



*A Report by The Trust for Public Land's
Center for City Park Excellence
For the Philadelphia Parks Alliance*

How Much Value Does the City of Philadelphia Receive from its Park and Recreation System?



THE TRUST *for* PUBLIC LAND
CONSERVING LAND FOR PEOPLE



How Much Value Does the City of Philadelphia Receive from its Park and Recreation System?

A Report by
The Trust for Public Land's
Center for City Park Excellence
for the Philadelphia Parks Alliance

June 2008





CITY OF PHILADELPHIA

Office of the Mayor
215 City Hall
Philadelphia, PA 19107
(215) 686-2181
FAX (215) 686-2180

MICHAEL A. NUTTER
Mayor

May 2008

Dear Citizens,

Philadelphians have long treasured our park and recreation system, encompassing more than 10,000 acres of trails, gardens, woodlands, rivers and streams, day camps, ballfields, golf courses, picnic areas, playgrounds, historic homes and environmental centers. While we have always believed in their value, this groundbreaking study quantifies it for the first time.

Commissioned by the Philadelphia Parks Alliance and funded by The Lenfest Foundation, this study conducted by the Trust for Public Land documents the tens of millions of dollars our parks and recreation system generates or saves the City and residents.

Our parks are an extraordinary regional and national treasure. The report makes the case for investing in them by documenting their value to the City, residents and visitors, and their impact on property values, tourism, stormwater management and air quality.

Philadelphia already has one of the best and biggest park systems in the nation. My goal as Mayor is to make it the best. This report puts the reasons why in dollars and cents.

I am grateful for the work and leadership of the Philadelphia Parks Alliance and its many supporters and allies who are at the forefront of the effort to revitalize our parks. Thank you to The Trust for Public Land's Center for City Park Excellence for studying our City and its parks.

Sincerely,

A handwritten signature in black ink, appearing to read "M. A. Nutter".

Michael A. Nutter
Mayor

Introduction from the Philadelphia Parks Alliance

“I want to make this Park the best in the country, bar none. To do that we must give it the resources it’s been denied for years.”

Mayor Michael Nutter
in his February 14, 2008 budget address

This report isn’t really about parks. It’s about cities and how to save them. If you care about cities, and the city of Philadelphia in particular, keep reading. You will see that Philadelphia’s parks are an essential part of the city’s economic and cultural infrastructure.

When it comes to urban investment, parks don’t generally get the same consideration as highways, convention centers, and downtown office towers. But the research revealed here proves that parks are undervalued. Philadelphia’s parks increase home values. They improve citizens’ health. They fight pollution. They attract tourists.

Altogether, the research undertaken for the Philadelphia Parks Alliance by The Trust for Public Land shows that Philadelphia’s parks provide the city and its residents with high value: \$23 million in city revenue; \$16 million in municipal cost savings; \$729 million generated in wealth for residents; and \$1.1 billion in cost savings for citizens. That’s billion with a “b.” It’s a very big number. And it’s about 100 times the amount that the city spends on parks each year.

That’s not a bad return on investment. And yet, the city has been under funding parks for years. Adjusted for inflation, Philadelphia’s park budget is less than half of what it was twenty years ago. Put simply, the city has been missing a chance it must now seize.

Last year, the Philadelphia Parks Alliance sponsored a series of citizens’ inspections of city parks. Virtually every park we looked at had serious problems: Vandalized playgrounds. Potholed ball fields. Weed-choked landscapes. Chronic under funding has left overworked park staff and dedicated neighborhood volunteers struggling to keep decay at bay.

But as the new mayor likes to say, it is a new day in Philadelphia. Philadelphia’s park supporters have strong allies in City Hall. Mayor Michael Nutter and his fellow park supporters in City Council know that Philadelphia’s extraordinary parks must be saved.

The Parks Alliance supports the financial improvements these leaders propose. But we also think that’s just the beginning.

Just imagine...

In their present state, the city’s parks generate \$18 million in added property tax revenue and \$689 million in increased equity for homeowners near parks. Improved parks could triple those numbers.

Imagine:

Philadelphia’s parks already bring in \$40 million in tourist revenue. Picture how they might perform when fully equipped with functioning restrooms, water fountains, restored historic homes, repaired picnic tables and upgraded trails.

Imagine:

Philadelphians already save \$70 million in medical expenses by using parks. That number would rise if the city's parks were cleaner, safer, and stocked with amenities like bikes to rent and water ice to slurp.

Imagine:

Our more than 10,000 acres of parks, woods, riverbeds and open space already provide at least \$7 million worth of storm water and air pollution control each year. Every new tree fights asthma. Every new trail fights obesity. Every cleared streambed dries out a basement and unclogs a storm drain.

Imagine all this, and then imagine doing nothing. To us it is unimaginable. It makes no sense to leave such powerful tools of economic and community development unused.

The Philadelphia Parks Alliance is calling on the city to take three steps to fully and adequately fund the city's park network:

Mayor Nutter's proposed 5 year budget increase of 46% for Fairmount Park should be fully realized, beginning with a \$3 million increase for parks and trees in the coming year.

Work must begin now to identify, secure and leverage new and diverse funding streams for the park. State and federal environmental and recreational funds must be aggressively pursued. Creative collaborations with local and national foundations are essential. And revenue generated in the park must stay in the park.

Work must also begin on a detailed inventory of all park properties and facilities. Park officials estimate that at least \$30 million may be needed for annual operations, along with \$85 million for capital repairs, but too little is known about the precise condition of our park infrastructure. Any serious fundraising effort must be guided by a clear understanding of the problems at hand. This inventory should be completed by May 2009.

All of these goals will require both visionary leadership from the Mayor and City Council, and a commitment to accountability and transparency at every level of park management. It won't be easy to reverse generations of park neglect. But we believe it must be done.

To attract and retain residents and businesses in the 21st century, cities have no choice but to provide residents with the best possible quality of life. Parks provide hundreds of millions of dollars worth of help. Here in Philadelphia, it is high time we helped our parks.

The Philadelphia Parks Alliance is especially grateful to The Lenfest Foundation for giving parks this boost. Their grant enabled us to contract with the Trust for Public Land for this groundbreaking study.

CONTENTS

Introduction	i
Executive Summary	3
Background	4
Methodology	4
1. Removal of Air Pollution by Vegetation	4
2. Reducing the Cost of Managing Urban Stormwater	5
3. Hedonic (property) Value	7
4. Direct Use Value	9
5. Helping to Promote Human Health	10
6. Income from Out-of-Town Park Visitor Spending (Tourists)	11
7. Stimulating Community Cohesion	12
Conclusion	13
Appendix 1 - Acknowledgments	14
Appendix 2 - Colloquium Participants	15
Appendix 3 - Resources	15

Note: The Numerical Calculators and Technical Attachments that underpin the financial analysis in this report are too voluminous to be included here. They are available upon request from the Center for City Park Excellence, or they are posted on the Internet at the following address: www.tpl.org/philaparkvalue

Executive Summary

The parks and park programs of Philadelphia – from the Fairmount Park system to the activities and facilities of the Philadelphia Recreation Department to the broad touristic reach of Independence National Historical Park – provide Philadelphians with so many joys and benefits that many residents would not want to live in the city without them.

Although the system was not created specifically as an economic development tool, there is a growing realization that the parks of Philadelphia are providing the city with hundreds of millions of dollars of value. This value, for the first time, is being defined. Not every aspect of a park system can be quantified – for instance, the mental health value of a walk in the woods has not yet been documented and is not counted here; and there is no agreed-upon methodology for valuing the carbon sequestration value of a city park—but seven major factors are enumerated—*clean air, clean water, tourism, direct use, health, property value* and *community cohesion*.

While the science of city park economics is in its infancy, the numbers reported here have been carefully considered and analyzed.¹

Two of the factors provided Philadelphia with *direct income*, to the city's treasury. The first is increased property tax due to the increase in property value of certain residences because of their proximity to parks. This came to \$18.1 million in fiscal year 2007. The second consists of sales tax receipts from tourism spending by out-of-towners who came to Philadelphia primarily because of its parks. This value came to \$5.2 million for the city of Philadelphia. (Additional tax revenue went to the state of Pennsylvania.)

Beyond the tax money, these factors also bolstered the *collective wealth* of Philadelphians—by \$688.8 million in total property value and by \$40.3 million in net income from tourists.

Three other factors provided Philadelphia residents with *direct savings*. By far the largest is via the human value of directly using the city's free parkland and recreation opportunities instead of having to purchase these items in the marketplace.

Estimated Annual Value of the Philadelphia Park and Recreation System Summary

Revenue Producing Factors for City Government	
Tax Receipts from Increased Property Value	\$18,129,000
Tax Receipts from Increased Tourism Value	\$5,177,000
Estimated Total, Municipal Revenue Producing Factors	\$23,306,000
Cost Saving Factors for City Government	
Stormwater Management Value	\$5,949,000
Air Pollution Mitigation Value	\$1,534,000
Community Cohesion Value	\$8,600,000
Estimated Total, Municipal Cost Saving Factors	\$16,083,000
Cost Saving Factors to Citizens	
Direct Use Value	\$1,076,303,000
Health Value	\$69,419,000
Estimated Total, Citizen Cost Saving Factors	\$1,145,722,000
Wealth Increasing Factors to Citizens	
Property Value from Park Proximity	\$688,849,000
Profit from Tourism	\$40,263,000
Estimated Total, Wealth Increasing Factors	\$729,112,000

Center for City Park Excellence, The Trust for Public Land, June 2008

¹ While beyond the scope of this report, it bears mentioning that the city of Philadelphia – like all cities – would benefit greatly from investing in the gathering of more data regarding park land, facilities, spending and use, and well as property effects around parks.

This value came to \$1.1 billion in 2007. Second is the health benefit—savings in medical costs—due to the beneficial aspects of exercise in the parks. This came to \$69.4 million. And third is the community cohesion benefit of people banding together to save and improve their neighborhood parks. This “know-your-neighbor” social capital, while hard to tabulate, helps ward off all kinds of anti-social problems that would otherwise cost the city more in police, fire, prison, counseling and rehabilitation costs. This value came to \$8.6 million in 2007.

The last two factors also provided *savings*, but of the *environmental sort*. The larger involves water pollution reduction—the fact that the trees and soil of Philadelphia’s parks retain rainfall and thus cut the cost of treating stormwater. This value came to \$5.9 million in 2007. The other concerns air pollution—the fact that park trees and shrubs absorb a variety of air pollutants. This value came to \$1.5 million.

The park system of Philadelphia thus provided the city with revenue of \$23.3 million, municipal savings of \$16.1 million, resident savings of \$1.1 billion and a collective increase of resident wealth of \$729.1 million in 2007.

Background

Cities are economic entities. They are made up of structures entwined with open space. Successful communities have a sufficient number of private homes and commercial and retail establishments to house their inhabitants and give them places to produce and consume goods. Cities also have public buildings—libraries, hospitals, arenas, city halls—for culture, health and public discourse. They have linear corridors—streets and sidewalks—for transportation. And they have a range of other public spaces—parks, plazas, trails, sometimes natural, sometimes almost fully paved—for recreation, health provision, tourism, sunlight, rainwater retention, air pollution removal, natural beauty, and views.

In successful cities the equation works. Private and public spaces animate each other with the sum greatly surpassing the parts. In unsuccessful com-

munities, some aspect of the relationship is awry: production, retail or transportation may be inadequate; housing may be insufficient; or the public realm might be too small or too uninspiring.

Methodology

Based on a two-day colloquium of park experts and economists held in October, 2003 (*see Appendix 2*), the Center believes that there are seven attributes of Philadelphia’s park system that are measurable and that provide economic value to the city. (*For a listing of studies done on these issues by participants in the colloquium as well as others, see Appendix 3.*)

What follows is a description of each attribute and an estimate of the specific economic value it provides. The Calculators and the Attachments can be obtained from The Trust for Public Land, or they can be accessed on-line at this address: www.TPL.org/PhilaParkValue.

1. Removal of Air Pollution by Vegetation

Air pollution is a significant and expensive urban problem, injuring health and damaging structures. The human cardiovascular and respiratory systems are affected with broad consequences for health-care costs and productivity. In addition, acid deposition, smog and ozone increase the need to clean and repair buildings and other costly infrastructure.

Trees and shrubs have the ability to remove air pollutants such as nitrogen dioxide, sulfur dioxide,

Philadelphia Parkland		
Type of Cover	Acres	Percent
Tree Canopy	5,580	54.0%
Other Pervious	2,817	27.3%
Impervious	1,380	13.4%
Water	557	5.4%
Total	10,334	100.0%

Source: Mapping Sustainability, LLC, 2007

carbon monoxide, ozone and some particulate matter. Leaves absorb gases, and particulates adhere to the plant surface, at least temporarily. Thus, vegetation in city parks plays a role in improving air quality, helping urban residents avoid costs associated with pollution.

In order to quantify the contribution of park vegetation to air quality, an air pollution calculator was designed at the Northeast Research Station of the U.S. Forest Service in Syracuse, N.Y. to estimate pollution removal and value for urban trees. This program, which is based on the Urban Forest Effects (UFORE) model of the U.S. Forest Service (see Attachment 1 for technical details), is location-specific, taking into account the air pollution characteristics of a given city. (Thus, even if two cities have similar forest characteristics the park systems could nevertheless generate different results based on differences in ambient air quality.)

First, land cover information for all of a city's parks was obtained through analysis of aerial photography from the National Agricultural Imagery Program.² (While every city has street trees and numerous other trees on private property, this study measures only the economic value of trees on public parkland.) Of 10,334 acres of parkland, 54 percent was found to be covered with trees.

Then the pollutant flow through an area within a given time period (known as "pollutant flux") was calculated, taking into account the concentration of pollutants and the velocity of pollutant deposition. The resistance of the tree canopy to the air, the different behavior of different types of trees and other vegetation, and seasonal leaf variation are taken into account by the calculator.

The calculator uses hourly pollution concentration data from cities that was obtained from the U.S. EPA.³ The total pollutant flux was multiplied by tree-canopy coverage to estimate total pollutant removal by trees in the study area. The monetary value of pollution removal by trees is estimated using the median U.S. externality values for each pollutant. (The externality value refers to the amount it would otherwise cost to prevent a unit of that pollutant from entering the atmosphere.) For instance, the externality value of preventing the emission of a short ton of carbon monoxide is \$870; the externality value of the same amount of

sulfur dioxide is \$1500.

The result of the Air Quality Calculator for the park system of Philadelphia is an economic savings value of \$1,534,000. (For details see Calculator 1)

2. Reducing the Cost of Managing Urban Stormwater

Stormwater runoff is a significant problem in urban areas. When rainwater flows off roads, sidewalks and other impervious surfaces, it carries pollutants with it. In some cases (cities with systems which separate household sewage from street runoff) the rainwater flows directly into waterways, causing significant ecological problems. In other cases (cities with combined household and street systems), the rainwater runoff is treated at a pollution control facility before going into a waterway. However, if a storm is large, the great amount of runoff overwhelms the combined system and flows untreated into rivers and bays. Philadelphia has a hybrid system, with about 60 percent of the city served by combined pipes and 40 percent served by separated pipes.

Parkland reduces stormwater management costs by capturing precipitation and/or slowing its runoff. Large pervious (absorbent) surface areas in parks allow precipitation to infiltrate and recharge

Philadelphia Parkland Perviousness

Type of Cover	Acres	Percent
Pervious	8,397	81.3%
Impervious	1,380	13.4%
Water	557	5.4%
Total	10,334	100.0%

Source: Mapping Sustainability, 2007

City of Philadelphia Perviousness (without parkland and without surface water)

Type of Cover	Acres	Percent
Pervious	26,507	34.88%
Impervious	49,486	65.12%
Total	75,993	100%

Source: Mapping Sustainability, 2007

² The aeriels were from the website: http://maps.pasda.psu.edu/website/Imagery_Viewier/viewer.asp?tools=NAIP The publication date is 2004 and the imagery was taken in June and August, 2004. The resolution is one meter.

³ The data is from 1994.

the ground water. Also, vegetation in parks provides considerable surface area that intercepts and stores rainwater, allowing some to evaporate before it ever reaches the ground. Thus urban green spaces function like mini-storage reservoirs.

A model has been developed by the Western Research Station of the U.S. Forest Service in Davis, Calif., to estimate the value of retained stormwater runoff due to green space in the parks. (See Attachment 2 for technical details.) Inputs to the model consist of geographic location, climate region, surface permeability index, park size, land cover percentages, and types of vegetation. Because of numerous data challenges, the model has not been perfected yet and thus gives only a preliminary indication of value for the park system of the City of Philadelphia.

First, land cover data—trees, open grassy areas, impervious surface, etc.—was obtained through analysis of aerial photographs. This analysis reveals that the park system of Philadelphia is 81.3 percent pervious. The rest consists of impervious roadways, trails, parking areas, buildings, hard courts, and also water surface. (While the model was developed with the sensitivity to distinguish between the different effects of such vegetation types as conifers, palms and shrubs, the sensitivity of the aerial photographs was not great enough to make that kind of determination.)

Second, the same photographs were analyzed for the amount of perviousness of the rest of the City of Philadelphia—in other words, the city without its parkland. It was determined that Philadelphia (without its parks and not counting surface water) is 34.9 percent pervious (32.7 percent pervious if surface water is counted). The pervious land consists primarily of residential front and backyards as well as private natural areas such

as cemeteries, university quadrangles and corporate campuses.

Third, the amount and characteristics of rainfall were calculated from U.S. weather data. Philadelphia receives an average of 43.29 inches of rain per year with the characteristic mid-Atlantic mix of drizzles, showers and downpours.

The model, which combines aspects of two other models developed by researchers with the U.S. Forest Service, uses hourly annual precipitation data from each study city to estimate annual runoff. Then, the reduction in runoff is calculated by comparing the modeled runoff with the runoff that would leave a hypothetical site of the same size but with land cover that is typical of surrounding urban development (i.e., with streets, rooftops, parking lots, etc.).

The final step in determining the economic value of a park system's contribution to clean water is calculating what it costs to manage stormwater using "hard infrastructure" (concrete pipes and holding tanks). This turns out to be a very difficult number to ascertain and is not known by the Philadelphia Water Department. The Department does know, however, that its annual budget for water treatment is approximately \$100 million. Thus, by knowing the amount of rainfall the city receives it is possible to make an educated guess about the cost of treatment. This comes out to be \$0.012 (1.2 cents) per cubic foot.

By plugging these rainfall, parkland, imperviousness and treatment cost factors into the formula, an annual Park Stormwater Retention Value of \$5,949,000 is obtained for Philadelphia. (For details see Calculator 2).

It should be noted that there is another possible methodology for determining stormwater savings due to parkland. Instead of looking at

Cost of Treating Stormwater in Philadelphia (per cubic foot)

1	Rainfall per acre per year	164,984 cu. ft./acre
2	Acres of impervious surface	52,534 acres
3	Rainfall on impervious surface (line 1 * line 2)	8,667,269,456 cu. ft.
4	Annual expenditure on water treatment	\$100,000,000
	COST PER CUBIC FOOT (LINE 4/LINE 3)	\$0.012



Parks have great environmental value in stormwater retention and reducing air pollution, as illustrated here with Pennypack Park.

annual rainfall and the annual operating costs for the system, we could look at the one-time capital costs associated with constructing the system to handle single large storms. This may be more relevant considering that the U.S. Environmental Protection Agency is tightening its regulations and requiring more construction for clean water. A rough estimate may put this cost as high as \$500 million (which would then be amortized over a 30-year period). We are presently seeking to analyze this different approach.

3. Hedonic (Property) Value

More than 30 studies have shown that parks and open space have a positive impact on nearby residential property values. (*See Attachment 3 for technical details.*) Other things being equal, most people are willing to pay more for a home close to a nice park. Economists call this phenomenon “hedonic value.” (Hedonic value also comes into play with other amenities such as schools, libraries, police stations and transit stops. Theoretically, commercial office space also exhibits the hedonic principle; unfortunately, no study has yet been carried out to quantify it.) The property value added by a park,

incidentally, is separate from the direct use value gained; property value goes up even if the resident never goes into the park.

Hedonic value is affected primarily by two factors: distance from the park and the quality of the park itself. While proximate value (“nearby-ness”) can be measured up to 2,000 feet from a large park, most of the value—whether the park is large or small—is within the first 500 feet. In the interest of being conservative we have limited our valuation to this shorter distance. Moreover, people’s desire to live near a park depends on characteristics of the park. Beautiful natural resource parks with great trees, trails, meadows and gardens are markedly valuable. Other parks with excellent recreational facilities are also desirable (although sometimes the greatest property value is a block or two from the park rather than directly adjoining it, depending on issues of noise, lights and parking). However, less attractive or poorly maintained parks are only marginally valuable. And parks with dangerous or frightening aspects can reduce nearby property values.

Determining an accurate park-by-park, house-by-house property value for a city is technically feasible but it is prohibitively time-consuming and costly. Thus an extrapolative methodology was

If Philadelphia Properties Were Assessed at Market Value...

Assessed Value of all Residential Properties within 500 Feet of a Park	Average Factor by which Philadelphia Properties are Under-Assessed	“True” Value of all Residential Properties within 500 Feet of a Park	Portion of Value Due to Park Proximity Effect (5%)
\$4,387,574,062	314%	\$13,776,982,555	\$688,849,128

formulated to arrive at a reasonable estimate. Using computerized mapping technology known as GIS, all residential properties within 500 feet of every significant park and recreation area in Philadelphia were identified. (“Significant” was defined as one acre or more; “park” included every park in the city, even if owned by a county, state, federal or other agency.) According to records of the Board of Revision of Taxes, there are about 416,000 residential properties in the city of Philadelphia. (A residential property consists of a structure that is owned and taxed; thus, a single-family house is one property, a 100-unit apartment building is one property, and a 100-unit condominium building is 100 properties. There are actually over 660,000 dwelling units in Philadelphia, but some of them are contained within multi-family buildings.) Using GIS, we determined that there are 97,964 properties within 500 feet of the park and recreation land in the city. And these dwelling units in 2007 had a combined assessed value of \$4,387,574,062.

Unfortunately, because of data and methodology problems, it has not been possible thus far to determine which of Philadelphia’s parks are “strongly positive,” “slightly positive” and “negative” – i.e., adding significant value, slight value or subtracting value to surrounding residences. We are continuing this line of research, but thus far—despite interviews with park professionals, park users, realtors and assessors and after extensive analysis of crime data—we have not been able to make justifiable judgments on park quality. While new methodologies are being tested, we have chosen to assign the conservative value of 5 percent as the amount that parkland adds to the assessed value of all dwellings within 500 feet of parks. (This number is an average of the high, medium and low values of 15 percent, 5 percent and negative 5 percent that will be used when park quality can

be established.) The result for 2006 was \$219.4 million in value due to park proximity.

We then used the residential property tax rate to determine how much extra tax revenue was raised by the city of Philadelphia based on the extra property value due to parks. Using a millage rate of \$82.64 per \$1,000 in assessed value, the result of the Property Value Calculator for the city of Philadelphia is \$18,129,000.⁴ (*For details see Calculator 3*).

We also performed an additional calculation. It is widely known that assessments in Philadelphia are unrealistic in comparison with actual sales prices. We were able to identify approximately 39,000 dwelling units in Philadelphia for which both a 2006 assessment and an actual sales price were recorded. By totaling all the assessments and all the sales prices, we determined that, on average, the true value of a residential property is 3.14 times (314 percent) its assessed value. Normalizing the citywide assessment of all properties within 500 feet of a park by 314 percent brought the market value to just under \$13.8 billion in 2006. The portion of that value due to the park proximity effect—5 percent—was just under \$689 million in 2007. This is the amount that parks added to the aggregate “property wealth” of Philadelphians.

[Note: It is worth emphasizing that this hedonic estimate is conservative for three reasons. First, it does not include the effects of small parks (under an acre) although it is known that even minor green spaces have a property value effect. Second, it leaves out all the value of dwellings located between 500 feet and 2,000 feet from a park. Third, it does not include the potentially very significant property value for commercial offices located near downtown parks.]

⁴ Of this total, 60 percent is allocated to the Philadelphia school system.



Parks can significantly increase nearby property values, as evidenced in the real estate that surrounds Rittenhouse Square.

4. Direct Use Value

While city parks provide much indirect value, they also provide more tangible value through such activities as team sports, bicycling, skateboarding, walking, picnicking, bench-sitting and visiting a flower garden. Economists call these activities “direct uses.” (See Attachment 4 for technical details.)

Most direct uses in city parks are free of charge, but economists can still calculate value by determining the consumer’s “willingness to pay” for the recreation experience in the private marketplace. In other words, if parks were not available in Philadelphia, how much would the resident (or “consumer”) pay for similar experiences in commercial facilities or venues? Thus, rather than income, the direct use value represents the amount of money residents save by not having to pay market rates to indulge in the many park activities they enjoy.

The model used to quantify the benefits received by direct users is based on the “Unit Day Value” method as documented in Water Resources Council recreation valuation procedures by the U.S. Army Corps of Engineers. The Unit Day Val-

ue model counts park visits by specific activity, with each activity assigned a dollar value. For example, playing in a playground is worth \$3.50 each time to each user. Running, walking or rollerblading on a park trail is worth \$4.00, as is playing a game of tennis on a city court. For activities for which a fee is charged, like golf or ice skating, only the “extra value” (if any) is assigned; i.e., if a round of golf costs \$20 on a public course and \$80 on a private course, the direct use value of the public course would be \$60. Under the theory that the second and third repetitions of a park use in a given period are slightly less valuable than the first use (i.e., the value to a child of visiting a playground the seventh time in a week is somewhat lower than the first), we further modified this model by building in an estimated sliding scale of diminishing returns for heavy park users. Thus, for example, playground value diminished from \$3.50 for the first time to \$1.93 for the seventh time in a week. We also estimated an average “season” for different park uses to take into account reduced participation rates in the off-season. (Although some people are active in parks 365 days a year, we chose to be conservative and to eliminate seasons where participation



Parks provide services that city residents would otherwise have to purchase on the open market, such as pools and spraygrounds like the one shown here.

rates drop to low levels.) Finally, for the few activities where a fee is charged—such as golf, ice skating and the use of fields for team sports—we subtracted the per-person fee from the imputed value.

The number of park visits and the activities engaged in were determined via a professionally conducted telephone survey of 600 Philadelphia residents. (The random-digit-dialed survey had an accuracy level of plus or minus 4 percent). Residents were asked to answer for themselves; for those adults with children under the age of 18, a representative proportion were also asked to respond for one of their children. (Non-Philadelphia residents were not counted in this calculation; the value to the city of non-resident uses of parks is measured by the income to local residents from what these visitors spend on their trips. This is covered under income from out of town visitor spending.)

The result of the Direct Use Calculator for Philadelphia for the year 2007 is \$1,076,303,000. (For details see Calculator 4).

While it can be claimed that this very large number is not as “real” as the numbers for tax or tourism revenue, it nevertheless has true meaning.

Certainly, not all these park activities might take place if they had to be purchased. On the other hand, Philadelphians truly are getting pleasure and satisfaction—all \$1 billion worth—from their use of the parks. If they had to pay and if they consequently reduced some of this use, they would be materially “poorer” from not doing some of the things they enjoy.

5. Helping to Promote Human Health

Several studies have documented the large economic burden related to physical inactivity. (See *Attachment 5 for technical details*.) Lack of exercise is shown to contribute to obesity and its many effects, and experts call for a more active lifestyle. Recent research suggests that access to parks can help people increase their level of physical activity. The Parks Health Benefits Calculator measures the collective economic savings realized by city residents because of their use of parks for exercise.

The calculator was created by identifying the

common types of medical problems that are inversely related to physical activity, such as heart disease and diabetes. Based on studies that have been carried out in seven different states, a value of \$250 was assigned as the cost difference between those who exercise regularly and those who don't. For persons over the age of 65 that value was doubled to \$500 because seniors typically incur two or more times the medical care costs of younger adults.

The key data input for determining medical cost savings are the number of park users who are indulging in a sufficient amount of physical activity to make a difference. This is defined as "at least 30 minutes of moderate to vigorous activity at least three days per week." To determine this, we conducted telephone park use surveys of activities and of their frequency, dividing respondents by age. This telephone survey was, in fact, the same as the one carried out for direct use data (above), consisting of 600 respondents chosen through random-digit dialing, and had an accuracy rate of plus or minus four percent. In order to modify the results to serve the health benefits study, low-heart rate uses such as picnicking, sitting, strolling and bird watching were eliminated. Also, all respondents who engaged in strenuous activities less than three times per week were dropped as not being active enough for health benefit. Based on the survey and the computations, we found that about 255,000 Philadelphians engage actively enough in parks to improve their health—245,000 of them being under the age of 65, 10,000 of them above 65. The calculator makes one final computation, applying a small multiplier to reflect the differences in medical care costs between State of Pennsylvania and the U.S. as a whole.

The health savings due to park use for the residents of Philadelphia for the year 2007 is \$69,419,000. (*For details see Calculator 5*).

6. Income from Out-of-Town Park Visitor Spending (Tourists)

The amenities that encourage out-of-towners to visit a city include such features as cultural facilities, heritage places and parks as well as special

events that take place there, like festivals and sports contests. For instance, many out-of-towners participate in family reunions or the Walk for the Cure, or watch the Dad Vail Regatta. And of course, a huge tourist attraction is Independence National Park. Though not always recognized, parks play a major role in Philadelphia's tourism economy. (*See Attachment 6 for technical details.*)

To know the contribution of parks to the tourism economy requires knowledge of tourists' activities, the number of park visitors and their spending. Unfortunately, there is a severe shortage of data on park visitation and on the place of origin of park visitors. (By definition, local users are not tourists—any spending they do at or near the park is money not spent locally somewhere else, such as in their immediate neighborhood.) Future studies of park impact would be greatly aided by the collection of more data on this topic.

Two of the three principal park agencies in Philadelphia—Fairmount Park Commission and the Philadelphia Recreation Department—have virtually no information on out-of-town visitor activity and spending. Only the National Park Service, which operates Independence National Historic Park, monitors visitation rates, but it is not possible to extrapolate those numbers to the rest of the city. We thus sought visitation numbers and expenditures from other sources—the Greater Philadelphia Visitors and Convention Bureau and the Greater Philadelphia Tourism Marketing Corp. (GPTMC)—and then made educated guesses as to the percentage of trips that are entirely or substantially due to parks or a park. Based on research, we calculated that 41 percent of tourists visited a park while in Philadelphia. We also estimated that 20 percent of Philadelphia park visitors came because of the parks. (Although Fairmount Park and Department of Recreation land is also the site of museums, stadiums and The Zoo, our conservative methodology assures we did not count the tourists who came to Philadelphia for these reasons and merely happened to visit a park without planning to.)

Through these calculations we estimated that approximately 342,000 over-nighters and 396,000 day visitors came to Philadelphia because of the city's parks (slightly more than eight percent of all tourism).



Parks bring people together, and are central contributors to the social capital of Philadelphia’s neighborhoods.

As for visitor spending, we used data generated by GPTMC and modified it to match our visitor profiles. (For instance, GPTMC data covers “parties” rather than individuals and multi-day “visits” rather than days.) In any tourism study it is important to distinguish between suburban (day-trip) visitors and out-of-town (overnight) visitors, since lodging represents a large percentage of costs. This we did, yielding spending of \$75.4 million from park tourists staying overnight and \$39.6 million from park tourists coming just for the day. With an average tax rate on all tourist expenditures of approximately 4.5 percent,⁵ tax revenue to the city from park-based tourism in 2006 came to \$5,177,000. (For details, see Calculator 6).

In addition, since 35 percent of every tourist dollar is considered “profit” to the local economy (the rest of the income is merely pass-through to pay for expenses), the citizenry’s collective increase in wealth from park-based tourism was \$40,263,000.

7. Stimulating Community Cohesion

Numerous studies have shown that the more webs of human relationships a neighborhood has, the stronger, safer and more successful it is. Any institution that promotes relationship building—whether a religious institution, a club, a political campaign, a co-op, a school—adds value to a neighborhood and, by extension, to the whole city. (See Attachment 7 for technical details.)

This human web, for which the term “social capital” was coined by Jane Jacobs, is strengthened in some communities by parks. 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. Perhaps more significantly, the acts of improving, renewing or even saving a park can build extraordinary levels of social capital in a neighborhood that may well be suffering from fear and alienation partially due to the lack of safe public spaces.

While the economic value of social capital can-

⁵ This averages taxes paid by overnight visitors who stay in hotels with day-trippers who do not. The full sales and transient tax rate is higher than 4.5%, but 4.5% is the portion that goes to the city of Philadelphia rather than to other jurisdictions such as the state of Pennsylvania

not be measured directly, it is possible to tally up a crude proxy—the amount of time and money that residents donate to their parks. Philadelphia has thousands of park volunteers who do everything from picking up trash and pulling weeds to planting flowers, raising playgrounds, teaching about the environment, educating public officials and contributing dollars to the cause.

To arrive at the proxy number, all the financial contributions made to “friends of parks” groups, community organizations, non-profits, corporations, foundations and The Fairmount Park Conservancy were tallied. Also added up were all the hours of volunteer time donated to park organizations; the hours were then multiplied by the value assigned to volunteerism in 2006—\$18.77—by the Washington, D.C.-based organization Independent Sector.

The result of the Social Capital Calculator for the city of Philadelphia for 2007 is \$8,600,000. (For details, see Calculator 7).

Conclusion

While reams of urban research have been carried out on the economics of housing, manufacturing, retail, and even the arts, there has been until now no comprehensive study of the worth of a city’s park system. The Trust for Public Land (TPL) believes that answering this question—“How much value does an excellent city park system bring to a city?”—can be profoundly helpful to

all the nation’s urban areas. For the first time parks can be assigned the kind of numerical underpinning long associated with transportation, trade, housing and other sectors. Urban analysts will be able to obtain a major piece of missing information about how cities work and how parks fit into the equation. Housing proponents and other urban constituencies will potentially be able to find a new ally in city park advocates. And mayors, city councils, and chambers of commerce may uncover the solid, numerical motivation to strategically acquire parkland in balance with community development projects.

Nowhere is this information more needed than in Philadelphia in 2008 as this great American city, with one of the country’s most venerable park systems, strives to redefine and remake itself as an outstanding 21st century metropolis.

Determining the economic value of a city park system is a science still in its infancy. Much research and analysis must be undertaken—and the city of Philadelphia itself, perhaps in conjunction with one of its universities, could help greatly by collecting more specific data about park usership, park tourism, adjacent property transactions, water runoff and retention, and other measures. In fact, every aspect of city parks—from design to management to programming to funding to marketing—would benefit from much deeper investigation and analysis. In that spirit, this study, one of the first of its kind ever published, is offered as a mechanism to begin a great conversation about the present and future role of parks within the life—and economy—of Philadelphia.

Appendix I - Acknowledgments

The report was commissioned by the Philadelphia Parks Alliance, Lauren Bornfriend, Executive Director. It was funded through a generous grant from The Lenfest Foundation of West Conshohocken, Pa.

The principal author was Peter Harnik, Director, Center for City Park Excellence, The Trust for Public Land, Washington, D.C. Principal researcher was Linda Keenan with assistance by Ben Welle. Major consultation on the underlying economic formulas for this study was provided by:

David Chenoweth, Ph. D., Health Management Associates, New Bern, N.C.
John Crompton, Ph.D., Dept of Park, Recreation and Tourism Sciences, Texas A&M University
E.G. McPherson, Ph.D., U.S.Forest Service Research Station, Davis, Calif.
Sarah Nicholls, Ph.D., Dept of Park Recreation & Tourism Resources, Michigan State University
David Nowak, Ph.D., U.S. Forest Service Northeast Research Station, Syracuse, N.Y.
Dan Stynes, Ph.D., Dept of Park, Recreation and Tourism Resources, Michigan State University

The following individuals were extraordinarily helpful in finding and providing data and analysis for the City of Philadelphia. We thank them for their assistance.

Robert Allen, Assistant Managing Director, City of Philadelphia
Paul Bonfanti, Pennsylvania Horticulture Society
Blaine Bonham, Executive Vice President, Pennsylvania Horticultural Society
Lauren Bornfriend, Executive Director, Philadelphia Parks Alliance
Patricia L. Elkis, Associate Director, Delaware Valley Regional Planning Commission
Mark Focht, Executive Director, Fairmount Park Commission
Eva Gladstein, Director, Neighborhood Transformation Initiative
Ira Goldstein, The Reinvestment Fund
Mami Hara, Principal, WRT
Pete Hoskins, Board President, Philadelphia Parks Alliance
Kate Lapszynski, Director of Stewardship, Fairmount Park Commission
Brett Mandel, Executive Director, Philadelphia Forward
Barry Mescolotto, Assistant Administrator, Board of Revision of Taxes
John C. Mitkus, Board Member, Philadelphia Parks Alliance
Bill Moore, Independence Visitors Center
Howard Neukrug, Director, Office of Watersheds, Philadelphia Water Dept.
Inspector L.B. Rebstock, Police Dept.
Joan Reilly, Senior Director, Philadelphia Green, Pennsylvania Horticultural Society
Renee Reynolds, Director of Certifications, State Tax Equalization Board
Victor Richard, Commissioner, Philadelphia Dept. of Recreation
Capt. Dennis Salkowski, Police Dept.
Ceci Schickel, Consultant, Philadelphia Parks Alliance
Colby Schofield, Police Dept.
Patricia Smith, The Reinvestment Fund
Eric Werfel, GIS, Philadelphia Water Dept.

The underlying research for this project was funded in part by the U.S. Forest Service Urban and Community Forestry Challenge Cost Share Program, as recommended by the National Urban and Community Forestry Advisory Council.

Appendix II

The following individuals took part in the Colloquium, “How Much Value Does a Park System Bring to a City,” in October, 2003.

Susan Baird, *Denver Dept of Parks & Recreation, Denver, Colo.*
Kathy Blaha, *The Trust for Public Land, Washington D.C.*
Blaine Bonham, *Pennsylvania Horticultural Society, Philadelphia, Pa.*
Glenn Brill, *Ernst & Young, New York, N.Y.*
Valerie Burns, *Boston Natural Areas Network, Boston, Mass.*
Patrice Carroll, *Philadelphia Managing Director's Office, Philadelphia, Pa.*
Donald Colvin, *Indianapolis Dept of Parks and Recreation, Indianapolis, Ind.*
Ernest Cook, *The Trust for Public Land, Boston, Mass.*
John Crompton, *Texas A&M University, College Station, Tex.*
Dick Dadey, *City Parks Alliance, New York, N.Y.*
Nancy Goldenberg, *Philadelphia Center City Partners, Philadelphia, Pa.*
Peter Harnik, *The Trust for Public Land, Washington, D.C.*
Nancy Kafka, *The Trust for Public Land, Boston, Mass.*
Alastair McFarlane, *U.S. Dept of Housing & Urban Development, Washington, D.C.*
Ken Meter, *Crossroads Resource Center, Minneapolis, Minn.*
Sarah Nicholls, *Michigan State University, E. Lansing, Mich.*
Joan Reilly, *Pennsylvania Horticultural Society, Philadelphia, Pa.*
Dan Stynes, *Michigan State University, E. Lansing, Mich.*
Patrice Todisco, *Boston GreenSpace Alliance, Boston, Mass.*
Susan Wachter, *University of Pennsylvania, Philadelphia, Pa.*
Guijing Wang, *Centers for Disease Control, Atlanta, Ga.*
Richard Weisskoff, *Everglades Economics Group, N. Miami, Fla.*
Wayne Weston, *Mecklenburg Parks and Recreation Dept., Charlotte, N.C.*
Jennifer Wolch, *University of Southern California, Los Angeles, Calif.*
Kathleen Wolf, *University of Washington, Seattle, Wash.*
Matt Zieper, *The Trust for Public Land, Boston, Mass.*

Appendix III

Resources Related to the Economic Value of Parks

Bedimo-Rung, A. L., Mowen, A. J., & Cohen, D. 2005. *The significance of parks to physical activity and public health: A conceptual model.* American Journal of Preventive Medicine, 28(2S2), 159-168.

Center for Urban Forest Research. Collection of “Benefits and Cost” Research. U.S. Forest Service. Davis, California. <http://www.fs.fed.us/psw/programs/cufr/research/studies.php?TopicID=2>

Correll, M., J. Lillydahl, H. Jane, and L. D. Singell. 1978. *The effect of green belts on residential property values: Some findings on the political economy of open space.* Land Economics 54 (2): 07–217.

Crompton, J. L. 2004. *The proximate principle: The impact of parks, open space and water features on residential property values and the property tax base.* Ashburn, VA: National Recreation and Park Association.

Ernest and Young. 2003. Analysis of secondary economic impacts of New York city parks. New York: New Yorkers for Parks.

- Gies, Erica. 2006. *The Health Benefits of Parks: How Parks Keep Americans and Their Communities Fit and Healthy*. San Francisco, CA: The Trust for Public Land.
- Lutzenhiser, M., and N. Noelwahr. 2001. *The effect of open spaces on a home's sale price*. Contemporary Economic Policy 19 (3): 291–298.
- McPherson, E. G. 1998. *Structure and sustainability of Sacramento's urban forest*. Journal of Arboriculture 24 (4): 174–190.
- Miller, A. R. 2001. *Valuing open space: Land economics and neighborhood parks*. Cambridge, MA: Massachusetts Institute of Technology Center for Real Estate.
- Nicholls, S. and J. L. Crompton. 2005a. *The impact of greenways on property values: Evidence from Austin, Texas*. Journal of Leisure Research 37 (3): 321–341.
- Nicholls, S. and J. L. Crompton. 2005b. *Why do people choose to live in golf course communities?* Journal of Park and Recreation Administration 23 (1): 37–52.
- Nowak, D. J., D. E. Crane, and J. C. Stevens. 2006. *Air pollution removal by urban trees and shrubs in the United States*. Urban Forestry and Urban Greening 4: 115–123.
- Nowak, D. J., D. E. Crane, J. C. Stevens, and M. Ibarra. 2002. *Brooklyn's urban forest*. USDA Forest Service General Technical Report. NE-290. Newtown Square, PA: U.S. Department of Agriculture.
- Nowak, D. J., R. E. Hoehn, D. E. Crane, J. C. Stevens, J. T. Walton, J. Bond, and G. Ina. 2006a. *Assessing urban forest effects and values: Minneapolis' urban forest*. USDA Forest Service Resource Bulletin. NE-166. Newtown Square, PA: U.S. Department of Agriculture.
- Nowak, D. J., R. E. Hoehn, D. E. Crane, J. C. Stevens, and J. T. Walton. 2006b. *Assessing urban forest effects and values: Washington, D.C.'s urban forest*. USDA Forest Service Resource Bulletin. NRS-1. Newtown Square, PA: U.S. Department of Agriculture.
- Nowak, D. J., P. J. McHale, M. Ibarra, D. Crane, J. Stevens, and C. Luley. 1998. *Modeling the effects of urban vegetation on air pollution*. In Air pollution modeling and its application XII, ed. S. Gryning and N. Chaumerliac. New York: Plenum Press, New York, 399–407.
- Stynes, D.J., Propst, D.B., Chang, W.H., and Sun, Y. 2000. *Estimating regional economic impacts of park visitor spending: Money Generation Model Version 2 (MGM2)*. East Lansing, MI: Department of Park, Recreation and Tourism Resources, Michigan State University.
- Stynes, D.J. 1997. *Economic impacts of Tourism: A handbook for tourism professionals*. Urbana, IL: University of Illinois, Tourism Research Laboratory. <http://web4.canr.msu.edu/mgm2/econ/>
- Wachter, Susan M. and Wong, Grace. July, 2006. *What is a Tree Worth? Green-City Strategies and Housing Prices*. Available at SSRN: <http://ssrn.com/abstract=931736>
- Walker, Chris. 2004. *The Public Value of Urban Parks*. Washington, D.C.: Urban Institute. <http://www.wallacefoundation.org/NR/rdonlyres/5EB4590E-5E12-4E72-B00D-613A42E292E9/0/ThePublicValueofUrbanParks.pdf>



The Trust for Public Land conserves land for people to enjoy as parks, gardens, and other natural places, ensuring livable communities for generations to come. The mission of TPL's Center for City Park Excellence is to make cities more successful through the innovative renewal and creation of parks for their social, ecological and economic benefits to residents and visitors alike.

The Trust for Public Land
National Office
116 New Montgomery Street
Fourth Floor
San Francisco, CA 94105

415.495.4014
tpl.org

The Center for City Park Excellence
660 Pennsylvania Ave., S.E.
Washington, D.C. 20003

202.543.7552
tpl.org/ccpe



The Philadelphia Parks Alliance is an advocacy and education organization working to build a diverse, powerful constituency that recognizes and supports Philadelphia's parks as a priceless asset that belongs to us all. The mission of the Philadelphia Parks Alliance is to mobilize community support, build coalitions, educate the public, and otherwise advocate for changes that will bring about superior systems of parks and open space throughout Philadelphia.

Philadelphia Parks Alliance
P.O. Box 12677
Philadelphia, PA 19129

friends@philaparks.org
215.879.8159
philaparks.org