration of *GreenPlan Philadelphia* recommendations could also be rewarded in design-review criteria for this and any other design review panel, such as that for historic preservation. In this way, the review board can encourage superior environmental performance and set high but workable benchmarks for agencies and developers to meet.

RECOMMENDATION

Establish a design awards program for recently-constructed buildings and landscapes that recognize the best in design, responsiveness to needs, and environmental performance.

Responsible Agency: City Planning Commission

Partners: Department of Public Property, Water Department, Mayor's Office of Sustainability

Though professional design groups, like the American Institute of Architects and the American Society of Landscape Architects, present design awards to encourage excellence, a City-sponsored awards program could honor the creation of public places that improve the city. A design awards program can recognize excellence and innovation in achieving *GreenPlan Philadelphia* goals. Or those goals can be part of a broader awards program that recognizes a variety of public benefits—for example, providing public amenities in projects, projecting an inspiring image, spurring neighborhood revitalization, improving livability, and inspiring local pride and stewardship. The program can consider both private and government projects, but an independent jury should be convened by a third party so that the judging can be at the very highest level, with the degree of independence necessary to make the awards compelling. Such a program underlines the City's commitment to excellence at nominal cost and urges owners and developers to strive for the best.

Building success. Best practices from Philadelphia, like on the University of Pennsylvania's campus, and other cities will inform the development of design standards for parks, streets, and other civic spaces.



PARTNERSHIPS AND VOLUNTEERS

Partnerships, corporate involvement, and volunteer efforts help to expand a stewardship constituency for parks and other facilities, which is integral to the mission of *GreenPlan Philadelphia*. Not only do these efforts stretch City resources, they help people identify with their city and neighborhood. They build understanding of the value of open-space resources, and they make facilities and the neighborhoods they serve seem safer, more stable, and more appealing for investment. They truly make parks and other facilities seem “for everyone.”

Many partnerships and volunteer efforts are described and encouraged throughout *GreenPlan Philadelphia*, and the targets and recommendations in this chapter create consistency in their use, help the City expand its capacity to use and manage partnerships and volunteers, and help encourage more partnerships and increased volunteerism.

The City works with partners in several different ways. Nonprofit organizations advocate for, create, and help maintain open space. Companies can provide in-kind labor, expertise, fundraising, and professional services, among others. Partnerships can take several forms. Many are made with volunteer organizations. One such partnership is Fairmount Park’s agreement with the Friends of the Wissahickon to help maintain the Wissahickon Valley. It includes in-kind labor, fundraising, and project management. Other relationships are contractual: fee-for-service agreements with nonprofits, such as the Pennsylvania Horticultural Society’s Philadelphia Green, which manages vacant-lot maintenance contracts with various community organizations.

TARGET

Strengthen and expand private stewardship, partnerships, and volunteer efforts in parks and other public open-space facilities.

Responsible Agencies: Fairmount Park, Department of Recreation
Partners: Mayor’s Office of Sustainability, Water Department, School District of Philadelphia, Pennsylvania Horticultural Society

These recommendations support and encourage partnerships and partnership organizations and build the City’s capacity to work with them. They seek to expand the many existing partnerships that work well, while setting out to build more such relationships in communities lacking organizations to support park and recreation spaces.

RECOMMENDATION

Standardize procedures and outreach to expand participation in open-space initiatives by partnerships and volunteers.

Responsible Agencies: Fairmount Park, Department of Recreation
Partners: Mayor’s Office of Sustainability, Water Department, School District of Philadelphia, Pennsylvania Horticultural Society

Many *GreenPlan Philadelphia* recommendations involve the participation of partners and volunteers, and this recommendation proposes that agencies share expertise and best practices for encouraging volunteerism and partnership with neighborhood and advocacy organizations. Each agency currently makes its own agreements with partnerships and volunteers, but some of these are not documented, which can lead to miscommunication and a loss of commitment from neighborhood organizations when it is essential to harvest their enthusiasm. To keep these relationships as straightforward as possible—and as appealing as possible for partners—the City should adopt the Fairmount Park Partners’ Agreement, which provides a standard-form park and partner organization written agreement to document the relationship so that commitments on both sides are clearly spelled out.

Agencies need to create protocols for identifying tasks and projects that can effectively be undertaken by partners or volunteers. In this way, each agency can reach out to relevant groups, especially in neighborhoods lacking advocates, with compelling, well-defined projects. Similarly, agencies must identify relevant personnel—an external-relations coordinator, for example—to encourage and receive suggestions and proposals from outside groups, so that their commitment and enthusiasm can be quickly and effectively translated into more partnerships, touching more neighborhoods.

Accountability standards should also be included in written agreements with partners and volunteer groups. These can include issues of accounting, data management, quality assurance, public outreach, and publicity (including allocating recognition accurately among partners and the City).

Managing Vacancy. A comprehensive approach to acquiring, managing and disposing of vacant land will speed the redevelopment of the city's 30,000 vacant lots for both public and private purposes.



LAND MANAGEMENT

Land management is key to the success of *GreenPlan Philadelphia*. Upgrading the City's procedures for acquiring, managing, and disposing of land—especially vacant land—is very important. The *GreenPlan Philadelphia* targets and recommendations pertaining to vacant land are in a single chapter, but the recommendations below apply to City procedures for making vacant land and underutilized City land available for new use.

One of the methodologies for repurposing land to suit *GreenPlan Philadelphia* purposes, whether vacant or not, is to use land trusts. Land trusts have become well-developed tools to conserve ecologically valuable lands through purchases (like those undertaken by the Nature Conservancy) that are then held by the trust until another entity, usually a government agency, can negotiate outright purchase or the purchase of development rights or easements. This tool has been used in a limited way in Philadelphia—for example, in converting vacant land to community gardens—but standardizing procedures, making them more transparent, and explicitly encouraging the participation of trusts may broaden the value of this useful tool.

TARGET

Streamline City procedures related to repurposing land.

Responsible Agency: Office of the Deputy Mayor for Planning and Economic Development
Partners: Philadelphia Industrial Development Corporation, Redevelopment Authority, other agencies that manage land for the city .

Several agencies are charged with redeveloping land: the Redevelopment Authority (RDA), the Philadelphia Housing Authority (PHA), and the Philadelphia Industrial Development Corporation (PIDC), for example. Because no one agency has responsibility for the management of land, identification of valued parcels, coordination, and prioritization for re-use has been difficult. PIDC will soon release an “Industrial Market Analysis and Land Use Strategy” that will be a vital source of information about the status, condition and possible repurposing of vacant industrial parcels and facilities.

KEY RECOMMENDATION 

Revise methods for the acquisition, management, and disposal of land to increase efficiency.

Responsible Agency: Office of the Deputy Mayor for Planning and Economic Development
Partners: Department of Public Property, Redevelopment Authority, Philadelphia Industrial Development Corporation

The administrative procedures for handling vacant and surplus land are beyond the scope of *GreenPlan Philadelphia*, but its targets and recommendations related to management of these lands could be much more effectively realized with changes in the way the City acquires, manages, and disposes of land. The City's land-holding agencies should coordinate their procedures, share best practices, and use the Unified Land Record System as a basis for decision making.

The City should create standard, transparent procedures for: moving land from one agency to another; resolving competing agency claims on a parcel (parks versus natural-preserve use for example); cooperative use agreements among agencies; means by which the City can accept donated land; means by which privately-owned land is purchased, transferred, or otherwise conveyed both to and from the City; use of interim land-holding procedures like land trusts or land banking; means by which *GreenPlan Philadelphia* measures (like tree planting) can be attached to parcels that are conveyed to agencies for their use or to private owners for development.

RECOMMENDATION

Partner with land trusts to purchase and hold land for public purposes.

Responsible Agency: Mayor's Office of Sustainability
Partners: Philadelphia and regional land trust organizations

Land trusts are a useful means of acquiring land for public use when the City is not able to purchase available land or when other reasons encumber outright purchase. When a parcel valuable to the City comes on the market, a land trust may be able to purchase and hold the parcel until the City is able to raise funds for purchase or arrange its donation. Where the owner does not want to sell a fee-simple interest in a parcel, land trusts may be able to negotiate the purchase of rights the City most wants to obtain. Conservation easements, for example, can preserve a parcel valued for its ecological, cultural, or historic significance in perpetuity and at lower cost than outright purchase. The trust then manages the rights purchased on behalf of the City. The Friends of the Wissahickon has partnered with a land trust to create conservation easements with owners of property adjoining the Wissahickon Valley in Fairmount Park. The Neighborhood Gardens Association preserves existing community-managed gardens and open spaces. Often the gardens were created as pure volunteer efforts on formerly vacant, trash-strewn lots. Since the land under the gardens was not owned by those who cultivated it, acquisition by the trust prevents development and protects valuable community assets.

Compared to other cities, land trusts are in limited use in Philadelphia. The City could encourage much broader use of land trusts: for acquiring vacant land on an interim basis for ultimate transfer to City agencies or private developers; or for acquiring privately-owned parcels key to the development of parks, greenways, natural preserves, bikeways, trails, and other elements of the envisioned green infrastructure network.

“Vacant land in the City should be re-conditioned to become the base for producing locally-grown and distributed food.”

GreenPlan Philadelphia
civic engagement participant
from Center City

MANAGEMENT AND OPERATIONS

OVERVIEW

ENVIRONMENTAL EDUCATION AND OUTREACH

MANAGEMENT AND MAINTENANCE

MEASURING PROGRESS

FUNDING

ENVIRONMENT	ECONOMICS	QUALITY OF LIFE
Clean Air	Efficient Energy Use	Fresh, Local Produce
Healthy Watersheds	Valuable Properties	Convenient Recreation Access
Robust Habitat	Productive Land Use	Healthy Residents
Hospitable Climate	Competitive Economy	Strong, Safe Neighborhoods

Realizing the transformative potential of *GreenPlan Philadelphia* means building consistently from the baselines and measuring progress so that procedures can be adjusted. The City needs to share this information among agencies, with partners, and with citizens, so that they can see how commitments are being acted upon. Collecting consistent, comprehensive data is key to setting priorities for the commitment of the City's limited funds and human resources and acting on them, so that evaluations of progress are built on complete and credible information. This chapter covers these interrelated issues.

TARGET

Regularly measure and update the progress of *GreenPlan Philadelphia*. Revise targets and goals as circumstances warrant.

Responsible Agency: Mayor's Office of Sustainability
Partners: Responsible Agencies

The targets spelled out in each chapter form the benchmarks against which to measure progress. The following chart provides baseline and target indicators that Responsible Agencies can measure with data that is currently available. As new data and measurement techniques become available, additional indicators could be added. However, it is important to remember that many of the essential goals of *GreenPlan Philadelphia* are qualitative, and responsible agencies will be asked to evaluate progress toward those as well.

Since *GreenPlan Philadelphia* is the basis of the open-space component of *Greenworks Philadelphia*, some indicators are integrated into that plan's goals.

ENVIRONMENT

Clean Air

days per year when Air Quality Index is
100 or below (good or moderate)



Healthy Watersheds

Biological Health



Chemical Health



Infiltration



Chemical Health



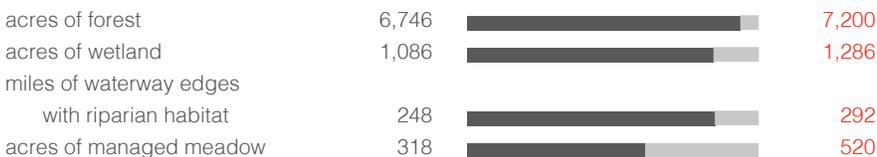
Storm Events



percent of city managing

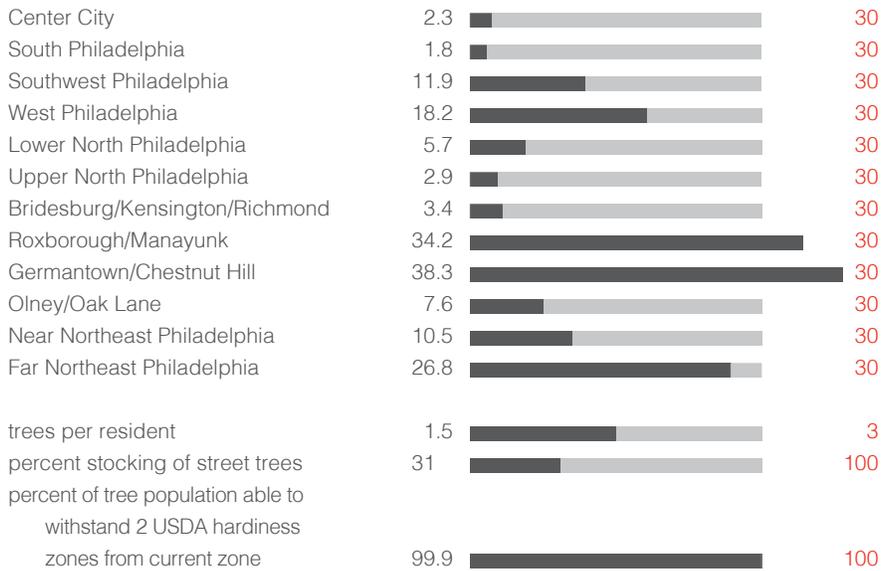


Robust Habitat



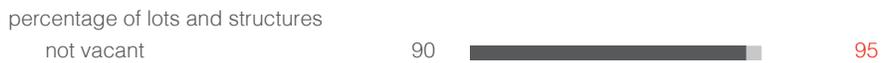
Trees

Percent Tree Canopy per Planning Area



ECONOMY

Productive Land Use

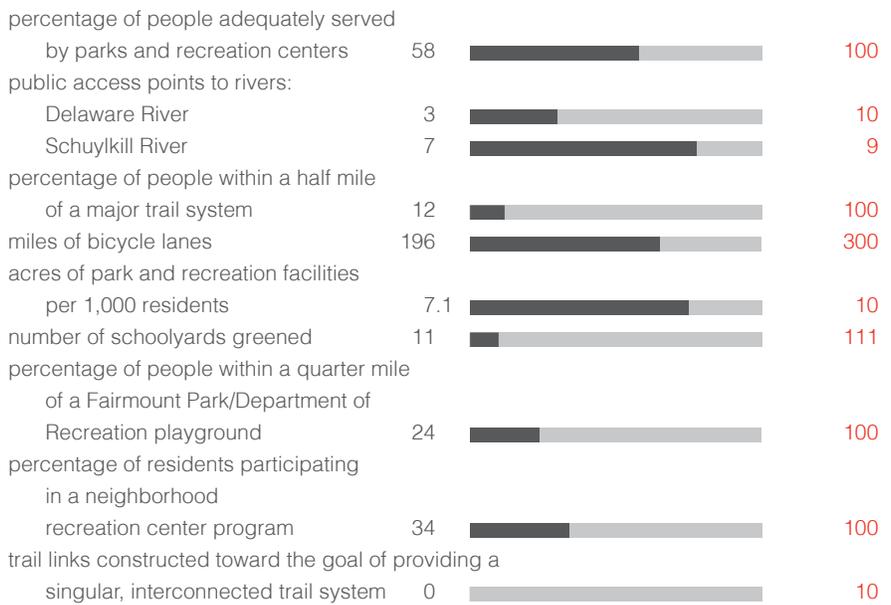


QUALITY OF LIFE

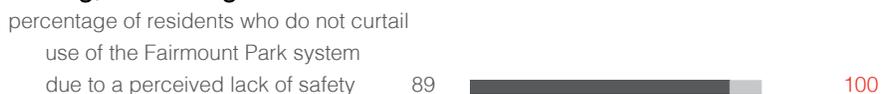
Fresh, Local Produce



Convenient Recreation Access



Strong, Safe Neighborhoods



KEY RECOMMENDATION 

Report annually on progress toward each *GreenPlan Philadelphia* target.

Responsible Agency: Mayor's Office of Sustainability
Partners: Responsible Agencies

The picture of progress is made up of all the qualitative and quantitative values taken together. In this way, *GreenPlan Philadelphia's* aspirations toward well-being and neighborhood stability, among other aspects, are also assessed.

The baselines, target indicators, and recommendations should be adjusted to recognize progress as well as changed circumstances: advancing technologies, for example, or altered funding opportunities.

TARGET

Support *GreenPlan Philadelphia* implementation with increased capacity to collect, analyze, and maintain relevant data.

Responsible Agency: Division of Technology
Partner: Responsible Agencies

In the process of creating *GreenPlan Philadelphia*, the Management Group identified many gaps in the City's data-collection capacity. A much clearer picture of the current status of many open-space factors will become available by improving existing data-collection methods and doing a better job of sharing that data. The City will be better able to measure progress and better able to efficiently allocate resources.

The City should also establish standards to ensure that data continues to be meaningful, comprehensive, and up-to-date.

KEY RECOMMENDATION 

Upgrade standards for creating, deriving, and sharing data.

Responsible Agency: Department of Technology
Partners: Responsible Agencies

The City should review and evaluate data it collects, with the goal of standardizing information so that it can be readily understood and readily updated. Data standards should be coordinated with the City's PhillyStat program. The City should be clear about the expectations it has in terms of data that is provided by outside vendors or partner organizations (whether for-profit vendors or nonprofit partners). Whenever possible, software platforms and datasets should be created that can be shared among relevant agencies. When provided by vendors and shared with partners, the City should use widely-recognized formats and descriptions of individual datasets, such as the Uniform Vacant Land System, to create efficiencies in procuring and sharing information.

The City should assemble and regularly update demographic base layers for use throughout City departments so that facilities and services can be targeted at communities and populations on the basis of age, presence of children, and other relevant socioeconomic factors.

The City's Unified Land Record System (ULRS) should be enhanced. It currently documents street centerline data, parcels, and addresses. Enhancements would permit parcels, buildings, and open-space to be easily related.

MANAGEMENT AND OPERATIONS

OVERVIEW

ENVIRONMENTAL EDUCATION AND OUTREACH

MANAGEMENT AND MAINTENANCE

MEASURING PROGRESS

FUNDING

The implementation of this bold, long-range Plan requires significant growth in both capital and operating funds. This chapter identifies a variety of means to expand funding.

The City's open-space resource needs include increased operating funds to better maintain new and existing parks, recreation centers, programs, as well as the new and expanded initiatives recommended by *GreenPlan Philadelphia*. Capital dollars are needed to address deferred capital improvements of parks and other elements of the city's green infrastructure and to undertake the new efforts envisioned in the Plan.

Because fiscal conditions may significantly limit the ability to expand capital and operating budgets, this chapter identifies a broad menu of potential revenue sources and offers guidance in their use.

PRIVATE FUNDING SOURCES

TARGET

Increase private funding participation to achieve 30 percent of funding for *GreenPlan Philadelphia* initiatives through non-governmental sources.

Responsible Agency: Mayor's Office of Sustainability

Partners: Department of Finance, Office of Philanthropic Relations, Project Sponsoring Agencies

These recommendations consider non-governmental funding of both operating expenses and capital projects. Non-governmental funding options are described in various *GreenPlan Philadelphia* recommendations, but this target and its recommendation offer guidance for private funding participation that can apply broadly in expanding the City's capacity to meet park and open-space needs.

KEY RECOMMENDATION

Expand opportunities for private funding of parks, recreation centers, and *GreenPlan Philadelphia* initiatives, and create consistent, comprehensive fundraising procedures.

Responsible Agencies: Mayor's Office of Sustainability

Partners: Office of the Director of Finance, Office of Philanthropic Relations, Fairmount Park Conservancy

Because of their visibility and wide appeal, many park and open-space projects appeal to private funders, whether individuals, nonprofit organizations, or corporate givers. Expanding revenues from private sources means creating a means by which potential funders can contact individual agencies with ideas for funding, which then can be coordinated through the Office of Philanthropic Relations. (This procedure is similar to that proposed for coordinating the work of partners and volunteers above.)

Similarly, the Office of Philanthropic Relations could reach out to funders with projects drawn from a database compiled from City agencies so that funders can determine the best fit for their goals. Procedures should ensure that funders' ideas get action and that projects that need funding can get promoted to backers and prompt follow-up by the City.

The *GreenPlan Philadelphia* team examined many possible funding opportunities. Rather than be prescriptive about which ones should be used for which purpose, they are presented as a menu of possibilities. This way, decision makers can match the funding tool to the funder or project.

Private Operating Funding Sources

- **Private or corporate foundation grants.**
- **Corporate sponsorships:** underwriting of events, arts presentations, or projects.
- **Naming rights:** Items as small as paving stones in a prominent plaza can be “sold” to donors, but other possibilities include park benches, fountains, trails, parks, and public buildings such as recreation centers.
- **Individual endowments** can support maintenance, operations, or programs. Any discreet landscape or structure can be endowed, such as a plaza, fountain, statue, tree-planting project, building, or even a distinct landscape or forest.
- **Friends of Parks.** These groups offer a means for community groups to support individual parks and recreation facilities. They already substantially expand the City's maintenance capacity. A coordinated outreach program may identify many more communities and facilities that can be matched to Friends groups. A related effort could permit groups to “adopt” a green street, trail, or schoolyard.
- **Individual purchase or donations** of land, structures, rent, or other tangible goods the city requires.
- **In-kind donation** of goods, services, and labor.
- **Carbon offsets:** The City is in the process of creating a program that ties grants from carbon-emitting industries to renewable energy, tree planting, or other carbon-negative projects.

RECOMMENDATION

Create the Fund for *GreenPlan Philadelphia* as a consolidated resource of private matching funds for *GreenPlan Philadelphia* projects.

Responsible Agency: Mayor's Office of Sustainability

Partners: Office of the Director of Finance, Office of Philanthropic Relations

The growing interest in environmental sustainability, along with the substantial public commitment represented by *GreenPlan Philadelphia*, makes a fund dedicated to improving the City's environmental performance appealing to private funders. This plan's strategic framework and its role in support of *Greenworks Philadelphia* helps build confidence among donors, according to funders who offered their expertise in the development of *GreenPlan Philadelphia*. The quantifiable targets and the progress measurements instituted by *GreenPlan Philadelphia* also give donors confidence that they will be able to determine the benefits their contributions have conferred.

The Fund for *GreenPlan Philadelphia* could be designed as a family of financial resources so that grantors can contribute to initiatives relevant to their missions. There may be, for example, a Fund for the Rivers, a Fund for Great Parks, and a Fund for Trees. The Fund could be administered by a nonprofit organization with expertise in development that

will work closely with agencies through the City's Office of Philanthropic Relations. As a source of matching dollars, the Fund will augment (rather than supplant) efforts by key nonprofit fundraising partners, such as the Fairmount Park Conservancy, the Pennsylvania Horticultural Society, the Pennsylvania Environmental Council, and others.

RECOMMENDATION

Develop revenue-generating amenities at park and recreation sites to support improved maintenance and programs.

Responsible Agencies: Fairmount Park, Department of Recreation
Partner: Office of the Director of Finance

Given constraints on public spending, finding ways to generate revenue for park and recreation sites and programs is critical. Heavily-used trails, ball fields, facilities, and special event venues offer opportunities to provide amenities like bike rentals and food and beverage service through concession agreements with vendors. The revenues generated from these activities could be reinvested in park and recreation maintenance and programs. The 2004 Fairmount Park Strategic Plan recommended that revenue-generating activities be expanded. In response, the Park created an Office of Property and Concession Management which has been successful in implementing new revenue generating concession agreements. However, many more opportunities exist, and park systems in other cities have been able to generate as much as 35% of the operating budget from outside sources of revenue.

A wide range of user charges or fees could be dedicated to parks, recreation, open-space, and *GreenPlan Philadelphia* initiatives. These funding mechanisms generally avoid raising taxes, permitting tax resources to be applied to other essential government activities. They generally garner greatest public support when the revenue item is closely tied to a benefit related to parks, open space, or improved environmental performance. The value of each varies according to the projects it will fund and the general economic environment. The public tends to support revenue-generating commercial activities in parks when incomes are tight and the activities permit lower costs for users. A parks capital-improvement fee, for example, is a user fee that could be added to park event admissions charges.

Park-related commercial amenities, if thoughtfully selected and managed to avoid over-commercialization of public facilities, can generate revenues through license and marketing income. Festivals and temporary events can often generate considerable income that can be devoted to supporting the park or facility where the event is held. Concession possibilities include expanded equipment rental, facilities rental (playing fields, tennis courts), refreshment stands and carts, and specialized, privately-organized recreational activities.

PUBLIC FUNDING SOURCES

TARGET

Diversify public funding sources for *GreenPlan Philadelphia* initiatives.

Responsible Agency: Department of Finance
Partner: Mayor's Office of Sustainability

KEY RECOMMENDATION

Access a wide range of public funding sources that can be dedicated to parks, recreation, and other *GreenPlan Philadelphia* initiatives.

Responsible Agency: Department of Finance
Partners: Mayor's Office of Sustainability, Fairmount Park, Department of Recreation

A number of public-funding devices could be used to generate revenue to fund *GreenPlan Philadelphia* initiatives. Some of these devices are already used in Philadelphia, but the City should consider dedicating some or all of these revenues to *GreenPlan Philadelphia* initiatives, especially those that are closely related to the revenue source.

Dedicated Funding Sources: Under City Control

- **Dedicated taxes:** Dedicating taxes to a specific government function guarantees a revenue stream, which can also pay off debt service on low-cost debt. Dedicated taxes (like the federal gas tax, which is devoted solely to transportation) tend to find political favor when there is a clear relationship between the source of the tax and the benefits it confers. A portion of the real-estate transfer tax could fund the creation of new parks, for example, because they enhance surrounding property values.
- **Development exactions:** Exactions can take the form of a fee to pay for public facilities, either for amenities related to the development or to acquire open space in an another part of the city that is currently underserved. Sometimes the developer is required to build the amenity (a park, plaza, or recreation center) as a condition of being granted zoning or building permission. An exaction applied to a large-scale residential development, for example, may be dedicated to the improvement of an adjacent amenity that offers broad public benefits, like a park or playground, but which also enhances the value of the development. Development exactions work best for large-scale projects undertaken in a fast-growing real-estate market.
- **Water, sewer surcharges:** These additions to citizens' monthly utility bills can be dedicated to pervious surface targets, stormwater management tools targets, wetlands targets, water-quality opportunities, and so on. The surcharge ultimately reduces both costs and environmental burdens on taxpayers.
- **Fines and fees:** Some percentage of fines or fees related to water-quality and air-quality violations, for example, could be dedicated to *GreenPlan Philadelphia* efforts that improve water or air quality.
- **Conservation easements:** The City may be able to achieve some public open-space acquisition goals at lower cost through conservation easements on property that remains in private hands. Easements entail purchase of development rights in perpetuity by the City, which may include some public rights of access, while permitting the owner to retain ownership and use of the land as long as the ecological value of the property is maintained.

- **Sale or lease of City assets:** Buildings and property the City no longer needs, and which do not lend themselves to the furtherance of public needs, can be sold with the proviso that proceeds be dedicated to a high-priority park, recreation amenity, or *GreenPlan Philadelphia* initiative.
- **Tax abatements:** Abatements involve forgiveness of taxes over a set period of time to encourage development and economic growth. They can also be used to encourage developers to provide public amenities, like riverfront recreation trails or parks, that the City could otherwise not afford. The City's existing ten-year tax abatement program could be targeted or enhanced to encourage redevelopment of vacant land or to meet other *GreenPlan Philadelphia* objectives. And, a portion of the revenue from expiring ten-year tax abatement projects could be utilized for open space funding.

Other Public Funding Options: Other Levels of Government

- **Competitive grant opportunities and earmarks:** Many federal agencies offer competitive grants to improve the urban environment or to upgrade environmental performance.
- **State funding:** Several agencies offer grants or loans for activities related to achieving *GreenPlan Philadelphia* targets.
- **Regional funding:** The Delaware Valley Regional Planning Commission and other regional planning and development agencies offer funding for projects that help link *GreenPlan Philadelphia* objectives to similar efforts within the metropolitan area, multiplying value.

CAPITAL PROJECT FUNDING

TARGET

Diversify funding, and strategically prioritize the capital needs of Fairmount Park, the Department of Recreation, and *GreenPlan Philadelphia* initiatives.

Responsible Agencies: Office of the Director of Finance, Department of Public Property
Partners: Fairmount Park, Department of Recreation

While previous sections have focused primarily on operations funding, these recommendations focus on the unique funding issues and opportunities related to capital projects. Because building a park or recreation amenity can be costly and have a 50-year or longer life, they are often funded by different means than ongoing operations. These recommendations propose expanded and innovative capital funding methods without being prescriptive. The appropriateness of various methods depends on economic conditions and the types of projects under consideration.

KEY RECOMMENDATION

Broaden public and private sources of capital funding.

Responsible Agency: Office of the Director of Finance
Partner: Department of Public Property

Facilities acquisition, construction, and renovation are traditionally funded in several ways. Projects can be funded with an allocation from the City's budget. Large projects, or a series of projects, are often funded with bonds, which are paid off by general-tax revenue, by voter-approved dedicated taxes, and by fee revenue. The methods below expand this menu of funding options.



Informing the public about capital improvements. Simple sign like this one at the Water Works highlight capital improvements and inform taxpayers where their money is being put to use.

Capital Funding Mechanisms

- **Special-purpose bonds:** The Philadelphia Authority for Industrial Development could issue bonds for waterfront developments that include acquisition and development of parks and greenways. Bonds related to School District of Philadelphia construction could also fund campus-park upgrades. Stormwater related projects can be funded by bonds paid by revenues from dedicated sewer and water charges.
- **Special Districts**
 - **Businesses Improvement Districts (BIDs):** In a defined area, local businesses voluntarily agree to pay an additional tax to underwrite the maintenance or upgrading of key local amenities like a square, park, or streetscape improvement.
 - **Community Benefits Districts:** These are formed to provide services above the “general benefit” level provided by a City’s general fund budget. They are typically not capital expenditure items. A package of benefits may be negotiated to upgrade local amenities to mitigate impacts of large-scale development, and to create local appeal for neighbors and the development alike.
 - **Tax Increment Financing (TIF) districts:** TIFs use gains in property tax revenue within a defined area to finance the improvements that create the gains. The increased tax revenue, or tax increment, provides debt service on bonds used to fund the improvements.
- **Federal, state, and regional capital grants:** These require the City to develop a rationale to demonstrate the state, federal, and regional interest served by the grant sought. Some government developments require dollars to be set aside to mitigate damage the project causes. Should a highway pass through a mapped wetland, for example, the road’s project costs would include a mitigation fund that could underwrite the creation or restoration of wetlands that “make up” the loss in ecological value according to formulas. Park, open space, and habitat projects can often be undertaken using mitigation funds. (The Water Department created its Watershed Registry to offer a range of projects that can be funded as mitigations.)
- **Capital projects fund:** A *GreenPlan Philadelphia* capital projects fund in the City’s six-year capital program would allow the City to leverage other capital sources, such as state and foundation grants.
- **Capital projects appealing to private funders:** Certain capital projects that serve the public good are now almost completely privately financed—museum and performing arts facilities, most prominently. The City needs to identify capital projects with agendas that appeal to individual donors, corporations, and foundations. The Projects and Opportunities section of *GreenPlan Philadelphia* is a good place to start. The Objectives for Open Space Projects checklist presents an opportunity for project sponsors to link projects to *GreenPlan Philadelphia* objectives, and an endorsement of such *GreenPlan Philadelphia* projects by the City could become a means to prepare worthy, high-priority projects for private funding.

Generally, projects attract private funding that advance business or donor objectives. Trails, for example, may appeal to funders interested in increasing public health. Permanent buildings and facilities allow donors to give back to the community in a tangible, permanent way, since the facility will be forever associated with the donor. Donor-friendly projects tap into advocacy-group interests, whether wildlife enthusiasts (for park, wetland, forest, meadow projects) or historic preservationists (historically significant structures, historic houses, historic waterfronts). In developing procedures, the City should examine the ways in which institutions like the Philadelphia Zoo and Philadelphia Museum of Art raise private capital funds. These funding methods may require the formation of nonprofit boards of trustees and other legal arrangements that characterize independent nonprofit entities, to assure that funds are spent as designated and that operating funds and endowments, if needed, are established and maintained.



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Park and Recreation Opportunities

Trail Opportunities

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Green Development Opportunities

Rail and Utility Corridor Enhancement Opportunities

Signature Projects

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In developing *GreenPlan Philadelphia*, a large number of projects and opportunities were identified. While it cannot be expected that all of the opportunities will be implemented within the timeframe of this plan, the projects and opportunities here can serve as a guide to implementing the plan's physical recommendations.

In order to determine which opportunities to pursue, a set of project objectives follows that will determine whether a project gets *GreenPlan Philadelphia* endorsement. In the coming years, the objectives will also be used to rank projects against each other to determine which projects should receive priority.

WHY YOUR PROJECT SHOULD BE ALIGNED WITH GREENPLAN PHILADELPHIA

GreenPlan Philadelphia is the city's official open space plan that will guide public and private investments over the next 20 years. *GreenPlan Philadelphia* endorsement will:

- provide recognition that the project supports the city's strategic goals and contains the elements of a successful and sustainable project;
- provide credibility with senior members of city government;
- provide the project with support from *GreenPlan Philadelphia*-related departments in moving through the City's approval process;
- improve the likelihood of funding by public and private sources, since funding organizations want to know that a project is aligned with the City's strategies and goals for greening and open space;
- provide an opportunity for collaboration with City departments and agencies and, where appropriate, make connections to other City programs and projects to leverage available resources; and
- enable the project to apply for capital funding to supplement the major sources of project funding.

HOW YOUR PROJECT BECOMES ALIGNED WITH GREENPLAN PHILADELPHIA

Success in reaching the citywide goals set forth in *GreenPlan Philadelphia* will depend on a range of high-quality projects to protect and expand the city's green infrastructure. High-quality projects are those that are strategically planned and designed to maximize their environmental, economic, and quality-of-life benefits.

We encourage open space projects that achieve a combination of sustainability-oriented objectives. The Objectives for Open Space Projects included on the following pages outline the full range of objectives the City seeks in projects and provides a corresponding

scoring system. These objectives are designed to guide project sponsors in the design and development of projects and to assist them in achieving *GreenPlan Philadelphia* endorsement. Some of the objectives are place-based and can be met only if the project is located in a specific area, identified by corresponding maps.

Please note that the objectives—and the projects and opportunities maps—may be refined over time as the City changes and knowledge increases. Throughout the lifetime of this plan, the Mayor's Office of Sustainability will provide current versions of the objectives and maps to applicants.

There are two stages of *GreenPlan Philadelphia* project review. By meeting a certain minimum number of objectives, a project is identified as a *GreenPlan Philadelphia* opportunity, which helps a project's sponsor to gain funding and support in the early phases of planning. To receive full endorsement as a *GreenPlan Philadelphia* project, a project must meet a greater number of objectives, including some that are mandatory.

Beyond endorsement as a *GreenPlan Philadelphia* project is a special tier for projects that meet an additional, more rigorous set of mandatory objectives. If projects meet those objectives, they will earn endorsement as a *GreenPlan Philadelphia* signature project. *GreenPlan Philadelphia* supports the development of several key signature projects that will significantly promote the city's quality of life, economic development, and position as a city of choice.

GREENPLAN PHILADELPHIA PROJECTS AND OPPORTUNITIES

On the following pages are maps and lists of current *GreenPlan Philadelphia* projects and possible *GreenPlan Philadelphia* opportunities. The current *GreenPlan Philadelphia* projects are compiled into one map. The map provides a snapshot of greening efforts throughout the city and will be updated annually.

The *GreenPlan Philadelphia* opportunities are organized by element or green place on separate maps. Most have been identified on the basis of locational criteria and need advocates to advance any further. Others may be further along in the stages of planning and development. Each has a score based on the number of place-based objectives it currently meets. These project lists and scores will change over time, and revised versions will be posted on the *GreenPlan Philadelphia* website. Please note that project boundaries and names may change as opportunity sites gain advocates and more detailed plans.

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OPPORTUNITY IDENTIFICATION

The first stage in becoming a *GreenPlan Philadelphia* project entails reaching the threshold for *GreenPlan Philadelphia* opportunities, which occurs at project identification or conceptual design, before a final description, design, and budget are established for a project. To reach the threshold, a project must meet at least 10 out of 34 possible objectives. Place-based objectives will be evaluated by the City Planning Commission Community Planning staff.

PROJECT ENDORSEMENT

Once a project meets one of the following conditions, it is eligible to be reviewed for endorsement as a *GreenPlan Philadelphia* project. It must be:

- funded for design or construction,
- located on a site that is under the applicant's control and have an owner-approved design, or
- be under construction.

The project must also meet at least 15 out of 34 possible objectives and meet four additional mandatory objectives. A project description and a budget showing committed and yet-to-be-raised funds will be required for all projects.

Projects denied endorsement may be reviewed again if changes are made to meet *GreenPlan Philadelphia* objectives.

SIGNATURE PROJECT ENDORSEMENT

Finally, a project that receives endorsement and meets a more rigorous set of mandatory objectives related to uniqueness, site location, and design will gain endorsement as a *GreenPlan Philadelphia* signature project. Signature projects are those that will, on their own, significantly promote the city's quality of life and economic development and position Philadelphia as a city of choice.

GENERAL

- Leveraging Assets and Audiences** The project is within a half mile of a neighborhood anchor, such as a school, library, train station, community center, park, or recreation center.
- The project coincides with scheduled new street creation or existing street rehabilitation.
- The project integrates green infrastructure into scheduled street improvements.
-
- Life Cycle Cost** The project reduces life cycle costs and long-term site or facility maintenance and management as compared to conventional project development practices, and project design is coordinated with the maintenance practices of the entity responsible for maintenance.

ENVIRONMENT

- Clean Air** The project significantly reduces carbon production.
- At least 25% of the project site is within an area with a National Air Toxins Assessment risk of at least 65 per million and is devoted to tree-planting, using species specially selected for pollutant absorption.
-
- Healthy Watersheds** The project prevents water pollution through source control measures.
- The project manages stormwater with green infrastructure techniques.
- The project infiltrates, reuses, or evapotranspires the first inch of each rainfall from the development footprint.
- At least 25% of the project site is currently impervious, and the project will reduce impervious surfaces by at least 20%.
- The project creates no impervious surfaces within the 500-year floodplain, or if it does, then at least 90% of the project site is pervious.
-
- Robust Habitat** The project creates, protects, or restores habitat for native species or increases diversity of habitat.
- At least 25% of the project site is devoted to habitat improvements within an area of high environmental potential.
-
- Hospitable Climate** The project increases tree canopy, and at least 25% of the site is within an area of less than 30% tree cover.
- The project creates at least 30% tree cover on the project site or plants street trees at the rate of 180 trees per mile, and is in a planning analysis section (PAS) with less than 30% tree cover.

ECONOMY

- Efficient Energy Use** The project creates energy savings, employs alternative energy production methods, or provides alternative commuting forms, such as trails.
-
- Valuable Properties** At least 25% of the project site is within a distressed or transitional residential housing market.
-
- Productive Land Use** The project encourages sustainable development strategies, such as smart growth, use of public transit, development of infill sites, or reuse of previously developed sites.
-
- Competitive Economy** The project is planned to stimulate increased tourism or to enhance the tourist experience.
- The project creates a major tourist destination, enhances the landscape of an existing tourist destination, or enhances tourism routes.
- The project provides connections and access to commercial nodes, commercial corridors, or employment centers.
- The project provides workforce, job training, or similar capacity-building opportunities for community groups, institutions, or businesses.

QUALITY OF LIFE

- Fresh, Local Produce** The project contains an urban agriculture program..

- Convenient Recreation Access**
 - At least 25% of the project site is in an area that has at least 40 people per acre.
 - At least 25% of the project site is within an area currently underserved by parks and recreation.
 - At least 25% of the project site is farther than a half mile from a major trail.
 - The project provides connections to other public open space or cultural resources.
 - The project extends over a length of at least 7 miles.

- Healthy Residents**
 - The project encourages recreation.
 - The project provides educational opportunities.

- Strong, Safe Neighborhoods**
 - At least 25% of the project site is within an area that has at least five degrees of disadvantage, as defined by DVRPC.
 - At least 25% of the project site is in one or more of the nine Police Department districts targeted in the city's *Crime Fighting Strategy Action Plan*.
 - The project is designed to increase the perception of safety.
 - The project includes multiple partners, participation by grassroots stakeholders, and has community support.

THRESHOLD

- Objectives** The project meets at least ten of the above objectives, including a minimum of one in each of the four categories.

ENDORSEMENT

(all are required)

- Objectives** The project meets at least fifteen of the above objectives, including a minimum of one in each of the four categories.

- Site Control** The applicant has control of the site or commitments for control have been made.

- Sponsoring Agency or Organization** The project has a champion and is sponsored and managed by a city agency or credible organization or business.

- Funding** The project is attractive to funders, has a high likelihood of secured funding, or has a credible, long-term funding plan.

- Timeframe** A realistic timeframe has been identified, and all significant obstacles to achieving

SIGNATURE PROJECT ENDORSEMENT

(all are required)

- Endorsement** The project has received endorsement.

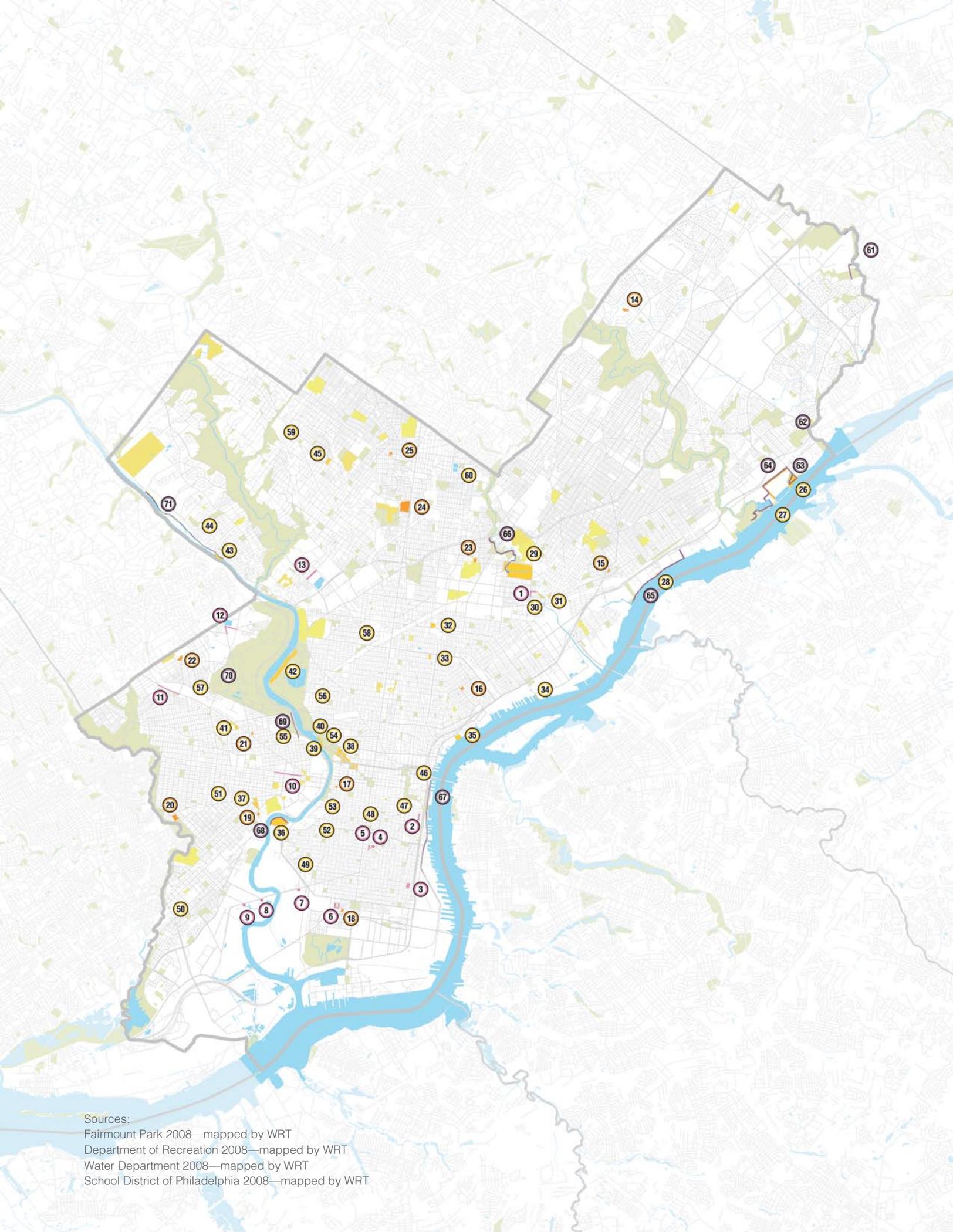
- Uniqueness** The project presents a unique set of opportunities.

- Site Location**
 - The project site is highly visible or prominent.
 - The project site is adjacent to a major resource, like the Delaware or Schuylkill River.
 - The project site is adjacent to a major tourist destination that it may support.

- Design** The project achieves the highest standard of design.

- For Parks Only**
 - The park has the ability to accommodate large crowds.
 - The park has a managing organization

- Objective
- Place-Based Objective (point only possible if the project is located in certain areas)



Sources:
Fairmount Park 2008—mapped by WRT
Department of Recreation 2008—mapped by WRT
Water Department 2008—mapped by WRT
School District of Philadelphia 2008—mapped by WRT

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Mapping Current Projects (facing page). The projects indicated on this map either already have funding for design or construction, or possess control over the site control and an owner-approved design, or are under construction.

Id Number and Name

Green Streets

- 1 Sidewalk Planters and Tree Trenches at Bureau of Laboratory Services (part of Leiper St-Hunting Park Ave corridor)
- 2 South Street/Headhouse (part of 2nd St-3rd St-American St-Dock St-38th Parallel Pl-Moyamensing Ave-4th St-Penrose Ave-Bartram Ave corridor)
- 3 Streetscape at Burke Playground (part of Snyder Ave corridor)
- 4 Columbus Square Rain Garden
- 5 Columbus Square Sidewalk Planters
- 6 Streetscape at Barry Playground (part of 19th St - 20th St - 21st St - 22nd St - Master St - S College Ave corridor)
- 7 Passyunk Ave at 28th Street (part of Passyunk Ave-Essington Ave corridor)
- 8 Passyunk Ave at 61st Street (part of Passyunk Ave-Essington Ave corridor)
- 9 Passyunk Ave at 63rd Street (part of Passyunk Ave-Essington Ave corridor)
- 10 (A section of) Market St-JFK Blvd corridor
- 11 (A section of) Lancaster Ave corridor
- 12 Belmont Ave Bump-outs (part of 44th St-Belmont Ave and Ford Rd corridors)
- 13 Queen Lane Curb Bump-outs

Green Schoolyards

- 14 Greenberg, Joseph
- 15 Sullivan, James J.
- 16 Hackett, Horatio B.
- 17 Greenfield, Albert M.
- 18 Bregy, F. Amedee
- 19 Wilson, Alexander
- 20 Turner, John
- 21 Miller, E. Spender
- 22 Gompers, Samuel
- 23 Feltonville/Barton
- 24 Girls, High School for
- 25 Kinsey, John L.

Parks and Recreation Spaces

- 26 Pleasant Hill Park
- 27 Pennypack-Pleasant Hill Greenway
- 28 Lardner's Point Park
- 29 Juniata Golf Course
- 30 Frankford Creek PWD
- 31 Womrath Park
- 32 Rivera, Ramonita Negrón Recreation Center

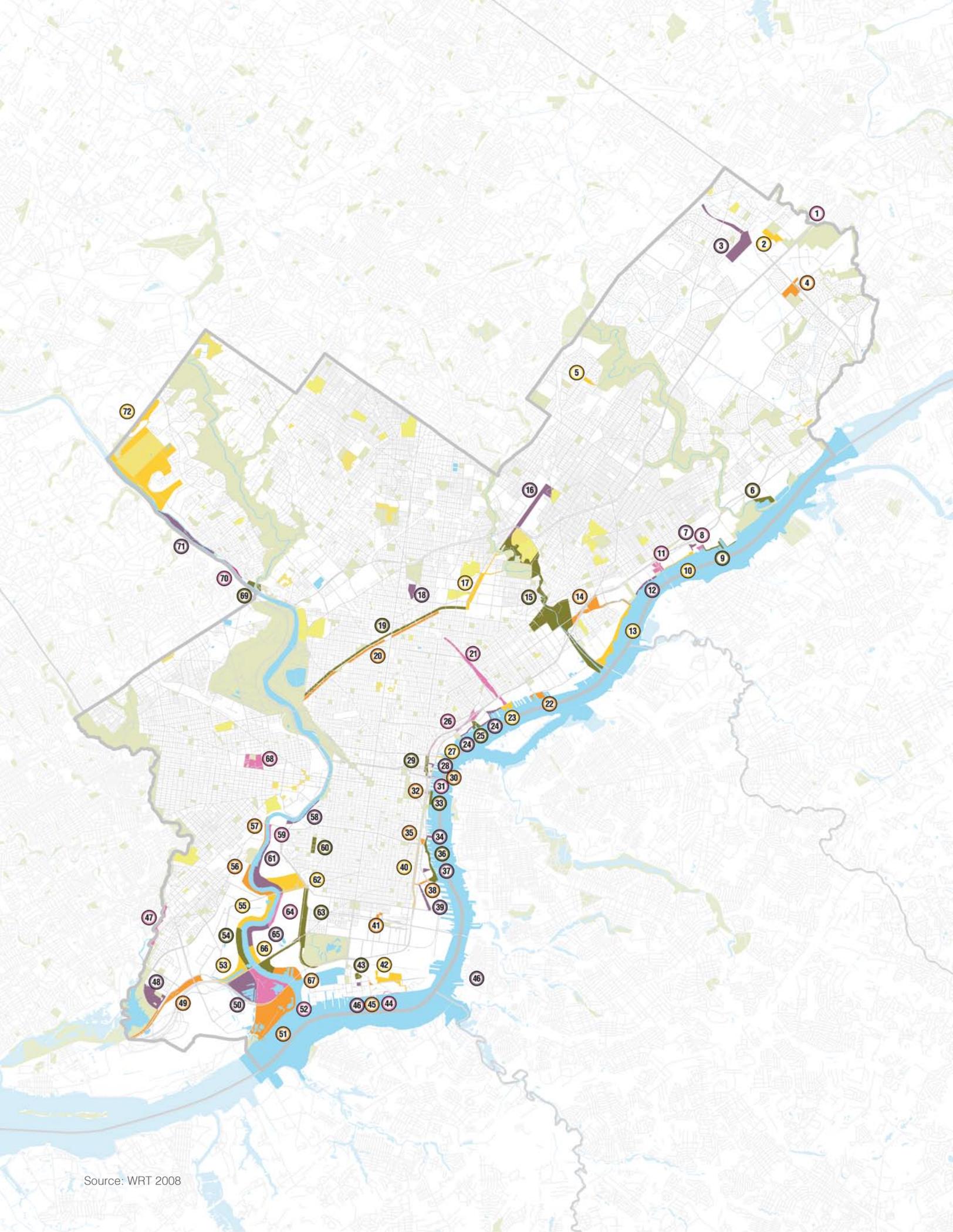
Id Number and Name

Parks and Recreation Spaces

- 33 Fairhill Square
- 34 Pulaski Park
- 35 Penn Treaty Park
- 36 Dupont Crescent
- 37 Clark Park
- 38 Benjamin Franklin Parkway
- 39 Water Works Dock
- 40 Water Works
- 41 Muhammad Park
- 42 Kelly Drive
- 43 Lower Venice Island
- 44 Manayunk Canal and Towpath
- 45 Cliveden Park
- 46 Race Street Park
- 47 Delancey Park
- 48 Hawthorne Park
- 49 Smith Playground
- 50 Elmwood Park
- 51 Cedar Park
- 52 22nd Street Park
- 53 Schuylkill River Park
- 54 Philadelphia Museum of Art Sculpture Garden
- 55 Philadelphia Zoo Children's Zoo
- 56 Athletic Recreation Center
- 57 Parkside-Evans Playground
- 58 Panati Playground
- 59 Mount Airy Playground
- 60 Sturgis Playground

Trails

- 61 (A section of) Poquessing Creek Trail
- 62 (A section of) Fluehr Trail
- 63 (A section of) Pleasanthill Park Trail
- 64 (A section of) North Delaware Greenway (part of Delaware River Trail)
- 65 K&T Trail (part of Delaware River Trail)
- 66 (A section of) Tacony Trail
- 67 Central Delaware Provisional Trail (part of Delaware River Trail)
- 68 Dupont Crescent
- 69 Westbank Greenway (part of University City-Mantua Trail)
- 70 Centennial District Trail
- 71 Manayunk Towpath (part of East Schuylkill River Trail)



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Score* Id Number and Name

- 5 **1** Poquessing Creek Park: Byberry section
- 5 **2** Somerton Youth Center
- 6 **3** Byberry Woods
- 5 **4** Palmer Playground
- 4 **5** Stanwood Park
- 5 **6** Pennypack on the Delaware North
- 8 **7** Princeton Park
- 8 **8** Cottman Park
- 9 **9** Northern Shipping Greenway
- 7 **10** Dodge Steel Greenway
- 7 **11** Tacony Bridge Park
- 7 **12** Tacony Waterfront Park
- 11 **13** Bridesburg Waterfront Park
- 11 **14** Old Frankford Creek Park
- 10 **15** Lower Tacony Creek Park
- 9 **16** Crescentville Greenway
- 11 **17** Feltonville Greenway
- 9 **18** Hunting Park South
- 11 **19** Sedgley Greenway
- 11 **20** Glenwood Greenway
- 10 **21** Lehigh Greenway
- 9 **22** Pulaski Park
- 8 **23** Lehigh Waterfront Park
- 8 **24** Fishtown-Port Richmond Greenway
- 8 **25** Gunners Run Park
- 9 **26** Viaduct Park
- 7 **27** Spring Garden Waterfront Park
- 7 **28** Pegg's Run Park
- 6 **29** Dive Park
- 6 **30** West Shipyard Park
- 6 **31** Franklin Bridge Park
- 5 **32** Market Street Park
- 6 **33** Penn's Landing Park
- 7 **34** Pier 39 Park
- 7 **35** Swedes Park
- 8 **36** Central Delaware Greenway

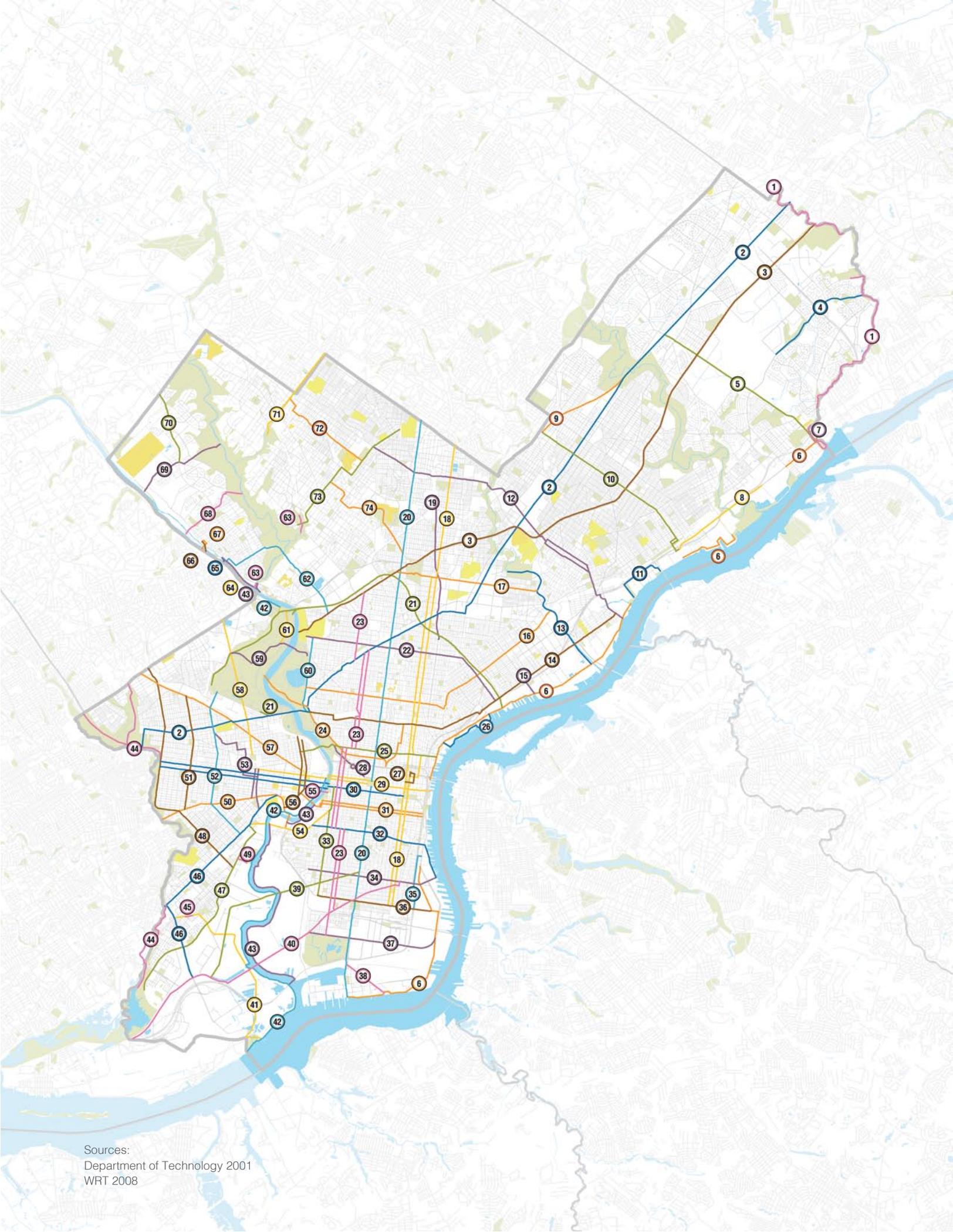
Score* Id Number and Name

- 6 **37** Morris Waterfront Park
- 7 **38** Snyder Park
- 6 **39** Weccacoe Park
- 10 **40** Pennsport Greenway
- 7 **41** Stella Maris Park
- 5 **42** Navy Yard Wetlands Park
- 7 **43** Central Green
- 6 **44** Lower Delaware Riverfront Esplanade
- 6 **45** The Triangle
- 6 **46** Constitution Square
- 7 **47** Cobbs Creek Park: Clearview Section
- 6 **48** Lower Eastwick Park
- 8 **49** Southwest Greenway
- 7 **50** Hog Island Park
- 7 **51** Confluence Park
- 7 **52** Italian Gardens
- 7 **53** Mingo Creek Park
- 6 **54** Harkness Point
- 7 **55** Elmwood Waterfront Park
- 7 **56** Passyunk Crescent
- 9 **57** Woodlands Greenway
- 9 **58** Grays Ferry Greenway
- 9 **59** Forgotten Bottom Waterfront Park
- 10 **60** Point Breeze Park
- 8 **61** Sunoco Riverfront Park
- 9 **62** Grays Ferry Park
- 9 **63** Wishbone Park
- 8 **64** Passyunk Greenway
- 8 **65** Yankee Point
- 7 **66** Tidal Park
- 8 **67** Girard Point Park
- 8 **68** West Philadelphia Park
- 6 **69** Gustine Lake Park
- 5 **70** Manayunk Waterfront Park
- 5 **71** Venice Island
- 6 **72** Upper Schuylkill Park

Mapping Park Opportunities (facing page). The opportunities shown on this map are not yet—but could become—*GreenPlan Philadelphia* endorsed projects.

Note: Colors are used strictly as a visual aid to distinguish adjacent opportunities.

*Number of place-based objectives met by virtue of the opportunity's location. Other objectives could be met through appropriate design.



Sources:
Department of Technology 2001
WRT 2008

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Score* Id Number and Name

- 5 **1** Poquessing Creek Trail
- 9 **2** Cobbs-Poquessing Trail
- 9 **3** Boulevard Trail
- 6 **4** Northeast Airport-Poquessing Trail
- 7 **5** Bustleton-Homesburg Trail
- 10 **6** Delaware River Trail
- 3 **7** Fluehr Trail
- 7 **8** Tacony-Holmesburg Trail
- 8 **9** Lawncrest-Pennypack Trail
- 11 **10** Lawncrest-Tacony Trail
- 8 **11** Frankford-Tacony Trail
- 10 **12** Bridesburg-East Germantown Trail
- 10 **13** Tacony-Frankford Trail
- 9 **14** Overbrook-Bridesburg Trail
- 7 **15** Allegheny Trail
- 8 **16** Brewerytown-Tacony Trail
- 10 **17** Tioga-Juniata Park Trail
- 10 **18** Packer Park-East Oak Lane Trail
- 10 **19** Fairhill-Olney Trail
- 9 **20** Broad Street Superway
- 10 **21** Richmond-Mantua Trail
- 7 **22** Strawberry Mansion-Kensington Trail
- 8 **23** FDR-Tioga Trail
- 8 **24** Poplar-West Park Trail
- 7 **25** Powelton-Delaware Trail
- 9 **26** Fishtown-Kensington Riverfront Trail
- 5 **27** Ben Franklin Bridge Trail
- 7 **28** Parkway Trail
- 7 **29** Market Street Superway
- 11 **30** Independence-Cobbs Creek Trail
- 7 **31** University City-Society Hill Trail
- 9 **32** Point Breeze-Pennsport Trail
- 9 **33** Fitter-Girard Estates Trail
- 10 **34** Grays Ferry-Pennsport Trail
- 9 **35** Packer Park-Riverfront Trail
- 7 **36** Girard Estates-Pennsport Trail
- 6 **37** FDR-Delaware Trail

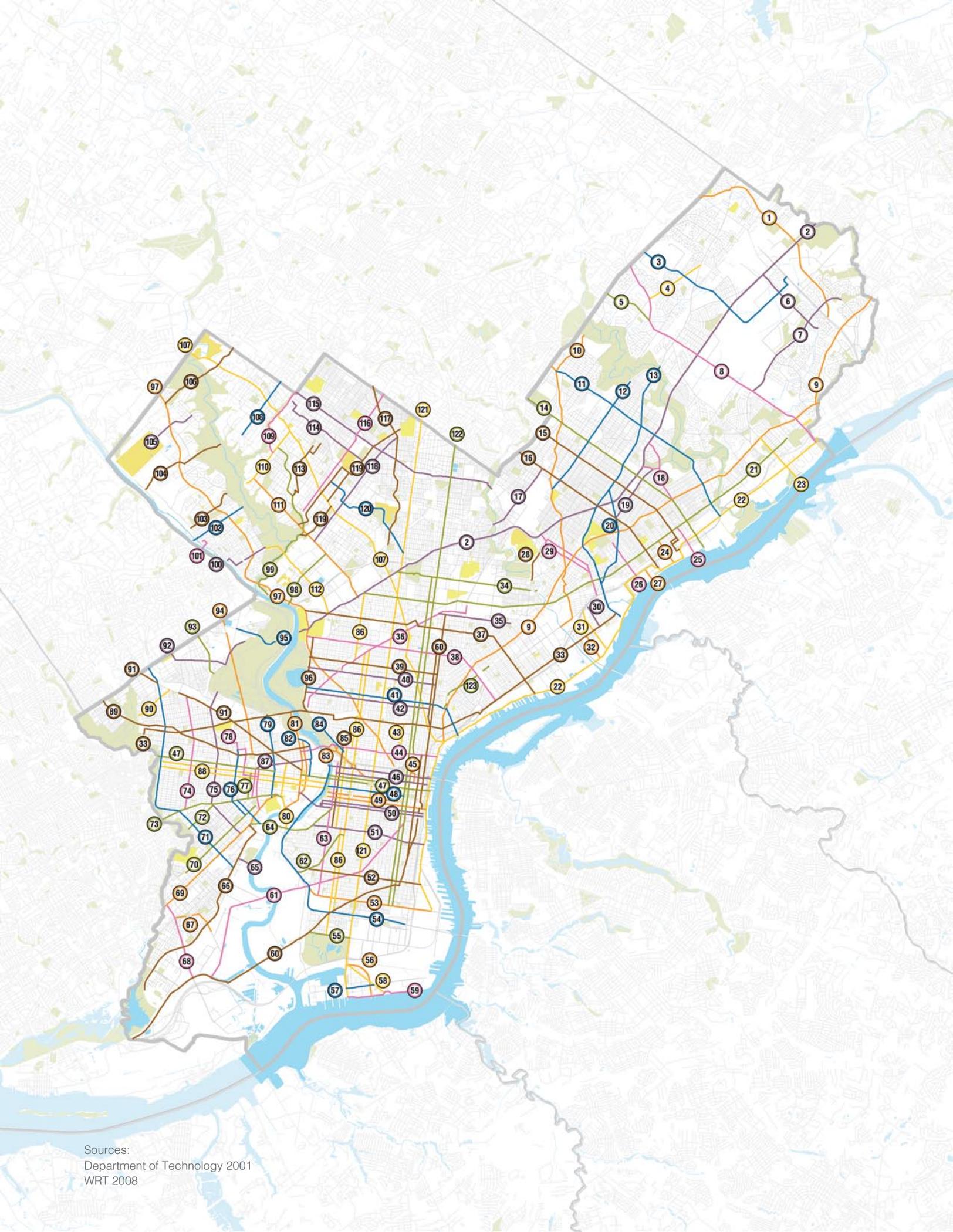
Score* Id Number and Name

- 7 **38** Navy Trail
- 9 **39** Bella Vista-Elmwood Trail
- 10 **40** Pennsport-Eastwick Trail
- 8 **41** Eastwick-Fort Mifflin Trail
- 11 **42** West Schuylkill River Trail
- 11 **43** East Schuylkill River Trail
- 6 **44** Cobbs Creek Trail
- 9 **45** Elmwood-Eastwick Trail
- 10 **46** University City-Eastwick Trail
- 8 **47** Kingsessing-Eastwick Trail
- 9 **48** Overbrook-Elmwood Trail
- 7 **49** Bartram's Gardens Trail
- 9 **50** Grays Ferry-Cobbs Creek Trail
- 10 **51** Wynnefield-Cobbs Creek Trail
- 9 **52** Kingsessing-Wynnefield Trail
- 9 **53** Mill Creek Trail
- 7 **54** Grays Ferry-Kingsessing Trail
- 8 **55** Locust Bridge Trail
- 9 **56** University City-Mantua Trail
- 8 **57** Powelton-Overbrook Trail
- 7 **58** Powelton-Wynnefield Trail
- 5 **59** Cross-Schuylkill Trail
- 10 **60** Brewerytown-Strawberry Mansion Trail
- 6 **61** East Falls-West Park Trail
- 8 **62** Allegheny West-Manayunk Trail
- 6 **63** Wissahickon Trail
- 5 **64** Wissahickon-Lower Merion Trail
- 4 **65** Manayunk-Lower Merion Trail
- 4 **66** Cynwyd Trail
- 4 **67** Belmont Avenue Trail
- 6 **68** Wissahickon-Venice Island Trail
- 6 **69** Wissahickon-Roxborough Trail
- 5 **70** North Roxborough Trail
- 5 **71** Cresheim Valley Trail
- 9 **72** East Germantown-East Mount Airy Trail
- 8 **73** Wissahickon-West Oak Lane Trail
- 9 **74** Logan-East Germantown Trail

Mapping Trail Opportunities (facing page). The opportunities shown on this map are not yet—but could become—*GreenPlan Philadelphia* endorsed projects.

Note: Colors are used strictly as a visual aid to distinguish adjacent opportunities.

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Sources:
Department of Technology 2001
WRT 2008

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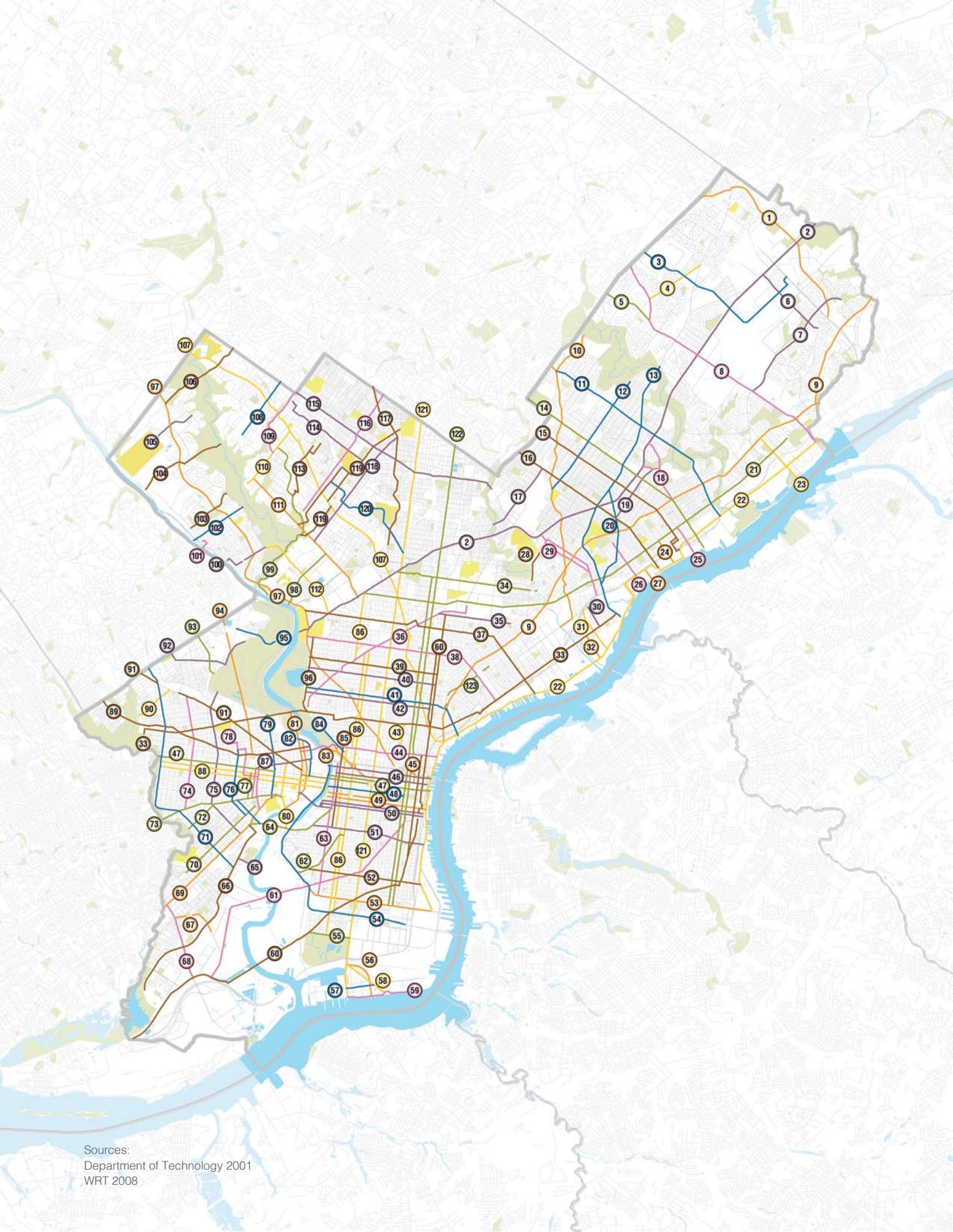
SIGNATURE PROJECTS

	Score*	Id Number and Name	Score*	Id Number and Name
	6	1 Southampton Rd-Philmont Ave	8	41 Columbia Ave-Cecil B Moore Ave
	9	2 Roosevelt Blv-Hunting Park Ave	7	42 Oxford Ave
	7	3 Norcom Rd-Red Lion Rd	6	43 8th St-Fairmount Ave
	7	4 Verree Rd	7	44 Spring Garden St
	6	5 Alburger Ave	5	45 4th St-5th St-Marginal Rd
	6	6 Comly Rd	7	46 Race St-Arch St
	5	7 Academy Rd	8	47 Market St-JFK Blv
	7	8 Grant Ave-Welsh Rd	8	48 Sansom St
	10	9 Frankford Ave-Knights Rd	9	49 Locust St-Spruce St
	8	10 Pine Rd-Oxford Ave-Paul St-Kinsey St-Waln St-Church St-Aramingo Ave	7	50 Pine St-Taney St-Lombard St-27th St-South St
	7	11 Rhawn St	8	51 Washington Ave
	7	12 Algon Ave	9	52 Snyder Ave
	8	13 Bustleton Ave-Bridge St	7	53 Oregon Ave-Vare Ave
	7	14 Cottman Ave	7	54 Schuylkill Blvd
	11	15 Tyson Ave-Tulip St-Keystone St-Longshore Ave-New State Rd	6	55 Pattison Ave
	11	16 Levick St	7	56 League Island Blvd
	9	17 Tabor Rd	6	57 Kitty Hawk Ave
	7	18 Ryan Ave-Sandyford Ave	7	58 Diagonal Blvd
	8	19 Brous Ave	6	59 Admiral Peary Way
	8	20 Harbison Ave	11	60 2nd St-3rd St-American St-Dock St-38th Parallel Pl-Moyamensing Ave-4th St-Penrose Ave-Bartram Ave
	10	21 Torresdale Ave-Erie Ave	9	61 Passyunk Ave-Essington Ave
	10	22 River Rd-Delaware Ave-Columbus Blvd	9	62 Federal St-Point Breeze Ave-Jackson Ave
	7	23 Linden Ave	9	63 23rd St
	8	24 Unruh Ave	7	64 Grays Ferry Ave
	9	25 Princeton Ave	7	65 56th St
	8	26 Comly St	8	66 49th St-Grays Ave-Lindbergh Ave
	6	27 Devereaux Ave	8	67 70th St-Passyunk Ave
	8	28 Castor Ave	8	68 Island Ave
	9	29 Allengrove St-Castor Ave-Harrison St-Wakeling St	10	69 Woodland Ave
	9	30 Lefevre St	9	70 Kingsessing Ave
	8	31 Orthodox St	9	71 63rd St-Cobbs Creek Pky-58th St
	8	32 Hedley St	9	72 Whitby Ave
	9	33 Richmond St-Girard Ave-S College Ave-Poplar St-W College Ave-67th St	9	73 Baltimore Ave
	10	34 Leiper St-Hunting Park Ave	10	74 57th St
	9	35 Tioga St	8	75 52nd St
	9	36 B St-Venango St-Glenwood Ave-32nd St	9	76 47th St-48th St
	7	37 Allegheny Ave	8	77 45th St
	7	38 Lehigh Ave	9	78 Brown St-48th St-Fairmount Ave-46th St-Sansom St-43rd St-44th St
	8	39 Dauphin St	8	79 40th St
	8	40 Diamond St	9	80 38th St-University Ave-34th St

Mapping Green Street Opportunities (facing page). The opportunities shown on this map are not yet—but could become—*GreenPlan Philadelphia* endorsed projects.

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Sources:
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WRT 2008

Score* Id Number and Name

- 8 **81** 33rd St-34th St-Civic Center Blv
- 7 **82** 31st St-32nd St-Mantua Ave
- 7 **83** Ben Franklin Pky
- 6 **84** Pennsylvania Ave
- 7 **85** 22nd St
- 8 **86** 19th St-20th St-21st St-22nd St-Master St-S College Ave
- 8 **87** Powelton Ave
- 10 **88** Chestnut St-Walnut St
- 8 **89** Haverford Ave
- 11 **90** Lebanon Ave
- 8 **91** Lancaster Ave
- 7 **92** Edgley Ave-Parkside Ave-Wynnefield Ave
- 8 **93** Bryn Mawr Ave
- 7 **94** 44th St-Belmont Ave
- 8 **95** Ford Rd
- 10 **96** 33rd St
- 7 **97** Ridge Ave
- 6 **98** Midvale Ave
- 7 **99** Lincoln Dr
- 6 **100** Hermit St-Shurs Ln-Cresson St
- 4 **101** Green Ln-Baker St-Dupont St
- 5 **102** Leverington Ave

Score* Id Number and Name

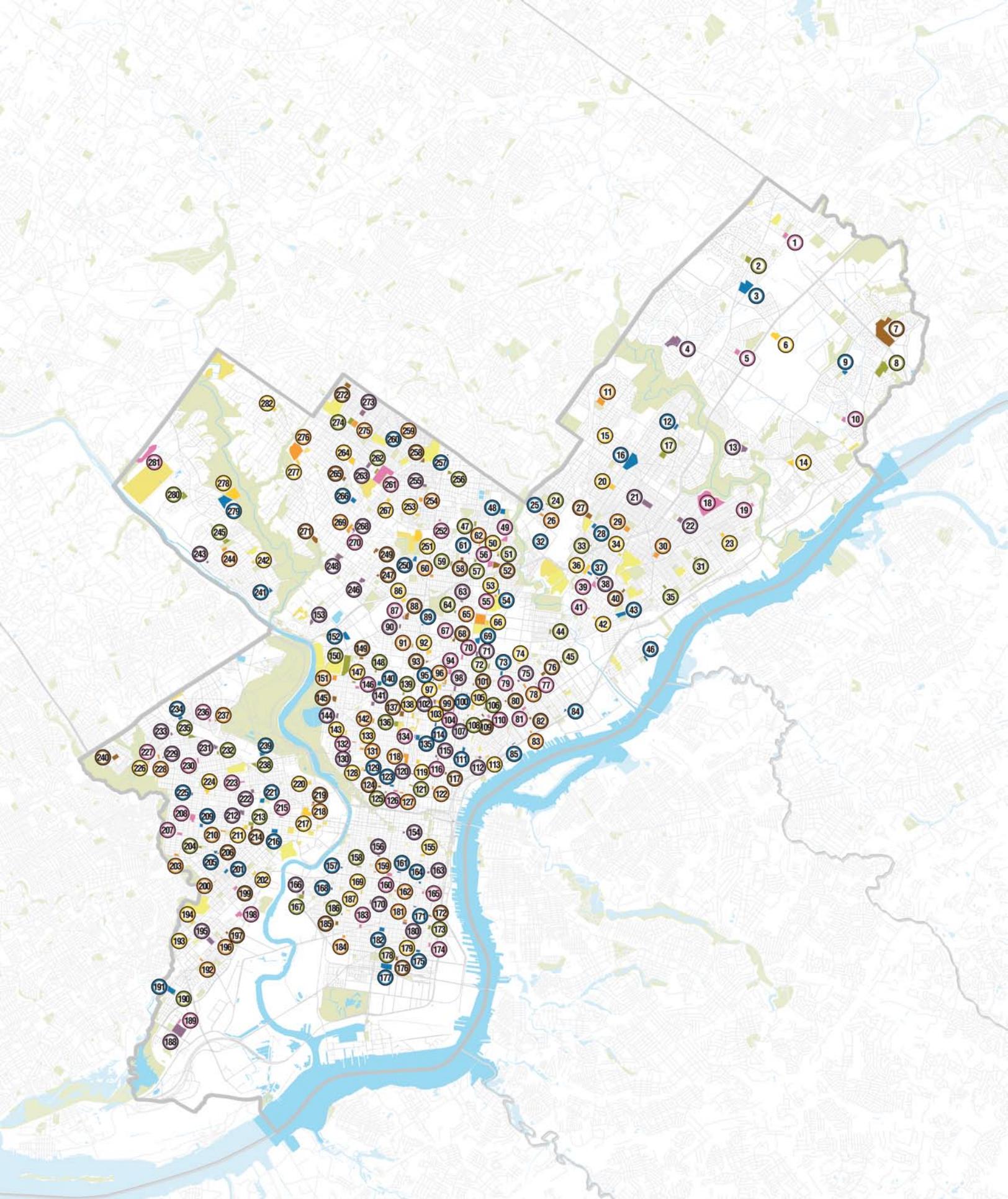
- 6 **103** Fountain St
- 6 **104** Wises Mill Rd-Shawmont Ave
- 6 **105** Cathedral Rd
- 5 **106** Bells Mill Rd
- 9 **107** Germantown Ave-Laurel St
- 6 **108** Willow Grove Ave
- 5 **109** Cresheim Valley Dr-Emlen St
- 5 **110** Allens Ln
- 6 **111** Wissahickon Ave
- 8 **112** Henry Ave
- 9 **113** Phil Ellena St-Musgrave St-Slocum St-Pelham Rd-Upsal St-Greene St-Upsal St
- 8 **114** Ardleigh St-Roumfort Rd-Anderson St
- 7 **115** Godfrey Ave-Stenton Ave
- 9 **116** Washington Ln
- 10 **117** Ogontz Ave
- 8 **118** Wyncote Ave-Cheltenham Ave
- 7 **119** 69th Ave-Haines St-Chew Ave-Tulpehocken St-Walnut Ln-High St-Rittenhouse St
- 9 **120** Belfield Ave-Baynton St-Price St-Morton St
- 9 **121** Broad St
- 10 **122** 5th St-6th St-Independence Mall
- 10 **123** Trenton Ave-Blair St

Mapping Green Street Opportunities

(facing page). The opportunities shown on this map are not yet—but could become—*GreenPlan Philadelphia* endorsed projects.

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Sources:
City Planning Commission 2004
School District of Philadelphia—mapped by WRT

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SIGNATURE PROJECTS

Score* Id Number and Name

- 5 **1** Comly, Watson
- 5 **2** Loesche, William H.
- 7 **3** Washington, George
- 5 **4** Baldi, C. C. A.
- 5 **5** Frank, Anne
- 6 **6** Swenson Arts and Technology Center (AVTS)
- 6 **7** Shallcross, Thomas
- 5 **8** Fitzpatrick, Aloysius L.
- 5 **9** La Brum, General J. Harry
- 6 **10** Hancock, John
- 5 **11** Fox Chase
- 6 **12** Farrell, Louis H.
- 5 **13** Pollock, Robert B.
- 6 **14** Holme, Thomas
- 7 **15** Crossan, Kennedy C.
- 6 **16** Northeast High
- 7 **17** Rhawnhurst
- 6 **18** Lincoln, Abraham
- 6 **19** Brown, Joseph H.
- 6 **20** Moore, J. Hampton
- 9 **21** Solis-Cohen, Solomon
- 8 **22** Mayfair
- 9 **23** Forrest, Edwin
- 7 **24** Franklin Annex (Pilgram Baptist)
- 7 **25** Franklin Elem. Annex (Salvation Army)
- 7 **26** Franklin, Benjamin (EL)
- 7 **27** Fels, Samuel
- 7 **28** Carnell, Laura H.
- 7 **29** Spruance, Gilbert
- 8 **30** Allen, Ethan
- 6 **31** Disston, Hamilton
- 7 **32** Creighton, Thomas
- 9 **33** Carnell Annex (Glading Memorial)
- 9 **34** Ziegler, William H.
- 7 **35** Lawton, Henry W.
- 7 **36** Frankford Field
- 8 **37** Edmunds, Henry R.
- 9 **38** Frankford Memorial UMC
- 9 **39** Frankford
- 8 **40** Smedley, Franklin
- 8 **41** Marshall, John
- 9 **42** Stearne, Allen M.
- 9 **43** Harding, Warren G.
- 7 **44** Hopkinson, Francis
- 7 **45** Feltonville Annex (Horne)
- 9 **46** Bridesburg
- 8 **47** Lowell, James R.

Score* Id Number and Name

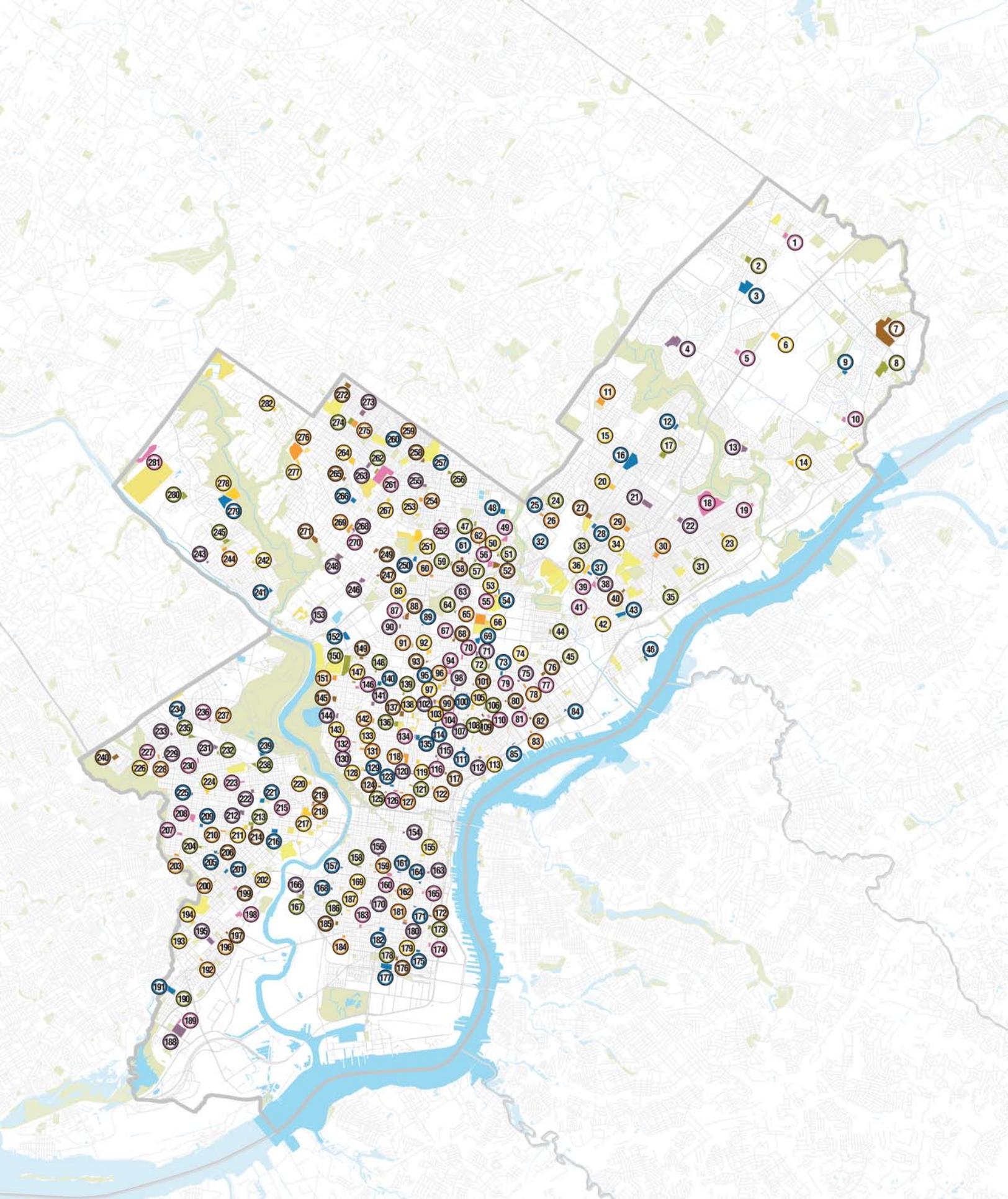
- 7 **48** Finletter, Thomas K.
- 8 **49** Washington Jr., Grover
- 8 **50** Olney Elem. Annex (St. James)
- 8 **51** Olney Elementary
- 8 **52** Olney High Field
- 10 **53** Northwood Charter School II
- 10 **54** Feltonville Intermediate
- 9 **55** Feltonville School of Arts and Science
- 10 **56** Olney High
- 10 **57** Morrison, Andrew J.
- 8 **58** Marshall, Thurgood
- 10 **59** Birney, General David B.
- 8 **60** Cooke, Jay
- 10 **61** Morrison Annex (La Resurreccion Lindley)
- 9 **62** Morrison Annex (1st Presbyterian)
- 10 **63** Cayuga
- 9 **64** McClure, Alexander K.
- 9 **65** Edison, Thomas A.
- 9 **66** Community Education Partners (CEP)
- 11 **67** Taylor Annex
- 10 **68** Taylor, Bayard
- 9 **69** Clemente, Roberto
- 8 **70** Marin, Luis Munoz
- 9 **71** Cramp, William
- 9 **72** Stetson, John B.
- 8 **73** Elkin, Lewis
- 9 **74** Sheridan, Philip H.
- 8 **75** Conwell, Russell
- 8 **76** Webster, John H.
- 8 **77** Jones Annex (Masland Bldg.)
- 9 **78** Mastbaum, Jules E. (AVTS)
- 8 **79** Willard, Frances
- 9 **80** Willard Annex B (CWEP Bldg.)
- 8 **81** Jones, John Paul
- 8 **82** Richmond
- 8 **83** Carroll, Charles
- 8 **84** AMY, at James Martin
- 9 **85** Douglas, Stephen A.
- 9 **86** Steel, Edward
- 9 **87** Gratz Field
- 10 **88** Gratz, Simon
- 8 **89** Sheridan Annex (St. Stephen)
- 10 **90** Cleveland, Grover
- 10 **91** Kenderton
- 10 **92** Bethune, Mary Mc Leod
- 8 **93** Muhr, Simon
- 9 **94** Potter-Thomas

Mapping Schoolyard Opportunities

(facing page). The opportunities shown on this map are not yet—but could become—*GreenPlan Philadelphia* endorsed projects.

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Sources:
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School District of Philadelphia 2008—mapped by WRT

Score* Id Number and Name

- 9 **95** Corino Building (St. Bonaventure)
- 9 **96** Fairhill
- 9 **97** Formerly deBurgos
- 9 **98** deBurgos, Julia
- 6 **99** Welsh Annex (Rivera Bldg.)
- 8 **100** Sheppard Annex (Buena Vista Plaza)
- 9 **101** Sheppard, Isaac
- 6 **102** Hartranft Community Center
- 7 **103** Hartranft, John F.
- 7 **104** Welsh, John
- 7 **105** Hunter, William
- 8 **106** Brown, Henry A.
- 8 **107** Hunter Gym
- 6 **108** Hunter, William H.
- 8 **109** Kensington Culinary Arts
- 8 **110** Kensington CAPA
- 8 **111** Moffet, John
- 6 **112** Adaire, Alexander
- 6 **113** Penn Treaty
- 7 **114** Ferguson, Joseph C.
- 6 **115** Ludlow Community Center
- 6 **116** Ludlow, James R.
- 8 **117** Bodine, William W.
- 7 **118** Penn, William
- 8 **119** Harrison, William
- 8 **120** Formerly Spring Garden School
- 8 **121** Spring Garden
- 7 **122** Kearny, General Philip
- 8 **123** Franklin Learning Center
- 7 **124** Waring, Laura W.
- 9 **125** Masterman, Julia R.
- 8 **126** Franklin, Benjamin
- 8 **127** Business & Technology/fka Stoddart Fleisher
- 7 **128** Bache / Martin
- 7 **129** Bache Annex
- 8 **130** Morris, Robert
- 8 **131** Vaux, Roberts
- 8 **132** Boone, Daniel
- 8 **133** Reynolds, General John
- 6 **134** Dunbar, Paul Laurence
- 6 **135** Wanamaker, John
- 9 **136** Carver, George Washington
- 8 **137** Duckrey, Tanner
- 7 **138** Elverson Military Academy
- 9 **139** Stanton, M. Hall
- 7 **140** Dobbins, Murrell (AVTS)
- 8 **141** Pratt, Anna

Score* Id Number and Name

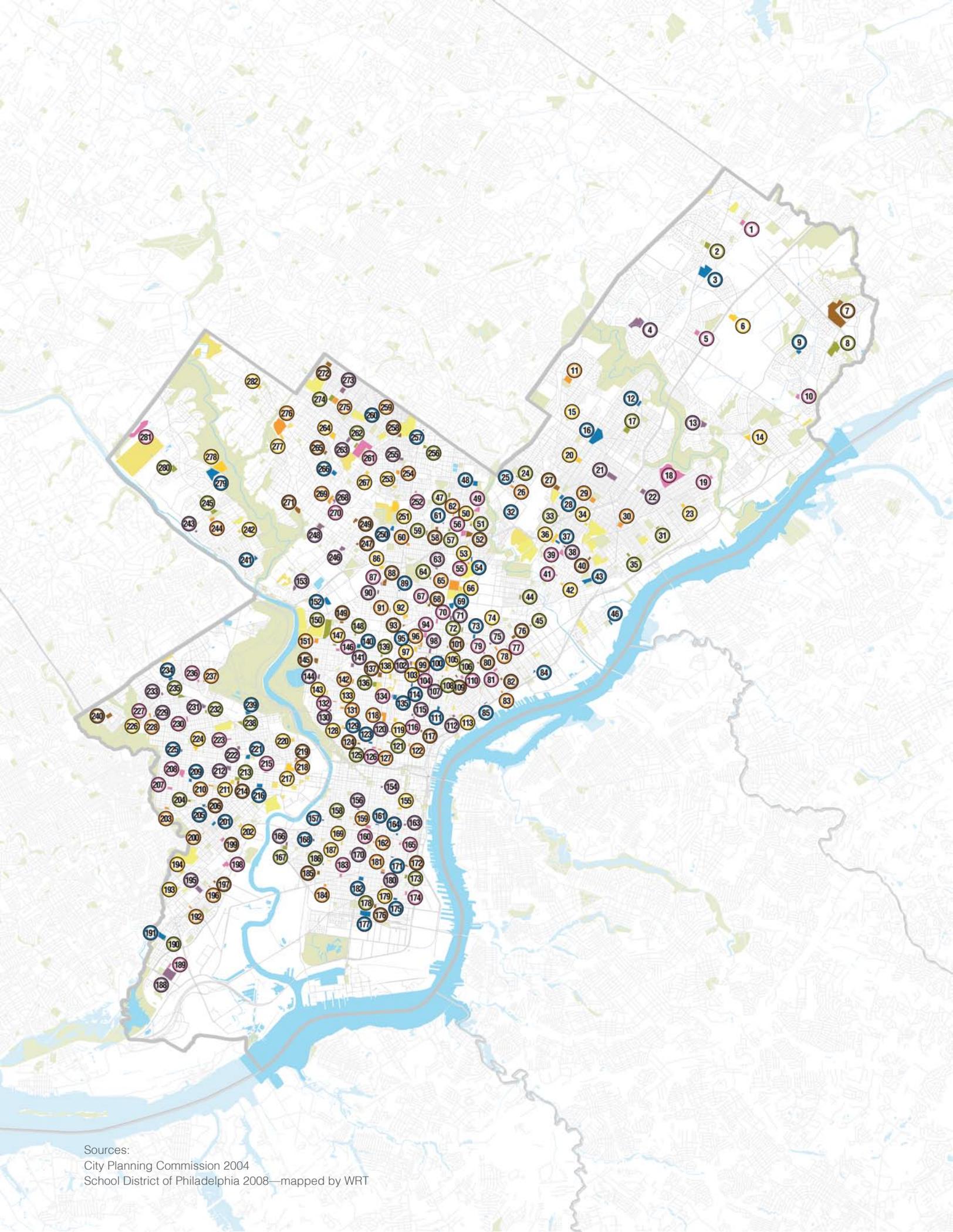
- 9 **142** Douglass, Frederick
- 9 **143** Kelley, William D.
- 9 **144** Blaine, James G.
- 9 **145** Strawberry Mansion
- 9 **146** FitzSimons, Thomas
- 9 **147** Walton (Comm Barry)
- 10 **148** Pierce, Thomas M.
- 9 **149** Whittier, John
- 11 **150** Rhodes, E. Washington
- 9 **151** Allen, Ethel D.
- 10 **152** Randolph Skills Center
- 6 **153** Mifflin, Thomas
- 7 **154** Parkway Center City
- 6 **155** McCall, General George A.
- 7 **156** Durham, Thomas
- 7 **157** Pierce, William S.
- 8 **158** Arthur, Chester A.
- 8 **159** Stanton, Edwin M.
- 7 **160** Creative and Performing Arts
- 7 **161** Barrett Annex (Palumbo)
- 7 **162** Jackson, Andrew
- 7 **163** Meredith, William M.
- 8 **164** Nebinger, George W.
- 7 **165** Washington, George (EL)
- 7 **166** Alcorn, James
- 9 **167** Audenried, Charles Y.
- 8 **168** McDaniel Annex (King of Peace)
- 9 **169** Smith, Walter George
- 9 **170** Childs, George W.
- 9 **171** Kirkbride, Elizabeth B.
- 7 **172** Vare, Abigail
- 9 **173** Furness, Horace
- 9 **174** Sharswood, George
- 8 **175** Taggart, John H.
- 7 **176** Fell, D. Newlin
- 5 **177** South Phila. Field
- 7 **178** Jenks, Abram
- 9 **179** Key, Francis Scott
- 9 **180** Bok, Edward (AVTS)
- 9 **181** Southwark
- 7 **182** South Philadelphia
- 9 **183** Girard, Stephen
- 7 **184** Girard Academic Music Program (Poe, Edgar Allen)
- 8 **185** Vare, Edwin H.
- 10 **186** McDaniel Annex (St. Edmond)
- 9 **187** McDaniel, Delaplaine
- 8 **188** Pepper, George

Mapping Schoolyard Opportunities

(facing page). The opportunities shown on this map are not yet—but could become—*GreenPlan Philadelphia* endorsed projects.

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School District of Philadelphia 2008—mapped by WRT

Score* Id Number and Name

- 8  189 Communications Technology
- 7  190 Motivation
- 8  191 Penrose
- 8  192 Patterson, John M.
- 8  193 Catherine Annex (St Vincent)
- 7  194 Catherine, Joseph
- 10  195 Tilden, William
- 8  196 Phila HS for Business
- 9  197 Morton, Thomas G.
- 9  198 Bartram Field
- 9  199 Mitchell, Weir
- 7  200 Longstreth Annex (Cutler Bldg.)
- 9  201 Shaw, Anna
- 9  202 Comegys, Benjamin B.
- 7  203 Anderson, Add B.
- 8  204 Harrity, William
- 10  205 Harrington, Avery
- 10  206 Harrington Annex
- 7  207 Bryant, William Cullen
- 8  208 Sayre, William
- 9  209 Hamilton, Andrew
- 8  210 Huey, Samuel B.
- 10  211 West Phila. Field
- 10  212 Middle Years Alternative (MYA)
- 10  213 West Philadelphia
- 10  214 Lea, Henry C.
- 8  215 Robeson, Paul
- 8  216 Alexander, Sadie
- 8  217 University City
- 7  218 Powel, Samuel
- 7  219 Powel Annex (Metropolitan Baptist)
- 7  220 McMichael, Morton
- 8  221 Locke, Alain
- 8  222 Sulzberger, Mayer
- 8  223 Rhoads, James
- 8  224 Daroff, Samuel H.
- 9 225 Barry, Commodore John
- 8 226 Overbrook Educational Center
- 8 227 Overbrook Educational Center Annex (Convent)
- 8 228 Cassidy, Lewis C.
- 8 229 Cassidy Annex (Good Sheppard Presby)
- 9 230 Bluford, Guion
- 10 231 Heston, Edward
- 9 232 Shoemaker/Mastery Charter School
- 10 233 Overbrook Elementary
- 9 234 Beeber, Dimner
- 9 235 Overbrook High

Score* Id Number and Name

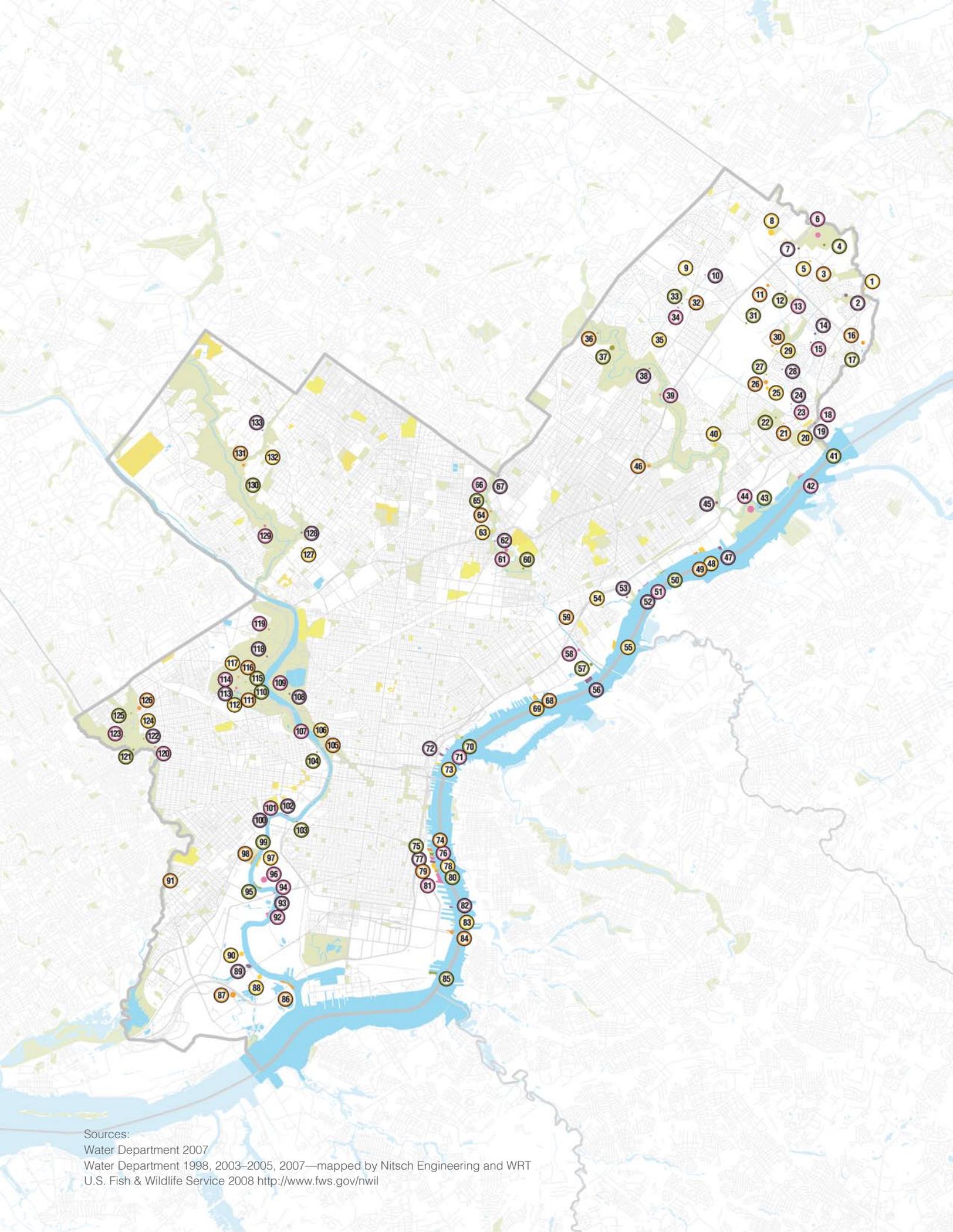
- 8  236 Mann, Willam
- 9  237 Beeber-Wynnefield
- 8  238 Blankenburg, Rudolph
- 8  239 Leidy, Joseph
- 8  240 Lambertson, Robert E.
- 5  241 Cook-Wissahickon
- 5  242 Levering, William
- 4  243 Dobson, James
- 5  244 Roxborough Field
- 6  245 Roxborough
- 8  246 Kelly, John B.
- 8  247 Fittler, Edwin H.
- 7  248 Pickett, Clarence
- 9  249 Wister, John
- 8  250 Logan, James
- 9  251 Central
- 8  252 Howe, Julia Ward
- 8  253 Pennell, Joseph
- 9  254 Prince Hall
- 8  255 Wagner, General Louis
- 9  256 Ellwood
- 9  257 Ellwood Annex (Holy Angels)
- 9  258 Rowen, William
- 10  259 Pennypacker Annex
- 8  260 Pennypacker, Samuel
- 8  261 King, Martin Luther
- 7  262 Hill, J. E. / Sampson Freedman
- 7  263 Day, Anna Blakiston
- 7  264 St. Therese RC for AMY
- 8  265 Emlen, Eleanor C.
- 8  266 Roosevelt, Theodore
- 8  267 Pastorius, Francis
- 8  268 Fulton, Robert
- 8  269 Germantown High School
- 7  270 Fulton, Robert (parking)
- 8  271 Lingelbach, Anna L.
- 8 272 McCloskey, John F.
- 8 273 Edmonds, Franklin S.
- 7 274 Leeds, Morris E.
- 7 275 Germantown Field
- 7 276 AMY Northwest
- 5 277 Houston, Henry E.
- 4 278 Manatawna Farms
- 4 279 Saul, Walter B. (AVTS)
- 7 280 Shawmont
- 5 281 Lankenau
- 6 282 Jenks, John S.

Mapping Schoolyard Opportunities

(facing page). The opportunities shown on this map are not yet—but could become—*GreenPlan Philadelphia* endorsed projects.

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Sources:
Water Department 2007
Water Department 1998, 2003–2005, 2007—mapped by Nitsch Engineering and WRT
U.S. Fish & Wildlife Service 2008 <http://www.fws.gov/nwl>

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Score* Id Number and Watershed

Score* Id Number and Watershed

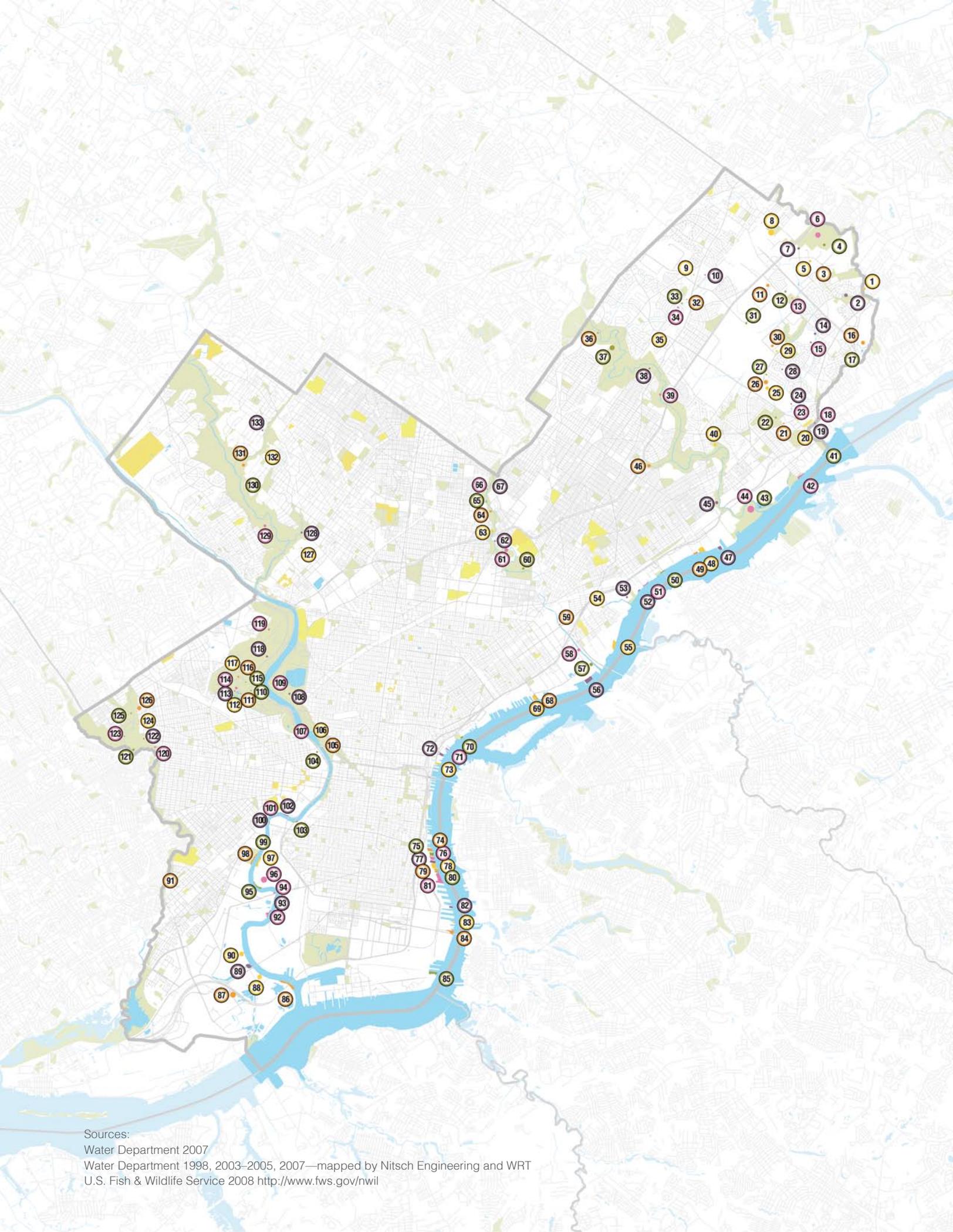
	1	1	Poquessing
	5	2	Poquessing
	5	3	Poquessing
	6	4	Poquessing
	6	5	Poquessing
	6	6	Poquessing
	6	7	Poquessing
	6	8	Poquessing
	5	9	Pennypack
	7	10	Pennypack
	4	11	Poquessing
	5	12	Poquessing
	6	13	Poquessing
	4	14	Poquessing
	6	15	Poquessing
	5	16	Poquessing
	4	17	Poquessing
	3	18	Poquessing
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	5	28	Poquessing
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	3	30	Poquessing
	6	31	Poquessing
	6	32	Pennypack
	5	33	Pennypack
	5	34	Pennypack
	5	35	Pennypack
	3	36	Pennypack
	3	37	Pennypack
	2	38	Pennypack
	3	39	Pennypack
	2	40	Pennypack
	4	41	Delaware
	4	42	Delaware
	5	43	Pennypack

5	44	Pennypack
3	45	Pennypack
4	46	Pennypack
8	47	Delaware
8	48	Delaware
7	49	Delaware
4	50	Delaware
7	51	Delaware
6	52	Delaware
8	53	Tookany/Tacony-Frankford
9	54	Tookany/Tacony-Frankford
8	55	Delaware
8	56	Delaware
8	57	Tookany/Tacony-Frankford
7	58	Tookany/Tacony-Frankford
7	59	Tookany/Tacony-Frankford
7	60	Tookany/Tacony-Frankford
6	61	Tookany/Tacony-Frankford
5	62	Tookany/Tacony-Frankford
5	63	Tookany/Tacony-Frankford
5	64	Tookany/Tacony-Frankford
5	65	Tookany/Tacony-Frankford
5	66	Tookany/Tacony-Frankford
4	67	Tookany/Tacony-Frankford
7	68	Delaware
6	69	Delaware
6	70	Delaware
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6	72	Delaware
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6	74	Delaware
7	75	Delaware
7	76	Delaware
5	77	Delaware
4	78	Delaware
4	79	Delaware
4	80	Delaware
5	81	Delaware
4	82	Delaware
5	83	Delaware
5	84	Delaware
4	85	Delaware
6	86	Schuylkill

Mapping Wetland Opportunities (facing page). The opportunities shown on this map are not yet—but could become—*GreenPlan Philadelphia* endorsed projects.

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Sources:
Water Department 2007
Water Department 1998, 2003–2005, 2007—mapped by Nitsch Engineering and WRT
U.S. Fish & Wildlife Service 2008 <http://www.fws.gov/nwl>

Score* Id Number and Watershed

- 6 **87** Schuylkill
- 6 **88** Schuylkill
- 6 **89** Schuylkill
- 4 **90** Schuylkill
- 7 **91** Darby-Cobbs
- 5 **92** Schuylkill
- 5 **93** Schuylkill
- 5 **94** Schuylkill
- 6 **95** Schuylkill
- 7 **96** Schuylkill
- 8 **97** Schuylkill
- 6 **98** Schuylkill
- 6 **99** Schuylkill
- 9 **100** Schuylkill
- 8 **101** Schuylkill
- 8 **102** Schuylkill
- 8 **103** Schuylkill
- 4 **104** Schuylkill
- 5 **105** Schuylkill
- 5 **106** Schuylkill
- 4 **107** Schuylkill
- 5 **108** Schuylkill
- 5 **109** Schuylkill
- 3 **110** Schuylkill

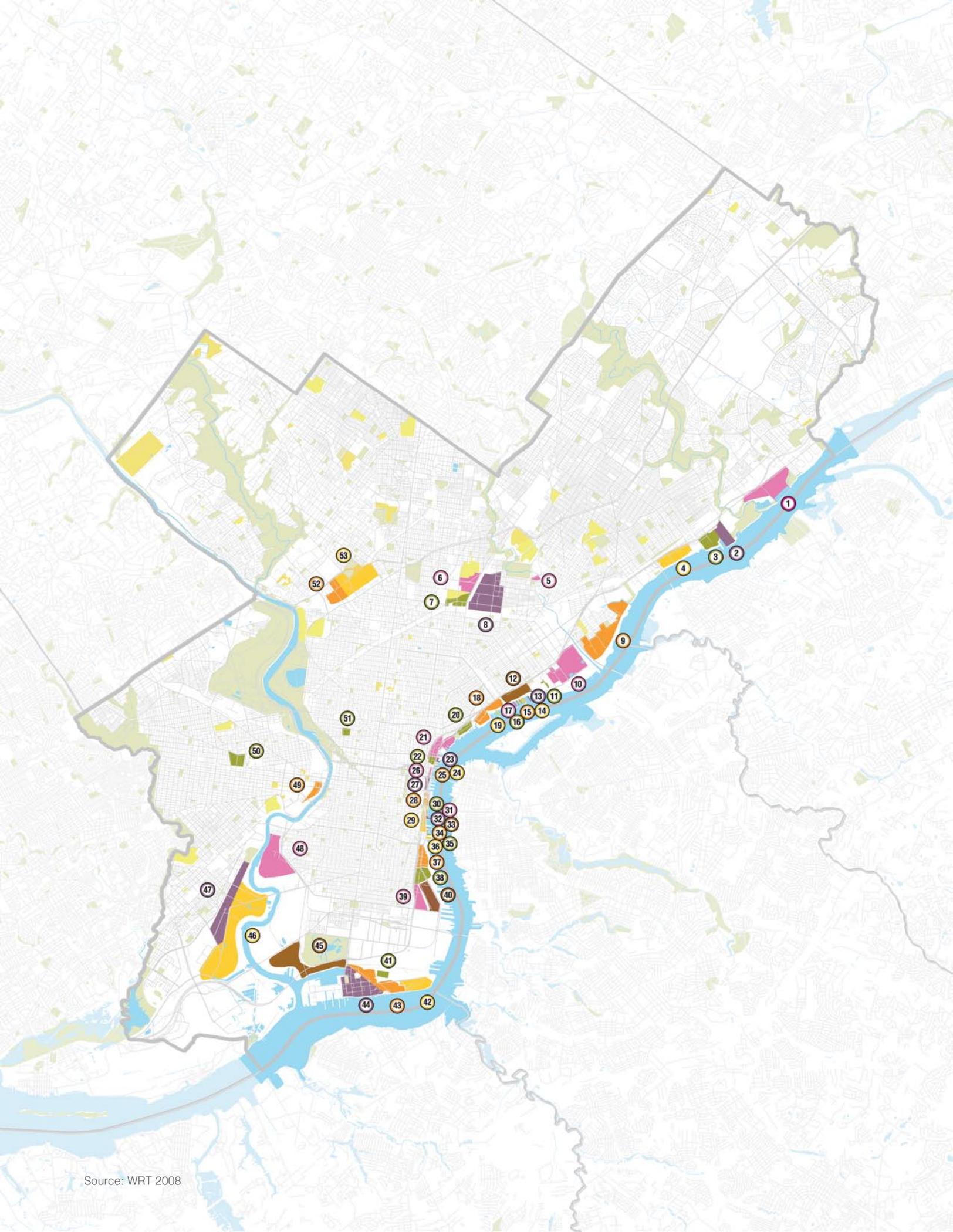
Score* Id Number and Watershed

- 5 **111** Schuylkill
- 5 **112** Schuylkill
- 6 **113** Schuylkill
- 6 **114** Schuylkill
- 5 **115** Schuylkill
- 5 **116** Schuylkill
- 5 **117** Schuylkill
- 4 **118** Schuylkill
- 5 **119** Schuylkill
- 5 **120** Darby-Cobbs
- 4 **121** Darby-Cobbs
- 7 **122** Darby-Cobbs
- 6 **123** Darby-Cobbs
- 7 **124** Darby-Cobbs
- 4 **125** Darby-Cobbs
- 9 **126** Darby-Cobbs
- 4 **127** Wissahickon
- 2 **128** Wissahickon
- 4 **129** Wissahickon
- 3 **130** Wissahickon
- 4 **131** Wissahickon
- 3 **132** Wissahickon
- 3 **133** Wissahickon

Mapping Wetland Opportunities (facing page). The opportunities shown on this map are not yet—but could become—*GreenPlan Philadelphia* endorsed projects.

Note: Colors are used strictly as a visual aid to distinguish adjacent opportunities.

*Number of place-based objectives met by virtue of the opportunity's location. Other objectives could be met through appropriate design.



OVERVIEW

OBJECTIVES FOR OPEN SPACE PROJECTS

CURRENT PROJECTS

PARK AND RECREATION OPPORTUNITIES

TRAIL OPPORTUNITIES

GREEN STREET OPPORTUNITIES

GREEN SCHOOLYARD OPPORTUNITIES

WETLAND OPPORTUNITIES

GREEN DEVELOPMENT OPPORTUNITIES

RAIL AND UTILITY CORRIDOR

ENHANCEMENT

OPPORTUNITIES

SIGNATURE PROJECTS

Score* Id Number

- 6 (1)
- 8 (2)
- 10 (3)
- 7 (4)
- 7 (5)
- 10 (6)
- 10 (7)
- 10 (8)
- 11 (9)
- 10 (10)
- 9 (11)
- 8 (12)
- 6 (13)
- 6 (14)
- 6 (15)
- 6 (16)
- 6 (17)
- 8 (18)
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- 9 (21)
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- 8 (23)
- 7 (24)
- 6 (25)
- 6 (26)
- 5 (27)

Score* Id Number

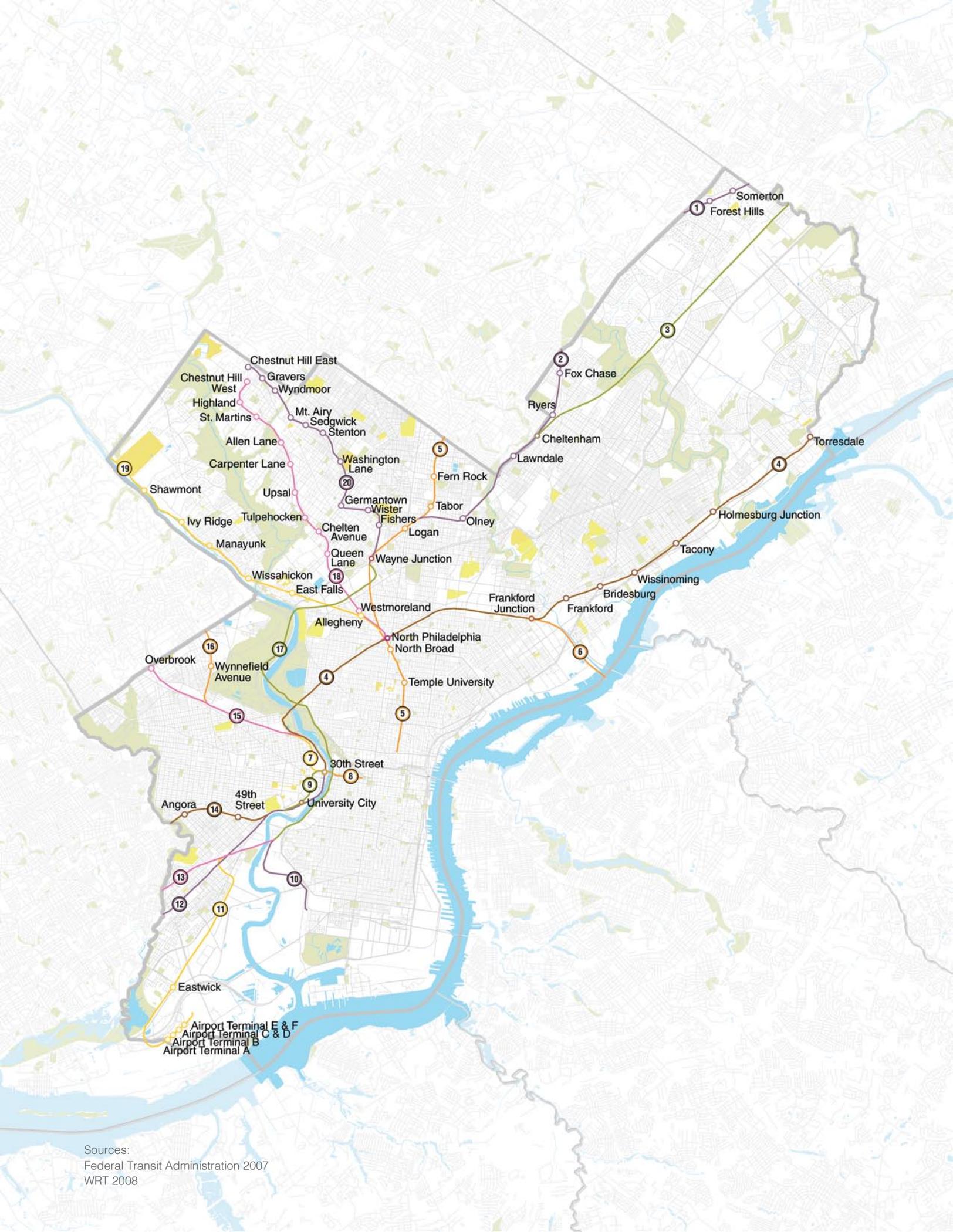
- 6 (28)
- 7 (29)
- 6 (30)
- 6 (31)
- 7 (32)
- 7 (33)
- 7 (34)
- 7 (35)
- 7 (36)
- 8 (37)
- 7 (38)
- 7 (39)
- 7 (40)
- 5 (41)
- 6 (42)
- 7 (43)
- 7 (44)
- 8 (45)
- 8 (46)
- 8 (47)
- 9 (48)
- 9 (49)
- 10 (50)
- 8 (51)
- 10 (52)
- 10 (53)

Mapping Green Development

Opportunities (facing page). The opportunities shown on this map are not yet—but could become—*GreenPlan Philadelphia* endorsed projects.

Note: Colors are used strictly as a visual aid to distinguish adjacent opportunities.

*Number of place-based objectives met by virtue of the opportunity's location. Other objectives could be met through appropriate design.



Sources:
 Federal Transit Administration 2007
 WRT 2008

PROJECTS AND OPPORTUNITIES

OVERVIEW

OBJECTIVES FOR OPEN SPACE PROJECTS

CURRENT PROJECTS

PARK AND RECREATION OPPORTUNITIES

TRAIL OPPORTUNITIES

GREEN STREET OPPORTUNITIES

GREEN SCHOOLYARD OPPORTUNITIES

WETLAND OPPORTUNITIES

GREEN DEVELOPMENT OPPORTUNITIES

RAIL AND UTILITY CORRIDOR ENHANCEMENT OPPORTUNITIES

SIGNATURE PROJECTS

Score* Id Number and Name

7	①	SEPTA R3 West Trenton
6		Somerton
5		Forest Hills
10	②	SEPTA R8 Fox Chase
5		Fox Chase
3		Ryers
5		Cheltenham
3		Lawndale
8		Olney
8	③	CSX Northeast
11	④	Amtrak Northeast Corridor/SEPTA R7 Trenton
4		Torresdale
6		Holmesburg Junction
7		Tacony
7		Wissinoming
7		Bridesburg
8		Frankford
7		Frankford Junction
8		North Philadelphia
11	⑤	SEPTA North
8		Fern Rock
8		Tabor
9		Logan
9		Wayne Junction
9		North Broad
7		Temple University
10	⑥	New Jersey Transit Atlantic City
5	⑦	SEPTA West
6	⑧	SEPTA Center City
9	⑨	SEPTA Southwest
10	⑩	CSX South
8	⑪	SEPTA R1 Airport
6		Eastwick
4		Airport Terminal A
5		Airport Terminal B
5		Airport Terminal C & D
5		Airport Terminal E & F
11	⑫	Amtrak Northeast Corridor/ SEPTA R2 Newark
4		30th Street
7		University City

Score* Id Number and Name

11	⑬	CSX Southwest
11	⑭	SEPTA R3 Elwyn
8		49th Street
7		Angora
11	⑮	Amtrak Pennsylvanian/SEPTA R5 Thorndale
9		Overbrook
11	⑯	SEPTA R6 Cynwyd
7		Wynnefield Avenue
11	⑰	CSX Central
10	⑱	SEPTA R8 Chestnut Hill West
10		Westmoreland
10		Queen Lane
6		Cheltenham Avenue
5		Tulpehocken
5		Upsal
8		Carpenter Lane
3		Allen Lane
6		St. Martins
5		Highland
6		Chestnut Hill West
8	⑲	SEPTA R6 Norristown
10		Allegheny
6		East Falls
4		Wissahickon
5		Manayunk
4		Ivy Ridge
3		Shawmont
9	⑳	SEPTA R7 Chestnut Hill East
8		Fishers
8		Wister
8		Germantown
8		Washington Lane
7		Stenton
7		Sedgwick
6		Mt. Airy
6		Wyndmoor
5		Gravers
7		Chestnut Hill East

Mapping Rail Corridor and Station Enhancement Opportunities (facing page). The opportunities shown on this map are not yet—but could become—*GreenPlan Philadelphia* endorsed projects.

Note: Colors are used strictly as a visual aid to distinguish adjacent opportunities.

*Number of place-based objectives met by virtue of the opportunity's location. Other objectives could be met through appropriate design.

[OVERVIEW](#)[OBJECTIVES FOR OPEN SPACE PROJECTS](#)[CURRENT PROJECTS](#)[PARK AND RECREATION OPPORTUNITIES](#)[TRAIL OPPORTUNITIES](#)[GREEN STREET OPPORTUNITIES](#)[GREEN SCHOOLYARD OPPORTUNITIES](#)[WETLAND OPPORTUNITIES](#)[GREEN DEVELOPMENT OPPORTUNITIES](#)[RAIL AND UTILITY CORRIDOR ENHANCEMENT OPPORTUNITIES](#)

SIGNATURE PROJECTS

We look forward to partnering on significant, transformative projects throughout the city. At this moment in time, several possible projects show the potential to become signature projects, but no parks projects have yet formally achieved signature park status, given the recent conception of the category. The following are brief descriptions of some projects showing early, but great, promise.

CENTRAL DELAWARE RIVERFRONT PARKS

In *A Civic Vision for the Central Delaware*, a connected series of parks line the Delaware River from Pulaski Park at the northern end to Pier 70 at the southern end. Most of the proposed chain of parks is missing. A few already exist but need significant redesign. The proposed riverfront park chain coincides with areas of high environmental and recreational need. *A Civic Vision for the Central Delaware* presents the greatest opportunity to transform the city's economic future, quality of the environment, and quality of life for residents through park development. It is an ambitious, long-term plan, proposing an integrated network of streets, public transit, new development, parks, and environmental enhancements.

Several of the parks are proposed on new lids over I-95. Nationally, there is significant precedent for this type of park. At least 18 cities have already constructed park decks over highways, and several other park lids are in the planning stage. In Philadelphia, a park already spans I-95, establishing a connection to Penn's Landing. Park lids are an outstanding potential source of future city parkland because they solve two problems at the same time—the negative effects of the roadway and the need for more green space. While decking a highway is not inexpensive, the cost is offset somewhat by the fact that the air rights are free and that substituting a park for a noisy road adds significantly to the property value of the surrounding residences and commercial buildings. Because of the economics, projects of this kind are generally limited to parcels of high land value in downtown locations, but they are on the rise in most metropolitan areas. There are several obvious opportunities for this solution along both I-95 and the Vine Street Expressway.

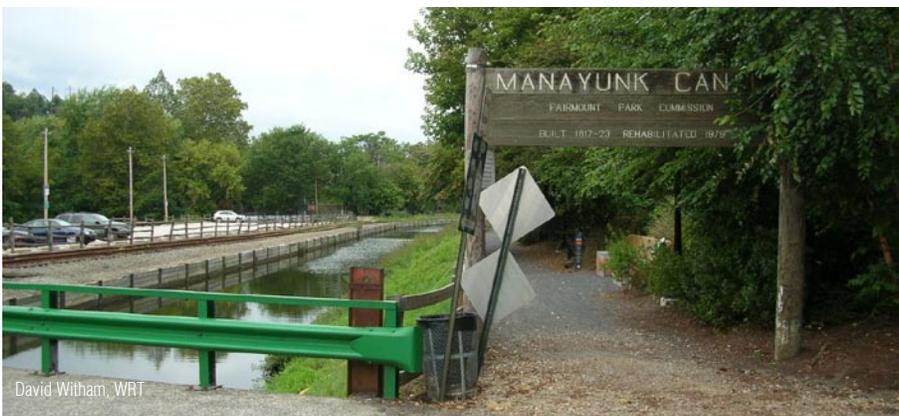
NORTH DELAWARE RIVER GREENWAY

Many of the large-scale post-industrial landscapes of the North Delaware present special opportunities for interpretation and recreation and for reconnecting several neighborhoods to the river; areas along the North Delaware are some of the highest need areas [for recreation] in the entire city. In *North Delaware Riverfront Greenway: Master Plan and Cost Benefit Analysis* and *North Delaware Riverfront, Philadelphia: A Long-Term Vision for Renewal and Redevelopment*, the Pennsylvania Environmental Council (PEC) has laid out a powerful vision for a series of connected parks and trails throughout the northern Delaware waterfront—the waterfront north of Pulaski Park up to the city limits. The plans describe the role of parks and trails in supporting revitalization of adjacent neighborhoods, remediation of contaminated sites and significant enhancement of recreation opportunities for the city. PEC’s studies have outlined the high economic return on investment the North Delaware parks and trails could provide. Widely expanding support by organizations and advocates points to the tremendous need and demand for recreation that they could help fulfill.



MANAYUNK CANAL

The Manayunk Canal and Towpath present a landscape experience that is relatively unique in Philadelphia. The canal and towpath offer a glimpse into the city’s industrial and ecological heritage. The towpath also serves as an important section of the Schuylkill River Trail, which is planned to stretch from the river’s headwaters in Schuylkill County to its confluence with the Delaware River in Philadelphia. Over the past decade, the City, through Fairmount Park and the Water Department, has partnered with several community organizations to invest millions of dollars to improve the quality of the public experience along the towpath and water flow in the canal. There is, however, additional work which can be done to raise the quality of the experience and the environment along the canal and towpath.



BENJAMIN FRANKLIN PARKWAY

Over the past decade, the City and its partners have made significant public realm improvements to the Benjamin Franklin Parkway, including new roadway, building, and sculpture lighting, interpretive and directional signage, and complete renovations to the Swann Memorial Fountain landscape and Aviator Park at Logan Square. In 2010, renovations began on the Parkway's streetscape, Rodin Museum landscape, and Sister Cities Plaza. Projects in 2011 will complete the upgrade of the pedestrian realm along the Parkway from 16th Street to Eakins Oval. These projects will significantly improve user amenities and balance needs of motorists, pedestrians, and cyclists. Future plans, such as the I-676 bridge replacements, Eakins Oval circulation, and 25th Street/Pennsylvania Avenue/Kelly Drive intersection should continue in the spirit of the recent work, striking a balance between the Parkway's distinctive landscape and horticulture, its role in all modes of movement, its place as host to the City's most significant public events, and the tremendous opportunities it presents for further development of cultural facilities and ancillary uses.



MUNICIPAL TRIPLEX

The plazas surrounding City Hall, the Municipal Services Building, and the One Parkway Building offer some of the greatest opportunities to reinvigorate Philadelphia's image and positively touch the lives of a large percentage of the city's residents. The plazas are currently uninviting, with few amenities, but they have the potential to become a continuous, dynamic landscape, offering an array of activities. Studies for some of the plazas have been developed, including the City Planning Commission's *Parks and Plazas* and *Extending the Vision for North Broad Street*. Center City District's *Center City: Planning for Growth 2007–2012* also includes a redesign of Dilworth Plaza on the western side of City Hall, which envisions a great civic gathering place with lawns, a café, and a seasonally-changing water feature that transforms into an ice skating rink in the winter. The re-conception of the municipal triplex should include re-greening the Broad Street and Market Street corridors intersecting with City Hall to extend the use and impact of a redefined civic core.

THE READING VIADUCT

The abandoned elevated railway lines that comprise the Reading Viaduct extend from Vine Street at 11th Street to Fairmount Avenue at 9th Street. While structurally sound, the viaduct creates negative visual impacts and inhibits pedestrian circulation. Some community organizations advocate for dismantling the viaduct and using the area for residential and commercial development. Others believe the viaduct should become a ribbon of parkland and an economic catalyst that would connect the surrounding, underserved communities to Center City and encourage development along its perimeter.

The City Planning Commission and the Department of Commerce recently commissioned a study to examine options for the viaduct. The study concluded that renovation could be accomplished for a fraction—one-seventh—of the cost of demolition.

The Viaduc des Arts section of the Promenade Plantée in Paris is an example of a successful viaduct promenade and park that has had a tremendous economic impact on surrounding communities. Its designers used the arched spaces under the railway to create studios for 50 craftsmen, thereby creating an identity for the community as an arts and crafts district. Another example is the Highline in New York City, a 1.5 mile stretch of elevated railway along the west side of Manhattan that is currently being turned into a linear park.



Andrew Dobshinsky, WRT

REFERENCES

1. Interagency National Survey Consortium. *National Survey on Recreation and the Environment: 2000–2004*. USDA Forest Service and University of Tennessee. 2004.
2. Clements, Rhonda. "An Investigation of the State of Outdoor Play." *Contemporary Issues in Early Childhood* 5.1 (2004): 68–80.
3. Karsten, Lia. "It All Used to Be Better? Different Generations on Continuity and Change in Urban Children's Daily Use of Space." *Children's Geographies* 3.3 (2005): 275–290.
4. Kellert, Stephen R. "Nature and Childhood Development." *Building for Life: Designing and Understanding the Human-Nature Connection*. Washington: Island Press, 2005. 63–89.
5. Greater Philadelphia Tourism Marketing Corporation. *Think Outside*. Osiris Group, Inc. January 2005. <http://www.gophila.com/Go/AboutUs/pdfs/think-outside.pdf> (accessed October 2009).
6. Riley, Alison. Department of Public Health, City of Philadelphia. "Re: GreenPlan Philadelphia Map." Message to Andrew Dobshinsky. December 11, 2007. E-mail.
7. U.S. Department of Agriculture, U.S. Forest Service, Northern Research Station. *Assessing Urban Forest Effects and Values: Philadelphia's Urban Forest*. February 2007. http://nrs.fs.fed.us/pubs/rb/rb_nrs007.pdf (accessed October 2009).
8. Pennsylvania Natural Heritage Program. *A Natural Heritage Inventory of Philadelphia County, Pennsylvania*. Western Pennsylvania Conservancy. December 2008. http://www.naturalheritage.state.pa.us/CNAI_PDFs/Philadelphia_County_NHI_2008_WEB.pdf (accessed October 2009).
9. The Trust for Public Land. *Urban Parks—the New ROI: A Presentation by Will Rogers for Lambda Alpha*. May 16, 2007. http://www.tpl.org/content_documents/speech_UrbanParksNewROIMay07.pdf (accessed October 2009).
10. Pennsylvania Convention and Visitors Bureau. "Generic Visitor Data." 2007.
11. Wachter, Susan M., and Kevin C. Gillen. *Public Investment Strategies: How They Matter for Neighborhoods in Philadelphia*. The Wharton School, University of Pennsylvania, 2006. [http://www.upenn.edu/penniur/pdf/Public Investment Strategies.pdf](http://www.upenn.edu/penniur/pdf/Public%20Investment%20Strategies.pdf) (accessed October 2009).
12. Philadelphia Parks Alliance. *How Much Value Does the City of Philadelphia Receive from its Park and Recreation System?* The Trust for Public Land, 2008. <http://salsa.democracyinaction.org/o/372/images/PhilaParkValueReport08.pdf> (accessed October 2009).
13. City of Philadelphia. "2006 Mayor's Report on Citizen Services." 2006.
14. Frank, Lawrence D., Martin A. Andresen, and Thomas L. Schmid. "Obesity Relationships with Community Design, Physical Activity, and Time Spent in Cars." *American Journal of Preventive Medicine* 27.2 (2004): 87–96. <http://download.journals.elsevierhealth.com/pdfs/journals/0749-3797/PIIS074937970400087X.pdf> (accessed October 2009).
15. Cannuscio, Carolyn, David Grande, Elizabeth Wildsmith, and Eve Weiss. "Green Space and Health: A Review of the Scientific Evidence." Philadelphia: Robert Wood Johnson Health & Society Scholars Program, University of Pennsylvania, 2007.
16. Office of Justice Programs, U.S. Department of Justice. *National Criminal Justice Reference Service*. 2009. <http://www.ncjrs.org> (accessed October 2009).
17. The American Institute of Architects. *The American Institute of Architects*. 2009. <http://www.aia.org> (accessed October 2009).
18. Crowe, Timothy. *Crime Prevention through Environmental Design*. Boston: National Crime Prevention Institute/Butterworth-Heinemann, 1991.

19. Kuo, Frances E., and William C. Sullivan. "Environment and Crime in the Inner City: Does Vegetation Reduce Crime?" *Environment and Behavior* 33.3 (2001): 343–367. <https://webs.aces.uiuc.edu/herl/docs/environment&crime.pdf> (accessed October 2009).
20. Masayoshi, Oka. "The Influence of Urban Street Characteristics on Pedestrian Heat Comfort Levels in Philadelphia." Philadelphia: Department of Earth and Environmental Science, University of Pennsylvania, 2006. http://repository.upenn.edu/mes_capstones/5 (accessed October 2009).
21. American Forests. *Urban Ecosystem Analysis Delaware Valley Region: Calculating the Value of Nature*. March 2003. http://www.americanforests.org/downloads/rea/AF_DelawareValley.pdf (accessed October 2009).
22. Vadillo, Miguel, and Brian Hughes. "More Green Spaces." *The Toronto Star*, February 17, 2007. http://www3.thestar.com/static/PDF/070217_gt_Green.pdf (accessed October 2009).
23. Water Environment Research Foundation. "Chicago, Illinois." *WERF*. http://www.werf.org/livablecommunities/studies_chic_il.htm (accessed October 2009).
24. City of Baltimore. "TreeBaltimore." *City of Baltimore, Maryland — Official Website*. <http://www.baltimorecity.gov/treebaltimore/> (accessed October 2009).
25. MillionTreesNYC. "NYC Tree Facts." *MillionTreesNYC*. http://www.milliontreesnyc.org/html/urban_forest/urban_forest_facts.shtml (accessed October 2009).
26. Russell, Jenna. "A Plan Takes Root: City to Plant More than 100,000 Trees." *The Boston Globe*, April 28, 2007. http://www.boston.com/news/local/articles/2007/04/28/a_plan_takes_root_city_to_plant_more_than_100000_trees/ (accessed October 2009).
27. Howard, Holly. Casey Trees. Personal interview by Robert Allen. May 22, 2008. Telephone.
28. Department of Transportation, City of Boston. *Access Boston 2000-2010: Boston's Citywide Transportation Plan*. Boston, 2007. 6. <http://www.cityofboston.gov/transportation/accessboston/pdfs/front.pdf> (accessed October 2009).
29. Feldberg, Rebecca. City Arborist, Forestry Division, Department of Recreation and Parks, Baltimore City. Personal interview by Andrew Dobshinsky. August 15, 2008. Telephone.
30. Baltimore City Department of Transportation. "Department of Transportation." *City of Baltimore, Maryland — Official Website*. <http://www.baltimorecity.gov/government/transportation/index.php> (accessed October 2009).
31. Casey Trees. "DC Street Tree Map." *Casey Trees*. <http://www.caseytrees.org/geographic/maps-tools/tree-map/index.php> (accessed October 2009).
32. District Department of Transportation. "Snow Facts and Figures." *District Department of Transportation*. <http://ddot.dc.gov/ddot/cwp/view,a,1256,q,639376,ddotNav,%7C32397%7C.asp> (accessed October 2009).
33. Department of Streets and Sanitation, City of Chicago. "Forestry & Trees." *City of Chicago*. http://www.cityofchicago.org/city/webportal/portalDeptCategoryAction.do?deptCategoryOID=-536889070&contentType=COC_EDITORIAL&topChannelName=Dept&entityName=Streets+and+Sanitation (accessed October 2009).
34. Department of Streets and Sanitation, City of Chicago. "Winter Facts." *City of Chicago*. http://egov.cityofchicago.org/city/webportal/portalContentItemAction.do?contentOID=536918677&contentType=COC_EDITORIAL&topChannelName=Dept&blockName=Streets+and+Sanitation%2F2004%2FI+Want+To&context=dept&channelId=0&programId=0&entityName=Streets+and+Sanitation&deptMainCategoryOID=-536893234 (accessed October 2009).
35. City of New York. *PlaNYC*. New York, 2007. 38. http://www.nyc.gov/html/planyc2030/downloads/pdf/full_report.pdf (accessed October 2009).
36. New York City Department of Parks & Recreation. "Trees Count! Tree Census." *New York City Department of Parks & Recreation*. http://www.nycgovparks.org/sub_your_park/trees_greenstreets/treescount/index.php (accessed October 2009).
37. New York City Department of Transportation. "DOT Lays Out Ambitious, Sustainable Vision in New Strategic Plan, 'Sustainable Streets.'" *New York City Department of Transportation*. April 28, 2008. http://home2.nyc.gov/html/dot/html/pr2008/pr08_011.shtml (accessed October 2009).
38. U.S. Environmental Protection Agency. "Section 404 of the Clean Water Act: How Wetlands are Defined and Identified." *U.S. Environmental Protection Agency*. January 12, 2009. <http://www.epa.gov/owow/wetlands/facts/fact11.html> (accessed October 2009).
39. Institute for Innovations in Local Farming. *Farming in Philadelphia: Feasibility Analysis and Next Steps*. Urban Partners, 2007. http://www.spinifarming.com/common/pdfs/STF_inst_for_innovations_exec_summary_dec07.pdf (accessed October 2009).

40. Rain Garden Network. "The Urban Water Cycle." *Rain Garden Network*. <http://www.raingardennetwork.com/urban.htm> (accessed October 2009).
41. American Concrete Pavement Association. "Albedo: A Measure of Pavement Surface Reflectance." *R&T Update: Concrete Pavement Research & Technology* 3.5 (June 2002). <http://www.pavement.com/Downloads/RT/RT3.05.pdf> (accessed October 2009).
42. Köhler, Manfred. "Plant survival research and biodiversity: Lessons from Europe." Chicago: Green Roofs for Healthy Cities, 2003.
43. Peck, Steven, Chris Callaghan, Monica E. Kuhn, and Brad Bass. *Greenbacks from Green Roofs: Forging a New Industry in Canada*. Ottawa: Canadian Mortgage and Housing Corporation, 1999.
44. Pomerantz, Melvin, Hashem Akbari, and John T. Harvey. *Cooler Reflective Pavements Give Benefits Beyond Energy Savings: Durability and Illumination*. Berkeley: Lawrence Berkeley National Laboratory, 2000. <http://www.osti.gov/bridge/servlets/purl/789110-hfzCDE/native/789110.pdf> (accessed October 2009).
45. Pomerantz, Melvin, B. Pon, Hashem Akbari, and S-C Chang. *The Effect of Pavements' Temperatures on Air Temperatures in Large Cities*. Berkeley: Lawrence Berkeley National Laboratory, 2000. <http://eetd.lbl.gov/HeatIsland/PUBS/2000/43442rep.pdf> (accessed October 2009).
46. U.S. Census Bureau. "Summary File 1, Table P1 Total Population." *Census 2000*. Washington, 2000.
47. The Trust for Public Land. "Total Parkland per 1,000 Residents, by City." July 13, 2007.
48. Van Alan Institute "Background: Philadelphia History." *Urban Voids: Grounds for Change*. 2005. <http://www.vanalan.org/urbanvoids/index.php?option=content&task=view&id=86&Itemid=58#history> (accessed October 2009).
49. Philadelphia City Planning Commission. "Vacant Land in Philadelphia." *Philadelphia City Planning Commission*. 1995. 15, 20. <http://www.philaplanning.org/plans/vls.pdf> (accessed October 2009).
50. Philadelphia Urban Resources Partnership. "Green Land Initiative." Philadelphia, 1999. 2.
51. Pennsylvania Environmental Council. *North Delaware Riverfront Greenway Master Plan*. Philadelphia, 2005. <http://www.drcc-phila.org/plans.htm> (accessed October 2009).
52. Pennsylvania Environmental Council. "Lardner's Point Park to Receive Restoration Funding." *The Pennsylvania Environmental Council | Conservation through Cooperation*. January 7, 2008. <http://www.pecpa.org/node/613> (accessed October 2009).
53. Government Affairs, Amtrak. *Amtrak's Northeast Corridor Facts and Background Information*. Washington, 2009. <http://www.amtrak.com/pdf/NortheastCorridor.pdf> (accessed October 2009).
54. Southeastern Pennsylvania Transportation Authority. *SEPTA Operating Facts, Fiscal Year 2009*. http://www.septa.com/inside/reports/Operating_facts.pdf (accessed October 2009).
55. Philadelphia Department of Commerce, and Philadelphia City Planning Commission. *Reading Viaduct Feasibility Study*. Philadelphia: Urban Engineers, Inc., 2004.
56. Russell, James S. "Arts Ban in Stimulus Bill Is Stupid Economics." *Bloomberg.com*. February 13, 2009. <http://www.bloomberg.com/apps/news?pid=newsarchive&sid=aDnEmMKvavc> (accessed October 2009).
57. Schuylkill River Development Corporation. "SRDC's Report Card: Schuylkill River Development Corporation's 2006 Milestones." *Schuylkill Banks*. 2007. <http://www.schuylkillbanks.org/newsView.aspx?topicID=0&newsID=82> (accessed October 2009).

