# How Much Value Does the City of Wilmington Receive from Its Park and Recreation System?

THE TRUST *for* PUBLIC LAND

CONSERVING LAND FOR PEOPLE

Cover Photos: Darcy Kiefel (left), TCDavis (right)

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*A Report by The Trust for Public Land's*
*Center for City Park Excellence*

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Dear Parks Advocates, Citizens, and Decision Makers:

Wilmingtonians have long enjoyed a wonderful parks and recreation system. Nearly 444 acres of public park land in our city provides us with diverse resources: pools and spray grounds, ball fields and organized sports, trees and flowers, trails and wildlife sightings, fishing and kayaking, playgrounds and monuments, gathering spaces and cultural events, and much more. Our parks enhance our neighborhoods, create a sense of community, and define Wilmington as an attractive place to live and work.

Most people in Wilmington intuitively understand that our parks have value. This study summarizing research conducted by The Trust for Public Land's Center for City Park Excellence, provides us with scientific and economic data to quantify this value. Based on techniques that have been utilized in other cities to measure environmental, recreational, public health, property value, tourism, and social benefits of parks, we discovered that our parks are worth many millions of dollars to us each year. The research results are a valuable tool for planning park improvements in Wilmington.

Despite the health and vitality of our city parks, we have important challenges to address. Improving our system of parks in strategic ways will increase its economic value for city government and Wilmington residents. If parks were treated on par with other urban infrastructure, study findings indicate that the return on investment far outweighs the additional resources needed to make park system improvements and enhancements. Just imagine what Wilmington's park system could be with increased funding, staff upgrades, deferred maintenance completed, and additional volunteer support. With the proper level of investment, parks can be economic drivers, locations for friends to meet, places to be physically active outdoors, and efficient filters of clean air and water. Parkland increases property values, improves quality of life, draws tourists, and attracts and retains residents and businesses.

This initiative is about our city and how to make it better.

People care about Wilmington's parks. In 2008, citizens and private sources donated more than $1,000,000 in financial contributions and volunteer time to our parks. Thanks to The Trust for Public Land, we now have a new tool to envision the future of Wilmington's parks. We hope that this study will become a catalyst to increase parks advocacy. We look forward to supporting policy recommendations that will prioritize park needs, increase public involvement, and implement significant improvements to our park system.

Please join us in supporting Wilmington parks!

Sincerely,
Wilmington Parks Study Working Group

*Funding for this report was generously provided by the Division of Parks and Recreation Delaware Department of Natural Resources and Environmental Control, Nemours Health and Prevention Services, Rotary Club of Wilmington, and the Wilmington Beautification Commission with the guidance of the working group including the City of Wilmington's Department of Parks and Recreation and Delaware Center for Horticulture.*

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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/WilmingtonParksValue

# Executive Summary

The parks and park programs of Wilmington, Delaware—from Stapler Park to Eastlake Playground to Brandywine Park—provide Wilmingtonians with so many joys and benefits that many residents would not want to live in the city without them.

Although the park system was not created specifically as an economic development tool, there is a growing realization that the parks of Wilmington are providing the city with millions of dollars of value. This value has now been defined. Seven major factors (comprising 10 specific value amounts) are enumerated in this paper: property value, tourism, direct use, health, community cohesion, clean air and clean water. While the science of city park economics is in its infancy, the numbers reported here have been carefully considered and analyzed.

Two of the factors (and three amounts) provide Wilmington with direct income to the city's treasury. The first consists of increased property tax receipts from the rise in property value of certain residences because of their proximity to parks. This revenue came to $1,080,000 in 2008. Tax revenue also stems from the transfer tax on houses actually sold. In 2008 the park-added revenue from that tax in Wilmington came to $154,000. The second factor consists of sales tax receipts from spending by tourists who visit Wilmington primarily because of its parks. This revenue came to $129,000 in 2008.

In addition to increasing direct tax receipts, these factors bolstered the collective wealth of Wilmingtonians that year—by $10,256,000 in realized property value and by $715,000 from net income from tourists.

Three other factors provide Wilmington residents with direct savings. By far the largest is through the direct use of the city's free parkland and recreation facilities, which obviates the need to purchase these items in the marketplace. This value came to $41.8 million in 2008. Second is the health benefit—savings in medical costs—due to the beneficial aspects of exercise in the parks. This came to $4.3 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 precisely, helps ward off all kinds of antisocial behavior that would otherwise cost the city more in police, fire, prison, counseling, and rehabilitation costs. This value came to $1.1 million in 2008.

The final two factors also provide savings but of the environmental sort. The larger involves water pollution reduction—the fact that the trees and soil of Wilmington's parks retain rainfall and thus cut the cost of treating stormwater. This value came to $409,000 in 2008. The other concerns air pollution—the fact that park trees and shrubs absorb and adsorb a variety of air pollutants. (Through adsorption, pollutants adhere as a thin layer of molecules to plant leaves and stems.) This value came to just under $39,000 in 2008.

The park system of Wilmington thus provided the city government with direct revenue of more than $1.36 million and added to the general wealth of the citizenry by nearly $11 million. It also provided residents with savings of over $47 million, and the city government with cost savings of more than $448,000, in 2008.

| The Estimated Annual Value of the Wilmington Park and Recreation System | |
|---|---|
| **Summary** | |
| **Revenue-Producing Factors for City Government** | |
| Revenue from property tax, due to increased property value | $1,080,000 |
| Revenue from transfer tax, due to increased property value | $154,000 |
| Revenue from sales tax, due to park-related tourism | $129,000 |
| ***Estimated Total, Municipal Revenue-Producing Factors*** | ***$1,363,000*** |
| | |
| **Wealth-Increasing Factors to Citizens** | |
| Property value from park proximity, at time of sale | $10,256,000 |
| Profits from tourism | $715,000 |
| ***Estimated Total, Wealth-Increasing Factors*** | ***$10,971,000*** |
| | |
| **Cost-Saving Factors to Citizens** | |
| Direct use value | $41,805,000 |
| Health value | $4,322,000 |
| Community cohesion value | $1,058,000 |
| ***Estimated Total, Citizen Cost-Saving Factors*** | ***$47,185,000*** |
| | |
| **Cost-Saving Factors for City Government** | |
| Stormwater management value | $409,000 |
| Air pollution mitigation value | $39,000 |
| ***Estimated Total, Municipal Cost-Saving Factors*** | ***$448,000*** |
| | |
| *Source:* Center for City Park Excellence, The Trust for Public Land, 2009. | |

# Background

Cities are economic entities. They are made up of structures entwined with open space. Successful communities have a sufficient number of private homes, commercial establishments, and retail outlets 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 communities 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.

Since cities are economic entities, their parks also have an economic dimension. Finance may not be a paramount reason to walk in the woods or play a game of tennis, but it is a significant factor when it comes to public and private decisions regarding investments in urban infrastructure. It is for this reason that the Center for City Park Excellence has undertaken a study of the economic value of urban park systems generally, and Wilmington's specifically.

# The Parks of Wilmington

# Methodology

Based on a two-day colloquium of 26 park experts and economists held in Philadelphia in October 2003, the center believes there are seven attributes of Wilmington'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 other studies, see Appendix 2.)

What follows is a description of each attribute and an estimate of the specific economic value it provides. The numerical calculators, as well as the technical methodology sheets, can be obtained from The Trust for Public Land, Center for City Park Excellence, 660 Pennsylvania Ave. S.E., Washington, D.C. 20003, or they can be directly accessed online at www.tpl.org/WilmingtonParksValue.

## 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 remove air pollutants such as nitrogen dioxide, sulfur dioxide, 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, researchers at the U.S. Forest Service in Syracuse, New York, designed an air pollution calculator to estimate pollution removal and value for trees in urban parks.[1] This calculator, which is based on the Urban Forest Effects (UFORE) model, is location specific, taking into account the air pollution characteristics of a given city. Thus, even if two cities have similar park forest characteristics, the systems could nevertheless generate different results based on differences in ambient air quality.

First, land cover information for all of Wilmington's parks was obtained through analysis of aerial photography.[2] It should be noted that while Wilmington and every other city has street trees and numerous other trees on private property, this study measures only the economic value of trees on public parkland. Of 444 acres of parkland, 58.5 percent was found to be covered with trees.

**Wilmington Parkland Characteristics**

| Type of Cover | Acres | Percent |
|---|---|---|
| ***Parkland with Tree Canopy*** | ***259.4*** | ***58.5%*** |
| Other pervious surface | 124.8 | 28.1% |
| Impervious surface | 56.7 | 12.8% |
| Water | 2.7 | .6% |
| ***Total*** | ***443.6*** | ***100.0%*** |

Source: Mapping Sustainability, LLC, 2009.

Then the pollutant flow through Wilmington 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 calculator also took into account the resistance of the tree canopy to the air, the different behavior of different types of trees and other vegetation, and seasonal leaf variation.

The calculator uses hourly pollution concentration data from cities that were obtained from the U.S. Environmental Protection Agency.[3] The total pollutant flux was multiplied by tree-canopy coverage to estimate total pollutant removal by park 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 $1,500.

TCDavis

Parks not only afford great places for recreation, but also provide significant environmental value in stormwater retention and reducing air pollution, as illustrated here in Brandywine Park.

[1] The Methods for Air Pollution Model is provided in Attachment 1 at www.tpl.org/WilmingtonParksValue.

[2] U.S. Department of Agriculture Geospatial Data Gateway, http://datagateway.nrcs.usda.gov/GatewayHome.html.

[3] The EPA data are from 1994, at which time the U.S. Forest Service created the model.

The result of the Air Quality Calculator for the park system of Wilmington is an economic savings value of $39,000. For computations and methodology, see Calculator 1 at www.tpl.org/WilmingtonParksValue.

## 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 (surfaces that do not absorb water), it carries pollutants with it. In cities with systems that separate household sewage from street runoff, the rainwater flows directly into waterways, causing significant ecological problems. In 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. Fortunately, Wilmington's system consists mostly of separated pipes, thus reducing spillage of sewage; however, in larger storms street runoff still fouls waterways.

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 groundwater. 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 space functions like a mini-storage reservoir.

A model was developed for TPL by researchers with the U.S. Forest Service in Davis, California, to estimate the value of retained stormwater runoff due to green space in the parks.[4] Inputs to the model consist of geographic location, climate region, surface permeability index, park size, land cover percentages, and types of vegetation.[5]

First, Wilmington's land cover data—trees, open grassy areas, impervious surface, and so on—were obtained through analysis of aerial photographs. This analysis reveals that the city's park system is 86.6 percent pervious. The rest consists of impervious roadways, trails, parking areas, buildings, hard courts, and also water surface. (While the model has 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.)

**Wilmington Parkland Perviousness**

| Type of Cover | Acres | Percent |
|---|---|---|
| Pervious | 384.2 | 86.6% |
| Impervious | 56.7 | 12.8% |
| Water features | 2.7 | 0.6% |
| ***Total*** | ***443.6*** | ***100.0%*** |

Source: Mapping Sustainability, LLC, 2009.

Second, the same photographs were analyzed for the amount of perviousness of the rest of Wilmington—in other words, the city without its parkland. It was determined that Wilmington (without its parks and not counting surface water) is 38.8 percent pervious. The pervious private land consists

[4] The Methods for Water Pollution Model is provided in Attachment 2 at www.tpl.org/WilmingtonParksValue.

[5] It should be noted that there is another possible methodology for determining stormwater savings due to parkland. Instead of looking at 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. The Center for City Park Excellence hopes to analyze this different approach in the future.

primarily of residential front and backyards as well as private natural areas such as cemeteries, school quadrangles, and corporate campuses.

| City of Wilmington Perviousness | | |
|---|---|---|
| **(Without Parkland or Surface Water)** | | |
| Type of Cover | Acres | Percent |
| Total Pervious | 2,436 | 38.8% |
| Total Impervious | 3,846 | 61.2% |
| ***Total (without water or parks)*** | ***6,282*** | ***100%*** |
| Source: Mapping Sustainability, LLC, 2009. | | |

Third, the amount and characteristics of rainfall were calculated from U.S. weather data. Wilmington has a characteristic mid-Atlantic climate; it receives an average of 41.36 inches of rain per year. The model, which combines aspects of two other models developed by researchers with the U.S. Forest Service, uses hourly annual precipitation data to estimate annual runoff.

Next, the reduction in runoff is calculated. That is done 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 traditional "hard infrastructure" (concrete pipes and holding tanks). This cost turns out to be a difficult number to ascertain and is not known by the Wilmington Stormwater Management Program. It is known, however, that the city's annual budget for water treatment in fiscal year 2007 was $46.7 million, of which an estimated 30 percent, or $13.99 million, was for stormwater control. Thus, knowing the amount of rainfall the city receives makes it possible to estimate the cost of treatment. This came out to be $0.0229 (2.3 cents) per cubic foot.

By plugging these rainfall, parkland, imperviousness, and treatment cost factors into the formula, we obtain an annual park stormwater retention value of $409,000 for Wilmington. For computations and methodology, see Calculator 2 at www.tpl.org/WilmingtonParksValue.

| Cost of Treating Stormwater in Wilmington | | | |
|---|---|---|---|
| **(per cubic feet)** | | | |
| 1. | Rainfall per acre per year | 150,137 | cu. ft./acre |
| 2. | Acres of impervious surface | 4,074 | acres |
| 3. | Rainfall on impervious surface (line 1 x line 2) | 611,658,138 | cu. ft. |
| 4. | Annual expenditure on stormwater treatment (est.) | $13,999,982 | |
| | ***Cost per cubic foot*** *(line 4/line 3)* | ***$0.023*** | |

## 3. Hedonic (Property) Value

More than 30 studies have shown that parks and open space have a positive impact on nearby residential property values. 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 hedonic value of a park, incidentally, is separate from its direct use value; property value increases 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. It has been found that proximate value ("nearby-ness") can be measured up to 2,000 feet from a large park. However, most of the value of a park, whether large or small, is within the first 500 feet. In the interest of being conservative, we have limited our valuation to this distance. It has also been found that people's desire to live near a park depends on the characteristics of the park. Beautiful natural resource parks with great trees, trails, meadows, and gardens are markedly valuable. Parks with excellent recreational facilities are also desirable (although sometimes the greatest hedonic 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. Parks with dangerous or frightening aspects, such as unsafe equipment or a high crime rate, can also reduce nearby property values.

Determining an accurate park-by-park, house-by-house hedonic value for a city is technically feasible but prohibitively time consuming and costly. It is thus necessary to make an extrapolation from studies done earlier by other researchers, plugging average historic national hedonic values into the specific housing and park situation of the city under study. But this has a problem, too. Although sales data are available, only a small percentage of dwellings sell in any given year. In order to be comprehensive, we must rely on assessment data. But assessments, unlike sales prices, focus on items such as bedrooms, bathrooms, structure age, and size but ignore hedonic value. An extrapolative methodology was formulated to arrive at a reasonable estimate.

Using computerized mapping technology known as Geographic Information System (GIS), we identified all residential properties within 500 feet of every significant park in Wilmington. ("Significant" was defined as one-half acre or more; "park" included every park in the city, even those owned by the state of Delaware.) According to records of the New Castle County Assessors Office, there are about 124,000 residential properties (dwelling units) in Wilmington. Using GIS, we determined that 46.4 percent of dwelling units are within 500 feet of a park in the city; these dwelling units have a combined assessed value of $515,421,000.

When comparing properties within 500 feet of parks to properties outside that area, we found that the park-proximate properties were receiving a 15 percent benefit from the parks. The result for 2008 was $77,313,180 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 Wilmington based on the extra property value due to parks.Using a tax rate (sometimes referred to as a "millage") of $1.397 per $100 in assessed value and the Property Value Calculator, we arrived at $1,080,065.[6] For computations and methodology, see Calculator 3 at www.tpl.org/WilmingtonParksValue.

Delaware Center for Horticulture

Parks significantly increase nearby property values in Wilmington.

Because Delaware has a property transfer tax, Wilmington received an additional tax value from the park effect on houses. The tax amounts to 3 percent on the sales value of a home, of which the state

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

gets half and Wilmington gets half. Based on the park affected sales value of homes sold in 2008, the 1.5 percent tax brought in $154,000.

It is also important to recognize that while the tax millage brings in actual dollars to the city, the overall increased value of the near-park properties is a different kind of "real" number. Thus, because of parks, there is an increase in aggregate "property wealth" of Wilmingtonians of $293,016,952. Since 3.5 percent of Wilmington homes were sold in 2008, the proximate park value realized at the time of sale was $10,255,593.

To restate: the direct municipal tax value is of direct benefit to the city government; the park effect property value benefits a large number of individual Wilmington residents.

## 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 community gardening. Economists call these activities "direct uses."

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 Wilmington, 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.

TCDavis

Parks provide opportunities for exercise, helping residents avoid healthcare costs, and the use of parks allows Wilmingtonians to save millions in recreational services they would otherwise have to purchase on the open market.

The model used to quantify the benefits received by direct users is based on the "Unit Day Value" method.[7] The Unit Day Value model counts park visits by specific activity, assigning each activity a dollar value. For example, playing in a playground is worth $3.50 each time to each user. Running, walking, or in-line skating on a park trail is worth $4, as is playing a game of tennis on a city court. For activities for which a fee is charged, such as golf or ice skating, only the "extra value" (if any) is assigned; that is, if a round of golf costs $30 on a public course and $65 on a private course, the direct use value of the public course would be the difference: $35. 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.

The number of park visits and the activities engaged in were determined by a telephone survey of 609 residents (giving an accuracy level of plus-or-minus 4 percent). Residents were asked to answer for

[7] Water Resources Council recreation valuation procedures. U.S. Army Corps of Engineers. 2004. Unit day values for recreation, Fiscal Year 2004 Economic Guidance Memorandum 04-03. Directorate of Civil Works, Planning and Policy. http://www.usace.army.mil/inet/functions/cw/cecwp/General_guidance/egm04-03.pdf

themselves; for those adults with children under the age of 18, a representative proportion (132) was also asked to respond for one of their children. (Nonresidents were not counted in this calculation; the value to the city of nonresident 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 Wilmington for 2008 is $41,805,000. For computations and methodology, see Calculator 4 at www.tpl.org/WilmingtonParksValue.

While it can be claimed that this very large number is not as tangible as the numbers for tax or tourism revenue, it nevertheless has true meaning. Certainly, not all these park activities would take place if they had to be purchased. On the other hand, Wilmingtonians truly are getting pleasure and satisfaction—all $42 million 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. 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.[8]

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 do not. For people 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 is the number of park users indulging in a sufficient amount of physical activity to make a difference. This is defined according to Centers for Disease Control guidelines as "at least 75 minutes of vigorous or 150 minutes of moderate activity." To determine this, we conducted telephone park use surveys of activities and their frequency, dividing respondents by age. This telephone survey—the same one carried out to obtain the direct-use data—had an accuracy rate of plus-or-minus 4 percent. In order to modify the results to serve the health benefits study, low-heart-rate uses such as picnicking, sitting, strolling, and birdwatching were eliminated. Based on the survey and the computations, we found that 15,498 Wilmingtonians engage actively enough in parks to improve their health—13,996 of them being under the age of 65 and 1,502 of them above 65. The calculator makes one final computation, applying a small multiplier to reflect the differences in medical care costs between the state of Delaware and the United States as a whole.

The health savings due to park use for the residents of Wilmington for 2008 was $4,322,000. For computations and methodology, see Calculator 5 at www.tpl.org/WilmingtonParksValue.

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

The amenities that encourage out-of-towners to visit a city include such features as cultural facilities, heritage places, arenas, and parks as well as special events that take place there, like festivals and sports contests. Though not always recognized, parks play a major role in Wilmington's tourism economy.

[8] While there are other aspects of health besides physical activity, not every one of them can as yet be calculated. For instance, the mental health value of a walk in the woods has not yet been documented and is not counted here.

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 neighborhoods.)

No agency in Wilmington or the state of Delaware has much information on out-of-town park visitor activity and spending. We thus sought visitation numbers and expenditures from other sources and then made estimates on the percentage of trips that are entirely or substantially due to parks or a park. Based on data from the Wilmington Convention and Visitors Bureau, we calculated that in 2008 about 814,000 visitors stayed overnight in New Castle County. Of those (extrapolating from the Travel Industry Association of America's Delaware Travel Barometer report for 2006), 6 percent visited a park, yielding a total of about 48,840 overnight tourists who visited a park. Through a similar computation, we determined that about 83,160 day tourists visited a park. Knowing the average spending level of those tourists and making an estimate that one-fifth of all park visitors come to Wilmington *because* of a park, we determined that total park-derived tourist spending came to just over $2 million. (This conservative methodology assures that we did not count the many tourists who came to Wilmington for other reasons and happened to visit a park without planning a visit.) With a hotel tax rate of 13 percent, tax revenue to the city from park-based tourism is $128,719. For computations and methodology, see Calculator 6 at www.tpl.org/WilmingtonParksValue.

In addition, since 35 percent of every tourist dollar is considered profit to the local economy (the rest being pass-through costs), the citizenry's collective increase in wealth from park-based tourism is $714,533.

## 7. Stimulating Community Cohesion

Numerous studies have shown that the more human relationship webs a neighborhood has, the stronger, safer, and more successful it is. Any institution that promotes relationship building—house of worship, club, political campaign, co-op, or school—adds value to a neighborhood and, by extension, to the whole city.

These human webs, for which renowned urbanist Jane Jacobs coined the term "social capital," are 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 significant, 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 owing to the lack of safe public spaces.

Nemours

Parks bring people together, and contribute to the dynamic social capital of Wilmington's neighborhoods.

While the economic value of social capital cannot be measured directly, it is possible to tally up a crude proxy: the amount of time and money that residents donate to their parks. Wilmington 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 parks organizations and "friends of parks" groups in Wilmington were tallied. Also added up were all the hours of volunteer time donated to park organizations; the hours were then multiplied by the value the non-profit organization Independent Sector assigned to volunteerism in Wilmington—$21.56.[9]

The result of the Social Capital Calculator for Wilmington in 2008 is $1,058,000. For computations and methodology, see Calculator 7 at www.tpl.org/WilmingtonParksValue.

# Conclusion

While reams of urban research have been carried out on the economics of housing, manufacturing, retail, and the arts, until now there has been 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.

# Appendix 1

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

David Chenoweth, Ph.D., Health Management Associates, New Bern, North Carolina
John Crompton, Ph.D., Department of Park, Recreation and Tourism Sciences, Texas A&M University, College Station
E. G. McPherson, Ph.D., U.S. Forest Service Research Station, Davis, California
Sarah Nicholls, Ph.D., Department of Park Recreation and Tourism Resources, Michigan State University, East Lansing
David Nowak, Ph.D., U.S. Forest Service Northeast Research Station, Syracuse, New York
Dan Stynes, Ph.D., Department of Park, Recreation and Tourism Resources, Michigan State University, East Lansing

Additional consultation was provided by:
Denise Castronovo, Mapping Sustainability, Inc., Jupiter, Florida
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[9] Independent Sector, www.independentsector.org/programs/research/volunteer_time.html.

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- Susan Moerschel, Program Manager, Park Resource Office, Division of Parks and Recreation Delaware Department of Natural Resources and Environmental Control
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# Appendix 2
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# Sponsors

### City of Wilmington/Parks and Recreation Department and Wilmington Beautification Commission

The Department of Parks and Recreation provides comprehensive programming that supports the holistic wellness of City residents and provides recreational, social, cultural, vocational and educational opportunities for City residents regardless of age or physical abilities. The department also maintains the lands and facilities under its management to ensure the continuation of attractive park land through effective management.

The Wilmington Beautification Commission was conceived by Mayor James M. Baker in 2004. Since that time it has mobilized more than 1,800 volunteers to beautify and care for our parks. The WBC envisions: a city whose inhabitants understand that the role played by parks and open space goes beyond beauty and amenity, that natural areas for active and passive recreation close to home are essential to healthy urban living; a city of residents, businesses and government working collaboratively to ensure that public green spaces contribute toward the quality of the city they share; and a city whose policies and actions reflect this vision. The WBC includes representatives from city departments, city council, local nonprofit organizations and city residents.

### Delaware Center for Horticulture

The Delaware Center for Horticulture (DCH) cultivates greener communities by inspiring appreciation and improvement of the environment through horticulture, education and conservation. DCH supports 16 active community gardens throughout the city of Wilmington; organizes park improvement projects; beautifies Delaware's roadsides with native vegetation; maintains the landscaping of many urban gateways, corridors, and streetscapes; leads regional conservation projects to enhance Delaware's urban forest; and provides educational programs for children, teens, and adults. Visit www.dehort.org

### Division of Parks and Recreation, Delaware Department of Natural Resources and Environmental Control

Our mission is to provide Delaware's residents and visitors with safe and enjoyable recreational opportunities and open spaces, responsible stewardship of the lands and the cultural and natural resources that we have been entrusted to protect and manage and resource-based interpretive and educational services. Visit www.destateparks.com

### Nemours Health and Prevention Services

Nemours Health and Prevention Services (NHPS), based in Newark, Delaware, works with families and communities to help children grow up healthy. A division of Nemours, one of the nation's largest child health systems, NHPS expands the organization's reach beyond clinical care to consider the health of the whole child. With an initial emphasis on childhood obesity prevention, the goal is to create long-term policy and practice changes that promote healthy lifestyles and lead to better health outcomes. Learn more at GrowUpHealthy.org.

### Rotary Club of Wilmington

The Rotary Club of Wilmington, as part of Rotary International, shares its Mission Statement "...to provide service to others, to promote high ethical standards, and to advance world understanding, goodwill and peace through its fellowship of business, professional and community leaders...,"and its Vision Statement "...to be universally recognized for its commitment to 'Service Above Self' to advance world understanding, goodwill and peace."

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Center for City Park Excellence
The Trust for Public Land
660 Pennsylvania Avenue SE, Suite 401
Washington, D.C. 20003
202.543.7552
*tpl.org/ccpe*

National Office
The Trust for Public Land
116 New Montgomery Street, 4th Floor
San Francisco, CA 94105
415.495.4014
*tpl.org*