



# Connecting and Strengthening Communities

The Economic Benefits of Great Rivers Greenway

THE  
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PUBLIC  
LAND





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The Trust for Public Land  
June 2016



The Trust for Public Land creates parks  
and protects land for people,  
ensuring healthy, livable communities  
for generations to come.

The Trust for Public Land's Conservation Economics team, in collaboration with our Center for City Park Excellence, measures the economic value and fiscal impacts of parks and land conservation. We quantify these impacts using models developed in consultation with leading academics across the country and with our award-winning GIS team.

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# Table of Contents

Introduction .....	2
Analysis of Greenway and Park Access .....	4
Analysis of Enhanced Property Value.....	9
Analysis of Economic Development and Business Use .....	12
Quality of Life .....	12
Measuring the Impact .....	15
Tourism .....	16
Outdoor Recreation .....	17
Great Rivers Greenway's Spending .....	21
Conclusion .....	23
References .....	24
Appendices .....	27
Appendix A. Enhanced Property Value Methodology .....	27
Appendix B. Greenways and Parks Adjacent to Greenways .....	31



# Introduction

Great Rivers Greenway, a regional parks and trails district, was created in 2000 when the residents of St. Charles County, St. Louis City, and St. Louis County approved Proposition C (Exhibit 1).<sup>1</sup> Great Rivers Greenway has been working for over 15 years to make the St. Louis region a more vibrant place to live, work, and play by developing a network of greenways to connect people to their rivers, parks, and communities via the “River Ring.” Great Rivers Greenway works with partner organizations and the community to build, promote, and sustain greenways, which are outdoor spaces connecting people and places. Most greenways are paved so they can be used to take a walk, go for a run, ride a bike, or get some fresh air. More than just a trail, each greenway is unique, with neighborhoods, businesses, parks, and rivers to explore.

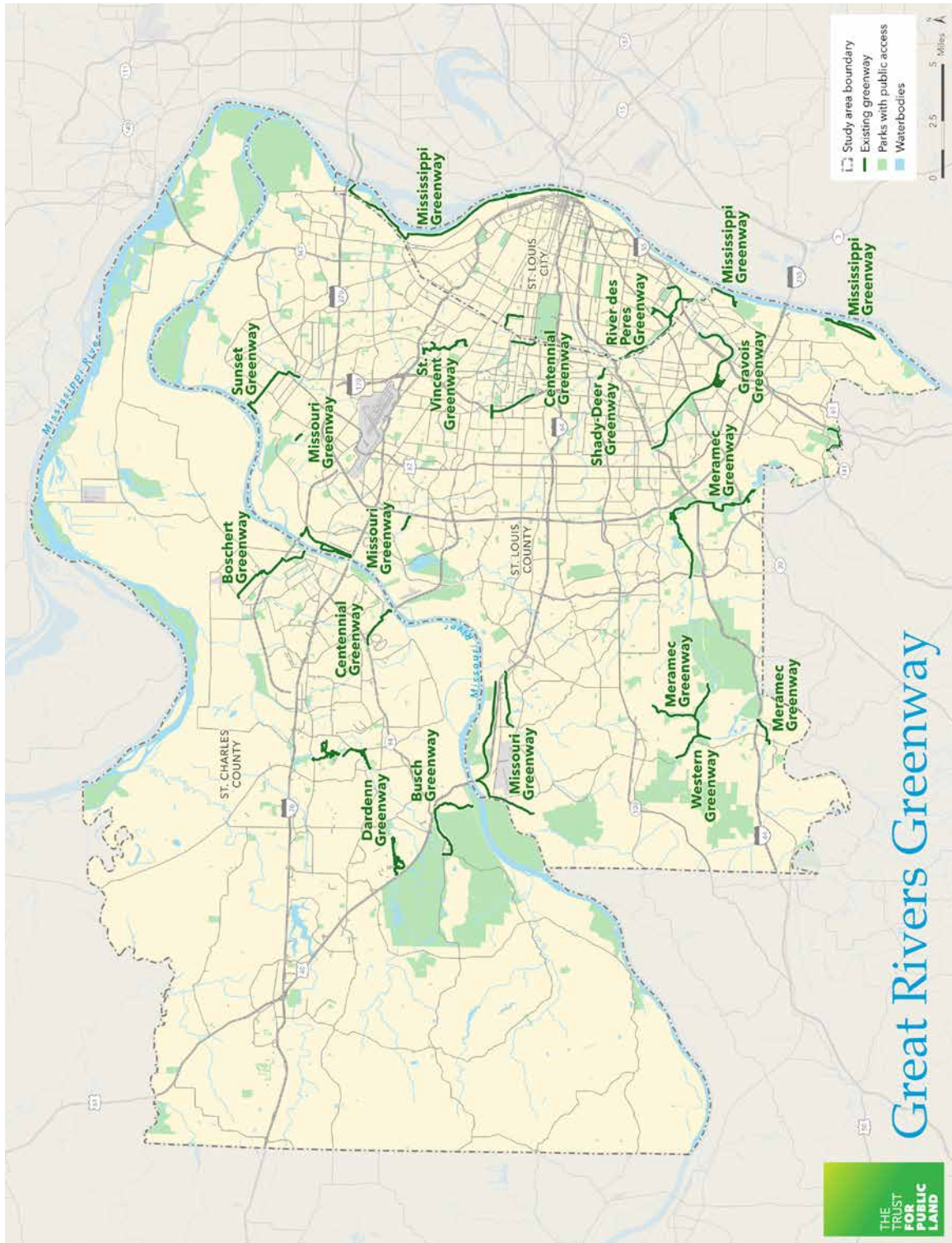
Great Rivers Greenway is now interested in developing metrics to assess the organization’s success in generating social, environmental, and economic benefits as well as the effectiveness of its expanded communications efforts to engage residents and community leaders, increase facility use, and expand support.

This report includes three analyses that provide a benchmark of Great Rivers Greenway’s success in meeting its objective of generating social and economic benefits. The first analysis provides an in-depth look at the network of greenways and the communities served to identify areas in need of additional greenway access. The second analysis looks at the extent to which completed greenways enhance the value of the residential properties that are located in proximity to these assets. The third analysis provides information on how the network of greenways enhances quality of life, attracts employees and employers, and improves economic opportunity.



<sup>1</sup> Proposition C also created a 1/10th of one-cent sales tax, which provided an average of \$10 million annually to Great Rivers Greenway. In 2013, voters in St. Louis City and County approved a tax rate increase to 3/16ths of one cent through Proposition P. Great Rivers Greenway currently manages approximately 110 miles of trails across its 1,200-square-mile geographic area, which will be referred to as the “district” throughout the report.

Exhibit 1. Map of Great Rivers Greenway's district boundary and completed greenways<sup>2</sup>



<sup>2</sup> This map shows all of the completed greenways that were included in the data provided by Great Rivers Greenway in August 2015.



# Analysis of Greenway and Park Access

The Trust for Public Land's Park Equity tool is used to analyze public access to existing parks, open space, and greenways. The analysis incorporates a two-step approach, first determining where there are gaps in park availability, and then constructing a demographic profile to identify gaps with the most urgent need for greenways or parks. For this project, The Trust for Public Land considered walkable and bike-able access to greenways. Access is defined as entirely within the public road network and uninterrupted by physical barriers such as highways, train tracks, rivers, or fences. Greenways and parks are considered walkable if they can be accessed within a ten-minute, half-mile walk. These amenities are considered bike-able if they can be accessed within an easy, one-and-a-half mile bike ride.



In past research, The Trust for Public Land identified a half mile, or ten-minute, walk to a park as a common national standard. As regions have vied to attract talented college graduates and sustain population growth, they have focused attention on parks to increase livability and support a strong economy. Since parks must be convenient if they are to provide their benefits, many places have set goals for the maximum distance any resident should be from the nearest park. Although the goals of individual regions vary with population density – from a remarkable eighth of a mile in Chicago to two miles in Atlanta – The Trust for Public Land's data support a standard of no more than a half mile as a reasonable distance to walk to a park. Among the 100 largest cities in the United States, 70 have explicit distance goals, with 43 (61 percent) using a half mile standard. Of the remaining 27 cities, 12 have a standard of less than a half mile (many using a quarter mile), and 15 have a standard greater than a half mile. Thus, this research uses a half mile as a walkable distance.<sup>3</sup>

Bike-able distance was determined following a search of relevant literature. Various studies supported the assumption that a mile and a half is a reasonable distance to cover during an easy bicycle ride. For example, one study found that the average bicycle speed was approximately 11–12 miles per hour in

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3 Peter Harnik and Abby Martin, "Close-to-Home Parks: A Half-Mile or Less" (The Trust for Public Land).



St. Petersburg, Florida.<sup>4</sup> Another study found that children 14 years and younger cycle at an average speed of 8.9 miles per hour, while adults travel at an average 9.6 miles per hour.<sup>5</sup> Thus, The Trust for Public Land used a distance of one-and-a-half miles as a conservative estimate of a bike-able distance for a family with children.

For the purposes of determining which open space amenities the public has access to, this analysis included completed greenways, parks, and schoolyards.<sup>6</sup> Access points were created through an automated process, placing a point at all intersections between the street network and a 60-foot buffer around parks, open spaces, and greenways. By using the street network, the analysis is able to consider highways, freeways, interstates, rivers, and railroads as barriers.

The Trust for Public Land then created demographic profiles based on 2015 Forecast block groups provided by Esri to determine the need for parks based on density of youth, density of individuals in households with income less than 75 percent of the county median household income, and population density (people per acre).<sup>7</sup>

The Park Equity result combines the three demographic profiles and assigns the following weights:

- 50 percent: population density (people per acre)
- 25 percent: density of youth age 19 and younger
- 25 percent: density of individuals in households with income less than 75 percent of the county median household income

Exhibits 2 and 3 depict areas in need of parks to address equity issues. Areas in dark red show a very high need for parks or greenways, and areas in dark orange indicate a high need. To determine these levels of need, The Trust for Public Land analyzed the demographics for the block groups without park access. Block groups were then divided into one of four quartiles based on the average of their



GREAT RIVERS GREENWAY

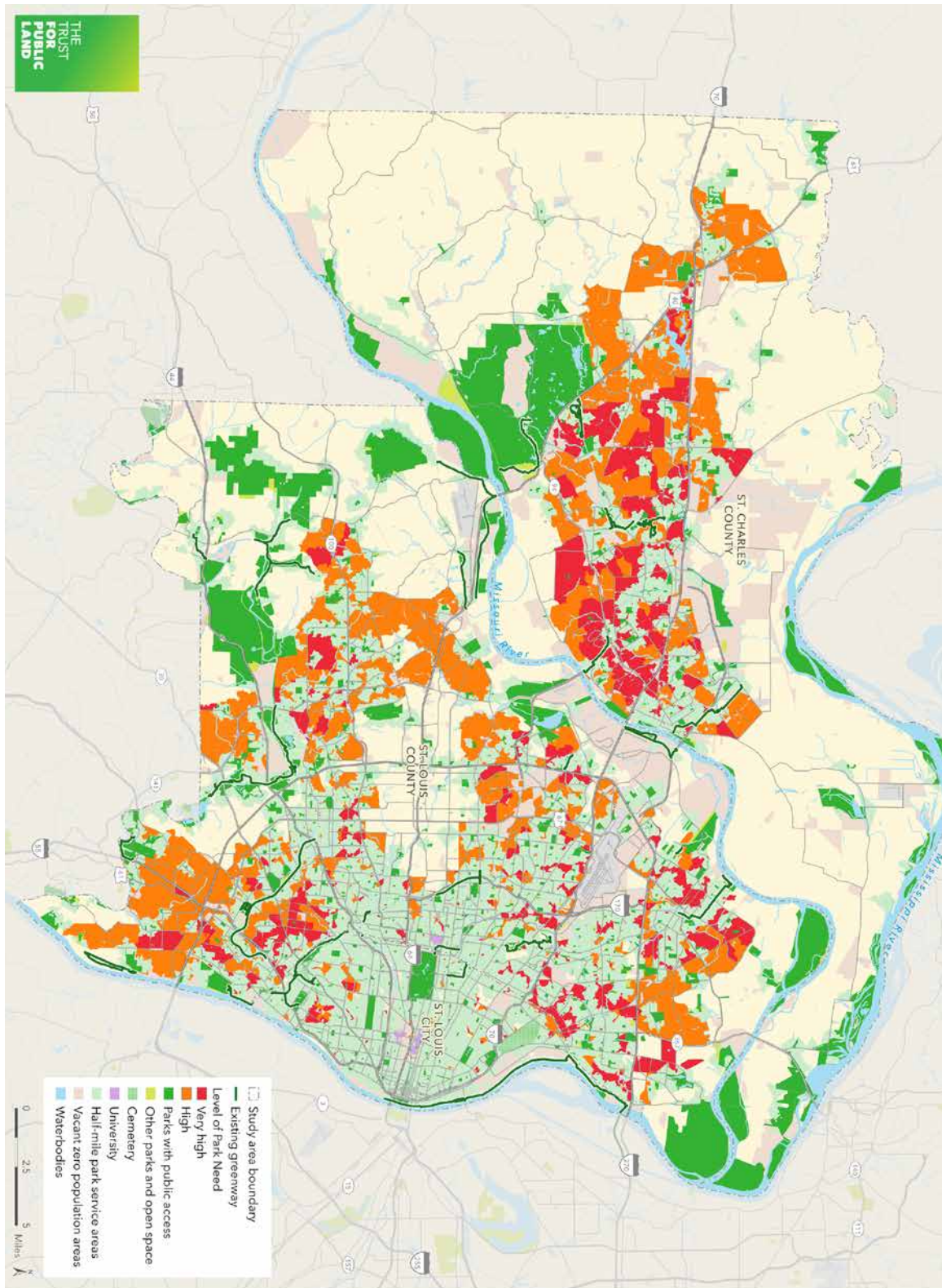
4 William W. Hunter, Raghavan Srinivasan, and Carol A. Martell, "An Examination of Bicycle Counts and Speeds Associated with the Installation of Bike Lanes in St. Petersburg, Florida" (University of North Carolina, Highway Safety Research Center, 2009, accessed November 17, 2015, [http://www.stpete.org/transportation/citytrails/docs/Examination\\_of\\_bicycle\\_counts\\_and\\_speeds\\_associated\\_with\\_bike\\_lanes.pdf](http://www.stpete.org/transportation/citytrails/docs/Examination_of_bicycle_counts_and_speeds_associated_with_bike_lanes.pdf)).

5 Lorraine Chow, "Biking Is Faster Than Driving in These Major Cities" (*EcoWatch*, May 20, 2015, accessed November 17, 2015, <http://ecowatch.com/2015/05/20/biking-faster-than-driving/>).

6 This analysis includes all high schools, although some of the high schools analyzed were fenced in, had gates, or had notices allowing use by permit only.

7 Esri is a company that provides geographic information systems (GIS) software.

Exhibit 2. Map of priority areas to increase walkability



demographic profiles. Areas of very high need are those with the most need for access to parks because their block group's demographic profile falls in the lowest two quartiles. Areas with high need are the block groups with demographic profiles falling into the third-lowest quartile.

In addition, the analysis provides demographic statistics for the district. Looking at the areas around the completed greenways and parks that are walkable and bike-able, the analysis calculates the population served and population not served (Tables 1 and 2). The results indicate that roughly half of the population is within walking distance of greenways and parks. The population served jumps to nearly 90 percent within a bike-able distance. For both walkable and bike-able distances, access is evenly distributed across age groups. On the other hand, households with less than 75 percent of the median income are better served than households above the median income. This finding is consistent with other large cities across the country. The Trust for Public Land has measured the number of residents within a half-mile walk of a park in each of the 75 largest cities, and in most cases, households earning below 75 percent of the local median income have better park access than households earning at least 125 percent of the median income. In many cases, this is because lower-income residents tend to live in the older more walkable neighborhoods.

Table 1. Park and greenway walking access (2016)<sup>8</sup>

Demographic Category	Total Households	Households Served	Percent Served	Households Not Served	Percent Not Served
Total Population	1,690,000	853,000	51%	835,000	49%
Age 19 and Younger	420,000	208,000	49%	212,000	51%
20-64 Years	1,010,000	521,000	51%	491,000	49%
Over 64 Years Old	255,000	124,000	49%	131,000	51%
Demographic Category	Total Households	Households Served	Percent Served	Households Not Served	Percent Not Served
Under 75% Median Income	213,000	136,000	64%	76,700	36%
75%-125% Median Income	221,000	118,000	53%	103,000	47%
Over 125% Median Income	257,000	107,000	42%	150,000	58%

Table 2. Park and greenway biking access (2016)<sup>9</sup>

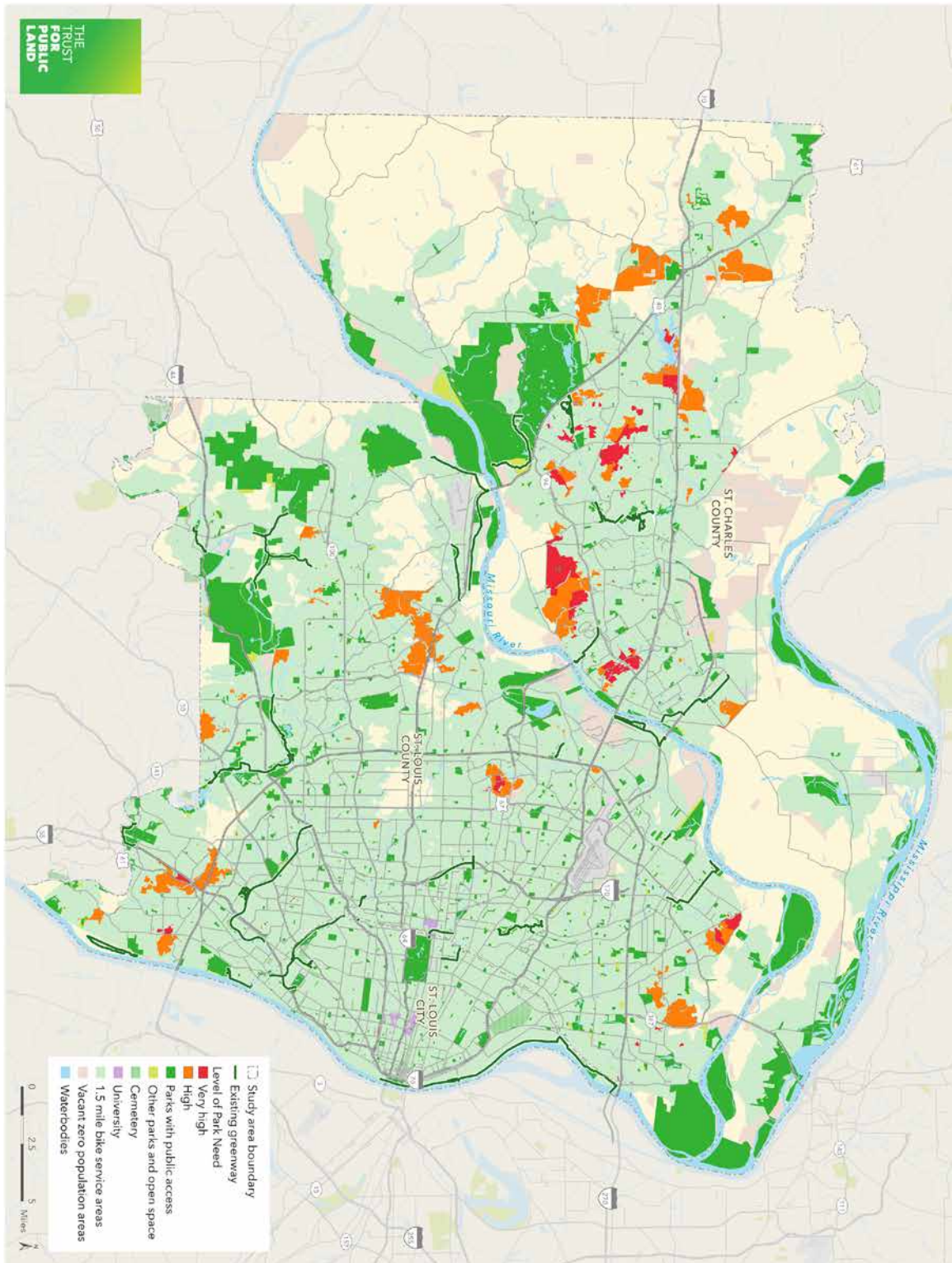
Demographic Category	Total Population	Population Served	Percent Served	Population Not Served	Percent Not Served
Total Population	1,690,000	1,500,000	89%	184,000	11%
Age 19 and Younger	420,000	371,000	88%	48,900	12%
20-64 Years	1,010,000	905,000	89%	108,000	11%
Over 64 Years Old	255,000	228,000	89%	27,500	11%
Demographic Category	Total Households	Households Served	Percent Served	Households Not Served	Percent Not Served
Under 75% Median Income	213,000	201,000	95%	11,500	5%
75%-125% Median Income	221,000	200,000	91%	20,700	9%
Over 125% Median Income	257,000	220,000	86%	36,700	14%

<sup>8</sup> Populations, households, and percentages served include those inside a 0.5-mile dynamic park buffer. Unless otherwise noted, figures have been rounded to three significant digits.

<sup>9</sup> Populations, households, and percentages served include those inside a 1.5-mile dynamic park buffer. Unless otherwise noted, figures have been rounded to three significant digits.



Exhibit 3. Map of priority areas to increase bike-ability





# Analysis of Enhanced Property Value

Numerous studies have shown that parks and trails have a positive impact on nearby residential property values. All things being equal, most people are willing to pay more for a home close to a nice park, greenway, or trail. The property value added by greenway and park areas is separate from the recreational use value gained by residents who use these amenities; property values of nearby properties go up even if the resident never visits the greenway or park.

The Trust for Public Land analyzed the enhanced property value attributable to greenways using digitized parcel boundaries, parcel valuation data, and tax information provided by the City of St. Louis and the Counties of St. Louis and St. Charles. The data provided included information about each parcel's land use, assessed value, and taxes paid. This analysis included residential units located in the city of St. Louis, St. Louis County, and St. Charles County. The residential properties included in the analysis did not include vacant, unoccupied, or abandoned lots.<sup>10</sup> The data provided by the three jurisdictions making up the district contained 531,000 residential parcels. Further limiting our study sample, 17,900 vacant or abandoned lots were removed representing 3.3 percent of the total 531,000 parcels. The remaining 514,000 parcels had a total market value of \$88.9 billion and a total assessed value of \$16.9 billion, and generated a total of \$1.41 billion in property taxes in 2015.<sup>11</sup>

Property value is affected primarily by two factors related to greenways and parks: proximity and quality. Many rigorous analyses have been conducted to determine the best way to capture the effect that park and trail proximity has on property values. Many analyses find there is an enhancement in property value due to park and open space proximity, and this premium is found with direct adjacency as well as with distances extending up to a mile.<sup>12</sup> While the value of parks can be measured at such distances from these amenities, most of the value – whether such spaces are large or small – is within the first 500 feet.<sup>13</sup>

Moreover, people's desire to live near a greenway or park also depends on its quality – which determines the amount of value that is added to properties located in proximity. 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 marginally increased value to surrounding properties, and in some cases, these areas may actually reduce nearby property values. 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.

Given the difficulty in assessing park quality, this analysis utilizes estimates from the published literature regarding the value of parks and greenways on property values. 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 (increasing the value of adjacent homes

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<sup>10</sup> Vacant, unoccupied, and abandoned homes are excluded from the analysis because these properties are significantly different from the houses within the residential housing market that is being considered for this analysis. This enhanced property value analysis seeks to estimate the incremental value greenways provide to nearby residential property owners. Vacant properties often lack owners who will claim responsibility for them. In addition to the value that accrues to homeowners, the enhanced property value analysis provides an estimate of the additional property tax revenues generated for the city and counties; however, this is not relevant for vacant properties, since the majority of them are also tax delinquent.

<sup>11</sup> Unless otherwise noted, figures have been rounded to three significant digits.

<sup>12</sup> Virginia McConnell and Margaret Walls, *The Value of Open Space: Evidence from Studies of Nonmarket Benefits* (Resources for the Future, January 2005).

<sup>13</sup> This is a conservative distance and its use will result in an underestimate of the "true" enhanced property value, since the value of homes farther away are likely also to be enhanced. For more information, please see the methodology in Appendix A on page 27.

by 20 percent and declining as distance from the park increases).<sup>14</sup> There are also studies about the effect of trails on nearby property values. For example, a study of the Little Miami Scenic Trail, a 70-mile rail trail in Springfield, Ohio, found that every foot closer a house is to the trail increases its price by \$7.05.<sup>15</sup> In addition, homes within a half mile of Indiana's Monon Trail sell for an average of 11 percent more than identical homes farther away.<sup>16</sup> Further, houses located in areas with above-average levels of walkability command a premium between \$4,000 and \$34,000 more than similar houses in areas with average walkability levels.<sup>17</sup> Additionally, while more anecdotal, two-thirds of the homeowners living near trails in Omaha, Nebraska, believed that the trails would increase the selling price of their homes.<sup>18</sup>

Exhibit 4. Example of a selection of residential parcels within 500 feet of greenways and adjacent parks



14 Brad Broberg, "Everybody Loves a Park: Green Space Is a Premium when Building, Buying, or Selling," *National Association of Realtors, On Common Ground*, Winter 2009, 20-25.

15 Duygu Karadeniz, "The Impact of the Little Miami Scenic Trail on Single Family Residential Property Values," unpublished master's thesis, University of Cincinnati, 2008.

16 Greg Lindsey, Joyce Man, Seth Payton, and Kelly Dickson, "Property Values, Recreation Values, and Urban Greenways," *Journal of Park and Recreation Administration*, 22, no. 3 (2004) : 69-90.

17 Joe Cortright, "Walking the Walk: How Walkability Raises Home Values in U.S. Cities," *CEOs for Cities*, 2009, accessed October 20, 2015, <http://www.reconnectingamerica.org/assets/Uploads/2009WalkingTheWalkCEOsforCities.pdf>.

18 Donald L. Greer, "Omaha Recreational Trails: Their Effect on Property Values and Public Safety," *University of Nebraska Omaha*, with funding from the National Park Service, accessed October 20, 2015, <http://www.unomaha.edu/recadmin/trails/omahatrails.pdf>.



Based on a thorough literature review, The Trust for Public Land assigned a conservative value of 5 percent as the amount that greenways add to the market value of all dwellings within 500 feet. Then the Trust for Public Land identified all the homes within 500 feet of greenways. Homes are defined as all residential structures that are owned and taxed; thus, this analysis includes multiple-unit dwellings (e.g., apartments) and single-family homes. Exhibit 4 provides an illustration of how homes within 500 feet of greenways were identified. There are 7,890 homes located within 500 feet of greenways in the district. These homes located within 500 feet of a greenway had a total market value of \$1.26 billion in 2015 (Table 3).

Table 3. Enhanced residential property value due to proximity to greenways (2015)

	Number of homes within 500 feet	Total market value of homes within 500 feet	Market value of premium homes within 500 feet	Tax premium of homes within 500 feet
Greenway	7,890	\$1,260,000,000	\$62,800,000	\$963,000

The Trust for Public Land's enhanced property value analysis estimates that an added \$62.8 million in residential property value existed in the district because of proximity to greenways in 2015 (Table 3). The Trust for Public Land expects that the contribution of the greenways will increase over time as the greenway system expands. In addition, parks that are connected to greenways add significant value to surrounding property values; however, this analysis is conservative because it does not include parks that are part of the greenway system. For an analysis of greenways and parks, please see Appendix B on page 31.

The Trust for Public Land also determined how much additional tax revenue was raised by local units of government using each home's residential property taxes.<sup>19</sup> The total value captured in additional property tax revenue derived from greenways in the district is \$963,000 each year (Table 3).



<sup>19</sup> Real property in Missouri is assessed at 19 percent of its true value in money. "State Tax Commission Definitions," *Missouri State Tax Commission*, accessed January 28, 2016, <http://stc.mo.gov/definitions>.

# Analysis of Economic Development and Business Use

The network of greenways bolsters economic development and business activity. This analysis explores the nature of the connection between the greenways and the economy. The first section qualitatively describes the extent to which the greenway system enhances quality of life, a driving force of economic activity in the region. The second section introduces a set of quantitative metrics that have been designed to measure the success of the network of greenways in supporting economic activity within the district. It details how to establish a baseline to measure future success against, and provides an approach to collect data and measure success over time. Metrics span various topics, including tourism, outdoor recreation, and Great Rivers Greenway's spending.



## Quality of Life

The network of greenways contributes to economic development in several ways. Greenways are scenic amenities that provide diverse leisure opportunities and enhance quality of life. They also provide safe and enjoyable means of alternative transportation to work, school, and other activities. This enhanced quality of life attracts talent, employers, and investment to the region.

Quality of life plays a critical role in the region's economic development 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.<sup>20</sup> Another survey of high-tech workers found that a job's attractiveness increases by 33 percent in a community

<sup>20</sup> 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](https://books.google.com/books?id=SDeUAgAAQBAJ&dq=quality+of+life+job+attractiveness+workers&source=gbs_navlinks_s).



with a high quality of life.<sup>21</sup> High quality of life is particularly important in the St. Louis region, where data processing, hosting, and related services make up the most concentrated service industry in the region and the number of jobs in professional, scientific, and technical services is expected to grow by 20.7 percent, or 12,100 jobs, between 2012 and 2022.<sup>22</sup>

The St. Louis region is an attractive area for families, individuals, and businesses. The St. Louis region is the 19th-largest metropolitan area in the United States; it is very livable and known as a good place to raise a family.<sup>23</sup> The St. Louis Regional Chamber touts the region's abundant educational, cultural, and recreational opportunities that are convenient and affordable. In fact, the National Center for Arts Research recently ranked the St. Louis Metropolitan Statistical Area (MSA) as the 13th arts vibrant large city.<sup>24</sup>

Greenways and their amenities, such as those provided by Great Rivers Greenway, can enhance a community's quality of life and its ability to attract and retain residents. Across the country, skilled workers are attracted to places with open space, clean air and water, alternative transportation options, and diverse opportunities for outdoor recreation. For example, one study of individuals who had recently moved to Portland, Oregon, found that the city's bike friendliness was a factor in 62 percent of people's decisions to move there.<sup>25</sup> The St. Louis region, which has a host of parks and trails with beautiful scenery and ample recreational opportunities, makes the area an attractive place to live and work. Robert Boroff, the managing director of Reachion Search International, says, "The thing about St. Louis comes down to a really good quality of life."<sup>26</sup>

Businesses also are drawn to these places to recruit the best workers. Companies, particularly those involved in the information economy, or knowledge economy,<sup>27</sup> are increasingly moving to places with access to nature and outdoor spaces. One article recently argued that the debates about public lands "often miss this fundamental nexus between beautiful places, quality of life and economic opportunity. Lazy discourse often pegs public lands as a drag on local economies. In reality, they are a boon, luring new companies, top talent and local investment."<sup>28</sup> A study by Headwaters Economics described that in "today's economy, the bulk of economic 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."<sup>29</sup>

The East-West Gateway Council of Governments, the St. Louis metropolitan planning organization, considers innovation a primary driver of economic growth. Innovation in the St. Louis region is propelled by numerous institutions, including four major research universities, the Danforth Plant

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21 Garry Sears and Daniela De Cecco, "High-Tech Labour Survey: Attracting and Retaining High-Tech Workers," *KPMG and CATA Alliance*, June 5, 1998.

22 Missouri Economic Research and Information Center, Missouri Department of Economic Development, *St. Louis Region: Industry Analysis* (May 2015).

23 St. Louis Regional Chamber, "St. Louis Quality of Life" (from Tim Alexander, St. Louis Regional Chamber, July 27, 2015).

24 Zannie Giraud Voss, Glenn Voss, Rick Briesch, with Meghann Bridgeman, "NCAR Arts Vibrancy Index II: Hotbeds of America's Arts and Culture," March 2016, accessed April 14, 2016, <http://www.smu.edu/~media/Site/Meadows/NCAR/NCARWhitePaper-ArtsVibrancyIndexII>.

25 City of Portland Bureau of Transportation, Transportation Options Division, "Portland Bicycle Maps and Information Survey," 2009, accessed October 20, 2015, <http://bikeportland.org/2009/01/28/60000-free-bike-maps-a-look-at-transportation-options-survey-results-13989#more-13989>.

26 Jim Gallagher, "From First to Worst, St. Louis Shows Up Everywhere in National Rankings. Does It Matter?," *St. Louis Today*, accessed March 4, 2016, [http://www.stltoday.com/business/columns/jim-gallagher/from-first-to-worst-st-louis-shows-up-everywhere-in/article\\_81856606-9d61-5c58-8028-03d372e37ec4.html](http://www.stltoday.com/business/columns/jim-gallagher/from-first-to-worst-st-louis-shows-up-everywhere-in/article_81856606-9d61-5c58-8028-03d372e37ec4.html).

27 The information economy, or knowledge economy, is an economy where the basic economic resource is knowledge rather than capital, natural resources, or labor. The people who work within this economy are referred to as the Creative Class, which includes people who work in science and engineering, architecture and design, education, arts, music, and entertainment, as well as creative professionals in business and finance, law, health care, and related fields. Source: Richard Florida, *The Rise of the Creative Class*, 10th Anniversary Edition (New York: Basic Books, 2014).

28 GreenBiz, "For Today's Companies, Nature Is a Top Recruiter," accessed September 2, 2015, <http://www.greenbiz.com/article/todays-companies-nature-top-recruiter?src=nws8-20>.

29 Headwaters Economics, *The Economic Benefits of the Land and Water Conservation Fund*, November 2009, [http://headwaterseconomics.org/pubs/protected-lands/LWCF\\_Economic\\_Benefits.pdf](http://headwaterseconomics.org/pubs/protected-lands/LWCF_Economic_Benefits.pdf).

Science Center, innovation incubators such as Cortex Innovation Community (CIC) and T-REX, and companies such as Monsanto and Boeing. Dennis Lower, the president and CEO of the Cortex Innovation Community, believes that “having transportation options is an international standard; they are an essential for attracting a vibrant workforce to innovation districts like the Cortex Innovation Community.”<sup>30</sup> The network of greenways is critical in providing transportation options, enabling workers in the St. Louis region to commute by bike or foot and connect to transit or other destinations directly from the greenways. For example, the St. Vincent Greenway in the City of St. Louis connects several neighborhoods to a nearby MetroLink station, and the counter on the greenway shows that people are walking and biking during rush hour on weekdays, rain or shine, suggesting that the greenway is being used for transportation and not just recreation. According to Great Rivers Greenway’s Eco Counter, 72,900 trips were made made last year on the St. Vincent Greenway during weekday rush hour.<sup>31</sup>

Parks and greenways are critical pieces of infrastructure in innovation districts and university research parks, where alternative and active transportation is highly desired by the people who work there as well as potential employees these innovation districts are trying to attract. According to the Brookings Institute, “Instead of inventing on their own in real or metaphorical garages, an array of entrepreneurs are starting their companies in collaborative spaces, where they can mingle with other entrepreneurs and have efficient access to everything from legal advice to sophisticated lab equipment. Rather than submitting to long commutes and daily congestion, a growing share of metropolitan residents is choosing to work and live in places that are walkable, bike-able, and connected by transit and technology.”<sup>32</sup>

Dougan Sherwood is the cofounder and managing director of the Cambridge Innovation Community-St. Louis, a company located within the CIC in midtown St. Louis. CIC-St. Louis provides office work space and accommodations to start-up companies. According to Sherwood, “parks, trails, and green space amenities are essential ingredients to attracting businesses and people. Especially in urban areas, the value of things like parks, green spaces, and accessible bike trails is in their ability to make people happy, pull people together, and ultimately create a community where people want to live, work, play, and learn.”<sup>33</sup>

According to Eileen Walker, chief executive officer of the Association of University Research Parks, “Many university research parks are designed to be holistic environments for enhancing local economic development. Some research parks are located on city parks and incorporate greenspace, trails, and other ‘quiet,’ but very important and meaningful amenities. By the nature of university parks, which are frequently large developments, greenways are frequently incorporated as water retention areas, and with good design, can be a huge benefit to the people who are employed within the park.”<sup>34</sup>

Trail-oriented development is not only occurring in innovation districts; it has been popping up across the country, as developers recognize that they can leverage a growing interest in active transportation. Examples include Bici Flats in Des Moines, Iowa; Circa in Indianapolis, Indiana; and MoZaic in Minneapolis, Minnesota. In fact, walkability is a top priority when considering where to live for 50 percent of residents in the United States, and bicycling is one of the fastest-growing forms of transportation in the United States. By incorporating designated bicycle storage areas and project

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30 Great Rivers Greenway, *Great Rivers Greenway 2014 Annual Report*, accessed September 18, 2015, <http://3saguo2foe1c2j78571kps4o.wpengine.netdna-cdn.com/wp-content/uploads/2015/05/Great-Rivers-Greenway-2014-Annual-Report.pdf>.

31 Eco Counter data for St. Vincent Greenway provided by Great Rivers Greenway on April 22, 2016.

32 Bruce Katz and Julie Wagner, “The Rise of Innovation Districts: A New Geography of Innovation in America,” *Brookings Institute*, May 2014, accessed March 3, 2016, <http://www.brookings.edu/~media/Programs/metro/Images/Innovation/InnovationDistricts1.pdf>.

33 Personal communication with Dougan Sherwood, Cortex Innovation Community, September 23, 2015.

34 Personal communication with Eileen Walker, Association of University Research Parks, September 14, 2015.

investments in public active transportation infrastructure, among other bicycle-related development features, developers are able to differentiate and add value to their projects.<sup>35</sup> Residential development is taking place near trails and increasing surrounding property values. For example, over \$200 million has been invested to construct over 1,200 apartment buildings along Minneapolis' Midtown Greenway.<sup>36</sup> In addition, the value of properties within 500 feet of the Indianapolis Cultural Trail has risen 148 percent since its opening in 2008.<sup>37</sup>



## Measuring the Impact

While employees, employers, experts, and many others recognize the value of greenways, their impact has never been measured. In fact, many cities and regions around the United States have been interested in measuring their impact, but available studies are limited. The Trust for Public Land combed the literature, consulted experts, and reviewed available data to design the metrics included in this section. Only metrics that gauge the Great Rivers Greenway's success were considered. That is, The Trust for Public Land included metrics related to the organization's mission and excluded factors outside of the Great Rivers Greenway's influence (e.g., total tourist spending in the St. Louis region). The potential metric categories include economic development via tourism and outdoor recreation, bicycle-related economic activity, and economic activity directly supported by Great Rivers Greenway spending.

35 Rachel MacCleery, Stuart Ackenberg, Wade Lange, Jeremy Stephenson, and Matthew Norris, "Active Transportation and Real Estate: The Next Frontier," *Urban Land Institute*, accessed April 14, 2016, [http://uli.org/wp-content/uploads/ULI-Documents/PPT\\_ActiveTransportation\\_4-13PDF.pdf?utm\\_source=mm&utm\\_medium=update&utm\\_campaign=ActiveTransportation](http://uli.org/wp-content/uploads/ULI-Documents/PPT_ActiveTransportation_4-13PDF.pdf?utm_source=mm&utm_medium=update&utm_campaign=ActiveTransportation).

36 Thomas Fisher, "Streetscapes: Midtown Greenway Spurs Urban Development, Especially in Uptown: How a Bike Path in an Old Railroad Trench Sparked \$200 Million in Residential Development in the Heart of Minneapolis. And What Still Needs to Be Done," *Star Tribune*, May 9, 2015, accessed April 14, 2016, <http://www.startribune.com/midtown-greenway-spurs-urban-development-especially-in-uptown/303081591/>.

37 Indiana University Public Policy Institute, "Reasons to Love the Indianapolis Cultural Trail: A Legacy of Gene and Marilyn Glick," accessed April 14, 2016, <https://policyinstitute.iu.edu/Uploads/PublicationFiles/Cultural%20Trail%20issue%20brief%2015-C23.pdf>.



## Tourism

Tourism is a large industry in Missouri, having a \$15.9 billion economic impact in 2015. In the same year, the state experienced 40.4 million visitors, who spent an average of \$280 per person, and directly supported 297,000 tourism jobs.<sup>38</sup> Total tourism expenditures totaled \$1.40 billion in the city of St. Louis, and this spending supported 27,200 tourism-related jobs. The counties of St. Louis and St. Charles experienced \$2.52 billion and \$723 million in tourism spending, respectively. This spending supported 61,200 and 20,200 jobs, respectively.<sup>39</sup>

Outdoor recreation is an important subset of the tourism economy. In fact, in Missouri, outdoor recreation generates \$11.2 billion in consumer spending, and \$780 million in state and local tax revenue. This consumer spending supports 111,000 direct Missouri jobs with \$3.3 billion in wages and salaries.<sup>40</sup>

National monuments, historic trails, and historic sites, as well as state parks, regional greenways, and local parks in Missouri attract millions of visitors each year who spend money in the local economy and support local jobs. These various levels of government each make contributions that are essential to the establishment and maintenance of park spaces and trails for public use. These amenities attract visitors both locally and regionally.



38 Missouri Division of Tourism, *Annual Report: FY 2015*, accessed April 14, 2016, [https://industry.visitmo.com/Portals/1/Research/MarketingPlan\\_AnnualReport/Missouri%20Division%20of%20Tourism%20Annual%20Report%20FY15.pdf](https://industry.visitmo.com/Portals/1/Research/MarketingPlan_AnnualReport/Missouri%20Division%20of%20Tourism%20Annual%20Report%20FY15.pdf).

39 Ibid.

40 Outdoor Industry Association, *Missouri: The Outdoor Recreation Economy*, accessed September 17, 2015, [https://outdoorindustry.org/images/ore\\_reports/MO-missouri-outdoorrecreationeconomy-oia.pdf](https://outdoorindustry.org/images/ore_reports/MO-missouri-outdoorrecreationeconomy-oia.pdf).



#### POTENTIAL METRIC 1. Percentage of tourists whose primary purpose is to visit greenways

Tourists visit greenways, parks, and trails in St. Louis to participate in a wide variety of activities. Though not always recognized, these amenities play a significant role in the tourism economy of the district. Tourists' activities, the number of visitors, and tourist spending determine the contribution of parks and trails to the tourism economy. In the St. Louis region, trails are constructed by Great Rivers Greenway, numerous municipalities, state agencies, and the city of St. Louis as well as the counties of St. Louis and St. Charles. However, visitor numbers and tourist expenditures are not tracked by each entity. Thus, it is not possible to extrapolate the number of visitors to all of the parks and trails in the region based on those numbers.

Nonetheless, with some additional information about visitors to the area, information from the Missouri Division of Tourism could be utilized to measure the value of greenways in the district's tourism economy. One can get a sense of how much money is spent and how much tax revenue is generated in the region due to its parks and trails by applying the percentage of visitors who primarily visit the region to use the greenways to the total direct travel spending (e.g., visitor expenditures on lodging, food, and gas) and the tax revenues within the region.

**Source:** Data would be developed in partnership with Explore St. Louis, which has expressed interest in adding questions about outdoor recreation/ greenways/trails to the existing visitor survey.

**Scale:** City and county of St. Louis.

**Updated:** To be determined by Great Rivers Greenway.

**Baseline:** To be determined by Great Rivers Greenway.

#### POTENTIAL METRIC 2. Approximate spending by tourists who visited greenways (tourist spending in the district, multiplied by the percentage of tourists whose primary purpose is to visit greenways)

In 2015, the communities within the district accounted for \$4.65 billion of the state's total tourism expenditures of \$12.4 billion. This spending generated 108,000 in tourism-related jobs (of the 297,000 total tourism jobs statewide). In a 2014 visitor survey, 5.3 percent of tourists visited state and national parks, making it one of the top ten activities engaged in while traveling in Missouri.<sup>41</sup>

**Source:** This would require data from the Missouri Division of Tourism.

**Scale:** Great Rivers Greenway's district.

**Updated:** Great Rivers Greenway would need to work with the Missouri Division of Tourism to ensure data are available annually.

**Baseline:** To be determined by Great Rivers Greenway.

### Outdoor Recreation

Greenways in the district are utilized for multiple types of activities, including bird watching, fishing, hiking, kayaking, photography, in-line skating, running, and walking, among others. These activities generate economic activity and support businesses, including those that sell related equipment and provide food and drink near the greenway.

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41 Missouri Division of Tourism, "Missouri Traveler Activities," March 3, 2015, Economic Impact of Tourism in Missouri Report by Tourism Economics/TNS Travels America Data July 2013–June 2014 (FY 14).

The following set of metrics has been developed in order to understand the bicycle-related economic activity that occurs in the St. Louis region and how it changes over time. Understanding this bicycle-related activity is of interest due to the essential work that Great Rivers Greenway does to develop greenways, connect communities, support the local bicycle network, and enable commuters to find safe alternative ways to get to work. While bicycle-related activity is not the only activity of interest, high-quality, specific economic data are not available for the other activities.<sup>42</sup> Data from the American Community Survey and Esri Business Analyst are utilized.

**POTENTIAL METRIC 3. The percentage of the St. Louis population that walks or bikes for transportation**

Biking and walking are becoming more important modes of transportation. In a 2015 Emerging Trends Report that surveyed industry leaders, pedestrian and bike friendly environments were noted by 92 percent of respondents as “important.”<sup>43</sup> In recognition of its dedication to bicycling, the city of St. Louis is ranked as a bronze Bicycle Friendly Community by the Bikes Belong Coalition.<sup>44</sup> The city of St. Louis has seen a dramatic increase in bike commuting recently. A report from the League of American Bicyclists indicates that about 1,860 individuals, or 1.3 percent of the St. Louis population, commute by bike and that St. Louis experienced a 270 percent increase in bike commuting between 2000 and 2014, ranking fifth in the nation for percent growth.<sup>45</sup>

In addition to commuting by bike, greenways can be used by pedestrians walking for transportation. According to the American Community Survey, 4.5 percent of the



42 For example, a more general “outdoor recreation” business classification cannot be included because the most closely related classification as defined by NAICS Association is the “sporting goods stores” category, which includes things like athletic uniform supply stores, fishing and tackle supply stores, diving equipment, bicycle shops, pro shops (e.g., golf, skiing, tennis), bowling equipment and supply stores, saddlery stores, sporting goods stores (e.g., scuba, skiing, outdoor), exercise equipment stores, gun shops, and specialty sports footwear stores (e.g., bowling, golf, spiked). These businesses are not related to greenway activities and are thus excluded. However, certain data are available within the Esri Business Analyst tool at a finer scale. For example, business information and spending potential indices are available for the businesses classified as sports, recreation, and exercise equipment, which includes the following categories that can also be broken out: exercise equipment, gear, game tables, bicycles, camping equipment, hunting and fishing equipment, winter sports equipment, water sports equipment, other sports equipment, and rental/repair of sports/recreation/exercise equipment. The Trust for Public Land recommends including the bicycle category since it is the one most relevant to Great Rivers Greenway, especially because data are not available for further sub-subcategories and the existing categories likely include types of sales that are entirely unrelated to the greenway activity (i.e., it is not possible to break out hunting and fishing, so while fishing may occur on the greenways, its impacts cannot be isolated).

43 Urban Land Institute, “2015 St. Louis Emerging Trends,” *ULI St. Louis and Focus St. Louis* with research support from Saint Louis University and underwriting sponsor Ameren Services, accessed October, 2015, <http://stlouis.uli.org/wp-content/uploads/sites/51/2014/10/2015-Emerging-Trends-local-report.pdf>).

44 Bikes Belong Coalition, “2010 Bicycle Friendly America,” accessed October 20, 2015, [http://www.bikeleague.org/sites/default/files/american\\_bicyclists\\_jan\\_feb10.pdf](http://www.bikeleague.org/sites/default/files/american_bicyclists_jan_feb10.pdf).

45 The League of American Bicyclists, “Where We Ride: Analysis of Bicycle Commuting in American Cities,” report on 2014 American Community Survey data, accessed October 20, 2015, [http://www.bikeleague.org/sites/default/files/Where\\_We\\_Ride\\_2014\\_data\\_web.pdf](http://www.bikeleague.org/sites/default/files/Where_We_Ride_2014_data_web.pdf).

workers 16 and over commute by walking.<sup>46</sup>

**Source:** Existing American Community Survey.

**Scale:** City of St. Louis.

**Updated:** Annually.

**Baseline:** 1.3 percent bikes (2014); 4.5 percent walks (2014).

**Note:** While the percent increase in bike commuting is a large and exciting statistic, The Trust for Public Land recommends using the percentage of bike commuters as the metric since the percentage change will most likely decrease over time as more commuters choose to use bicycles. The number of commuters is also subject to change from population growth or decline.

#### POTENTIAL METRIC 4. Average annual bicycle-related spending by households in the district

Households in the district spend more per year on bicycles when compared to households in the St. Louis Metropolitan Statistical Area (MSA). For example, according to Esri Business Analyst, households in the district spend an average of \$32 on bicycles and related bicycling gear and equipment each year. For context, this is higher than the average household spending of \$29 per year in the St. Louis MSA.

**Source:** Existing data that would need to be accessed and analyzed from Esri Business Analyst. Consumer spending data were derived by Esri Business Analyst from the 2011 and 2012 Consumer Expenditure Surveys (Bureau of Labor Statistics).

**Scale:** Great Rivers Greenway's district.

**Updated:** Annually.

**Baseline (2015):** \$32 per household.



GREAT RIVERS GREENWAY

<sup>46</sup> American Community Survey, "Commuting Characteristics by Sex," U.S. Census Bureau, accessed April 15, 2016, [http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS\\_14\\_5YR\\_S0801&prodType=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_14_5YR_S0801&prodType=table).

#### POTENTIAL METRIC 5. Spending Potential Index for the district

The potential for bicycle-related spending is higher than the national average and higher than the potential spending by households in the St. Louis MSA. For example, Esri Business Analyst generates a spending potential index (SPI) that represents the amount spent on bicycles relative to the national average of 100. The SPI for the district is 107 and the SPI for the St. Louis MSA is 97.

**Source:** Existing data that would need to be accessed and analyzed from Esri Business Analyst. The Spending Potential Index is household based.

**Scale:** Great Rivers Greenway's district.

**Updated:** Annually.

**Baseline (2015):** Spending Potential Index: 107.

#### POTENTIAL METRIC 6. Number of bicycle-related businesses and employees within the district

Bicycle infrastructure, such as that provided by Great Rivers Greenway, is important for supporting local bike-related businesses.

**Source:** Existing data that would need to be accessed and analyzed from Esri Business Analyst.

**Scale:** Great Rivers Greenway's district.

**Updated:** Annually.

**Baseline (2015):** 35 bicycle-related businesses, 236 employees, \$40.5 million in sales.

#### POTENTIAL METRIC 7. Number of bicycle-related businesses and employees within a walkable distance of the greenway

Relatively more bicycle-related economic activity occurs within a walkable distance of the greenway than one would expect based on the population within a walkable distance. For example, while 11 percent of the 2015 population of Great Rivers Greenway's district is located within a half mile of the greenway system, 14 percent of the bicycle-related businesses, 17 percent of the employees at bicycle-related businesses, and 16 percent of the bicycle-related sales occur within a half mile.

**Source:** Existing data that would need to be accessed and analyzed from Esri Business Analyst.

**Scale:** Great Rivers Greenway's district.

**Updated:** Annually.

**Baseline (2015):** 5 businesses (14 percent), 39 employees (17 percent), \$6.63 million in sales (16 percent).

**Note:** This walkable distance is calculated as the crow flies and does not directly relate to the distances calculated in the park and greenway access analysis.

#### POTENTIAL METRIC 8. Number of bicycle-related businesses and employees within a bike-able distance of the greenway

Relatively more bicycle-related economic activity occurs within a bike-able distance of the greenway than one would expect based on the district's population within a bike-able distance. That is, 46 percent of the 2015 population is within a 1.5-mile distance to



the greenways; however, 49 percent of the bicycle-related businesses, 52 percent of the employees at bicycle-related businesses, and 53 percent of the bicycle-related sales occur within a 1.5-mile distance of the greenway system.

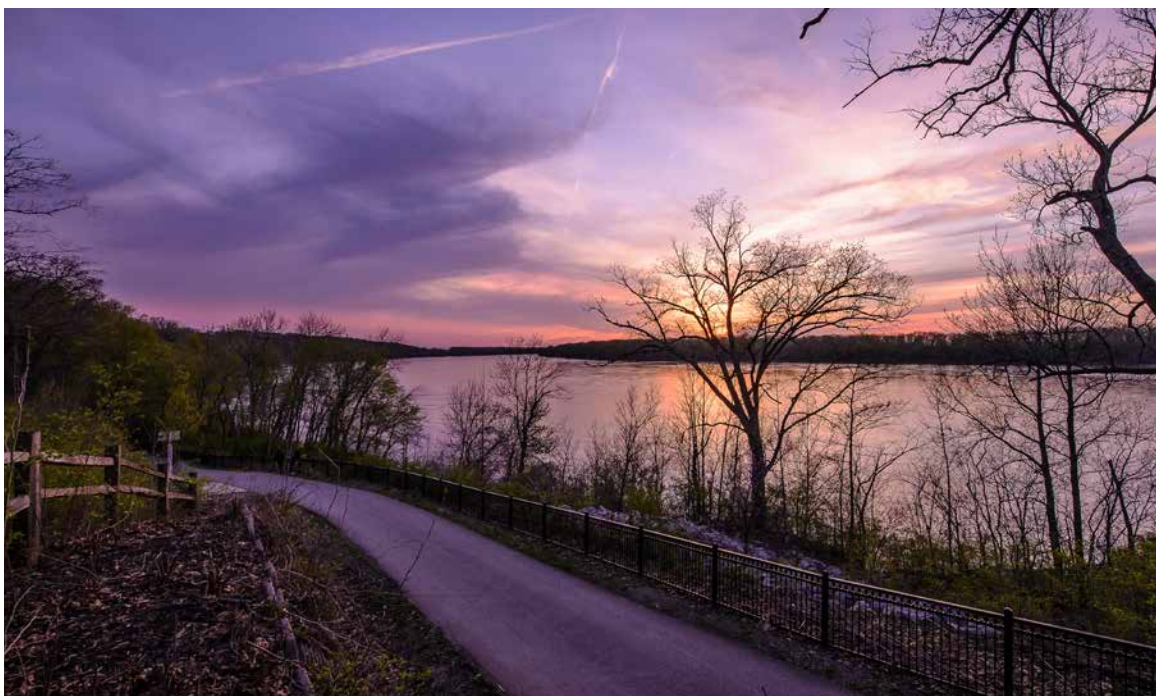
**Source:** Existing data that would need to be accessed and analyzed from Esri Business Analyst.

**Scale:** Great Rivers Greenway's district.

**Updated:** Annually.

**Baseline (2015):** 17 businesses (49 percent), 123 employees (52 percent), \$21.3 million in sales (53 percent).

**Note:** This bike-able distance is calculated as the crow flies and does not directly relate to the distances calculated in the park and greenway access analysis.



## Great Rivers Greenway's Spending

Great Rivers Greenway directly impacts the local and regional economy through its work designing, engineering, and constructing greenways. The spending necessary to complete these projects has implications in the local economy because supplies need to be purchased and people need to be hired to complete the tasks.

### POTENTIAL METRIC 9. Output, earnings, and employment supported by Great Rivers Greenway expenditures

Recent work by the Public Policy Research Center utilized expenditures for the construction of the Dardenne Greenway at Barathaven to estimate output, earnings, and employment multipliers that result from the type of spending Great Rivers Greenway typically spends for greenway projects. The analysis included an output multiplier (on a per dollar basis) that measures the total value in the local economy of purchasing the inputs needed to complete a Great Rivers Greenway project, as well as an earnings multiplier that measures

the change in income received by households due to the Great Rivers Greenway output, and an employment multiplier that measures the change in the number of jobs in the economy due to the direct output. Spending by Great Rivers Greenway on the greenway's design and construction resulted in an output multiplier (in dollars) of 2.18, an earnings multiplier (in dollars) of 0.71, and an employment multiplier (in jobs per \$1 million) of 18.0.<sup>47</sup>

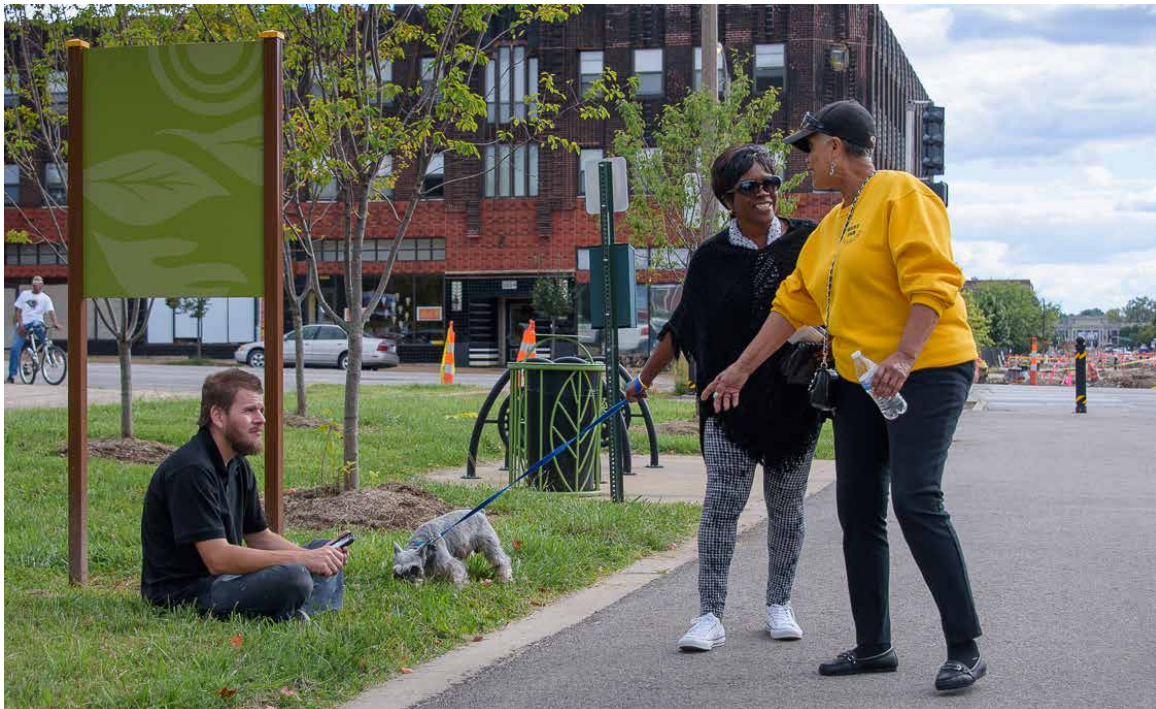
It is not appropriate to calculate the output, earnings, and employment impacts of Great Rivers Greenway's annual spending with these multipliers since the multipliers were created using a project that had unique expenditures that were not typical of all Great Rivers Greenway projects. In order to estimate the typical output, earnings, and employment impacts, The Trust for Public Land recommends creating a new set of multipliers using a representative set of projects. This would require first determining a set of projects that are similar to most of Great Rivers Greenway projects. Then, these projects would need to be analyzed in an input-output model, such as IMPLAN, to estimate the multipliers.

**Source:** New multipliers would be created using a set of projects that are representative of Great Rivers Greenway spending.

**Scale:** Great Rivers Greenway's district.

**Updated:** Rolling average, updated annually.

**Baseline:** To be determined by Great Rivers Greenway.



GREAT RIVERS GREENWAY

<sup>47</sup> Public Policy Research Center, "Estimated Spending and Employment Impact of Great Rivers Greenway" (internal document, provided by Todd Antoine, March 17, 2015).

# Conclusion

This study illustrates that Great Rivers Greenway generates substantial social and economic benefits and will continue to do so into the future. The network of greenways provide, and will continue to improve, essential access to parks and trails for enjoyment, recreation, physical activity, and transportation. By looking at areas around the completed greenways and parks, this analysis found that roughly half of the population is within walking distance of greenways and parks. The population served jumps to nearly 90 percent within a bike-able distance. The network of greenways enhances the value of the residential properties that are located in proximity by \$62.8 million, which increases property tax revenues by \$963,000 a year. These amenities also strengthen quality of life, attract employees and employers, and bolster economic opportunity.

Great Rivers Greenway's network of greenways provides a host of other important economic benefits that were not quantified in this analysis. These include recreation and tourism, helping to promote human health, air pollution removal by vegetation, and reducing stormwater. These benefits create substantial and sustained economic value above and beyond what was captured in this study.



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# Appendix A. Enhanced Property Value Methodology

The methodology for this enhanced property value analysis was developed for The Trust for Public Land by John Crompton of Texas A&M University. In each enhanced property value analysis completed by The Trust for Public Land, the research team combs through the recent and geographically relevant literature to ensure this methodology is reliable and conservative.

The premise that parks and open space have a positive impact on proximate property values derives from the observation that people frequently are willing to pay a larger amount of money for a home close to these types of areas than they are for a comparable home that is not proximate to such an amenity. This observation has been empirically validated in over 30 studies whose results have been reported in the literature.<sup>1</sup> In effect, this represents a “capitalization” of park and open space land into increased property values for proximate landowners. It adopts the mechanism of market pricing to assess the value of parks. This process of capitalization is termed “the proximate principle.” Conceptually, it is argued that the competitive market will bid up the value of property just equal to the capitalized value of the benefits that property owners perceive they receive from the presence of the park or open space. Economists refer to this approach as “hedonic pricing.” It is a means of inferring the value of a nonmarket resource (e.g., a greenway) from the prices of goods actually traded in the market place (e.g., surrounding residential properties).

An implication of this proximate principle is that impacted homeowners are likely to pay higher property taxes to government entities. The incremental amount of taxes paid by each property that is attributable to the presence of the park, when aggregated, is likely to substantially enhance the value of the tax base. If related either to the cost of acquisition and development of a park or open space, or to the annual maintenance and operating expenses, the annual increments of proximate value may be sufficient to meet or exceed either of those costs.

## Diversity of proximate impacts

It is important to recognize that some parks and open spaces are more desirable than others as places to live nearby. Some spaces are flat, sterile green fields; others belong to another era and have not changed in design or intended uses, even though the demographics of proximate populations have changed, so they have become irrelevant; others embrace nuisances such as traffic congestion, noise, litter, vandalism, or ball field lights intruding into adjacent residences; others are poorly maintained; others are dispirited, blighted, derelict facilities; and others attract undesirable elements who engage in socially unacceptable behavior. It is unlikely that such parks and open spaces will add proximate value. Indeed, it is likely that in some of these cases they would detract from property values.

## Challenges in deriving an estimate of proximate impact

To undertake hedonic studies that calculate the impact of parks and open spaces on property taxes and the property tax base requires a significant number of arms-length sales transactions within the housing market, detailed attribute data for each parcel, the use of statistical techniques, and a substantial amount of time. It is likely to be impractical for most park agencies to replicate studies of this nature, given their limited budgets and time frames. Nevertheless, many agencies seek a method

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<sup>1</sup> John L Crompton, *The Proximate Principle: The impact of parks, open space and water features on residential property values and the property tax base*, second edition (Ashburn, Virginia: National Recreation and Park Association, 2004); Virginia McConnell and Margaret Walls, *The Value of Open Space: Evidence from Studies of Nonmarket Benefits* (Resources for the Future, January 2005).

of applying a valuation to parks that they can adapt for use in their own communities. The approach offered here is one that can generate a more rudimentary estimate. This is due to the difficulty of interpreting the results of empirical studies and adapting them to parks in different contexts. There are three challenges in making such adaptations.

The first challenge lies in the diversity of areas that are described by the rubric “parks.” A park may be a one-tenth-acre brick plaza with minimal planting, subjected to the noise and pollution of a large city center, or it may consist of several million acres of mountainous wilderness in Alaska; even within the 50 largest cities in the United States, parks that are beloved by their residents range in size from the jewel-like 1.7-acre Post Office Square in Boston to the 16,300-acre South Mountain Preserve in Phoenix.<sup>2</sup> A park may be designed for recreational use with multiple floodlit athletic facilities, an array of cultural buildings and large paved parking lots, or a tranquil natural resource oasis with no improvements; or it may be a blighted eyesore, or a breathtakingly beautiful spectacle. In short, a park is a nebulous concept that defies standardization. For this reason, it is likely that the proximate impact of selected parks within the same community will be different, and it is unlikely that a selected park in one community will have the same proximate impact of another park in a different context.

A second challenge relates to the nature of the results reported in the empirical studies. It is difficult to directly compare these results because they have been ascertained in a variety of manners and have used a number of different measures of value.<sup>3</sup> Among the variations are the measure of property value, the measure of distance, and the comparison criterion.

Many of the studies, especially those completed before 1980, used assessed valuation rather than sales price as their measure of property value. Assessed values are doubtful surrogates for sales price in these kinds of studies because most tax assessors are unlikely to consider park proximity in their valuations. Assessed valuations tend to be rather gross measures that ignore subtleties like the proximate principle. They also tend to be lower than sales price as tax assessors seek to avoid appeals from homeowners challenging their assessments.

To measure distance from a property to a park, some of the studies used a straight-line from the property to the park, whereas others measured the distance people would have to travel along roads or paths to access the park. This latter street network approach is more accurate and has been more frequently used in recent years since the widespread adoption of GIS mapping has made it easier. The distances over which impact was measured also varied from two or three blocks to half a mile or more.

Premiums associated with the proximate principle were presented in a variety of forms. Some were presented in absolute terms without a comparison criterion. For example, a study in Leon County, Florida, reported an average premium across the county of \$6,010 for homes within 200 feet of a park compared to a similar home outside the influence of the park’s proximity.<sup>4</sup> However, the proportionate magnitude of this premium is unclear because the mean value of homes in the area is not reported. If these were \$75,000 homes, then the premium would be 8 percent, but if they were \$300,000 homes, it would be 2 percent. The absence of an indicator of the proportionate magnitude of the premium makes it impossible to meaningfully transfer these data to other contexts.

The most useful information for transferability purposes is offered by studies such as one Portland, Oregon, example where proportionate property premiums are based on comparisons with similar

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2 Peter Harnik, *Inside City Parks* (Washington, DC: Urban Land Institute, 2000).

3 Sarah Nicholls, *Does Open Space Pay? Measuring the Impacts of Green Spaces on Property Values and the Property Tax Base* (College Station, Texas: Department of Recreation, Park and Tourism Sciences, Ph.D. Dissertation, 2002).

4 Cape Ann Economics, *Land Values and Open Space—Leon County* (San Francisco: The Trust for Public Land, 2003).

properties outside the proximate impact area.<sup>5</sup> In other cases, for example, a study in Austin, Texas, the premiums are based on average home prices within the impacted area, which means they are likely to be substantially lower than if the comparison criterion was with like houses outside the impacted area.<sup>6</sup>

A third challenge in identifying a premium value that may be transferable to park sites in other communities from the results of the empirical studies may be termed “the aggregation problem.” A number of studies, for example, the Leon County<sup>7</sup> and Portland<sup>8</sup> articles, reported proximate premiums that were derived by averaging the impact across a large number of parks in a jurisdiction. Thus, in the Portland case, the premiums of \$1,210 and \$10,600 were averages derived from 115 urban parks and 34 natural parks, respectively. It was emphasized in the previous section that there are many situations in which the proximate premium may be negative, reflecting the undesirable nature of the open space. When premiums are derived from averages across multiple parks, it is likely that results will be self-canceling to some extent, since the impacts at individual parks may range from high positive to high negative. From a transferability perspective, premiums derived from case studies of individual parks whose attributes are carefully described are more useful than those derived from averages across multiple parks.

## The calculation parameters

The goal for this methodology was to develop a relatively simple formulary approach that could be used to derive an estimate of the proximate premium in a community. It is assumed that there will be electronic access to the assessed values of property assigned by the tax assessor’s office and that the community has a GIS mapping system. It was noted earlier that market values are preferred to assessed values, but in some cases only assessed values will be available. If assessed values are used, and assessed values are invariably lower than market values, the resulting estimates should be viewed as conservative.

The following parameters are suggested as reasonable points of departure for deriving these premiums based on the empirical results reported in the literature.<sup>9</sup>

The area of proximate impact of a park should be limited to 500 feet or three blocks. The empirical results suggest this is likely to capture almost all the premium from small neighborhood parks and 75 percent of the premium from relatively large parks. The remaining 25 percent is likely to be dissipated over properties between 500 and 2,000 feet. Disregarding this will lead to an underestimate of the proximate impact of large parks, which may be substantial because while the premiums at these distances are relatively low, the number of properties within these parameters is relatively high. However, adopting this 500-foot parameter substantially simplifies the estimation task.

This methodology uses all parks in the city of one-half acre or more. It is not practical to carry out the hedonic analysis for parks of less than one-half acre in size. It is sufficient to note that the final calculation is conservative because it omits the many tiny park fragments that exist in every city.

Based on the literature, good parks are associated with a 15 percent premium. Average parks are associated with a 5 percent premium, and bad parks have a premium of -5 percent. After a review of

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5 Margot Lutzenhiser and Noelwah R. Netusil, “The Effect of Open Spaces on a Home’s Sale Price” (*Contemporary Economic Policy* 19, no. 3, pp. 291-298, 2001).

6 Sarah Nicholls and John L. Crompton, “The impact of greenways on property values: Evidence from Austin, Texas” (*Journal of Leisure Research*, 37, no. 3, pp. 321-341, 2005).

7 Cape Ann Economics, Land Values and Open Space—Leon County. (San Francisco: The Trust for Public Land, 2003).

8 Margot Lutzenhiser and Noelwah R. Netusil, “The Effect of Open Spaces on a Home’s Sale Price” (*Contemporary Economic Policy*, 19, no. 3, pp. 291-298, 2001).

9 John L. Crompton, *The Proximate Principle: The Impact of Parks, Open Space, and Water Features on Residential Property Values and the Property Tax Base*, second edition, (Ashburn, Virginia: National Recreation and Park Association, 2004).



the literature, these premiums may appear low to some readers.<sup>10</sup> Several technically strong studies (for example, Portland,<sup>11</sup> the Barton neighborhood in Austin,<sup>12</sup> and the Dallas-Fort Worth metroplex<sup>13</sup>) reported premiums in the range of 16 to 22 percent. However, these were measuring the impact within the first block immediately adjacent to the park and the premiums declined for properties in the second and third blocks. The proportionate premiums suggested here are averages to be used for all properties within the 500-foot (three-block) radius. Furthermore, the average for all parks is 5 percent.

### Steps in calculating an estimate of the impact of parks on the property tax base

1. Identify all public parks of one-half acre or more.
2. Draw a 500-foot buffer around each park.
3. Aggregate the assessed value of all homes within each of the 500-foot buffers, using data from the local tax assessor's office.
4. Apply the percentage premium suggested above (5 percent). This figure represents an estimate of the overall change in property value attributable to the parks examined.
5. Multiply the aggregated premiums calculated in Step 4 by the effective local property tax rates imposed by all taxing entities to estimate the total positive impact of parks on the property tax base.

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10 John L. Crompton, *The Proximate Principle: The Impact of Parks, Open Space, and Water Features on Residential Property Values and the Property Tax Base*, second edition, (Ashburn, Virginia: National Recreation and Park Association, 2004).

11 Cape Ann Economics, *Land Values and Open Space—Leon County*. (San Francisco: The Trust for Public Land, 2003).

12 Sarah Nicholls and John L. Crompton, "The impact of greenways on property values: Evidence from Austin, Texas" (*Journal of Leisure Research*, 37, no. 3, pp. 321–341, 2005).

13 Andrew R. Miller, *Valuing Open Space: Land economics and neighborhood parks* (Cambridge, Massachusetts: MIT Center for Real Estate, 2001).

# Appendix B. Greenways and Parks Adjacent to Greenways

The parks that are intertwined with the greenway system also enhance the value of surrounding properties. Thus, The Trust for Public Land identified all the homes within 500 feet of greenways and parks that are adjacent to greenways. Parks were included in this analysis if they were within 500 feet of the completed greenway corridor. Exhibit B provides an illustration of how homes within 500 feet of greenways and parks were identified.

Exhibit B. Example of a selection of residential parcels within 500 feet of greenways and adjacent parks.



As shown in Table B, there were 12,100 residential parcels within 500 feet of these greenways and parks. This analysis estimates that an added \$104 million in residential property value existed in the district because of proximity to greenways and adjacent parks in 2015. This value cannot be combined with the \$62.8 million in estimated market value due to greenways in Table 3. The \$62.8 million in enhanced property value from greenways is a subset of the \$104 million in enhanced property value from greenways and adjacent parks.

Table B. Enhanced residential property value due to proximity to greenways and adjacent parks in Great Rivers Greenway's district (2015)

	Number of homes within 500 feet	Total market value of homes within 500 feet	Market value of premium homes within 500 feet	Tax premium of homes within 500 feet
Greenway and adjacent parks	12,100	\$2,070,000,000	\$104,000,000	\$1,550,000



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