PARKS AND ENVIRONMENTAL JUSTICE

EXAMINING CHANGES IN DISPARITIES IN PARK AVAILABILITY, FEATURES, AND QUALITY ACROSS GREENVILLE COUNTY, SC

Greenville County Rec
Parks • Recreation • Tourism

city of greenville
Parks & Recreation

Greer
City of Greer, SC
Parks and Recreation

Fountain Inn
Parks & Recreation

Mauldin
Parks & Recreation

Simpsonville
Parks & Recreation

"PARKS ARE LUNGS OF THE CITY AND THE HEART OF A COMMUNITY"

FREDERIC LAW OLMSTED

Figure 1: Greenville County, South Carolina

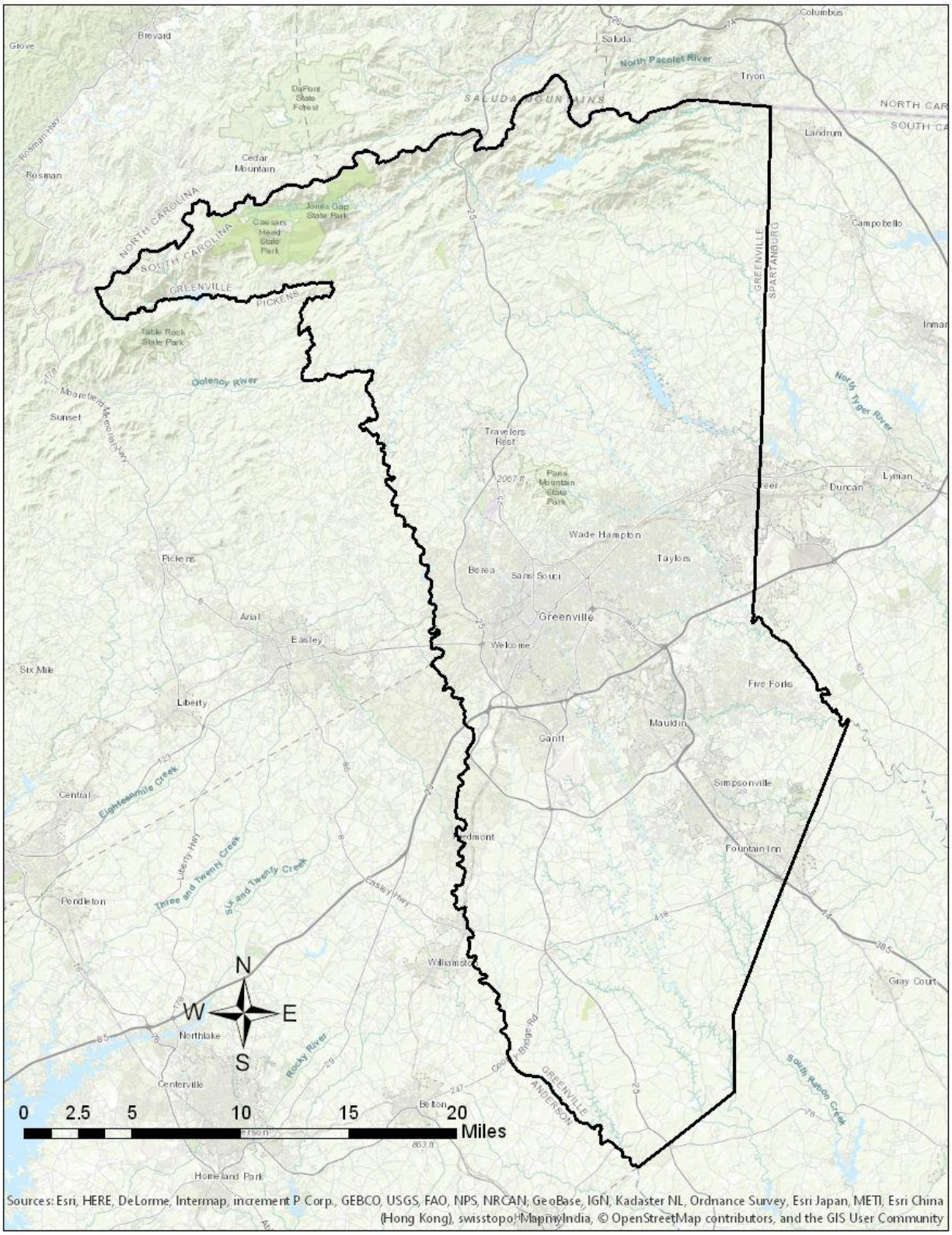


Table of Contents

The following paragraphs provide a summary of the rationale for the project, its purpose and methods, detailed findings, and conclusions.

Background

Parks are acknowledged as important settings for physical activity and health, especially in low income areas where other accessible, low cost resources may not be available. Generally, persons from lower income and minority backgrounds exhibit lower physical activity levels. This may be partly explained by growing evidence showing that parks and other recreation facilities are often less common in low income and racially-diverse neighborhoods. However, some authors have reported discrepant findings and few such studies have considered the actual content of parks. Further, little research has been done on park content change over time, particularly with emphasis on improvements in park equity. Thus, more research is needed to fully assess access to quality park environments and potential park improvements in low income and high minority areas. This has been identified as an important environmental justice issue for public health.

Study Objective

This study examined whether the availability, features, and quality of parks were equitably distributed across Greenville County according to median household income and percent racial/ethnic minority in 2013 and 2017. Further, this study assessed if inequities by income and race/ethnicity improved in availability, features, and quality of parks over a four-year period.

Methods

All census block groups (n=255) in Greenville County, SC were included in the study. Data from the U.S. Census Bureau's American Community Survey were used to identify the median household income and the percentage of minority residents (i.e., all residents other than non-Hispanic White persons) for each block group. For both income and percent minority, all block groups were categorized into tertiles (low, medium, high). Parks were enumerated using geographic information systems (GIS) shape files provided by both the City of Greenville and Greenville County. Parks

MeSA Soccer Complex

in Greenville County were included in an edited file after an in-person audit if they were deemed useable and publicly accessible. Park availability within block groups was measured using ArcView 10.2 by determining the number of parks and the total area of parks intersecting each block group.

Park features and quality were assessed via the Community Park Audit Tool (CPAT). Trained observers used the CPAT to assess the presence of 14 park facilities (e.g., playgrounds, sports fields, trails) and 23 park amenities (e.g., restrooms, lights, car parking). We compared the total number of individual facilities as well as the average number of amenities across block groups. The condition of park facilities was also measured using the audit tool. Park quality was measured by the average number of quality concerns (e.g., graffiti), aesthetic features (e.g., landscaping), and number of surrounding neighborhood concerns (e.g., poorly maintained properties) per park in the block group.

Multinomial logistic regression was used to analyze whether a larger number of parks and greater park acreage were more likely in block groups of differing income and percentage minority residents. As well, analyses of covariance (ANCOVAs) with Sidak post-hoc tests were used to analyze differences in park features and park quality across income and percent minority tertiles. All analyses controlled for the area of the block group, total population in the block group, percentage of the population under 18 years, and the block group's income or percent minority (when these variables were not used to stratify the sample of block groups to begin with).

Results

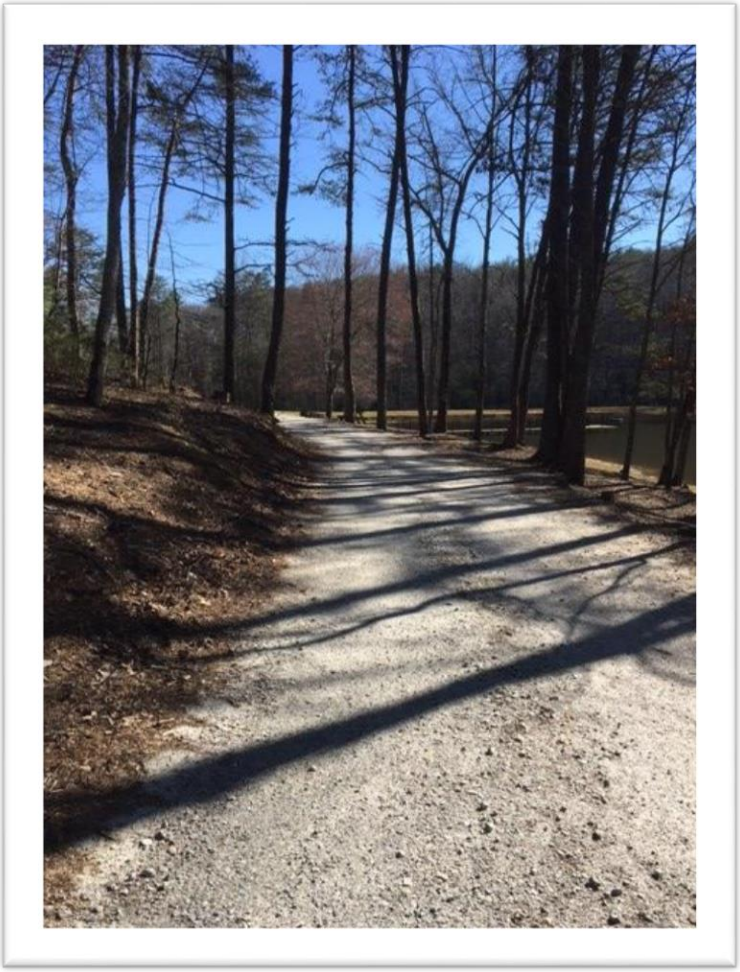
In 2013, of the 255 block groups in Greenville County, approximately 33.3% contained parks (n=85). Across all block groups, there were 0-5 parks, with an average of 0.47 parks and 17.87 park acres per block group. No differences were found across income groups and percent minority groups for several park variables: number of parks, park acreage, total number of individual facilities, park amenities, park aesthetic features, and park quality concerns. However, on average, there were more surrounding neighborhood concerns in high minority block groups (M=3.05, SD=1.43) compared to medium (M=1.45, SD=1.26) and low-minority block groups (M=1.98, SD=1.66). Further, high income block groups were more likely to have all park facilities in good condition compared to low income block groups (OR=5.23, CI=1.06, 25.76).

In 2017, of the 255 block groups in Greenville County, approximately 34.5% contained parks (n=88). Across all block groups, there were 0-5 parks, with an average of 0.50 parks and 17.49 park acres per block group. No differences were found across income groups and percent minority groups for several park variables: number of parks, park acreage, total number of individual facilities, park amenities, park aesthetic features, and park neighborhood concerns. Analyses detected that medium (OR=11.71, CI=1.65-75.63) and high (OR=23.79, CI=2.73-207.36) income block groups were more likely to have all park facilities in good condition

compared to low income block groups. Medium (M=6.30, CI=1.47-26.96) and high (OR=6.91, CI=1.41-33.81) minority block groups were also more likely to have park facilities to be considered in good condition than were low minority block groups. Furthermore, there were more park quality concerns in high minority block groups (M=1.03, SD=1.29) compared to medium (M=0.57, SD=0.96) and low minority (M=0.60, SD=1.16) block groups.

Conclusion

This study adds to an important body of literature examining income and racial/ethnic disparities in access to active living environments. In Greenville County, SC, park availability was equitably distributed across low, medium, and high income areas as well as across block groups that had a low, medium, and high percentage of minority residents. In 2013, high minority block groups had more neighborhood concerns in the area surrounding the park compared to low and medium percent minority block groups. In 2017, high minority block groups had more facilities in good condition than low minority block groups, but there were more park quality concerns for high minority block groups compared to low minority block groups. In both 2013 and 2017, high income block groups were more likely to have all facilities in good condition compared to low income block groups, and all levels of income and percent minority residents were similar on park acreage, number of individual facilities, total park amenities, and park quality.



Pleasant Ridge Park

In Greenville County and elsewhere, public health and parks and recreation researchers and practitioners should work together to examine policies that contribute to and that might rectify any disparities in access to safe and attractive parks and open spaces. This can ensure a level playing field so that future generations from all backgrounds and neighborhoods may enjoy the health benefits of parks in Greenville County.

AUTHORS AND ACKNOWLEDGEMENTS

In collaboration with Greenville County Parks, Recreation, & Tourism, City of Greenville Parks and Recreation Department, Fountain Inn Parks and Recreation Department, Mauldin Recreation Department, City of Greer Parks and Recreation Department, Simpsonville Parks and Recreation Department, and LiveWell Greenville, the current project was led by:

Dr. Andrew Kaczynski
University of South Carolina
Arnold School of Public Health
Department of Health Promotion, Education, and Behavior
Discovery I, Room 529
Columbia, SC 29208
(803) 777-7063
atkaczyn@mailbox.sc.edu

Morgan Hughey, PhD, MPH
University of South Carolina
Arnold School of Public Health
Department of Health Promotion, Education, and Behavior
Discovery I, Room 529
Columbia, SC 29208
morganhughey@gmail.com

Ellen W. Stowe, MPH
University of South Carolina
Arnold School of Public Health
Department of Health Promotion, Education, and Behavior
Discovery I, Room 529
Columbia, SC 29208
ewstowe@email.sc.edu

Sarah King, BS
University of South Carolina
Arnold School of Public Health
Department of Health Promotion, Education, and Behavior
Discovery I, Room 529
Columbia, SC 29208
sbking@mailbox.sc.edu

The following students were also invaluable members of the study team:

- Sarah Shephard, Department of Health Promotion, Education, and Behavior, University of South Carolina
- Shea McCarthy, Department of Health Promotion, Education, and Behavior, University of South Carolina

Finally, we wish to acknowledge the technical and administrative assistance provided by numerous departments within Greenville County and the generous funding received from the Piedmont Health Foundation in Greenville, SC as well as the Centers for Disease Control and Prevention through a Partnerships to Improve Community Health award to LiveWell Greenville (award number 1U58DP005588-01).

Stowe, E.W., Hughey, S.M., Kaczynski, A.T., King, S. B. (2017). Parks and environmental justice: Examining changes in disparities in park availability, features, and quality across Greenville County, SC. Columbia, SC: University of South Carolina.

List of Figures

List of Tables

INTRODUCTION

Obesity and related chronic diseases have reached epidemic proportions in the United States.[1] Obesity and one of its primary causes, low rates of physical activity, are disproportionately problematic among low income populations and persons from minority backgrounds.[2-4] Recent physical activity and health promotion efforts have adopted social ecological models that emphasize the role of the built environment in facilitating or constraining opportunities for active transportation and recreation.[5] Public parks are a major environmental resource in most communities and their proximity, accessibility, design, and quality are all important factors influencing their usage and impact on population-level physical activity.[6-9] Indeed, public parks generally offer diverse opportunities for physical activity, are present in most communities at low or no cost, and can thereby reach a large proportion of the population, especially disadvantaged groups who may not have access to other resources.[10]

Environmental justice can be defined as the fair treatment and meaningful involvement of all people in the development, implementation, and enforcement of laws, regulations, and policies about diverse environmental issues.[11] Similar to environmental justice, deprivation amplification[12] refers to the concern that persons with fewer *personal* resources that might support active living (e.g., income, knowledge) also may reside in areas more deprived of *neighborhood* physical activity resources (e.g., sidewalks, parks). Taken together, these ideas provide a conceptual foundation for investigating environmental disparities in low income and racially/ethnically diverse communities.[13]

A growing body of research has examined the distribution of physical activity resources by neighborhood socioeconomic status (SES) or ethnic/racial composition. It has often been concluded that areas with lower SES and/or a higher minority population contain significantly fewer parks and recreational resources than their higher SES and low minority counterparts.[14-19] However, other studies have reported that park availability is equal or greater in low-income and/or high minority neighborhoods,[20-23] so further research is warranted. Moreover, few studies have explored disparities in the specific facilities and amenities within parks[24,25] or have evaluated the actual quality of parks and recreation resources by race/ethnicity or income. [26,27] Finally, little research has been conducted on longitudinal park assessments to assess changes in parks, particularly across income and racial/ethnic minority categories.

The purpose of this project was to examine disparities in park availability, features, and quality across socioeconomically and racially/ethnically diverse block groups in Greenville County, SC. Furthermore, this study assessed changes in park availability, features, and quality across socioeconomically and racially/ethnic diverse block groups from 2013 to 2017. Better understanding how access to parks differs by income and percent minority is a critical first step in environmental and policy changes aimed at reducing inequalities in health resources (e.g., parks), behaviors (e.g., physical activity), and outcomes (e.g., obesity, disease). Furthermore, assessment of park improvements for low income and racial/ethnic minority communities can emphasize the value of environmental justice efforts and support advocacy and policy efforts aimed at reducing inequality.

METHODS

Study Area and Sample

Located in the Upstate of South Carolina and the foothills of the Appalachian Mountains, Greenville County is the largest county by population in South Carolina with 498,766 residents as of 2016. Greenville County includes several suburban areas, a respected liberal arts university (Furman University), urban neighborhoods, and a vibrant downtown area. These factors contribute to a growing, diverse community. The population of Greenville County has increased 10.5% since 2010, higher than the state average population increase (7.3%). The population estimates, racial/ethnic composition, and percent of residents below the poverty line for both Greenville County and the primary urban area, the City of Greenville, for 2010 and 2016 are presented in Table 1A and 1B.[28]

Parks were identified for enumeration and location through park lists that were provided by Greenville County Parks, Recreation, and Tourism and the City of Greenville Parks and Recreation Department. In addition, Greenville County and City of Greenville Geographical Information Systems (GIS) departments provided shape files that identified each park and the total acreage of each park. Ultimately, in 2013, 103 parks (0.12 to 293.42 acres) were included in an edited GIS file after an in-person audit determined that they were parkland useable for recreation, were publicly accessible, free of cost, and were located in Greenville County (also, it should be noted that state parks and other large natural spaces were excluded from this analysis). In 2017, 107 parks (0.12 to 293.24 acres) were included per the same conditions.

Table 1A: Population Characteristics of Study Area 2010

	Greenville County	City of Greenville
Population	474,266	60,709
Non-Hispanic White (%)	77.1	64.0
African American (%)	18.5	30.0
Hispanic or Latino (%)	8.5	5.9
Below Poverty Line (%)	15.2	18.6

Table 1B: Population Characteristics of Study Area 2016

	Greenville County	City of Greenville
Population	498,766	67,453
Non-Hispanic White (%)	76.7	64.0*
African American (%)	18.6	30.0*
Hispanic or Latino (%)	9.0	5.9*
Persons in Poverty (%)	13.8	19.3

*data from 2010

The final compilation of parks represented approximately 2,523.9 total acres in 2013 and 2,505.46 total acres in 2017. This Greenville County parkland included a wide array of facilities and amenities of varying quality. Greenville County parks in 2013 are displayed in Figure 2A and parks in 2017 are displayed in Figure 2B.

Figure 2A: Map of Parks in Greenville County, South Carolina 2013

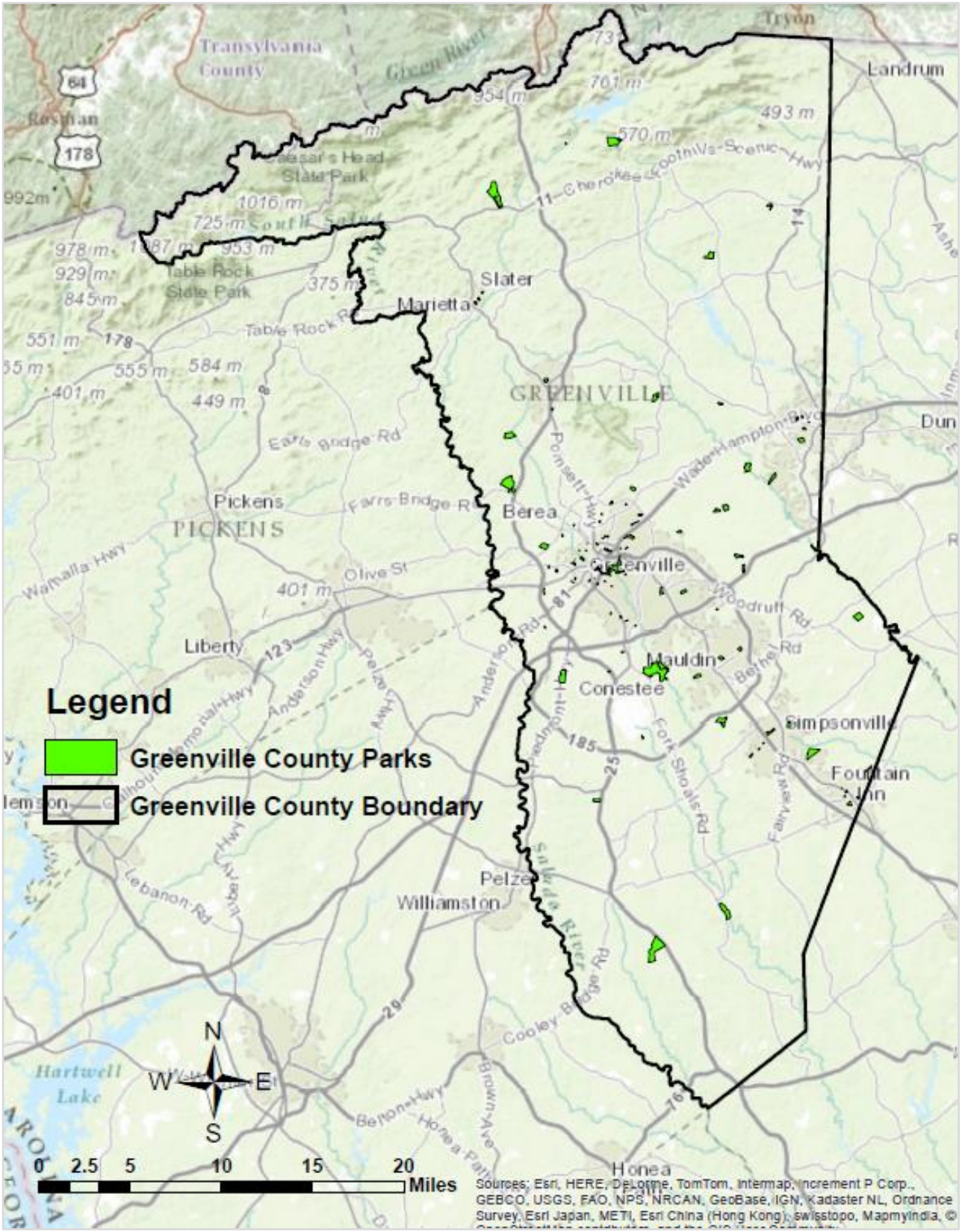
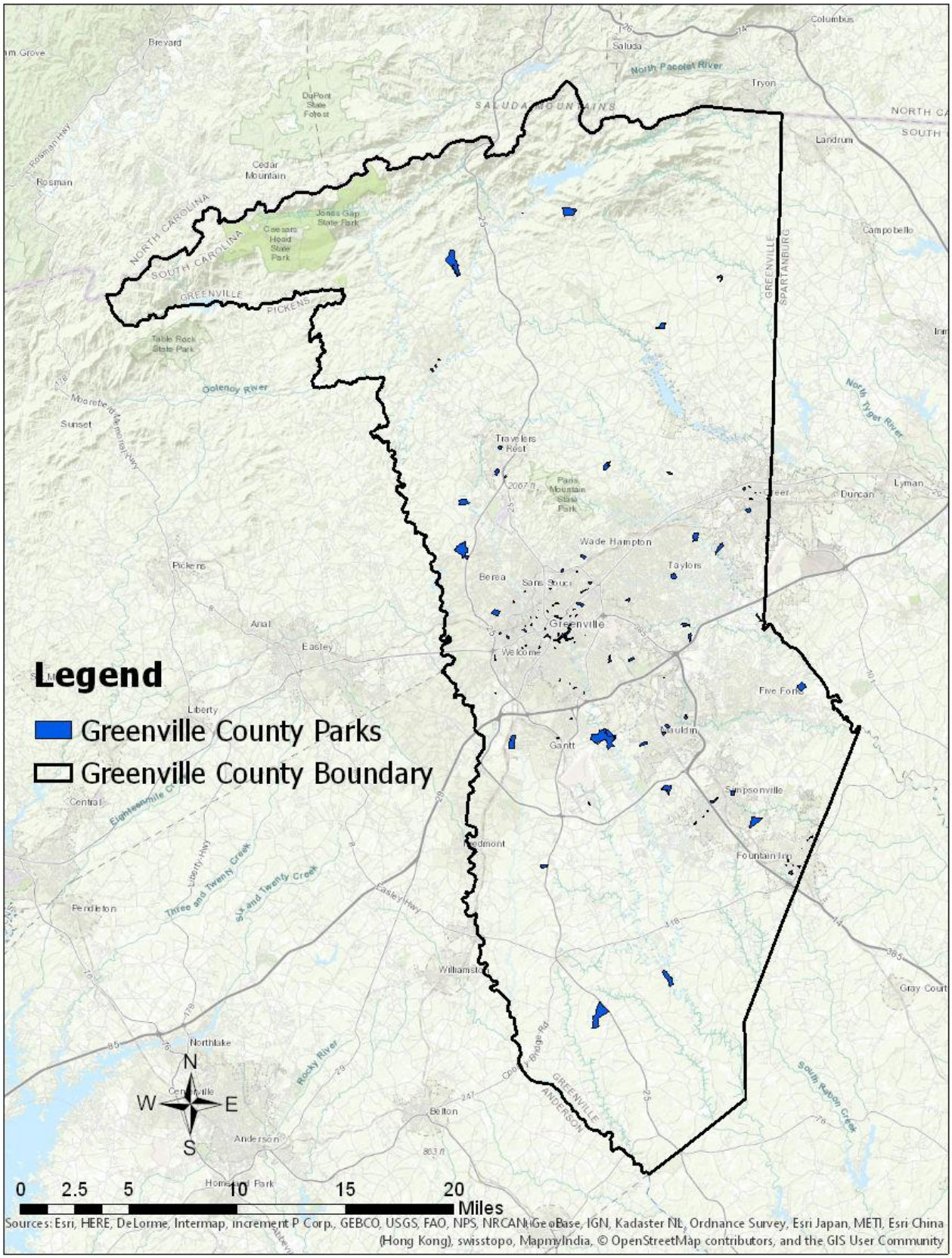


Figure 2B: Map of Parks in Greenville County, South Carolina 2017



The units of analysis for this study were all census block groups located in Greenville County, SC. Block groups are the next to smallest geographical unit recognized by the Census Bureau. They are small, generally permanent subdivisions of a county that usually contain from 600-3,000 people and are fairly homogenous in terms of population characteristics, economic status, and living conditions.[29] In ArcGIS, shape files representing the Greenville County geographical boundary and all block groups were overlaid to determine the total number of block groups in the County (n=255). Figures 3A and 3B display maps of Greenville County block groups in 2013 and 2017.

As described further below, the consolidated file of public parks in Greenville County was cross-referenced by location with census block groups to allocate parks (and their area and characteristics) to block groups.

Figure 3A: Map of Greenville County, SC Block Groups 2013

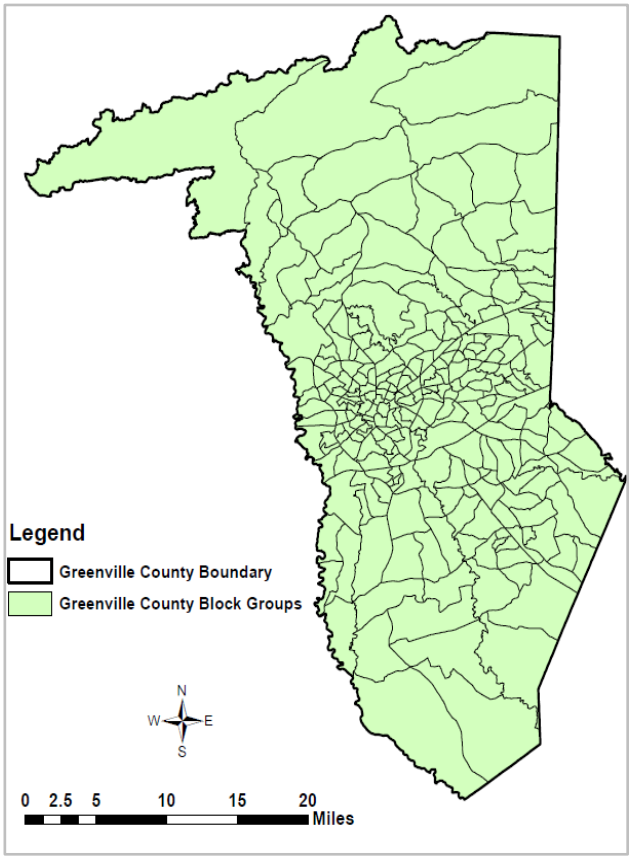
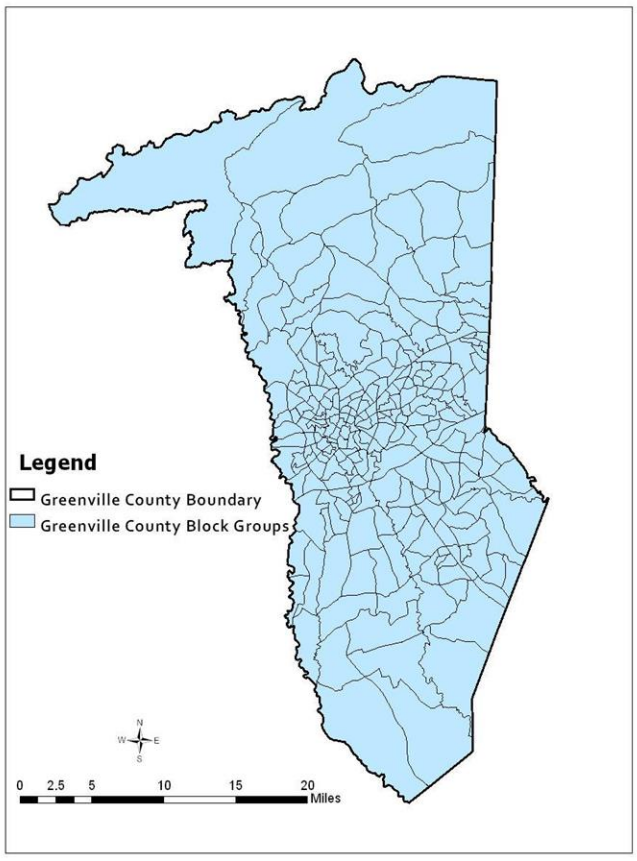


Figure 3B: Map of Greenville County, SC Block Groups 2017



Measures

BLOCK GROUP INCOME AND RACE/ETHNICITY

The American Community Survey (ACS) was used to gather information on income and race/ethnicity for each census block group in Greenville County, SC. The ACS is operated

through the US Census Bureau and provides communities with annual data outputs to plan investments and services.[30] ACS 5-year estimates (2008-2012 for 2013 analyses; 2011-2015 for 2017 analyses) were available at the block group level and were downloaded from the ACS website. The median household income for each census block group was used to categorize block groups into three tertiles (low, medium, and high income). The tertiles were determined by conceptual definitions of income levels while also ensuring a large enough sample to run analyses for each tertile. Each income category was defined as follows: low income ($0 to $34,999), medium income ($35,000 to $60,000), and high income (>$60,000). For race/ethnicity, we identified the percentage of minority residents, defined as residents that do not identify with being non-Hispanic White, and block groups were again categorized into tertiles (low, medium, and high percent minority). Each race/ethnicity category was defined as follows: low percentage racial/ethnic minority (0-19.99%), medium percentage racial/ethnic minority (20.00-40.00%), and high percentage racial/ethnic minority (>40.00%). The study block groups for 2013 are shown in Figures 4A and 5A and for 2017 are shown in Figures 4B and 5B according to income and percent minority.

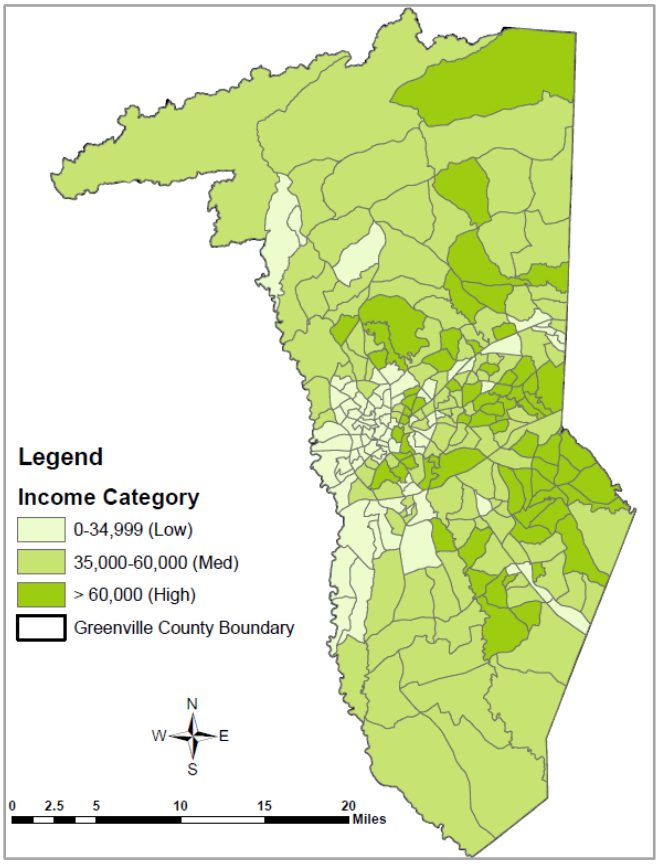


Figure 4A: Map of Greenville County Block Groups by Income Category 2013

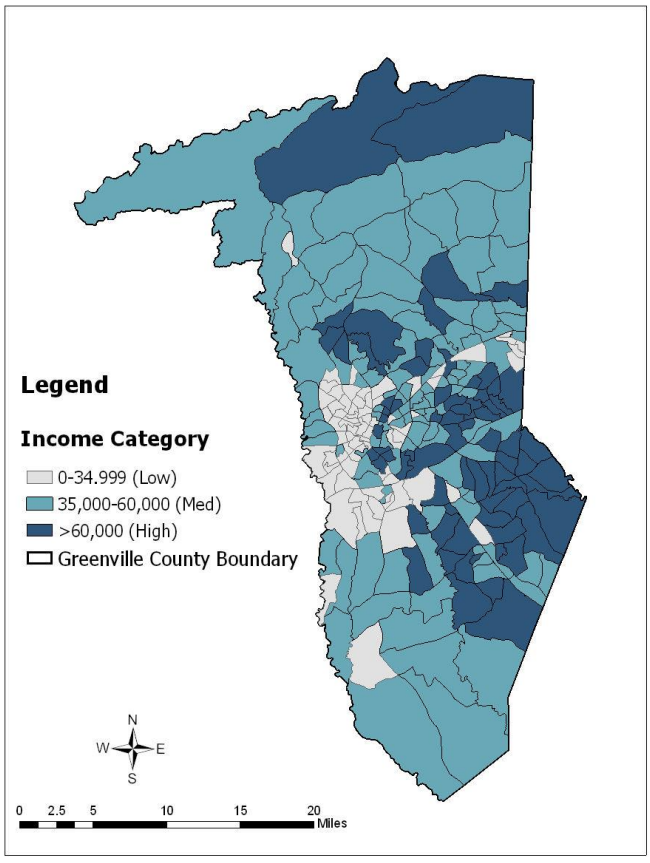


Figure 4B: Map of Greenville County Block Groups by Income Category 2017

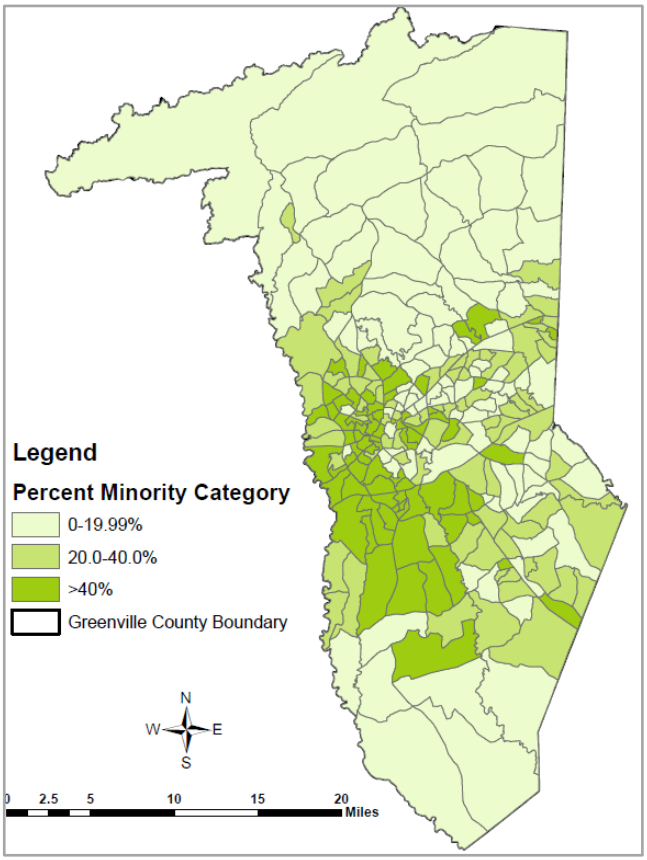


Figure 5A: Map of Greenville County Block Groups by Percent Minority Category 2017

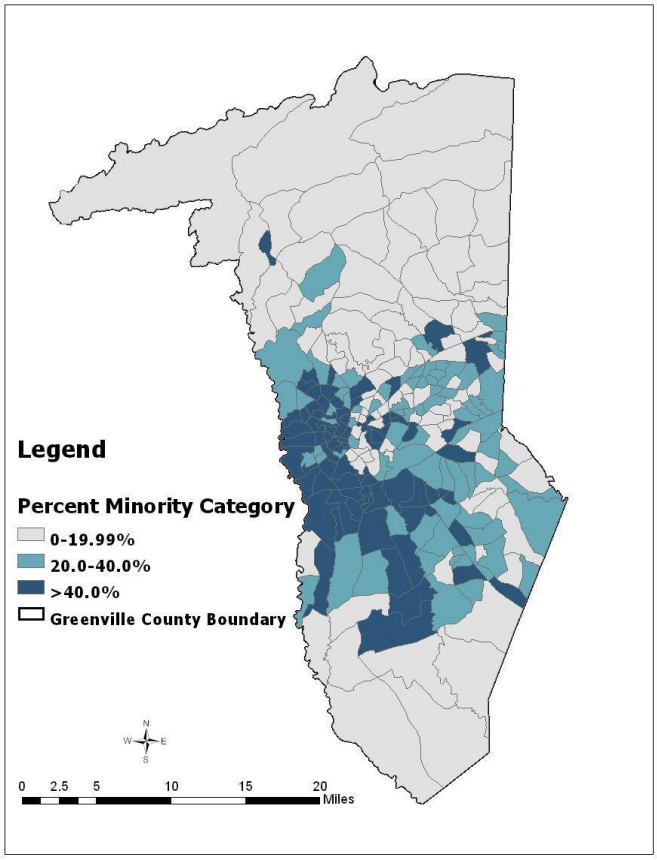


Figure 5B: Map of Greenville County Block Groups by Percent Minority Category 2017

PARK AVAILABILITY

The first community resource variable of interest in this study was park availability, which was measured in two ways. First, we used ArcGIS to determine the number of parks that intersected each census block group.[20] Second, a total amount of park space (in acres) was calculated for each block group by summing the area of all parks that intersected the block group.

PARK FEATURES

The characteristics (e.g., features, quality) of all parks in the study were assessed using the Community Park Audit Tool (CPAT). The CPAT was developed to capture key attributes of park environments for physical activity, including the surrounding neighborhood, park facilities and amenities, and safety and quality features (see Appendix A). In a recent study, the CPAT displayed excellent reliability.[31] Audits of all Greenville County parks were conducted by trained research assistants from September 2013 – January 2014 and from March – May 2017.

The park features examined in the audit tool comprised both park facilities and amenities. Park *facilities* included 14 park activity areas:

- Playgrounds
- Baseball fields
- Basketball courts
- Dog parks
- Fitness stations
- Green spaces
- Lakes
- Skate parks
- Splash pads
- Sports fields
- Swimming pools
- Tennis courts
- Trails
- Volleyball courts

For each park facility in the CPAT, researchers indicated whether the facility was in good condition or not, which can be defined as appearing clean and maintained (e.g., minimal rust).

Park *amenities* included 23 neighborhood, quality, and safety amenities:

<u>Neighborhood</u>

- Bike lanes
- Bike racks
- Car parking
- External Trail
- Sidewalks
- Visibility
- Transit stops

<u>Quality</u>

- Animal waste bags
- Benches
- Drinking fountains
- Grills
- Restrooms
- Rules posted about animals
- Picnic shelters
- Picnic tables
- Shade
- Trash cans
- Vending machines

<u>Safety</u>

- Traffic signals
- Park monitored
- Roads through
- Emergency
- Lights

PARK QUALITY

To assess park quality, the presence of quality concerns and aesthetic features in each park were audited. *Quality concerns* were measured using an index of 8 negative attributes which were noted if they were present:

- Graffiti
- Vandalism
- Excessive litter
- Excessive animal waste
- Excessive noise
- Poor maintenance
- Dangerous spots
- Threatening behaviors

Likewise, *aesthetic features* were measured with a list of 7 features that might enhance park attractiveness or enjoyment:

- LANDSCAPING
- WOODED AREA
- WATER FEATURE
- HISTORICAL OR EDUCATIONAL FEATURE
- ARTISTIC FEATURE
- TREES THROUGHOUT PARK
- MEADOW

The total number of quality concerns and the total number of aesthetic features were summed for each park to determine the average number of quality concerns and aesthetic features per park for each block group.

NEIGHBORHOOD QUALITY CONCERNS

Lastly, the presence of neighborhood quality concerns was audited for each park. Neighborhood concerns were measured using an index of 10 attributes which were noted if they were visible in the area around the perimeter of the park:

- INADEQUATE LIGHTING
- GRAFFITI
- VANDALISM
- EXCESSIVE LITTER
- HEAVY TRAFFIC
- EXCESSIVE NOISE
- VACANT OR UNFAVORABLE BUILDINGS
- POORLY MAINTAINED PROPERTIES
- LACK OF EYES ON THE STREET
- EVIDENCE OF THREATENING PERSONS OR BEHAVIORS

The total number of neighborhood concerns was summed for each park to determine the average number of neighborhood concerns per park for each block group.

ANALYSES

To examine whether park-related disparities exist across Greenville County, SC, several analyses were undertaken. First, descriptive statistics (frequencies, means) were used to describe the income level and racial/ethnic characteristics of Greenville County block groups as well as the availability, features, and quality of parks within them. Multinomial logistic regression was used to examine whether the number of parks was equally distributed among Greenville County block groups where the dependent variable was categorized as no parks or at least one park per block group. Multinomial logistic regression was also used to examine whether there were differences in park acreage among various income and racial/ethnic minority block groups. Park acreage was categorized into less than 10 acres of parkland and greater than or equal to 10 acres of parkland per block group.

In both 2013 and 2017, individual analyses of covariance (ANCOVAs) were used to compare low, medium, and high block groups (for each of income and percent minority) with respect to

i) the total number of park features, facilities, and amenities per block group, ii) the average number of park quality concerns, park aesthetic features, and neighborhood concerns per park, and iii) percentage of park facilities that were in good condition. Significant ANCOVAs were followed by Sidak post-hoc tests to examine between group differences. All analyses controlled for the land area of the block group, total block group population, percentage of the block group population under 18 years old, and the block group's income or percent minority (when not used to stratify the sample of tracts to begin with). All analyses were conducted using SPSS 24.0 and findings were considered significant at $p<0.05$.

RESULTS

Block Group Characteristics

Data for income and race/ethnicity were obtained for all 255 block groups in Greenville County. Tables 2A and 2B show the income and percent minority values for all block groups in the study as well as those block groups within the low, medium, and high income and percent minority groups.

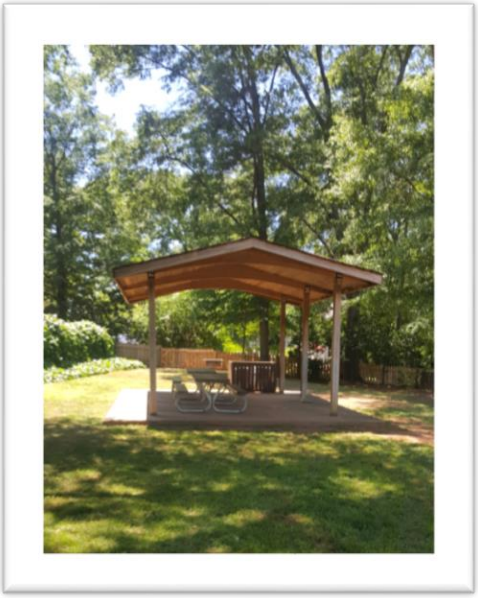
As shown in Table 2A, the average median household income of all block groups in 2013 was $48,866 (SD=$23,825). The low income category (n=78) ranged from $9,705 to $34,597 (M=$24,997, SD=$6,300), the medium income category (n=109) from $35,000 to $59,848 (M=$46,026, SD=$7,104), and the high income category (n=68) from $60,307 to $147,679 (M=$80,798 SD=$17,715). The mean percent racial/ethnic minority for all block groups was 31.5% (SD=23.32%), with the low category (n=99) ranging from 0-19.48% (M=10.44%, SD=5.65%), the medium category (n=82) from 20.14-39.68% (M=29.54%, SD=5.96%), and the high category (n=74) from 40.08-98.60% (M=61.82%, SD=16.49%).

Table 2A: Block Group Characteristics 2013

	N	Median Household Income		Percent Racial and Ethnic Minority	
		Mean	SD	Mean	SD
All Block Groups	255	$48,866	$23,825	31.50%	23.32%
Income[#]					
Low	78	$24,997	$6,300	50.46%	22.75%
Medium	109	$46,026	$7,104	27.98%	20.30%
High	68	$80,798	$17,715	15.37%	9.99%
Percent Minority[#]					
Low	99	$62,389	$23,002	10.44%	5.65%
Medium	82	$48,586	$22,068	29.54%	5.96%
High	74	$31,806	$12,489	61.82%	16.49%

[#] Income and Percent Minority tertiles were determined through conceptual definitions of income levels as well as considering a large enough sample to run analyses for each tertile.

By 2017, as depicted in Table 2B, the average median household income of all block groups was $50,482 (SD=$23,870). The low income category (n=72) ranged from $12,386 to $34,053 (M=$25,210, SD=$5,601), the medium income category (n=109) from $35,037 to $59,750 (M=$47,556, SD=$6,831), and the high income category (n=74) from $60,000 to $151,630 (M=$79,380, SD=$19,602). The mean percent racial/ethnic minority for all block groups in 2017 was 32.09% (SD=23.26%), with the low category (n=95) ranging from 0.62-19.97% (M=10.26%, SD=5.29%), the medium category (n=79) from 20.34-39.93% (M=29.56%, SD=5.75%), and the high category (n=81) from 40.02-96.52% (M=60.15%, SD=16.76%).



Rockwood Park

Table 2B: Block Group Characteristics 2017

	N	Median Household Income		Percent Racial and Ethnic Minority	
		Mean	SD	Mean	SD
All Block Groups	255	$50,482	$23,870	32.09%	23.26%
Income[#]					
Low	72	$25,210	$5,601	57.25%	21.26%
Medium	109	$47,556	$6,831	24.83%	16.59%
High	74	$79,380	$19,602	18.29%	11.72%
Percent Minority[#]					
Low	95	$62,698	$21,985	10.26%	5.29%
Medium	79	$54,456	$23,741	29.56%	5.75%
High	81	$32,278	$12,432	60.15%	16.76%

[#] Income and Percent Minority tertiles were determined through conceptual definitions of income levels as well as considering a large enough sample to run analyses for each tertile.

The description of all park attributes within Greenville County block groups is presented in Tables 3A and 3B. As displayed in table 3A, a total of 85 block groups (33.3%) contained at least 1 park in the 2013 analyses. Of those block groups that contained a park, there was an average of 1.42 parks (SD=0.81) and the average park acreage was 53.60 (SD=85.61, range=0.60-337.65). Also, for block groups with parks, there was an average of 12.29 total park facilities per block group (SD=12.55, range=2-65). With respect to park amenities, there

was an average of 4.35 total neighborhood amenities per block group (SD=3.75, range=1-24), 9.13 total quality amenities per block group (SD=5.50, range=1-32), and 3.44 total safety amenities per block group (SD=2.17, range=0-12). Finally, we observed an average of 3.14 neighborhood concerns per block group (SD=2.70, range=0-12), 1.35 park quality concerns per block group (SD=1.65, range=0-10), and 4.66 park aesthetic features per block group (SD=2.94, range=0-15). Among all block groups in Greenville County (i.e., including block groups that did *not* contain a park), there was an average of 0.47 parks (SD=0.82) and an average of 17.87 acres of park space (SD=55.36). Figure 6A displays the number of parks and Figure 7A displays total park acreage per block group in 2013.

Table 3A: Park Availability, Features, and Quality Across All Block Groups 2013

	All Block Groups N=255		Block Groups with Parks N=85	
	Mean	SD	Mean	SD
Number of Parks	0.47	0.82	1.42	0.81
Park Acreage	17.87	55.36	53.60	85.61
Facilities per BG	4.10	9.26	12.29	12.55
Neighborhood Amenities per BG	1.45	2.98	4.35	3.75
Quality Amenities per BG	3.04	5.35	9.13	5.50
Safety Amenities per BG	1.15	2.05	3.44	2.17
Total Amenities per BG	5.64	10.06	16.92	10.62
Neighborhood Concerns per BG	1.05	2.15	3.14	2.70
Park Quality Concerns per BG	0.45	1.15	1.35	1.65
Park Aesthetic Features per BG	1.55	2.78	4.66	2.94

As displayed in Table 3B, a total of 88 block groups (34.5%) contained at least 1 park in the 2017 analysis. Of those block groups that contained a park, there was an average of 1.45 parks (SD=0.83) and the average park acreage was 50.67 (SD=83.29, range=0.61-337.65). Also, for block groups with parks, there was an average of 9.49 total park facilities per block group (SD=8.70, range=1-39). With respect to park amenities, there was an average of 3.78 total neighborhood amenities per block group (SD=2.75, range=0-15), 7.66 total quality amenities per block group (SD=4.04, range=2-18), and 2.20 total safety amenities per block group (SD=1.79, range=0-12). Finally, we observed an average of 1.76 neighborhood concerns per block group (SD=1.59, range=0-8), 0.77 park quality concerns per block group (SD=1.17, range=0-5), and 3.82 park aesthetic features per block group (SD=2.95, range=0-15). Among all block groups in Greenville County (i.e., including block groups that did *not* contain a park), there was an average of 0.50 parks (SD=0.85) and an average of 17.49 acres of park space (SD=54.39). Figure 6B displays the number of parks per block group in 2013 and Figure 7B displays total park acreage per block group in 2017.

Table 3B: Park Availability, Features, and Quality Across All Block Groups 2017				
	All Block Groups N=255		Block Groups with Parks N=88	
	Mean	SD	Mean	SD
Number of Parks	0.50	0.85	1.45	0.83
Park Acreage	17.49	54.39	50.67	83.29
Facilities per BG	3.27	6.81	9.49	8.70
Neighborhood Amenities per BG	1.30	2.41	3.78	2.75
Quality Amenities per BG	2.64	4.35	7.66	4.04
Safety Amenities per BG	0.76	1.48	2.20	1.79
Total Amenities per BG	4.71	7.89	13.64	7.65
Neighborhood Concerns per BG	0.61	1.25	1.76	1.59
Park Quality Concerns per BG	0.26	0.77	0.77	1.17
Park Aesthetic Features per BG	1.32	2.51	3.82	2.95

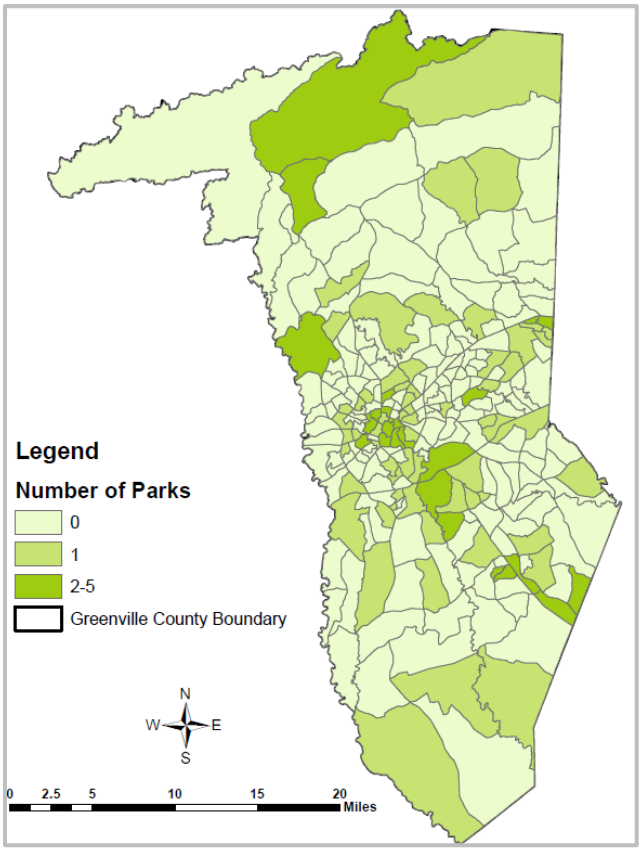


Figure 6A: Map of Greenville County Block Groups by Number of Parks 2013

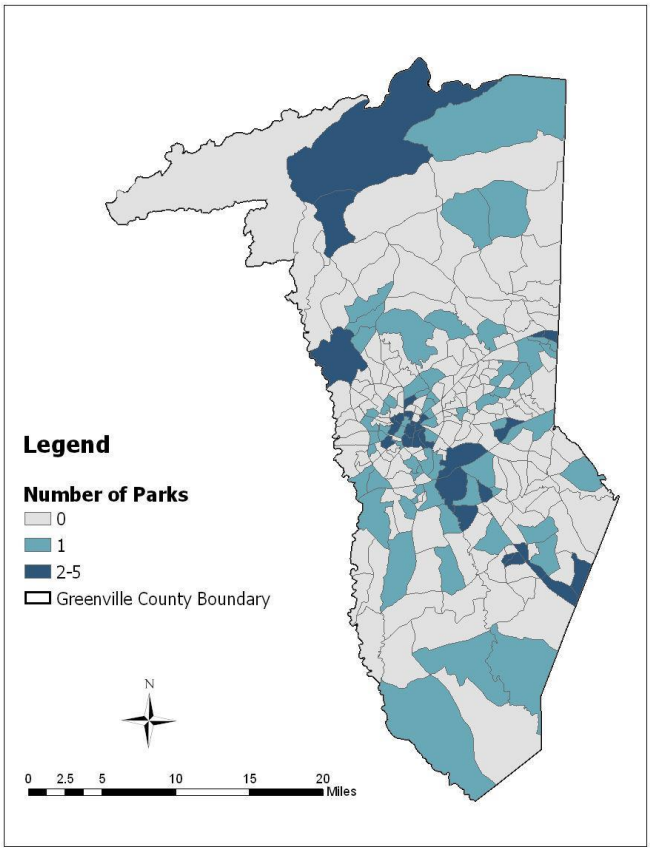


Figure 6B: Map of Greenville County Block Groups by Number of Parks 2017

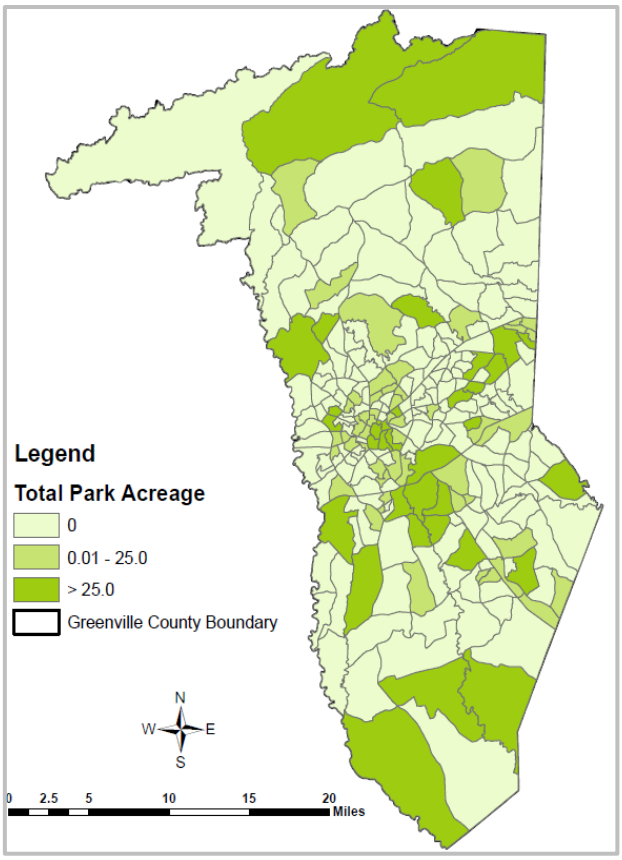


Figure 7A: Map of Greenville County Block Groups by Total Park Acreage 2013

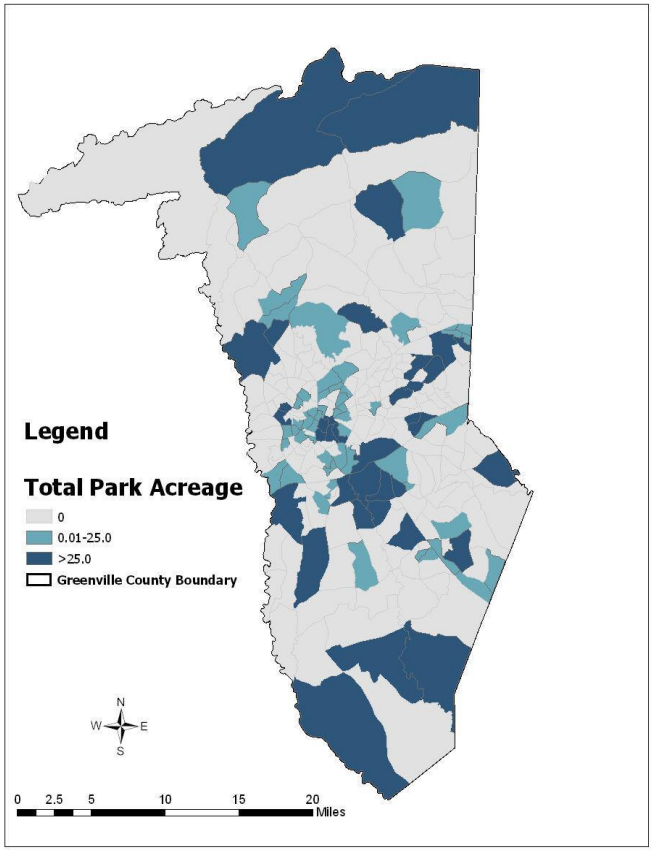


Figure 7B: Map of Greenville County Block Groups by Total Park Acreage2017

Nicholtown Community Center

Table 4A displays the characteristics across parks (n=103) in Greenville County that were included in this project in 2013. There was an average of 24.5 acres per park (SD=49.08, range=0.12-293.42). With respect to park activity areas, there were, on average 7.21 per park (SD=6.37, range=1-47). On average, parks had 2.95 out of 7 neighborhood amenities (SD=1.86, range=0-7), 6.18 out of 11 quality amenities (SD=2.69, range=0-11), and 2.49 out of 5 safety amenities (SD=0.80, range=0-4). Parks had an average of 2.20 neighborhood concerns (SD=1.65, range=0-7), 1.04 quality concerns per park (SD=1.24, range=0-6), and 3.02 aesthetic features per park (SD=1.51, range=0-6).

Table 4A: Characteristics of All Parks in Greenville County 2013		
	Mean	SD
Park Acres	24.50	49.08
Facilities (Activity Areas) Per Park	7.21	6.37
Neighborhood Amenities Per Park	2.95	1.30
Quality Amenities Per Park	6.18	2.69
Safety Amenities Per Park	2.49	0.80
Total Amenities Per Park	11.61	3.43
Neighborhood Concerns Per Park	2.20	1.65
Quality Concerns Per Park	1.04	1.24
Aesthetic Features Per Park	3.02	1.51

Table 4B displays the characteristics across parks (n=107) in Greenville County that were included in this project in 2017. There was an average of 23.42 acres per park (SD=47.89, range=0.12-293.24). With respect to park activity areas, there were, on average 5.37 per park (SD=5.06, range=0-26). On average, parks had 1.92 out of 7 neighborhood amenities (SD=1.35, range=0-7), 5.12 out of 11 quality amenities (SD=2.29, range=0-10), and 1.44 out of 5 safety amenities (SD=0.96, range=0-4). Parks had an average of 1.24 neighborhood concerns (SD=1.09, range=0-5), 0.48 quality concerns per park (SD=0.78, range=0-3), and 2.43 aesthetic features per park (SD=1.49, range=0-6).

Table 4B: Characteristics of All Parks in Greenville County 2017		
	Mean	SD
Park Acres	23.42	47.89
Facilities (Activity Areas) Per Park	5.37	5.06
Neighborhood Amenities Per Park	1.92	1.35
Quality Amenities Per Park	5.12	2.29
Safety Amenities Per Park	1.44	0.96
Total Amenities Per Park	9.14	3.15
Neighborhood Concerns Per Park	1.24	1.09
Quality Concerns Per Park	0.48	0.78
Aesthetic Features Per Park	2.43	1.49

Park Availability

Tables 5A and 5B show the number and proportion of block groups that have no parks and that contain at least 1 park by income tertiles and racial/ethnic minority tertiles. To analyze park availability, we used multinomial logistic regression, which determines the likelihood of getting one outcome (i.e., having 1 or more parks) compared to another outcome (i.e., having no parks) for a particular independent variable (i.e., income tertile). This result is expressed in an odds ratio (OR) where a value of 1 means there is no association between the two variables of interest and an odds ratio of above or below 1 means the outcome is more or less likely for that particular group. This particular analysis also allows for us to control for certain variables that may be masking the true relationship between the independent variable (e.g., income tertile) and dependent variable (e.g., containing a park or not). In this study, all results

controlled for block group area, total population of the block group, percent of the population under 18 years of age, and either income or percent racial and ethnic minority, depending on the independent variable that was examined.

As shown in Table 5A, in 2013 compared to the low income tertile, the medium and high income tertiles were not significantly more likely to contain at least one park. Likewise, the medium and high minority tertiles were not more likely to contain a park than the low minority tertile. These findings were found to be consistent in the 2017 analysis and are displayed in Table 5B. Figures 8A and 8B show the number of parks per block group by income category in 2013 and 2017; Figures 9A and 9B show the number of parks per block group by percent minority in 2013 and 2017.

Table 5A: Number of Parks by Income and Percent Minority 2013

	N	Number of Parks			
		0 parks (%)	≥1 parks (%)	Odds Ratio (OR)	95% CI
All Block Groups	255	170 (66.7%)	85 (33.3%)		
Income					
Low	78	48 (61.5%)	30 (38.5%)	1.00	--
Medium	109	72 (66.1%)	37 (33.9%)	1.07	(.515, 2.217)
High	68	50 (73.5%)	18 (26.5%)	1.01	(.397, 2.589)
Percent Minority					
Low	99	71 (71.7%)	28 (28.3%)	1.00	--
Medium	82	56 (68.3%)	26 (31.7%)	1.18	(.579, 2.397)
High	74	43 (58.1%)	31 (41.9%)	1.77	(.796, 3.941)

Table 5B: Number of Parks by Income and Percent Minority 2017

	N	Number of Parks			
		0 parks (%)	≥1 parks (%)	Odds Ratio (OR)	95% CI
All Block Groups	255	167 (65.5%)	88 (34.5%)		
Income					
Low	72	42 (58.3.5%)	30 (41.7%)	1.00	--
Medium	109	72 (66.1%)	37 (33.9%)	1.417	(.606, 3.315)
High	74	53 (71.6%)	21 (28.4%)	1.254	(.449, 3.509)
Percent Minority					
Low	95	70 (73.7%)	25 (26.3%)	1.00	--
Medium	79	51 (64.6%)	28 (35.4%)	1.529	(.749, 3.119,)
High	81	46 (56.8%)	35 (43.2%)	1.692	(.757 3.783)

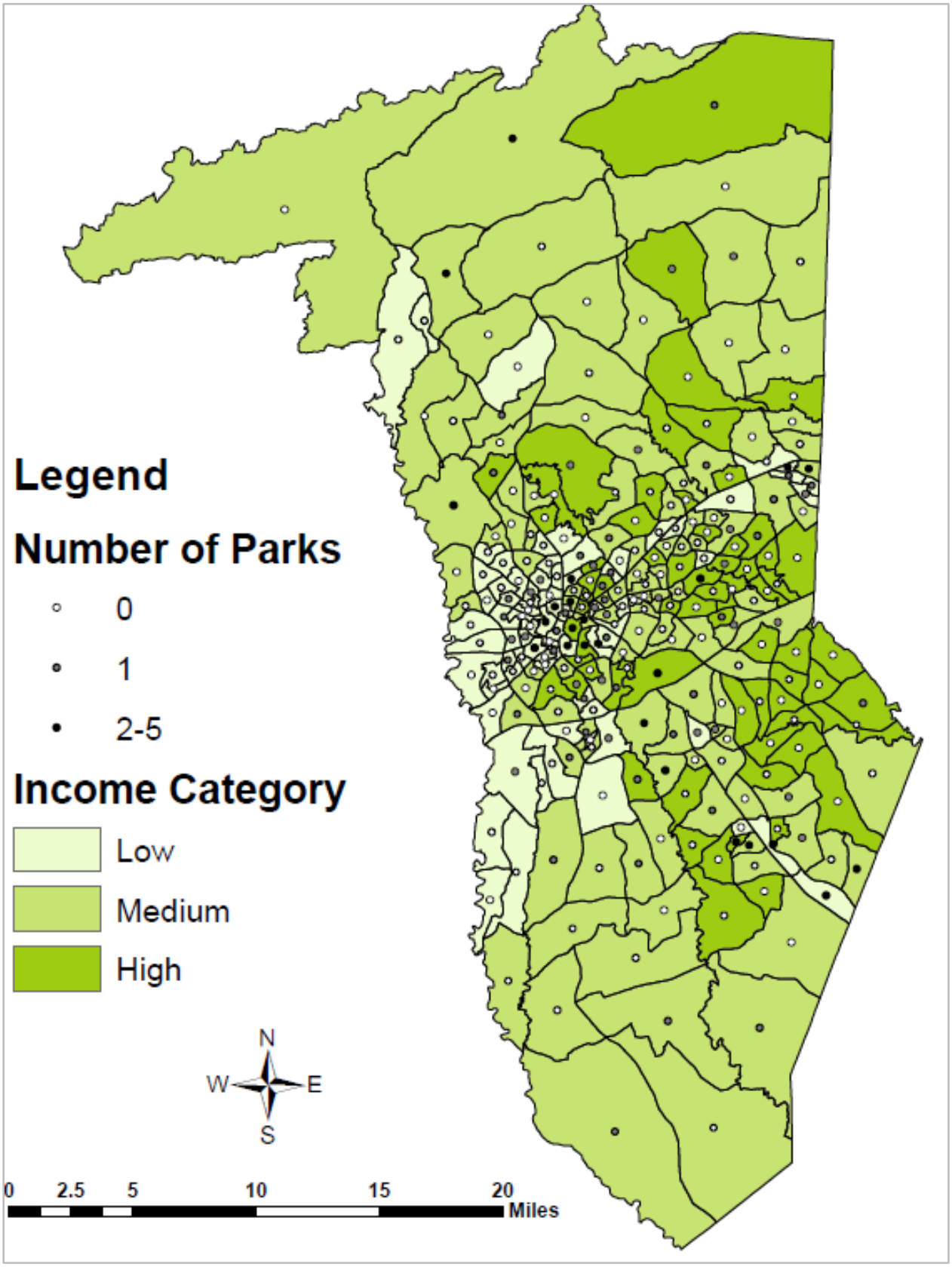


Figure 8A: Number of Parks per Block Group by Income 2013

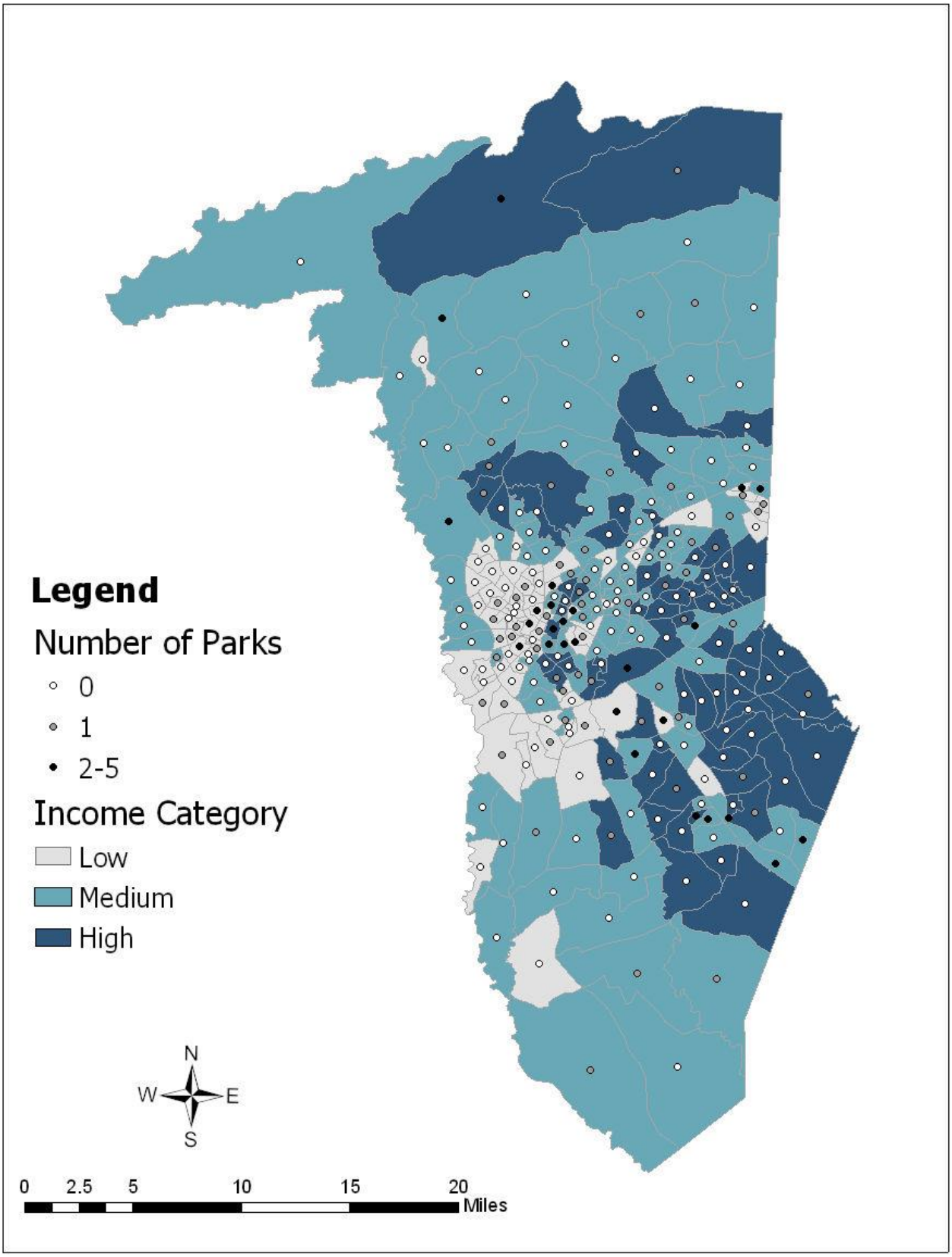


Figure 8B: Number of Parks per Block Group by Income 2017

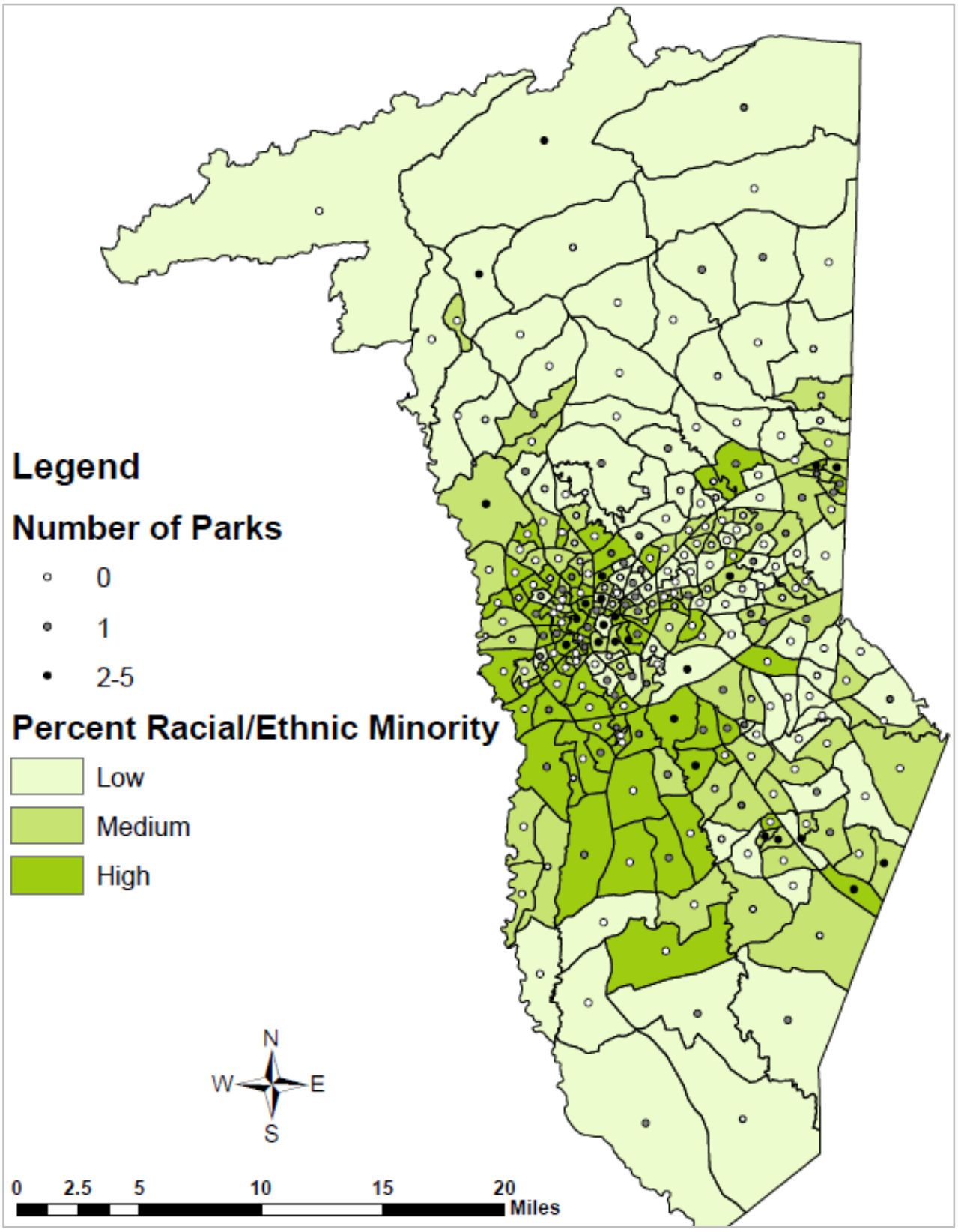


Figure 9A: Number of Parks per Block Group by Percent Minority 2013

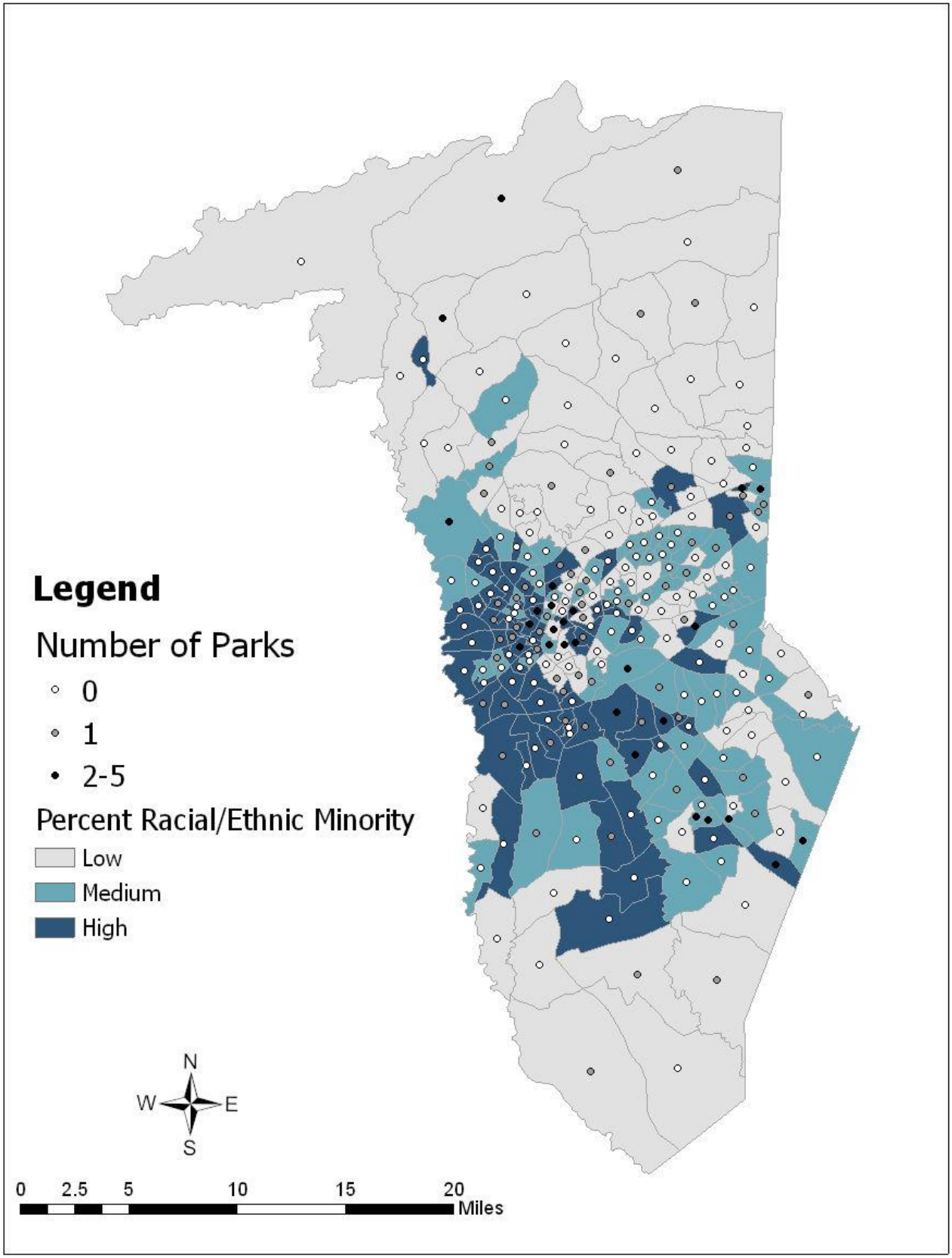


Figure 9B: Number of Parks per Block Group by Percent Minority 2017

Two final analyses related to park availability, shown in Tables 6A and 6B, used only the block groups that contained parks. The first analysis examined whether the various income tertiles and percent minority tertiles were more likely to have more than one park compared to having only one park. In both 2013 and 2017, medium and high income block groups were not more likely than low income block groups to contain more than one park; similarly, medium and high minority block groups were not more likely than low minority block groups to contain more than one park.

A final analysis of park availability examined whether park acreage differed among income tertiles and percent minority tertiles. The outcome variable was categorized as less than 10 acres of parkland ('low') and greater than or equal to 10 acres of parkland ('high'). Again, no significant associations were detected between park acreage and income tertile or percent minority tertile in 2013 (Table 6A) and 2017 (Table 6B).

Table 6A: Number of Parks and Park Acreage by Income and Percent Minority 2013

	N	Number of Parks				Park Acreage			
		1 (%)	>1 (%)	OR	CI	<10 (%)	≥10 (%)	OR	CI
Block Groups	85	61 (71.8%)	24 (28.2%)			35 (41.2%)	50 (58.8%)		
Income									
Low	30	21 (70%)	9 (30%)	1.00	--	19 (63.3%)	11 (36.7%)	1.00	--
Medium	37	27 (73%)	10 (27%)	1.52	(0.40, 5.79)	10 (27.0%)	27 (73.0%)	1.25	(0.32, 4.81)
High	18	13 (72.2%)	5 (27.8%)	2.15	(0.41, 11.37)	6 (33.3%)	12 (66.7%)	0.74	(0.14, 4.02)
Percent Minority									
Low	28	22 (78.6%)	6 (21.4%)	1.00	--	8 (28.6%)	20 (71.4%)	1.00	--
Medium	26	18 (69.2%)	8 (30.8%)	2.55	(0.59, 10.95)	9 (34.6%)	17 (65.4%)	0.95	(0.23, 3.98)
High	31	21 (67.7%)	10 (32.3%)	2.12	(0.49, 9.21)	18 (58.1%)	13 (41.9%)	0.37	(0.09, 1.59)

Needmore Community Center

Table 6B: Number of Parks and Park Acreage by Income and Percent Minority 2017									
	N	Number of Parks				Park Acreage			
		1 (%)	>1 (%)	OR	CI	<10 (%)	≥10 (%)	OR	CI
Block Groups	88	61 (69.3%)	27 (30.7%)			36 (40.9%)	52 (59.1%)		
Income									
Low	30	21 (70.0%)	9 (30.0%)	1.0	-	21 (70.0%)	9 (30.0%)	1.0	-
Medium	37	24 (64.9%)	13 (35.1%)	3.25	(0.63, 16.70)	9 (24.3%)	28 (75.7%)	2.44	(0.50, 11.83)
High	21	17 (81.0%)	4 (19.0%)	1.54	(0.22, 11.02)	6 (28.6%)	15 (71.4%)	1.05	(0.16, 6.81)
Percent Minority									
Low	25	20 (80.0%)	5 (20.0%)	1.0	-	8 (32.0%)	17 (68.0%)	1.0	-
Medium	28	20 (71.4%)	8 (28.6%)	2.34	(0.49, 11.16)	9 (32.1%)	19 (67.9%)	1.02	(0.23, 4.8)
High	35	22 (62.9%)	13 (37.1%)	3.39	(0.64, 17.91)	19 (54.3%)	16 (45.7%)	0.95	(0.20, 4.49)

PARK FEATURES

While park availability is important, park features (i.e., facilities and amenities) may be equally significant determinants of park use and physical activity behavior.[9]

Park Facilities

The analyses undertaken to examine park facilities included block groups that contained parks in Greenville County. Table 7A illustrates the average number of total park facilities (e.g., total number of playgrounds) per block group stratified by income and percent racial/ethnic minority tertiles in 2013. Fourteen facilities were assessed during the on-site park audits; six were not included in this analysis either because they were not present (pools, splash pads, and skate parks) or too scarce (fitness stations, dog park) to compare across tertiles. As shown in Table 7A, there were no statistically significant differences in the average number of any park facility by income or percent minority tertiles in 2013. As an example, Figure 10A displays the total number of playgrounds per block group by income group in 2013.

In 2017, a total of 8 facilities were analyzed and are displayed in Table 7B. There were no statistically significant differences in the average number of any park facility by both income and percent minority tertiles, which was consistent with the 2013 findings.

Table 7A: Number of Individual Facilities Per Block Group by Income and Percent Minority 2013								
Block Groups	Playground	Green Space	Baseball Field	Volleyball Court	Basketball Court	Tennis Court	Trail	Other Area
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Income								
Low (n=30)	1.43 (1.50)	3.23 (3.65)	1.23 (1.38)	0.20 (.61)	1.23 (1.04)	1.10 (2.60)	1.03 (1.45)	0.37 (.77)
Medium (n=37)	1.38 (1.32)	3.00 (2.47)	1.35 (1.80)	0.19 (.52)	0.73 (.90)	1.08 (2.23)	1.86 (2.07)	0.68 (.88)
High (n=18)	1.78 (1.46)	3.28 (4.27)	0.67 (1.28)	0.33 (.69)	0.78 (1.00)	1.61 (2.68)	1.44 (1.50)	0.67 (1.09)
p	.356	.713	.246	.681	.795	.877	.579	.915
Percent Minority								
Low (n=28)	1.43 (1.14)	3.00 (3.14)	0.93 (1.33)	0.29 (.60)	0.71 (.81)	1.21 (2.15)	1.57 (1.60)	0.75 (1.11)
Medium (n=26)	1.62 (1.72)	3.31 (4.01)	1.31 (1.76)	0.19 (.57)	0.69 (1.09)	1.42 (2.66)	1.23 (1.39)	0.58 (.76)
High (n=31)	1.42 (1.52)	3.13 (2.87)	1.26 (1.61)	0.19 (.60)	1.29 (.97)	1.00 (2.57)	1.61 (2.20)	.39 (.76)
p	.802	.680	.709	.964	.092	.855	.292	.385

Table 7B: Number of Individual Facilities Per Block Group by Income and Percent Minority 2017								
Block Groups	Playground	Green Space	Baseball Field	Volleyball Court	Basketball Court	Tennis Court	Trail	Sports Field
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Income								
Low (n=30)	1.07 (1.14)	1.13 (1.31)	0.90 (1.42)	0.03 (0.18)	0.80 (0.81)	0.60 (2.25)	2.20 (6.51)	0.43 (.63)
Medium (n=37)	1.54 (1.54)	1.65 (1.90)	1.38 (1.61)	0.24 (0.50)	0.51 (0.77)	1.27 (2.24)	1.95 (4.23)	0.54 (1.12)
High (n=21)	1.38 (1.35)	1.76 (2.23)	0.71 (1.38)	0.19 (0.40)	0.71 (0.96)	1.24 (2.43)	3.81 (7.39)	1.57 (4.19)
p	.640	.454	.111	.752	.590	.669	.660	.320
Percent Minority								
Low (n=25)	1.32 (1.46)	1.32 (1.91)	0.76 (1.20)	0.28 (0.54)	0.40 (0.71)	1.12 (2.09)	1.64 (2.06)	1.20 (3.86)
Medium (n=28)	1.46 (1.29)	1.86 (1.98)	1.25 (1.67)	0.18 (0.39)	0.68 (0.98)	1.32 (2.29)	1.89 (4.68)	0.68 (1.02)
High (n=35)	1.26 (1.34)	1.34 (1.59)	1.11 (1.57)	0.06 (0.24)	0.83 (0.75)	0.74 (2.44)	3.54 (8.14)	0.49 (0.98)
p	.955	.586	.979	.162	.098	.691	.065	.178

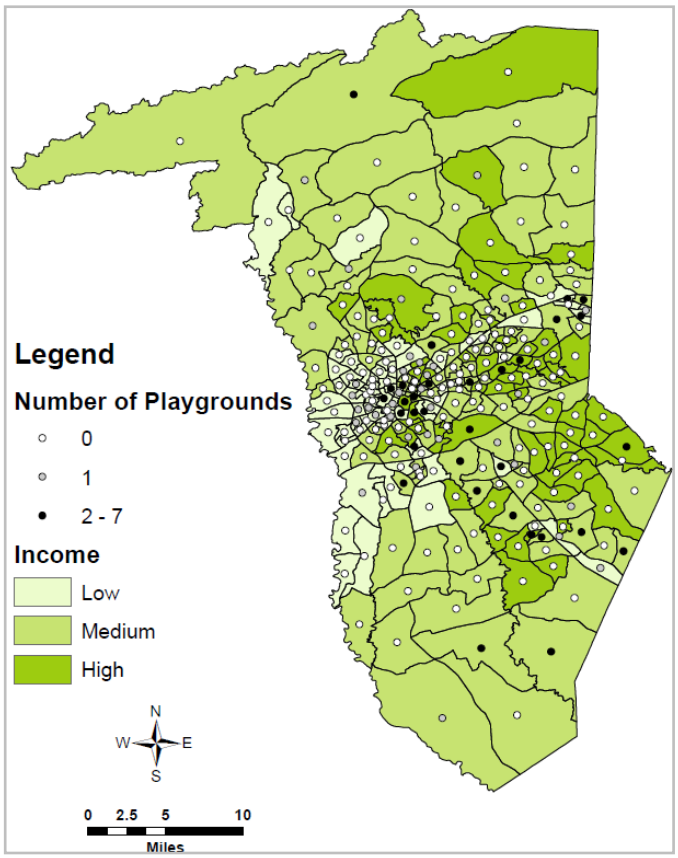


Figure 10A: Number of Playgrounds per Block Group by Income 2013

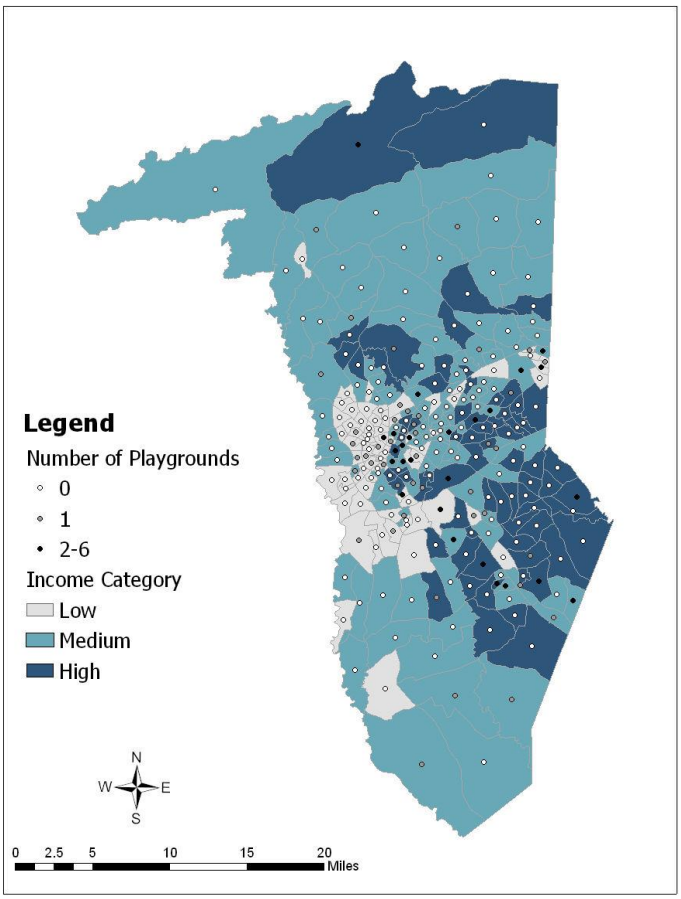


Figure 10B: Number of Playgrounds per Block Group by Income 2017

Quality of Park Facilities

We also calculated a variable to indicate the percentage of facilities that were in good condition at the time of the park audit. We categorized parks as having at least one condition concern among the facilities or no condition concerns among the facilities. As shown in Table 8A, the results indicated that high income block groups were more likely to have no facility condition concerns compared to low income block groups in 2013 (OR=5.23, CI=1.06, 25.76). No other significant differences were detected.

Table 8A: Condition of Park Facilities by Income and Percent Minority 2013

	N	Number of Facility Condition Concerns			
		≥ 1 Condition Concern (%)	No Condition Concerns (%)	Odds Ratio (OR)	95% CI
Block Groups	85	40 (47.1%)	45 (52.9%)		
Income					
Low	30	20 (66.7%)	10 (33.3%)	--	--
Medium	37	15 (40.5%)	22 (59.5%)	2.81	(0.81, 9.85)
High	18	5 (27.8%)	13 (72.2%)	**5.23**	**(1.06, 25.76)**
Percent Minority					
Low	28	11 (39.3%)	17 (60.7%)	--	--
Medium	26	10 (38.5%)	16 (61.5%)	1.10	(0.31, 3.97)
High	31	19 (61.3%)	12 (38.7%)	0.67	(1.83, 2.49)

Bold indicates significant differences compared to the referent group (i.e., low)

As shown in table 8B, in 2017, significant differences were detected among income and percent minority block groups. Similar to the 2013 results, high income block groups were more likely to have no facility condition concerns compared to low income block groups (OR=23.79, CI=2.73, 207.36). In addition to high income block groups, medium income block groups were also found to be more likely to have no facility condition concerns compared to parks within low income block groups (OR=11.71, CI=1.65, 75.63).

According to the percent minority block groups, in 2017, high minority (OR=6.91, CI=1.41, 33.81) and medium minority (OR=6.30, CI=1.47, 26.96) block groups were more likely to have no facility condition concerns compared to low minority block groups.

Table 8B: Condition of Park Facilities by Income and Percent Minority 2017					
	N	Number of Facility Condition Concerns			
		≥ 1 Condition Concern (%)	No Condition Concerns (%)	Odds Ratio (OR)	95% CI
Block Groups	88	51 (58.0%)	37 (42.0%)		
Income					
Low	30	19 (63.3%)	11 (36.7%)	--	--
Medium	37	22 (59.5%)	15 (40.5%)	**11.71**	**(1.65, 75.63)**
High	21	10 (47.6%)	11 (52.4%)	**23.79**	**(2.73, 207.36)**
Percent Minority					
Low	25	18 (72.0%)	7 (28.0%)	--	--
Medium	28	14 (50.0%)	14 (50.0%)	**6.30**	**(1.47, 26.96)**
High	35	19 (54.3%)	16 (45.7%)	**6.91**	**(1.41, 33.81**
Bold indicates significant differences compared to the referent group (i.e., low)					

Pelham Mill Park

Park Amenities

To reflect conceptual differences between the types of park amenities assessed by the Community Park Audit Tool, we split the 21 amenities into three distinct groups for the analyses: 'neighborhood' amenities, 'safety' amenities, and 'quality' amenities. The sum of each amenities category was calculated for each block group that contained parks in 2013 (n=85) and 2017 (n=88); then, we examined if there were differences in the number of each type of amenity across income and percent minority tertiles after controlling for the same aforementioned variables. As shown in Table 9A and 9B, there were no differences between income groups and percent minority groups for any of the various types of park amenities in both 2013 and 2017.

Table 9A: Neighborhood, Quality, and Safety Amenities per Block Group 2013								
	Neighborhood Amenities		Quality Amenities		Safety Amenities		Total Amenities	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Income								
Low (n=30)	5.40	4.77	8.6	6.57	4.20	2.52	18.20	13.39
Medium (n=37)	3.65	2.58	9.46	4.87	3.00	1.94	16.11	8.43
High (n=18)	4.06	3.67	9.33	4.97	3.06	1.70	16.44	9.82
p	.771		.887		.636		.959	
Percent Minority								
Low (n=28)	3.32	3.04	9.39	4.88	3.07	2.21	15.79	9.19
Medium (n=26)	4.54	4.48	9.42	6.09	3.38	2.21	17.35	12.30
High (n=31)	5.13	3.56	8.65	5.65	3.81	2.12	17.58	10.59
p	.347		.821		.895		.806	

Table 9B: Neighborhood, Quality, and Safety Amenities per Block Group 2017								
	Neighborhood Amenities		Quality Amenities		Safety Amenities		Total Amenities	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Income								
Low (n=30)	4.00	2.23	6.07	3.64	2.13	1.48	12.20	5.96
Medium (n=37)	3.76	3.28	8.84	3.80	2.35	1.92	14.95	8.34
High (n=21)	3.48	2.48	7.86	4.41	2.05	2.01	13.38	8.44
p	.568		.218		.764		.382	
Percent Minority								
Low (n=25)	3.16	2.48	7.92	3.76	1.96	1.57	13.04	7.14
Medium (n=28)	3.71	2.75	8.11	4.10	2.21	2.04	14.04	8.26
High (n=35)	4.26	2.91	7.11	4.23	2.37	1.75	13.74	7.69
p	.243		.968		.433		.595	

Park and Neighborhood Quality

Tables 10A and 10B show the average number of park quality concerns, park aesthetic features, and neighborhood quality concerns per park by income and percent minority tertiles. In 2013, the average number of quality concerns and aesthetic features per park did not vary by income or minority groups. However, the average number of neighborhood concerns per park (visible from within the park) varied across percent minority groups, with significantly more quality concerns observed in high minority block groups (M=3.05, SD=1.43) compared to medium (M=1.45, SD=1.26) and low-minority block groups (M=1.98, SD=1.66).

Figures 11, 13A, and 14A on the following pages provide maps of the block groups in Greenville County that contain parks and depict the number of park quality concerns per park across percent income tertiles (Figure 11), park aesthetic features per park across percent income tertiles (Figure 13A), and neighborhood concerns per park across percent minority tertiles (Figure 14A).

Table 10A: Park Quality Concerns, Neighborhood Concerns, and Aesthetic Features by Income and Percent Minority 2013

	Quality Concerns Per Park		Aesthetic Features Per Park		Neighborhood Concerns Per Park	
Block Group Characteristic	Mean	SD	Mean	SD	Mean	SD
Income						
Low (n=30)	1.44	1.44	2.64	1.51	2.83	1.67
Medium (n=37)	0.87	0.87	3.71	1.35	2.01	1.46
High (n=18)	0.80	1.19	3.72	1.48	1.58	1.46
p	.326		.332		.717	
Percent Minority						
Low (n=28)	0.90	0.91	3.82	1.39	**1.98**[b]	1.66
Medium (n=26)	0.97	1.13	3.06	1.42	**1.45**[b]	1.26
High (n=31)	1.26	1.43	3.13	1.61	**3.05**[a]	1.43
p	.481		.103		.006	

[a,b] Means with different superscript letters were significantly different at p<.05

By 2017, the average number of quality concerns, aesthetic features, and neighborhood concerns per park did not vary by block group income category. As indicated in Table 10B, fewer park quality and neighborhood concerns were observed in each of the parks in 2017 compared to the 2013 analysis. However, the average number of quality concerns per park for percent minority groups was significantly more among high minority block groups (M=1.03, SD=1.29) compared to medium (M=0.57, SD=0.96) and low minority block groups (M=0.60, SD=1.16). No other significant differences were detected for aesthetic features and neighborhood concerns per parks within percent minority block groups.

Figures 12, 13B, and 14B on the following pages provide maps of the block groups in Greenville County that contain parks and depict the number of park quality concerns per park across percent minority tertiles (Figure 12), park aesthetic features per park across percent income tertiles (Figure 13B), and neighborhood concerns per park across percent minority tertiles (Figure 14B).

Legacy Park

Table 10B: Park Quality Concerns, Neighborhood Concerns, and Aesthetic Features by Income and Percent Minority 2017						
	Quality Concerns Per Park		Aesthetic Features Per Park		Neighborhood Concerns Per Park	
Block Group Characteristic	Mean	SD	Mean	Mean	SD	Mean
Income						
Low	1.00	1.29	3.07	2.32	1.97	1.79
Medium	0.41	0.76	4.22	3.22	1.76	1.54
High	1.05	1.43	4.19	3.17	1.48	1.40
p	.076		.742		.756	
Percent Minority						
Low (n=25)	**0.60[b]**	1.16	3.88	2.95	1.56	1.50
Medium (n=28)	**0.57[b]**	0.96	3.93	3.15	1.57	1.55
High (N=35)	**1.03[a]**	1.29	3.69	2.87	2.06	1.68
p	**.020**		.674		.185	
[a,b] Means with different superscript letters were significantly different at p<.05						

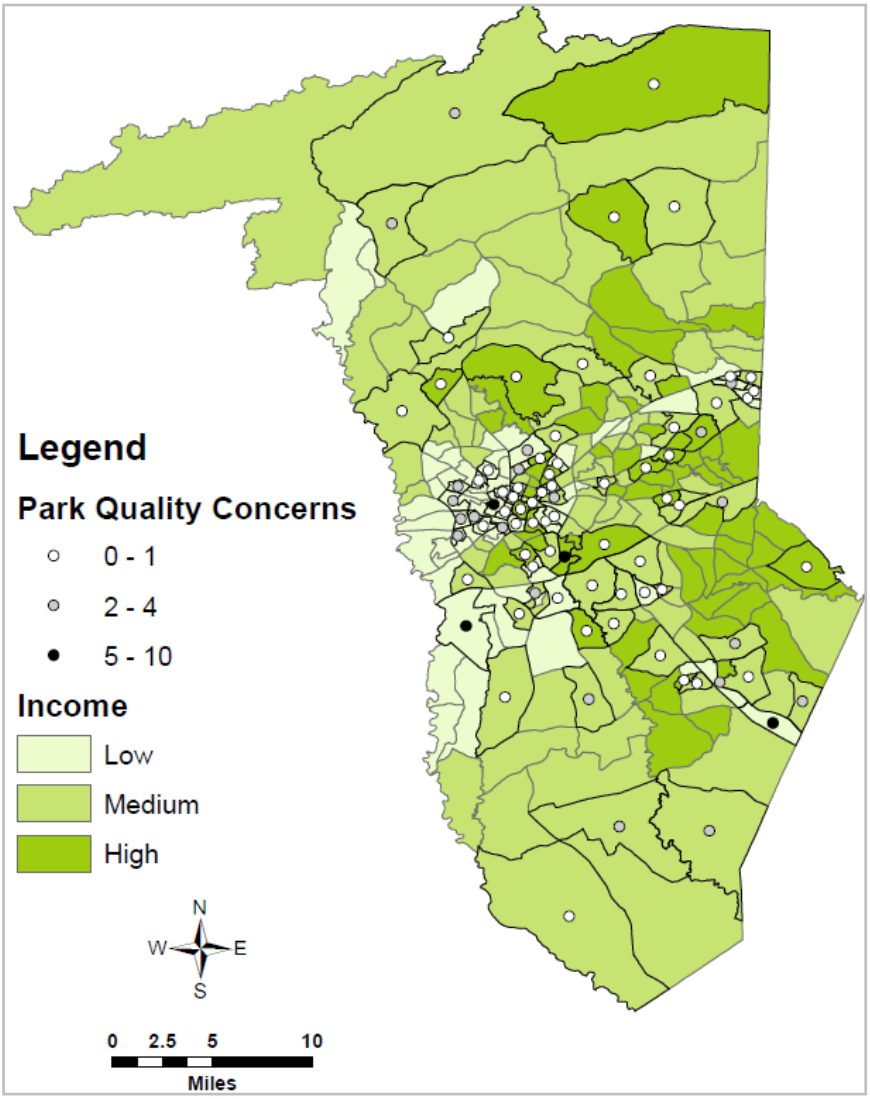


Figure 11: Number of Park Quality Concerns per Block Group by Income 2013

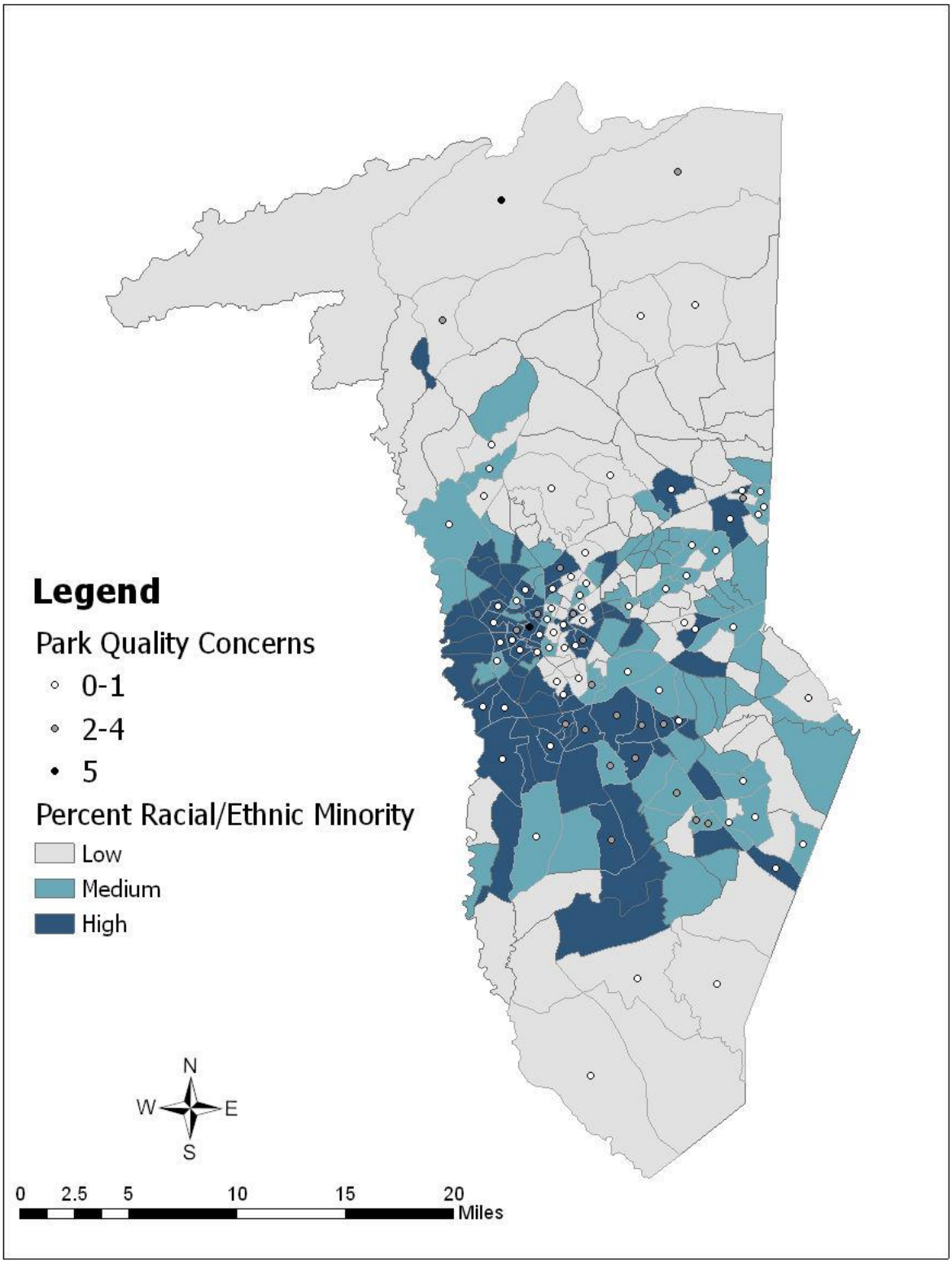


Figure 12: Number of Park Quality Concerns per Block Group by Percent Minority 2017

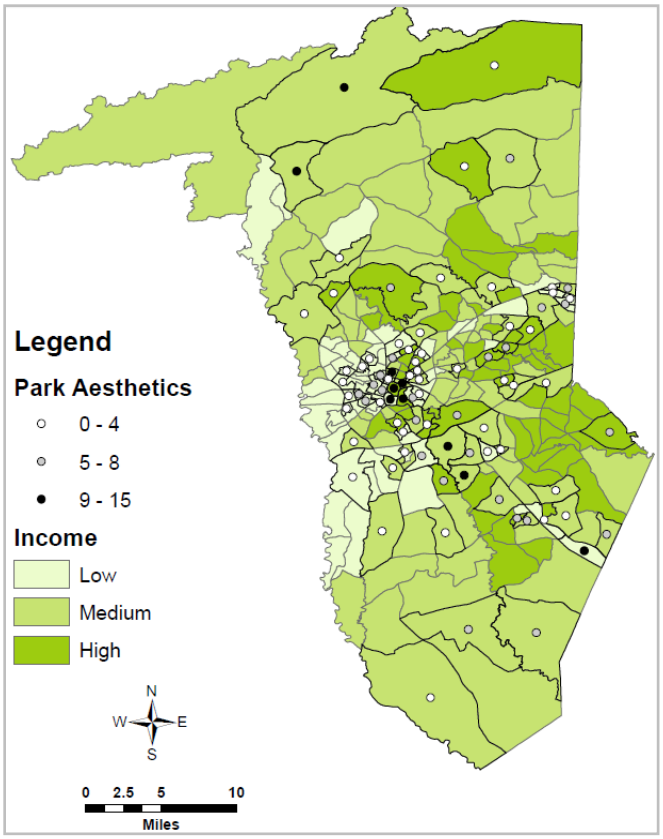


Figure 13A: Number of Park Aesthetic Features per Block Group by Income 2013

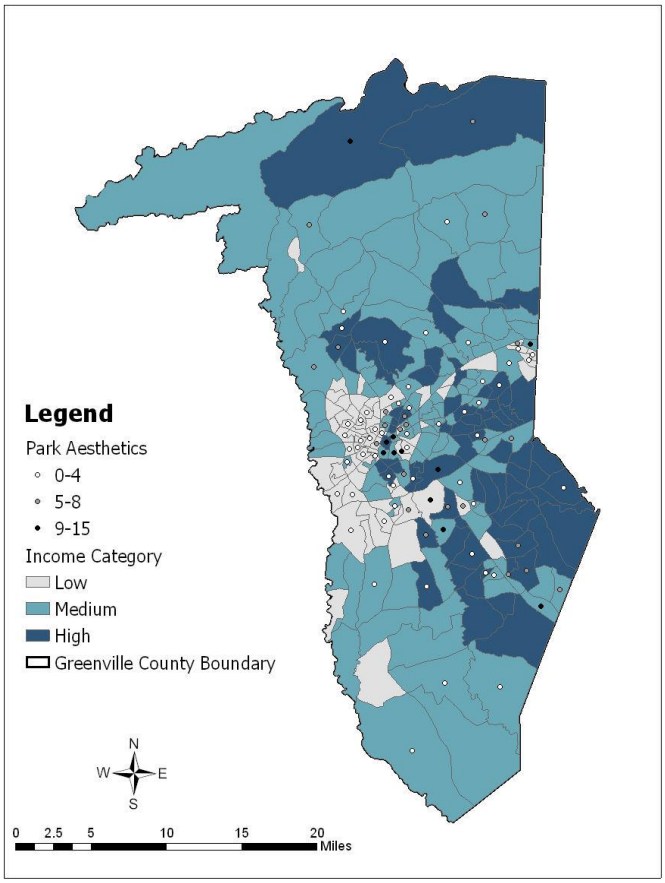


Figure 13B: Number of Park Aesthetic Features per Block Group by Income 2017

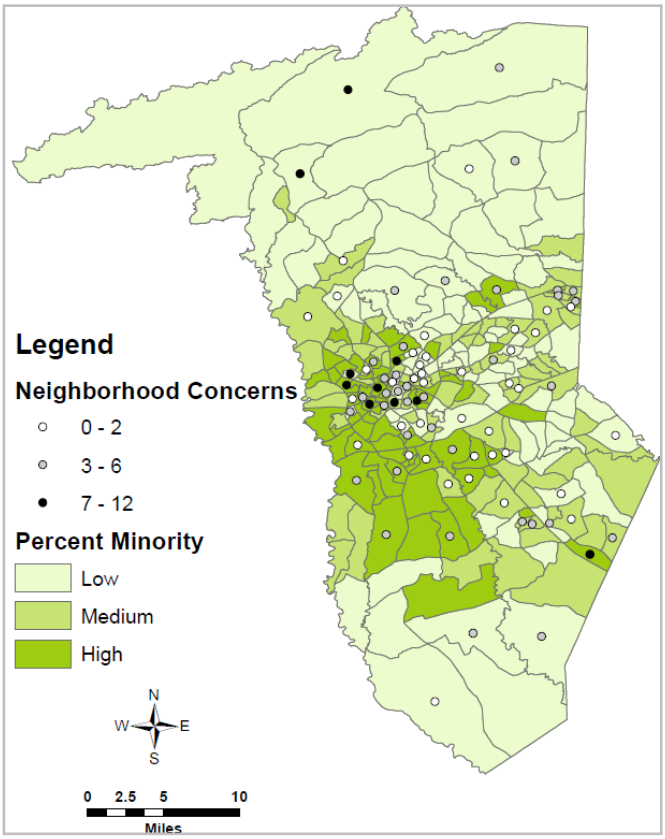


Figure 14A: Number of Neighborhood Concerns per Block Group by Percent Minority 2013

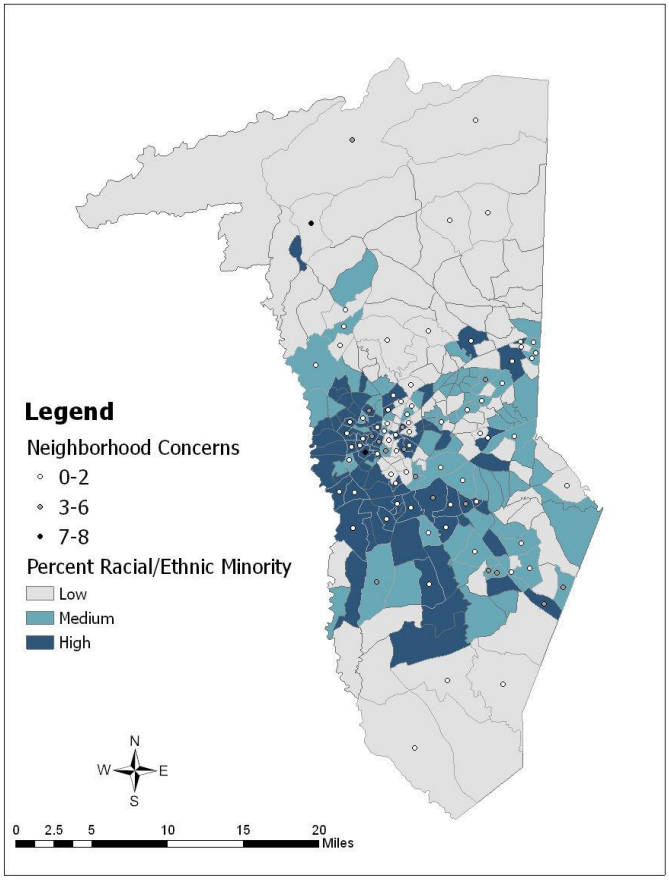


Figure 14B: Number of Neighborhood Concerns per Block Group by Percent Minority 2017

CONCLUSIONS

Study Limitations

The present study provided an overview of how park availability, features, and quality are distributed by income and race/ethnicity in Greenville County in 2013 and 2017. However, the current study had several limitations that should be taken into account. First, the unit of analysis was block groups, which is comparable to several past studies on similar topics. However, other geographic areas, such as census tracts, municipal planning districts, zip codes, or locally-defined neighborhoods may be equally useful for examining these issues. Additionally, we defined parks as being in a block group if they intersected the block group boundary, whereas future research may wish to examine more complex measures of availability and accessibility. Another limitation was that, given our detailed emphasis on local park availability, features, and quality, resources such as state parks, private parks, church facilities, school grounds, and other recreation facilities were not examined. Further, not all of the park facilities and amenities audited could be included in the analyses due to a lack of variability for some (too scarce or non-existent). It is also important to note that in 2013 and 2017 only one-third of the block groups in Greenville County contained parks. Our sample sizes for both points of collection (n=85, n=88) were relatively small for the analyses that considered only block groups that contained parks, which may have limited the ability to detect differences between the groups on factors such as facilities and quality. Additionally, a few extra parks were selected to be included in 2017, and many, but not all, of the same parks that were evaluated in 2013 were also evaluated in 2017. As well, while consistent methods and analyses were applied in 2013 and 2017, the trained research assistants evaluating the parks were different. Finally, for park amenities, we examined multiple groups of features that might support park use and enjoyment (e.g., safety amenities, quality amenities), but not specific individual amenities (e.g., lighting, restrooms). Certainly, opportunities exist to continue to explore how park-related factors vary by socioeconomic status and race/ethnicity in Greenville County and beyond.

Tryon Recreation Center

Park Availability

In 2013, only one third of the block groups in Greenville County contained a minimum of one park that intersected the block group boundary. There were no statistically significant

relationships between the number of parks or park acreage and income or percent racial/ethnic minority group in Greenville County, SC. Nevertheless, approximately two-thirds of the block groups did not have a park present within or intersecting the block group boundary, potentially indicating a need for more park space in many neighborhoods or communities across Greenville County.

By 2017, there was a slight increase in the percentage of block groups in Greenville County that contained a minimum of one park, up from 33.3% in 2013 to 34.5% in 2017. However, no statistically significant relationships between the number of parks or park acreage and income or percent racial/ethnic minority groups were detected in 2017. There is still a need for more parks and park space in certain neighborhoods and communities within Greenville County.

Similar to these findings in Greenville County, other researchers have reported no discrepancies in park availability between areas of differing SES.[21,29,32,33] However, there is an equally substantial body of evidence documenting fewer parks in lower income areas.[14-19] For example, in a study conducted in Los Angeles, there were fewer parks and park acres in areas of the city of lower SES and higher percent minority, leading to greater park pressure (park area per capita) in those neighborhoods.[34] Conversely, other studies have also found that there were more places to engage in physical activity in low SES areas.[22,25] Consequently, it is important to evaluate – and continue to monitor – these issues locally to ensure an equitable distribution of parkland across communities.

Park Facilities

In 2013, study results indicated that there were no differences among block groups of various income and racial/ethnic composition with respect to the total number of individual park facilities (e.g., playgrounds) across Greenville County. However, we did find that high income block groups were more likely to have all park facilities in good condition compared to low income block groups. A similar study conducted in Australia found contradictory results in that there were fewer playgrounds and other facilities and amenities (i.e., bike paths, picnic tables) conducive to children's physical activity in lower SES areas.[24] Research has shown that playgrounds promote higher physical activity intensity and healthier weight status among children[35-39] and that playground quality can vary and that better quality playgrounds promote greater use and physical activity among youth.[40] Therefore, while this report did not analyze which specific facilities were in better or worse condition in high vs. low

College Park

income areas, our results suggest that variations exist overall that warrant attention and possible remediation

Similar to the 2013 results, in 2017, there were no statistically significant differences in the average number of any park facility by both income and percent minority block groups. However, in 2017, both medium and high income block groups and medium and high minority block groups were significantly more likely to have all park facilities be considered in good condition compared to those in low income and low minority block groups. We also saw similar improvements in high minority block groups for a reduction in facility quality concerns. These findings are promising, as a past study found that for those living in high minority neighborhoods, inadequate or poorly maintained facilities were barriers to engaging in park use.[41] Thus, improvements to facility conditions for medium and high minority block groups may promote park use and physical activity.

Park Quality & Neighborhood Concerns

In 2013, there were statistically significant differences across racial/ethnic minority groups for the average number of neighborhood concerns per park, in that high and medium minority block groups were more likely to have a greater number of surrounding neighborhood concerns. As well, though not statistically significant, the results also showed that, on average, low income and high minority block groups possessed more park quality concerns per park and that high income and low minority groups contained more aesthetic features per park. Researchers in Melbourne also found that there were more aesthetic features (i.e., picnic tables, water features, lighting) in higher SES areas,[24] and that the quality of neighborhood resources is a predictor of engaging in more outdoor activities.[35]

Veterans Park

Overall, there were no significant differences detected among income block groups for number of park quality concerns, park aesthetic features, and neighborhood concerns in 2017. However, high and medium percent minority block groups had more park quality concerns than low percent minority block groups. These findings are similar to a previous study, which stated that high minority areas had parks with poorer quality characteristics, including park features and amenities.[42] Environmental justice efforts must take into account not only the availability of parks and the features therein, but also the quality of those resources and their attractiveness for physical and social activity to address health inequities in communities.

This comprehensive study compared park availability, features, and quality by income and the percentage of minority residents across all block groups in Greenville County, South Carolina at two time points (2013 and 2017). We found that there were few discrepancies in availability, features, or quality among block groups when all block groups at an income or minority level were aggregated together. In our analyses, we found that the population of the block group was a significant variable related to the number of parks and park acreage found in block groups, suggesting that population is a significant factor related to park distribution. However, despite the apparent equality in park availability by income and race/ethnicity overall in Greenville County, it is still possible that so-called 'park deserts' exist in particular pockets of the County with respect to park numbers or acreage, features, and/or quality. These could be uncovered with more fine-grained analyses specific to particular areas.

Nevertheless, the overall lack of disparities by income and minority level was encouraging from an environmental justice perspective in that there is relatively equal distribution for number of parks, park acreage, facilities, amenities, and quality across block groups in Greenville County. Certain neighborhoods in Greenville County, many in lower income and/or higher minority areas, have benefitted substantially from the construction of local community centers that contain outdoor park area and amenities that facilitate recreation. Future efforts in Greenville County could assess if such community centers have indeed improved access to indoor and outdoor facilities and enhanced social or physical health of youth and adults in surrounding areas. Moreover, research is needed to examine how disparities in access to quality park environments are associated with physical activity and health and disease outcomes. Continuing to monitor and address any such disparities in low income and high minority areas will help in leveling the playing field to combat the obesity crisis through the provision of equitable environmental supports for all.

Greer City Park

REFERENCES

1. Flegal KM, Carroll MD, Ogden CL, Curtin LR. Prevalence and Trends Among US Adults 1999-2008. JAMA. 2010; *303*3: 325-341.
2. Coogan PF, Cozier YC, Krishnan S, Wise LA, Adams-Campbell LL, Rosenberg L, Palmer JR. Neighborhood socioeconomic status in relation to 10-year weight gain in the Black Women's Health Study. Obesity. 2010; 1810: 2064-2065.
3. Zhang Q, Wang Y. Socioeconomic inequality of obesity in the United States: Do gender, age, and ethnicity matter? Soc Sci Med. 2004; 58: 1171-1180.
4. August KJ, Sorkin, DH. Racial/ethnic disparities in exercise and dietary behaviors of middle-aged and older adults. J Gen Intern Med. 2011; 26: 245-250.
5. Sallis JF, Cervero R, Ascher WW, Henderson K. Kraft, MK, Kerr J. An ecological approach to creating active living communities. Annu Rev Public Health. 2006; 27: 1-26.
6. Bedimo-Rung AL, Mowen AJ, Cohen DA. The significance of parks to physical activity and public health: A conceptual model. Am J Prev Med. 2005; 28: 159-168.
7. Giles-Corti B, Broomhall MH, Knuiman M, Collins C, Douglas K, Ng K, Lange A, Donovan RJ. Increasing walking: How important is distance to, attractiveness, and size of public open space. Am J Prev Med. 2005; 28: 169-176.
8. Kaczynski AT Henderson K A. Environmental correlates of physical activity: A review of evidence about parks and recreation. Leisure Sciences. 2007; 29: 315-354.
9. Kaczynski AT, Potwarka LR, Saelens BE. Association of park size, distance, and features with physical activity in neighborhood parks. Am J Public Health. 2008; 98, 1451-1456.
10. Godbey GC, Caldwell LL, Floyd M, Payne LL. Contributions of leisure studies and recreation and park management research to the active living agenda. Am J Prev Med. 2005; 28: 150-158.
11. Taylor WC, Poston WSC, Jones L, Kraft K. Environmental justice: Obesity, physical activity, and healthy eating. J Phys Act Health. 2005; 3: S30-S54.
12. Macintyre S. The social patterning of exercise behaviours: The role of personal and local resources. Br J Sports Med. 2000; 34: 6.
13. Floyd MF, Taylor WC, Whitt-Glover M. Measurement of park and recreation environments that support physical activity in low-income communities of color: Highlights of challenges and recommendations. Am J Prev Med. 2009; 36: S156-S160.
14. Moore LV, Diez-Roux AV, Evenson KR, McGinn AP, Brines SJ. Availability of recreational resources in minority and low socioeconomic status areas. Am J Prev Med. 2008; 34: 16-22.
15. Powell LM, Slater S, Chaloupka FJ, Harper D. Availability of physical activity-related facilities and neighborhood demographic and socioeconomic characteristics: A national study. Am J Public Health. 2006; 96: 1676-1680.
16. Estabrooks PA, Lee RE, Gyurcsik NC. Resources for physical activity participation: Does availability and accessibility differ by neighborhood socioeconomic status? Ann Behav Med. 2003; 25: 100-104.
17. Gordon-Larsen P, Nelson MC, Page P, Popkin BM. Inequality in the built environment underlies key health disparities in physical activity and obesity. Pediatrics. 2006; 117: 417-424.
18. Talen E. The social equity of urban service distribution: An exploration of park access in Pueblo, Colorado and Macon, Georgia. Urban Geography. 1997; 18: 521-541.

19. Wolch J, Wilson JP, Fehrenbach J. Parks and park funding in Los Angeles: An equity-mapping analysis. Urban Geography. 2005; 26: 4-35.
20. Abercrombie LC, Sallis JF, Conway TL, Frank LD, Saelens BE, Chapman JE. Income and racial disparities in access to public parks and private recreation facilities. Am J Prev Med. 2008; 34: 9-15.
21. Gilliland J, Holmes M, Irwin J, Tucker P. Environmental equity is child's play: Mapping public provision of recreation opportunities in urban neighborhoods. Vulnerable Children and Youth Studies. 2006; 1: 256-268.
22. Lee RE, Cubbin C, Winkleby M. Contribution of neighborhood socioeconomic status and physical activity resources to physical activity among women. J Epidemiol Community Health. 2007; 61: 882-890.
23. Macintyre S, Macdonald L, Ellaway A. Do poorer people have poorer access to local resources and facilities? The distribution of local resources by area deprivation in Glasgow, Scotland. Soc Sci Med. 2008; 67: 900-914.
24. Crawford D, Timperio A, Giles-Corti B, et al. Do features of public open spaces vary according to neighborhood socio-economic status? Health Place. 2008; 14: 889-893.
25. Vaughan, KB, Kaczynski, AT, Wilhelm Stanis, SA, Besenyi, GM, Bergstrom, R, & Heinrich, KM. Exploring the distribution of park availability, features, and quality across Kansas City, Missouri by income and race/ethnicity: An environmental justice investigation. Annals of Behavioral Medicine. 2013; 45(S1), 28-38
26. Smoyer-Tomic KE, Hewko JN, Hodgson MJ. Spatial accessibility and equity of playgrounds in Edmonton, Canada. The Canadian Geographer. 2004; 48: 287-302.
27. Lee RE, Booth KM, Reese-Smith JY, Regan G, Howard HH. The Physical Activity Resource Assessment (PARA) instrument: Evaluating features, amenities and incivilities of physical activity resources in urban neighborhoods. International Journal of Behavioral Nutrition and Physical Activity. 2005; 2: 1-9.
28. U.S. Census Bureau. State and county quick facts; Greenville county, South Carolina. Available at: https://www.census.gov/quickfacts/fact/table/SC/PST045216. Accessed August 1, 2017.
29. United States Census Bureau. Census tracts and block numbering areas. United States Census Bureau, Geography Division. Accessed at: http://www.census.gov/geo/www/cen_tract.html on May 1, 2011.
30. American Community Survey (2011). About the American Community Survey. Accessed at: http://www.census.gov/acs/www/about_the_survey/american_community_survey/ on May 1, 2011.
31. Kaczynski AT, Wilhelm Stanis SA, Besenyi GM. Development and testing of a community stakeholder park audit tool. Accepted for publication in Am J Prev Med. 2012.
32. Nicholls S. Measuring the accessibility and equity of public parks: A case study using GIS. Managing Leisure. 2001; 6: 201-219.
33. Timpiero A, Giles-Corti B, Crawford D, et al. Features of public open spaces and physical activity among children: Findings from the CLAN study. Prev Med. 2008; 47: 514-518.
34. Sister C, Wolch J, Wilson J. Got green? Addressing environmental justice in park provision. GeoJournal. 2010; 75: 229-248.
35. Veitch J, Timperio A, Crawford D, Abbott G, Giles-Corti B, Salmon J. Is the neighborhood environment associated with sedentary behavior outside of school hours among children? Ann Behav Med. 2011; 41: 333-341.

36. Besenyi GB, Wilhelm Stanis SA, Kaczynski AT. Observed physical activity by park setting among youth by gender, age, and race/ethnicity. Presented at the Active Living Research Eighth Annual Conference, February 22-24, 2011, San Diego, CA.
37. Floyd MF, Spengler JO, Maddock JE, Gobster PH, Suau LJ. Park-based physical activity in diverse communities of two United States cities. Am J Prev Med. 2008; 34: 299-305.
38. Potwarka LR, Kaczynski AT, Flack AL. Places to play: Association of park space and facilities with healthy weight status among children. J Community Health. 2008; 33: 344-350.
39. Wilson DK, Kirtland KA, Ainsworth B, Addy CL. Socioeconomic status and perceptions of access and safety for physical activity. Ann Behav Med. 2004; 28: 20-28.
40. Colabianchi N, Kinsella AE, Coulton CJ, & Moore SM. Utilization and physical activity levels at renovated and unrenovated school playgrounds.Preventive Medicine. 2009; 48(2), 140-143.
41. Carlson SA, Brooks JD, Brown DR, Buchner DM. Racial/Ethnic Differences in Perceived Access, Environmental Barriers to Use, and Use of Community Parks. Preventing Chronic Disease. 2010;7(3):A49.
42. Suminski RR, Connolly EK, May LE, Wasserman J, Olvera N, Lee RE. Park Quality in Racial/Ethnic Minority Neighborhoods. Environmental Justice. December 2012, 5(6): 271-278.

APPENDIX A

Community Park Audit Tool

COMMUNITY PARK AUDIT TOOL

Instructions

Before you begin, try to locate a map of the park. Next, review the CPAT training guide and audit tool. It is important to make sure each question and response is clear when you are marking your answer. Then, go to the park and fill out this audit tool. The tool (6 pages) is divided into four sections that focus on different parts of the park. Further instructions are at the top of each section.

Tips for Using the Community Park Audit Tool (CPAT)

- Drive, bike, or walk around the park to get a feel for what's in the park and the neighborhood around the park.
- Questions on the CPAT are grouped in sections in the order that you might come across them in a park. However, you may need to switch between sections or pages as you complete the park audit. Therefore, it is important to look through the tool before you begin.
- When you are finished, go back and make sure you have completed all the sections and questions.
- There is space at the end of each section where you can write down comments as you complete your audit. The margins or back of the page can be used to take notes, but make sure to transfer your comments into the answer spaces.
- If you see anything that requires immediate attention, contact the local parks department.

Section 1: Park Information

Park Name: _____ **Observer Name or ID:** _____

Park Address/Location: _____

Were you able to locate a map for this park? ❑ No ❑ Yes

Was the park easy to find onsite? ❑ No ❑ Somewhat ❑ Yes

Date (m/d/yr): ___ /___ /_____

Temperature: ___ °F **Weather:** ❑ Clear ❑ Partly Cloudy ❑ Rain/Snow

Start Time: _____ am or pm (circle) **End Time:** _____ am or pm (circle) **Length of visit:** ____ min

Comments on Park Information:

Section 2: Access and Surrounding Neighborhood

This section asks about accessing the park and about the neighborhood surrounding the park. Several questions include follow-up responses if you answered yes. There are spaces for comments at the end of the section. **When thinking about the surrounding neighborhood, consider all areas that you can see from inside of the park.**

When rating the access and surrounding neighborhood, please use the following definition:

- **Useable**: everything necessary for use is present and nothing prevents use (e.g., sidewalks are passable)

1. Can the park be accessed for use? (e.g., not locked/fenced, available for activity, etc.) ❑ No ❑ Yes

2. Are there signs that state the following (could be same sign)? *(check all that are present)* ❑ None present
   ❑ Park name ❑ Park hours ❑ Park contact information ❑ Park/facility rental information
   ❑ Park rules ❑ Park map ❑ Rental equipment information ❑ Event/program information

3. How many points of entry does the park have? ❑ More than 5 (or park boundary is open) ❑ 2-5 ❑ Only 1

4. Is there a public transit stop within sight of the park? ❑ No ❑ Yes

5. What types of parking are available for the park? *(check all that are present)*
   ❑ None ❑ Parking Lot ❑ On street parking ❑ Bike rack(s)

6. Are there sidewalks on *any* roads bordering the park? (could be on opposite side of road) ❑ No ❑ Yes
   If yes … Are they useable? ❑ All or most are useable ❑ About half ❑ None or few useable
   If yes … Are there curb cuts and/or ramps on *any* sidewalks bordering or entering the park? ❑ No ❑ Yes

7. Is there an external trail or path connected to the park? ❑ No ❑ Yes
   If yes … Is it useable? ❑ No ❑ Yes

8. Are there bike routes on *any* roads bordering the park? *(check all that are present)*
   ❑ None ❑ Marked bike lane ❑ Bike route sign ❑ Share the road signs/markers

9. Are there nearby traffic signals on *any* roads bordering the park? (e.g., crosswalk, stop light/sign) ❑ No ❑ Yes

10. What are the main land use(s) around the park? *(check all that apply)* ❑ None present
    ❑ Residential ❑ Commercial ❑ Institutional (e.g., school) ❑ Industrial (e.g., warehouse) ❑ Natural

11. Which of the following safety or appearance concerns are present in the neighborhood surrounding the park?
    (check all that are present <u>in the surrounding neighborhood</u> within sight on any side of the park)
    ❑ Poor lighting (e.g., low or no lighting on surrounding neighborhood streets)
    ❑ Graffiti (e.g., markings or paintings that reduce the visual quality of the area)
    ❑ Vandalism (e.g., damaged signs, vehicles, etc.)
    ❑ Excessive litter (e.g., noticeable amounts of trash, broken glass, etc.)
    ❑ Heavy traffic (e.g., steady flow of vehicles)
    ❑ Excessive noise (e.g., noticeable sounds that are unpleasant or annoying)
    ❑ Vacant or unfavorable buildings (e.g., abandoned houses, liquor store)
    ❑ Poorly maintained properties (e.g., overgrown grass, broken windows)
    ❑ Lack of eyes on the street (e.g., absence of people, no houses or store fronts)
    ❑ Evidence of threatening persons or behaviors (e.g., gangs, alcohol/drug use)
    ❑ Other _____
    ❑ None present

Comments on Access or Surrounding Neighborhood Issues:

Section 3: Park Activity Areas

This section asks about the activity areas in the park. For <u>each</u> activity area type:

1. **First, mark the number (#) of areas that are present in the park** (if none, write "0").
2. Then, respond to questions about up to three of those activity areas. If there are more than three areas for a specific activity area type, rate the first three you come across during the audit. If there were no activity areas of that type present in the park, move on to the next type.
3. Finally, use the space provided to note any additional comments about each type of activity area.

When rating the activity areas, please use the following definitions:

- **Useable**: everything necessary for use is present (excluding portable equipment - rackets, balls, etc.) and nothing prevents use (e.g., are there nets up for tennis courts, goals for sport fields, are trails passable, etc.)
- **Good condition**: looks clean and maintained (e.g., minimal rust, graffiti, broken parts; even surface; etc.)

12. Activity Areas	# of Areas	Area 1	Area 2	Area 3
a. Playground	(# :_____)			
Useable		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Good condition		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Distinct areas for different age groups		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Colorful equipment (i.e., 3+ colors)		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Shade cover for some (25%+) of the area		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Benches in/surrounding area		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Fence around area (i.e., half or more)		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Separation or distance from road		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Comments:				
b. Sport Field (football/soccer)	(# :_____)			
Useable		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Good condition		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Comments:				
c. Baseball Field	(# :_____)			
Useable		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Good condition		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Comments:				
d. Swimming Pool	(# :_____)			
Useable		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Good condition		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Comments:				
e. Splash Pad	(# :_____)			
Useable		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Good condition		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Comments:				
f. Basketball Court	(# :_____)			
Useable		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Good condition		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Comments:				
g. Tennis Court	(# :_____)			
Useable		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Good condition		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Comments:				

Activity Areas	# of Areas	Area 1	Area 2	Area 3
h. Volleyball Court	(# :_____)			
Useable		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Good condition		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Comments:				
i. Trail	(# :_____)			
Useable		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Good condition		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Connected to activity areas		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Distance markers/sign		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Benches along trail		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
What is the trail surface? *(check one)*		❑ Paved ❑ Crushed stone ❑ Dirt/mulch	❑ Paved ❑ Crushed stone ❑ Dirt/mulch	❑ Paved ❑ Crushed stone ❑ Dirt/mulch
Comments:				
j. Fitness Equipment/Stations	(# :_____)			
Useable		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Good condition		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Comments:				
k. Skate Park	(# :_____)			
Useable		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Good condition		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Comments:				
l. Off-Leash Dog Park	(# :_____)			
Useable		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Good condition		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Comments:				
m. Open/Green Space	(# :_____)			
Useable		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Good condition		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Comments:				
n. Lake	(# :_____)			
Useable		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Good condition		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Is there a designated swimming area?		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Comments:				
o. Other (*fill in a type description for each*)		_____	_____	_____
Useable		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Good condition		❑ No ❑ Yes	❑ No ❑ Yes	❑ No ❑ Yes
Comments:				

Comments on Park Activity Areas:

Section 4: Park Quality and Safety

This section asks about factors related to comfort and safety when using the park. Several questions include follow-up responses if you answered yes. There are spaces for comments at the end of the section.

When rating the quality and safety features of the park, please use the following definitions:

- **Useable**: everything necessary for use is present and nothing prevents use (e.g., can get into restrooms, drinking fountains work, etc.)
- **Good condition**: looks clean and maintained (e.g., minimal rust, graffiti, broken parts; etc.)

13. Are there public **restroom(s) or portable toilet(s)** at the park? ❑ No ❑ Yes
    If yes …
    Are the restroom(s) useable? ❑ All or most are useable ❑ About half ❑ None or few are useable
    Are they in good condition? ❑ All or most in good condition ❑ About half ❑ None or few in good condition
    Is there a family restroom? ❑ No ❑ Yes
    Is there a baby change station in any restroom? ❑ No ❑ Yes

14. Are there **drinking fountain(s)** at the park? ❑ No ❑ Yes
    If yes …
    How many different fountains are there? (i.e., units, not spouts) _____
    Are the fountains useable? ❑ All or most are useable ❑ About half ❑ None or few are useable
    Are they in good condition? ❑ All or most in good condition ❑ About half ❑ None or few in good condition
    Are they near activity areas? ❑ All or most are near ❑ About half ❑ None or few are near

15. Are there **bench(es)** to sit on in the park? ❑ No ❑ Yes
    If yes …
    Are the benches useable? ❑ All or most are useable ❑ About half ❑ None or few are useable
    Are they in good condition? ❑ All or most in good condition ❑ About half ❑ None or few in good condition

16. Are there **picnic table(s)** in the park? ❑ No ❑ Yes
    If yes …
    Are the tables useable? ❑ All or most are useable ❑ About half ❑ None or few are useable
    Are they in good condition? ❑ All or most in good condition ❑ About half ❑ None or few in good condition
    Is there a picnic shelter in the park? ❑ No ❑ Yes
    Is there a grill or fire pit in the park? ❑ No ❑ Yes

17. Are there **trash cans** in the park? ❑ No ❑ Yes
    If yes …
    Are they overflowing with trash? ❑ All or most overflowing ❑ About half ❑ None or few overflowing
    Are they near activity areas? ❑ All or most are near ❑ About half ❑ None or few are near
    Are recycling containers provided? ❑ No ❑ Yes

18. Is there **food/vending machines** available in the park? ❑ No ❑ Yes
    If yes …
    Are fruits and/or vegetables available in the park? ❑ No ❑ Yes

19. If the sun was directly overhead, how much of the park would be **shaded**? ❑ <25% ❑ 25-75% ❑ >75%

20. Are there **rules posted about animals** in the park? (e.g., dogs must be leashed)? ❑ No ❑ Yes

21. Is there a place to get **dog waste pick up bags** in the park? ❑ No ❑ Yes
    If yes … Are bags available at any of the locations? ❑ No ❑ Yes

22. Are there **lights** in the park? (not including neighborhood street lights) ❑ No ❑ Yes
If yes …
How much of the park could be lit? ❑ <25% ❑ 25-75% ❑ >75%
Are the activity areas lit? ❑ All or most are lit ❑ About half ❑ None or few are lit

23. Is the **park monitored**? (e.g., volunteer or paid staff, patrolled by police, cameras, etc.) ❑ Unsure ❑ Yes

24. Are there **any emergency devices** in the park? (e.g., phone, button, emergency directions) ❑ No ❑ Yes

25. From the center of the park, how **visible is the surrounding neighborhood**? ❑ Fully ❑ Partially ❑ Not at all

26. Are there **road(s)** of any type through the park? ❑ No ❑ Yes
If yes … Are there traffic control mechanisms on the roads within the park? (e.g., crosswalk, stop light or sign, brick road, speed bumps, roundabouts) ❑ No ❑ Yes

27. Which of the following **park quality or safety concerns** are present **in the park**? *(check all that are present)*
- ❑ Graffiti (e.g., markings or paintings that reduce the visual quality of the area)
- ❑ Vandalism (e.g., damaged signs, buildings, equipment, etc.)
- ❑ Excessive litter (e.g., noticeable amounts of trash, broken glass, etc.)
- ❑ Excessive animal waste (e.g., noticeable amounts of dog waste)
- ❑ Excessive noise (e.g., noticeable sounds that are unpleasant or annoying)
- ❑ Poor maintenance (e.g., overgrown grass/weeds/bushes or lack of grass in green areas)
- ❑ Evidence of threatening persons or behaviors (e.g., gangs, alcohol/drug use)
- ❑ Dangerous spots in the park (e.g., abandoned building, pit/hole)
- ❑ Other _____
- ❑ None present

28. What **aesthetic (i.e., beautiful/pleasing) features** are present **in the park**? *(check all that are present)*
- ❑ Evidence of landscaping (e.g., flower beds, pruned bushes)
- ❑ Artistic feature (e.g., statue, sculpture, gazebo, fountain)
- ❑ Historical or educational feature (e.g., monument, nature display, educational signs, etc.)
- ❑ Wooded area (e.g., thick woods or dense trees)
- ❑ Trees throughout the park (e.g., scattered trees)
- ❑ Water feature (e.g., lake, stream, pond)
- ❑ Meadow (e.g., natural, tall grassy area)
- ❑ Other _____
- ❑ None present

Comments on Park Quality and Safety Issues:

Before you are finished, please make you have answered all questions in the tool.

About the Community Park Audit Tool

The Community Park Audit Tool (CPAT) was developed in 2010 in Kansas City, Missouri by Andrew Kaczynski (Kansas State University) and Sonja Wilhelm Stanis (University of Missouri) in collaboration with the City of Kansas City Missouri Parks and Recreation Department. Development of the CPAT was supported by a grant from Active Living Research, a national program of the Robert Wood Johnson Foundation.