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



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A Report by
The Trust for Public Land's
Center for City Park Excellence
for the City of Sacramento Department of Parks and Recreation

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The numerical calculation sheets, as well as the technical methodology sheets, are available 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/SacramentoParksValue.

Executive Summary

The parks and park programs of Sacramento—from the American River Parkway to McKinley Park to William Land Park—provide Sacramentans 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 gradually growing realization that the parks of Sacramento are providing the city with hundreds of millions of dollars of value. This value has now been 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.

Two of the factors provide Sacramento with direct income to the city's treasury. The first consists of increased property tax receipts due to the rise in property value of certain residences because of their proximity to parks. This value came to \$417,000 in fiscal year 2007. The second consists of sales tax receipts from tourism spending by out-of-towners who came to Sacramento primarily because of its parks. This value came to \$2.6 million. Beyond the tax money, these factors also bolstered the collective wealth of Sacramentans—by \$7.2 million in realized property value that year and by \$9.2 million from net income from tourists.¹

Three other factors provide Sacramento residents with direct savings. By far the largest is through the human value of directly using the city's free parkland and recreation opportunities instead of having to purchase these items in the marketplace. This value came to \$345.6 million in 2007. Second is the health benefit—savings in medical costs—due to the beneficial aspects of exercise in the parks. This came to \$19.9 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 \$5.5 million, based on available data for 2006.

The last two factors also provide savings, but of the environmental sort. The larger involves water pollution reduction—the fact that the trees and soil of Sacramento's parks retain rainfall and thus cut the cost of treating stormwater. This value came to \$842,000 in 2007. 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 \$359,000.

The park system of Sacramento thus provided the city government with direct revenue of more than \$3 million and with cost savings of more than \$1.2 million in 2007. In addition, it provided residents with savings of nearly \$371 million in that year. Finally, it added to the general wealth of the citizenry by more than \$16 million.

¹ The full increase in property wealth due to parks is estimated at \$71.9 million, and an estimated 10 percent of park-proximate dwelling units were sold during the year.

Annual Value of the Sacramento Park and Recreation System Summary

Revenue-Producing Factors for City Government

Tax Receipts from Increased Property Value	\$417,000
Tax Receipts from Increased Tourism Value	<u>\$2,613,000</u>
Total, Revenue-Producing Factors	\$3,030,000

Wealth-Increasing Factors to Citizens

Property Value from Park Proximity (annualized)	\$7,200,000
Profit from Tourism	<u>\$9,225,000</u>
Total, Wealth-Increasing Factors to Citizens	\$16,425,000

Cost-Saving Factors to Citizens

Direct Use Value	\$345,597,000
Health Value	\$19,872,000
Community Cohesion Value	<u>\$5,525,000</u>
Estimated Total, Citizen Cost-Saving Factors	\$370,994,000

Cost-Saving Factors for City Government

Stormwater Management Value	\$842,000
Air Pollution Mitigation Value	<u>\$359,000</u>
Total, Cost-Saving Factors for City Government	\$1,201,000

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

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For a list of local officials who assisted in gathering data for this study, see Appendix I.

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 Sacramento's specifically.

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 Sacramento'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.

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, carbon monoxide, ozone, and some particulate matter. Gases are absorbed by leaves, 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 to estimate pollution removal and value for urban trees. (The Methods for Air Pollution Model are provided in the technical methodology sheets.) This program, which is based on the Urban Forest Effects (UFORE) model of the U.S. Forest Service, 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 Sacramento's parks was obtained through analysis of aerial photography. (While Sacramento and every other city have street trees and numerous other trees on private property, this study measures only the economic value of trees on public parkland.) Of 5,223 acres of parkland, 28 percent was found to be covered with trees.

Then the pollutant flow through Sacramento 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 concentra-

Sacramento Parkland Characteristics

Type of Cover	Acres	Percent
Parkland with Tree Canopy	1,462	28.0%
Other Pervious Surface	2,512	48.1%
Impervious Surface	1,022	19.6%
Water	227	4.3%
Total	5,223	100.0%

Source: Mapping Sustainability, LLC, 2008.

tion data from cities that were obtained from the U.S. EPA.² 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.)

The result of the Air Quality Calculator for the park system of Sacramento (see Calculator 1) is an economic savings value of \$359,000.

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 some cases—cities with systems that 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. Fortunately, Sacra-

mento'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 the 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 has been developed to estimate the value of retained stormwater runoff due to green space in the parks. Inputs to the model consist of geographic location, climate region, surface permeability index, park size, land cover percentages, and types of vegetation. Because of data challenges, the model is not perfect and thus gives only a preliminary indication of value for the park system of the city of Sacramento.

First, Sacramento's land cover data—trees, open grassy areas, impervious surface, etc.—were obtained through analysis of aerial photographs. This analysis reveals that the city's park system is 76.1 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.)

Second, the same photographs were analyzed for the amount of perviousness of the rest of the city of Sacramento—in other words, the city without

² The data are from 1994, the most recent available at the time to the U.S. Forest Service, author of the Air Quality and Stormwater Calculators.

its parkland. It was determined that Sacramento (without its parks and not counting surface water) is 50.9 percent pervious. The pervious private land consists primarily of residential front yards and backyards as well as private natural areas such as cemeteries, university quadrangles, and corporate campuses.

Sacramento Parkland Perviousness

Type of Cover	Acres	Percent
Pervious	3,974	76.1%
Impervious	1,022	19.6%
Water Features	227	4.3%
Total	5,223	100.0%

Source: Mapping Sustainability, LLC, 2007.

Third, the amount and characteristics of rainfall were calculated from U.S. weather data. Sacramento has a characteristic Mediterranean climate with precipitation confined to five winter months; it receives an average of 17.52 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.

City of Sacramento Perviousness

(Without Parkland or Water Surface)

Type of Cover	Acres	Percent
Total Pervious	29,109	50.9%
Total Impervious	28,124	49.1%
Total (without water or parks)	57,233	

Source: Mapping Sustainability, LLC, 2007.

Next, the reduction in runoff was 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 Sacramento Stormwater Management Program. It is known, however, that the city's annual budget for water treatment in fiscal year 2008 was \$37.8 million. Thus, by knowing the amount of rainfall the city receives, it is possible to make an estimate about the cost of treatment. This came out to be \$0.0204 (2.0 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 \$842,000 for Sacramento. (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 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 is presently analyzing 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. 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

Cost of Treating Stormwater in Sacramento

(per cubic foot)

1	City acreage that is impervious (including impervious parkland)	29,145 acres
2	Average annual rainfall per year	17.52 inches
3	Cubic feet of rain per acre	63,598 cu. ft.
4	Cubic feet of rain falling on impervious city land (line 1 x line 3)	1,853,589,149 cu. ft.
5	Annual expenditure on water treatment	\$37,836,000
6	Cost of treatment per cubic foot (line 5 ÷ line 4)	\$0.0204

park itself. It has been found that proximate value (“nearby-ness”) can be measured up to 2,000 feet from a large park. Most of the value, however—whether the park is large or small—is within the first 500 feet, and 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 previous studies, 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 like bedrooms, bathrooms, structure age, and size but ignore hedonic value. Also, because of the effect of the Proposition 13 tax limitation law³ in California, assessments in Sacramento are extremely variable and sometimes widely diverge from sales prices. Thus an extrapo-

lative methodology was formulated to arrive at a reasonable estimate.

Using computerized mapping technology known as GIS, we identified all residential properties within 500 feet of every significant park in Sacramento. (“Significant” was defined as one acre or more; “park” included every park in the city, even those owned by a county, state, federal, or other agency.) According to records of the Sacramento County Assessors Office, there are about 124,000 residential properties (dwelling units) in the city of Sacramento. Using GIS, we determined that there are 28,517 (or 23 percent of the total) dwelling units within 500 feet of a park in the city; these dwelling units have a combined assessed value of \$1,438,394,000.

Unfortunately, because of data and methodology problems, it has not been possible thus far to determine which of Sacramento’s parks are “strongly positive,” “slightly positive,” and “negative”—i.e., adding significant value or 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 as well as an 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 across-the-board amount that parkland adds to the assessed value of all dwellings within 500 feet of parks. (This number is an average of the high [15 percent], medium [5 percent], and low [-5 percent] values that will be used when park quality can be established.) The result for 2006 was \$71.9 million in value due to park proximity.

We then used the residential property tax rate

³ Proposition 13 is an amendment to the state constitution passed in 1978 to roll back property assessments to their 1976 values (the “base year value”) and limit property tax increases to 1 percent of their assessed value. Proposition 13 also limits property valuation to 2 percent per year unless the property was sold.

to determine how much extra tax revenue was raised by the city of Sacramento based on the extra property value due to parks. With a tax rate (sometimes referred to as a “millage”) of \$0.58 per \$100 in assessed value, the result of the Property Value Calculator for the city of Sacramento is \$417,134. (For computations, see Calculator 3; for details, see technical methodology sheets.)

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 Sacramentans of \$71.9 million. If it is assumed that approximately 10 percent of Sacramentans sell their dwellings every year, then the proximate park value realized at the time of sale is \$7.2 million.

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 Sacramento residents.

[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 hedonic effect. Second, it leaves out all the hedonic value of dwellings located between 500 feet and 2,000 feet from a park. Third, it does not include the potentially very significant hedonic value for commercial offices located near downtown parks.]

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 Sacramento, 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 procedures (1979) and by the U.S. Army Corps of Engineers planning manual (2004). The Unit Day Value 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 in-line skating 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 \$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 residents (with 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 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 Sacramento for the year 2007 is \$345,597,000. (For computations, 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, Sacramentans truly are getting pleasure and satisfaction—all \$350 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.

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 is the number of park users 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—the same one carried out for direct use data (above)—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 bird-watching were eliminated. Also, all respondents who engaged in strenuous activities less than three times per week were dropped. Based on the survey and the computations, we found that about 78,000 Sacramentans engage actively enough in parks to improve their health—72,000 of them being under the age of 65 and about 6,000 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 California and the United States as a whole.

The health savings from park use for the residents of Sacramento for the year 2007 is \$19,872,000. (For computations, 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, arenas, and parks as well as special events that take place there, like festivals and sports contests. Though not always appreciated, parks play a major role in Sacramento's tourism economy.

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.)

The principal park agency in Sacramento, the city's Department of Parks and Recreation, has little information on out-of-town 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 Greater Sacramento Convention and Visitors Bureau, we calculated that in 2006 about 5.2 million leisure visitors stayed overnight in the region and that 58 percent of those stayed in the city of Sacramento. Of those, 24 percent visited a park (including Old Sacramento State Park and the State Capitol grounds), yielding a total of about 736,000 overnight tourists who visited a park. Through a similar computation, we determined that about 608,000 day tourists visited a park. (Unfortunately, there are no data on business travel to Sacramento.) Knowing the average spending level of those tourists and making an estimate that one-fifth of all park visitors come to Sacramento *because* of a park, we determined that total park-derived tourist spending came to \$26.1 million. (This conservative methodology assures that we did not count the many tourists who came to Sacramento for other reasons and happened to visit a park without planning a visit.) With an average tax rate on all tourist expenditures of approximately 8.25 percent,⁴ tax revenue to the

city from park-based tourism is \$2,156,000. (For computations, refer to Calculator 6.)

In addition, since 35 percent of every tourist dollar is considered "profit" to the local economy, the citizenry's collective increase in wealth from park-based tourism is \$9,225,000.



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—religious institution, club, political campaign, co-op, or school—adds value to a neighborhood and, by extension, to the whole city.

These human webs, for which the term "social capital" was coined by Jane Jacobs, are strengthened in some communities by parks. From playgrounds to sports fields to park benches to chessboards to swimming pools to ice skating rinks

⁴ 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 8.25 percent, but this is the portion that goes to the City of Sacramento rather than to other jurisdictions such as the State of California.

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 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. Sacramento 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 park foundations, conservancies, and “friends of parks” organizations in Sacramento 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 California—\$20.36 per hour—by the organization Independent Sector.

The result of the Social Capital Calculator for the city of Sacramento in 2006 (the most recent year available) is \$5,525,000. (For computations, see Calculator 7; for details, see technical methodology sheet.)

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 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.

Determining the economic value of a city park system is a science still in its infancy. Much more research and analysis must be undertaken. But 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 Sacramento.



Appendix 1

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

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George Nicholas, *Sacramento County GIS*
Bob Overstreet, *Sacramento City Department of Parks & Recreation*
Ralph Pettingell, *Sacramento City Department of Parks & Recreation*
Jennifer Ragsdale, *Sacramento City Department of Parks & Recreation*
Jonathan Rewers, *Sacramento City Department of Parks & Recreation*
Michael Root, *Sacramento City Department of Parks & Recreation*
Steve Schweigerdt, *Sacramento Tree Foundation*
Carol Shearly, *Sacramento City Department of Planning*
Pat Singer, *Sacramento Department of Utilities*
Jason Sirney, *Sacramento City Department of Fire, GIS*
Kim Swaback, *Sacramento City Department of Parks & Recreation*
Mike Testa, *Greater Sacramento Convention and Visitors Bureau*
J. P. Tindell, *Sacramento City Department of Parks & Recreation*
Alan Tomiyama, *Sacramento City Department of Parks & Recreation*
Tiffany Urnuss, *Research Manager, California Travel and Tourism Commission*
Erik Vink, *Sacramento Office, The Trust for Public Land*

Appendix 2

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 Department 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 Department, 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 3

Resources Related to the Economic Value of Parks

Bedimo-Rung, A. L., A. J. Mowen, and D. Cohen, 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, CA. 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, E. 2006. *The Health Benefits of Parks: How Parks Keep Americans and Their Communities Fit and Healthy*. San Francisco: 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. 2005. 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. 2006. 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. *Air Pollution Modeling and its Application XII*, ed. S. Gryning and N. Chaumerliac: 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. web4.canr.msu.edu/mgm2/econ/.

Wachter, S. M. and G. Wong. July 2006. What Is a Tree Worth? Green-City Strategies and Housing Prices. Available at SSRN: ssrn.com/abstract=931736.

Walker, C. 2004. The Public Value of Urban Parks. Washington, DC: Urban Institute. www.wallacefoundation.org/NR/rdonlyres/5EB4590E-5E12-4E72-B00D-613A42E292E9/0/ThePublicValueofUrbanParks.pdf.



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