

APPENDIX B

Letter 86 Attachment



The Economic Benefits of the Public Park and Recreation System in the City of Los Angeles, California

THE
TRUST
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LAND



The Economic Benefits of the Public Park and Recreation System in the City of Los Angeles, California

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and protects land for people,
ensuring healthy, livable communities
for generations to come.

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Executive summary

LOS ANGELES' LARGE AND VARIED PARK SYSTEM provides substantial economic benefits to the city's residents.¹ The city boasts 40,400 acres of city parkland managed by a host of entities such as the City of Los Angeles, Los Angeles County, the State of California, and the federal government. These spaces include natural spaces and facilities such as dog parks, golf courses, Echo Park Lake, Griffith Park, hundreds of playgrounds and picnic areas, beaches, gardens, trails, and other amenities.

Parks in Los Angeles generate numerous economic benefits for residents by providing free and low-cost recreation activities.² Parks and trails also enhance property values, provide recreational opportunities, improve human health, attract visitors, and provide natural goods and services such as filtering air pollutants and retaining stormwater. They support local jobs, boost spending at local businesses, and create local tax revenue. Specifically, these park areas produce the following economic benefits:³ [See Table 1.](#) ➔

- Parks and trails increase the value of nearby residential properties because people enjoy living close to parks and trails and are willing to pay for the proximity. Parks in Los Angeles raise the value of nearby residential properties by \$2.29 billion and increase property tax revenues by \$27.2 million a year. [See Table 2.](#) ➔
- Parks provide stormwater benefits by capturing precipitation, slowing its runoff, and reducing the volume of water that enters the stormwater system. Parks in Los Angeles provide stormwater retention valued at \$8.03 million annually. [See Table 4.](#) ➔
- Trees and shrubs in parks remove air pollutants that endanger human health and damage structures. Such spaces provide health benefits and reduce pollution control costs in Los Angeles by \$1.58 million per year. [See Table 5.](#) ➔
- At least 7.7 percent of visitors to Los Angeles come to visit parks, trails, recreation centers, and beaches. These visitors are estimated to spend \$415 million annually in the local economy and generate \$27.5 million in local tax revenues. [See Tables 6 and 7.](#) ➔
- Residents also enjoy Los Angeles parks, trails, and recreation centers. Each year residents of Los Angeles receive a benefit of \$334 million for the recreational use of these park facilities. [See Table 9.](#) ➔
- Independent research shows that park use translates into increased physical activity, resulting in medical care costs savings. While all Los Angeles residents who visit the city's parks and recreation centers improve their health simply by visiting, approximately 106,000 adult residents use Los Angeles parks, trails, and recreation centers exclusively to engage in physical activity at a level sufficient to generate measurable health benefits, yielding an annual medical cost savings of \$151 million. [See Table 10.](#) ➔

¹ In this report, "Los Angeles" is used to refer to the City of Los Angeles, unless specified otherwise.

² All economic benefit values estimated in this report are based on an analysis of the entire public park system in the City of Los Angeles, including but not limited to city parks.

³ Los Angeles parks, trails, and recreation centers provide a number of other important economic benefits that cannot be quantified at this time. These include improving quality of life and boosting the local economy by attracting businesses and residents. These benefits create substantial and sustained economic value, which unfortunately is difficult to quantify.

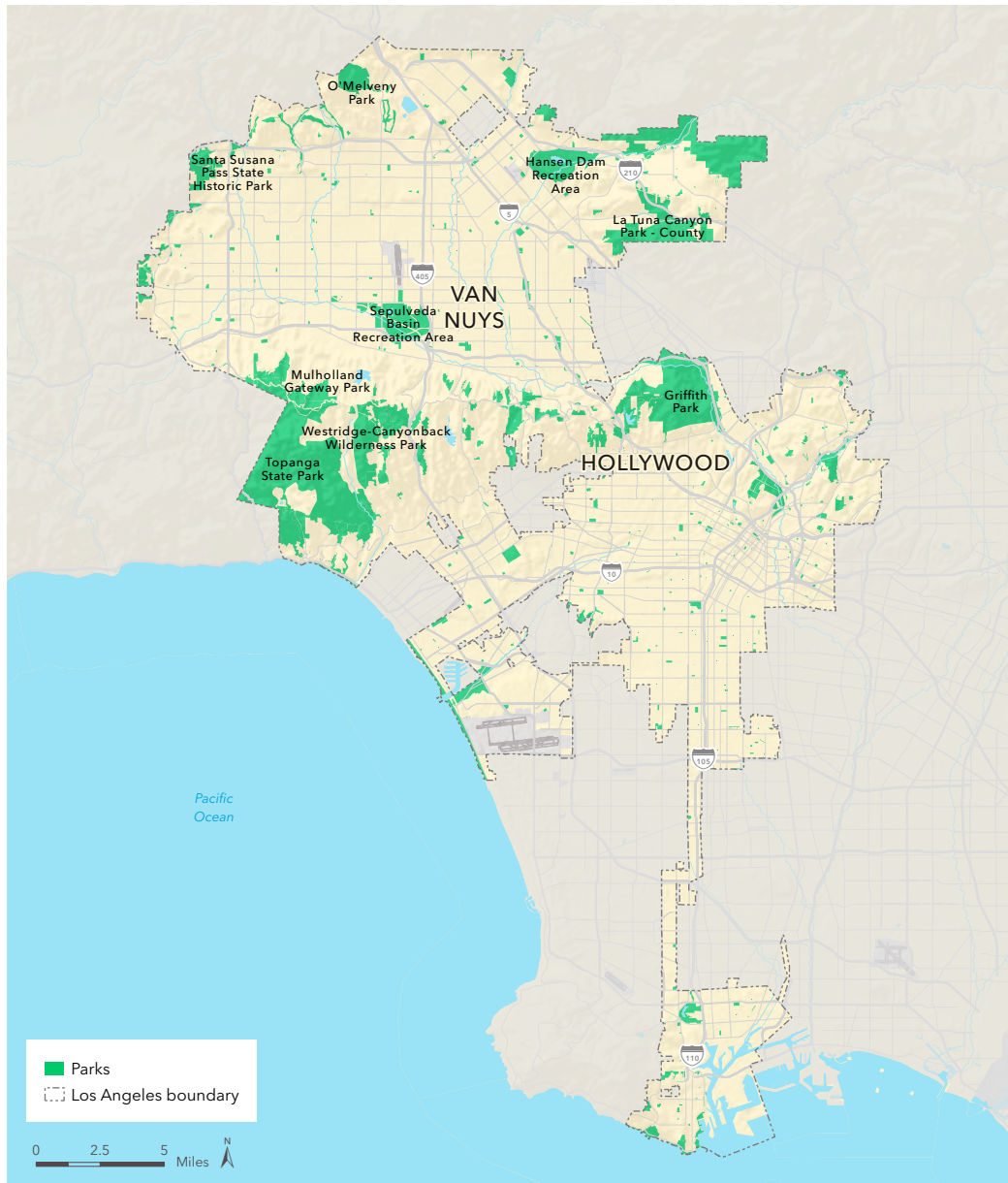
- Parks create a community cohesion benefit of people coming together to improve their parks. This “know-your-neighbor” social capital, while difficult to fully capture, can be measured in terms of the amount of time and money that residents donate to their parks. Annually, \$12.5 million in volunteer time and financial contributions is donated to Los Angeles parks.

See Table 11. ➔

This study illustrates that parks, trails, and recreation centers in Los Angeles are key economic drivers that contribute millions annually in economic benefits.

TABLE 1. SUMMARY OF ESTIMATED BENEFITS OF PARKS, TRAILS, AND RECREATION CENTERS IN LOS ANGELES (2016\$)	
Benefit category	Total
Enhanced property value	
Total additional property value	\$2,290,000,000
Additional annual property tax	\$27,200,000
Stormwater retention	\$8,030,000
Air pollution removal	\$1,580,000
Park tourism	
Total park visitor spending	\$415,000,000
Local sales tax on park visitor spending	\$27,500,000
Recreational use	\$334,000,000
Human health	\$151,000,000
Community cohesion	\$12,500,000

➔ **TABLE 1** All numbers in the text and tables are rounded to three significant digits unless otherwise noted. Because of rounding, some report figures and tables may appear not to sum.



Parkland in the City of Los Angeles

LOS ANGELES ECONOMIC BENEFITS ANALYSIS

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➔ **FIGURE 1** Map of Public Parks in Los Angeles



JUANCARLOS CHAN/LOS ANGELES DEPARTMENT OF RECREATION AND PARKS

Introduction

IT IS IMPOSSIBLE TO IMAGINE Los Angeles without the beauty and positive environmental impact of its large and varied park system or the tremendous human benefits of its recreational opportunities and programs.⁴ With approximately 40,400 acres of parkland managed by a host of entities such as the City of Los Angeles, Los Angeles County, the State of California, and the federal government, the city's vast natural spaces and facilities include dog parks, golf courses, Echo Park Lake, Griffith Park, hundreds of playgrounds and picnic areas, Muscle Beach (and miles of other oceanfront), a Japanese garden, equestrian trails, sports fields and courts, and the Korean Friendship Bell. Los Angeles' Department of Recreation and Parks also provides a diverse set of opportunities involving sports, classes, and special events such as the Lotus Festival, the Hawaiian Family Festival, and world-famous performances at the Greek Theatre.

Park amenities enhance the quality of life in Los Angeles, which is an essential component of any strategy for economic development, especially because the most sought-after employees in today's economy consider more than salary when choosing places of employment. For example, focus groups conducted by Carnegie Mellon University have found that young creative workers, particularly those in high-technology fields, consider lifestyle factors, such as environmental and recreational quality, more heavily than the job itself when choosing where to live.⁵ Another survey of high-technology workers found that a job's attractiveness increases by 33 percent in a community with a high quality of life.⁶ Skilled workers are attracted to places with parks, clean air and water, and diverse opportunities for outdoor recreation. Los Angeles' parks, which provide a host of trails and park-related amenities, as well as ample recreational opportunities, help contribute to making Los Angeles a desirable place to live and work.⁷

By providing park areas and access to an array of free and low-cost recreation activities, such as biking, exercising, exploring nature, gardening, hiking, picnicking, swimming, walking, and wildlife viewing, parks in Los Angeles generate numerous economic benefits. Parks enhance property values, provide recreational opportunities, improve human health, attract visitors, and provide natural goods and services such as filtering air pollutants and retaining stormwater. They support local jobs, boost spending at local businesses, and create local tax revenue. The remainder of this report quantifies these benefits.⁸

4 In this report, "Los Angeles" is used to refer to the City of Los Angeles, unless specified otherwise.

5 Richard Florida, *Cities and the Creative Class* (New York: Routledge, 2005), accessed April 14, 2016, https://books.google.com/books?id=SDeUAgAAQBAJ&dq=quality+of+life+job+attractiveness+workers&source=gbs_navlinks_s.

6 Garry Sears and Daniela De Cecco, *High-Tech Labour Survey: Attracting and Retaining High-Tech Workers*, KPMG and CATA Alliance, 1998, accessed June 21, 2016, <http://www.cata.ca/files/PDF/misc/High-TechLabourSurvey98.pdf>.

7 Businesses are also drawn to these places to recruit the best workers. Companies, particularly those involved with the knowledge economy, are increasingly moving to places with access to nature and outdoor spaces. One article explains that the debates about public lands argue that they are a drag on local economies, when in fact they are essential to providing the types of places that attract businesses, talent, and investment. Furthermore, the study by Headwaters Economics states that the "value of public lands lies in its ability to attract people—and their businesses—who want to live near protected lands for quality of life reasons." Sources: Lynn Scarlett, "For Today's Companies, Nature Is a Top Recruiter," *Greenbiz*, August 12, 2015, accessed September 2, 2015, <http://www.greenbiz.com/article/todays-companies-nature-top-recruiter?src=nws8-20>; Chris Mehl, *The Economic Benefits of the Land and Water Conservation Fund*, Headwaters Economics, 2009, accessed June 21, 2016, http://headwaterseconomics.org/pubs/protected-lands/LWCF_Economic_Benefits.pdf.

8 All economic benefit values estimated in this report are based on an analysis of the entire public park system in the City of Los Angeles, including but not limited to city parks.

Enhanced property value

NUMEROUS STUDIES HAVE SHOWN THAT PARKS AND TRAILS have a positive impact on nearby residential property values.⁹ In fact, two recent studies of homes in Los Angeles found that parks increase the value of the properties in proximity.¹⁰ All things being equal, most people are willing to pay more for a home close to a nice park. The property value added by park areas is separate from the direct recreational use value gained; property value goes up even if the resident never visits the park.

Property value is affected primarily by two factors: distance from and quality of the park. While proximate value can be measured up to 2,000 feet from a park, most of the value – whether such spaces are large or small – is within the first 500 feet.¹¹ Therefore, this analysis of enhanced property value has been limited to 500 feet.

The Trust for Public Land identified all residential parcels within 500 feet of all public parks in the City of Los Angeles.¹² Thus, this analysis includes multiple-unit dwellings (e.g., apartments) and single-family homes.¹³ The Trust for Public Land utilized tax assessment data for 2015. All values and tax amounts were then adjusted to 2016 dollars using the consumer price index for all urban consumers and for all items.¹⁴ In 2015, 84,300, or 12 percent, of Los Angeles' 719,000 residential parcels were located within 500 feet of a park. **These residential parcels had a total assessed value of \$45.7 billion (2016\$), as shown in Table 2.** ➔

People's desire to live near a park also depends on the quality of the park. Beautiful natural resource areas with public access, scenic vistas, and bodies of water are markedly valuable. Those with excellent recreational facilities are also desirable, although sometimes the greatest property values are realized a block or two away if there are issues of noise, lights, or parking. Less attractive or poorly maintained parks may provide only marginal value to surrounding property values, and in some cases, these areas may actually reduce nearby property values.

9 Virginia McConnell and Margaret Walls, *The Value of Open Space: Evidence from Studies of Nonmarket Benefits* (Washington, DC: Resources for the Future, 2005); John L. Crompton, "The Impact of Parks on Property Values: Empirical Evidence from the Past Two Decades in the United States," *Managing Leisure* 10, no. 4 (2005): 203-218.

10 Delores Conway et al., "A Spatial Autocorrelation Approach for Examining the Effects of Urban Greenspace on Residential Property Values," *Journal of Real Estate Finance and Economics* 41, no. 2 (2010): 150-169; Jean-Daniel Saphores and Wei Li, "Estimating the Value of Urban Green Areas: A Hedonic Pricing Analysis of the Single Family Housing Market in Los Angeles, CA," *Landscape and Urban Planning* 104, no. 3-4 (2012): 373-387.

11 B. Bolitzer and N. R. Netusil, "The Impact of Open Spaces on Property Values in Portland, Oregon," *Journal of Environmental Management* 59, no. 3 (2000): 185-193; John L. Crompton, "The Impact of Parks on Property Values: A Review of the Empirical Evidence," *Journal of Leisure Research* 33, no. 1 (2001): 1-31; Brad Broberg, "Everybody Loves a Park: Green Space Is a Premium When Building, Buying, or Selling," *On Common Ground*, National Association of Realtors, 2009, 20-25; John L. Crompton, *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, 2004); Sarah Nicholls and John Crompton, "The Impact of Greenways on Property Values: Evidence from Austin, Texas," *Journal of Leisure Research* 37, no. 3 (2005): 321-341.

12 Residential parcels were determined using data from Los Angeles County. A residential parcel can contain multiple residential units. According to the most recent data from the U.S. Census, there were 1.41 million housing units in Los Angeles in 2010.

13 Other property types were not considered in this analysis because sufficient data were not available to quantify the benefit. Nonresidential property types are rarely studied in the literature as they are much more difficult to statistically analyze because there are more variables that influence value and fewer real estate transactions to compare.

14 The adjustment to 2016 dollars was made using the Bureau of Labor Statistics' consumer price index for all urban consumers and for all items, specifically utilizing the annual average index from 2015 and the May 2016 unadjusted index, which was the most recent index available at the time of this analysis. Source: U.S. Department of Labor, Bureau of Labor Statistics, "Consumer Price Index," accessed June 30, 2016, <http://www.bls.gov/cpi/data.htm>.

Assessing the quality of parks for this type of analysis is difficult given the subjective nature of park quality and the variation in quality across time. As such, this analysis utilizes estimates from the published literature regarding the value of parks on property values.¹⁵

A conservative value of 5 percent has been assigned as the amount that parks add to the market value of all dwellings within 500 feet. This value takes into consideration lower-quality parks that could potentially decrease property values, as well as high-quality parks that could boost property values by as much as 20 percent. For example, a 2009 report from the National Association of Realtors found the premium for homes near parks can extend three blocks and start at 20 percent for those homes directly adjacent (declining as distance from the park increases).¹⁶ The 5 percent premium assigned in this study is the increase in a home's value due to its proximity to the park system alone. The measurement controls for characteristics of the house as well as other locational characteristics such as proximity to transportation networks and central business districts. Holding all other factors constant, The Trust for Public Land assumes that parks alone increase property values by 5 percent.

This analysis estimates that in 2015 an added \$2.29 billion (2016\$) in residential property value existed because of proximity to parks in Los Angeles¹⁷ (Table 2). • The residential property tax rates for each parcel were used to determine how much additional tax revenue was raised by local units of government.¹⁸ As shown in Table 2, the total value captured in additional property tax revenue derived from parks in Los Angeles annually is \$27.2 million (2016\$). •

These estimates are conservative for the following reasons. First, the estimates leave out the value of dwellings located beyond 500 feet from a park, even though evidence exists for marginal property value increases beyond such distances. For example, one study in Portland, Oregon, found that public parks within 1,500 feet increase a home's sale price by \$2,260, or 3.4 percent of the average home's value. Other studies have found that value can be measured at distances up to 2,000 feet. Second, these estimates only capture a 5 percent marginal value for parks, though studies have shown higher premiums. One study in Austin, Texas, found that direct adjacency to greenbelts increased average home value by 5.7 or 12.2 percent, depending on the greenbelt. Other studies have found that parks can have up to a 20 percent premium.

15 Crompton, *The Proximate Principle: The Impact of Parks, Open Space and Water Features on Residential Property Values and the Property Tax Base*.

16 Broberg, "Everybody Loves a Park: Green Space Is a Premium When Building, Buying, or Selling."

17 In addition to the literature cited, this estimate relies on geospatial parks data provided by the City of Los Angeles and parcel and tax assessment data provided by Los Angeles County. Assessed value is used in this analysis. Local real property is assessed at acquisition value and adjusted upward each year. The process that county assessors use to determine the value of real property was established by California Proposition 13 (1978). Under this system, when real property is purchased, the county assessor assigns it an assessed value that is equal to its purchase price, or "acquisition value." Each year thereafter, the property's assessed value increases by 2 percent or the rate of inflation, whichever is lower. This process continues until the property is sold, at which point the county assessor again assigns it an assessed value equal to its most recent purchase price. In other words, a property's assessed value resets to market value (what a willing buyer would pay for it) when it is sold. Source: California Legislative Analyst's Office, "Understanding California's Property Taxes," last modified November 29, 2012, accessed August 18, 2015, <http://www.lao.ca.gov/reports/2012/tax/property-tax-primer-112912.aspx>.

18 According to the California Legislative Analyst's Office, the general tax levy is based on state law and is limited to 1 percent of assessed value (\$1 per \$100 of assessed value). Source: "Understanding California's Property Taxes."

Therefore, these estimates provide a lower bound estimate of the “true” impact of parks on property values.¹⁹

The Trust for Public Land recognizes that with increased property values comes the potential for displacement of current residents due to rising, unaffordable housing costs. Careful community engagement, planning, and crafted policy can help ensure park projects are and continue to be enjoyed by existing residents, as well as newcomers, for years to come. This is a complicated issue, but a vital piece of the conversation surrounding the economic benefits of parks.

TABLE 2. ENHANCED RESIDENTIAL PROPERTY VALUE DUE TO PROXIMITY TO PARKS IN LOS ANGELES (2016\$)

Number of homes within 500 feet	Total assessed value within 500 feet	Additional assessed value due to parks*	Additional property tax revenue due to parks**
84,300	\$45,700,000,000	\$2,290,000,000	\$27,200,000

*This benefit is a one-time value that would accrue to property owners upon the sale of their home.

**This benefit represents the additional annual revenue received by the City of Los Angeles’ General Fund, providing a direct benefit to all city residents.



¹⁹ Bolitzer and Netusil, “The Impact of Open Spaces on Property Values in Portland, Oregon”; Broberg, “Everybody Loves a Park: Green Space Is a Premium When Building, Buying, or Selling”; Nicholls and Crompton, “The Impact of Greenways on Property Values: Evidence from Austin, Texas.”

Stormwater retention value

STORMWATER IS AN IMPORTANT ISSUE FOR LOS ANGELES. Traditionally seen as a negative in the region, rainwater flows off roads, sidewalks, and other impervious surfaces, causing flooding, erosion, and declines in water quality by picking up and carrying pollutants with it. However, given the water challenges currently faced in Southern California, stormwater is beginning to be viewed as a resource that can be harnessed to help meet current and future water demands.²⁰

The parks in Los Angeles capture precipitation, slow runoff, and recharge groundwater supplies, helping to provide a barrier against seawater intrusion.²¹ Large pervious (absorbent) surface areas allow precipitation to infiltrate and recharge groundwater. In effect, parks function like mini storage reservoirs and are the original form of green infrastructure.

In order to measure the value of stormwater retention, The Trust for Public Land needed to estimate how much stormwater was being captured by parks. To do this, the team relied on a model developed by the former Western Research Station of the U.S. Forest Service to estimate the quantity of stormwater retained by parks. Inputs to the model consist of geographic location, climate region, surface permeability, acres of parkland, land cover, and vegetation types.

To calculate the quantity of stormwater retained by parks, The Trust for Public Land first determined the perviousness of the parks in Los Angeles using geospatial information on public parks in the City of Los Angeles and the 2011 National Land Cover Database.²² Impervious areas in parks consist of things like roadways, trails, parking areas, buildings, and hard courts. **Parks in Los Angeles are 94 percent permeable and 6 percent impermeable (Table 3).** ➔

20 The Los Angeles Department of Water and Power (LADWP) is responsible for delivering water to nearly 4 million residents at 675,000 active service connections. Between FY 2011 and FY 2015, 29 percent of LADWP's water was sourced from the Los Angeles Aqueduct from the eastern Sierra Nevada, 57 percent was purchased from the Metropolitan Water District (Bay Delta and Colorado River), 12 percent was from groundwater, and 2 percent was recycled water. LADWP is committed to expanding the use of recycled water to offset potable demands as well as irrigation and industrial demands. By 2035, LADWP aims to increase the supply met by recycled water to 59,000 acre feet per year (AFY). This, along with other policies, would decrease the amount of water purchased from the Metropolitan Water District. In Los Angeles, stormwater capture is essential to stopping the long-term decrease in stored groundwater and is seen as an important way to recharge groundwater and capture water for reuse. The city estimates that additional stormwater projects will increase groundwater recharge by 66,000 AFY and increase direct use by 2,000 AFY, conservatively resulting in a stormwater capture potential of 132,000 AFY by 2035. Sources: Los Angeles Department of Water and Power, *Urban Water Management Plan*, 2015, accessed July 6, 2016, https://www.ladwp.com/ladwp/faces/wcnav_externalId/a-w-sos-uwmp;jsessionid=Jtp3X9bcwb9bJc6Dg1bzZkPNMdyNz62xSpr6BIGVg7MQ8V1PSpGT!1460259645?_adf.ctrl-state=x43losjh1_4&_afLoop=1345813815961759&_afWindowMode=0&_afWindowId=null#%40%3F_afrWindowId%3Dnull%26_afrLoop%3D1345813815961759%26_afrWindowMode%3D0%26_afrWindowId%3Dsdn8jdjk_4; Los Angeles Department of Water and Power, "Facts and Figures," accessed December 31, 2015, https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-water/a-w-factandfigures?_adf.ctrl-state=twvho617j_4&_afLoop=1122906587789348; Los Angeles Department of Water and Power, and LA Sanitation, LADWP Recycled Water Annual Report: Fiscal Year 2014-15, 2015; Los Angeles Department of Water and Power, "Stormwater Capture Master Plan," accessed December 31, 2015, https://www.ladwp.com/ladwp/faces/wcnav_externalId/a-w-stormwatercapturemp?_afLoop=1125326084216423&_afWindowMode=0&_afWindowId=twvho617j_96#%40%3F_afrWindowId%3Dtwvho617j_96%26_afrLoop%3D1125326084216423%26_afrWindowMode%3D0%26_afrWindowId%3Dtwvho617j_128.

21 Saltwater intrusion can occur when groundwater pumping reduces the normally occurring flow of freshwater toward the sea and causes saltwater to be drawn into the freshwater aquifer, often spoiling the drinking water quality. The growth in population and groundwater use in Los Angeles has led to saltwater intrusion in its coastal aquifers. Barriers, or injection wells, have been constructed to try to stop saltwater intrusion; however, the barriers are only partially effective. Sources: "Saltwater Intrusion," U.S. Geological Survey, accessed June 22, 2016, <http://water.usgs.gov/ogw/gwrp/saltwater/salt.html>; Brian D. Edwards and Kevin R. Evans, *Saltwater Intrusion in Los Angeles Area Coastal Aquifers—The Marine Connection*, U.S. Geological Survey, 2002, last modified May 17, 2005, accessed June 22, 2016, <http://pubs.usgs.gov/fs/2002/fs030-02/index.html>.

22 The percent impervious surface area is defined by the U.S. Geological Survey and represents the fraction of impervious surface area in a 30-meter grid.

Second, The Trust for Public Land estimated the amount of perviousness of the rest of Los Angeles (i.e., the city without its parkland) using the same data. The pervious land consists largely of residential front and back yards and private open space areas such as country clubs, cemeteries, public institution grounds, and office campuses. Impervious land includes sidewalks, streets, parking areas, and rooftops. Los Angeles, without its parkland, is 49 percent permeable and 51 percent impermeable. Therefore, the parkland in Los Angeles is more permeable than the land in other parts of Los Angeles.²³ That is, parks have more land area that allows water to be absorbed compared to the other parts of the city.

Third, the University of California, Davis, modeled the runoff reduction of parks in Los Angeles as part of The Trust for Public Land's analysis. Using the amount and characteristics of rainfall from weather data, researchers determined that Los Angeles typically receives 14.4 inches of rain per year.²⁴ They calculated the reduction in runoff attributable to parks in Los Angeles by comparing the modeled runoff with the runoff that would leave a hypothetical park site of the same size but with land cover that is typical of surrounding development (i.e., with streets, rooftops, or parking lots).²⁵ In other words, this analysis does not measure all of the water that is absorbed by parks in Los Angeles, but instead the amount of water that is retained by parks above what would be retained had the parkland been developed as the rest of the city.

The final step is determining the economic value of stormwater retention by parks in Los Angeles. Los Angeles Department of Water and Power (LADWP) considers infiltrated stormwater to be beneficial and values it in the city's cost-benefit analyses at the full-service untreated-water rate, which at the time of analysis was \$594 per acre foot, or \$0.01 per cubic foot (ft³).²⁶

A total annual stormwater retention value of \$8.03 million (2016\$) is estimated for all public parks in Los Angeles²⁷ (Table 4). ➔

23 The infiltration capacity of the soil varies across pervious areas and the soil type determines how much water is actually infiltrated. For example, parks with sandy soils will retain and infiltrate more water than parks with clay soils. However, owing to resource and data limitations, the infiltration capacity is not included in this analysis.

24 The model uses real precipitation data from 2008. The selection of which year's precipitation data to use is based on the annual precipitation that is closest to normal with the smallest standard deviation for annual precipitation and for annual air temperature. Furthermore, the year must be within the last 20 years.

25 The model also takes into account vegetation coverage. According to a recent study of Los Angeles' park trees, 43 percent are broadleaf evergreen, 27 percent are broadleaf deciduous, 22 percent are conifers, and 8 percent are palms. Source: Davey Resource Group, *City of Los Angeles Urban Forest Resource Analysis of Inventoried Park Trees*, prepared for City of Los Angeles Department of Recreation and Parks, 2014.

26 Rafael Villegas, Los Angeles Department of Water and Power, email message to author, March 28, 2016; Metropolitan Water District of Southern California, "Financial Information—Water Rates and Charges," accessed February 23, 2016, <http://www.mwdh2o.com/WhoWeAre/Management/Financial-Information/Pages/default.aspx>.

27 This estimate represents the value of water that is retained by parks above and beyond what would be retained if parks were developed similarly to the surrounding city. While not all of this water reaches the potable water aquifer and becomes part of the water supply, it is a reasonable estimate of the additional volume of water absorbed by parks. LADWP sees captured stormwater as an alternative to having to import and infiltrate water from more expensive sources, including the Metropolitan Water District. Stormwater that is captured at locations that do not infiltrate into a potable aquifer would not directly offset the needs to import more water. Not all of the parks in Los Angeles capture water that becomes part of a potable aquifer; however, The Trust for Public Land believes that this is still a conservative estimate of the stormwater value. The full-service untreated-water rate is used because the water captured would have to be treated before use; however, the degree of treatment would depend on the intended use of the water. In many cases, parks have the potential to capture water that can be used to meet landscaping needs within the park, or captured, treated, and sold for other purposes, including drinking water or groundwater replenishment. This benefit accrues to all residents and businesses in Los Angeles.

TABLE 3. ACREAGE AND PERMEABILITY OF ALL PARKS IN LOS ANGELES (2016)

Acres of parks	Acres	Percent of total area
With pervious area	38,000	94%
With impervious area	2,420	6%
Total	40,400	100%

TABLE 4. ANNUAL STORMWATER COST SAVINGS FROM ALL PARKS IN LOS ANGELES (2016\$)

Acres of parks	Acres	Percent of total area
Rainfall	14.4	2,120,000,000ft ³
Runoff with parks	0.75	110,000,000ft ³
Runoff without parks	4.77	699,000,000ft ³
Runoff reduction from parks*	4.02	589,000,000ft ³
Value of stormwater (\$ per cubic foot)**		\$0.01
Total park stormwater infiltration value		\$8,030,000

➔ **TABLE 4** All figures in this table are derived from the model that was developed by the University of California, Davis, with the exception of the value of stormwater, which is based on LADWP water rates.

* A more accurate estimate of runoff reduction from parks would consider soil type and slope; however, these data were not available at the time of the analysis.

** Metropolitan Water District of Southern California, "Financial Information—Water Rates and Charges."



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Air pollution removal by vegetation

ASSOCIATED WITH METROPOLITAN GROWTH, AIR POLLUTION IS A SIGNIFICANT AND EXPENSIVE PROBLEM that injures human health and damages structures. Human cardiovascular and respiratory systems are affected, with broad consequences for health care costs and productivity.²⁸ In addition, particulate matter, smog, and ozone increase the need to clean and repair buildings and other infrastructure.²⁹

Trees and shrubs have the ability to remove pollutants from the air. Leaves absorb gases such as nitrogen dioxide, sulfur dioxide, carbon monoxide, and ozone. Particulate matter, which includes small particles of dust, metals, chemicals, and acids, can also be removed when it adheres to plant surfaces.³⁰ The vegetation in parks plays a role in improving air quality, helping nearby areas avoid the costs associated with pollution.³¹ This is especially important in the Los Angeles Basin, where federal ozone standards are exceeded on an average of 115 days per year.³²

This study includes an analysis of the air pollution removal benefits that result from public parks within the City of Los Angeles. The Northern Research Station of the U.S. Forest Service in Syracuse, New York, designed a calculator for The Trust for Public Land to estimate air pollution removal by park vegetation and the value of pollution removed by this vegetation. This program utilizes the U.S. Forest Service's i-Tree Eco model, which is location-specific, and incorporates factors such as tree canopy, pollution, weather, and U.S. Census data for Los Angeles.³³

The Trust for Public Land determined the amount of tree canopy cover in the public parks in Los Angeles using the 2011 National Land Cover Database (the most recent data available).³⁴ Tree canopy covers 6 percent of the parkland owned by the city and 7 percent of the other parkland in Los Angeles. The i-Tree Eco model processed the tree canopy cover data to estimate hourly changes in annual air pollution removal due to park trees. The model then estimated the value of these changes for each pollutant based on values established by i-Tree researchers, which were primarily related to savings in health care costs. These values were derived from the

28 Marilena Kampa and Elias Castanas, "Human Health Effects of Air Pollution, Environmental Pollution," *Environmental Pollution* 151 (2007): 362-367; Janet Currie, "Pollution and Infant Health," *Child Development Perspectives* 7 (2013): 237-242.

29 R. N. Butlin, "Effects of Air Pollutants on Buildings and Materials," *Proceedings of the Royal Society of Edinburgh. Section B. Biological Sciences* 97 (1990): 255-272; U.S. Environmental Protection Agency, *The Plain English Guide to the Clean Air Act*, EPA-456/K-07-001, Office of Air Quality Planning and Standards, 2007; American Lung Association, "Health Effects of Ozone and Particle Pollution," accessed February 17, 2017, <http://www.lung.org/our-initiatives/healthy-air/sota/health-risks/>.

30 Particulate matter includes fine and coarse particles. Fine particles consist of particulate matter less than 2.5 micrometers in diameter and are so small they can be detected only with an electron microscope. Sources include all types of combustion, including motor vehicles, power plants, and residential wood burning. Coarse dust particles consist of particulate matter between 2.5 and 10 micrometers in diameter and are generated by crushing and grinding operations as well as dust stirred up by cars traveling on roads. Source: U.S. Environmental Protection Agency, "Particle Pollution (PM)," accessed February 17, 2017, <https://www.airnow.gov/index.cfm?action=aqibasics.particle>.

31 David J. Nowak et al., "Modeled PM_{2.5} Removal by Trees in Ten U.S. Cities and Associated Health Effects," *Environmental Pollution* 178 (2013): 395-402.

32 Davey Resource Group, *City of Los Angeles Urban Forest Resource Analysis of Inventoried Park Trees*.

33 David J. Nowak et al., "Tree and Forest Effects on Air Quality and Human Health in the United States," *Environmental Pollution* 193 (2014): 119-129.

34 The percent tree canopy cover is defined by the U.S. Geological Survey as the proportion of a 30-meter grid covered by tree canopy. Using this data results in a conservative estimate as it may not fully capture all individual trees.

Environmental Protection Agency's environmental Benefits Mapping and Analysis Program (BenMap) as well as other externality values used in energy decision making developed by a well-cited study.³⁵ These values were then adjusted to 2016 dollars using the producer price index.³⁶

A total value of \$1.58 million (2016\$) in air pollution removal was estimated for public parks in Los Angeles³⁷ (Table 5). ➔

TABLE 5. VALUE OF AIR POLLUTION REMOVED BY PUBLIC PARKS IN LOS ANGELES EACH YEAR

Pollutant	Pollution removed (pounds)	Pollutant removal value
Carbon monoxide	5,400	\$3,730
Nitrogen dioxide	34,500	\$20,700
Ozone	192,000	\$1,110,000
Coarse dust particles	48,600	\$158,000
Fine particles	2,900	\$284,000
Sulfur dioxide	6,950	\$1,300
Total	290,900	\$1,580,000



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³⁵ F. J. Murray, L. Marsh, and P. A. Bradford, *New York State Energy Plan, Vol. II: Issue Reports* (Albany, NY: New York State Energy Office).

³⁶ U.S. Department of Labor, Bureau of Labor Statistics, "Producer Price Indexes", accessed February 17, 2017, www.bls.gov/ppi/.

³⁷ This benefit accrues to the residents, businesses, and visitors of Los Angeles.

City park tourism

LOS ANGELES IS FAMOUS FOR GREAT WEATHER, so its parks and beaches are a particular lure as outdoor venues for sunshine-based tourism. Tourists visit parks and trails in Los Angeles to participate in a wide variety of activities. For example, Griffith Park, one of the largest municipal parks in the U.S., offers great views, hiking trails, the Griffith Observatory, the Greek Theatre, golf, a zoo, and even horseback riding. Runyon Canyon in the middle of Hollywood offers 106 acres for visitors to walk, bike, and bring their dogs. Out-of-towners also come for numerous special park events and festivals, including the Lotus Festival in Echo Park, the Hawaiian Family Festival in Northridge Park, the Hansen Dam Triathlon, concerts at MacArthur Park and Pershing Square, Old Fort MacArthur Days, and Victorian Christmas at the Banning Museum.

In Los Angeles, parks and trails are owned and managed by a great diversity of agencies: the City of Los Angeles Department of Recreation and Parks, the Los Angeles County Department of Parks and Recreation, the California Department of Parks and Recreation, the Mountains Recreation and Conservation Authority, the U.S. Forest Service, the Los Angeles Department of Water and Power, and the Port of Los Angeles.³⁸ Together, these entities provide vast acreage and much of the programming that brings out-of-towners to the city.

Though not always recognized, parks and trails play a significant role in the tourism economy of Los Angeles. Even if tourists use many parks for free, or spend modestly on recreational activities, they end up spending considerable amounts on food, entertainment, lodging, fuel, gifts, and other factors during their time in Los Angeles.

Unfortunately, visitor numbers and tourist expenditures are not tracked by park agencies and organizations – and park visits are not tracked by the tourism agency. Since it is not possible to extrapolate the number of visitors to all of the parks and trails in the city based on visitor information, The Trust for Public Land sought an alternative approach to estimating visitor spending attributable to park visitors.

This alternative approach relies on information about visitor spending in the city as well as information about the reasons people come to the city. While visitor information is not available for the city alone, data are available for Los Angeles County. Thus, The Trust for Public Land estimated tourism statistics for the city using the available data on tourism in the county. **As shown in Table 6, total direct travel spending by visitors in Los Angeles County is \$19.6 billion (2014\$) annually, which generates \$1.3 billion (2014\$) in local tax revenue.**³⁹ Since visitor information is not available for the city, The Trust for Public Land utilized data on

³⁸ Peter Harnik, Abby Martin, and Kyle Barnhart, 2015 *City Park Facts*, The Trust for Public Land, accessed June 21, 2016, https://www.tpl.org/sites/default/files/files_upload/2015-City-Park-Facts-Report.pdf.

³⁹ At the time of this analysis, the most recent tourism statistics were available for 2014 only. These 2014 figures were cited in the 2014 and 2015 *Quick Facts* reports available on the Los Angeles Tourism's research website. Sources: Tourism Economics, *Los Angeles Tourism by Numbers: 2015 Quick Facts*, accessed June 21, 2016, <http://www.discoverlosangeles.com/tourism/research>; Tourism Economics, *Los Angeles Tourism by Numbers: 2014 Quick Facts*, accessed December 23, 2015, <http://www.discoverlosangeles.com/tourism/research>; Los Angeles Tourism and Convention Board, *Annual Report 2013-2014*.



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hotel rooms as the best available proxy for tourism activity.⁴⁰ First, The Trust for Public Land determined the percentage of rooms in Los Angeles County that are in fact located within the city boundary. According to STR, Inc., a leading provider of data for the hotel industry, 26,600 of the county's 98,100 rooms, or 27.1 percent, are located in the city.⁴¹ The Trust for Public Land determined that using hotel rooms as a proxy for tourism activity is a reasonable approach as two-thirds (or 29.5 million of the total 44.2 million) of the visitors to Los Angeles County were overnight visitors staying in hotels, and these overnight visitors accounted for 95.4 percent (or \$18.7 billion of the total \$19.6 billion) of direct visitor spending in 2014.⁴² The Trust for Public Land then applied the percentage of rooms in the city to the county's total visitor spending and tax revenues to estimate the total visitor spending and tax revenues in the city. The Trust for Public Land also adjusted the 2014 estimates to 2016 dollars using the consumer price index for all urban consumers for all items. **This resulted in an estimate of \$5.39 billion (2016\$) in travel spending by visitors to the city and \$358 million (2016\$) in local tax revenues (Table 7).** ➔

Next, The Trust for Public Land estimated the proportion of the city's tourism spending and local tax revenues that were attributable to parks. While there has been no hard study of the primary reason tourists come to Los Angeles, information provided by Visit California reveals that 7.7 percent of visitors to California come primarily to take part in outdoor recreation.⁴³ The Trust for Public Land believes applying this percentage to the city is conservative because recent tourism research in Los Angeles County found that many visitors engage in park activities, that is, 20.7 percent of leisure visitors participated in outdoor recreation and 49.8 percent visited a beach.⁴⁴

⁴⁰ The Trust for Public Land used hotel rooms as a proxy for tourism activity despite the fact that not all tourists utilize such accommodations. While many tourists stay with family or seek other accommodations, such as those provided by Airbnb, hotel rooms can still be utilized to roughly estimate how total tourism expenditures are distributed between the city and the remainder of the county. Using this proxy requires the assumption that there is a similar distribution of non-hotel lodging options between the city and county as well.

⁴¹ Elyse Carfrey, STR, Inc., email message to the author, February 2, 2016.

⁴² Tourism spending was not available for 2015 at the time that this report was finalized in July 2016; however, there was a similar percentage of overnight visitors in 2014 and 2015. Tourism Economics, *Los Angeles Tourism by Numbers: 2014 Quick Facts*.

⁴³ TNS TravelsAmerica, 2014 *Domestic Travel to California: Trip and Travel Behavior and Stats*, accessed June 25, 2015, http://industry.visitcalifornia.com/media/uploads/files/editor/Domestic%20Travel%20Report%202014_Final.pdf.

⁴⁴ Chelsea Hoff, Tourism Insights, Los Angeles Tourism and Convention Board, email message with the author, January 7, 2016. This email included information produced by Destination Analysts.

While these activities were not the primary purposes of tourists' visits, these findings do support the importance of these amenities in attracting visitors. Extrapolating this percentage to the city, The Trust for Public Land estimates that approximately \$415 million in spending each year is attributable to visitors' use of the city's parks and trails.⁴⁵ Spending by these park-using visitors generates an estimated \$27.5 million in local tax revenue.⁴⁶ (Table 7) ➔

**TABLE 6. TOURISM SPENDING AND THE OUTDOORS
IN LOS ANGELES COUNTY (2014\$)**

Category	Value
Total direct travel spending by visitors to Los Angeles County*	\$19,600,000,000
Local tourism tax revenue in Los Angeles County**	\$1,300,000,000
Percentage of tourists whose primary reason to visit California is outdoor recreation	7.7%

* This total direct travel spending is reported for 2014. Tourism Economics, *Los Angeles Tourism by Numbers: 2014 Quick Facts*.

** Local tax revenue is reported for 2013 by the Los Angeles Tourism and Convention Board, *Annual Report 2013-2014*.

**TABLE 7. TOURISM SPENDING AND THE OUTDOORS
IN THE CITY OF LOS ANGELES (2016\$)**

Category	Value
Estimated proportion of Los Angeles County tourism spending that occurs in Los Angeles City*	27.1%
Estimated total direct travel spending by visitors to Los Angeles City	\$5,390,000,000
Estimated local tourism tax revenue in Los Angeles City	\$358,000,000
Approximate spending of tourists whose primary reason to visit Los Angeles City is parks and trails	\$415,000,000
Approximate local tourism tax revenue attributable to parks and trails	\$27,500,000

* As of January 2016, there were 98,135 rooms in Los Angeles County, 26,631 of which were in the City of Los Angeles, or 27.1 percent. The Trust for Public Land used this percentage as a proxy for the percentage of spending by overnight visitors in the city. Source: Elyse Carfrey, STR Inc., email message to the author, February 2, 2016.

⁴⁵ The Trust for Public Land estimated the visitor spending and tax revenues that are generated in Los Angeles due to its parks and trails by applying the percentage of visitors who primarily visit California to recreate outdoors to the estimated direct travel spending in the city (e.g., visitor expenditures on lodging, food, and gas) and the tax revenues within the city. Direct travel spending does not represent collective profit to the city economy from park-generated tourism. A portion of consumer spending covers expenses (e.g., materials and labor) and a portion represents profit.

⁴⁶ These tourism benefits accrue to local businesses as well as residents of Los Angeles who gain from the additional tax revenue.

Recreational use value

IN ADDITION TO BOLSTERING THE TOURISM ECONOMY, parks and trails provide substantial economic benefits through their wide use by local residents. Parks, trails, and recreation centers in Los Angeles provide direct recreational value to residents by offering access to recreational opportunities such as using playgrounds, picnicking, resting and relaxing, visiting the beach, and participating in water sports such as kayaking, surfing, or swimming.

Most recreational uses in public parks, such as Los Angeles' parks, are free of charge, but economists can calculate their value by determining the consumer's "willingness-to-pay" for the same experience in the private marketplace. In other words, if parks were not available in Los Angeles, how much would residents have to pay for similar experiences in commercial facilities or venues? Rather than income, the recreational use value represents the amount of money that residents save by not having to pay market rates to indulge in the park activities they enjoy. The value from nonresident park use was excluded from this analysis since it is covered in the previous tourism section (see page 18).⁴⁷

The Trust for Public Land first determined the number of visits to parks and facilities in Los Angeles through a professionally conducted telephone survey of Los Angeles residents.⁴⁸ Respondents provided information related to their visitation of Los Angeles parks and facilities and the types of activities in which they participated. Adults with children under the age of 18 also provided information about the visitation and participation of one of their children.

The survey was conducted in April 2016 and was statistically representative of Los Angeles residents with an accuracy level of plus or minus 4 percent. The results of the survey indicate that 43.0 percent of adults and 74.9 percent of children have visited parks, trails, and recreation centers in Los Angeles in the last 12 months. These results are generally consistent with previous research, including park research in Los Angeles and outdoor recreation statistics for the state.⁴⁹

The survey also indicated that the most popular activities for adults were general park activities,⁵⁰ followed by walking or hiking, visiting beaches or aquatic centers, and participating in water sports such as kayaking, surfing, or swimming. For children, general park activities were

47 This analysis considers residents to be those who live within the city's boundaries. While residents outside the city in Los Angeles County may cross city boundaries to use parks, they are considered nonresidents.

48 The survey was conducted of a statistically representative sample of 800 residents of Los Angeles in English and Spanish. While numerous languages are spoken in Los Angeles, only a small proportion of the overall population speaks each of the languages. For example, 40.1 percent of the population speaks only English and 43.0 percent speaks Spanish or Spanish Creole. Tagalog, Korean, Armenian, and Chinese are the next most common languages, each spoken by 2.56 percent, 2.53 percent, 1.87 percent, and 1.62 percent of the population, respectively. Source: U.S. Census Bureau, American Community Survey, *Language Spoken at Home, 2007-2011*. The survey sampled respondents using landlines as well as cellular telephones.

49 Statewide statistics compiled by the Outdoor Industry Association indicate that an estimated 59 percent of California adults participate in outdoor recreation. The results of The Trust for Public Land's survey of Los Angeles residents indicate lower participation by adults when compared with the Outdoor Industry Association figures, potentially indicating that city residents seek recreational opportunities outside the city's park system and/or generally engage in less outdoor recreation compared to residents in California overall. Source: Outdoor Industry Association, *California: The Outdoor Recreation Economy*, accessed June 21, 2016, https://outdoorindustry.org/images/ore_reports/CA-california-outdoorrecreationconomy-oia.pdf.

50 General park activities include enjoying the outdoor space, picnicking, reading, relaxing, resting, sitting, using playgrounds, exploring nature, or viewing birds and wildlife.



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followed by bicycling, visiting beaches or aquatic centers, and participating in water sports such as kayaking, surfing, or swimming. See Table 8 for a listing of the five most popular activities overall. The breakout of participation by activity is consistent with a recent national study of park use, which found that the top five facilities present in parks included lawns (96.6 percent), play areas (88.5 percent), basketball courts (52.9 percent), picnic areas (43.1 percent), and baseball fields (49.4 percent). The participation numbers estimated as part of The Trust for Public Land’s analysis are also in line with the top reported activities in a study of park use in Los Angeles, which found that walking, sitting, and playgrounds were the most frequently reported activities.⁵¹

TABLE 8. TOP FIVE ACTIVITIES OF LOS ANGELES RESIDENTS AS DETERMINED BY SELF-REPORTED PARTICIPATION FOR PARKS, TRAILS, AND RECREATION CENTERS IN LOS ANGELES (2016)*			
Activity	Participation (annual visits)		
	Total	Adults	Children
General park use	29,900,000	17,000,000	12,900,000
Walking or hiking	18,300,000	14,100,000	4,230,000
Water sports, beaches, pools	13,500,000	8,590,000	4,940,000
Running or jogging	10,300,000	7,760,000	2,550,000
Bicycling	10,100,000	4,660,000	5,450,000

*The original participation that individuals reported was adjusted to account for overreporting of park use as well as their participation in multiple activities during a single visit. The numbers included in the table reflect these adjustments.

51 Deborah Cohen et al., *Park Use and Physical Activity in a Sample of Public Parks in the City of Los Angeles* (Santa Monica, CA: RAND Corporation, 2006).

To be conservative for the purposes of the recreational use analysis, the self-reported participation data were adjusted to account for overreporting of park use by respondents, as well as for participation in multiple activities during a single visit. Once the participation data were adjusted, The Trust for Public Land assigned dollar values to each park use by each participant in each activity. The methodology applied by The Trust for Public Land was developed using the framework of the Unit Day Value method, which is employed by the U.S. Army Corps of Engineers to count park visits by specific activity, assigning each activity a dollar value.⁵² The Trust for Public Land determined the value of recreation activities in Los Angeles utilizing estimates of outdoor recreation value from Oregon State University's Recreation Use Values Database, as well as market rates when available. Oregon State University's database contains use values for over 20 activities and is based on over 350 economic valuation studies that estimated the use value of recreation activities in the U.S. and Canada from 1958 to 2006, adjusted to 2010 dollars. This analysis applied the most conservative and relevant values to Los Angeles.⁵³ The Trust for Public Land then adjusted all values to 2016 dollars.⁵⁴

In quantifying the benefits of resident use, The Trust for Public Land also recognized that not every visit within a given period has the same value to the visitor. In fact, additional uses of a park are less valuable than the first use. For example, an individual's first visit of the year to a playground is worth more than that same individual's 10th visit of the year.⁵⁵ The Trust for Public Land also estimated an average season for different park activities to take into account the potential for reduced participation rates due to high temperatures. Although some people are active in parks 365 days a year, the recreational use valuation does not include uses during seasons in which participation rates could drop to lower levels.⁵⁶ Furthermore, for activities for which a fee is charged, like golfing at a municipal golf course, the per-person fee is subtracted from the imputed value and only the "extra" value is assigned. For example, if playing golf costs \$30 at a public golf course in Los Angeles and \$80 at a private country club, the value of the resident's first time playing golf at a public course would be \$50.

52 Bruce D. Carlson, "Memorandum for Planning Community of Practice, Economic Guidance Memorandum, 16-03, Unit Day Values for Recreation for Fiscal Year 2016," U.S. Army Corps of Engineers, October 16, 2015, accessed July 26, 2016, <http://planning.usace.army.mil/toolbox/library/EGMs/EGM15-03.pdf>.

53 Oregon State University, Recreation Use Values Database, accessed September 1, 2016, <http://recvaluation.forestry.oregonstate.edu/database>.

54 This adjustment was made using the Bureau of Labor Statistics' consumer price index, specifically utilizing the annual average index for all urban consumers and all items from the original year and the most current available index for the current year. At the time of this analysis, the most recent index was available for May 2016, and this analysis utilized the unadjusted index for all urban consumers for all items. U.S. Department of Labor, Bureau of Labor Statistics, "Consumer Price Index," accessed June 30, 2016, <http://www.bls.gov/cpi/data.htm>.

55 This is consistent with the economic law of diminishing marginal utility, which recognizes that the more of a good one consumes, within a given time and holding all else constant, the smaller the gain in the total utility derived from each additional amount. Utility, in this case, is the amount of satisfaction derived from the consumption of park and trail amenities.

56 The Trust for Public Land made this conservative assumption of seasonal park use despite the lack of a statistically significant difference in seasonal park use in Southern California. Source: Deborah Cohen et al., "Neighborhood Poverty, Park Use, and Park-Based Physical Activity in a Southern California City," *Journal of Social Science and Medicine* 75 (2012): 2317-2325.



This analysis finds the recreational use value for Los Angeles is \$334 million for 2016.⁵⁷ (Table 9). ➔ This estimate is conservative compared to estimates in other literature that has been conducted locally.⁵⁸

TABLE 9. THE ANNUAL ECONOMIC VALUE OF RECREATIONAL USE OF PARKS AND TRAILS IN LOS ANGELES BY RESIDENTS OF LOS ANGELES (2016\$)

Person visits	Average value per visit	Value
117,000,000	\$2.86	\$334,000,000

⁵⁷ This economic benefit accrues to the residents of Los Angeles who use the park system.

⁵⁸ These estimates of park use per person are lower than the results of two recent studies of park use. For example, a recent study of neighborhood park use in Los Angeles estimates the neighborhood park system receives approximately 660,000 visits and 404,000 visitors per week, which results in 1.63 visits per visitor per week. In this recent study, the neighborhood parks in Los Angeles accounted for 45.6 percent of the city's 487 park sites. Therefore, the estimates did not include visitors to 201 pocket parks or 64 regional attractions managed by the City of Los Angeles Department of Recreation and Parks. Furthermore, these estimates did not include any parks, trails, or recreation center amenities located within the city boundary but managed or owned by other public entities. The study also limited visits to those made by the local population, defined as living within a one-mile radius of parks. If these other park amenities had been included, as well as residents living within the city outside the one-mile buffer, the analysis would most likely have found higher visitation statistics per person. Source: Bing Han et al., "How Much Neighborhood Parks Contribute to Local Residents' Physical Activity in the City of Los Angeles: A Meta-Analysis," *Preventive Medicine* 69 (2014): S106-S110.

Another study of park use in Southern California found that residents report lower usage compared to park users. Specifically, residents reported 0.9 visits per week and park users reported 2.8 visits per week. Source: Cohen et al., "Neighborhood Poverty, Park Use, and Park-Based Physical Activity in a Southern California City."

Compared with these two studies, our analysis finds a lower number of visits for each park user. Specifically, our calculations find 1.13 visits per park visitor per week.

Helping to promote human health

IN THIS ANALYSIS, THE TRUST FOR PUBLIC LAND MEASURED the collective economic savings realized on an annual basis by residents of Los Angeles who use parks, trails, and recreation centers in the city to exercise. Several studies have documented the economic burden related to physical inactivity. Recent research has found that physical activity can lead to lower health care costs, fewer chronic diseases, and greater longevity.⁵⁹ Many medical problems can result from, or be exacerbated by, physical inactivity. This list of medical problems includes heart disease,⁶⁰ type 2 diabetes, stroke,⁶¹ mental disorders,⁶² and some forms of cancer.⁶³ One report released in August 2009 by the U.S. Centers for Disease Control and Prevention (CDC) estimated that obesity cost the U.S. economy \$147 billion in 2008 alone.⁶⁴ Lack of exercise is shown to contribute to obesity and its many effects, and for this reason experts call for a more active lifestyle.

The CDC recognizes that physical activity helps improve overall health and reduces the risk for chronic diseases. As such, the CDC promotes physical activity guidelines, defining sufficient activity as at least 150 minutes of moderate-intensity activity per week or at least 75 minutes of vigorous-intensity activity per week, along with muscle-strengthening activities at least two days per week.⁶⁵

Having access to places to walk can help individuals meet recommendations for regular physical activity.⁶⁶ Parks have been found to be one of the most commonly reported convenient places for improved physical and mental health, especially if the space is well maintained, safe, and accessible. From a public health perspective, parks provide low-cost, high-yield wellness opportunities.⁶⁷

59 Han et al., "How Much Neighborhood Parks Contribute to Local Residents' Physical Activity in the City of Los Angeles: A Meta-Analysis."

60 Jacob Sattelmair et al., "Dose Response Between Physical Activity and Risk of Coronary Heart Disease: A Meta-Analysis," *Circulation* 124 (2011): 789-795; Edward Archer and Steven N. Blair, "Physical Activity and the Prevention of Cardiovascular Disease: From Evolution to Epidemiology," *Progress in Cardiovascular Diseases* 53 (2011): 387-396.

61 Larissa Roux et al., "Cost Effectiveness of Community-Based Physical Activity Interventions," *American Journal of Preventive Medicine* 35 (2008): 578-588.

62 Joshua Hayward et al., "Lessons from Obesity Prevention for the Prevention of Mental Disorders: The Primordial Prevention Approach," *BMC Psychiatry* 14 (2014): 254.

63 I-Min Lee et al., "Impact of Physical Inactivity on the World's Major Non-Communicable Diseases," *The Lancet* 380 (2012): 219-229.

64 Centers for Disease Control and Prevention, "Adult Obesity Causes and Consequences," accessed December 15, 2015, <http://www.cdc.gov/obesity/adult/causes.html>.

65 Centers for Disease Control and Prevention, "How Much Physical Activity Do Adults Need?" accessed January 27, 2015, <http://www.cdc.gov/physicalactivity/everyone/guidelines/adults.html>.

66 B. Giles-Corti and R. J. Donovan, "The Relative Influence of Individual, Social, and Physical Environment Determinants of Physical Activity," *Social Science and Medicine* 54 (2002): 1793-1812.

67 Deborah Cohen et al., "The Potential for Pocket Parks to Increase Physical Activity," *American Journal of Health Promotion* 28 (2014): S19-S26; Meredith A. Barrett, Daphne Miller, and Howard Frumkin, "Parks and Health: Aligning Incentives to Create Innovations in Chronic Disease Prevention," *Preventing Chronic Disease*, Centers for Disease Control and Prevention (2014), doi: <http://dx.doi.org/10.5888/pcd11.130407>.



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Based on the CDC's guidelines for physical activity, The Trust for Public Land used the results of a professionally conducted telephone survey (see page 21) to determine how many adults were using the parks in Los Angeles at a frequency and intensity that would result in medical care cost savings. In accordance with CDC guidelines, The Trust for Public Land defined vigorous-intensity activities to include running, bicycling, and swimming. Moderate-intensity activities included walking, hiking, using gyms and fitness equipment, participating in team sports, taking exercise classes, using outdoor fitness zones, and gardening. This analysis does not include low-heart-rate activities, such as using dog parks or wildlife watching. Individuals must also utilize the parks, trails, or recreation centers in Los Angeles exclusively to an extent that is sufficient to meet the CDC's physical activity guidelines. This analysis does not include individuals who use

private facilities in conjunction with parks to meet the CDC's physical activity thresholds.

This analysis finds that 83,600 adults between 18 and 64 years old and 22,500 adults 65 years and older in Los Angeles use parks to a degree that improves their health (Table 10). ➔

While all residents who visit parks improve their health by visiting, not all residents use these areas to an extent that is sufficient to meet the CDC's physical activity guidelines.

Based on previous work in health care economics, The Trust for Public Land assigned a value of \$1,170 as the annual medical cost savings between adults in Los Angeles who exercise regularly and those who do not. This value was chosen based on a careful review of health care economics literature that focuses on the cost difference between physically active and inactive persons. The cost savings were based on the National Medical Expenditures Survey that has been widely cited in the literature.⁶⁸ The medical care cost savings were adjusted for inflation and brought to 2016 dollars.⁶⁹ For persons over the age of 65, health care cost savings were assigned a doubled value because seniors typically incur two or more times the medical care costs of younger adults.⁷⁰ This doubling of health care cost savings is conservative. For example, one study found that average health care expenses for adults over 65 were over three times those of working-age people.⁷¹

68 M. Pratt, C. A. Macera, and G. Wang, "Higher Direct Medical Costs Associated with Physical Inactivity," *Physician and Sportsmedicine* 28 (2000): 63-70.

69 The unadjusted medical cost consumer price index for all urban consumers was used to account for inflation. Specifically, the 1987 annual average was used for the base year and the most current unadjusted medical care index for the current year. At the time of this analysis, the most recent index was available for May 2016. Source: U.S. Department of Labor, Bureau of Labor Statistics, "Consumer Price Index," accessed June 30, 2016, <http://www.bls.gov/cpi/data.htm>.

70 Roland D. McDevitt and Sylvester J. Schieber, *From Baby Boom to Elder Boom: Providing Health Care for an Aging Population* (Washington, DC: Watson Wyatt Worldwide, 1996).

71 U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality, "The High Concentration of U.S. Health Care Expenditures," accessed September 18, 2013, <http://www.ahrq.gov/research/findings/factsheets/costs/expriach/index.html#HowAre>.

In 2016, the combined health savings from park and trail use for the residents of Los Angeles were \$151 million⁷² (Table 10). 🟢 This finding is consistent with previous research in Los Angeles that found its parks contribute to the health of area residents.⁷³

TABLE 10. ESTIMATED HEALTH BENEFITS OF PHYSICAL ACTIVITY IN LOS ANGELES PARKS (2016\$)	
Adults 18–64 years of age	
Number of adults (18–64) physically active in parks*	83,600
Average annual medical care cost difference between active and inactive persons between 18 and 64 years old	\$1,170
Subtotal of health care benefits (18–64)	\$97,800,000
Adults 65 years of age and older	
Number of adults (65+) physically active in parks*	22,500
Average annual medical care cost difference between active and inactive persons over 65 years old	\$2,340
Subtotal of health care benefits (65+)	\$52,800,000
Total adults physically active in parks*	106,000
Total annual value of health benefits from parks	\$151,000,000

* Calculations are based on persons using Los Angeles parks, trails, and recreation centers exclusively to engage in sufficient levels of moderate and/or vigorous activity that meet the CDC’s physical activity guidelines.

72 This benefit accrues to the residential park users in Los Angeles who engage in sufficient physical activity to receive a health benefit.

73 Han et al., “How Much Neighborhood Parks Contribute to Local Residents’ Physical Activity in the City of Los Angeles: A Meta-Analysis.”

Community cohesion

PARKS ARE ESSENTIAL TO BUILDING COHESIVE COMMUNITIES, along with schools, churches, and other social gathering spaces. Studies show that these institutions and places can make a neighborhood stronger, safer, and more successful.⁷⁴ This network, for which urbanist Jane Jacobs coined the term “social capital,” is strengthened in some communities by parks. Parks offer opportunities for people of all ages to interact, learn, and grow. The acts of improving, renewing, or even saving a park can build extraordinary levels of social capital in a neighborhood that may be suffering from fear and alienation partially owing to the lack of safe public spaces. Local groups and organizations, including but not limited to the Los Angeles Parks Foundation and Los Angeles Neighborhood Initiative, have garnered support for parks and enhanced the recreational, educational, and cultural assets in Los Angeles by encouraging and soliciting support of the community’s park resources.

The economic value of social capital is difficult to fully capture, but it is possible to measure the amount of time and money that residents donate to their parks. Hundreds of Los Angeles residents do everything from picking up trash and pulling weeds to planting flowers, raising playgrounds, teaching about the environment, and educating public officials. Individuals and organizations also make financial contributions toward improving park resources.

The Trust for Public Land calculated the financial contributions made to “friends of parks” groups, community park organizations, and nonprofits for park purposes in 2015, the most recent year for which data are available. The Trust for Public Land also included all the hours of volunteer time donated directly to the city in service of parks. This number of volunteer hours was then multiplied by the value of a volunteer hour in California in 2015 – \$27.60 – assigned by Independent Sector.⁷⁵

Overall Los Angeles has a high rate of community service. In 2014, 20.6 percent of residents volunteered and 41.9 percent of residents donated \$25 or more to charity.⁷⁶ Parks generate a noteworthy portion of volunteer hours and financial contributions. In 2015, the financial contribution to Los Angeles parks was \$11.8 million (2016\$) and 24,700 hours of volunteer time were donated.⁷⁷ **Therefore, as shown in Table 11, the combined social capital value was \$12.5 million (2016\$).**⁷⁸ ➡

74 Puget Sound Regional Council, *Sustainable Parks and Open Space: Planning for Whole Communities Toolkit*, accessed September 22, 2014, http://www.psrc.org/assets/11774/Sustainable_Parks_and_Open_Space.pdf?processed=true.

75 Independent Sector, “The Value of Volunteer Time,” accessed June 2, 2016, https://www.independentsector.org/volunteer_time.

76 Corporation for National and Community Service, “Volunteering and Civic Engagement in Los Angeles, CA,” accessed June 2, 2016, <https://www.volunteeringinamerica.gov/CA/Los-Angeles>.

77 Information about donated volunteer hours and financial contributions was provided to The Trust for Public Land by Los Angeles park support organizations, including American Paddle Tennis Association, American Southwestern Railway Association, Inc., Cabrillo Beach Boosters Association, Campo de Cahuenga Historical Memorial Association, Friends of Drum Barracks Civil War Museum, Friends of EXPO Center, Friends of Griffith Park, Friends of Oakridge, Friends of Runyon Canyon, Friends of West Los Angeles, LA84 Foundation, Los Angeles Community Garden Council, Los Angeles Neighborhood Initiative (LANI), Los Angeles Park Foundation, Palos Verdes Peninsula Land Conservancy, Tony Hawk Foundation, Tree People, and West Coast Sports Association. The Trust for Public Land included funding and volunteer hours in this analysis only if they were directly related to recreational activity and parks within the City of Los Angeles.

78 Community cohesion provides cost savings to the government and to a community’s residents.

**TABLE 11. COMMUNITY COHESION VALUE
FOR LOS ANGELES PARKS (2016\$)**

Category	
Dollars donated	\$11,800,000
Hours of time donated	24,700
Value of a 2015 volunteer hour (2016\$)	\$28.00
Value of hours donated	\$692,000
Total	\$12,500,000



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Conclusion

WHILE MUCH PREVIOUS RESEARCH HAS FOCUSED on the economics of housing, manufacturing, retail, and the arts in Los Angeles, until now there has been no comprehensive study on the economic contributions of the city's park system. The Trust for Public Land believes that answering this question – “How much value does a city park system bring to a city?” – can be profoundly useful. For the first time, parks can be assigned the kind of numerical underpinning long associated with transportation, trade, residences, 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 now have a solid, numerical motivation to strategically acquire parkland in balance with community development projects.

This study illustrates that Los Angeles City parks are key economic drivers that contribute millions annually in economic benefits. As found in this study, these parks and programs increase the value of nearby residential properties by \$2.29 billion, which increases property tax revenues by \$27.2 million a year.

These park areas also provide natural goods and services. Specifically, by retaining stormwater, parks provide a value of \$8.03 million each year. By removing air pollutants that cause damage to structures and endanger human health, the trees and shrubs within Los Angeles parks reduce health care costs and lower pollution control costs by \$1.58 million per year.

Parks in Los Angeles contribute to the tourism economy. Approximately 7.7 percent of visitors to Los Angeles come for the purposes of visiting parks, trails, and recreation centers. These visitors spend \$415 million annually in the local economy and generate \$27.5 million in local taxes each year.

People who live in Los Angeles certainly gain from their parks. Each year residents receive a benefit of \$334 million from the direct recreational use of the parks. And approximately 106,000 adult residents of Los Angeles engage in physical activity at a level sufficient to generate measurable health benefits, yielding annual medical cost savings of \$151 million.

People coming together to improve their local parks create a community cohesion benefit. In 2015, parks in Los Angeles received \$12.5 million in donated volunteer time and financial contributions.

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Notes

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